**Product Data Sheet**
November 2013
00813-0100-4016, Rev NA

# Rosemount DP Level Transmitters and 1199 Seal Systems

*Applications*

- Level, Flow, Pressure, Interface, Density
- Extreme hot and cold temperatures
- Corrosive, clogging, or viscous processes
- Hygienic requirements
- Special process connections

ROSEMOUNT

EMERSON. Process Management

# Proven, Reliable, and Innovative DP Level Technologies

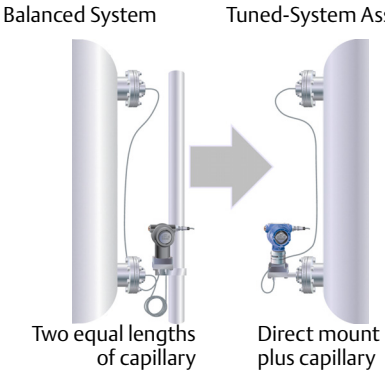
To meet your application requirements, Rosemount DP level technologies deliver an unsurpassed product offering that is easy to specify, order, and install. The offering includes a wide variety of process connections, direct mount or capillary connections, and materials of construction to address almost any application. If you don't see what you need listed here, ask us. We can create a custom engineered solution to meet your needs.

## Rosemount Level Transmitters

Level transmitters combine world-class Rosemount pressure instrumentation with direct-mount seals, all in a single integrated model number.

**Rosemount 3051SAL, 3051L, and 2051L Level Transmitters**

- Achieve best-in-class system reliability with All-Welded systems
- Wireless configurations provide new data access
- Connect to virtually any process with a comprehensive offering of process connections, fill fluids, direct mount or capillary connections, and materials
- Quantify and optimize total system performance with QZ option

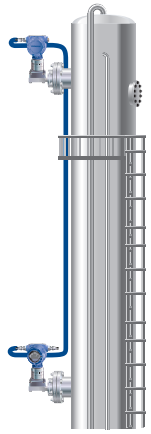



**Rosemount Tuned-System™ Assemblies optimize results**

- Reduce installed costs by 20% by eliminating excess capillary and transmitter mounting hardware
- Improve performance by up to 30%
- Increase response time by up to 80%
- Reduce risk with up-front quantified performance reports

## Rosemount 3051S Electronic Remote Sensor Systems

The Rosemount 3051S ERS System is a new digital DP Level architecture that links two 3051S pressure sensors together electronically. Differential pressure, level, and volume is calculated and transmitted using a standard two-wire 4-20 mA HART signal.



**A Digital Upgrade to a Proven Technology**

- 90% improvement in time response
- Elimination of temperature effects and measurement drift
- MultiVariable capabilities including DP, $P_{LO}$, $P_{HI}$, Volume, and Level
- Proven Rosemount 3051S sensor technology

**Simplified Installations and Maintenance Routines**

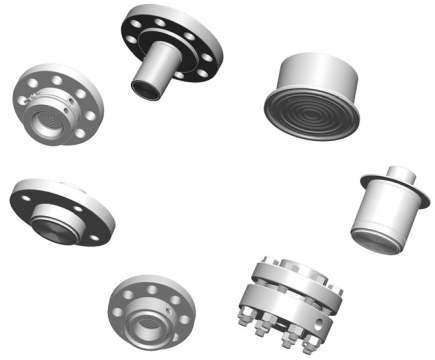
- Elimination of wet legs or dry legs
- Easy installations without need for heat tracing and insulation
- Proactive maintenance and troubleshooting with sensor alerts and diagnostics
- Simplified inventories with sensors and standard cable

## Rosemount 1199 Seal Systems

A seal system consists of a pressure transmitter, one or two seals, a fill fluid, and either a direct mount or capillary style connection. Seal systems provide a reliable process pressure measurement and prevent the process medium from contacting the transmitter diaphragm. Transmitter/diaphragm seal systems should be considered when:

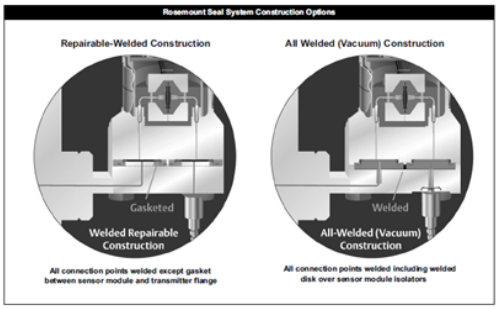
- The process temperature is outside of the operating ranges of the transmitter.
- The process is corrosive and/ or requires specific exotic materials of construction.
- The process contains suspended solids or is viscous and is prone to plugging of connections.
- The application requires the use of flush-mount hygienic connections that facilitates CIP/SIP service.
- There is a requirement for easier cleaning of the process from the connections to avoid contamination between batches.

**Application Flexibility**



- Flanged, threaded, and hygienic process connections
- Meets industry standards such as EN 1092-1, ANSI/ASME B16.5, JIS B2238, ANSI/ASME B1.20.1, EN 10226-1, GOST 12815-80, China Chemical Industrial Standards HG20615 and HG20592, and 3-A Standard 74-03
- Variety of fill fluids including cold temperature (-102 °F / -75 °C), hot temperature (698 °F / 370 °C), and hygienic & food grade
- Three different capillary diameters allow for optimization of accuracy and time response

**Reliable System Construction**



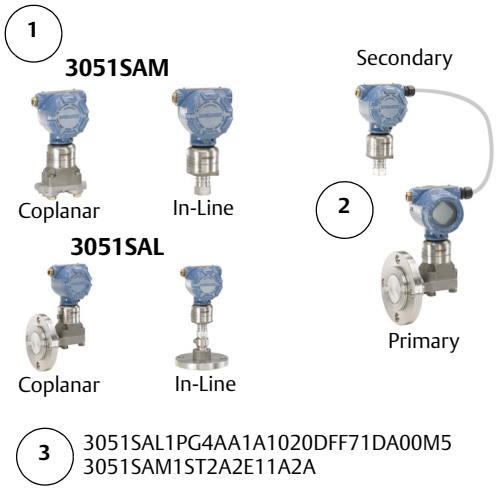

- Welded design with no threaded connections
- 100% Helium leak tested
- Advanced manufacturing techniques ensure air-free, leak-tight system that is stable over time
- Reliable operation in full vacuum applications

**Robust Seal Design**

- Backup convolutions on the diaphragm protect seal integrity
- Recessed diaphragms reduce potential for handling damage

## Contents

# Rosemount 3051S Electronic Remote Sensor System




3 3051SAL1PG4AA1A1020DFF71DA00M5
3051SAM1ST2A2E11A2A

The 3051S ERS™ System is a flexible, 2-wire 4-20 mA HART architecture that calculates differential pressure (DP) electronically using two pressure sensors that are linked together with a non-proprietary electrical wire.

Ideal applications for the 3051S ERS System include tall vessels and distillation columns that have traditionally required long lengths of capillary or impulse piping. When used in these types of applications, the 3051S ERS System can deliver:

- More accurate and repeatable DP measurements
- Faster time response
- Simplified installations
- Reduced maintenance

## How to order

1. Choose two 3051S ERS transmitter models. These may be any combination of 3051SAM and 3051SAL models.
2. Decide which model will be the ERS Primary (4-20 mA loop termination and optional LCD) and which will be the ERS Secondary. This will be specified by the "Configuration Type" code in each model number.
3. Specify two full model numbers per the desired configuration.

**Additional Information**
Specifications: page 101
Certifications: page 119
Dimensional Drawings: page 130

**Rosemount 3051SAM Transmitter for ERS Applications**

- Coplanar and In-Line sensor module platforms
- Variety of process connections including threaded NPT, flanges, manifolds, and 1199 remote seals
- Available with 10-year stability and limited 12-year warranty

### Table 1. 3051SAM Transmitter for ERS Applications Ordering Information

★ The Standard offering represents the most com nd options. The starred options (★) should be selected for best delivery.
The Expanded offering is subject to additional delivery lead time.

| Model | Transmitter Type | |
|---|---|---|
| 3051SAM | Scalable Advanced Measurement Transmitter | |
| **Performance Class(1)** | | |
| **Standard** | | **Standard** |
| 1 | Ultra: 0.025% span accuracy, 200:1 rangedown, 10-year stability, 12-year limited warranty | ★ |
| 2 | Classic: 0.035% span accuracy, 150:1 rangedown, 5-year stability | ★ |

### Table 1. 3051SAM Transmitter for ERS Applications Ordering Information

★ The Standard offering represents the most common models and options. The starred options (★) should be selected for best delivery. The Expanded offering is subject to additional delivery lead time.

| **Configuration Type** | | | | | |
|---|---|---|---|---|---|
| **Standard** | | | | | **Standard** |
| P | Electronic Remote Sensor - Primary | | | | ★ |
| S | Electronic Remote Sensor - Secondary | | | | ★ |
| **Pressure Module Type** | | **Pressure Sensor Type** | | | |
| **Standard** | | | | | **Standard** |
| G | Coplanar | Gage | | | ★ |
| T | In-Line | Gage | | | ★ |
| E | In-Line | Absolute | | | ★ |
| **Expanded** | | | | | |
| A | Coplanar | Absolute | | | |
| **Pressure Range**[(2)] | | | | | |
| | **Coplanar Gage** | **In-Line Gage** | **In-Line Absolute** | **Coplanar Absolute** | |
| **Standard** | | | | | **Standard** |
| 1A | N/A | -14.7 to 30 psig (-1,0 to 2,06 bar) | 0 to 30 psia (0 to 2,06 bar) | 0 to 30 psia (0 to 2,06 bar) | ★ |
| 2A | -250 to 250 inH2O (-623 to 623 mbar) | -14.7 to 150 psig (-1,0 to 10,34 bar) | 0 to 150 psia (0 to 10,34 bar) | 0 to 150 psia (0 to 10,34 bar) | ★ |
| 3A | -393 to 1000 inH2O (-0,98 to 2,49 bar) | -14.7 to 800 psig (-1,0 to 55,2 bar) | 0 to 800 psia (0 to 55,2 bar) | 0 to 800 psia (0 to 55,2 bar) | ★ |
| 4A | -14.2 to 300 psig (-0,98 to 20,7 bar) | -14.7 to 4000 psig (-1,0 to 275,8 bar) | 0 to 4000 psia (0 to 275,8 bar) | 0 to 4000 psia (0 to 275,8 bar) | ★ |
| 5A | -14.2 to 2000 psig (-0,98 to 137,9 bar) | -14.7 to 10000 psig (-1,0 to 689,5 bar) | 0 to 10000 psia (0 to 689,5 bar) | N/A | ★ |
| **Isolating Diaphragm** | | | | | |
| **Standard** | | | | | **Standard** |
| 2[(3)] | 316L SST | | | | ★ |
| 3[(3)] | Alloy C-276 | | | | ★ |
| **Expanded** | | | | | |
| 4[(4)] | Alloy 400 | | | | |
| 5[(4)(5)] | Tantalum | | | | |
| 6[(4)] | Gold-plated Alloy 400 (includes Graphite-Filled PTFE O-Ring) | | | | |
| 7[(4)] | Gold-plated 316L SST | | | | |
| **Process Connection** | | | | | |
| | **Coplanar Module Type** | | **In-Line Module Type** | | |
| **Standard** | | | | | **Standard** |
| 000 | None | | N/A | | ★ |
| A11[(6)] | Assemble to Rosemount 305 Manifold | | Assemble to Rosemount 306 Manifold | | ★ |
| A12[(6)] | Assemble to Rosemount 304 or AMF Manifold with SST Traditional Flange | | N/A | | ★ |
| B11[(6)(7)] | Assemble to One Rosemount 1199 Remote Seal with SST transmitter flange | | Assemble to One Rosemount 1199 Remote Seal | | ★ |
| E11 | Coplanar Flange (CS), ¼-18 NPT, 316 SST Drain Vents | | ½ -14 NPT Female | | ★ |
| E12 | Coplanar Flange (SST), ¼-18 NPT, 316 SST Drain Vents | | N/A | | ★ |
| E13[(3)] | Coplanar Flange (Cast C-276), ¼-18 NPT, Alloy C-276 Drain Vents | | N/A | | ★ |

**Table 1. 3051SAM Transmitter for ERS Applications Ordering Information**

★ The Standard offering represents the most common models and options. The starred options (★) should be selected for best delivery. The Expanded offering is subject to additional delivery lead time.

| **Standard** | | | **Standard** |
|---|---|---|---|
| E14 | Coplanar Flange (Cast Alloy 400), ¼-18 NPT, Alloy 400/K-500 Drain Vents | N/A | ★ |
| E15[3] | Coplanar Flange (SST), ¼-18 NPT, Alloy C-276 Drain Vents | N/A | ★ |
| E16[3] | Coplanar Flange (CS), ¼-18 NPT, Alloy C-276 Drain Vents | N/A | ★ |
| E21 | Coplanar Flange (CS), RC ¼, 316 SST Drain Vents | N/A | ★ |
| E22 | Coplanar Flange (SST), RC ¼, 316 SST Drain Vents | N/A | ★ |
| E23[3] | Coplanar Flange (Cast C-276), RC ¼, Alloy C-276 Drain Vents | N/A | ★ |
| E24 | Coplanar Flange (Cast Alloy 400), RC ¼, alloy 400/K-500 Drain Vents | N/A | ★ |
| E25[3] | Coplanar Flange (SST), RC ¼, Alloy C-276 Drain Vents | N/A | ★ |
| E26[3] | Coplanar Flange (CS), RC ¼, Alloy C-276 Drain Vents | N/A | ★ |
| F12 | Traditional Flange (SST), 1/4-18 NPT, 316 SST Drain Vents | N/A | ★ |
| F13[3] | Traditional Flange (Cast C-276), 1/4-18 NPT, Alloy C-276 Drain Vents | N/A | ★ |
| F14 | Traditional Flange (Cast Alloy 400), 1/4-18 NPT, Alloy 400/K-500 Drain Vents | N/A | ★ |
| F15[3] | Traditional Flange (SST), 1/4-18 NPT, Alloy C-276 Drain Vents | N/A | ★ |
| F22 | Traditional Flange (SST), RC ¼, 316 SST Drain Vents | N/A | ★ |
| F23[3] | Traditional Flange (Cast C-276), RC ¼, Alloy C-276 Drain Vents | N/A | ★ |
| F24 | Traditional Flange (Cast Alloy 400), RC ¼, Alloy 400/K500 Drain Vents | N/A | ★ |
| F25[3] | Traditional Flange (SST), RC ¼, Alloy C-276 Drain Vents | N/A | ★ |
| F52 | DIN-Compliant Traditional Flange (SST), ¼-18 NPT, 316 Drain Vents, 7-16-in. Bolting | N/A | ★ |
| G11 | Vertical Mount Level Flange (SST), 2-in ANSI Class 150, 316 SST Drain Vents | G ½ A DIN 16288 Male (Range 1-4 Only) | ★ |
| G12 | Vertical Mount Level Flange (SST), 2-in ANSI Class 300, 316 SST Drain Vents | N/A | ★ |
| G21 | Vertical Mount Level Flange (SST), 3-in ANSI Class 150, 316 SST Drain Vents | N/A | ★ |
| G22 | Vertical Mount Level Flange (SST), 3-in ANSI Class 300, 316 SST Drain Vents | N/A | ★ |
| G31 | Vertical Mount Level Flange (SST), DIN-DN 50 PN 40, 316 SST Drain Vents | N/A | ★ |
| G41 | Vertical Mount Level Flange (SST), DIN-DN 80 PN 40, 316 SST Drain Vents | N/A | ★ |
| **Expanded** | | | |
| F11 | Traditional Flange (CS), ¼-18 NPT, 316 SST Drain / Vents | Non-Threaded Instrument Flange (I-Flange) (Range 1-4 only) | |
| F32 | Bottom Vent Traditional Flange (SST), ¼-18 NPT, 316 SST Drain Vents | N/A | |
| F42 | Bottom Vent Traditional Flange (SST), RC ¼, 316 SST Drain Vents | N/A | |
| F62 | DIN-Compliant Traditional Flange (316 SST), ¼-18 NPT, 316 Drain Vents, M10 Bolting | N/A | |
| F72 | DIN-Compliant Traditional Flange (316 SST), ¼-18 NPT, 316 Drain Vents, M12 Bolting | N/A | |

### Table 1. 3051SAM Transmitter for ERS Applications Ordering Information

★ The Standard offering represents the most common models and options. The starred options (★) should be selected for best delivery. The Expanded offering is subject to additional delivery lead time.

| **Transmitter Output** | | | | |
|---|---|---|---|---|
| **Standard** | | | | **Standard** |
| A | 4–20 mA with digital signal based on HART protocol | | | ★ |
| **Housing Style** | | **Material** | **Conduit Entry Size** | |
| **Standard** | | | | **Standard** |
| Housings for ERS Primary - Configuration Type code P | | | | |
| 1A | PlantWeb Housing | Aluminum | 1/2–14 NPT | ★ |
| 1B | PlantWeb Housing | Aluminum | M20 x 1.5 (CM 20) | ★ |
| 1J | PlantWeb Housing | SST | 1/2–14 NPT | ★ |
| 1K | PlantWeb Housing | SST | M20 x 1.5 (CM 20) | ★ |
| 2E | Junction Box with Remote Display Output | Aluminum | 1/2–14 NPT | ★ |
| 2F | Junction Box with Remote Display Output | Aluminum | M20 x 1.5 (CM 20) | ★ |
| 2M | Junction Box with Remote Display Output | SST | 1/2–14 NPT | ★ |
| **Standard** | | | | **Standard** |
| Housings for ERS Secondary - Configuration Type code S | | | | |
| 2A | Junction Box | Aluminum | 1/2–14 NPT | ★ |
| 2B | Junction Box | Aluminum | M20 x 1.5 (CM 20) | ★ |
| 2J | Junction Box | SST | 1/2–14 NPT | ★ |
| **Expanded** | | | | |
| Housings for ERS Primary - Configuration Type code P | | | | |
| 1C | PlantWeb Housing | Aluminum | G1/2 | |
| 1L | PlantWeb Housing | SST | G1/2 | |
| 2G | Junction Box with Remote Display Output | Aluminum | G1/2 | |
| Housings for ERS Secondary - Configuration Type code S | | | | |
| 2C | Junction Box | Aluminum | G1/2 | |

## Options (Include with selected model number)

| **Electronic Remote Sensor Connection Cable** | | |
|---|---|---|
| **Standard** | | **Standard** |
| R05 | 50 ft. (15.2 m) Spool of Electronic Remote Sensor Cable | ★ |
| R10 | 100 ft. (30.5 m) Spool of Electronic Remote Sensor Cable | ★ |
| R15 | 150 ft. (45.7m) Spool of Electronic Remote Sensor Cable | ★ |
| **Mounting Bracket** | | |
| **Standard** | | **Standard** |
| B1[(4)] | Traditional flange bracket, CS, 2-in. pipe | ★ |
| B2[(4)] | Traditional flange bracket, CS, panel | ★ |
| B3[(4)] | Traditional flange flat bracket, CS, 2-in. pipe | ★ |
| B4 | Bracket, all SST, 2-in. Pipe and Panel | ★ |
| B7[(4)] | Traditional flange bracket, B1 with SST bolts | ★ |
| B8[(4)] | Traditional flange bracket, B2 with SST bolts | ★ |
| B9[(4)] | Traditional flange bracket, B3 with SST bolts | ★ |
| BA[(4)] | Traditional flange bracket, B1, all SST | ★ |
| BC[(4)] | Traditional flange bracket, B3, all SST | ★ |

### Table 1. 3051SAM Transmitter for ERS Applications Ordering Information

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| **Special Configuration (Software)** | | |
|---|---|---|
| **Standard** | | **Standard** |
| C1[8] | Customer Software Configuration (“Configuration Data Sheet” Must Be Completed) | ★ |
| C3 | Gage Pressure Calibration on Rosemount 3051SAM_ _A4 only | ★ |
| C4[8] | NAMUR Alarm and Saturation Levels, High Alarm | ★ |
| C5[8] | NAMUR Alarm and Saturation Levels, Low Alarm | ★ |
| C6[8] | Custom Alarm and Saturation Levels, High Alarm (Requires C1 and Configuration Data Sheet) | ★ |
| C7[8] | Custom Alarm and Saturation Levels, Low Alarm (Requires C1 and Configuration Data Sheet) | ★ |
| C8[8] | Low alarm (standard Rosemount alarm and saturation levels) | ★ |
| **Special Configuration (Hardware)** | | |
| **Standard** | | **Standard** |
| D2[9] | 1/2-14 NPT Flange Adapters | ★ |
| D4 | External ground screw assembly | ★ |
| D5[9] | Delete transmitter drain/vent valves (install plugs) | ★ |
| **Expanded** | | |
| D7[9] | Coplanar flange without drain/vent ports | |
| D9[9] | RC 1/2 Flange Adapters | |
| **Product Certifications** | | |
| **Standard** | | **Standard** |
| E1 | ATEX Flameproof | ★ |
| I1 | ATEX Intrinsic Safety | ★ |
| N1 | ATEX Type n | ★ |
| K1 | ATEX Flameproof and Intrinsically Safe, Type n, Dust | ★ |
| ND | ATEX Dust | ★ |
| E4 | TIIS Flameproof | ★ |
| E5 | FM Explosion-proof, Dust Ignition-proof | ★ |
| I5 | FM Intrinsically Safe, Division 2 | ★ |
| K5 | FM Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 | ★ |
| E6[10] | CSA Explosion-proof, Dust Ignition-proof, Division 2 | ★ |
| I6 | CSA Intrinsically Safe | ★ |
| K6[10] | CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 | ★ |
| E7 | IECEx Flameproof | ★ |
| I7 | IECEx Intrinsic Safety | ★ |
| N7 | IECEx Type n | ★ |
| K7 | IECEx Flameproof, Intrinsic Safety, Type n | ★ |
| E2 | INMETRO Flameproof | ★ |
| I2 | INMETRO Intrinsically Safe | ★ |
| K2 | INMETRO Flameproof, Intrinsic Safety, Type n | ★ |
| E3 | China Flameproof | ★ |
| I3 | China Intrinsic Safety, Dust Ignition-proof | ★ |
| KA[10] | ATEX and CSA Flameproof, Intrinsically Safe, Division 2 | ★ |
| KB[10] | FM and CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 | ★ |
| KC | FM and ATEX Explosion-proof, Intrinsically Safe, Division 2 | ★ |
| KD[10] | FM, CSA, and ATEX Explosion-proof, Intrinsically Safe | ★ |

### Table 1. 3051SAM Transmitter for ERS Applications Ordering Information

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| | | |
|---|---|---|
| **Special Certifications** | | |
| **Standard** | | **Standard** |
| Q4 | Calibration Certificate | ★ |
| QP | Calibration Certificate and Tamper Evident Seal | ★ |
| **Material Traceability Certification** | | |
| **Standard** | | **Standard** |
| Q8 | Material Traceability Certification per EN 10204 3.1 | ★ |
| **Quality Certification for Safety** | | |
| **Standard** | | **Standard** |
| QS | Prior-use Certificate of FMEDA Data | ★ |
| **Surface Finish Certification** | | |
| **Standard** | | **Standard** |
| Q16[(11)] | Surface Finish Certification for Hygienic Remote Seals | ★ |
| **Toolkit Performance Reports** | | |
| **Standard** | | **Standard** |
| QZ[(12)] | Remote Seal System Performance Calculation Report | ★ |
| **Terminal Blocks** | | |
| **Standard** | | **Standard** |
| T1[(8)] | Transient Terminal Block | ★ |
| **Sensor Fill Fluid** | | |
| **Standard** | | **Standard** |
| L1[(13)] | Inert Sensor Fill Fluid | ★ |
| **O-Ring** | | |
| **Standard** | | **Standard** |
| L2 | Graphite-Filled PTFE O-Ring | ★ |
| **Bolting Material** | | |
| **Standard** | | **Standard** |
| L4[(9)] | Austenitic 316 SST Bolts | ★ |
| L5[(3)(9)] | ASTM A 193, Grade B7M Bolts | ★ |
| L6[(9)] | Alloy K-500 Bolts | ★ |
| L7[(3)(9)] | ASTM A 453, Class D, Grade 660 Bolts | ★ |
| L8[(9)] | ASTM A 193, Class 2, Grade B8M Bolts | ★ |
| **Display Type (ERS Primary Only)** | | |
| **Standard** | | **Standard** |
| M5[(8)] | PlantWeb LCD Display | ★ |
| M7[(8)] | Remote Mount LCD Display and Interface, PlantWeb Housing, No Cable, SST Bracket | ★ |
| M8[(8)] | Remote Mount LCD Display and Interface, PlantWeb Housing, 50 ft. (15.2 m) Cable, SST Bracket | ★ |
| M9[(8)] | Remote Mount LCD Display and Interface, PlantWeb Housing, 100 ft. (30.5 m) Cable, SST Bracket | ★ |
| **Special Procedures** | | |
| **Expanded** | | |
| P1 | Hydrostatic Testing with Certificate | |

### Table 1. 3051SAM Transmitter for ERS Applications Ordering Information

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The Expanded offering is subject to additional delivery lead time.

| | | |
|---|---|---|
| **Special Cleaning** | | |
| **Expanded** | | |
| P2[9] | Cleaning for Special Services | |
| P3[9] | Cleaning for Less than 1 PPM Chlorine/Fluorine | |
| **NACE Certificate** | | |
| **Standard** | | **Standard** |
| Q15[14] | Certificate of Compliance to NACE MRO175/ISO 15156 for wetted materials | ★ |
| Q25[14] | Certificate of Compliance to NACE MRO103 for wetted materials | ★ |
| **Typical Model Number: 3051SAM 1 S T 2A 2 E11 A 2A** | | |

(1) For the 3051SAM with B11 "Assemble to" code for 1199 Remote Seals, use ±0.55% of span for Ultra and ±0.65% of span for Classic performance.

(2) The pressure range should be specified based on the maximum static pressure, not differential pressure.

(3) Materials of Construction comply with metallurgical requirements highlighted within NACE MR 0175 / ISO 15156 for sour oil field production environments. Environmental limits apply to certain materials. Consult latest standard for details. Selected materials also conform to NACE MR 0103 for sour refining environments.

(4) Not available with Pressure Sensor / Module codes T or E.

(5) Tantalum diaphragm material is only available with Pressure Sensor / Module code G.

(6) "Assemble to" items are specified separately and require a completed model number.

(7) Consult an Emerson Process Management representative for performance specifications.

(8) Not available with Configuration Type code S.

(9) Not available with Process Connection code A11.

(10) Not available with M20 or G ½ conduit entry size.

(11) Q16 is only available when the diaphragm seal has surface finish options.

(12) The QZ report quantifies the performance of the entire ERS system. One report is provided per ERS system. The QZ option is specified on the Primary Transmitter (Configuration Type code P).

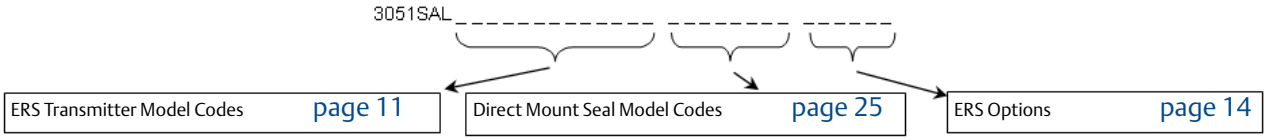
(13) Silicone fill fluid is standard.

(14) NACE wetted compliant materials are identified by footnote (3).

**Rosemount 3051SAL Transmitter for ERS Applications**

- Integrated transmitter and remote seal in a single model number
- Variety of process connections including flanged, threaded, and hygienic remote seals
- Available with 10-year stability and limited 12-year warranty

A 3051SAL Transmitter consists of 3 parts. First, specify the transmitter model codes found on page 11. Then, specify a remote seal found on page 25. Finish the model number by specifying all desired options on page 14.




## Table 2. Rosemount 3051SAL Transmitter for ERS Applications Ordering Information

★ The Standard offering represents the most common models and options. These options should be selected for best delivery.
The Expanded offering is subject to additional delivery lead time.

| **Model** | **Transmitter Type** | | | | |
|---|---|---|---|---|---|
| 3051SAL | Scalable Advanced Level Transmitter | | | | |
| **Performance Class** | | | | | |
| **Standard** | | | | | **Standard** |
| 1 | Ultra: 0.055% span accuracy, 150:1 rangedown, 12-year limited warranty | | | | ★ |
| 2 | Classic: 0.065% span accuracy, 150:1 rangedown | | | | ★ |
| **Configuration Type** | | | | | |
| **Standard** | | | | | **Standard** |
| P | Electronic Remote Sensor - Primary | | | | ★ |
| S | Electronic Remote Sensor - Secondary | | | | ★ |
| **Pressure Module Type** | | **Pressure Sensor Type** | | | |
| **Standard** | | | | | **Standard** |
| G | Coplanar | Gage | | | ★ |
| T | In-Line | Gage | | | ★ |
| E | In-Line | Absolute | | | ★ |
| **Expanded** | | | | | |
| A | Coplanar | Absolute | | | |
| **Pressure Range**[(5)] | | | | | |
| | **Coplanar Gage** | **In-Line Gage** | **In-Line Absolute** | **Coplanar Absolute** | |
| **Standard** | | | | | **Standard** |
| 1A | N/A | -14.7 to 30 psig<br>(-1,0 to 2,06 bar) | 0 to 30 psia<br>(0 to 2,06 bar) | 0 to 30 psia<br>(0 to 2,06 bar) | ★ |
| 2A | -250 to 250 inH2O<br>(-623 to 623 mbar) | -14.7 to 150 psig<br>(-1,0 to 10,34 bar) | 0 to 150 psia<br>(0 to 10,34 bar) | 0 to 150 psia<br>(0 to 10,34 bar) | ★ |
| 3A | -393 to 1000 inH2O<br>(-0,98 to 2,49 bar) | -14.7 to 800 psig<br>(-1,0 to 55,2 bar) | 0 to 800 psia<br>(0 to 55,2 bar) | 0 to 800 psia<br>(0 to 55,2 bar) | ★ |
| 4A | -14.2 to 300 psig<br>(-0,98 to 20,7 bar) | -14.7 to 4000 psig<br>(-1,0 to 275,8 bar) | 0 to 4000 psia<br>(0 to 275,8 bar) | 0 to 4000 psia<br>(0 to 275,8 bar) | ★ |
| 5A | -14.2 to 2000 psig<br>(-0,98 to 137,9 bar) | -14.7 to 10000 psig<br>(-1,0 to 689,5 bar) | 0 to 10000 psia<br>(0 to 689 bar) | N/A | ★ |

### Table 2. Rosemount 3051SAL Transmitter for ERS Applications Ordering Information

★ The Standard offering represents the most common models and options. These options should be selected for best delivery. The Expanded offering is subject to additional delivery lead time.

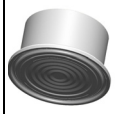
| **Transmitter Output** | | | | |
|---|---|---|---|---|
| **Standard** | | | | **Standard** |
| A | 4-20 mA with Digital Signal Based on HART Protocol | | | ★ |
| **Housing Style** | | **Material** | **Conduit Entry Size** | |
| **Standard** | | | | **Standard** |
| Housings for ERS Primary - Configuration Type code P | | | | |
| 1A | PlantWeb Housing | Aluminum | 1/2–14 NPT | ★ |
| 1B | PlantWeb Housing | Aluminum | M20 x 1.5 (CM 20) | ★ |
| 1J | PlantWeb Housing | SST | 1/2–14 NPT | ★ |
| 1K | PlantWeb Housing | SST | M20 x 1.5 (CM 20) | ★ |
| 2E | Junction Box with Remote Display Output | Aluminum | 1/2–14 NPT | ★ |
| 2F | Junction Box with Remote Display Output | Aluminum | M20 x 1.5 (CM 20) | ★ |
| 2M | Junction Box with Remote Display Output | SST | 1/2–14 NPT | ★ |
| Housings for ERS Secondary - Configuration Type code S | | | | |
| 2A | Junction Box | Aluminum | 1/2–14 NPT | ★ |
| 2B | Junction Box | Aluminum | M20 x 1.5 (CM 20) | ★ |
| 2J | Junction Box | SST | 1/2–14 NPT | ★ |
| **Expanded** | | | | |
| Housings for ERS Primary - Configuration Type code P | | | | |
| 1C | PlantWeb Housing | Aluminum | G1/2 | |
| 1L | PlantWeb Housing | SST | G1/2 | |
| 2G | Junction Box with Remote Display Output | Aluminum | G1/2 | |
| Housings for ERS Secondary - Configuration Type code S | | | | |
| 2C | Junction Box | Aluminum | G1/2 | |
| **Seal System Type** | | | | |
| **Standard** | | | | **Standard** |
| 1 | Direct-Mount Seal System | | | ★ |
| **Direct-Mount Extension (Between Transmitter Flange and Seal)** | | | | |
| **Standard** | | | | **Standard** |
| 0 | No Extension | | | ★ |
| 2 | 2-in. (50 mm) Extension | | | ★ |
| 4 | 4-in. (100 mm) Extension | | | ★ |
| 5 | Thermal Optimizer | | | ★ |
| **Transmitter Reference Pressure Connection** | | | | |
| **Standard** | | | | **Standard** |
| 00 | None (In-Line Style Sensor) | | | ★ |
| 20 | 316L SST Isolator / SST Transmitter Flange | | | ★ |
| 30 | Alloy C-276 Isolator / SST Transmitter Flange | | | ★ |

### Table 2. Rosemount 3051SAL Transmitter for ERS Applications Ordering Information

★ The Standard offering represents the most common models and options. These options should be selected for best delivery.
The Expanded offering is subject to additional delivery lead time.

| Seal Fill Fluid | | Specific Gravity at 77 °F (25 °C) | Temperature Limits[1] | | | | |
|---|---|---|---|---|---|---|---|
| | | | No Extension | 2-in. (50 mm) Extension | 4-in. (100 mm) Extension | Thermal Optimizer | |
| **Standard** | | | | | | | **Standard** |
| D | Silicone 200 | 0.93 | -49 to 401 °F (-45 to 205 °C) | -49 to 401 °F (-45 to 205 °C) | -49 to 401 °F (-45 to 205 °C) | -49 to 401 °F (-45 to 205 °C) | ★ |
| C | Silicone 704 | 1.07 | 32 to 401 °F[2] (0 to 205 °C) | 32 to 464 °F[2] (0 to 240 °C) | 32 to 500 °F[2] (0 to 260 °C) | 32 to 599 °F (0 to 315 °C) | ★ |
| V | Silicone 705 | 1.09 | 68 to 401 °F[2] (20 to 205 °C) | 68 to 464 °F[2] (20 to 240 °C) | 68 to 500 °F[2] (20 to 260 °C) | 68 to 698 °F[2] (20 to 370 °C) | ★ |
| A | Syltherm XLT | 0.85 | -102 to 293 °F (-75 to 145 °C) | -102 to 293 °F (-75 to 145 °C) | -102 to 293 °F (-75 to 145 °C) | -102 to 293 °F (-75 to 145 °C) | ★ |
| H | Inert (Halocarbon) | 1.85 | -49 to 320 °F (-45 to 160 °C) | -49 to 320 °F (-45 to 160 °C) | -49 to 320 °F (-45 to 160 °C) | -49 to 320 °F (-45 to 160 °C) | ★ |
| G[3][4] | Glycerin and Water | 1.13 | 5 to 203 °F (-15 to 95 °C) | 5 to 203 °F (-15 to 95 °C) | 5 to 203 °F (-15 to 95 °C) | 5 to 203 °F (-15 to 95 °C) | ★ |
| N[3] | Neobee M-20 | 0.92 | 5 to 401 °F[2] (-15 to 205 °C) | 5 to 437 °F (-15 to 225 °C) | 5 to 437 °F (-15 to 225 °C) | 5 to 437 °F (-15 to 225 °C) | ★ |
| P[3][4] | Propylene Glycol and Water | 1.02 | 5 to 203 °F (-15 to 95 °C) | 5 to 203 °F (-15 to 95 °C) | 5 to 203 °F (-15 to 95 °C) | 5 to 203 °F (-15 to 95 °C) | ★ |

**Continue specifying a completed model number by choosing a remote seal type below:**

| | | | |
|---|---|---|---|
|  | page 25 | FF Flush Flanged Seal | Process Connections:<br>2 in. / DN 50 / 50A<br>3 in. / DN 80 / 80A<br>4 in. / DN 100 / 100A |
|  | page 27 | EF Extended Flanged Seal | Process Connections:<br>3 in. / DN 80 / 80A<br>4 in. / DN 100 / 100A |
|  | page 28 | RF Remote Flanged Seal | Process Connections:<br>1 in. / DN 25 / 25A<br>1.5 in. / DN 40 / 40A |
|  | page 30 | RT Remote Threaded Seal | Process Connections:<br>¼ - 18 NPT<br>½ - 14 NPT<br>¾ - 14 NPT<br>1 – 11.5 NPT |
|  | page 32 | SC Hygienic Tri-Clamp Seal | Process Connections:<br>1.5 in.<br>2 in.<br>3 in. |
|  | page 33 | SS Hygienic Tank Spud Seal | Process Connections:<br>4 in. |

## Options (Include with selected model number)[1][2][3][4]

| | | |
|---|---|---|
| **Electronic Remote Sensor Connection Cable** | | |
| **Standard**[5] | | **Standard** |
| R05 | 50 ft. (15.2 m) Spool of Electronic Remote Sensor Cable | ★ |
| R10 | 100 ft. (30.5 m) Spool of Electronic Remote Sensor Cable | ★ |
| R15 | 150ft. (45.7m) Spool of Electronic Remote Sensor Cable | ★ |
| **Software Configuration** | | |
| **Standard** | | **Standard** |
| C1[6] | Custom Software Configuration (Requires Configuration Data Sheet) | ★ |
| **Gage Pressure Calibration** | | |
| **Standard** | | **Standard** |
| C3 | Gage Pressure Calibration on Rosemount 3051SAL_ _A4 only | ★ |
| **Alarm Limit** | | |
| **Standard** | | **Standard** |
| C4[6] | NAMUR Alarm and Saturation Levels, High Alarm | ★ |
| C5[6] | NAMUR Alarm and Saturation Levels, Low Alarm | ★ |
| C6[6] | Custom Alarm and Saturation Levels, High Alarm (Requires C1 and Configuration Data Sheet) | ★ |
| C7[6] | Custom Alarm and Saturation Levels, Low Alarm (Requires C1 and Configuration Data Sheet) | ★ |
| C8[6] | Low Alarm (Standard Rosemount Alarm and Saturation Levels) | ★ |
| **Ground Screw** | | |
| **Standard** | | **Standard** |
| D4 | External Ground Screw Assembly | ★ |
| **Conduit Plug** | | |
| **Standard** | | **Standard** |
| DO | 316 SST Conduit Plug | ★ |
| **Product Certifications** | | |
| **Standard** | | **Standard** |
| E1 | ATEX Flameproof | ★ |
| I1 | ATEX Intrinsic Safety | ★ |
| N1 | ATEX Type n | ★ |
| K1 | ATEX Flameproof and Intrinsically Safe, Type n, Dust | ★ |
| ND | ATEX Dust | ★ |
| E4 | TIIS Flameproof | ★ |
| E5 | FM Explosion-proof, Dust Ignition-proof | ★ |
| I5 | FM Intrinsically Safe, Division 2 | ★ |
| K5 | FM Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 | ★ |
| E6[7] | CSA Explosion-proof, Dust Ignition-proof, Division 2 | ★ |
| I6 | CSA Intrinsically Safe | ★ |
| K6[7] | CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 | ★ |
| E7 | IECEx Flameproof | ★ |
| I7 | IECEx Intrinsic Safety | ★ |
| N7 | IECEx Type n | ★ |
| K7 | IECEx Flameproof, Intrinsic Safety, Type n | ★ |
| E2 | INMETRO Flameproof | ★ |
| I2 | INMETRO Intrinsically Safe | ★ |
| K2 | INMETRO Flameproof, Intrinsic Safety, Type n | ★ |
| KA[7] | ATEX and CSA Flameproof, Intrinsically Safe, Division 2 | ★ |
| KB[7] | FM and CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 | ★ |
| KC | FM and ATEX Explosion-proof, Intrinsically Safe, Division 2 | ★ |
| KD[7] | FM, CSA, and ATEX Explosion-proof, Intrinsically Safe | ★ |

| | | |
|---|---|---|
| **Sensor Fill Fluid** | | |
| **Standard** | | **Standard** |
| L1[8] | Inert Sensor Fill Fluid | ★ |
| **O-Ring** | | |
| **Standard** | | **Standard** |
| L2 | Graphite-filled PTFE O-ring | ★ |
| **Bolting Material** | | |
| **Standard** | | **Standard** |
| L4 | Austenitic 316 SST Bolts | ★ |
| L5[9] | ASTM A 193, Grade B7M Bolts | ★ |
| L6 | Alloy K-500 Bolts | ★ |
| L7[9] | ASTM A 453, Class D, Grade 660 Bolts | ★ |
| L8 | ASTM A 193, Class 2, Grade B8M Bolts | ★ |
| **Display Type (ERS Primary Only)** | | |
| **Standard** | | **Standard** |
| M5[6] | PlantWeb LCD Display | ★ |
| M7[6] | Remote Mount LCD Display and Interface, PlantWeb Housing, No Cable, SST Bracket | ★ |
| M8[6] | Remote Mount LCD Display and Interface, PlantWeb Housing, 50 ft. (15.2 m) Cable, SST Bracket | ★ |
| M9[6] | Remote Mount LCD Display and Interface, PlantWeb Housing, 100 ft. (30.5 m) Cable, SST Bracket | ★ |
| **Special Procedures** | | |
| **Pressure Testing** | | |
| **Expanded** | | |
| P1 | Hydrostatic Testing with Certificate | |
| **Special Cleaning** | | |
| **Expanded** | | |
| P2 | Cleaning for Special Services | |
| P3 | Cleaning for Less than 1 PPM Chlorine/Fluorine | |
| **Special Certifications** | | |
| **Calibration Certification** | | |
| **Standard** | | **Standard** |
| Q4 | Calibration Certificate | ★ |
| QP | Calibration certificate with tamper evident seal | ★ |
| **Material Traceability Certification** | | |
| **Standard** | | **Standard** |
| Q8 | Material traceability certification per EN 10204 3.1 | ★ |
| **Quality Certification for Safety** | | |
| **Standard** | | **Standard** |
| QS | Prior-use certificate of FMEDA Data | ★ |
| **Toolkit Performance Reports** | | |
| **Standard** | | **Standard** |
| QZ[10] | Remote Seal System Performance Calculation Report | ★ |
| **Transient Protection** | | |
| **Standard** | | **Standard** |
| T1[6] | Transient Terminal Block | ★ |

| NACE Certificate | | |
|---|---|---|
| **Standard** | | **Standard** |
| Q15[9] | Certificate of Compliance to NACE MRO175/ISO 15156 for wetted materials | ★ |
| Q25[9] | Certificate of Compliance to NACE MRO103 for wetted materials | ★ |
| **Typical Model Number: 3051SAL 1 P G 4A A 1A 1 0 20 D FF 7 1 DA 0 0 M5** | | |

(1) At ambient pressure of 14.7 psia (1 bar-a) and ambient temperature of 70 °F (21 °C). Temperature limits are reduced in vacuum service and may be limited by seal selection.

(2) Maximum process temperature is limited by heat transfer to the transmitter electronics and must be further derated if ambient, temperature exceeds 70 °F (21 °C).

(3) This is a food grade fill fluid.

(4) Not suitable for vacuum applications.

(5) The pressure range should be specified based on the maximum static pressure, not differential pressure.

(6) Not available with Configuration Type code S.

(7) Not available with M20 or G ½ conduit entry size.

(8) Silicone fill fluid is standard.

(9) Materials of construction comply with metallurgical requirements highlighted within NACE MR 0175 / ISO 15156 for sour oil field production environments. Environmental limits apply to certain materials. Consult latest standard for details. Selected materials also conform to NACE MR 0103 for sour refining environments.

(10) The QZ report quantifies the performance of the entire ERS system. One report is provided per ERS system. The QZ option is specified on the Primary Transmitter (Configuration Type code P).

# Rosemount 3051S Scalable Level Transmitter

3051SAL In-Line with "FF" Flanged Seal

3051SAL Coplanar with "SS" Hygienic Tank Spud Seal

Tuned-System Assembly Comprised of 3051SAL with 1199 Flanged Seal

Rosemount 3051S Scalable Level Transmitters combine the features and benefits of a high-performance 3051S pressure transmitter with the durability and reliability of a direct mount seal all in a single model number.

Level transmitters can also be ordered with an additional 1199 Remote Mount Seal to form a Tuned-System Assembly that offers improved performance and reduced costs compared to traditional symmetrical (balanced) assemblies.

Product features and capabilities include:

- Variety of process connections including flanged, threaded, and hygienic seals
- Quantified performance for the entire transmitter / seal assembly (QZ option)
- HART, FOUNDATION fieldbus, and Wireless protocols

**Additional Information**
**Specifications:** page 114
**Dimensional Drawings:** page 130

**Rosemount 3051SAL Scalable Level Transmitter**

A 3051SAL Scalable Level Transmitter consists of 3 parts. First, specify the transmitter model codes found on page 17. Then, specify a remote seal found on page 25. Finish the model number by specifying all desired options on page 20.

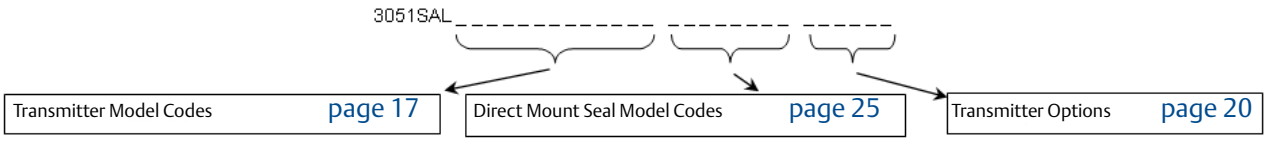



**Table 3. Rosemount 3051SAL Scalable Level Transmitter Ordering Information**

**★ The Standard offering represents the most common models and options. These options should be selected for best delivery.**
**The Expanded offering is subject to additional delivery lead time.**

| Model | Transmitter Type | | |
|---|---|---|---|
| 3051SAL | Scalable Level Transmitter | | |
| **Performance Class** | | | |
| **Standard** | | | **Standard** |
| 1 | Ultra: 0.055% span accuracy, 150:1 rangedown, 12-year limited warranty | | ★ |
| 2 | Classic: 0.065% span accuracy, 150:1 rangedown | | ★ |
| **Configuration Type** | | | |
| **Standard** | | | **Standard** |
| C | Liquid Level Transmitter | | ★ |
| **Pressure Module Type** | | **Pressure Sensor Type** | |
| **Standard** | | | **Standard** |
| D | Coplanar | Differential | ★ |
| G | Coplanar | Gage | ★ |
| T | In-Line | Gage | ★ |
| E | In-Line | Absolute | ★ |
| **Expanded** | | | |
| A | Coplanar | Absolute | |

### Table 3. Rosemount 3051SAL Scalable Level Transmitter Ordering Information

★ **The Standard offering represents the most common models and options. These options should be selected for best delivery.**
**The Expanded offering is subject to additional delivery lead time.**

| **Pressure Range** | | | | | | |
|---|---|---|---|---|---|---|
| | **Coplanar DP** | **Coplanar Gage** | **In-Line Gage** | **In-Line Absolute** | **Coplanar Absolute** | |
| **Standard** | | | | | | **Standard** |
| 1A | N/A | N/A | -14.7 to 30 psig (-1,0 to 2,06 bar) | 0 to 30 psia (0 to 2,06 bar) | 0 to 30 psia (0 to 2,06 bar) | ★ |
| 2A | -250 to 250 inH2O (-623 to 623 mbar) | -250 to 250inH2O (-623 to 623 mbar) | -14.7 to 150 psig (-1,0 to 10,3 bar) | 0 to 150 psia (0 to 10,34 bar) | 0 to 150 psia (0 to 10,34 bar) | ★ |
| 3A | -1000 to 1000 inH2O (-2,5 to 2,5 bar) | -393 to 1000 inH2O (-0,98 to 2,5 bar) | -14.7 to 800 psig (-1,0 to 55,2 bar) | 0 to 800 psia (0 to 55,2 bar) | 0 to 800 psia (0 to 55,2 bar) | ★ |
| 4A | -300 to 300 psi (-20,7 to 20,7 bar) | -14.2 to 300 psig (-0,98 to 20,7 bar) | -14.7 to 4000 psig (-1,0 to 275,8 bar) | 0 to 4000 psia (0 to 275,8 bar) | 0 to 4000 psia (0 to 275,8 bar) | ★ |
| 5A | -2000 to 2000 psi (-137,9 to 137,9 bar) | -14.2 to 2000 psig (-0,98 to 137,9 bar) | -14.7 to 10000 psig (-1,0 to 689 bar) | 0 to 10000 psia (0 to 689 bar) | N/A | ★ |
| **Transmitter Output**[(2)] | | | | | | |
| **Standard** | | | | | | **Standard** |
| A | 4-20 mA with digital signal based on HART protocol | | | | | ★ |
| F[(11)] | FOUNDATION fieldbus protocol | | | | | ★ |
| X[(12)] | Wireless (Requires wireless options and wireless PlantWeb housing) | | | | | ★ |
| **Housing Style** | | | **Material**[(18)] | **Conduit Entry** | | |
| **Standard** | | | | | | **Standard** |
| 1A | PlantWeb housing | | Aluminum | 1/2–14 NPT | | ★ |
| 1B | PlantWeb housing | | Aluminum | M20 x 1.5 | | ★ |
| 1J | PlantWeb housing | | SST | 1/2–14 NPT | | ★ |
| 1K | PlantWeb housing | | SST | M20 x 1.5 | | ★ |
| 2A | Junction Box housing | | Aluminum | 1/2–14 NPT | | ★ |
| 2B | Junction Box housing | | Aluminum | M20 x 1.5 | | ★ |
| 2E | Junction Box with output for remote interface | | Aluminum | 1/2–14 NPT | | ★ |
| 2F | Junction Box with output for remote interface | | Aluminum | M20 x 1.5 | | ★ |
| 2J | Junction Box housing | | SST | 1/2–14 NPT | | ★ |
| 5A[(6)] | Wireless PlantWeb housing | | Aluminum | 1/2–14 NPT | | ★ |
| 5J[(6)] | Wireless PlantWeb housing | | SST | 1/2–14 NPT | | ★ |
| 7J[(13)] | Quick Connect (A size Mini, 4-pin male termination) | | SST | | | ★ |
| **Expanded** | | | | | | |
| 1C | PlantWeb housing | | Aluminum | G1/2 | | |
| 1L | PlantWeb housing | | 316L SST | G1/2 | | |
| 2C | Junction Box housing | | Aluminum | G1/2 | | |
| 2G | Junction Box with output for remote interface | | Aluminum | G1/2 | | |

### Table 3. Rosemount 3051SAL Scalable Level Transmitter Ordering Information

★ **The Standard offering represents the most common models and options. These options should be selected for best delivery.**
**The Expanded offering is subject to additional delivery lead time.**

| **Direct-Mount Extension (Between Transmitter Flange and Seal)** | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Standard** | | | | | | | **Standard** |
| 10 | No Extension | | | | | | ★ |
| 12 | 2-in. (50 mm) Extension | | | | | | ★ |
| 14 | 4-in. (100 mm) Extension | | | | | | ★ |
| 15[5] | Thermal Optimizer | | | | | | ★ |
| **Transmitter Reference Pressure Connection** | | | | | | | |
| **Standard** | | | | | | | **Standard** |
| 00 | None (Inline Module Type Only) | | | | | | ★ |
| 10[14] | Tuned-System Assembly, One Capillary Remote Seal (Requires separate 1199 model number) | | | | | | ★ |
| 20 | 316 L SST Isolator with SST Transmitter Flange | | | | | | ★ |
| 30 | Alloy C-276 Isolator with SST Transmitter Flange | | | | | | ★ |
| **Seal Fill Fluid** | | **Specific Gravity at 77 °F (25 °C)** | **Temperature Limits[1]** | | | | |
| | | | **No Extension** | **2-in. (50 mm) Extension** | **4-in. (100 mm) Extension** | **Thermal Optimizer** | |
| **Standard** | | | | | | | **Standard** |
| D | Silicone 200 | 0.93 | -49 to 401 °F (-45 to 205 °C) | -49 to 401 °F (-45 to 205 °C) | -49 to 401 °F (-45 to 205 °C) | -49 to 401 °F (-45 to 205 °C) | ★ |
| C | Silicone 704 | 1.07 | 32 to 401 °F (0 to 205 °C)[2] | 32 to 464 °F (0 to 240 °C)[2] | 32 to 500 °F (0 to 260 °C)[2] | 32 to 599 °F (0 to 315 °C) | ★ |
| V | Silicone 705 | 1.09 | 68 to 401 °F[2] (20 to 205 °C) | 68 to 464 °F[2] (20 to 240 °C) | 68 to 500 °F[2] (20 to 260 °C) | 68 to 698 °F[2] (20 to 370 °C) | ★ |
| A | Syltherm XLT | 0.85 | -102 to 293 °F (-75 to 145 °C) | -102 to 293 °F (-75 to 145 °C) | 102 to 293 °F (-75 to 145 °C) | 102 to 293 °F (-75 to 145 °C) | ★ |
| H | Inert (Halocarbon) | 1.85 | -49 to 320 °F (-45 to 160 °C) | -49 to 320 °F (-45 to 160 °C) | -49 to 320 °F (-45 to 160 °C) | -49 to 320 °F (-45 to 160 °C) | ★ |
| G[3][4] | Glycerine and Water | 1.13 | 5 to 203 °F (-15 to 95 °C) | 5 to 203 °F (-15 to 95 °C) | 5 to 203 °F (-15 to 95 °C) | 5 to 203 °F (-15 to 95 °C) | ★ |
| N[3] | Neobee M-20 | 0.92 | 5 to 401 °F (-15 to 205 °C)[2] | 5 to 437 °F (-15 to 225 °C) | 5 to 437 °F (-15 to 225 °C) | 5 to 437 °F (-15 to 225 °C) | ★ |
| P[3][4] | Propylene Glycol and Water | 1.02 | 5 to 203 °F (-15 to 95 °C) | 5 to 203 °F (-15 to 95 °C) | 5 to 203 °F (-15 to 95 °C) | 5 to 203 °F (-15 to 95 °C) | ★ |

Continue specifying a completed model number by choosing a remote seal type below:

| | | | |
|---|---|---|---|
|  | page 25 | FF Flush Flanged Seal | Process Connections:<br>2 in. / DN 50 / 50A<br>3 in. / DN 80 / 80A<br>4 in. / DN 100 / 100A |
|  | page 27 | EF Extended Flanged Seal | Process Connections:<br>3 in. / DN 80 / 80A<br>4 in. / DN 100 / 100A |
|  | page 28 | RF Remote Flanged Seal | Process Connections:<br>1 in. / DN 25 / 25A<br>1.5 in. / DN 40 / 40A |
|  | page 30 | RT Remote Threaded Seal | Process Connections:<br>¼ - 18 NPT<br>½ - 14 NPT<br>¾ - 14 NPT<br>1 – 11.5 NPT |
|  | page 32 | SC Hygienic Tri-Clamp Seal | Process Connections:<br>1.5 in.<br>2 in.<br>3 in. |
|  | page 33 | SS Hygienic Tank Spud Seal | Process Connections:<br>4 in. |

## Wireless Options (Requires option code X and wireless PlantWeb housing)[1][2][3][4][5]

| | | |
|---|---|---|
| **Update Rate** | | |
| **Standard**[6] | | **Standard** |
| WA | User Configurable Update Rate | ★ |
| **Operating Frequency and Protocol** | | |
| **Standard**[7] | | **Standard** |
| 3 | 2.4 GHz DSSS, IEC 62591 (WirelessHART) | ★ |
| **Omnidirectional Wireless Antenna** | | |
| **Standard**[8] | | **Standard** |
| WK | External Antenna | ★ |
| WM | Extended Range, External Antenna | ★ |
| **Expanded** | | |
| WN | High-Gain, Remote Antenna | |
| **SmartPower™** | | |
| **Standard**[9] | | **Standard** |
| 1[10] | Adapter for Black Power Module (I.S. Power Module Sold Separately) | ★ |

## Other Options (Include with selected model number)

| | | |
|---|---|---|
| **PlantWeb Control Functionality** | | |
| **Standard** | | **Standard** |
| A01[11][12] | FOUNDATION fieldbus Advanced Control Function Block Suite | ★ |
| **Hardware Adjustments** | | |
| **Standard** | | **Standard** |
| D01[11][12] | FOUNDATION fieldbus Diagnostics Suite | ★ |
| DA2[13] | Advanced HART Diagnostics Suite | ★ |

| | | |
|---|---|---|
| **Software Configuration** | | |
| **Standard**[14] | | **Standard** |
| C1[15] | Custom software configuration (Requires Configuration Data Sheet) | ★ |
| **Gage Pressure Calibration** | | |
| **Standard** | | **Standard** |
| C3 | Gage pressure calibration on Rosemount 3051SAL_ _A4 only | ★ |
| **Alarm Limit** | | |
| **Standard** | | **Standard** |
| C4[11][15] | NAMUR alarm and saturation levels, high alarm | ★ |
| C5[11][15] | NAMUR alarm and saturation levels, low alarm | ★ |
| C6[11][15] | Custom alarm and saturation signal levels, high alarm (Requires C1 and Configuration Data Sheet) | ★ |
| C7[11][15] | Custom alarm and saturation signal levels, low alarm (Requires C1 and Configuration Data Sheet) | ★ |
| C8[11][15] | Low alarm (standard Rosemount alarm and saturation levels) | ★ |
| **Hardware Adjustments** | | |
| **Standard** | | **Standard** |
| D1[11][15][16] | Hardware adjustments (zero, span, alarm, security) | ★ |
| **Flange Adapter** | | |
| **Standard** | | **Standard** |
| D2 | 1/2-14 NPT flange adapter | ★ |
| **Expanded** | | |
| D9 | RC 1/2 SST flange adapter | ★ |
| **Ground Screw** | | |
| **Standard** | | **Standard** |
| D4 | External ground screw assembly | ★ |
| **Drain/Vent Valve** | | |
| **Standard** | | **Standard** |
| D5 | Delete transmitter drain/vent valves (install plugs) | ★ |
| **Conduit Plug** | | |
| **Standard** | | **Standard** |
| DO[17] | 316 SST Conduit Plug | ★ |
| **Product Certifications**[18] | | |
| **Standard** | | **Standard** |
| E1 | ATEX Flameproof | ★ |
| I1 | ATEX Intrinsic Safety | ★ |
| IA | ATEX FISCO Intrinsic Safety (FOUNDATION fieldbus protocol only) | ★ |
| N1 | ATEX Type n | ★ |
| K1 | ATEX Flameproof, Intrinsic Safety, Type n, Dust | ★ |
| ND | ATEX Dust | ★ |
| E4 | TIIS Flameproof | ★ |
| E5 | FM Explosion-proof, Dust Ignition-proof | ★ |
| I5 | FM Intrinsically Safe, Division 2 | ★ |
| IE | FM FISCO Intrinsically Safe (FOUNDATION fieldbus protocol only) | ★ |
| K5 | FM Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 | ★ |
| E6[19] | CSA Explosion-proof, Dust Ignition-proof, Division 2 | ★ |
| I6 | CSA Intrinsically Safe | ★ |
| IF | CSA FISCO Intrinsically Safe (FOUNDATION fieldbus protocol only) | ★ |

| **Standard** | | **Standard** |
|---|---|---|
| K6[19] | CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 | ★ |
| D3[20] | Measurement Canada Accuracy Approval | ★ |
| E7 | IECEx Flameproof, Dust Ignition-proof | ★ |
| I7 | IECEx Intrinsic Safety | ★ |
| IG | IECEx FISCO Intrinsic Safety (FOUNDATION fieldbus protocol only) | ★ |
| N7 | IECEx Type n | ★ |
| K7 | IECEx Flameproof, Dust Ignition-proof, Intrinsic Safety, Type n | ★ |
| E2 | INMETRO Flameproof | ★ |
| I2 | INMETRO Intrinsic Safety | ★ |
| K2 | INMETRO Flameproof, Intrinsic Safety | ★ |
| E3 | China Flameproof | ★ |
| I3 | China Intrinsic Safety, Dust Ignition-proof | ★ |
| KA[19] | ATEX and CSA Flameproof, Intrinsically Safe, Division 2 | ★ |
| KB[19] | FM and CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 | ★ |
| KC | FM and ATEX Explosion-proof, Intrinsically Safe, Division 2 | ★ |
| KD[19] | FM, CSA, and ATEX Explosion-proof, Intrinsically Safe | ★ |
| **Sensor Fill Fluid** | | |
| **Standard** | | **Standard** |
| L1[21] | Inert sensor fill fluid | ★ |
| **O-Ring** | | |
| **Standard** | | **Standard** |
| L2 | Graphite-filled PTFE o-ring | ★ |
| **Bolting Material** | | |
| **Standard** | | **Standard** |
| L4 | Austenitic 316 SST bolts | ★ |
| L5[22] | ASTM A193, Grade B7M bolts | ★ |
| L6 | Alloy K-500 bolts | ★ |
| L7[22] | ASTM A453, Class D, Grade 660 bolts | ★ |
| L8 | ASTM A193, Class 2, Grade B8M bolts | ★ |
| **Display Type[23]** | | |
| **Standard** | | **Standard** |
| M5 | PlantWeb LCD Display | ★ |
| M7[11] | Remote mount LCD display and interface, PlantWeb housing, no cable, SST bracket | ★ |
| M8[11] | Remote mount LCD display and interface, PlantWeb housing, 50 ft. (15 m) cable, SST bracket | ★ |
| M9[11] | Remote mount LCD display and interface, PlantWeb housing, 100 ft. (31 m) cable, SST bracket | ★ |
| **Pressure Testing** | | |
| **Expanded** | | |
| P1 | Hydrostatic testing with certificate | |
| **Special Cleaning** | | |
| **Expanded** | | |
| P2 | Cleaning for special services | |
| P3 | Cleaning for less than 1PPM Chlorine/Fluorine | |
| **Calibration Certification** | | |
| **Standard** | | **Standard** |
| Q4 | Calibration certificate | ★ |
| QP | Calibration certificate and tamper evident seal | ★ |

| | | |
|---|---|---|
| **Material Traceability Certification** | | |
| **Standard** | | **Standard** |
| Q8 | Material traceability certification per EN 10204 3.1 | ★ |
| **Quality Certification for Safety** | | |
| **Standard** | | **Standard** |
| QS[11][15] | Prior-use certificate of FMEDA Data | ★ |
| QT[24] | Safety-certified to IEC 61508 with certificate of FMEDA data | ★ |
| **Toolkit Performance Reports** | | |
| **Standard** | | **Standard** |
| QZ | Remote Seal System Performance Calculation Report | ★ |
| **Transient Protection** | | |
| **Standard** | | **Standard** |
| T1[25][26] | Transient terminal block | ★ |
| **Conduit Electrical Connector** | | |
| **Standard** | | **Standard** |
| GE[27] | M12, 4-pin, Male Connector (*eurofast*®) | ★ |
| GM[27] | A size Mini, 4-pin, Male Connector (*minifast*®) | ★ |
| **NACE Certificate** | | |
| **Standard** | | **Standard** |
| Q15[22] | Certificate of Compliance to NACE MRO175/ISO 15156 for wetted materials | ★ |
| Q25 | Certificate of Compliance to NACE MRO103 for wetted materials | ★ |
| **Typical Model Number: 3051SAL 1 C G 2A A 1A 10 20 D FF G 1 DA 0 0** | | |

(1) At ambient pressure of 14.7 psia (1 bar-a) and ambient temperature of 70 °F (21 °C). Temperature limits are reduced in vacuum service and may be limited by seal selection.

(2) Maximum process temperature is limited by heat transfer to the transmitter and must be further derated if ambient, temperature exceeds 70 °F (21 °C). See "" on page 107 for more information.

(3) This is a food grade fill fluid.

(4) Not suitable for vacuum applications.

(5) Only available with In-line style gage and absolute transmitters (Option codes T and E).

(6) Only available with output code X.

(7) Long-Life Power Module must be shipped separately, order Part #00753-9220-0001.

(8) Only available with output code X.

(9) Not available with output code A.

(10) Requires PlantWeb housing and Output code A. Includes Hardware Adjustments as standard.

(11) Requires PlantWeb housing.

(12) Available approvals are FM Intrinsically Safe, Division 2 (option code I5), CSA Intrinsically Safe (option code I6), ATEX Intrinsic Safety (option code I1), and IECEx Intrinsic Safety (option code I7).

(13) Available with output code A only. Available approvals are FM Intrinsically Safe, Division 2 (option code I5), ATEX Intrinsic Safety (option code I1), or IECEx Intrinsic Safety (option code I7). Contact an Emerson Process Management representative for additional information.

(14) With option code 10, user must select Seal Location option code M in Table 7 of Rosemount DP Level PDS.

(15) Not available with output code F.

(16) Transmitter is shipped with 316 SST conduit plug (uninstalled) in place of carbon steel conduit plug.

(17) Not available with housing style codes 2E, 2F, 2G, 2M, 5A, 5J, or 7J.

(18) Valid when SuperModule Platform and housing have equivalent approvals.

(19) Not available with M20 or G ½ conduit entry size.

(20) Requires PlantWeb housing and Hardware Adjustments option code D1. Limited availability depending on transmitter type and range. Contact an Emerson Process Management representative for additional information.

(21) Silicone fill fluid is standard.

(22) Materials of construction comply with metallurgical requirements highlighted within NACE MR0175 / ISO 15156 for sour oil field production environments. Environmental limits apply to certain materials. Consult latest standard for details. Selected materials also conform to NACE MR 0103 for sour refining environments.

(23) Not available with Housing code 01 or 7J.

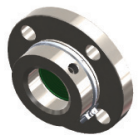
(24) Not available with output code F or X. Not available with housing code 01 or 7J.

(25) Not available with Housing code 00, 01, 5A, or 7J.

(26) The T1 option is not needed with FISCO Product Certifications; transient protection is included in the FISCO product certification codes IA, IE, IF, and IG.

(27) Not available with Housing code 00, 01, 5A, or 7J. Available with Intrinsically Safe approvals only. For FM Intrinsically Safe, Division 2 (option code I5) or FM FISCO Intrinsically Safe (option code IE), install in accordance with Rosemount drawing 03151-1009 to maintain outdoor rating (NEMA 4X and IP66).

# Direct Mount Seals for 3051SAL



**Flush Flanged (FF) Seal**

- Most common seal
- Good for use in general applications
- Easy installation on flanged connections ranging from 2-in. (DN 50) to 4-in. (DN 100)

### Table 4. Flush Flanged (FF) Seal Ordering Information

★ The Standard offering represents the most common models and options. These options should be selected for best delivery.
The Expanded offering is subject to additional delivery lead time.

| Model | Process Connection | | | |
|---|---|---|---|---|
| FF | Flush Flanged Seal | | | |
| **Process Connection Size** | | | | |
| **Standard** | | | | **Standard** |
| G | 2-in. / DN 50 / 50A | | | ★ |
| 7 | 3-in. / 80A | | | ★ |
| J | DN 80 | | | ★ |
| 9 | 4-in. / DN 100 / 100A | | | ★ |
| **Flange / Pressure Rating** | | | | |
| **Standard** | | | | **Standard** |
| 1 | ANSI/ASME B16.5 Class 150 | | | ★ |
| 2 | ANSI/ASME B16.5 Class 300 | | | ★ |
| 4 | ANSI/ASME B16.5 Class 600 | | | ★ |
| G | PN 40 per EN 1092-1 | | | ★ |
| **Expanded** | | | | |
| A | 10K per JIS B2238 | | | |
| B | 20K per JIS B2238 | | | |
| D | 40K per JIS B2238 | | | |
| E | PN 10/16 per EN 1092-1, Available with DN 100 only | | | |
| **Materials of Construction** | | | | |
| | **Isolating Diaphragm** | **Upper Housing** | **Flange** | |
| **Standard** | | | | **Standard** |
| CA | 316L SST | 316L SST | CS | ★ |
| DA | 316L SST | 316L SST | 316 SST | ★ |
| CB[(1)] | Alloy C-276, seam welded | 316L SST | CS | ★ |
| DB[(1)] | Alloy C-276, seam welded | 316L SST | 316 SST | ★ |
| CC | Tantalum, seam welded | 316L SST | CS | ★ |
| DC | Tantalum, seam welded | 316L SST | 316 SST | ★ |
| **Flushing Connection Ring (Lower Housing)[(2)]** | | | | |
| **Standard** | | | | **Standard** |
| 0 | None | | | ★ |
| A | 316 SST | | | ★ |
| B | Alloy C-276 | | | ★ |
| **Flushing Connection Quantity & Size** | | | | |
| **Standard** | | | | **Standard** |
| 0 | None | | | ★ |
| 1 | One 1/4-18 NPT Flushing Connection | | | ★ |
| 3 | Two 1/4-18 NPT Flushing Connections | | | ★ |
| 7 | One 1/2-14 NPT Flushing Connection | | | ★ |
| 9 | Two 1/2-14 NPT Flushing Connections | | | ★ |

### Table 4. Flush Flanged (FF) Seal Ordering Information

★ The Standard offering represents the most common models and options. These options should be selected for best delivery.
The Expanded offering is subject to additional delivery lead time.

**Options (Include with selected model number)**

| | | |
|---|---|---|
| **Cold Temperature Remote Seal Applications** | | |
| **Expanded** | | |
| SB | Extra Fill Fluid for Cold Temperature Applications | |
| **Remote Seal Diaphragm Thickness** | | |
| **Expanded** | | |
| SC[3] | 0.006-in. (150 ì m) Diaphragm Thickness | |
| **Flushing Connection Ring Plugs** | | |
| **Standard** | | **Standard** |
| SD | Alloy C-276 Plug(s) for Flushing Connection(s) | ★ |
| SG | SST Plug(s) for Flushing Connection(s) | ★ |
| SH | SST Drain / Vent(s) for Flushing Connection(s) | ★ |
| **Flushing Connection Ring Gaskets** | | |
| **Expanded** | | |
| SJ | PTFE Gasket | |
| SK | Barium Sulfate-Filled PTFE Gasket | |
| SN | Grafoil Gasket | |
| **Additional Options** | | |
| **Expanded** | | |
| SZ[3] | 0.0002-in. (5 µ m) Gold Plated Diaphragm | |
| SV | PTFE Coated Diaphragm for Non-Stick Purposes | |

Complete the 3051SAL model number by specifying options as needed:

| | | |
|---|---|---|
| page 14 | ERS Transmitter Options | |
| page 20 | Scalable Level Transmitter Options | |

(1) Not available with option code SC.

(2) Supplied with Thermo Tork TN9000 gasket.

(3) Not available with Tantalum diaphragms (Material of Construction codes CC and DC).

**Extended Flanged (EF) Seal**

- Good for use in viscous applications with plugging issues
- Seal diaphragm installed flush with inner tank wall to prevent process plugging
- Easy installation on 3-in. (DN 80) and 4-in. (DN 100) flanged connections

### Table 5. Extended Flanged (EF) Seal Ordering Information

★ The Standard offering represents the most common models and options. These options should be selected for best delivery.
The Expanded offering is subject to additional delivery lead time.

| Model | Process Connection | | | |
|---|---|---|---|---|
| EF | Extended Flanged Seal | | | |
| **Process Connection Size** | | | | |
| **Standard** | | | | **Standard** |
| 7 | 3-in. / DN 80 / 80A | | | ★ |
| 9 | 4-in. / DN 100 / 100A | | | ★ |
| **Flange / Pressure Rating** | | | | |
| **Standard** | | | | **Standard** |
| 1 | ANSI/ASME B16.5 Class 150 | | | ★ |
| 2 | ANSI/ASME B16.5 Class 300 | | | ★ |
| 4 | ANSI/ASME B16.5 Class 600 | | | ★ |
| G | PN 40 per EN 1092-1 | | | ★ |
| **Expanded** | | | | |
| A | 10K per JIS B2238 | | | |
| B | 20K per JIS B2238 | | | |
| D | 40K per JIS B2238 | | | |
| E | PN 10/16 per EN 1092-1, Available with DN 100 only | | | |
| **Materials of Construction** | | | | |
| | **Isolating Diaphragm** | **Extension / Gasket Surface** | **Mounting Flange** | |
| **Standard** | | | | **Standard** |
| CA | 316L SST | 316L SST | CS | ★ |
| DA | 316L SST | 316L SST | 316 SST | ★ |
| CB | Alloy C-276 | Alloy C-276 | CS | ★ |
| DB | Alloy C-276 | Alloy C-276 | 316 SST | ★ |
| **Seal Extension Length** | | | | |
| **Standard** | | | | **Standard** |
| 20 | 2-in. (50 mm) | | | ★ |
| 40 | 4-in. (100 mm) | | | ★ |
| 60 | 6-in. (150 mm) | | | ★ |

### Options (Include with selected model number)

| | | |
|---|---|---|
| **Cold Temperature Remote Seal Applications** | | |
| **Standard** | | **Standard** |
| SB | Extra Fill Fluid for Cold Temperature Applications | ★ |
| **Remote Seal Diaphragm Thickness** | | |
| **Expanded** | | |
| SC | 0.006-in. (150 ì m) Diaphragm Thickness | |
| **Remote Seal Diaphragm Coating** | | |
| **Expanded** | | |
| SZ | 0.0002-in. (5 µ m) Gold Plated Diaphragm | |
| SV | PTFE Coated Diaphragm for Non-Stick Purposes | |

Complete the 3051SAL model number by specifying options as needed:

| | | |
|---|---|---|
| page 14 | ERS Transmitter Options | |
| page 20 | Scalable Level Transmitter Options | |

**Remote Flanged (RF) Seal**

- Designed to improve performance on smaller process connections
- Easy installation on flanged connections ranging from 1-in. to 1.5-in. (DN 50 – DN 40)
- Lower housing / flushing ring required

### Table 6. Remote Flanged (RF) Seal Ordering Information

★ The Standard offering represents the most common models and options. These options should be selected for best delivery. The Expanded offering is subject to additional delivery lead time.

| Model | Process Connection | | | |
|---|---|---|---|---|
| RF | Remote Flanged Seal | | | |
| **Process Connection Size** | | | | |
| **Standard** | | | | **Standard** |
| 2 | 1-in. / 25A | | | ★ |
| 4 | 1.5-in. / 40A | | | ★ |
| D | DN 25 | | | ★ |
| F | DN 40 | | | ★ |
| **Flange / Pressure Rating** | | | | |
| **Standard** | | | | **Standard** |
| 1 | ANSI/ASME B16.5 Class 150 | | | ★ |
| 2 | ANSI/ASME B16.5 Class 300 | | | ★ |
| 4 | ANSI/ASME B16.5 Class 600 | | | ★ |
| G | PN 40 per EN 1092-1 | | | ★ |
| **Expanded** | | | | |
| A | 10K per JIS B2238 | | | |
| B | 20K per JIS B2238 | | | |
| D | 40K per JIS B2238 | | | |
| **Materials of Construction** | | | | |
| | **Isolating Diaphragm** | **Upper Housing** | **Flange** | |
| **Standard** | | | | **Standard** |
| CA | 316L SST | 316L SST | CS | ★ |
| DA | 316L SST | 316L SST | 316 SST | ★ |
| CB | Alloy C-276 | 316L SST | CS | ★ |
| DB | Alloy C-276 | 316L SST | 316 SST | ★ |
| CC | Tantalum | 316L SST | CS | ★ |
| DC | Tantalum | 316L SST | 316 SST | ★ |
| **Flushing Connection Ring Material (Lower Housing)[(1)]** | | | | |
| **Standard** | | | | **Standard** |
| A | 316L SST | | | ★ |
| B | Alloy C-276 | | | ★ |
| D | Plated CS | | | ★ |
| **Number of Flushing Connections** | | | | |
| **Standard** | | | | **Standard** |
| 1 | One ¼-18 NPT Flushing Connection | | | ★ |
| 3 | Two ¼-18 NPT Flushing Connections | | | ★ |
| 5 | None | | | ★ |

### Table 6. Remote Flanged (RF) Seal Ordering Information

★ The Standard offering represents the most common models and options. These options should be selected for best delivery.
The Expanded offering is subject to additional delivery lead time.

**Options (Include with selected model number)**

| | | |
|---|---|---|
| **Remote Seal Diaphragm Thickness** | | |
| **Standard** | | **Standard** |
| SB | Extra Fill Fluid for Cold Temperature Applications | ★ |
| **Remote Seal Diaphragm Thickness** | | |
| **Expanded** | | |
| SC[2] | 0.006-in. (150 ì m) Diaphragm Thickness | |
| **Remote Seal Flushing Connection Plug, Drain/Vent** | | |
| **Standard** | | **Standard** |
| SD | Alloy C-276 Plug(s) for Flushing Connection(s) | ★ |
| SG | 316 SST Plug(s) for Flushing Connection(s) | ★ |
| SH | 316 SST Drain / Vent(s) for Flushing Connection(s) | ★ |
| **Remote Seal Gasket Material** | | |
| **Standard** | | **Standard** |
| SJ | PTFE Gasket (for use with Flushing Connection Ring) | ★ |
| **Expanded** | | |
| SK | Barium Sulfate-Filled PTFE Gasket (for use with Flushing Connection Ring) | |
| SN | Grafoil Gasket (for use with Flushing Connection Ring) | |
| **Remote Seal Diaphragm Coating** | | |
| **Expanded** | | |
| SZ[2] | 0.0002-in. (5 µ m) Gold Plated Diaphragm | |
| SV | PTFE Coated Diaphragm for Non-Stick Purposes | |

Complete the 3051SAL model number by specifying options as needed:

| | | |
|---|---|---|
| page 14 | ERS Transmitter Options | |
| page 20 | Scalable Level Transmitter Options | |

(1) Supplied with C4401 Aramid fiber gasket.

(2) Not available with Tantalum diaphragms (Material of Construction codes CC and DC).

**Remote Threaded (RT) Seal**

- For use with threaded process connections ($^1/_4$-18 to 1-11.5 NPT)
- Rated for use in high-pressure applications (up to 2500 PSI)
- Optional flushing connections available

### Table 7. RT Threaded Seal Ordering Information

**★ The Standard offering represents the most common models and options. These options should be selected for best delivery.**
**The Expanded offering is subject to additional delivery lead time.**

| **Process Connection Style** | | | | |
|---|---|---|---|---|
| **Standard** | | | | **Standard** |
| RT | Remote Threaded Seal | | | ★ |
| **Process Connection Size** | | | | |
| **Standard** | | | | **Standard** |
| 3 | $^1/_2$-14 NPT | | | ★ |
| 4 | $^3/_4$-14 NPT | | | ★ |
| 5 | 1-11.5 NPT | | | ★ |
| **Expanded** | | | | |
| 1 | $^1/_4$-18 NPT | | | |
| **Pressure Rating** | | | | |
| **Standard** | | | | **Standard** |
| 0 | 2500 psi | | | ★ |
| **Isolating Diaphragm Material** | | **Upper Housing Material** | **Flange** | |
| **Standard** | | | | **Standard** |
| CA | 316L SST | 316L SST | CS | ★ |
| DA | 316L SST | 316L SST | 316 SST | ★ |
| CB | Alloy C-276 | 316L SST | CS | ★ |
| DB | Alloy C-276 | 316L SST | 316 SST | ★ |
| CC | Tantalum | 316L SST | CS | ★ |
| DC | Tantalum | 316L SST | 316 SST | ★ |
| **Flushing Connection Ring Material (Lower Housing)**[(1) (2)] | | | | |
| **Standard** | | | | **Standard** |
| A | 316L SST | | | ★ |
| B | Alloy C-276 | | | ★ |
| **Expanded** | | | | |
| D | Plated CS | | | |
| **Number of Flushing Connections** | | | | |
| **Standard** | | | | **Standard** |
| 1 | One $^1/_4$-in. Flushing Connection | | | ★ |
| 3 | Two $^1/_4$-in. Flushing Connections | | | ★ |
| 5 | No Flushing Connection | | | ★ |

### Table 7. RT Threaded Seal Ordering Information

**★ The Standard offering represents the most common models and options. These options should be selected for best delivery.**

**The Expanded offering is subject to additional delivery lead time.**

**Options (Include with selected model number)**

| | | |
|---|---|---|
| **Remote Seal Diaphragm Thickness** | | |
| **Standard** | | **Standard** |
| SB | Extra Fill Fluid for Cold Temperature Applications | ★ |
| **Remote Seal Diaphragm Thickness** | | |
| **Expanded** | | |
| SC(3) | 0.006-in. (150 ì m) Diaphragm Thickness | |
| **Remote Seal Flushing Plug, Drain/Vent** | | |
| **Standard** | | **Standard** |
| SD | Alloy C-276 Plug(s) for Flushing Connection(s) | ★ |
| SG | 316 SST Plug(s) for Flushing Connection(s) | ★ |
| SH | 316 SST Drain / Vent(s) for Flushing Connection(s) | ★ |
| **Remote Seal Gasket Material** | | |
| **Standard** | | **Standard** |
| SJ | PTFE Gasket (for use with Flushing Connection Ring) | ★ |
| SN | Grafoil Gasket (for use with Flushing Connection Ring) | ★ |
| SR | Ethylene Propylene Gasket (for use with Flushing Connection Ring) | ★ |
| **Expanded** | | |
| SK | Barium Sulfate-Filled PTFE Gasket (for use with Flushing Connection Ring) | |
| **Remote Seal Bolt** | | |
| **Standard** | | **Standard** |
| S3 | 304 SST Bolts | ★ |
| **Expanded** | | |
| S4 | 316 SST Bolts | |
| **Remote Seal Diaphragm Coating** | | |
| **Expanded** | | |
| SZ(3) | 0.0002-in. (5 µ m) Gold Plated Diaphragm | |
| SV | PTFE Coated Diaphragm for Non-Stick Purposes | |

Complete the 3051SAL model number by specifying options as needed:

| | | |
|---|---|---|
| page 14 | ERS Transmitter Options | |
| page 20 | Scalable Level Transmitter Options | |

(1) Supplied with C4401 aramid fiber gasket.

(2) Flushing Connection Ring/ Lower Housing assembly bolts provided as standard are carbon steel.

(3) Not available with Tantalum diaphragms (Material of Construction codes CC and DC).

**Hygienic Tri-Clamp (SC) Seal**

- Good for use in hygienic applications
- Easy installation on Tri-Clover style Tri-Clamp® connections (1.5-in. to 3-in.)
- Conforms to 3-A standard 74-03
-

### Table 8. SC Hygienic Tri-Clover Style Tri-Clamp Seal Ordering Information

**★ The Standard offering represents the most common models and options. These options should be selected for best delivery.**
**The Expanded offering is subject to additional delivery lead time.**

| | | | |
|---|---|---|---|
| **Process Connection** | | | |
| **Standard** | | | **Standard** |
| SC(1) | Tri-Clover Style Tri-Clamp Seal | | ★ |
| **Process Connection Size** | | | |
| **Standard** | | | **Standard** |
| 3(2) | 1½ in. | | ★ |
| 5(3) | 2 in. | | ★ |
| 7 | 3 in. | | ★ |
| **Maximum Working Pressure** | | | |
| **Standard** | | | **Standard** |
| 0 | 1000 PSI | | ★ |
| **Isolating Diaphragm Material** | | **Upper Housing Material** | |
| **Standard** | | | **Standard** |
| LA00 | 316L SST | 316L SST | ★ |
| **Expanded** | | | |
| LB00 | Alloy C-276 | 316L SST | |

### Options (Include with selected model number)

| | | |
|---|---|---|
| **Remote Seal Diaphragm Polishing** | | |
| **Expanded** | | |
| R6 | Electropolishing | |
| **Remote Seal Diaphragm Surface Finish** | | |
| **Expanded** | | |
| RD | 10 µin. (0.25 µm) $R_a$ Diaphragm Surface Finish | |
| RG | 15 µin. (0.375 µm) $R_a$ Diaphragm Surface Finish | |
| RH | 20 µin. (0.5 µm) $R_a$ Diaphragm Surface Finish | |
| **Surface Finish Certification** | | |
| **Standard** | | **Standard** |
| Q16(4) | Surface Finish Certification for Hygienic Remote Seals | ★ |

Complete the 3051SAL model number by specifying options as needed:

| | |
|---|---|
| page 14 | ERS Transmitter Options |
| page 20 | Scalable Level Transmitter Options |

(1) Clamp and gasket furnished by user. The maximum working pressure is dependent upon the clamp pressure rating.

(2) Rosemount 1199 Remote Seal Minimum Span Summary calls out a minimum span of 500 in$H_2O$ or 2490 mbar for 1-$^1$/2" SSCW

(3) Rosemount 1199 Remote Seal Minimum Span Summary calls out a minimum span of 50 in$H_2O$ or 373 mbar for 2" SSCW

(4) Q16 is only available when the diaphragm seal has surface finish options (RD, RG, and RH)

**Hygienic Tank Spud (SS) Seal**

- Commonly used in hygienic level applications
- Seal diaphragm installed flush with inner tank wall
- Conforms to 3-A standard 74-03

### Table 9. SS Hygienic Tank Spud Seal Ordering Information

**★ The Standard offering represents the most common models and options. These options should be selected for best delivery.**
**The Expanded offering is subject to additional delivery lead time.**

| | | | |
|---|---|---|---|
| **Process Connection** | | | |
| **Standard** | | | **Standard** |
| SS[1] | Hygienic Tank Spud Seal | | ★ |
| **Process Connection Size** | | | |
| **Standard** | | | **Standard** |
| A | 4-in. Sch. 5 Tri-Clamp | | ★ |
| **Maximum Working Pressure (Clamp Rating)** | | | |
| **Standard** | | | **Standard** |
| 0 | 600 PSI (41 bar) | | ★ |
| **Upper Housing** | | | |
| **Standard** | | | **Standard** |
| A | 316L SST | | ★ |
| **Diaphragm and Wetted, Extension Material** | | | |
| | **Diaphragm and Wetted** | **Extension** | |
| **Standard** | | | **Standard** |
| AL | 316L SST[2] | 316L SST[2] | ★ |
| **Expanded** | | | |
| BB | Alloy C-276 | 316L SST | |
| **Extension Length** | | | |
| **Standard** | | | **Standard** |
| 2 | 2-in. (50 mm) Extension | | ★ |
| 6 | 6-in. (150 mm) Extension | | ★ |

## Options (Include with selected model number)

| | | |
|---|---|---|
| **Remote Seal Diaphragm Thickness** | | |
| **Expanded** | | |
| SC | 0.006-in. (150 µm) Diaphragm Thickness | |
| **Tank Spud Included with Shipment** | | |
| **Standard** | | **Standard** |
| S1 | Tank Spud Included with Shipment | ★ |
| **Remote Seal Diaphragm Polishing** | | |
| **Expanded** | | |
| R6 | Electropolishing | |
| **Remote Seal Diaphragm Surface Finish** | | |
| **Expanded** | | |
| RH | 20 µin. (0.5 µm) $R_a$ Diaphragm Surface Finish | |
| RG[3] | 15 µin. (0.375 µm) $R_a$ Diaphragm Surface Finish | |

### Table 9. SS Hygienic Tank Spud Seal Ordering Information

**★ The Standard offering represents the most common models and options. These options should be selected for best delivery.**
**The Expanded offering is subject to additional delivery lead time.**

## Additional Options

| Surface Finish Certification | | |
|---|---|---|
| **Standard** | | **Standard** |
| Q16[4] | Surface Finishing Certification for Hygienic Remote Seals | ★ |

Complete the 3051SAL model number by specifying options as needed:

| | |
|---|---|
| page 14 | ERS Transmitter Options |
| page 20 | Scalable Level Transmitter Options |

(1) Clamp and Ethylene Propylene o-ring (conforms to 3-A standard 74 and USP class VI) supplied.

(2) Diaphragm brazed and TIG-welded to extension.

(3) Require Option code R6 (Electropolishing).

(4) Q16 is only available when the diaphragm seal has surface finish options (RG and RH).

# Rosemount 3051L Level Transmitter

Rosemount 3051L level transmitters combine the features and benefits of a 3051 pressure transmitter with the durability and reliability of a direct mount seal all in a single model number.

Level transmitters can also be ordered with an additional 1199 remote seal to form a Tuned-System Assembly that offers improved performance and reduced costs compared to traditional symmetrical (balanced) assemblies.

Product features and capabilities include:

- Variety of process connections
- Quantified performance for the entire transmitter / seal assembly (QZ option)
- 4-20 mA HART, FOUNDATION fieldbus, Profibus-PA, and 1-5 Vdc HART low power protocols

Additional Information
Specifications: page 101
Certifications: page 122
Dimensional Drawings: page 130

**Table 10. Rosemount 3051L Level Transmitter Ordering Information**

**★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.**
**The Expanded offering is subject to additional delivery lead time.**

| **Model** | **Transmitter Type** | | | |
|---|---|---|---|---|
| 3051L | Level Transmitter | | | |
| **Pressure Range** | | | | |
| **Standard** | | | | **Standard** |
| 2 | –250 to 250 in$H_2O$ (–0,6 to 0,6 bar) | | | ★ |
| 3 | –1000 to 1000 in$H_2O$ (–2,5 to 2,5 bar) | | | ★ |
| 4 | –300 to 300 psi (–20,7 to 20,7 bar) | | | ★ |
| **Transmitter Output** | | | | |
| **Standard** | | | | **Standard** |
| A | 4–20 mA with Digital Signal Based on *HART* Protocol | | | ★ |
| F | FOUNDATION fieldbus Protocol | | | ★ |
| W[(1)] | Profibus – PA Protocol | | | ★ |
| **Expanded** | | | | |
| M[(2)] | Low-Power 1–5 Vdc with Digital Signal Based on *HART* Protocol (See Option Code C2 for 0.8–3.2 Vdc Output) | | | |
| **Process Connection Size, Material, Extension Length (High Side)** | | | | |
| **Standard** | | | | **Standard** |
| **Code** | **Process Connection Size** | **Material** | **Extension Length** | ★ |
| G0[(3)] | 2-in./DN 50 / 50A | 316L SST | None, Flush Mount | ★ |
| H0[(3)] | 2-in./DN 50 / 50A | Alloy C-276, seam welded | None, Flush Mount | ★ |
| J0 | 2-in./DN 50 / 50A | Tantalum, seam welded | None, Flush Mount | ★ |
| A0[(3)] | 3-in./DN 80 / 80A | 316L SST | None, Flush Mount | ★ |
| A2[(3)] | 3-in./DN 80 / 80A | 316L SST | 2-in./50 mm | ★ |
| A4[(3)] | 3-in./DN 80 / 80A | 316L SST | 4-in./100 mm | ★ |
| A6[(3)] | 3-in./DN 80 / 80A | 316L SST | 6-in./150 mm | ★ |

### Table 10. Rosemount 3051L Level Transmitter Ordering Information

**★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.**

**The Expanded offering is subject to additional delivery lead time.**

| **Standard** | | | | **Standard** |
|---|---|---|---|---|
| B0[3] | 4-in./DN 100 / 100A | 316L SST | None, Flush Mount | ★ |
| B2[3] | 4-in./DN 100 / 100A | 316L SST | 2-in./50 mm | ★ |
| B4[3] | 4-in./DN 100 / 100A | 316L SST | 4-in./100 mm | ★ |
| B6[3] | 4-in./DN 100 / 100A | 316L SST | 6-in./150 mm | ★ |
| C0[3] | 3-in./DN 80 / 80A | Alloy C-276, seam welded | None, Flush Mount | ★ |
| C2[3] | 3-in./DN 80 / 80A | Alloy C-276 | 2-in./50 mm | ★ |
| C4[3] | 3-in./DN 80 / 80A | Alloy C-276 | 4-in./100 mm | ★ |
| C6[3] | 3-in./DN 80 / 80A | Alloy C-276 | 6-in./150 mm | ★ |
| D0[3] | 4-in./DN 100 / 100A | Alloy C-276, seam welded | None, Flush Mount | ★ |
| D2[3] | 4-in./DN 100 / 100A | Alloy C-276 | 2-in./50 mm | ★ |
| D4[3] | 4-in./DN 100 / 100A | Alloy C-276 | 4-in./100 mm | ★ |
| D6[3] | 4-in./DN 100 / 100A | Alloy C-276 | 6-in./150 mm | ★ |
| E0 | 3-in./DN 80 / 80A | Tantalum, seam welded | None, Flush Mount | ★ |
| F0 | 4-in./DN 100 / 100A | Tantalum, seam welded | None, Flush Mount | ★ |
| **Mounting Flange Size, Rating, Material (High Side)** | | | | |
| | **Size** | **Rating** | **Material** | |
| **Standard** | | | | **Standard** |
| M | 2-in. | ANSI/ASME B16.5 Class 150 | CS | ★ |
| A | 3-in. | ANSI/ASME B16.5 Class 150 | CS | ★ |
| B | 4-in. | ANSI/ASME B16.5 Class 150 | CS | ★ |
| N | 2-in. | ANSI/ASME B16.5 Class 300 | CS | ★ |
| C | 3-in. | ANSI/ASME B16.5 Class 300 | CS | ★ |
| D | 4-in. | ANSI/ASME B16.5 Class 300 | CS | ★ |
| P | 2-in. | ANSI/ASME B16.5 Class 600 | CS | ★ |
| E | 3-in. | ANSI/ASME B16.5 Class 600 | CS | ★ |
| X[3] | 2-in. | ANSI/ASME B16.5 Class 150 | 316 SST | ★ |
| F[3] | 3-in. | ANSI/ASME B16.5 Class 150 | 316 SST | ★ |
| G[3] | 4-in. | ANSI/ASME B16.5 Class 150 | 316 SST | ★ |
| Y[3] | 2-in. | ANSI/ASME B16.5 Class 300 | 316 SST | ★ |
| H[3] | 3-in. | ANSI/ASME B16.5 Class 300 | 316 SST | ★ |
| J[3] | 4-in. | ANSI/ASME B16.5 Class 300 | 316 SST | ★ |
| Z[3] | 2-in. | ANSI/ASME B16.5 Class 600 | 316 SST | ★ |
| L[3] | 3-in. | ANSI/ASME B16.5 Class 600 | 316 SST | ★ |
| Q | DN 50 | PN 40 per EN 1092-1 | CS | ★ |
| R | DN 80 | PN 40 per EN 1092-1 | CS | ★ |
| S | DN 100 | PN 40 per EN 1092-1 | CS | ★ |
| V | DN 100 | PN 10 / 16 per EN 1092-1 | CS | ★ |
| K[3] | DN 50 | PN 40 per EN 1092-1 | 316 SST | ★ |
| T[3] | DN 80 | PN 40 per EN 1092-1 | 316 SST | ★ |
| U[3] | DN 100 | PN 40 per EN 1092-1 | 316 SST | ★ |
| W[3] | DN 100 | PN 10 / 16 per EN 1092-1 | 316 SST | ★ |
| 7[3] | 4 in. | ANSI/ASME B16.5 Class 600 | 316 SST | ★ |

### Table 10. Rosemount 3051L Level Transmitter Ordering Information

**★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.**

**The Expanded offering is subject to additional delivery lead time.**

| | | | | |
|---|---|---|---|---|
| **Expanded** | | | | |
| 1 | — | 10K per JIS B2238 | CS | |
| 2 | — | 20K per JIS B2238 | CS | |
| 3 | — | 40K per JIS B2238 | CS | |
| 4[3] | — | 10K per JIS B2238 | 316 SST | |
| 5[3] | — | 20K per JIS B2238 | 316 SST | |
| 6[3] | — | 40K per JIS B2238 | 316 SST | |

| | | | | |
|---|---|---|---|---|
| **Seal Fill Fluid** | | **Specific Gravity at 77 °F (25 °C)** | **Temperature Limits[4]** | |
| **Standard** | | | | **Standard** |
| D | Silicone 200 | 0.93 | -49 to 401 °F (-45 to 205 °C) | ★ |
| C[5] | Silicone 704 | 1.07 | 32 to 401 °F (0 to 205 °C) | ★ |
| V[5] | Silicone 705 | 1.09 | 68 to 401 °F (20 to 205 °C) | ★ |
| A | Syltherm XLT | 0.85 | -102 to 293 °F (-75 to 145 °C) | ★ |
| H | Inert (Halocarbon) | 1.85 | -49 to 320 °F (-45 to 160 °C) | ★ |
| G[6][7] | Glycerine and Water | 1.13 | 5 to 203 °F (-15 to 95 °C) | ★ |
| N[5][6] | Neobee M-20 | 0.92 | 5 to 401 °F (-15 to 205 °C) | ★ |
| P[6][7] | Propylene Glycol and Water | 1.02 | 5 to 203 °F (-15 to 95 °C) | ★ |

| | | | | |
|---|---|---|---|---|
| **Low Pressure Side** | | | | |
| | **Configuration** | **Diaphragm Material** | **Sensor Fill Fluid** | |
| **Standard** | | | | **Standard** |
| 11[3] | Gage | 316L SST | Silicone | ★ |
| 21 | Differential | 316L SST | Silicone | ★ |
| 22 | Differential | Alloy C-276 | Silicone | ★ |
| 2A | Differential | 316L SST | Inert (Halocarbon) | ★ |
| 2B | Differential | Alloy C-276 | Inert (Halocarbon) | ★ |
| 31[3] | Tuned-System Assembly with Remote Seal | 316L SST | Silicone *(Requires Option Code S1)* | ★ |

| | | | |
|---|---|---|---|
| **O-ring** | | | |
| **Standard** | | | **Standard** |
| A | Glass-filled PTFE | | ★ |

| | | | |
|---|---|---|---|
| **Housing Material** | | **Conduit Entry Size** | |
| **Standard** | | | **Standard** |
| A | Aluminum | ½–14 NPT | ★ |
| B | Aluminum | M20 × 1.5 | ★ |
| J | SST | ½–14 NPT | ★ |
| K | SST | M20 × 1.5 | ★ |
| **Expanded** | | | |
| D | Aluminum | G½ | |
| M | SST | G½ | |

### Table 10. Rosemount 3051L Level Transmitter Ordering Information

**★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.**

**The Expanded offering is subject to additional delivery lead time.**

**Options (Include with selected model number)**

| **PlantWeb Control Functionality** | | |
|---|---|---|
| **Standard** | | **Standard** |
| A01 | FOUNDATION fieldbus Advanced Control Function Block Suite | ★ |
| **PlantWeb Diagnostic Functionality** | | |
| **Standard** | | **Standard** |
| D01 | FOUNDATION fieldbus Diagnostics Suite | ★ |
| **Seal Assemblies** | | |
| **Standard** | | **Standard** |
| S1[8] | Assembled to One Rosemount 1199 Seal (Requires 1199M) | ★ |
| **Product Certifications** | | |
| **Standard** | | **Standard** |
| E5 | FM Explosion-proof, Dust Ignition-proof | ★ |
| I5 | FM Intrinsically Safe, Division 2 | ★ |
| K5 | FM Explosion-proof, Dust Ignition-proof, Intrinsically Safe, and Division 2 | ★ |
| I1[9] | ATEX Intrinsic Safety and Dust | ★ |
| N1[9] | ATEX Type n Certification and Dust | ★ |
| E8 | ATEX Flameproof and Dust Certification | ★ |
| E4[9] | TIIS Flameproof | ★ |
| E3 | China Flameproof | ★ |
| I3 | China Intrinsic Safety, Dust Ignition-proof | ★ |
| C6 | CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, and Division 2 | ★ |
| K6[9] | CSA and ATEX Explosion-proof, Intrinsically Safe, and Division 2 (combination of C6 and K8) | ★ |
| KB | FM and CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, and Division 2 (combination of K5 and C6) | ★ |
| K7 | IECEx Flameproof, Dust Ignition-proof, Intrinsic Safety, and Type n (combination of I7, N7, and E7) | ★ |
| K8[9] | ATEX Flame-proof and Intrinsic Safety Approvals (combination of I1 and E8) | ★ |
| KD[9] | FM, CSA, and ATEX Explosion-proof, Intrinsically Safe (combination of K5, C6, I1, and E8) | ★ |
| I7 | IECEx Intrinsic Safety | ★ |
| E7 | IECEx Flameproof, Dust Ignition-proof | ★ |
| N7 | IECEx Type n Certification | ★ |
| IA | ATEX FISCO Intrinsic Safety | ★ |
| IE | FM FISCO Intrinsically Safe | ★ |
| E2 | INMETRO Flameproof | ★ |
| I2 | INMETRO Intrinsic Safety | ★ |
| K2 | INMETRO Flameproof, Intrinsic Safety | ★ |
| **Shipboard Approvals** | | |
| **Standard** | | **Standard** |
| SBS | American Bureau of Shipping (ABS) Type Approval | ★ |
| SBV | Bureau Veritas (BV) Type Approval | ★ |
| SDN | Det Norske Veritas (DNV) Type Approval | ★ |
| SLL | Lloyds Register (LR) Type Approval | ★ |

### Table 10. Rosemount 3051L Level Transmitter Ordering Information

**★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.**
**The Expanded offering is subject to additional delivery lead time.**

| **Bolting Material** | | |
|---|---|---|
| **Standard** | | **Standard** |
| L4 | Austenitic 316 SST Bolts | ★ |
| L5 | ASTM A 193, Grade B7M bolts | ★ |
| L6 | Alloy K-500 Bolts | ★ |
| L8 | ASTM A 193 Class 2, Grade B8M Bolts | ★ |
| **Display Type** | | |
| **Standard** | | **Standard** |
| M4[(10)] | LCD Display with Local Operator Interface | ★ |
| M5 | LCD Display for Aluminum Housing (Housing Codes A, B, C, and D only) | ★ |
| M6 | LCD Display for SST Housing (Housing Codes J, K, L, and M only) | ★ |
| **Calibration Certification** | | |
| **Standard** | | **Standard** |
| Q4 | Calibration Certificate | ★ |
| QP | Calibration Certificate and tamper evident seal | ★ |
| QG | Calibration Certificate and GOST Verification Certificate | ★ |
| **Material Traceability Certification** | | |
| **Standard** | | **Standard** |
| Q8 | Material Traceability Certification per EN 10204 3.1 | ★ |
| **Quality Certification for Safety** | | |
| **Standard** | | **Standard** |
| QS[(11)] | Prior-use certificate of FMEDA data | ★ |
| **Conduit Electrical Connector** | | |
| **Standard** | | **Standard** |
| GE | M12, 4-pin, Male Connector (eurofast®) | ★ |
| GM | A size Mini, 4-pin, Male Connector (minifast®) | ★ |
| **Configuration Buttons** | | |
| **Standard** | | **Standard** |
| J1[(12)(13)] | Local Zero Adjustment Only | ★ |
| J3[(12)(13)] | No Local Zero or Span Adjustment | ★ |
| **Transient Protection** | | |
| **Standard** | | **Standard** |
| T1[(14)] | Transient Protection Terminal Block | ★ |
| **Software Configuration** | | |
| **Standard** | | **Standard** |
| C1[(12)] | Custom Software Configuration (Completed CDS 00806-0100-4001 required with order) | ★ |
| **Low Power Output** | | |
| **Standard** | | **Standard** |
| C2[(12)] | 0.8–3.2 Vdc Output with Digital Signal Based on HART Protocol (Available with Output code M only) | ★ |

## Table 10. Rosemount 3051L Level Transmitter Ordering Information

**★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.**

**The Expanded offering is subject to additional delivery lead time.**

| | | | | |
|---|---|---|---|---|
| **Alarm Limit** | | | | |
| **Standard** | | | | **Standard** |
| C4[12][15] | NAMUR alarm and saturation levels, high alarm | | | ★ |
| CN[12][15] | NAMUR alarm and saturation levels, low alarm | | | ★ |
| CR | Custom alarm and saturation signal levels, high alarm | | | ★ |
| CS | Custom alarm and saturation signal levels, low alarm | | | ★ |
| CT | Low alarm (standard Rosemount alarm and saturation levels) | | | ★ |
| **Conduit Plug** | | | | |
| **Standard** | | | | **Standard** |
| D0 | 316 SST Conduit Plug | | | ★ |
| **Ground Screw** | | | | |
| **Standard** | | | | **Standard** |
| V5[16] | External Ground Screw Assembly | | | ★ |
| **Lower Housing Flushing Connection Options** | | | | |
| | **Ring Material** | **Number** | **Size (NPT)** | |
| **Standard** | | | | **Standard** |
| F1 | 316 SST | 1 | 1/4-18 NPT | ★ |
| F2 | 316 SST | 2 | 1/4-18 NPT | ★ |
| F3 | Alloy C-276 | 1 | 1/4-18 NPT | ★ |
| F4 | Alloy C-276 | 2 | 1/4-18 NPT | ★ |
| F7 | 316 SST | 1 | 1/2-14 NPT | ★ |
| F8 | 316 SST | 2 | 1/2-14 NPT | ★ |
| F9 | Alloy C-276 | 1 | 1/2-14 NPT | ★ |
| F0 | Alloy C-276 | 2 | 1/2-14 NPT | ★ |
| **Flange Adapters** | | | | |
| **Standard** | | | | **Standard** |
| DF[17] | 1/2-14 NPT flange adapter | | | ★ |
| **RC1/4 RC1/2 Process Connection** | | | | |
| **Expanded** | | | | |
| D9[17] | JIS Process Connection - RC 1/2 Flange Adapter | | | |
| **Toolkit Total System Performance Reports** | | | | |
| **Standard** | | | | **Standard** |
| QZ | Remote Seal System Performance Calculation Report | | | ★ |
| **Typical Model Number: 3051L 2 A A0 A D 21 A A F1** | | | | |

(1) Option Code M4 - LCD Display with Local Operator Interface required for local addressing and configuration.

(2) Not available with hazardous certification Option Codes I1, N1, E4, K6, and K8.

(3) Materials of Construction comply with metallurgical requirements highlighted within NACE MR 0175 / ISO 15156 for sour oil field production environments. Environmental limits apply to certain materials. Consult latest standard for details. Selected materials also conform to NACE MR 0103 for sour refining environments.

(4) At ambient pressure of 14.7 psia (1 bar-a) and ambient temperature of 70°F (21°C). Temperature limits are reduced in vacuum service and may be limited by seal selection.

(5) Maximum process temperature is limited by heat transfer to the transmitter and must be further derated if ambient, temperature exceeds 70 °F (21 °C).

(6) This is a food grade fill fluid.

(7) Not suitable for vacuum applications.

(8) "Assemble-to" items are specified separately and require a completed model number.

(9) Not available with low-power Option Code M

(10) Available only with output code W - Profibus PA

(11) Only available with HART 4-20 mA output (output code A).

(12) Not available with fieldbus (output code F) or profibus protocols (output code W).

(13) Local zero and span adjustments are standard unless Option Code J1 or J3 is specified.

(14) The T1 option is not needed with FISCO Product Certifications; transient protection is included in the FISCO product certification codes IA, IE, IF, and IG.

(15) NAMUR-Compliant operation is pre-set at the factory and cannot be changed to standard operation in the field.

(16) The V5 option is not needed with the T1 option; external ground screw assembly is included with the T1 option.

(17) Not available with Remote Mount Seal Assembly option S1.

# Rosemount 2051L Level Transmitter

Tuned-System Assembly Comprised of 2051L with 1199 Remote Mount Seal

Rosemount 2051L level transmitters combine the features and benefits of a 2051 pressure transmitter with the durability and reliability of a direct mount seal all in a single model number.

Level transmitters can also be ordered with an additional 1199 remote seal to form a Tuned-System Assembly that offers improved performance and reduced costs compared to traditional symmetrical (balanced) assemblies.

Product features and capabilities include:

- Variety of process connections
- Quantified performance for the entire transmitter / seal assembly (QZ option)
- 4-20 mA HART, FOUNDATION fieldbus, and 1-5 Vdc HART Low-Power outputs

Additional Information
Specifications: page 101
Certifications: page 127
Dimensional Drawings: page 130

**Table 11. Rosemount 2051L Level Transmitter Ordering Information**

**★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.**
**The Expanded offering is subject to additional delivery lead time.**

| Model | Transmitter Type | | |
|---|---|---|---|
| 2051L | Level Transmitter | | |
| **Pressure Range** | | | |
| **Standard** | | | **Standard** |
| 2 | –250 to 250 in$H_2O$ (–0,6 to 0,6 bar) | | ★ |
| 3 | –1000 to 1000 in$H_2O$ (–2,5 to 2,5 bar) | | ★ |
| 4 | –300 to 300 psi (–20,7 to 20,7 bar) | | ★ |
| **Transmitter Output** | | | |
| **Standard** | | | **Standard** |
| A | 4–20 mA with Digital Signal Based on HART Protocol | | ★ |
| F | FOUNDATION fieldbus Protocol | | ★ |
| W[(1)] | Profibus - PA Protocol | | ★ |
| **Expanded** | | | |
| M | Low-Power, 1–5 Vdc with Digital Signal Based on HART Protocol | | |
| **Process Connection Size, Diaphragm Material (High Side)** | | | |
| | **Process Connection Size** | **Diaphragm** | |
| **Standard** | | | **Standard** |
| G[(2)] | 2 in./DN 50 | 316L SST, seam welded | ★ |
| H[(2)] | 2 in./DN 50 | Alloy C-276, seam welded | ★ |
| J | 2 in./DN 50 | Tantalum | ★ |
| A[(2)] | 3 in./DN 80 | 316L SST | ★ |
| B[(2)] | 4 in./DN 100 | 316L SST | ★ |
| C[(2)] | 3 in./DN 80 | Alloy C-276, seam welded | ★ |
| D[(2)] | 4 in./DN 100 | Alloy C-276, seam welded | ★ |
| E | 3 in./DN 80 | Tantalum, seam welded | ★ |
| F | 4 in./DN 100 | Tantalum, seam welded | ★ |

### Table 11. Rosemount 2051L Level Transmitter Ordering Information

**★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.**
**The Expanded offering is subject to additional delivery lead time.**

| **Transmitter Extension Length (High Side)** | | | | | |
|---|---|---|---|---|---|
| **Standard** | | | | | **Standard** |
| 0 | None, Flush Mount | | | | ★ |
| 2 | 2 in./50 mm | | | | ★ |
| 4 | 4 in./100 mm | | | | ★ |
| 6 | 6 in./150 mm | | | | ★ |
| **Mounting Flange Size, Rating, Material (High Side)** | | | | | |
| | **Size** | **Rating** | **Material** | | |
| **Standard** | | | | | **Standard** |
| M | 2-in. | ANSI/ASME B16.5 Class 150 | CS | | ★ |
| A | 3-in. | ANSI/ASME B16.5 Class 150 | CS | | ★ |
| B | 4-in. | ANSI/ASME B16.5 Class 150 | CS | | ★ |
| N | 2-in. | ANSI/ASME B16.5 Class 300 | CS | | ★ |
| C | 3-in. | ANSI/ASME B16.5 Class 300 | CS | | ★ |
| D | 4-in. | ANSI/ASME B16.5 Class 300 | CS | | ★ |
| X[2] | 2-in. | ANSI/ASME B16.5 Class 150 | 316 SST | | ★ |
| F[2] | 3-in. | ANSI/ASME B16.5 Class 150 | 316 SST | | ★ |
| G[2] | 4-in. | ANSI/ASME B16.5 Class 150 | 316 SST | | ★ |
| Y[2] | 2-in. | ANSI/ASME B16.5 Class 300 | 316 SST | | ★ |
| H[2] | 3-in. | ANSI/ASME B16.5 Class 300 | 316 SST | | ★ |
| J[2] | 4-in. | ANSI/ASME B16.5 Class 300 | 316 SST | | ★ |
| Q | DN50 | PN 40 per EN 1092-1 | CS | | ★ |
| R | DN80 | PN 40 per EN 1092-1 | CS | | ★ |
| K[2] | DN50 | PN 40 per EN 1092-1 | 316 SST | | ★ |
| T[2] | DN80 | PN 40 per EN 1092-1 | 316 SST | | ★ |
| | **Seal Fill Fluid** | **Specific Gravity at 77 °F (25 °C)** | **Temperature Limits[3]** | | |
| **Standard** | | | | | **Standard** |
| D | Silicone 200 | 0.93 | -49 to 401 °F (-45 to 205 °C) | | ★ |
| C[4] | Silicone 704 | 1.07 | 32 to 401 °F (0 to 205 °C) | | ★ |
| V[4] | Silicone 705 | 1.09 | 68 to 401 °F (20 to 205 °C) | | ★ |
| A | Syltherm XLT | 0.85 | -102 to 293 °F (-75 to 145 °C) | | ★ |
| H | Inert (Halocarbon) | 1.85 | -49 to 320 °F (-45 to 160 °C) | | ★ |
| G[5][6] | Glycerin and Water | 1.13 | 5 to 203 °F (-15 to 95 °C) | | ★ |
| N[4] | Neobee M-20 | 0.92 | 5 to 401 °F (-15 to 205 °C) | | ★ |
| P[5][6] | Propylene Glycol and Water | 1.02 | 5 to 203 °F (-15 to 95 °C) | | ★ |
| **Sensor Module Configuration, Flange Adapter (Low Side)** | | | | | |
| | **Configuration** | | | | |
| **Standard** | | | | | **Standard** |
| 1[2] | Gage | | | | ★ |
| 2 | Differential | | | | ★ |
| 3[2] | Tuned-System Assembly with Remote Seal | | | | ★ |
| **Sensor Module Diaphragm Material, Sensor Fill Fluid (Low Side)** | | | | | |

## Table 11. Rosemount 2051L Level Transmitter Ordering Information

★ **The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.**
**The Expanded offering is subject to additional delivery lead time.**

| | Diaphragm Material | Sensor Fill Fluid | |
|---|---|---|---|
| **Standard** | | | **Standard** |
| 1[2] | 316L SST | Silicone | ★ |
| 2[2] | Alloy C-276 (SST Valve Seat) | Silicone | ★ |
| 7[2] | Alloy C-276 (SST Valve Seat) | Silicone | ★ |
| A[2] | 316L SST | Inert (Halocarbon) | ★ |
| B[2] | Alloy C-276 (SST Valve Seat) | Inert (Halocarbon) | ★ |
| G[2] | Alloy C-276 (SST Valve Seat) | Inert (Halocarbon) | ★ |
| **O-ring** | | | |
| **Standard** | | | **Standard** |
| A | Glass-filled PTFE | | ★ |
| **Housing Material, Conduit Entry Size** | | | |
| | **Housing Material** | **Conduit Entry Size** | |
| **Standard** | | | **Standard** |
| A | Aluminum | ½–14 NPT | ★ |
| B | Aluminum | M20 × 1.5 | ★ |
| J | SST | ½–14 NPT | ★ |
| K | SST | M20 × 1.5 | ★ |
| **Expanded** | | | |
| D | Aluminum | G½ | |
| M | SST | G½ | |

### Options (Include with selected model number)

| **PlantWeb Control Functionality** | | |
|---|---|---|
| **Standard** | | **Standard** |
| A01 | FOUNDATION fieldbus Advanced Control Function Block Suite | ★ |
| **Seal Assemblies** | | |
| **Standard** | | **Standard** |
| S1[7] | Assemble to One Rosemount 1199 Seal (Requires 1199M) | ★ |
| **Product Certifications** | | |
| **Standard** | | **Standard** |
| E1[8] | ATEX Flameproof | ★ |
| E2[8] | INMETRO Flameproof | ★ |
| E3[8] | China Flameproof | ★ |
| E4 | TIIS Flameproof | ★ |
| E5 | FM Explosion-proof, Dust Ignition-proof | ★ |
| E6 | CSA Explosion-proof, Dust Ignition-proof, Division 2 | ★ |
| E7[8] | IECEx Flameproof | ★ |
| EW | India (CCOE) Flameproof Approval | ★ |
| I1[8] | ATEX Intrinsic Safety | ★ |
| I2[8] | INMETRO Intrinsically Safe | ★ |
| I3[8] | China Intrinsic Safety | ★ |
| I5 | FM Intrinsically Safe, Division 2 | ★ |
| I6 | CSA Intrinsically Safe | ★ |
| I7[8] | IECEx Intrinsic Safety | ★ |
| IA[9] | ATEX FISCO Intrinsic Safety | ★ |
| IE[9] | FM FISCO Intrinsically Safe | ★ |

### Table 11. Rosemount 2051L Level Transmitter Ordering Information

**★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.**

**The Expanded offering is subject to additional delivery lead time.**

| **Standard** | | **Standard** |
|---|---|---|
| IF[9] | CSA FISCO Intrinsically Safe | ★ |
| IG[9] | IECEx FISCO Intrinsically Safe | ★ |
| IW | India (CCOE) Intrinsic Safety Approval | ★ |
| K1[8] | ATEX Flameproof, Intrinsic Safety, Type n, Dust | ★ |
| K2 | INMETRO Flameproof, Intrinsic Safety, Type n | ★ |
| K5 | FM Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 | ★ |
| K6 | CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 | ★ |
| K7[8] | IECEx Flameproof, Intrinsic Safety, Type n | ★ |
| KA[8] | ATEX and CSA Flameproof, Intrinsically Safe, Division 2 | ★ |
| KB | FM and CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 | ★ |
| KC[8] | FM and ATEX Explosion-proof, Intrinsically Safe, Division 2 | ★ |
| KD[8] | FM, CSA, and ATEX Explosion-proof, Intrinsically Safe | ★ |
| N1[8] | ATEX Type n | ★ |
| N7[8] | IECEx Type n | ★ |
| ND[8] | ATEX Dust | ★ |
| **Shipboard Approvals** | | |
| **Standard** | | **Standard** |
| SBS | American Bureau of Shipping (ABS) Type Approval | ★ |
| SBV | Bureau Veritas (BV) Type Approval | ★ |
| SDN | Det Norske Veritas (DNV) Type Approval | ★ |
| SLL | Lloyds Register (LR) Type Approval | ★ |
| **Digital Display** | | |
| **Standard** | | **Standard** |
| M4[10] | LCD Display With Local Operator Interface | ★ |
| M5 | LCD display | ★ |
| **Hardware Adjustments** | | |
| **Standard** | | **Standard** |
| D4[11] | Zero and Span Hardware Adjustments | ★ |
| **Flange Adapters** | | |
| **Standard** | | **Standard** |
| DF[12] | 1/2-14 NPT Flange Adapters | ★ |
| **Conduit Plug** | | |
| **Standard** | | **Standard** |
| DO[13] | 316 SST Conduit Plug | ★ |
| **RC1/4 RC1/2 Process Connection** | | |
| **Expanded** | | |
| D9[11] | JIS Process Connection - RC 1/2 Flange Adapter | |
| **Ground Screw** | | |
| **Standard** | | **Standard** |
| V5[14] | External Ground Screw Assembly | ★ |
| **Transient Protection** | | |
| **Standard** | | **Standard** |
| T1[15] | Transient Terminal Block | ★ |

## Table 11. Rosemount 2051L Level Transmitter Ordering Information

**★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.**

**The Expanded offering is subject to additional delivery lead time.**

| | | | | |
|---|---|---|---|---|
| **Software Configuration** | | | | |
| **Standard** | | | | **Standard** |
| C1[16] | Custom Software Configuration (Requires completed Configuration Data Sheet) | | | ★ |
| **Alarm Limit** | | | | |
| **Standard** | | | | **Standard** |
| C4[16][17] | NAMUR alarm and saturation levels, high alarm | | | ★ |
| CN[16][18] | NAMUR alarm and saturation levels, low alarm | | | ★ |
| **Calibration Certification** | | | | |
| **Standard** | | | | **Standard** |
| Q4 | Calibration Certificate1 | | | ★ |
| **Alarm Limit** | | | | |
| **Standard** | | | | **Standard** |
| Q8 | Material Traceability Certification per EN 10204 3.1 | | | ★ |
| **Quality Certification for Safety** | | | | |
| **Standard** | | | | **Standard** |
| QS[16] | Prior-use certificate of FMEDA data | | | ★ |
| **Toolkit Total System Performance Reports** | | | | |
| **Standard** | | | | **Standard** |
| QZ | Remote Seal System Performance Calculation Report | | | ★ |
| **Lower Housing Flushing Connection Ring Material** | | **Number** | **Size (NPT)** | |
| **Standard** | | | | **Standard** |
| F1 | 316 SST | 1 | 1/4-18 NPT | ★ |
| F2 | 316 SST | 2 | 1/4-18 NPT | ★ |
| F3[18] | Alloy C-276 | 1 | 1/4-18 NPT | ★ |
| F4[18] | Alloy C-276 | 2 | 1/4-18 NPT | ★ |
| F7 | 316 SST | 1 | 1/2-14 NPT | ★ |
| F8 | 316 SST | 2 | 1/2-14 NPT | ★ |
| F9 | Alloy C-276 | 1 | 1/2-14 NPT | ★ |
| F0 | Alloy C-276 | 2 | 1/2-14 NPT | ★ |
| **Typical Model Number:** | **2051L 2 A A0 X D 21 A A B4 M5 F1** | | | |

(1) Option Code M4 - LCD Display with Local Operator Interface required for local addressing and configuration.

(2) Materials of Construction comply with metallurgical requirements highlighted within NACE MR 0175 / ISO 15156 for sour oil field production environments. Environmental limits apply to certain materials. Consult latest standard for details. Selected materials also conform to NACE MR 0103 for sour refining environments.

(3) At ambient pressure of 14.7 psia (1 bar-a) and ambient temperature of 70 °F (21 °C). Temperature limits are reduced in vacuum service and may be limited by seal selection.

(4) Maximum process temperature is limited by heat transfer to the transmitter electronics and must be further derated if ambient temperatures exceed 70 °F (21 °C).

(5) This is a food grade fill fluid.

(6) Not suitable for vacuum applications.

(7) "Assemble-to" items are specified separately and require a completed model number.

(8) Not available with Low Power output code M.

(9) Only valid with FOUNDATION fieldbus output code F.

(10) Available only with output code W-PROFIBUS PA.

(11) Not valid with FOUNDATION fieldbus output code F.

(12) Not available with Remote Mount Seal Assembly option S1.

(13) Transmitter is shipped with 316 SST conduit plug (uninstalled) in place of standard carbon steel conduit plug,

(14) The V5 option is not needed with the T1 option; external ground screw assembly is included with the T1 option.

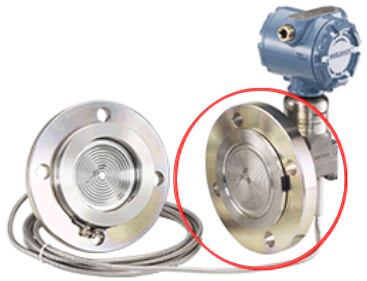
(15) The T1 option is not needed with FISCO Product Certifications; transient protection is included in the FISCO product certification codes IA, IE, IF, and IG.

(16) Only available with HART 4-20 mA output (output code A).

(17) NAMUR-Compliant operation is pre-set at the factory and cannot be changed to standard operation in the field.

(18) Not available with Option Codes A0, B0, and G0.

# Rosemount 1199 Direct Mount Seal Systems



Tuned-System Assembly Comprised of 1199 Direct Mount Seal combined with 1199 Remote Mount Seal

Rosemount 1199 Direct Mount Seals reduce installation costs by eliminating mounting hardware. Their advanced design also minimizes oil volume improving performance.

Product features and capabilities include:

- Direct Mount gage or absolute seal system can be used for open or vented to atmosphere tank applications
- Tuned-System Assembly order codes can be used to improve performance for DP measurements in closed or pressurized tank applications
- Variety of process connections
- Quantified performance for the entire transmitter / seal assembly (QZ option)

Additional Information
Specifications: page 113
Dimensional Drawings: page 130

### Rosemount 1199 Direct Mount Seal

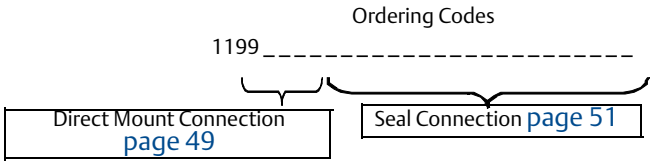
The 1199 Direct Mount Seal also requires specification of a Rosemount pressure transmitter. See the appropriate Product Data Sheet for the desired transmitter and include the option indicated in the table below for the configuration desired.

**Table 12. When ordering Rosemount 1199 Direct and Remote Mount Seals, please make sure to add the correct seal system ordering code to the transmitter model**

| Transmitter Model | 2 Seals | 1 Seal |
|---|---|---|
| 3051S_C | B12 | B11 |
| 3051C - Welded-Repairable | S2 | S1 |
| 3051C - All Welded(1) | S9 | S0 |
| 2051C | S2 | S1 |
| 3051S_T | — | B11 |
| 3051T, 2051T, 2088 | — | S1 |

(1) All welded system connection types require either a 316L SST or Alloy C-276 isolating diaphragm in the pressure transmitter model codes.

A 1199 Direct Mount Seal consists of 2 parts. First, specify the direct mount connection model codes found on page 49. Then, specify a remote seal found on page 51.




### Table 13. Rosemount 1199 Direct Mount Seal Systems Ordering Information

**★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.**

**The Expanded offering is subject to additional delivery lead time.**

| Model | Product Description | | | | | | |
|---|---|---|---|---|---|---|---|
| 1199 | Seal Systems | | | | | | |
| **Connection Type** | | | **Seal System** | | **Seal Location** | | |
| **Standard** | | | | | | | **Standard** |
| 3051S and 2051C Coplanar Transmitters (3051S_C and 2051C) | | | | | | | |
| W | Welded-Repairable | | One or Two Seal System | | High Side of Transmitter | | ★ |
| R[1] | All Welded | | One Seal System | | High Side of Transmitter | | ★ |
| T[1] | All Welded | | Two Seal System | | High Side of Transmitter | | ★ |
| All In-Line Transmitters (3051S_T, 3051T, 2051T, 2088) | | | | | | | |
| W | All Welded | | One Seal System | | — | | ★ |
| 3051C Coplanar Transmitters (3051C) | | | | | | | |
| W | Determined by Transmitter Code | | One or Two Seal System | | High Side of Transmitter | | ★ |
| **Seal Fill Fluid** | | **Specific Gravity at 77 °F (25 °C)** | **Temperature Limits[2]** | | | | |
| | | | **No Extension** | **2-in. (50 mm) Extension** | **4-in. (100 mm) Extension** | **Thermal Optimizer** | **Standard** |
| **Standard** | | | | | | | ★ |
| D | Silicone 200 | 0.93 | -49 to 401 °F (-45 to 205 °C)[4] | -49 to 401 °F (-45 to 205 °C) | -49 to 401 °F (-45 to 205 °C) | -49 to 401 °F (-45 to 205 °C) | ★ |
| C[3] | Silicone 704 | 1.07 | 32 to 401 °F (0 to 205 °C)[4] | 32 to 464 °F (0 to 240 °C)[4] | 32 to 500 °F (0 to 260 °C)[4] | 32 to 599 °F (0 to 315 °C) | ★ |
| V[4] | Silicone 705 | 1.09 | 68 to 401 °F[4] (20 to 205 °C) | 68 to 464 °F[4] (20 to 240 °C) | 68 to 500 °F[4] (20 to 260 °C) | 68 to 698 °F[4] (20 to 370 °C) | ★ |
| A | Syltherm XLT | 0.85 | -102 to 293 °F (-75 to 145 °C) | -102 to 293 °F (-75 to 145 °C) | 102 to 293 °F (-75 to 145 °C) | 102 to 293 °F (-75 to 145 °C) | ★ |
| H | Inert (Halocarbon) | 1.85 | -49 to 320 °F (-45 to 160 °C) | -49 to 320 °F (-45 to 160 °C) | -49 to 320 °F (-45 to 160 °C) | -49 to 320 °F (-45 to 160 °C) | ★ |
| G[5][6] | Glycerine and Water | 1.13 | 5 to 203 °F (-15 to 95 °C) | 5 to 203 °F (-15 to 95 °C) | 5 to 203 °F (-15 to 95 °C) | 5 to 203 °F (-15 to 95 °C) | ★ |
| N[5] | Neobee M-20 | 0.92 | 5 to 401 °F[4] (-15 to 205 °C) | 5 to 437 °F (-15 to 225 °C) | 5 to 437 °F (-15 to 225 °C) | 5 to 437 °F (-15 to 225 °C) | ★ |
| P[5][6] | Propylene Glycol and Water | 1.02 | 5 to 203 °F (-15 to 95 °C) | 5 to 203 °F (-15 to 95 °C) | 5 to 203 °F (-15 to 95 °C) | 5 to 203 °F (-15 to 95 °C) | ★ |
| **Seal Connection Type** | | | | | | | |
| **Standard** | | | | | | | **Standard** |
| A | Direct Mount | | | | | | ★ |

### Table 13. Rosemount 1199 Direct Mount Seal Systems Ordering Information

**★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.**

**The Expanded offering is subject to additional delivery lead time.**

| Direct Mount Connection Type | | | | |
|---|---|---|---|---|
| | **Extension Length** | **Seal System** | **Connection Type** | |
| **Standard** | | | | **Standard** |
| All Coplanar Transmitters (3051S_C, 3051C and 2051C) | | | | |
| 94 | Direct Mount, No Extension | Tuned-System Assembly, two seals | Welded-Repairable | ★ |
| 93 | Direct Mount, No Extension | One Seal System | Welded-Repairable | ★ |
| 96 | Direct Mount, No Extension | Tuned-System Assembly, two seals | All Welded | ★ |
| 97 | Direct Mount, No Extension | One Seal System | All Welded | ★ |
| B4 | Direct Mount, 2 in. (50 mm) Extension | Tuned-System Assembly, two seals | Welded-Repairable | ★ |
| B3 | Direct Mount, 2 in. (50 mm) Extension | One Seal System | Welded-Repairable | ★ |
| B6 | Direct Mount, 2 in. (50 mm) Extension | Tuned-System Assembly, two seals | All Welded | ★ |
| B7 | Direct Mount, 2 in. (50 mm) Extension | One Seal System | All Welded | ★ |
| D4 | Direct Mount, 4 in. (100 mm) Extension | Tuned-System Assembly, two seals | Welded-Repairable | ★ |
| D3 | Direct Mount, 4 in. (100 mm) Extension | One Seal System | Welded-Repairable | ★ |
| D6 | Direct Mount, 4 in. (100 mm) Extension | Tuned-System Assembly, two seals | All Welded | ★ |
| D7 | Direct Mount, 4 in. (100 mm) Extension | One Seal System | All Welded | ★ |
| All In-Line Transmitters (3051S_T, 3051T, 2051T, 2088) | | | | |
| 95 | Direct Mount, No Extension | One Seal System | All Welded | ★ |
| D5 | Thermal Optimizer | One Seal System | All Welded | ★ |

(1) All welded system connection types require either a 316L SST or Alloy C-276 isolating diaphragm in the pressure transmitter model codes.

(2) At ambient pressure of 14.7 psia (1 bar-a) and ambient temperature of 70 °F (21 °C).

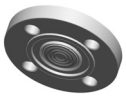
(3) Not available with Seal Connection Type \ Capillary ID, Description codes B, E, H or M.

(4) Maximum process temperature is limited by heat transfer to the transmitter and must be further derated if ambient temperature exceeds 70 °F.

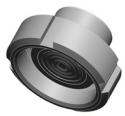
(5) This is a food grade fill fluid.

(6) Not suitable for vacuum applications.

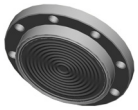
**Continue specifying a completed model number by choosing a remote seal type below:**
★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.
The Expanded offering is subject to additional delivery lead time.

| Flanged Seal Assemblies | | | ı = Transmitter Availability<br>— = Unavailable | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Inline | Coplanar Extensions | | | Process Connections | |
| | | | | 0 in. | 2-in. | 4-in. | | |
| **Standard** | | | | | | | | **Standard** |
|  | page 61 | FFW Flush Flanged Seal | • | (1) | • | • | 2-in. / DN 50 / 50A<br>3-in. / DN 80 / 80A<br>4-in. / DN 100 / 100A | ★ |
|  | page 65 | RFW Flanged Seal | • | — | • | • | 1/2-in. / DN 15<br>3/4-in.<br>1-in. / DN 25 / 25A<br>1 1/2-in. / DN 40 / 40A | ★ |
|  | page 68 | EFW Extended Flanged Seal | • | (1) | • | • | 1 1/2-in. / DN 40 / 40A<br>2-in. / DN 50 / 50A<br>3-in. / Headbox / DN 80 / 80A<br>4-in. / Headbox / DN 100 / 100A | ★ |
| **Expanded** | | | | | | | | |
|  | page 73 | FCW Flush Flanged Seal – Ring Type Joint (RTJ) Gasket Surface | • | (1) | • | • | 2-in.<br>3-in. | |
|  | page 75 | RCW Ring Type Joint (RTJ) Flanged Seal | • | — | • | • | ½-in.<br>¾-in.<br>1-in.<br>1 ½-in. | |
|  | page 78 | FUW and FVW Flush Flanged Type Seals | • | • | • | • | DN 50<br>DN 80 | |
| **Threaded Seal Assemblies** | | | **Inline** | **Coplanar Extensions** | | | **Process Connections** | |
| | | | | **0 in.** | **2-in.** | **4-in.** | | |
| **Standard** | | | | | | | | **Standard** |
|  | page 79 | RTW Threaded Seal | • | — | • | • | ¼ –18 NPT<br>3/8 –18 NPT<br>½ –14 NPT<br>¾ –14 NPT<br>1 – 11.5 NPT<br>1 ¼ –11.5 NPT<br>1 ½ –11.5 NPT<br>G1/2 A DIN 16288<br>R1/2 per ISO 7/1 | ★ |

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.
The Expanded offering is subject to additional delivery lead time.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Expanded** | | | | | | | | |
|  | page 82 | HTS Male Threaded Seal | • | • | • | • | G1<br>G1 ½<br>G2<br>1-11.5 NPT<br>1 ½-11.5 NPT<br>2-11.5 NPT | |
| **Hygienic Seal Assemblies** | | | **Inline** | **Coplanar Extensions** | | | **Process Connections** | |
| | | | | **0 in.** | **2-in.** | **4-in.** | | |
| **Standard** | | | | | | | | **Standard** |
|  | page 83 | SCW Hygienic Tri-Clover Style Tri-Clamp Seal | • | • | • | • | 1 ½-in.<br>2-in.<br>2 ½-in.<br>3-in.<br>4-in. | ★ |
|  | page 85 | SSW Hygienic Tank Spud Seal | • | • | • | • | 2-in. Extension<br>6-in. Extension | ★ |
| **Expanded** | | | | | | | | |
|  | page 88 | STW Hygienic Thin Wall Tank Spud Seal | • | — | • | • | 0.8 in Extension | |
|  | page 89 | EES Hygienic Flanged Tank Spud Extended Seal | • | • | • | • | DN 50<br>DN 80 | |
|  | page 90 | VCS Tri-clamp® In-Line Seal | • | — | — | — | 1-in.<br>1 ½-in.<br>2-in.<br>3-in.<br>4-in. | |
|  | page 91 | SVS Varivent® Compatible Hygienic Connection Seal | • | • | • | • | Tuchenhagen Varivent® Compatible | |
|  | page 92 | SHP Hygienic Cherry-Burrell “I” Line Seal | • | — | — | — | 2-in.<br>3-in. | |
|  | page 93 | SLS Dairy Process Connection - Female Thread Seal per DIN 11851 | • | — | — | — | DN 40<br>DN 50 | |

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.
The Expanded offering is subject to additional delivery lead time.

| Specialty Seal Assemblies | | | Inline | Coplanar Extensions | | | Process Connections | |
|---|---|---|---|---|---|---|---|---|
| | | | | 0 in. | 2-in. | 4-in. | | |
| **Expanded** | | | | | | | | |
|  | page 94 | WSP Saddle Seal | • | — | • | • | 2-in.<br>3-in.<br>4-in. or Larger | |
|   | page 96 | UCP Male Threaded Pipe Mount Seals and PMW Paper Mill Sleeve Seals | • | — | — | — | 1 ½-in. with Threaded Knurled Nut<br>1-in. with Cap Screw Retainer | |
|  | page 97 | CTW Chemical Tee Seal | • | — | • | • | Retro-fit | |
|  | page 98 | TFS Wafer Style In-Line Seal | • | — | — | — | 1-in. / DN 25<br>1 ½-in. / DN 40<br>2-in. / DN 50<br>3-in. / DN 80<br>4-in. / DN 100 | |
|  | page 99 | WFW Flow-Thru Flanged Seal | • | — | • | • | 1-in.<br>2-in.<br>3-in. | |

(1) Available with ANSI Class 300 or EN 1092-1 PN 40 or JIS B2238 20K or lower flange ratings.

# Rosemount 1199 Remote Mount Seal Systems

Tuned-System Assembly Comprised of 1199 Direct Mount Seal combined with 1199 Remote Mount Seal

Rosemount 1199 Remote Mount Seals are used commonly at the top of the vessel when a DP measurement is required. The capillary that is used is available in three different diameters to optimize time response and reduce temperature effects.

Product features and capabilities include:

- Remote Mount Seals can be used for high temperature applications
- Remote Mount Seals are used on the low pressure side of the transmitter for Tuned-System Assemblies that can be used for DP measurements in closed or pressurized tank applications
- Variety of process connections
- Quantified performance for the entire transmitter / seal assembly (QZ option)

Additional Information

Specifications: page 101
Certifications: page 114
Dimensional Drawings: page 130

### Rosemount 1199 Remote Mount Seal

The 1199 Remote Mount Seal also requires specification of a Rosemount pressure transmitter. See the appropriate Product Data Sheet for the desired transmitter and include the option indicated in the table below for the configuration desired.

**Table 14. When ordering Rosemount 1199 Direct and Remote Mount Seals, please make sure to add the correct seal system ordering code to the transmitter model**

| Transmitter Model | 2 Seals | 1 Seal |
|---|---|---|
| 3051S_C | B12 | B11 |
| 3051C - Welded-Repairable | S2 | S1 |
| 3051C - All Welded(1) | S8 or S9 | S7 |
| 2051C | S2 | S1 |
| 3051S_T | — | B11 |
| 3051T, 2051T, 2088 | — | S1 |

(1) All welded system connection types require either a 316L SST or Alloy C-276 isolating diaphragm in the pressure transmitter model codes.

A 1199 Remote Mount Seal consists of 2 parts. First, specify the capillary model codes found on page 55. Then, specify a remote seal found on page 58.

**Ordering Codes**

1199 _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

Remote Mount Connection page 55 Seal Connection page 58

## Capillary/Fill fluid

**Note**

Use Table 15 for Capillary Type Connections. Use Table 13 for Direct Mount Type Connections.

### Table 15. Rosemount 1199 Remote Mount Seal Systems Ordering Information

**★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.**
**The Expanded offering is subject to additional delivery lead time.**

| Model | Product Description | | | |
|---|---|---|---|---|
| 1199 | Seal System | | | |
| **Connection Type** | | **Seal System** | **Seal Location** | |
| **Standard** | | | | **Standard** |
| 3051S and 2051 Coplanar Transmitters (3051S_C and 2051C) | | | | |
| W | Welded-Repairable | One or Two Seal System | High Side of Transmitter | ★ |
| M | Welded-Repairable | One or Two Seal System | Low Side of Transmitter | ★ |
| D | Welded-Repairable | Two Seal System | Balanced System - Same Seal on Low and High Side | ★ |
| R[1] | All Welded | One Seal System | High Side of Transmitter | ★ |
| T[1] | All Welded | Two Seal System | High Side of Transmitter | ★ |
| S[1] | All Welded | Two Seal System | Low Side of Transmitter | ★ |
| All In-Line Transmitters (3051S_T, 3051T, 2051T, 2088) | | | | |
| W | All Welded | One Seal System | — | ★ |
| 3051 Coplanar Transmitters (3051C) | | | | |
| W | Determined by Transmitter Code | One or Two Seal System | High Side of Transmitter | ★ |
| M | Determined by Transmitter Code | One or Two Seal System | Low Side of Transmitter | ★ |
| D | Determined by Transmitter Code | Two Seal System | Balanced System - Same Seal on Low and High Side | ★ |
| **Seal Fill Fluid** | | **Specific Gravity at 77 °F (25 °C)** | **Temperature Limits[2]** | |
| **Standard** | | | | **Standard** |
| D | Silicone 200 | 0.93 | –49 to 401 °F (–45 to 205 °C) | ★ |
| C[3] | Silicone 704 | 1.07 | 32 to 599 °F (0 to 315 °C) | ★ |
| V[3] | Silicone 705 | 1.09 | 68 to 698 °F (20 to 370 °C) | ★ |
| A | Syltherm XLT | 0.85 | –102 to 293 °F (–75 to 145 °C) | ★ |
| H | Inert (Halocarbon) | 1.85 | –49 to 320 °F (–45 to 160 °C) | ★ |
| G[4][5] | Glycerin and Water | 1.13 | 5 to 203 °F (–15 to 95 °C) | ★ |
| N[4] | Neobee M-20 | 0.92 | 5 to 437 °F (–15 to 225 °C) | ★ |
| P[4][5] | Propylene Glycol and Water | 1.02 | 5 to 203 °F (–15 to 95 °) | ★ |

## Table 15. Rosemount 1199 Remote Mount Seal Systems Ordering Information

★ **The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.**

**The Expanded offering is subject to additional delivery lead time.**

| **Seal Connection Type / Capillary ID, Description** | | |
|---|---|---|
| **Standard** | | **Standard** |
| B | 0.03-in. (0.711 mm) ID | ★ |
| C | 0.04-in. (1.092 mm) ID | ★ |
| D | 0.075-in. (1.905 mm) ID | ★ |
| E | 0.03-in. (0.711 mm) ID, PVC Coated with Closed End | ★ |
| F[(6)] | 0.04-in. (1.092 mm) ID, PVC Coated with Closed End | ★ |
| G[(6)] | 0.075-in. (1.905 mm) ID, PVC Coated with Closed End | ★ |
| H[(6)] | 0.03-in. (0.711 mm) ID, 4-in. Support Tube | ★ |
| J | 0.04-in. (1.092 mm) ID, 4-in. Support Tube | ★ |
| K | 0.075-in. (1.905 mm) ID, 4-in. Support Tube | ★ |
| M[(6)] | 0.03-in. (0.711 mm) ID, PVC Coated, 4-in. Support Tube with Closed End | ★ |
| N[(6)] | 0.04-in. (1.092 mm) ID, PVC Coated, 4-in. Support Tube with Closed End | ★ |
| P[(6)] | 0.075-in. (1.905 mm) ID, PVC Coated, 4-in. Support Tube with Closed End | ★ |
| **Capillary Length / Direct Mount[(7)]** | | |
| **Standard** | | **Standard** |
| 01 | 1 ft (0.3 m) | ★ |
| 05 | 5 ft (1.5 m) | ★ |
| 10 | 10 ft (3.0 m) | ★ |
| 15 | 15 ft (4.5 m) | ★ |
| 20 | 20 ft (6.1 m) | ★ |
| 51 | 1.6 ft (0.5 m) | ★ |
| 52 | 3.3 ft (1.0 m) | ★ |
| 53 | 4.9 ft (1.5 m) | ★ |
| 54 | 6.6 ft (2.0 m) | ★ |
| 55 | 8.2 ft (2.5 m) | ★ |
| 56 | 9.8 ft (3.0 m) | ★ |
| 57 | 11.5 ft (3.5 m) | ★ |
| 58 | 13.1 ft (4.0 m) | ★ |
| 59 | 16.4 ft (5.0 m) | ★ |
| 60 | 19.7 ft (6.0 m) | ★ |
| **Expanded** | | |
| 25 | 25 ft (7.6 m) | |
| 30 | 30 ft (9.1 m) | |
| 35 | 35 ft (10.7 m) | |
| 40 | 40 ft (12.2 m) | |
| 45 | 45 ft (13.7 m) | |
| 50 | 50 ft (15.2 m) | |
| 61 | 23 ft (7.0 m) | |
| 62 | 26.2 ft (8.0 m) | |
| 63 | 29.5 ft (9.0 m) | |
| 64 | 32.8 ft (10.0 m) | |
| 65 | 36.1 ft (11.0 m) | |
| 66 | 39.4 ft (12.0 m) | |
| 67 | 42.6 ft (13.0 m) | |
| 68 | 45.9 ft (14.0 m) | |
| 69 | 49.2 ft (15.0 m) | |

(1) All welded system connection types require either a 316L SST or Alloy C-276 isolating diaphragm in the pressure transmitter model codes.

(2) At ambient pressure of 14.7 psia (1 bar-a) and ambient temperature of 70°F and must be further derated if ambient, temperature exceeds 70 °F (21 °C).

(3) Not available with Seal Connection Type \ Capillary ID, Description codes B, E, H or M.

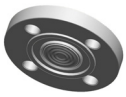
(4) This is a food grade fill fluid.

(5) Not suitable for vacuum applications.

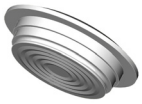
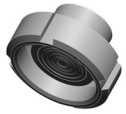
(6) Compression fitting does not provide a hermetic seal.

(7) For Submersible Seal TSM and FSM models, refer to the Rosemount 1199 Submersible Seal Product Data Sheet, document number 00813-0400-4016.

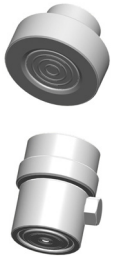
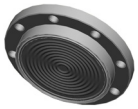
**Continue specifying a completed model number by choosing a remote seal type below:**
★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.
The Expanded offering is subject to additional delivery lead time.

| Flanged Seal Assemblies | | | Process Connections | |
|---|---|---|---|---|
| **Standard** | | | | **Standard** |
|  | page 61 | FFW Flush Flanged Seal | 2-in. / DN 50 / 50A<br>3-in. / DN 80 / 80A<br>4-in. / DN 100 / 100A | ★ |
|  | page 65 | RFW Flanged Seal | 1/2-in. / DN 15<br>3/4-in.<br>1-in. / DN 25 / 25A<br>1 1/2-in. / DN 40 / 40A | ★ |
|  | page 68 | EFW Extended Flanged Seal | 1 1/2-in. / DN 40 / 40A<br>2-in. / DN 50 / 50A<br>3-in. / Headbox / DN 80 / 80A<br>4-in. / Headbox / DN 100 / 100A | ★ |
|  | page 71 | PFW Pancake Seal | 2-in. / DN50<br>3-in. / DN 80 | ★ |
| **Expanded** | | | | |
|  | page 73 | FCW Flush Flanged Seal – Ring Type Joint (RTJ) Gasket Surface | 2-in.<br>3-in. | |
|  | page 75 | RCW Ring Type Joint (RTJ) Flanged Seal | ½-in.<br>¾-in.<br>1-in.<br>1 ½-in. | |
|  | page 78 | FUW and FVW Flush Flanged Type Seals | DN 50<br>DN 80 | |
| **Threaded Seal Assemblies** | | | **Process Connections** | |
| **Standard** | | | | **Standard** |
|  | page 79 | RTW Threaded Seal | ¼ –18 NPT<br>3/8 –18 NPT<br>½ –14 NPT<br>¾ –14 NPT<br>1 – 11.5 NPT<br>1 ¼ –11.5 NPT<br>1 ½ –11.5 NPT<br>G1/2 A DIN 16288<br>R1/2 per ISO 7/1 | ★ |
| **Expanded** | | | | |
|  | page 82 | HTS Male Threaded Seal | G1<br>G1 ½<br>G2<br>1-11.5 NPT<br>1 ½ -11.5 NPT<br>2-11.5 NPT | |

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.
The Expanded offering is subject to additional delivery lead time.

| **Hygienic Seal Assemblies** | | | **Process Connections** | |
|---|---|---|---|---|
| **Standard** | | | | **Standard** |
|  | page 83 | SCW Hygienic Tri-Clover Style Tri-Clamp Seal | 1 ½-in.<br>2-in.<br>2 ½-in.<br>3-in.<br>4-in. | ★ |
|  | page 85 | SSW Hygienic Tank Spud Seal | 2-in. Extension<br>6-in. Extension | ★ |
| **Expanded** | | | | |
|  | page 88 | STW Hygienic Thin Wall Tank Spud Seal | 0.8 in Extension | |
|  | page 89 | EES Hygienic Flanged Tank Spud Extended Seal | DN 50<br>DN 80 | |
|  | page 90 | VCS Tri-clamp® In-Line Seal | 1-in.<br>1 ½-in.<br>2-in.<br>3-in.<br>4-in. | |
|  | page 91 | SVS Varivent® Compatible Hygienic Connection Seal | Tuchenhagen Varivent Compatible | |
|  | page 92 | SHP Hygienic Cherry-Burrell “I” Line Seal | 2-in.<br>3-in. | |
|  | page 93 | SLS Dairy Process Connection - Female Thread Seal per DIN 11851 | DN 40<br>DN 50 | |
| **Specialty Seal Assemblies** | | | **Process Connections** | |
| **Expanded** | | | | |
|  | page 94 | WSP Saddle Seal | 2-in.<br>3-in.<br>4-in. or Larger | |

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.
The Expanded offering is subject to additional delivery lead time.

| | | | | |
|---|---|---|---|---|
|  | page 96 | UCP Male Threaded Pipe Mount Seals and PMW Paper Mill Sleeve Seals | 1 ½-in. with Threaded Knurled Nut<br>1-in. with Cap Screw Retainer | |
|  | page 97 | CTW Chemical Tee Seal | Retro-fit | |
|  | page 98 | TFS Wafer Style In-Line Seal | 1-in. / DN 25<br>1 ½-in. / DN 40<br>2-in. / DN 50<br>3-in. / DN 80<br>4-in. / DN 100 | |
|  | page 99 | WFW Flow-Thru Flanged Seal | 1-in.<br>2-in.<br>3-in. | |

# Flanged Seals

## FFW Flush Flanged Seal

**Table 16. FFW Flush Flanged Seal – Ordering Information**

**★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.**
**The Expanded offering is subject to additional delivery lead time.**

| Code | Industry Standards | | | |
|---|---|---|---|---|
| **Standard** | | | | **Standard** |
| A | ANSI/ASME B16.5 (American National Standards Institute/American Society of Mechanical Engineers) | | | ★ |
| D | EN 1092-1 (European Standard) | | | ★ |
| T | GOST 12815-80 (Russian Standard) | | | ★ |
| **Expanded** | | | | |
| J | JIS B2238 (Japanese Industrial Standard) | | | |
| **Process Connection Style** | | | | |
| **Standard** | | | | **Standard** |
| FFW | Flush Flanged Seal | | | ★ |
| **Process Connection Size** | | | | |
| | **ANSI/ASME B16.5** | **EN 1092-1 / GOST 12815-80** | **JIS B2238** | |
| **Standard** | | | | **Standard** |
| G | 2-in. | DN 50 | 50 A | ★ |
| 7 | 3-in. | — | 80 A | ★ |
| J | — | DN 80 | — | ★ |
| 9 | 4-in. | DN 100 | 100 A | ★ |
| **Flange / Pressure Rating** | | | | |
| | **ANSI/ASME B16.5** | **EN 1092-1 / GOST 12815-80** | **JIS B2238** | |
| **Standard** | | | | **Standard** |
| 1 | Class 150 | — | 10K | ★ |
| 2 | Class 300 | — | 20K | ★ |
| 4 | Class 600 | — | 40K | ★ |
| G | — | PN 40 | — | ★ |
| **Expanded** | | | | |
| E | — | PN 10 / 16 (DN 100 only) | — | |
| 5 | Class 900 | — | — | |
| 6 | Class 1500 | — | — | |
| 7 | Class 2500 | — | — | |
| H | — | PN 63 | — | |
| J | — | PN 100 | — | |
| K | — | PN 160 | — | |

### Table 16. FFW Flush Flanged Seal – Ordering Information

★ **The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.**

**The Expanded offering is subject to additional delivery lead time.**

| **Diaphragm and Wetted, Upper Housing, Flange Material** | | | | |
|---|---|---|---|---|
| | **Diaphragm and Wetted** | **Upper Housing** | **Flange** | |
| **Standard** | | | | **Standard** |
| CA[1][2] | 316L SST | 316L SST | CS | ★ |
| DA[2] | 316L SST | 316L SST | 316 SST | ★ |
| CB[1][3] | Alloy C-276, seam welded | 316L SST | CS | ★ |
| DB[3] | Alloy C-276, seam welded | 316L SST | 316 SST | ★ |
| CC[1] | Tantalum, seam welded | 316L SST | CS | ★ |
| DC | Tantalum, seam welded | 316L SST | 316 SST | ★ |
| C3[1][2][3][4] | Tantalum, brazed | 316L SST | CS | ★ |
| D3[1][2][3][4] | Tantalum, brazed | 316L SST | 316 SST | ★ |
| **Expanded** | | | | |
| MB[1][2] | Alloy C-276, solid faceplate | Alloy C-276 / 316L SST | CS | |
| KB[1][2] | Alloy C-276, solid faceplate | Alloy C-276 / 316L SST | 316 SST | |
| DJ | Alloy B, seam welded | 316L SST | 316 SST | |
| DF | 304L SST, seam welded | 316L SST | 316 SST | |
| DV | Alloy 400, seam welded | 316L SST | 316 SST | |
| RH[2][5] | Titanium Grade 4 | Titanium GR.4 | 316 SST | |
| DH[6] | Titanium Grade 4, seam welded | 316L SST | 316 SST | |
| DE | Alloy 600, seam welded | 316L SST | 316 SST | |
| DP | Nickel 201, seam welded | 316L SST | 316 SST | |
| WW[2][7] | 316Ti SST (WNr 1.4571) | 316Ti SST (WNr 1.4571) | 316Ti SST (WNr 1.4571) | |
| DZ[6] | Zirconium 702, seam welded | 316L SST | 316 SST | |
| D4 | Alloy C-22, seam welded | 316L SST | 316 SST | |
| D5 | Duplex 2507 SST, seam welded | 316L SST | 316 SST | |
| **Flushing Connection Ring Material (Lower Housing)[8]** | | | | |
| **Standard** | | | | **Standard** |
| 0 | None | | | ★ |
| A | 316L SST | | | ★ |
| B | Alloy C-276 | | | ★ |
| **Expanded** | | | | |
| 2 | Duplex 2205 SST | | | |
| H | Titanium Grade 4 | | | |
| 6 | Nickel 201 | | | |
| V | Alloy 400 | | | |
| **Flushing Connection Options, Quantity (Size)** | | | | |
| **Standard** | | | | **Standard** |
| 0 | None | | | ★ |
| 1 | 1 ($^1/_4$-18 NPT) | | | ★ |
| 3 | 2 ($^1/_4$-18 NPT) | | | ★ |
| 7 | 1 ($^1/_2$-14 NPT) | | | ★ |
| 9 | 2 ($^1/_2$-14 NPT) | | | ★ |

### Options (Include with selected model number)

| **Gasket Material** | | |
|---|---|---|
| **Standard** | | **Standard** |
| J | PTFE gasket (for use with flushing connection ring) | ★ |

### Table 16. FFW Flush Flanged Seal – Ordering Information

**★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.**
**The Expanded offering is subject to additional delivery lead time.**

| | | |
|---|---|---|
| **Expanded** | | |
| N | Grafoil gasket (for use with flushing connection ring) | |
| K | Barium Sulfate filled PTFE gasket (for use with flushing connection ring) | |
| **Flushing Plug, Vent/Drain Valve** | | |
| **Standard** | | **Standard** |
| D | Alloy C-276 plug(s) for flushing connection(s) | ★ |
| G | 316 SST plug(s) for flushing connection(s) | ★ |
| H | 316 SST vent/drain for flushing connection(s) | ★ |
| **Diaphragm Thickness** | | |
| **Expanded** | | |
| C | 0.006-in. (150 µm) available with 316L SST, Alloy C-276, and Duplex 2507 SST for abrasive applications | |
| 7 | 0.002-in. (50 µm) available with 316L SST and Alloy C-276 | |
| **Mounting Flange** | | |
| **Expanded** | | |
| 4[(9)] | Flat face, flush flanged | |
| **Code Conformance** | | |
| **Standard** | | **Standard** |
| T[(10)] | Wetted Material Compliance per NACE MR 0175/ISO 15156, MR 0103 | ★ |
| **Gasket Surface Finish** | | |
| **Expanded** | | |
| 1 | Gasket Surface Ra 125 Max. | |
| **Code Conformance** | | |
| **Standard** | | **Standard** |
| B | Extra Fill For Cold Temp Application | ★ |
| **Diaphragm Coating** | | |
| **Expanded** | | |
| Z[(11)] | 0.0002-in. (5 µ m) gold plated Diaphragm | |
| V[(11)] | PTFE coated diaphragm for nonstick purposes only | |
| **Capillary Change** | | |
| **Expanded** | | |
| 2 | Radial capillary connection | |
| **Alternate Design** | | |
| **Standard** | | **Standard** |
| E | One Piece Design | ★ |
| **Typical Model Number: 1199 W DC 1 0 A FFW 7 1 DA 0 0** | | |

(1) Only available with two piece design.

(2) For use with spiral wound metallic gaskets.

(3) Not available with option code C.

(4) Only available in Process Connection Size code G, 7, and J.

(5) Not available with welded capillary connections or direct mount.

(6) Operating temperature limited to 302 °F (150 °C).

(7) Only available with one-piece design, option code E.

(8) Supplied standard with ThermoTork TN9000.

(9) The mounting flange and upper housing are a single item for the one-piece design. Only available with diaphragm and wetted part material codes DA, DB, DJ, DF, DV, DH, DE, DP, WW, DZ, D4, DC, and D5.

(10) Materials of Construction comply with metallurgical requirements highlighted within NACE MR 0175 / ISO 15156 for sour oil field production environments. Environmental limits apply to certain materials. Consult latest standard for details. Selected materials also conform to NACE MR 0103 for sour refining environments.

(11) Only available on 316LSS, Alloy 400 and Alloy C-276.

## RFW Flanged Seal

### Table 17. RFW Flanged Seal Ordering Information

★ **The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.**
**The Expanded offering is subject to additional delivery lead time.**

| Code | Industry Standard | | | |
|---|---|---|---|---|
| **Standard** | | | | **Standard** |
| A | ANSI/ASME B16.5 (American National Standards Institute/American Society of Mechanical Engineers) | | | ★ |
| D | EN 1092-1 (European Standard) | | | ★ |
| T | GOST 12815-80 (Russian Standard) | | | ★ |
| **Expanded** | | | | |
| J | JIS B2238 (Japanese Industrial Standard) | | | |
| **Process Connection Style** | | | | |
| **Standard** | | | | **Standard** |
| RFW | Flanged Seal | | | ★ |
| **Process Connection Size** | | | | |
| | **ANSI/ASME B16.5** | **EN 1092-1 / GOST 12815-80** | **JIS B2238** | |
| **Standard** | | | | **Standard** |
| 2 | 1-in. | — | 25A | ★ |
| 4 | 1 1/2-in. | — | 40A | ★ |
| D | — | DN 25 | — | ★ |
| F | — | DN 40 | — | ★ |
| **Expanded** | | | | |
| 1 | 1/2-in. | — | — | |
| A | 3/4-in. | DN 10 | 10A | |
| B | — | DN 15 | 15A | |
| C | — | DN 20 | 20A | |
| **Flange/Pressure Rating** | | | | |
| | **ANSI/ASME B16.5** | **EN 1092-1 / GOST 12815-80** | **JIS B2238** | |
| **Standard** | | | | **Standard** |
| 1 | Class 150 | — | 10K | ★ |
| 2 | Class 300 | — | 20K | ★ |
| 4 | Class 600 | — | 40K | ★ |
| G | — | PN 40 | — | ★ |
| **Expanded** | | | | |
| 5 | Class 900 | — | — | |
| 6 | Class 1500 | — | — | |
| 7 | Class 2500 | — | — | |
| C | — | PN 6 | — | |
| H | — | PN 63 | — | |
| J | — | PN 100 | — | |
| K | — | PN 160 | — | |

### Table 17. RFW Flanged Seal Ordering Information

**★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.**
**The Expanded offering is subject to additional delivery lead time.**

| **Diaphragm, Upper Housing, Flange Material** | | | | |
|---|---|---|---|---|
| | **Diaphragm** | **Upper Housing** | **Flange** | |
| **Standard** | | | | **Standard** |
| CA | 316L SST | 316L SST | CS | ★ |
| DA | 316L SST | 316L SST | 316 SST | ★ |
| CB | Alloy C-276 | 316L SST | CS | ★ |
| DB | Alloy C-276 | 316L SST | 316 SST | ★ |
| CC | Tantalum | 316L SST | CS | ★ |
| DC | Tantalum | 316L SST | 316 SST | ★ |
| **Expanded** | | | | |
| DF | 304L SST | 316L SST | 316 SST | |
| DJ | Alloy B | 316L SST | 316 SST | |
| DE | Alloy 600 | 316L SST | 316 SST | |
| DV | Alloy 400 | 316L SST | 316 SST | |
| DP | Nickel 201 | 316L SST | 316 SST | |
| DK | Alloy 20 | 316L SST | 316 SST | |
| RH[(1)] | Titanium Grade 4 | Titanium Grade 4 | 316 SST | |
| DH | Titanium Grade 4 | 316L SST | 316 SST | |
| D4 | Alloy C-22 | 316L SST | 316 SST | |
| D5 | Duplex 2507 SST | 316L SST | 316 SST | |
| DZ | Zirconium 702 | 316L SST | 316 SST | |
| **Flushing Connection Ring Material (Lower Housing)[(2)]** | | | | |
| **Standard** | | | | **Standard** |
| A | 316L SST | | | ★ |
| B | Alloy C-276 | | | ★ |
| D | Plated CS | | | ★ |
| **Expanded** | | | | |
| 2 | Duplex 2205 | | | |
| F | 304L SST | | | |
| H | Titanium Grade 4 | | | |
| V | Alloy 400 | | | |
| C | Tantalum lined 316L SST (no flushing connection allowed) | | | |
| **Flushing Connection Options, Quantity Size** | | | | |
| **Standard** | | | | **Standard** |
| 5 | None | | | ★ |
| 1 | 1 ($^1/_4$-18 NPT) | | | ★ |
| 3 | 2 ($^1/_4$-18 NPT) | | | ★ |
| **Expanded** | | | | |
| 7 | 1 ($^1/_2$-14 NPT) | | | |
| 9 | 2 ($^1/_2$-14 NPT) | | | |

## Options (Include with selected model number)

| **Gasket Material** | | |
|---|---|---|
| **Standard** | | **Standard** |
| J | PTFE gasket | ★ |

### Table 17. RFW Flanged Seal Ordering Information

**★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.**

**The Expanded offering is subject to additional delivery lead time.**

| | | |
|---|---|---|
| **Expanded** | | |
| N | Grafoil® gasket | |
| K | Barium Sulfate filled PTFE gasket | |
| R | Ethylene Propylene gasket | |
| **Flushing Plug, Vent/Drain Valve** | | |
| **Standard** | | **Standard** |
| D | Alloy C-276 plug(s) for flushing connection(s) | ★ |
| G | 316 SST plug(s) for flushing connection(s) | ★ |
| H | 316 SST vent/drain for flushing connection(s) | ★ |
| **Diaphragm Thickness** | | |
| **Expanded** | | |
| C | 0.006-in. (150 µm) available with 316L SST, Alloy C-276, and Duplex 2507 SST for abrasive applications | |
| **Bolt Material** | | |
| **Expanded** | | |
| 3 | 304 SST Bolts (Only available for Stud Bolt Design) | |
| **Standard** | | **Standard** |
| T(3) | Wetted Material Compliance per NACE MR 0175/ISO 15156, MR 0103 | ★ |
| **Gasket Surface Finish** | | |
| **Expanded** | | |
| 1 | Gasket Surface Ra 125 Max. | |
| **Cold Temperature Application** | | |
| **Standard** | | **Standard** |
| B | Extra Fill For Cold Temp Application | ★ |
| **Diaphragm Coating** | | |
| **Expanded** | | |
| Z(4) | 0.0002-in. (5 µm) gold plated Diaphragm | |
| V(4) | PTFE coated diaphragm for nonstick purposes only | |
| **Large Diaphragm Size** | | |
| **Expanded** | | |
| 9 | 4.1-in. (104 mm) Diaphragm Diameter | |
| **Typical Model Number: 1199 W DC 1 0 A RFW 2 1 DA A 5** | | |

(1) Not available with welded capillary connections or direct mount.

(2) Supplied with C4401 Aramid fiber gasket.

(3) Materials of Construction comply with metallurgical requirements highlighted within NACE MR 0175 / ISO 15156 for sour oil field production environments. Environmental limits apply to certain materials. Consult latest standard for details. Selected materials also conform to NACE MR 0103 for sour refining environments.

(4) Only available on 316LSS, Alloy 400 and Alloy C-276.

## EFW Extended Flanged Seal

### Table 18. EFW Extended Flanged Seal Ordering Information

★ **The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.**
**The Expanded offering is subject to additional delivery lead time.**

| Code | Industry Standard | ● = Available — = Unavailable | |
|---|---|---|---|
| **Standard** | | | **Standard** |
| A | ANSI/ASME B16.5 (American National Standards Institute/American Society of Mechanical Engineers) | | ★ |
| D | EN 1092-1 (European Standard) | | ★ |
| T | GOST 12815-80 (Russian Standard) | | ★ |
| **Expanded** | | | |
| J | JIS B2238 (Japanese Industrial Standards) | | |
| **Process Connection Style** | | | |
| **Standard** | | | **Standard** |
| EFW | Extended Flanged Seal | | ★ |
| **Process Connection Size** | | | |

| | ANSI/ASME B16.5 | EN 1092-1 / GOST 12815-80 | JIS B2238 | Extension Diameters | |
|---|---|---|---|---|---|
| **Standard** | | | | | **Standard** |
| 7 | 3-in. Schedule 80 | DN 80 | 80A | 2.58-in. (66 mm) | ★ |
| 9 | 4-in. Schedule 80 | DN 100 | 100A | 3.50-in. (89 mm) | ★ |
| **Expanded** | | | | | |
| 4 | 1 1/2-in. | DN 40 | 40A | 1.45-in. (37 mm) | |
| G | 2-in. | DN 50 | 50A | 1.90-in. (48 mm) | |
| H | 3-in. (Headbox) | DN 80 (Headbox) | — | 2.875-in. (73 mm) | |
| K | 4-in. (Headbox) | DN 100 (Headbox) | | 3.780-in. (96 mm) | |
| R | 3-in. Schedule 40 | DN 80 | 80A | 2.85-in. (73 mm) | |
| T | 4-in.(Schedule 40) | DN 100 | 100A | 3.70-in. (94 mm) | |
| **Flange/Pressure Rating** | | | | | |

| | ANSI/ASME B16.5 | EN 1092-1 / GOST 12815-80 | JIS B2238 | |
|---|---|---|---|---|
| **Standard** | | | | **Standard** |
| 1 | Class 150 | — | 10K | ★ |
| 2 | Class 300 | — | 20K | ★ |
| 4 | Class 600 | — | 40K | ★ |
| G | — | PN 40 | — | ★ |
| **Expanded** | | | | |
| E | — | PN 10/16 (DN 100 only) | — | |
| 5 | Class 900 | — | — | |
| 6 | Class 1500 | — | — | |
| 7 | Class 2500 | — | — | |
| H | — | PN 63 | — | |
| J | — | PN 100 | — | |
| K | — | PN 160 | — | |
| J | — | PN 100 | — | |
| K | — | PN 160 | — | |

### Table 18. EFW Extended Flanged Seal Ordering Information

**★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.**
**The Expanded offering is subject to additional delivery lead time.**

| Diaphragm, Extension and Gasket Surface, Upper Housing, Flange Material | | | | | Available with Process Connection Code | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Code** | **Diaphragm** | **Extension/ Gasket Surface** | **Upper Housing** | **Mounting Flange** | **7** | **9** | **4** | **G** | **H** | **K** | | |
| **Standard** | | | | | | | | | | | | **Standard** |
| DA | 316L SST | 316L SST | 316L SST | 316 SST | ● | ● | ● | ● | ● | ● | | ★ |
| CA | 316L SST | 316L SST | 316L SST | CS | ● | ● | ● | ● | ● | ● | | ★ |
| DB | Alloy C-276 | Alloy C-276 | 316L SST | 316 SST | ● | ● | ● | ● | ● | ● | | ★ |
| CB | Alloy C-276 | Alloy C-276 | 316L SST | CS | ● | ● | ● | ● | ● | ● | | ★ |
| **Expanded** | | | | | | | | | | | | |
| DM | Alloy C-276 | 316L SST | 316L SST | 316 SST | ● | ● | ● | ● | ● | ● | | |
| DD | Tantalum | 316L SST | 316L SST | 316 SST | ● | ● | — | — | — | — | | |
| DC[1] | Tantalum | Tantalum Lined | 316L SST | 316 SST | ● | ● | — | ● | — | — | | |
| D5 | Duplex 2507 SST | Duplex 2205 SST | 316L SST | 316 SST | ● | ● | ● | ● | ● | ● | | |
| D9 | Duplex 2507 SST | 316L SST | 316L SST | 316 SST | ● | ● | ● | ● | ● | ● | | |
| **Extension Length** | | | | | | | | | | | | |
| | **ANSI/ASME B16.5** | | **EN 1092-1 / JIS B2238 / GOST 12815-80** | | | | | | | | | |
| **Standard** | | | | | | | | | | | | **Standard** |
| 2 | 2-in. | | 50 mm | | | | | | | | | ★ |
| 4 | 4-in. | | 100 mm | | | | | | | | | ★ |
| 6 | 6-in. | | 150 mm | | | | | | | | | ★ |
| **Expanded** | | | | | | | | | | | | |
| 8 | 8-in. | | 200 mm | | | | | | | | | |
| 1 | 1-in. | | 25 mm | | | | | | | | | |
| 3 | 3-in. | | 75 mm | | | | | | | | | |
| 5 | 5-in. | | 125 mm | | | | | | | | | |
| 7 | 7-in. | | 175 mm | | | | | | | | | |
| 9 | 9-in. | | 225 mm | | | | | | | | | |
| **Fractional Extension Length** | | | | | | | | | | | | |
| | **ANSI/ASME B16.5** | | **EN 1092-1 / JIS B2238 / GOST 12815-80** | | | | | | | | | |
| **Standard** | | | | | | | | | | | | **Standard** |
| 0 | 0-in. | | 0 mm | | | | | | | | | ★ |

## Options (Include with selected model number)

| **Diaphragm Thickness** | | |
|---|---|---|
| **Expanded** | | |
| **C** | 0.006-in. (150 µm) available with 316L SST, Alloy C-276, and Duplex 2507 SST for abrasive applications | |
| **Code Conformance** | | |
| **Standard** | | **Standard** |
| T[2] | Wetted Material Compliance per NACE MR 0175/ISO 15156, MR 0103 | ★ |
| **Gasket Surface Finish** | | |
| **Expanded** | | |
| 1 | Gasket Surface Ra 125 Max. | |

### Table 18. EFW Extended Flanged Seal Ordering Information

**★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.**

**The Expanded offering is subject to additional delivery lead time.**

| **Cold Temperature Application** | | |
|---|---|---|
| **Standard** | | **Standard** |
| B | Extra Fill For Cold Temperature Application | ★ |
| **Diaphragm Coating** | | |
| **Expanded** | | |
| Z(3) | 0.0002-in. (5 μm) Gold plated diaphragm | |
| V(3) | PTFE coated diaphragm for nonstick purposes only | |
| **Typical Model Number: 1199 W DC 1 0 A EFW 7 1 DA 2 0** | | |

(1) Requires Gasket Surface Finish Code 1 Gasket Surface Finish Ra 125 Max. Available in extension lengths 2, 4 & 6 in. For all other lengths consult factory.

(2) Materials of Construction comply with metallurgical requirements highlighted within NACE MR 0175 / ISO 15156 for sour oil field production environments. Environmental limits apply to certain materials. Consult latest standard for details. Selected materials also conform to NACE MR 0103 for sour refining environments.

(3) Only available on 316LSS, Alloy 400 and Alloy C-276.

## PFW Pancake Seal

### Table 19. PFW Pancake Seal Ordering Information

★ **The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.**
**The Expanded offering is subject to additional delivery lead time.**

| Code | Industry Standard | | | |
|---|---|---|---|---|
| **Standard** | | | | **Standard** |
| A | ANSI/ASME B16.5 (American National Standards Institute/American Society of Mechanical Engineers) | | | ★ |
| D | EN 1092-1 (European Standard) | | | ★ |
| T | GOST 12815-80 (Russian Standard) | | | ★ |
| **Process Connection Style** | | | | |
| **Standard** | | | | **Standard** |
| PFW | Pancake Seal | | | ★ |
| **Process Connection Size** | | | | |
| | **ANSI** | **EN 1092-1 / GOST 12815-80** | | |
| **Standard** | | | | **Standard** |
| G | 2-in. | DN 50 | | ★ |
| 7 | 3-in. | — | | ★ |
| J | — | DN 80 | | ★ |
| **Flange/Pressure Rating** | | | | |
| | **ANSI** | **EN 1092-1 / GOST 12815-80** | | |
| **Standard** | | | | **Standard** |
| 0 | No flange supplied, seal MWP based on customer supplied flange | | | ★ |
| 1 | Class 150 | — | | ★ |
| 2 | Class 300 | — | | ★ |
| 4 | Class 600 | — | | ★ |
| G | — | PN40 | | ★ |
| **Expanded** | | | | |
| 5 | Class 900 | — | | |
| 6 | Class 1500 | — | | |
| 7 | Class 2500 | — | | |
| H | — | PN 63 | | |
| J | — | PN 100 | | |
| **Diaphragm and Wetted, Upper Housing, Flange Material** | | | | |
| | **Diaphragm and Wetted** | **Upper Housing** | **Flange** | |
| **Standard** | | | | **Standard** |
| LA[(1)] | 316L SST | 316L SST | None | ★ |
| CA[(1)] | 316L SST | 316L SST | CS | ★ |
| DA[(1)] | 316L SST | 316L SST | 316 SST | ★ |
| LB | Alloy C-276, Seam Welded | 316L SST | None | ★ |
| CB | Alloy C-276, Seam Welded | 316L SST | CS | ★ |
| DB | Alloy C-276, Seam Welded | 316L SST | 316 SST | ★ |
| LC | Tantalum, Seam Welded | 316L SST | None | ★ |
| CC | Tantalum, Seam Welded | 316L SST | CS | ★ |
| DC | Tantalum, Seam Welded | 316L SST | 316 SST | ★ |

### Table 19. PFW Pancake Seal Ordering Information

★ **The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.**
**The Expanded offering is subject to additional delivery lead time.**

| **Flushing Connection Ring Material (Lower Housing)[2]** | | |
|---|---|---|
| **Standard** | | **Standard** |
| 0 | None | ★ |
| A | 316L SST | ★ |
| B | Alloy C-276 | ★ |
| **Flushing Connection Options, Quantity (Size)** | | |
| **Standard** | | **Standard** |
| 0 | None | ★ |
| 1 | 1 ($^1/_2$-14 NPT) | ★ |
| 2 | 2 ($^1/_2$-14 NPT) | ★ |
| 7 | 1 ($^1/_2$-14 NPT) | ★ |
| 9 | 2 ($^1/_2$-14 NPT) | ★ |

## Options (Include with selected model number)

| **Gasket Material** | | |
|---|---|---|
| **Standard** | | **Standard** |
| J | PTFE gasket | ★ |
| **Expanded** | | |
| N | Grafoil® gasket | |
| K | Barium Sulfate filled PTFE gasket | |
| **Flushing Plug, Vent/Drain Valve** | | |
| **Standard** | | **Standard** |
| D | Alloy C-276 plug(s) for flushing connection(s) | ★ |
| G | 316 SST plug(s) for flushing connection(s) | ★ |
| H | 316 SST vent/drain for flushing connection(s) | ★ |
| **Diaphragm Thickness** | | |
| **Expanded** | | |
| C | 0.006-in. (150 µm) available with 316L SST, Alloy C-276, and Duplex 2507 SST for abrasive applications | |
| **Code Conformance** | | |
| **Standard** | | **Standard** |
| T[3] | Wetted Material Compliance per NACE MR 0175/ISO 15156, MR 0103 | ★ |
| **Gasket Surface Finish** | | |
| **Expanded** | | |
| 1 | Gasket Surface Ra 125 Max. | |
| **Cold Temperature Application** | | |
| **Standard** | | **Standard** |
| B | Extra Fill For Cold Temp Application | ★ |
| **Diaphragm Coating** | | |
| **Expanded** | | |
| Z[4] | 0.0002-in. (5 µm) Gold plated diaphragm | |
| V[4] | PTFE coated diaphragm for nonstick purposes only | |
| **Typical Model Number: 1199 W DC 1 0 A PFW 7 1 DA 0 0** | | |

(1) For use with customer supplied spiral wound metallic gaskets.

(2) Supplied standard with Thermo Torque TN9000 gasket.

(3) Materials of Construction comply with metallurgical requirements highlighted within NACE MR 0175 / ISO 15156 for sour oil field production environments. Environmental limits apply to certain materials. Consult latest standard for details. Selected materials also conform to NACE MR 0103 for sour refining environments.

(4) Only available on 316LSST, Alloy 400, and Alloy C-276.

## FCW Flush Flanged Seal – Ring Type Joint (RTJ) Gasket Surface

**Table 20. FCW Flush Flanged Seal – Ring Type Joint (RTJ) Gasket Surface Ordering Information**

**This seal is part of the Expanded offering and is subject to additional delivery lead time.**

| Code | Industry Standards | | |
|---|---|---|---|
| **Expanded** | | | |
| A | ANSI/ASME B16.5 (American National Standards Institute/American Society of Mechanical Engineers) | | |
| **Process Connection Style** | | | |
| **Expanded** | | | |
| FCW | Flush Flanged Seal - Ring Type Joint Gasket Surface | | |
| **Process Connection Size** | | | |
| **Expanded** | | | |
| G | 2-in. | | |
| 7 | 3-in. | | |
| **Flange/Pressure Rating** | | | |
| **Expanded** | | | |
| 1 | Class 150 | | |
| 2 | Class 300 | | |
| 4 | Class 600 | | |
| 5 | Class 900 | | |
| 6 | Class 1500 | | |
| 7 | Class 2500 | | |
| **Diaphragm and Wetted, Upper Housing, Flange Material** | | | |
| | **Diaphragm and Wetted** | **Upper Housing** | **Flange** |
| **Expanded** | | | |
| DA | 316L SST | 316L SST | 316 SST |
| KB | Alloy C-276 | 316L SST | 316 SST |
| K5 | Duplex 2507 SST/Duplex 2205 | 316L SST | 316 SST |
| **Flushing Connection Ring Material (Lower Housing)** | | | |
| **Expanded** | | | |
| 0 | None | | |
| A | 316L SST | | |
| B | Alloy C-276 | | |
| 2 | Duplex 2205 SST | | |
| **Flushing Connection Options** | | | |
| **Expanded** | | | |
| 0 | None | | |
| 1 | 1 ($^1/_4$-18 NPT) | | |
| 3 | 2 ($^1/_4$-18 NPT) | | |
| 7 | 1 ($^1/_2$-14 NPT) | | |
| 9 | 2 ($^1/_2$-14 NPT) | | |

### Table 20. FCW Flush Flanged Seal – Ring Type Joint (RTJ) Gasket Surface Ordering Information

**This seal is part of the Expanded offering and is subject to additional delivery lead time.**

**Options (Include with selected model number)**

| | |
|---|---|
| **Flushing Plug, Vent/Drain Valve** | |
| **Expanded** | |
| D | Alloy C-276 plug(s) for flushing connection(s) |
| G | 316 SST plug(s) for flushing connection(s) |
| H | 316 SST vent/drain for flushing connection(s) |
| **Diaphragm Thickness** | |
| **Expanded** | |
| C | 0.006-in. (150 µm) available with 316L SST, Alloy C-276, and Duplex 2507 SST for abrasive applications |
| 7 | 0.002-in. (50 µm) available with 316L SST and Alloy C-276 |
| **Code Conformance** | |
| **Expanded** | |
| T(1) | Wetted Material Compliance per NACE MR 0175/ISO 15156, MR 0103 |
| **Cold Temp Application** | |
| **Expanded** | |
| B | Extra Fill For Cold Temp Application |
| **Diaphragm Coating** | |
| **Expanded** | |
| Z(2) | 0.0002-in. (5 µm) Gold plated diaphragm |
| V(2) | PTFE coated diaphragm for nonstick purposes only |
| **Alternate Design** | |
| **Expanded** | |
| E | One Piece Design |
| **Typical Model Number: 1199 W DC 1 0 A FCW 7 1 DA 0 0** | |

(1) Materials of Construction comply with metallurgical requirements highlighted within NACE MR 0175 / ISO 15156 for sour oil field production environments. Environmental limits apply to certain materials. Consult latest standard for details. Selected materials also conform to NACE MR 0103 for sour refining environments.

(2) Only available on 316LSST and Alloy C-276.

## RCW Ring Type Joint (RTJ) Flanged Seal

### Table 21. RCW Ring Type Joint Flanged Seal Ordering Information

**This seal is part of the Expanded offering and is subject to additional delivery lead time.**

| Code | Industry Standard | | |
|---|---|---|---|
| **Expanded** | | | |
| A | ANSI/ASME B16.5 (American National Standards Institute/American Society of Mechanical Engineers) | | |
| **Process Connection Style** | | | |
| **Expanded** | | | |
| RCW | Flanged Seal - Ring Type Joint Gasket Surface | | |
| **Process Connection Size** | | | |
| **Expanded** | | | |
| 1 | 1/2-in. (Bolts and studs included for ANSI Class 300 to 1500, not available for ANSI Class 150) | | |
| A | 3/4-in. (Not available for Class 150) | | |
| 2 | 1-in. | | |
| 4 | 1 1/2-in. | | |
| **Flange/Pressure Rating** | | | |
| **Expanded** | | | |
| 1 | Class 150 | | |
| 2 | Class 300 | | |
| 4 | Class 600 | | |
| 5 | Class 900 | | |
| 6 | Class 1500 | | |
| 7 | Class 2500 | | |
| **Diaphragm, Upper Housing, Flange Material** | | | |
| | **Diaphragm** | **Upper Housing** | **Flange** |
| **Expanded** | | | |
| DA | 316L SST | 316L SST | 316 SST |
| DB | Alloy C-276 | 316L SST | 316 SST |
| DC | Tantalum | 316L SST | 316 SST |
| DE | Alloy 600 | 316L SST | 316 SST |
| DF | 304L SST | 316L SST | 316 SST |
| DJ | Alloy B316L SST | 316L SST | 316 SST |
| DV | Alloy 400 | 316L SST | 316 SST |
| DP | Nickel 201 | 316L SST | 316 SST |
| RH | Titanium Grade 4 | Titanium Grade 4 | 316 SST |
| DH(1) | Titanium Grade 4 | 316L SST | 316 SST |
| D4 | Alloy 22 | 316L SST | 316 SST |
| D5 | Duplex 2507 SST | 316L SST | 316 SST |
| DZ(1) | Zirconium 702 | 316L SST | 316 SST |
| DK | Alloy 20 | 316L SST | 316 SST |

### Table 21. RCW Ring Type Joint Flanged Seal Ordering Information

**This seal is part of the Expanded offering and is subject to additional delivery lead time.**

| **Flushing Connection Ring Material (Lower Housing)** | |
|---|---|
| **Expanded** | |
| A | 316L SST |
| B | Alloy C-276 |
| F | 304L SST |
| H | Titanium Grade 4 |
| 2 | Duplex 2205 SST |
| V | Alloy 400 |
| **Flushing Connection Options** | |
| **Expanded** | |
| 5 | None |
| 1 | 1 ($^1/_4$-18 NPT) |
| 3 | 2 ($^1/_4$-18 NPT) |
| 7 | 1 ($^1/_2$-14 NPT) |
| 9 | 2 ($^1/_2$-14 NPT) |

## Options (Include with selected model number)

| **Gasket Material** | |
|---|---|
| **Expanded** | |
| J | PTFE gasket |
| N | Grafoil® gasket |
| K | Barium Sulfate filled PTFE gasket |
| R | Ethylene Propylene gasket |
| **Flushing Plug, Vent/Drain Valve** | |
| **Expanded** | |
| D | Alloy C-276 plug(s) for flushing connection(s) |
| G | 316 SST plug(s) for flushing connection(s) |
| H | 316 SST vent/drain for flushing connection(s) |
| **Diaphragm Thickness** | |
| **Expanded** | |
| C | 0.006-in. (150 µm) available with 316L SST, Alloy C-276, and Duplex 2507 SST for abrasive applications |
| **Bolt Material (Optional)** | |
| **Expanded** | |
| 3 | 304 SST Bolts (Only available for Stud Bolt Design) |
| **Code Conformance** | |
| **Expanded** | |
| T[(2)] | Wetted Material Compliance per NACE MR 0175/ISO 15156, MR 0103 |
| **Cold Temperature Application** | |
| **Expanded** | |
| B | Extra Fill For Cold Temp Application |
| **Diaphragm Coating** | |
| **Expanded** | |
| Z[(3)] | 0.0002-in. (5 µm) Gold plated diaphragm |
| V[(3)] | PTFE coated diaphragm for nonstick purposes only |

### Table 21. RCW Ring Type Joint Flanged Seal Ordering Information

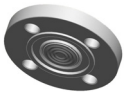
**This seal is part of the Expanded offering and is subject to additional delivery lead time.**

| **Large Diaphragm Size** | |
|---|---|
| **Expanded** | |
| 9 | 4.1-in. (104 mm) Diaphragm Diameter |
| **Typical Model Number: 1199 W DC 1 0 A RCW 2 1 DA A 5** | |

(1) Operating temperature is limited to 302 °F (150 °C).

(2) Materials of Construction comply with metallurgical requirements highlighted within NACE MR 0175 / ISO 15156 for sour oil field production environments. Environmental limits apply to certain materials. Consult latest standard for details. Selected materials also conform to NACE MR 0103 for sour refining environments.

(3) Only available on 316LSS, Alloy 400, and Alloy C-276.



## FUW and FVW Flush Flanged Type Seals

### Table 22. FUW and FVW Flush Flanged Type Seals – EN Ordering Information

**This seal is part of the Expanded offering is subject to additional delivery lead time.**

| Code | Industry Standard | | |
|---|---|---|---|
| **Expanded** | | | |
| D | EN 1092-1 (European Standard) | | |
| T | GOST 12815-80 (Russian Standard) | | |
| **Process Connection Style** | | | |
| **Expanded** | | | |
| FUW | Flush Flanged, EN 1092-1 Type D (Groove) | | |
| FVW | Flush Flanged, EN 1092-1 Type C (Tongue) | | |
| **Process Connection Size** | | | |
| **Expanded** | | | |
| G | DN 50 | | |
| J | DN 80 | | |
| **Flange/Pressure Rating** | | | |
| **Expanded** | | | |
| G | PN 40 | | |
| **Diaphragm and Wetted, Upper Housing, Flange Material** | | | |
| | **Diaphragm and Wetted** | **Upper Housing** | **Flange** |
| **Expanded** | | | |
| DA[1] | 316L SST | 316L SST | 316 SST |
| KB[2] | Alloy C-276 | 316L SST | 316 SST |
| DC[1] | Tantalum | 316L SST | 316 SST |
| **Flushing Connection Ring Material (Lower Housing)** | | | |
| **Expanded** | | | |
| 0 | None | | |
| **Flushing Connection Options, Quantity (Size)** | | | |
| **Expanded** | | | |
| 0 | None | | |

### Options (Include with selected model number)

| | |
|---|---|
| **Cold Temperature Application** | |
| **Expanded** | |
| B | Extra Fill For Cold Temperature Application |
| **Alternate Design** | |
| **Expanded** | |
| E | One Piece Design |
| **Typical Model Number: 1199 W DC 1 0 A FUW J G DA 0 0** | |

(1) Only available with one piece design, option code E.

(2) Only available with two-piece design.

# Threaded Seals

## RTW Threaded Seal

**Table 23. RTW Threaded Seal Ordering Information**

**★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery. The Expanded offering is subject to additional delivery lead time.**

| Code | Industry Standard | | | |
|---|---|---|---|---|
| **Standard** | | | | **Standard** |
| A | ANSI/ASME B1.20.1 (American National Standards Institute/American Society of Mechanical Engineers | | | ★ |
| D | EN 10226-1 (European Standard) | | | ★ |
| **Process Connection Style** | | | | |
| **Standard** | | | | **Standard** |
| RTW | Threaded (standard thread is female, for male select Option code 9) | | | ★ |
| **Process Connection Size** | | | | |
| | **ANSI/ASME B1.20.1** | **EN 10226-1** | | |
| **Standard** | | | | **Standard** |
| 3 | 1/2-14 NPT | — | | ★ |
| 4 | 3/4-14 NPT | — | | ★ |
| 5 | 1-11.5 NPT | — | | ★ |
| 7(1) | 1 1/2-11.5 NPT | — | | ★ |
| **Expanded** | | | | |
| 1 | 1/4-18 NPT | — | | |
| C | — | Parallel thread: G 1/2A DIN 16288 | | |
| 2 | 3/8-18 NPT | — | | |
| 6(1) | 1 1/4-11.5 NPT | — | | |
| N | — | Tapered thread: R 1/2 per ISO 7/1 | | |
| **Pressure Rating** | | | | |
| | **ANSI/ASME B1.20.1** | **EN 10226-1** | | |
| **Standard** | | | | **Standard** |
| 0 | 2500 psi | 172 bar | | ★ |
| **Expanded** | | | | |
| 2(2) | 5000 psi | 344 bar | | |
| 3(2)(3) | 10000 psi | — | | |
| 8 | 1500 psi (4.1-in. (104 mm) diaphragm | 103 bar (4.1-in. (104 mm) diaphragm | | |
| **Diaphragm, Upper Housing, Flange Material** | | | | |
| | **Diaphragm** | **Upper Housing** | **Flange** | |
| **Standard** | | | | **Standard** |
| CA | 316L SST | 316L SST | CS | ★ |
| DA | 316L SST | 316L SST | 316 SST | ★ |
| CB | Alloy C-276 | 316L SST | CS | ★ |
| DB | Alloy C-276 | 316L SST | 316 SST | ★ |
| CC | Tantalum | 316L SST | CS | ★ |
| DC | Tantalum | 316L SST | 316 SST | ★ |

### Table 23. RTW Threaded Seal Ordering Information

**★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.**
**The Expanded offering is subject to additional delivery lead time.**

| | | | | |
|---|---|---|---|---|
| **Expanded** | | | | |
| DJ | Alloy B | 316L SST | 316 SST | |
| DF | 304L SST | 316L SST | 316 SST | |
| DP | Nickel 201 | 316L SST | 316 SST | |
| DV | Alloy 400 | 316L SST | 316 SST | |
| RH[4] | Titanium Grade 4 | Titanium Grade 4 | 316 SST | |
| DH[5] | Titanium Grade 4 | 316L SST | 316 SST | |
| D4 | Alloy 22 | 316L SST | 316 SST | |
| D5 | Duplex 2507 SST | 316L SST | 316 SST | |
| DE | Alloy 600 | 316L SST | 316 SST | |
| DZ[5] | Zirconium 702 | 316L SST | 316 SST | |
| DK | Alloy 20 | 316L SST | 316 SST | |
| RZ[4] | Zirconium 702 | Zirconium 702 | 316 SST | |
| **Flushing Connection Ring Material (Lower Housing)[6][7]** | | | | |
| **Standard** | | | | **Standard** |
| A | 316L SST | | | ★ |
| B | Alloy C-276 | | | ★ |
| **Expanded** | | | | |
| D | Plated Carbon Steel | | | |
| 2 | Duplex 2205 SST | | | |
| H | Titanium Grade 4 | | | |
| V | Alloy 400 | | | |
| F | 304L SST | | | |
| **Flushing Connection Options** | | | | |
| **Standard** | | | | **Standard** |
| 5 | None | | | ★ |
| 1 | 1 (1/4-18 NPT) | | | ★ |
| 3 | 2 (1/4-18 NPT) | | | ★ |
| **Expanded** | | | | |
| 7 | 1 (1/2-14 NPT) | | | |
| 9 | 2 (1/2-14 NPT) | | | |

## Options (Include with selected model number)

| | | |
|---|---|---|
| **Gasket Material** | | |
| **Standard** | | **Standard** |
| J | PTFE gasket (for use with flushing connection ring) | ★ |
| N | Grafoil® gasket (for use with flushing connection ring) | ★ |
| R | Ethylene Propylene gasket (for use with flushing connection ring) | ★ |
| **Expanded** | | |
| K | Barium Sulfate filled PTFE gasket (for use with flushing connection ring) | |
| **Flushing Plug, Vent/Drain Valve** | | |
| **Standard** | | **Standard** |
| D | Alloy C-276 plug(s) for flushing connection(s) | ★ |
| G | 316 SST plug(s) for flushing connection(s) | ★ |
| H | 316 SST vent/drain for flushing connection(s) | ★ |

### Table 23. RTW Threaded Seal Ordering Information

**★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.**

**The Expanded offering is subject to additional delivery lead time.**

| | | |
|---|---|---|
| **Diaphragm Thickness** | | |
| **Expanded** | | |
| C | 0.006-in. (150 μm) available with 316L SST, Alloy C-276, and Duplex 2507 SST for abrasive applications | |
| **Bolt Material** | | |
| **Standard** | | **Standard** |
| 3 | 304 SST Bolts | ★ |
| **Expanded** | | |
| 4 | 316 SST Bolts | |
| **Code Conformance** | | |
| **Standard** | | **Standard** |
| T(8) | Wetted Material Compliance per NACE MR 0175/ISO 15156, MR 0103 | ★ |
| **Cold Temperature Application** | | |
| **Standard** | | **Standard** |
| B | Extra Fill For Cold Temp Application | ★ |
| **Diaphragm Coating** | | |
| **Expanded** | | |
| Z(9) | 0.0002-in. (5 μm) Gold plated diaphragm | |
| V(9) | PTFE coated diaphragm for nonstick purposes only | |
| **Special Threads in Lower Housing** | | |
| **Expanded** | | |
| 9 | Male Threads | |
| **Typical Model Number: 1199 W DC 1 0 A RTW 3 0 DA A 5** | | |

(1) Flushing connection not available.

(2) Consult an Emerson Process Management representative for pricing and availability on Pressure Rating codes 2 or 3.

(3) The following process connection sizes are D rated: $^{3}$/4-in (9000 psi/621 bar), 1-in. (8700 psi/600 bar), $1^{1}$/4-in (7000 psi/483 bar), and $1^{1}$/2-in. (6000 psi/414 bar).

(4) Not available with welded capillary connections or direct mount.

(5) Operating temperature is limited to 302 °F (150 °C).

(6) Supplied with C4401 aramid fiber gasket.

(7) Flushing Connection Ring/ Lower Housing assembly bolts provided as standard are carbon steel for ANSI and 304 SST for EN.

(8) Materials of Construction comply with metallurgical requirements highlighted within NACE MR 0175 / ISO 15156 for sour oil field production environments. Environmental limits apply to certain materials. Consult latest standard for details. Selected materials also conform to NACE MR 0103 for sour refining environments.

(9) Only available on 316LSS, Alloy 400, and Alloy C-276.

## HTS Male Threaded Seal

### Table 24. HTS Male Threaded Seal Ordering Information

**This seal is part of the Expanded offering and is subject to additional delivery lead time.**

| Code | Industry Standard | |
|---|---|---|
| **Expanded** | | |
| A | ANSI/ASME B1.20.1 (American National Standards Institute/American Society of Mechanical Engineers) | |
| D | EN 10226-1 (European Standard) | |
| **Process Connection Style** | | |
| **Expanded** | | |
| HTS | Male Threaded Seal | |
| **Process Connection Size, Pressure Rating** | | |
| | **ANSI/ASME B1.20.1** | **EN 10226-1** |
| **Expanded** | | |
| 5A(1) | 1-11,5 NPT, 8700 psi (600 bar) | — |
| 7A(2) | 1½-11,5 NPT, 6000 psi (414 bar) | — |
| 9A(3) | 2-11,5 NPT, 4000 psi (276 bar) | — |
| EA(1) | — | G1, 455 bar (6600 psi) |
| GA(2) | — | G1 1/2, BSP, 400 bar (5801 psi) |
| JA(3) | — | G2, BSP, 280 bar (4060 psi) |
| **Diaphragm and Wetted, Upper Housing Material** | | |
| | **Diaphragm and Wetted** | **Upper Housing** |
| **Expanded** | | |
| LA00 | 316L SST | 316L SST |
| **Typical Model Number: 1199 W DC 1 0 A HTS 7 A LA 0 0** | | |

(1) Consult factory for calibrated spans lower than 300 psi (21 bar).

(2) Consult factory for calibrated spans lower than 100 psi (7 bar).

(3) Consult factory for calibrated spans lower than 50 psi (3,4 bar).

# Hygienic seals

## SCW Hygienic Tri-Clover Style Tri-Clamp Seal

### Table 25. SCW Hygienic Tri-Clover Style Tri-Clamp Seal Ordering Information

★ **The Standard offering represents the most common options. The starred options (★) should be selected for best delivery. The Expanded offering is subject to additional delivery lead time.**

| | | | |
|---|---|---|---|
| **Industry Standard** | | | |
| **Standard** | | | **Standard** |
| S | Hygienic Seal (Conforms to 3-A Standard 74-03) | | ★ |
| **Process Connection Style** | | | |
| **Standard** | | | **Standard** |
| SCW[1] | Tri-Clover Style Tri-Clamp Seal | | ★ |
| **Process Connection Size** | | | |
| **Standard** | | | **Standard** |
| 30[2] | 1½-in. | | ★ |
| 50[3] | 2-in. | | ★ |
| 70 | 3-in. | | ★ |
| **Expanded** | | | |
| 60 | 2½-in. | | |
| 90 | 4-in. | | |
| **Diaphragm and Wetted, Upper Housing Material** | | | |
| | **Diaphragm and Wetted** | **Upper Housing** | |
| **Standard** | | | **Standard** |
| LA00 | 316L SST | 316L SST | ★ |
| **Expanded** | | | |
| LB00 | Alloy C-276 | 316L SST | |

**Options (Include with selected model number)**

| | | |
|---|---|---|
| **Surface Finish** | | |
| **Expanded** | | |
| D | 10 µin. (0.25 µm) $R_a$ surface finish | |
| G | 15 µin. (0.375 µm) $R_a$ surface finish | |
| H | 20 µin. (0.50 µm) $R_a$ surface finish | |
| **Non-Hygienic Fill Fluid** | | |
| **Expanded** | | |
| P | Non-Hygienic fill fluid (does not conform to 3-A Standard 74) | |
| **Clamp and Gasket Material** | | |
| **Expanded** | | |
| 2 | High-Pressure Ladish Clamp & Nitrile butadiene (NBR) gasket | |
| 3[4] | Nitrile butadiene (NBR) gasket | |

### Table 25. SCW Hygienic Tri-Clover Style Tri-Clamp Seal Ordering Information

**★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.**

**The Expanded offering is subject to additional delivery lead time.**

| **Polishing** | | |
|---|---|---|
| **Expanded** | | |
| 6 | Electro polishing | |
| **Typical Model Number: 1199 W NC 1 0 S SCW 7 0 LA 0 0** | | |

(1) Clamp and gasket furnished by user. The maximum working pressure is dependent upon the clamp pressure rating.

(2) Consult factory for calibrated spans lower than 15 psi (1034 mbar). Rosemount 1199 Remote Seal Minimum Span Summary calls out a minimum span of 1000 in$H_2O$ or 2490 mbar for 1-$^1/_2$“SSCW

(3) Consult factory for calibrated spans lower than 5 psi (345 mbar). Rosemount 1199 Remote Seal Minimum Span Summary calls out a minimum span of 150 in$H_2O$ or 373 mbar for 2” SSCW

(4) See Table 26 below.

### Table 26. High Pressure Ladish Clamp Maximum Working Pressure

| **Process connection size** | **70 °F (21 °C)** | **250 °F (121 °C)** |
|---|---|---|
| 1 $^1/_2$-in. | 1,500 psi (103 bar) | 1,200 psi (83 bar) |
| 2-in. | 1,000 psi (69 bar) | 800 psi (55 bar) |
| 2 $^1/_2$-in. | 1,000 psi (69 bar) | 800 psi (55 bar) |
| 3-in. | 1,000 psi (69 bar) | 800 psi (55 bar) |
| 4-in. | 1,000 psi (69 bar) | 800 psi (55 bar) |

## SSW Hygienic Tank Spud Seal

### Table 27. SSW Hygienic Tank Spud Seal Ordering Information

★ **The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.**
**The Expanded offering is subject to additional delivery lead time.**

| Code | Industry Standard | | |
|---|---|---|---|
| **Standard** | | | **Standard** |
| S | Hygienic Seal (Conforms to 3-A Standard 74-03) | | ★ |
| **Process Connection Style** | | | |
| **Standard** | | | **Standard** |
| SSW(1) | Tank Spud Seal | | ★ |
| **Process Connection Size, Pressure Rating** | | | |
| **Standard** | | | **Standard** |
| A0 | 600 psi (41 bar) | | ★ |
| **Upper Housing** | | | |
| **Standard** | | | **Standard** |
| A | 316L SST | | ★ |
| **Diaphragm and Wetted, Extension Material** | | | |
| | **Diaphragm and Wetted** | **Extension** | |
| **Standard** | | | **Standard** |
| AL | 316L SST(2) | 316L SST(2) | ★ |
| **Expanded** | | | |
| BB | Alloy C-276 | 316L SST | ★ |
| **Extension Length** | | | |
| **Standard** | | | **Standard** |
| 2 | 2-in. | | ★ |
| 6 | 6-in. | | ★ |

### Options (Include with selected model number)

| Surface Finish | | |
|---|---|---|
| **Expanded** | | |
| G(3) | 15 µin. (0.375 µm) diaphragm surface finish | |
| H | 20 µin.(0.5 µm) diaphragm surface finish | |
| **Diaphragm Thickness** | | |
| **Expanded** | | |
| C | 0.006-in. (150 µm) | |
| **Tank Spud** | | |
| **Standard** | | **Standard** |
| 1 | Tank Spud Included with Shipment | ★ |
| **Non-Hygienic Fill Fluid** | | |
| **Expanded** | | |
| P | Non-Hygienic fill fluid (Does not conform to 3-A Standard 74) | |

### Table 27. SSW Hygienic Tank Spud Seal Ordering Information

**★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.**

**The Expanded offering is subject to additional delivery lead time.**

| | | |
|---|---|---|
| **Non-Hygienic Fill Fluid** | | |
| **Expanded** | | |
| 3 | Nitrile butadiene (NBR) O-ring instead of Standard Ethylene Propylene O-ring (Conforms to 3-A Standard 74) | |
| 4 | Fluorocarbon (FMK)® O-ring, instead of Standard Ethylene Propylene O-ring (Conforms to 3-A Standard 74) | |
| **Polishing** | | |
| **Expanded** | | |
| 6 | Electro polishing | |
| **Typical Model Number: 1199 W NC 1 0 S SSW A 0 AA L 2** | | |

(1) Clamp and Ethylene Propylene o-ring (conforms to 3-A standard 74 and USP class VI) supplied.

(2) Diaphragm brazed and TIG-welded to extension.

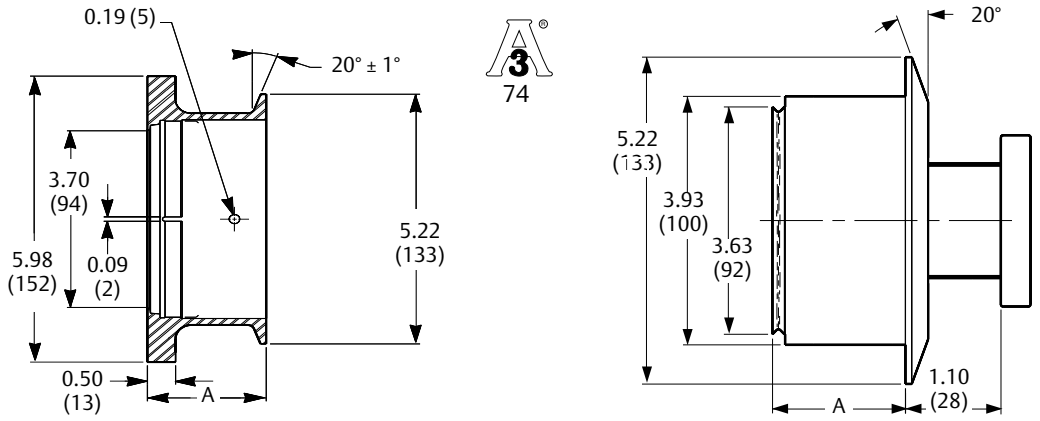
(3) Requires Option code 6, Electro polishing.

## Sanitary Tank Spud accessories

| Tank Spud and Clamp |
|---|
|  |
| **Rosemount 3051S with Direct Mount Sanitary Tank Spud with Clamp** |
|  |

**Tank Spud and Clamp**

**Tank Spud** **Tank Spud Plug**




Dimensions are in inches (millimeters)

**Table 28. Sanitary Tank Spud Optional Accessories**

| Model | Description |
|---|---|
| 01199-0061-0001 | 2 in. Sanitary Tank Spud(1) |
| 01199-0061-0002 | 6 in. Sanitary Tank Spud(1) |

(1) Welding procedures and material certifications are shipped with the tank spud. Standard material is cast equivalent of 316L SST per ASTM- A351 grade CF3M.

**Table 29. Sanitary Tank Spud Spare Parts**

| Part Number | Description |
|---|---|
| 01199-0526-0002 | Clamp |
| C53185-0070-0341 | Ethylene Propylene O-ring |

## STW Hygienic Thin Wall Tank Spud Seal

### Table 30. STW Hygienic Thin Wall Tank Spud Seal Ordering Information

**This seal is part of the Expanded offering and is subject to additional delivery lead time.**

| Code | Industry Standard | |
|---|---|---|
| **Expanded** | | |
| S | Hygienic Seal (Conforms to 3-A Standard 74-03) | |
| **Process Connection Style** | | |
| **Expanded** | | |
| STW(1) | Thin Wall Tank Spud Seal | |
| **Process Connection Size, Pressure Rating** | | |
| **Expanded** | | |
| B0 | 4-in. Tri-Clamp, 600 psi (41 bar) | |
| **Diaphragm and Wetted, Extension Material** | | |
| | **Diaphragm and Wetted** | **Extension** |
| **Expanded** | | |
| LA00 | 316L SST | 316L SST |
| BB00 | Alloy C-276 | Alloy C-276 |

### Options (Include with selected model number)

| | |
|---|---|
| **Surface Finish** | |
| **Expanded** | |
| G(2) | 15 µin. (0.375 µm) diaphragm surface finish |
| H | 20 µin.(0.5 µm) diaphragm surface finish |
| **Non-Hygienic Fill Fluid** | |
| **Expanded** | |
| P | Non-Hygienic fill fluid (Does not conform to 3-A Standard 74) |
| **Polishing** | |
| **Expanded** | |
| 6 | Electro polishing |
| **Typical Model Number: 1199 W NC 1 0 S STW B 0 LA 0 0** | |

(1) For tank walls up to 3/16-in. thick. Clamp and Ethylene Propylene o-ring supplied.

(2) Requires Option code 6, Electro polishing.

# EES Hygienic Flanged Tank Spud Extended Seal

### Table 31. EES Hygienic Flanged Tank Spud Extended Seal Ordering Information

**This seal is part of the Expanded offering and is subject to additional delivery lead time.**

| Code | Industry Standard | |
|---|---|---|
| **Expanded** | | |
| S | Hygienic Seal (Conforms to 3-A Standard 74-03) | |
| **Process Connection Style** | | |
| **Expanded** | | |
| EES | Flanged Tank Spud Seal | |
| **Process Connection Size, Pressure Rating** | | |
| **Expanded** | | |
| GG | DN 50, PN 40 | |
| JG | DN 80, PN 40 | |
| **Diaphragm and Wetted, Extension Material** | | |
| | **Diaphragm and Wetted** | **Extension** |
| **Expanded** | | |
| LA | 316L SST | 316L SST |
| LB | Alloy C-276 | 316L SST |
| **Extension Length**(1) | | |
| **Expanded** | | |
| 10 | 25 mm (1-in.) | |

## Options (Include with selected model number)

| | |
|---|---|
| **Surface Finish** | |
| **Expanded** | |
| G(2) | 15 µ-in. (0.375 µm) Ra surface finish |
| H | 20 µ-in. (0.50 µm) Ra surface finish |
| **Gasket Material** | |
| **Expanded** | |
| 1 | Fluorocarbon (FMK) O-ring, instead of Standard Ethylene Propylene O-ring (Conforms to 3-A Standard 74) |
| **Cold Temperature Application** | |
| **Expanded** | |
| B | Extra Fill For Cold Temperature Application |
| **Polishing** | |
| **Expanded** | |
| 6 | Electro polishing |
| **Typical Model Number: 1199 W NC 1 0 S EES J G LA 1 0** | |

(1) Other extension lengths are available upon request.

(2) Requires Option code 6, Electro polishing.

## VCS Tri-clamp® In-Line Seal

### Table 32. VCS Tri-Clamp In-Line Seal Ordering Information

**This seal is part of the Expanded offering and is subject to additional delivery lead time.**

| Code | Industry Standard | |
|---|---|---|
| **Expanded** | | |
| S | Hygienic Seal (Conforms to 3-A Standard 74-03) | |
| **Process Connection Style** | | |
| **Expanded** | | |
| VCS(1) | In-Line Tri-Clover Style Tri-Clamp Seal | |
| **Process Connection Size** | | |
| **Expanded** | | |
| 20(2) | 1-in. | |
| 30(3) | 1½-in. | |
| 50 | 2-in. | |
| 70 | 3-in. | |
| 90 | 4-in. | |
| **Diaphragm and Wetted, Upper Housing Material** | | |
| | **Diaphragm and Wetted** | **Upper Housing** |
| **Expanded** | | |
| LA00 | 316L SST | 316L SST |

### Options (Include with selected model number)

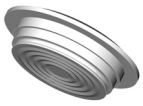
| | |
|---|---|
| **Surface Finish** | |
| **Expanded** | |
| G(4) | 15 µ-in. (0.375 µm) Ra surface finish |
| H | 20 µ-in. (0.50 µm) Ra surface finish |
| **Non-Hygienic Fill Fluid** | |
| **Expanded** | |
| P | Non-Hygienic fill fluid (does not conform to 3-A Standard 74) |
| **Polishing** | |
| **Expanded** | |
| 6 | Electro polishing |
| **Typical Model Number: 1199 W NC 1 0 S VCS 7 0 LA 0 0** | |

(1) Gasket and clamp are furnished by the user. The maximum working pressure is dependent upon the clamp pressure rating.

(2) Consult factory for calibrated spans lower than 15 psi (1034 mbar).

(3) Consult factory for calibrated spans lower than 5 psi (345 mbar).

(4) Requires Option code 6, Electro polishing.



## SVS Varivent® Compatible Hygienic Connection Seal

### Table 33. SVS Varivent® Compatible Hygienic Connection Seal Ordering Information

**This seal is part of the Expanded offering and is subject to additional delivery lead time.**

| Code | Industry Standard | |
|---|---|---|
| **Expanded** | | |
| S | Hygienic Seal (Conforms to 3-A Standard 74-03) | |
| **Process Connection Style** | | |
| **Expanded** | | |
| SVS | Tuchenhagen Varivent Compatible Seal | |
| **Process Connection Size** | | |
| **Expanded** | | |
| V0(1) | Varivent® Type N DN 40-162 | |
| **Diaphragm and Wetted, Upper Housing Material** | | |
| | **Diaphragm and Wetted** | **Upper Housing** |
| **Expanded** | | |
| LA00 | 316L SST | 316L SST |

### Options (Include with selected model number)

| | |
|---|---|
| **Non-Hygienic Fill Fluid** | |
| **Expanded** | |
| P | Non-Hygienic fill fluid (does not conform to 3-A Standard 74) |
| **Cold Temperature Application** | |
| **Expanded** | |
| B | Extra Fill For Cold Temperature Application |
| **Polishing** | |
| **Expanded** | |
| 6 | Electro polishing |
| **Typical Model Number: 1199 W NC 1 0 S SVS V 0 LA 0 0** | |

(1) Consult factory for calibrated spans lower than 15 psi (1034 mbar). Rosemount 1199 Remote Seal Minimum Span Summary calls out a minimum span of 150 in$H_2O$ or 373 mbar not 15 psi or 1034 mbar.

## SHP Hygienic Cherry-Burrell “I” Line Seal

### Table 34. SHP Hygienic Cherry-Burrell “I” Line Seal Ordering Information

**This seal is part of the Expanded offering and is subject to additional delivery lead time.**

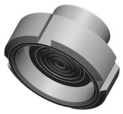
| Code | Industry Standard | |
|---|---|---|
| **Expanded** | | |
| S | Hygienic Seal (Conforms to 3-A Standard 74-03) | |
| **Process Connection Style** | | |
| **Expanded** | | |
| SHP(1) | Cherry-Burrell “I” Line Style Seal | |
| **Process Connection Size** | | |
| **Expanded** | | |
| 50(2) | 2-in. | |
| 70 | 3-in. | |
| **Diaphragm and Wetted, Upper Housing Material** | | |
| | **Diaphragm and Wetted** | **Upper Housing** |
| **Expanded** | | |
| AA00 | 316L SST | 316L SST |

### Options (Include with selected model number)

| Non-Hygienic Fill Fluid | |
|---|---|
| **Expanded** | |
| P | Non-Hygienic fill fluid (does not conform to 3-A Standard 74) |
| **Typical Model Number: 1199 W NC 1 0 S SHP 7 0 AA 0 0** | |

(1) Clamp and gasket furnished by user. Maximum working pressure is the lesser of either clamp pressure rating or 500 psi.

(2) Consult factory for calibrated spans lower than 5 psi (345 mbar).



## SLS Dairy Process Connection - Female Thread Seal per DIN 11851

### Table 35. SLS Hygienic Dairy Process Connection Female Thread Seal Ordering Information

**This seal is part of the Expanded offering and is subject to additional delivery lead time.**

| Code | Industry Standard | |
|---|---|---|
| **Expanded** | | |
| S | Hygienic Seal (Conforms to 3-A Standard 74-03) | |
| **Process Connection Style** | | |
| **Expanded** | | |
| SLS | Dairy Process Connection - Female Thread | |
| **Process Connection Size, Pressure Rating, Material** | | |
| **Expanded** | | |
| F0[(1)] | DIN 11851 with coupling nut DN 40, PN 40, 304 SST | |
| G0[(2)] | DIN 11851 with coupling nut DN 50, PN 25, 304 SST | |
| **Diaphragm and Wetted, Upper Housing Material** | | |
| | **Diaphragm and Wetted** | **Upper Housing** |
| **Expanded** | | |
| LA00 | 316L SST | 316L SST |

**Options (Include with selected model number)**

| Polishing | |
|---|---|
| **Expanded** | |
| 6 | Electro polishing |
| **Typical Model Number: 1199 W HC 1 0 S SLS J 0 LA 0 0** | |

(1) Consult factory for calibrated spans lower than 15 psi (1034 mbar).

(2) Consult factory for calibrated spans lower than 5 psi (345 mbar).

# Specialty Seals

## WSP Saddle Seal

### Table 36. WSP Saddle Seal Ordering Information

**This seal is part of the Expanded offering and is subject to additional delivery lead time.**

| Code | Industry Standard | |
|---|---|---|
| **Expanded** | | |
| N | Non-Industry Standard | |
| **Process Connection Style** | | |
| **Expanded** | | |
| WSP | Saddle Seal | |
| **Process Connection Size** | | |
| **Expanded** | | |
| G | 2-in. Pipe size | |
| 7 | 3-in. Pipe size | |
| 9 | 4-in. or larger Pipe size | |
| **Pressure Rating** | | |
| **Expanded** | | |
| 1 | 1500 psig at 100 °F (103 bar at 38 °C); eight bolt holes | |
| 0 | 1250 psig at 100 °F (86 bar at 38 °C); six bolt holes | |
| **Diaphragm, Upper Housing Material** | | |
| | **Diaphragm** | **Upper Housing** |
| **Expanded** | | |
| LA | 316L SST | 316L SST |
| LB | Alloy C-276 | 316L SST |
| LC | Tantalum | 316L SST |
| **Lower Housing Material**[(1)(2)] | | |
| **Expanded** | | |
| 00 | None | |
| L5 | 316L SST | |
| B5 | Alloy C-276 | |
| D5 | Plated Carbon Steel | |

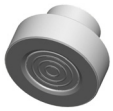
**Options (Include with selected model number)**

| Gasket Material | |
|---|---|
| **Expanded** | |
| J | PTFE gasket |
| N | Grafoil® gasket |
| **Code Conformance** | |
| **Expanded** | |
| T[(3)] | Wetted Material Compliance per NACE MR 0175/ISO 15156, MR 0103 |
| **Diaphragm Coating** | |
| **Expanded** | |
| V | PTFE Coated Diaphragm for nonstick purposes (316L SST and Alloy C-276 diaphragms only) |
| **Typical Model Number: 1199 W DC 1 0 N WSP 7 1 LA L N** | |

(1) Standard pipe schedule 40/40S, for other pipe schedules consult the factory.

(2) Supplied with C4401 Aramid fiber gasket.

(3) Materials of Construction comply with metallurgical requirements highlighted within NACE MR 0175 / ISO 15156 for sour oil field production environments. Environmental limits apply to certain materials. Consult latest standard for details. Selected materials also conform to NACE MR 0103 for sour refining environments.



# UCP Male Threaded Pipe Mount Seals and PMW Paper Mill Sleeve Seals

### Table 37. UCP and PMW Threaded Pipe Mount Seal Ordering Information

**This seal is part of the Expanded offering and is subject to additional delivery lead time.**

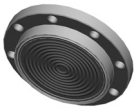
| | | |
|---|---|---|
| **Industry Standard** | | |
| **Expanded** | | |
| N | Non-Industry Standard | |
| **Process Connection Style** | | |
| **Expanded** | | |
| UCP | Male Threaded Pipe Mount Seal | |
| PMW | Paper Mill Sleeve | |
| **Process Connection Size, Pressure Rating** | | |
| **Expanded** | | |
| 30(1) | 1 1/2-in., Threaded Knurled Nut, 600 psi at 100 °F (41 bar at 38 °C) (UCP only) | |
| 50(2) | 1-in., Cap Screw Retainer, 300 psi at 100 °F (21 bar at 38 °C) (PMW only) | |
| **Diaphragm and Wetted, Upper Housing Material** | | |
| | **Diaphragm and Wetted** | **Upper Housing** |
| **Expanded** | | |
| AA | 316L SST | 316L SST |
| BB | Alloy C-276 | Alloy C-276 |
| **Lower Housing Material** | | |
| **Expanded** | | |
| 00 | None | |
| A0 | 316L SST | |
| B0 | Alloy C-276 | |

## Options (Include with selected model number)

| | |
|---|---|
| **Diaphragm Coating** | |
| **Expanded** | |
| V | PTFE coated diaphragm for nonstick purposes only |
| **Typical Model Number: 1199 W DC 1 0 N UCP 3 0 AA A 0** | |

(1) Only available with UCP process connection size. Consult factory for calibrated spans lower than 50 psi (3,4 bar).

(2) Only available with PMW process connection size. Consult factory for calibrated spans lower than 100 psi (6,9 bar).



## CTW Chemical Tee Seal

### Table 38. CTW Chemical Tee Seal Ordering Information

**This seal is part of the Expanded offering and is subject to additional delivery lead time.**

| Code | Industry Standard | |
|---|---|---|
| **Expanded** | | |
| N | Non-Industry Standard | |
| **Process Connection Style** | | |
| **Expanded** | | |
| CTW | Chemical Tee Seal | |
| **Maximum Working Pressure (Flange Rating)** | | |
| **Expanded** | | |
| 20 | 300 psi (21 bar) | |
| **Diaphragm and Wetted, Upper Housing Material** | | |
| | **Diaphragm and Wetted** | **Upper Housing** |
| **Expanded** | | |
| AA | 316L SST | 316L SST |
| BB | Alloy C-276 | Alloy C-276 |
| **Lower Housing** | | |
| **Expanded** | | |
| 00 | None | |

### Options (Include with selected model number)

| Code Conformance | |
|---|---|
| **Expanded** | |
| T[(1)] | Wetted Material Compliance per NACE MR 0175/ISO 15156, MR 0103 |
| **Diaphragm Coating** | |
| **Expanded** | |
| V | PTFE coated diaphragm for nonstick purposes only |
| **Typical Model Number: 1199 W NC 1 0 N CTW 2 0 AA 0 0** | |

(1) Materials of Construction comply with metallurgical requirements highlighted within NACE MR 0175 / ISO 15156 for sour oil field production environments. Environmental limits apply to certain materials. Consult latest standard for details. Selected materials also conform to NACE MR 0103 for sour refining environments.

## TFS Wafer Style In-Line Seal

### Table 39. TFS Wafer Style In-Line Seal Ordering Information

**This seal is part of the Expanded offering and is subject to additional delivery lead time.**

| Code | Industry Standard | |
|---|---|---|
| **Expanded** | | |
| A | ANSI/ASME B16.5 (American National Standards Institute/American Society of Mechanical Engineers) | |
| D | EN 1092-1 (European Standard) | |
| **Process Connection Style** | | |
| **Expanded** | | |
| TFS | Wafer Style In-Line Seal | |
| **Process Connection Size** | | |
| | **ANSI/ASME B16.5** | **EN 1092-1** |
| **Expanded** | | |
| G | 2-in. | DN 50 |
| 7 | 3-in. | — |
| J | — | DN 80 |
| 9 | 4-in. | — |
| 2(1) | 1-in. | — |
| 4(2) | 1½-in. | — |
| D(1) | — | DN 25 |
| F(2) | — | DN 40 |
| K | — | DN 100 |
| **Pressure Rating** | | |
| **Expanded** | | |
| 0 | Seal MWP based on customer supplied flange | |
| **Diaphragm and Wetted, Upper Housing Material** | | |
| | **Diaphragm and Wetted** | **Upper Housing** |
| **Expanded** | | |
| LA | 316L SST | 316L SST |
| LB | Alloy C-276 | 316L SST |
| **Housing Body Length** | | |
| **Expanded** | | |
| 00 | 3.54-in. (90 mm) | |
| **Typical Model Number: 1199 W DC 1 0 A TFS 7 0 LA 0 0** | | |

(1) Consult factory for calibrated spans lower than 15 psi (1034 mbar).

(2) Consult factory for calibrated spans lower than 5 psi (345 mbar).

## WFW Flow-Thru Flanged Seal

### Table 40. WFW Flow-Thru Flanged Seal Ordering Information

**This seal is part of the Expanded offering and is subject to additional delivery lead time.**

| Code | Industry Standard | |
|---|---|---|
| **Expanded** | | |
| A | ANSI/ASME B16.5 (American National Standards Institute/American Society of Mechanical Engineers) | |
| **Process Connection Style** | | |
| **Expanded** | | |
| WFW[1] | Flow-Thru Flanged Seal | |
| **Process Connection Size[2]** | | |
| **Expanded** | | |
| G | 2-in. | |
| 7 | 3-in. | |
| 2 | 1-in. | |
| **Flange Rating[2]** | | |
| **Expanded** | | |
| 1 | Class 150[2] | |
| **Diaphragm, Upper Housing Material** | | |
| | **Diaphragm** | **Upper Housing[2]** |
| **Expanded** | | |
| LA | 316L SST | 316L SST |
| **Lower Housing Material[1]** | | |
| **Expanded** | | |
| L | 316L SST | |
| **Pipe Schedule[2]** | | |
| **Expanded** | | |
| N | 40/40S | |

### Options (Include with selected model number)

| Gasket Material | |
|---|---|
| **Expanded** | |
| J | PTFE O-ring |
| K | Barium Sulfate filled PTFE gasket |
| N | Grafoil® gasket |
| R | Ethylene Propylene gasket |
| **Bolt Material** | |
| **Expanded** | |
| 3 | 304 SST bolts |
| **Code Conformance** | |
| **Expanded** | |
| T[3] | Wetted Material Compliance per NACE MR 0175/ISO 15156, MR 0103 |

### Table 40. WFW Flow-Thru Flanged Seal Ordering Information

**This seal is part of the Expanded offering and is subject to additional delivery lead time.**

| **Cold Temperature Application** | |
|---|---|
| **Expanded** | |
| B | Extra Fill For Cold Temperature Application |
| **Typical Model Number: 1199 W DC 1 0 A WFW 7 1 LA L N** | |

(1) Supplied with C4401 Aramid fiber gasket.

(2) Consult factory for special process connection sizes, flange pressure ratings, diaphragm/lower housing materials, and pipe schedules.

(3) Materials of Construction comply with metallurgical requirements highlighted within NACE MR 0175 / ISO 15156 for sour oil field production environments. Environmental limits apply to certain materials. Consult latest standard for details. Selected materials also conform to NACE MR 0103 for sour refining environments.

# Specifications

## Liquid Level Transmitter specifications

### Performance specifications

For zero-based spans, reference conditions, silicone oil fill, glass-filled PTFE O-rings, SST materials, Coplanar flange (3051SMV, 3051S_C) or 1/2-in.- 14 NPT (3051S_T) process connections, digital trim values set to equal range points.

**Conformance to specification (±3σ (Sigma))**

Technology leadership, advanced manufacturing techniques, and statistical process control ensure measurement specification conformance to ±3σ or better.

**Reference accuracy(1)**

Stated reference accuracy equations include terminal based linearity, hysteresis, and repeatability, but does not include analog output reference accuracy of ±0.005% of span.
For FOUNDATION™ fieldbus and wireless devices, use calibrated range in place of span.

| | | |
|---|---|---|
| 3051SAM(2) | Ultra<br>±0.025% of Span<br>For spans less than 10:1,<br>±(0.005% URL + 0.015% span) | Classic<br>±0.035% of Span.<br>For spans less than 10:1,<br>±(0.005% URL + 0.015% span) |
| 3051SAL_C | Ultra<br>±0.055% of Span.<br>For spans less than 10:1,<br>±(0.005% URL + 0.015% span) | Classic<br>±0.065% of Span.<br>For spans less than 10:1,<br>±(0.005% URL + 0.015% span) |
| 3051L | ±0.075% of Span.<br>For spans less than 10:1, ±(0.005% URL + 0.025% span) | |
| 2051L | ±0.075% of Span.<br>For spans less than 10:1, ±(0.005% URL + 0.025% span) | |

(1) Stated reference accuracy equations include terminal based linearity, hysteresis, and repeatability, but does not include analog only reference accuracy of ±0.005% of span.

(2) For the Rosemount 3051S with 1199 assemble to codes B11 & B12 and 3051SAM with 1199 assemble to code B11 a. Use ±0.55% of span for Ultra and ±0.65% of span for Classic

**DP Reference Accuracy of 3051S ERS System**

| **Two Coplanar Gage Sensors (3051SAM_ _G)** | | |
|---|---|---|
| | **Ultra** | **Classic** |
| Ranges 2-4 | ±0.035% of DP span | ±0.049% of DP span |
| Range 5 | ±0.071% of DP span | ±0.092% of DP span |
| **Two Coplanar (3051SAM_ _A)** | | |
| | **Ultra** | **Classic** |
| Ranges 1-4 | ±0.035% of DP span | ±0.049% of DP span |
| **Two In-Line Gage Sensors (3051SAM_ _T)<br>Two In-Line Absolute Sensors (3051SAM_ _E)** | | |
| | **Ultra** | **Classic** |
| Ranges 1-4 | ±0.035% of DP span | ±0.049% of DP span |
| **Two Liquid Level Sensors (3051SAL)** | | |
| | **Ultra** | **Classic** |
| Ranges 1-5 | ±0.055% of DP span | ±0.092% of DP span |

### Warranty[1]

| Models[1] | Ultra | Classic |
|---|---|---|
| 3051SAM and 3051SAL | 12-year limited warranty[2] | 1-year limited warranty[3] |

(1) Warranty details can be found in Emerson Process Management Terms and Conditions of Sale, Document 63445, Rev G (10/06).

(2) Rosemount Ultra and Ultra for Flow transmitter have a limited warranty of twelve (12) years from date of shipment. All other provisions of Emerson Process Management standard limited warranty remains the same.

(3) Goods are warranted for twelve (12) months from the date of initial installation or eighteen (18) months from the date of shipment by seller, whichever period expires first.

### Dynamic performance

Rosemount Level Transmitters - 3051SAL_C, 3051L, and 2051L models - have an 4 - 20 mA HART (1 - 5 Vdc HART Low Power) update rate of 22 updates per second. Electronic Remote Sensor Systems - 3051SAM, 3051SAL_P, and 3051SAL_S models - have an 4 - 20 mA HART (1 - 5 Vdc HART Low Power) update rate of 11 updates per second. See page 94 for WirelessHART update rates.
For total response time see Instrument Toolkit®.

### Ambient temperature effect

See Instrument Toolkit.

### Mounting position effects

With liquid level remote mount seal in vertical plane, zero shift of up to ±1 in$H_2O$ (2,49 mbar); with remote mount seal in horizontal plane, zero shift of up to ±5 in$H_2O$ (12,45 mbar) plus extension length on extended units; all zero shifts can be zeroed; no span effect.

### Vibration Effect

| | |
|---|---|
| **3051SAM**<br>**3051SAL** | Less than ±0.1% of URL when tested per the requirements of IEC60770-1 field or pipeline with high vibration level (10-60 Hz 0.21mm displacement peak amplitude / 60-2000 Hz 3g).<br><br>For Housing Style codes 1J, 1K, 1L, 2J, and 2M:<br>Less than ±0.1% of URL when tested per the requirements of IEC60770-1 field with general application or pipeline with low vibration level (10-60 Hz 0.15mm displacement peak amplitude / 60-500 Hz 2g). |
| **3051L** | Measurement effect due to vibrations is negligible except at resonance frequencies. When at resonance frequencies, vibration effect is less than ±0.1% of URL per g when tested between 15 and 2000 Hz in any axis relative to pipe-mounted process conditions. |
| **2051L** | Less than ±0.1% of URL when tested per the requirements of IEC60770-1 field or pipeline with high vibration level (10-60 Hz 0.21mm displacement peak amplitude / 60-2000 Hz 3g). |

### Power Supply Effect

Less than ±0.005% of calibrated span per volt.

### Electromagnetic Compatibility (EMC)

Meets all relevant requirements of EN 61326 and NAMUR NE-21.[(1)]

(1) NAMUR NE-21 does not apply to wireless output code X or ERS configurations.

### Transient protection (Option T1)

| | |
|---|---|
| **3051SAM**<br>**3051SAL** | Meets IEEE C62.41.2-2002, Location Category B<br>6 kV crest (0.5 µs - 100 kHz)<br>3 kA crest (8 × 20 microseconds)<br>6 kV crest (1.2 × 50 microseconds) |
| **3051L** | Meets IEEE C62.41, Category B<br>6 kV crest (0.5 µs - 100 kHz)<br>3 kV crest (8 × 20 microseconds)<br>6 kV crest (1.2 × 50 microseconds) |
| **2051L** | Meets IEEE C62.41, Category Location B<br>6 kV crest (0.5 µs - 100 kHz)<br>3 kV crest (8 × 20 microseconds)<br>6 kV crest (1.2 × 50 microseconds) |

## Functional Specifications

### Range and Sensor Limits

**Table 41. 3051SAM_ _G, 3051SAL_ _D, 3051SAL_ _G Range and Sensor Limits**

| Range | Minimum Span | | Range Limits | | |
|---|---|---|---|---|---|
| | Ultra | Classic | Upper (URL) | Lower (LRL) | |
| | | | | 3051SAL_G[(1)(2)] | 3051SAL_D[(1)] |
| 2 | 1.3 in$H_2O$ (3,11 mbar) | 2.5 in$H_2O$ (6,23 mbar) | 250.0 in$H_2O$ (0,62 bar) | -250.0 in$H_2O$ (-0,62 bar) | -250.0 in$H_2O$ (-0,62 bar) |
| 3 | 5.0 in$H_2O$ (12,4 mbar) | 10.0 in$H_2O$ (24,9 mbar) | 1000.0 in$H_2O$ (2,49 bar) | -393.0 in$H_2O$ (-979 mbar) | -1000.0 in$H_2O$ (-2,49 bar) |
| 4 | 1.5 psi (103,4 mbar) | 3.0 psi (206,8 mbar) | 300.0 psi (20,7 bar) | -14.2 psig (-979 mbar) | -300.0 psi (-20,7 bar) |
| 5 | 10.0 psi (689,5 mbar) | 20.0 psi (1,38 bar) | 2000.0 psi (137,9 bar) | -14.2 psig (-979 mbar) | - 2000.0 psi (-137,9 bar) |

(1) When specifying a 3051SAL Ultra, use Classic minimum span.

(2) Assumes atmospheric pressure of 14.7 psig (1 bar).

**Table 42. 3051SAM_ _A, 3051SAL_ _A Range and Sensor Limits[(1)]**

| Range | Minimum Span | | Range and Sensor Limits | |
|---|---|---|---|---|
| | Ultra | Classic | Upper (URL) | Lower (LRL) |
| 1 | 0.3 psia (20,7 mbar) | 0.3 psia (20,7 mbar) | 30 psia (2,07 bar) | 0 psia (0 bar) |
| 2 | 0.75 psia (51,7 mbar) | 1.5 psia (0,103 bar) | 150 psia (10,34 bar) | 0 psia (0 bar) |
| 3 | 4 psia (275,8 mbar) | 8 psia (0,55 bar) | 800 psia (55,16 bar) | 0 psia (0 bar) |
| 4 | 20 psia (1,38 bar) | 40 psia (2,76 bar) | 4000 psia (275,8 bar) | 0 psia (0 bar) |

(1) When specifying a 3051SAL Ultra, use Classic minimum span.

**Table 43. 3051SAM_ _T, 3051SAM_ _E, 3051SAL_ _T, 3051SAL_ _E Range and Sensor Limits**

| Range | Minimum Span | | Range and Sensor Limits | | |
|---|---|---|---|---|---|
| | Ultra | Classic | Upper (URL) | Lower (LRL) (Abs.) | Lower[1] (LRL) (Gage) |
| 1 | 0.3 psi (20,7 mbar) | 0.3 psi (20,7 mbar) | 30 psi (2,07 bar) | 0 psia (0 bar) | -14.7 psig (-1,01 bar) |
| 2 | 0.75 psi (51,7 mbar) | 1.5 psi (0,103 bar) | 150 psi (10,34 bar) | 0 psia (0 bar) | -14.7 psig (-1,01 bar) |
| 3 | 4 psi (275,8 mbar) | 8 psi (0,55 bar) | 800 psi (55,16 bar) | 0 psia (0 bar) | -14.7 psig (-1,01 bar) |
| 4 | 20 psi (1,38 bar) | 40 psi (2,76 bar) | 4000 psi (175,8 bar) | 0 psia (0 bar) | -14.7 psig (-1,01 bar) |
| 5 | 1000 psi (68,9 bar) | 2000 psi (137,9 bar) | 10000 psi (689,5 bar) | 0 psia (0 bar) | -14.7 psig (-1,01 bar) |

(1) Assumes atmospheric pressure of 14.7 psig (1 bar).

**Table 44. 3051L Range and Sensor Limits**

| Range | Minimum Span | Range and Sensor Limits | | |
|---|---|---|---|---|
| | | Upper (URL) | Lower (LRL) | |
| | | | 3051L Differential | 3051L Gage |
| 2 | 2.5 in$H_2O$ (6,2 mbar) | 250 in$H_2O$ (0,62 bar) | –250 in$H_2O$ (–0,62 bar) | –250 in$H_2O$ (–0,62 bar) |
| 3 | 10 in$H_2O$ (24,9 mbar) | 1000 in$H_2O$ (2,49 bar) | –1000 in$H_2O$ (–2,49 bar) | 0.5 psia (34,5 mbar abs) |
| 4 | 3 psi (0,20 bar) | 300 psi (20,6 bar) | –300 psi (–20,6 bar) | 0.5 psia (34,5 mbar abs) |
| 5 | 20 psi (1,38 bar) | 2000 psi (137,9 bar) | NA | NA |

**Table 45. 2051L Range and Sensor Limits**

| Range | Minimum Span | Range and Sensor Limits | | |
|---|---|---|---|---|
| | | Upper (URL) | Lower (LRL) | |
| | | | 2051L Differential | 2051L Gage[1] |
| 2 | 2.5 in$H_2O$ (6,2 mbar) | 250 in$H_2O$ (0,62 bar) | –250 in$H_2O$ (–0,62 bar) | –250 in$H_2O$ (–0,62 bar) |
| 3 | 10 in$H_2O$ (24,9 mbar) | 1000 in$H_2O$ (2,49 bar) | –1000 in$H_2O$ (–2,49 bar) | –393 in$H_2O$ (–979 mbar) |
| 4 | 3 psi (0,207 bar) | 300 psi (20,6 bar) | –300 psi (–20,7 bar) | –14.2 psig (–979 mbar) |

(1) Assumes atmospheric pressure of 14.7 psig.

**Service**

Liquid, gas, and vapor applications

**Protocols**

### 4–20 mA (Output Code A)

*Output*

Two-wire 4–20 mA, user-selectable for linear or square root output. Digital process variable superimposed on 4–20 mA signal, available to any host that conforms to the HART protocol.

*Power Supply*

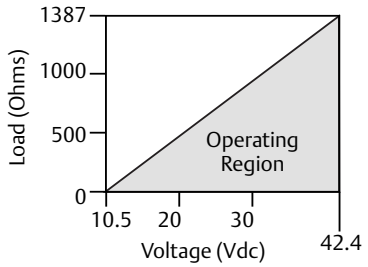
External power supply required. Standard transmitter (4–20 mA) operates on 10.5 to 42.4 Vdc with no load. The 3051S ERS System operates on 16 - 42.4 Vdc with no load.

*Load Limitations*

Maximum loop resistance is determined by the voltage level of the external power supplied as described by:

**Standard HART Transmitter**

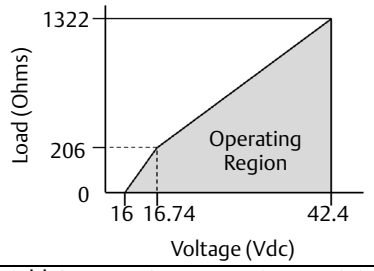
Maximum Loop Resistance = 43.5 * (Power Supply Voltage – 10.5)




The Field Communicator requires a minimum loop resistance of 250Ω for communication.

**3051S ERS System**

If supply voltage ≥ 16.74 Vdc:
Maximum Loop Resistance = 277 * (Power Supply Voltage – 16.0)
If supply voltage > 16.74 Vdc:
Maximum Loop Resistance = 43.5 * (Power Supply Voltage – 12.0)




The Field Communicator requires a minimum loop resistance of 250Ω for communication.

### FOUNDATION fieldbus (output code F)

*Power Supply*

External power supply required; transmitters operate on 9.0 to 32.0 Vdc transmitter terminal voltage.

*Current Draw*

17.5 mA for all configurations (including LCD display option)

*Indication*

Optional two line LCD Display

### FOUNDATION fieldbus Function Block Execution Times

| Block | Execution Time (Milliseconds) | | |
|---|---|---|---|
| | 3051SAL_C | 3051L | 2051L |
| Resource | - | - | - |
| Transducer | - | - | - |
| LCD Block | - | - | - |
| Analog Input 1, 2 | 20 | 30 | 35 |
| PID | 35(1) | 45 | 45 |
| Input Selector | 20 | 30 | 30 |
| Arithmetic | 20 | 35 | 35 |
| Signal Characterizer | 20 | 40 | 40 |
| Integrator | 20 | 35 | 35 |
| Output Splitter | 20 | N/A | N/A |
| Control Selector | 20 | N/A | N/A |

(1) PID with Auto-tune.

### FOUNDATION fieldbus parameters

| | |
|---|---|
| Schedule Entries | 7 (max.) |
| Links | 20 (max.) |
| Virtual Communications Relationships (VCR) | 12 (max.) |

***Standard Function Blocks***

***Resource Block***

Contains hardware, electronics, and diagnostic information.

***Transducer Block***

Contains actual sensor measurement data including the sensor diagnostics and the ability to trim the pressure sensor or recall factory defaults.

***LCD Block***

Configures the local display.

***2 Analog Input Blocks***

Processes the measurements for input into other function blocks. The output value is in engineering units or custom and contains a status indicating measurement quality.

***PID Block***

Contains all logic to perform PID control in the field including cascade and feedforward.

***Backup Link Active Scheduler (LAS)***

The transmitter can function as a Link Active Scheduler if the current link master device fails or is removed from the segment.

***Advanced Control Function Block Suite (Option Code A01)***

*Input Selector Block*

Selects between inputs and generates an output using specific selection strategies such as minimum, maximum, midpoint, average, or first "good."

*Arithmetic Block*

Provides pre-defined application-based equations including flow with partial density compensation, electronic remote seals, hydrostatic tank gauging, ratio control, and others.

*Signal Characterizer Block*

Characterizes or approximates any function that defines an input/output relationship by configuring up to twenty X, Y coordinates. The block interpolates an output value for a given input value using the curve defined by the configured coordinates.

Integrator Block

Compares the integrated or accumulated value from one or two variables to pre-trip and trip limits and generates discrete output signals when the limits are reached. This block is useful for calculating total flow, total mass, or volume over time.

***FOUNDATION fieldbus Diagnostics Suite (Option Code D01)***

The FOUNDATION fieldbus Diagnostics provide Abnormal Situation Prevention (ASP) indication. The integral statistical process monitoring (SPM) technology calculates the mean and standard deviation of the process variable 22 times per second. The 3051S_L and 3051L use these values and highly flexible configuration options for customization to detect many user-defined or application specific abnormal situations (e.g. detecting plugged impulse lines and fluid composition change).

**Profibus PA (Output Code W)**

***Profile Version***

3.02

***Power Supply***

External power supply required; transmitters operate on 9.0 to 32.0 Vdc transmitter terminal voltage.

***Current Draw***

17.5 mA for all configurations (including LCD display option)

***Output Update Rate***

Four times per second

**Standard Function Blocks**

***Analog Input (AI Block)***

The AI function block processes the measurements and makes them available to the host device. The output value from the AI block is in engineering units and contains a status indicating the quality of the measurement.

***Physical Block***

The physical block defines the physical resources of the device including type of memory, hardware, electronics, and diagnostic information.

***Transducer Block***

Contains actual sensor measurement data including the sensor diagnostics and the ability to trim the pressure sensor or recall factory defaults.

***Indication***

Optional two line LCD display

***Local Operator Interface***

Optional external configuration buttons

**3051SAL_C Wireless Self-Organizing Networks**

***Output***

IEC 62591 (WirelessHART), 2.4 GHz DSSS

***Radio Frequency Power Output from Antenna***

External Antenna (WK option): Maximum of 10 mW (10 dBm) EIRP

Extended Range, External Antenna (WM option): Maximum of 18 mW (12.5 dBm) EIRP

High-Gain, Remote Antenna (WN option): Maximum of 40 mW (16 dBm) EIRP

***Local Display***

The optional seven-digit LCD can display primary variable in engineering units, percent of range, sensor module temperature, and electronics temperature. Display updates at update rate up to once per minute. The display updates based on the wireless update rate.

***Update Rate***

User selectable 1 sec. to 60 min.

***Power Module***
Field replaceable, keyed connection eliminates the risk of incorrect installation, Intrinsically Safe Lithium-thionyl chloride Power Module with polybutadine terephthalate (PBT) enclosure. Ten-year life at one minute update rate.(1)

(1) Reference conditions are 70 °F (21 °C), and routing data for three additional network devices.
NOTE: Continuous exposure to ambient temperature limits of -40 °F or 185 °F (-40 °C or 85 °C) may reduce specified life by less than 20 percent.

### Overpressure Limits

Limit is 0 psia to the flange rating or sensor rating, whichever is lower.

**Table 46. 3051L and Level Flange Rating Limits**

| Standard | Type | CS Rating | SST Rating |
|---|---|---|---|
| ANSI/ASME | Class 150 | 285 psig | 275 psig |
| ANSI/ASME | Class 300 | 740 psig | 720 psig |
| ANSI/ASME | Class 600 | 1480 psig | 1440 psig |
| *At 100 °F (38 °C), the rating decreases with increasing temperature, per ANSI/ASME B16.5.* | | | |

**Table 46. 3051L and Level Flange Rating Limits**

| Standard | Type | CS Rating | SST Rating |
|---|---|---|---|
| DIN | PN 10–40 | 40 bar | 40 bar |
| DIN | PN 10/16 | 16 bar | 16 bar |
| DIN | PN 25/40 | 40 bar | 40 bar |
| At 122 °F (50 °C), the rating decreases with increasing temperature per EN 1092-1 Annex F. | | | |

### Temperature Limits

#### Ambient

-40 to 185 °F (-40 to 85 °C)
With LCD display(1): -40 to 175 °F (-40 to 80 °C)
With option code P0: -20 to 185 °F (-29 to 85 °C)

(1) LCD display may not be readable and LCD updates will be slower at temperatures below -4 °F (-20 °C).

#### Storage

-50 to 185 °F (-46 to 85 °C)
With LCD display: -40 to 185 °F (-40 to 85 °C)
With Wireless Output: -40 to 185 °F (-40 to 85 °C)

**Table 47. ERS Process Temperature Limits (Gage / Absolute Sensor)**

| Configuration | Coplanar Gage / Absolute Sensor (3051SAM_ _G, 3051SAM_ _A) | In-Line Gage Sensor / Absolute Sensor (3051SAM_ _T, 3051SAM_ _E) |
|---|---|---|
| Silicone Fill Fluid(1) | - | -40 to 250 °F (-40 to 121 °C)(3) |
| with Coplanar Flange(1) | -40 to 250 °F (-40 to 121 °C)(3) | - |
| with Traditional Flange(2) | -40 to 300 °F (-40 to 149 °C)(3) | - |
| with Level Flange(2) | -40 to 300 °F (-40 to 149 °C)(3) | - |
| with 305 Integral Manifold(1) | -40 to 300 °F (-40 to 149 °C)(3) | - |
| Inert Fill Fluid(1)(4) | -40 to 185 °F (-40 to 85 °C)(5) | -22 to 250 °F (-30 to 121 °C)(3) |

(1) Process temperatures above 185 °F (85 °C) require de-rating the ambient limits by a 1.5:1 ratio. For example, for process temperature of 195 °F (91 °C), new ambient temperature limit is equal to 170 °F (77 °C). This can be determined as follows: (195 °F - 185 °F) x 1.5 = 15 °F, 185 °F - 15 °F = 170 °F.

(2) Process temperatures above 185 °F (85 °C) require de-rating the ambient limits by a 1:1 ratio.

(3) 220 °F (104 °C) limit in vacuum service; 130 °F (54 °C) for pressures below 0.5 psia.

(4) Not available with 3051SAM_ _A.

(5) 160 °F (71 °C) limit in vacuum service.

## Table 48. Fill Fluid Specifications[1]

| Seal Fill Fluid | | Specific Gravity at 77 °F (25 °C) | Coeff. Of Therm. Exp. (cc/cc/°C) | Viscosity at 77 °F (25 °C) (Centistokes) | Temperature Limits[2] | | | | | Temperature Limits < 1 bar-a |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | No Extension | 2-in. (50mm) Extension | 4-in. (100mm) Extension | Thermal Optimizer | Capillary | Capillary |
| D | Silicone 200 | 0.93 | 0.00108 | 9.5 | -49 to 401 °F (-45 to 205 °C) | -49 to 401 °F (-45 to 205 °C) | -49 to 401 °F (-45 to 205 °C) | -49 to 401 °F (-45 to 205 °C) | -49 to 401 °F (-45 to 205 °C) | -49 to 212 °F (-45 to 100 °C) |
| C | Silicone 704 | 1.07 | 0.00095 | 44 | 32 to 401 °F (0 to 205 °C)[3] | 32 to 464 °F (0 to 240 °C)[3] | 32 to 500 °F (0 to 260 °C)[3] | 32 to 599 °F (0 to 315 °C) | 32 to 599 °F (0 to 315 °C) | 32 to 392 °F (0 to 200 °C) |
| V | Silicone 705 | 1.09 | — | — | 68 to 401 °F[3] (20 to 205 °C) | 68 to 464 °F[3] (20 to 240 °C) | 68 to 500 °F[3] (20 to 260 °C) | 68 to 698 °F[3] (20 to 370 °C) | 68 to 698 °F (20 to 370 °C) | — |
| A | Syltherm XLT | 0.85 | 0.001199 | 1.6 | -102 to 293 °F (-75 to 145 °C) | -102 to 293 °F (-75 to 145 °C) | 102 to 293 °F (-75 to 145 °C) | 102 to 293 °F (-75 to 145 °C) | 102 to 293 °F (-75 to 145 °C) | — |
| H | Inert (Halocarbon) | 1.85 | 0.000864 | 6.5 | -49 to 320 °F (-45 to 160 °C) | -49 to 320 °F (-45 to 160 °C) | -49 to 320 °F (-45 to 160 °C) | -49 to 320 °F (-45 to 160 °C) | -49 to 320 °F (-45 to 160 °C) | -49 to 176 °F (-45 to 80 °C) |
| G[4][5] | Glycerin and Water | 1.13 | 0.00034 | 12.5 | 5 to 203 °F (-15 to 95 °C) | 5 to 203 °F (-15 to 95 °C) | 5 to 203 °F (-15 to 95 °C) | 5 to 203 °F (-15 to 95 °C) | 5 to 203 °F (-15 to 95 °C) | — |
| N[5] | Neobee M–20 | 0.92 | 0.001008 | 9.8 | 5 to 401 °F[3] (-15 to 205 °C) | 5 to 437 °F (-15 to 225 °C) | 5 to 437 °F (-15 to 225 °C) | 5 to 437 °F (-15 to 225 °C) | 5 to 437 °F (-15 to 225 °C) | 5 to 248 °F (-15 to 120 °C) |
| P[4][5] | Proylene Glycol and Water | 1.02 | 0.00034 | 2.8 | 5 to 203 °F (-15 to 95 °C) | 5 to 203 °F (-15 to 95 °C) | 5 to 203 °F (-15 to 95 °C) | 5 to 203 °F (-15 to 95 °C) | 5 to 203 °F (-15 to 95 °C) | — |

(1) For more information on Fill Fluids please see technical note Rosemount 1199 Fill Fluid Specifications 00840-2100-4016.

(2) Temperature limits are reduced in vacuum service and may be limited by seal selection.

(3) Maximum process temperature is limited by heat transfer to the transmitter electronics and must be further derated if ambient temperatures exceed 70 °F (21 °C).

(4) Not suitable for vacuum applications.

(5) This is a food grade fill fluid.

**Figure 1. Thermal Optimizer with Silicone 704 Fill Fluid Temperature Limits**

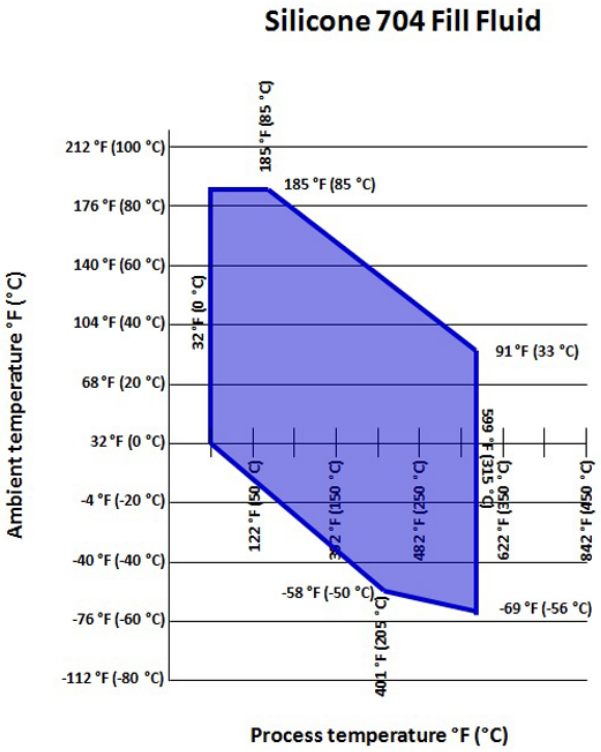
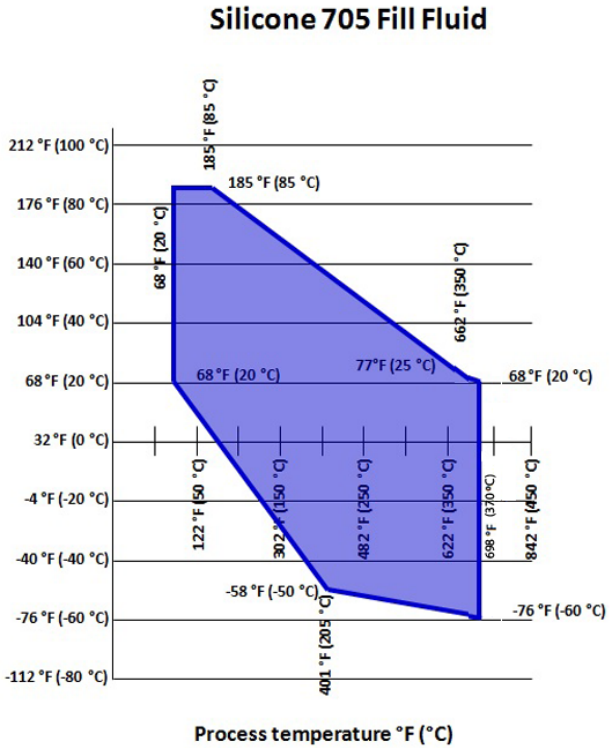



**Figure 2. Thermal Optimizer with Silicone 705 Fill Fluid Temperature Limits**




**Humidity Limits**

0–100% relative humidity

**Turn-On Time**

| | |
|---|---|
| 3051SAL_C | Performance within specifications less than 2.0 seconds after power is applied to the transmitter. |
| 3051L | Performance within specifications less than 2.0 seconds (10.0 s for Profibus protocol) after power is applied to the transmitter |
| 2051L | Performance within specifications less than 2.0 seconds after power is applied to the transmitter. |
| ERS System: | Performance within specifications less than 6.0 seconds after power is applied. |

**Volumetric Displacement**

Less than 0.005 $in^3$ (0.08 $cm^3$)

Damping(1)

Software damping is in addition to sensor module response time.

| | |
|---|---|
| 3051SAL_C | Analog output response to a step change is user-selectable from 0 to 60 seconds for one time constant. |
| 3051L | Analog output response to a step input change is user-selectable from 0 to 36 seconds for one time constant. |
| 2051L | Analog output response to a step input change is user-selectable from 0 to 25.6 seconds for one time constant. |
| ERS System: | The PHI and PLO Pressure measurements and the DP calculation may be independently dampened from 0 – 60 seconds for one time constant. |

(1) Does not apply to wireless option code X.

## Physical specifications

### Electrical connections

1/2–14 NPT, PG 13.5, G1/2, and M20 × 1.5 conduit. HART interface connections fixed to terminal block.Non-Wetted Parts Capillary Armor is SST.

| | 3051SAL | 3051L | 2051L |
|---|---|---|---|
| **Electrical Housing** | Low-copper aluminum alloy or CF-8M (Cast 316 SST)<br>NEMA 4X, IP 66, IP 68 (66 ft (20 m) for 168 hours)<br>Note: IP 68 not available with Wireless Output. | Low-copper aluminum or CF-3M (Cast version of 316L SST, material per ASTM-A743).<br>NEMA 4X, IP 65, IP 66 | Low-copper aluminum or CF-8M (Cast version of 316 SST). Enclosure Type 4X, IP 65, IP 66, IP 68 |
| **Coplanar Sensor Module Housing** | CF-3M (Cast version of 316L SST, material per ASTM-A743) | CF-3M (Cast version of 316L SST, material per ASTM-A743) | CF-3M (Cast version of 316L SST, material per ASTM-A743) |
| **Bolts** | Plated carbon steel per ASTM A449, Type 1<br>Austenitic 316 SST per ASTM F593<br>ASTM A453, Class D, Grade 660 SST<br>ASTM A193, Grade B7M alloy steel<br>ASTM A193, Class 2, Grade B8M SST<br>Alloy K-500 | ASTM A449, Type 1 (zinc-cobalt plated carbon steel)<br>ASTM F593G, Condition CW1 (Austenitic 316 SST)<br>ASTM A193, Grade B7M (zinc plated alloy steel)<br>Alloy K-500 | ASTM A449, Type 1 (zinc-cobalt plated carbon steel)<br>ASTM F593G, Condition CW1 (Austenitic 316 SST)<br>ASTM A193, Grade B7M (zinc plated alloy steel) |
| **Sensor Module Fill Fluid** | Silicone or inert halocarbon (Inert is not available with 3051S_CA). In-Line series uses Fluorinert® FC-43. | Silicone 200 or Fluorocarbon oil (Halocarbon or Fluorinert® FC-43 for 3051T) | Silicone 200 or Fluorocarbon oil (Halocarbon or Fluorinert® FC-43 for 2051T) |
| **Process Fill Fluid** | Syltherm XLT, Silicone 705, Silicone 704, Silicone 200, inert, glycerin and water, Neobee M-20, propylene glycol and water. | Syltherm XLT, Silicone 705, Silicone 704, Silicone 200, inert, glycerin and water, Neobee M-20, propylene glycol and water | Syltherm XLT, Silicone 705, Silicone 704, Silicone 200, inert, glycerin and water, Neobee M-20, propylene glycol and water |
| **Paint for Aluminum Housing** | Polyurethane | Polyurethane | Polyurethane |
| **Cover O-ring** | Nitrile butadiene (NBR) | Nitrile butadiene (NBR) | Nitrile butadiene (NBR) |
| **Wireless Antenna** | External Antenna (WK1 / WM1): PBT/ PC integrated omnidirectional antenna<br>Remote Antenna (WN1): Fiberglass omnidirectional antenna | N/A | N/A |
| **Power Module** | Field replaceable, keyed connection eliminates the risk of incorrect installation, Intrinsically Safe Lithium-thionyl chloride Power Module with PBT enclosure | N/A | N/A |

**Note**
If a lower housing is supplied, then the following gaskets are the default gaskets for each seal.

**Wetted Materials**

| Seal | Gaskets |
|---|---|
| FFW | ThermoTork TN-9000 gasket |
| FCW | No gasket is supplied |
| FUW | No gasket is supplied |
| FVW | No gasket is supplied |
| RCW | C-4401 gasket |
| RFW | C-4401 gasket |
| RTW | C-4401 gasket |
| PFW | ThermoTork TN-9000 gasket |
| PCW | No gasket is supplied |

Transmitter flange is CF-3M (Cast version of 316L SST, material per ASTM-A743)

**Shipping weights**

**Table 49. 3051SAL Weights Without SuperModule Platform, Housing, or Transmitter Options**

| Flange | Flush lb. (kg) | 2-in. Ext. lb (kg) | 4-in. Ext. lb (kg) | 6-in. Ext. lb (kg) |
|---|---|---|---|---|
| 2-in., 150 | 9.5 (4,3) | — | — | — |
| 3-in., 150 | 15.7 (7,1) | 16.4 (7,4) | 17.6 (8,0) | 18.9 (8,6) |
| 4-in., 150 | 21.2 (9,6) | 20.9 (9,5) | 22.1 (10,0) | 23.4 (10,6) |
| 2-in., 300 | 11.3 (5,1) | — | — | — |
| 3-in., 300 | 19.6 (8,9) | 20.3 (9,2) | 21.5 (9,8) | 22.8 (10,3) |
| 4-in., 300 | 30.4 (13.8) | 30.3 (13,7) | 31.5 (14,3) | 32.8 (14,9) |
| 2-in., 600 | 12.8 (5,8) | — | — | — |
| 3-in., 600 | 22.1 (10,0) | 22.8 (10,3) | 24.0 (10,9) | 25.3 (11,5) |
| DN 50 / PN 40 | 11.3 (5,1) | — | — | — |
| DN 80 / PN 40 | 16.0 (7,3) | 16.7 (7,6) | 17.9 (8,1) | 19.2 (8,7) |
| DN 100 / PN 10/16 | 11.2 (5,1) | 11.9 (5,4) | 13.1 (5,9) | 14.4 (6,5) |
| DN 100 / PN 40 | 12.6 (5,7) | 13.3 (6,0) | 14.5 (6,6) | 15.8 (7,1) |

**Table 50. 3051SAM and 3051SAL Transmitter Option Weights**

| Option Code | Option | Add lb (kg) |
|---|---|---|
| 1J, 1K, 1L | SST PlantWeb Housing | 3.5 (1,6) |
| 2J | SST Junction Box Housing | 3.4 (1,5) |
| 7J | SST Quick Connect | 0.4 (0,2) |
| 2A, 2B, 2C | Aluminum Junction Box Housing | 1.1 (0,5) |
| 1A, 1B, 1C | Aluminum PlantWeb Housing | 1.1 (0,5) |
| M5 | LCD Display for Aluminum PlantWeb Housing(1),<br>LCD Display for SST PlantWeb Housing(1) | 0.8 (0,4)<br>1.6 (0,7) |
| | Aluminum Standard Cover | 0.4 (0,2) |
| | SST Standard Cover | 1.3 (0,6) |
| | Aluminum Display Cover | 0.7 (0,3) |
| | SST Display Cover | 1.5 (0,7) |
| | Wireless Extended Cover | 0.7 (0,3) |
| | LCD Display(2) | 0.1 (0,04) |
| | Junction Box Terminal Block | 0.2 (0,1) |
| | PlantWeb Terminal Block | 0.2 (0,1) |
| | Power Module | 0.5 (0,2) |

(1) Includes LCD display and display cover.

(2) Display only.

**Table 51. 3051L Weights without Options**

| Flange | Flush lb. (kg) | 2-in. Ext. lb (kg) | 4-in. Ext. lb (kg) | 6-in. Ext. lb (kg) |
|---|---|---|---|---|
| 2-in., 150 | 12.5 (5,7) | — | — | — |
| 3-in., 150 | 17.5 (7,9) | 19.5 (8,8) | 20.5 (9,3) | 21.5 (9,7) |
| 4-in., 150 | 23.5 (10,7) | 26.5 (12,0) | 28.5 (12,9) | 30.5 (13,8) |
| 2-in., 300 | 17.5 (7,9) | — | — | — |
| 3-in., 300 | 22.5 (10,2) | 24.5 (11,1) | 25.5 (11,6) | 26.5 (12,0) |
| 4-in., 300 | 32.5 (14,7) | 35.5 (16,1) | 37.5 (17,0) | 39.5 (17,9) |
| 2-in., 600 | 15.3 (6,9) | — | — | — |
| 3-in., 600 | 25.2 (11,4) | 27.2 (12,3) | 28.2 (12,8) | 29.2 (13,2) |
| DN 50/PN 40 | 13.8 (6,2) | — | — | — |
| DN 80/PN 40 | 19.5 (8,8) | 21.5 (9,7) | 22.5 (10,2) | 23.5 (10,6) |
| DN 100/ PN 10/16 | 17.8 (8,1) | 19.8 (9,0) | 20.8 (9,5) | 21.8 (9,9) |
| DN 100/ PN 40 | 23.2 (10,5) | 25.2 (11,5) | 26.2 (11,9) | 27.2 (12,3) |

**Table 52. 3051L Transmitter Options Weights**

| Code | Option | Add lb (kg) |
|---|---|---|
| J, K, L, M | Stainless Steel Housing (T) | 3.9 (1,8) |
| J, K, L, M | Stainless Steel Housing (C, L, H, P) | 3.1 (1,4) |
| M5 | LCD display for Aluminum Housing | 0.5 (0,2) |
| M6 | LCD display for SST Housing | 1.25 (0,6) |

**Table 53. 2051L Weights without Options**

| Flange | Flush lb. (kg) | 2-in. Ext. lb (kg) | 4-in. Ext. lb (kg) | 6-in. Ext. lb (kg) |
|---|---|---|---|---|
| 2-in., 150 | 12.5 (5,7) | — | — | — |
| 3-in., 150 | 17.5 (7,9) | 19.5 (8,8) | 20.5 (9,3) | 21.5 (9,7) |
| 4-in., 150 | 23.5 (10,7) | 26.5 (12,0) | 28.5 (12,9) | 30.5 (13,8) |
| 2-in., 300 | 17.5 (7,9) | — | — | — |
| 3-in., 300 | 22.5 (10,2) | 24.5 (11,1) | 25.5 (11,6) | 26.5 (12,0) |
| 4-in., 300 | 32.5 (14,7) | 35.5 (16,1) | 37.5 (17,0) | 39.5 (17,9) |
| DN 50/PN 40 | 13.8 (6,2) | — | — | — |
| DN 80/PN 40 | 19.5 (8,8) | 21.5 (9,7) | 22.5 (10,2) | 23.5 (10,6) |
| DN 100/ PN 10/16 | 17.8 (8,1) | 19.8 (9,0) | 20.8 (9,5) | 21.8 (9,9) |
| DN 100/ PN 40 | 23.2 (10,5) | 25.2 (11,5) | 26.2 (11,9) | 27.2 (12,3) |

**Table 54. 2051L Transmitter Options Weights**

| Code | Option | Add lb (kg) |
|---|---|---|
| J, K, L, M | Stainless Steel Housing | 3.9 (1,8) |
| M5 | LCD display for Aluminum Housing | 0.5 (0,2) |

# Seal specifications

## Functional specifications

### Hygienic Seal Approvals

Hygienic Seals: Tri-Clamp, tank spud, thin wall tank spud, Tri-Clamp inline, and Cherry Burrell "I" line seal conform to 3-A Hygienic Standards for Sensor and Sensor Fittings and Connections used on Milk and Milk Product Equipment, Number 74-03.

Hygienic Fill Fluids: The hygienic fill fluids glycerin & water and Propylene Glycol & water meet United States Pharmacopeia (USP) and Food Chemical Codex (FCC) requirements and is Generally Recognized as Safe (GRAS) in accordance with the FDA Code of Federal Regulations Title 21. The hygienic fill fluid Neobee M-20 is approved under 21CFR 172.856 as a direct food additive and under 21 CFR 174.5 as an indirect food additive.

Hygienic O-rings: The EPDM, Fluorocarbon (FMK), and Nitrile butadiene (NBR) O-rings for the SSW Tank Spud Seal meet 3-A Hygienic Standard Number 18 Class 1 requirements. The EPDM O-ring also meets USP class VI approval requirements.

### Surface Finish Certification (Q16 Option)

When ordering the Q16 option in the pressure transmitter model number, the surface finish of the seal diaphragm is certified per BPE 2002 requirements. This surface finish certification is available for Tri-Clamp, Tri-Clamp Inline, Tank Spud, and Thin Wall Tank Spud seal types.

### NACE Standard (T Option)

NACE (National Association of Corrosion Engineers) standard MR0175/ISO 15156 defines metallic material requirements for resistance to sulfide stress cracking when applied on petroleum production, drilling, gathering and flow line equipment, and field processing facilities to be used in H2S bearing hydrocarbon service. MR0103 provides material requirements exclusive to sour petroleum refining environments. Compliance guidelines are intended to include "wetted" materials as recommended by both NACE standards. The option code T in several of the general purpose seal types limits the wetted material offering. Metallurgical requirements for alloys used are virtually identical for the two standards, but application conditions enforced are different and can limit material acceptance. Contact an Emerson Process Management representative to aid in selecting the proper materials to meet the NACE standard.

### Material Traceability (Q8 Option)

Material traceability is provided for the seal, upper housing, and if applicable, lower housing/flushing connection or diaphragm extension, upon selecting the option code Q8 in the pressure transmitter model number. Material traceability for the transmitter/seal system is provided per the DIN EN10204 3.1 standard, and is only available for general purpose seal types.

## Performance specifications

Instrument Toolkit calculates the remote seal system performance and validates model number configuration.

### Remote Seal System Performance Calculation Report (QZ Option)

When the QZ option code is specified within the pressure transmitter model structure, Emerson will generate a remote seal system calculation report for the given application. This report quantifies all aspects of remote seal system performance including seal temperature effects, head temperature effects, seal response time, and transmitter total probable error.

## Physical specifications

### Material of construction

Remote seal materials of construction (diaphragm, upper housing, flange, lower housing/flushing connection, bolts, and gaskets/O-rings) are listed for each remote seal type.

Remote seal materials of construction (diaphragm, upper housing, flange, lower housing/flushing connection, bolts, and baskets/O-rings) are listed for each remote seal type.

Fill fluids specifications are listed in Table .

Transmitter flanged connections and capillary are 316L SST.

### Tagging

The 1199 remote seal model number is marked on the transmitter nameplate (neck or top label). The pressure transmitter will be tagged in accordance with customer requirements. The standard stainless steel tag is wired to the transmitter. Tag is 0.02-in. (0.051 cm) thick with 0.125-in. (0.318 cm) high letters. A permanently attached tag is available upon request.

### Calibration

Transmitters are factory calibrated to customer's specified range. If calibration is not specified, then the transmitters are calibrated at maximum range. Calibration is performed at ambient temperature and pressure.

#### Custom configurations

**Rosemount 3051S, 3051, and 2051 (Option Code C1)**

If code C1 is ordered, the customer may specify the following data in addition to the standard configuration parameters. Refer to the respective configuration data sheet within the device PDS.

Descriptor: 16 alphanumeric characters.
Message: 32 alphanumeric characters.
Date: Day, month, year.
Damping: Sec.

# Rosemount 3051S Liquid Level certifications

## Approved Manufacturing Locations

Rosemount Inc. — Chanhassen, Minnesota USA
Emerson Process Management GmbH & Co. — Wessling, Germany
Emerson Process Management Asia Pacific Private Limited — Singapore
Beijing Rosemount Far East Instrument Co., LTD — Beijing, China
Emerson Process Management LTDA — Sorocaba, Brazil
Emerson Process Management (India) Pvt. Ltd. — Mumbai, India
Emerson Process Management, Emerson FZE — Dubai, United Arab Emirates

## Ordinary Location Certification for FM

As standard, the transmitter has been examined and tested to determine that the design meets basic electrical, mechanical, and fire protection requirements by FM, a nationally recognized testing laboratory (NRTL) as accredited by the Federal Occupational Safety and Health Administration (OSHA).

### European Directive Information

The EC declaration of conformity for all applicable European directives for this product can be found at www.rosemount.com. A hard copy may be obtained by contacting an Emerson Process Management representative.

***ATEX Directive (94/9/EC)***

Emerson Process Management complies with the ATEX Directive.

***European Pressure Equipment Directive (PED) (97/23/EC)***

Models 3051S_CA4; 3051S_CD2, 3, 4, 5; (also with P9 option)

Pressure Transmitters — QS Certificate of Assessment - EC No. 59552-2009-CE-HOU-DNV, Module H Conformity Assessment

All other Model 3051S Pressure Transmitters — Sound Engineering Practice

Transmitter Attachments: Diaphragm Seal - Process Flange - Manifold — Sound Engineering Practice

Primary Elements, Flowmeter — See appropriate Primary Element QIG

***Electro Magnetic Compatibility (EMC) (2004/108/EC)***

EN 61326-1:2006
EN 61326-2-3:2006

## HART & FOUNDATION Fieldbus Hazardous Locations Certifications

### North American Certifications

***FM Approvals***

**E5** Explosion-proof for Class I, Division 1, Groups B, C, and D, T5 ($T_a$ = 85 °C); Dust Ignition-proof for Class II and Class III, Division 1, Groups E, F, and G, T5 ($T_a$ = 85 °C); hazardous locations; enclosure Type 4X, conduit seal not required when installed according to Rosemount drawing 03151-1003.

**I5/IE** Intrinsically Safe for use in Class I, Division 1, Groups A, B, C, and D, T4 ($T_a$ = 70 °C for output options A or X; $T_a$ = 60 °C for output option F or W); Class II, Division 1, Groups E, F, and G; Class III, Division 1; Class I, Zone 0 AEx ia IIC T4 ($T_a$ = 70 °C for output options A or X; $T_a$ = 60 °C for output option F or W) when connected in accordance with Rosemount drawing 03151-1006; Non-Incendive for Class I, Division 2, Groups A, B, C, and D; T4 ($T_a$ = 70 °C for output options A or X;
$T_a$ = 60 °C for output option F or W) Enclosure Type 4X
For entity parameters see control drawing 03151-1006.

***Canadian Standards Association (CSA)***

All CSA hazardous approved transmitters are certified per ANSI/ISA 12.27.01-2003.

**E6** Explosion-proof for Class I, Division 1, Groups B, C, and D; Dust Ignition-proof for Class II and Class III, Division 1, Groups E, F, and G; suitable for Class I, Division 2, Groups A, B, C, and D, when installed per Rosemount drawing 03151-1013, CSA Enclosure Type 4X; conduit seal not required; Dual Seal.

**I6/IF** Intrinsically Safe for Class I, Division 1, Groups A, B, C, and D when connected in accordance with Rosemount drawings 03151-1016; Dual Seal.
For entity parameters see control drawing 03151-1016.

### European Certifications

**I1/IA** ATEX Intrinsic Safety
Certificate No.: BAS01ATEX1303X ⟨Ex⟩ II 1G
Ex ia IIC T4 ($T_a$ = -60 °C to 70 °C) -HART/Remote Display/Quick Connect/HART Diagnostics
Ex ia IIC T4 ($T_a$ = -60 °C to 70 °C) -FOUNDATION fieldbus
Ex ia IIC T4 ($T_a$ = -60 °C to 40 °C) -FISCO
CE 1180

### Input Parameters

| Loop / Power | Groups |
|---|---|
| $U_i$ = 30 V | HART / FOUNDATION fieldbus/ Remote Display / Quick Connect / HART Diagnostics |
| $U_i$ = 17.5 V | FISCO |
| $I_i$ = 300 mA | HART / FOUNDATION fieldbus/ Remote Display / Quick Connect / HART Diagnostics |
| $I_i$ = 380 mA | FISCO |
| $P_i$ = 1.0 W | HART / Remote Display / Quick Connect / HART Diagnostics |
| $P_i$ = 1.3 W | FOUNDATION fieldbus |
| $P_i$ = 5.32 W | FISCO |
| $C_i$ = 30 nF | SuperModule Platform |
| $C_i$ = 11.4 nF | HART / HART Diagnostics / Quick Connect |
| $C_i$ = 0 | FOUNDATION fieldbus / Remote Display / FISCO |
| $L_i$ = 0 | HART / FOUNDATION fieldbus/ FISCO / Quick Connect / HART Diagnostics |
| $L_i$ = 60 µH | Remote Display |
| **RTD Assembly (3051SFx Option T or R)** | |
| $U_i$ = 5 Vdc | |
| $I_i$ = 500 mA | |
| $P_i$ = 0.63 W | |

**Special conditions for safe use (x)**

1. The apparatus, excluding the Types 3051 S-T and 3051 S-C (In-line and Coplanar SuperModule Platforms respectively), is not capable of withstanding the 500 V test as defined in Clause 6.3.12 of EN 60079-11. This must be considered during installation.
2. The terminal pins of the Types 3051 S-T and 3051 S-C must be protected to IP20 minimum.

**N1** ATEX Type n
Certificate No.: BAS01ATEX3304X ⟨Ex⟩ II 3 G
Ex nL IIC T4 ($T_a$ = -40 °C TO 70 °C)
Ui = 45 Vdc max
Ci = 11.4 nF (Transmitter Output Option A)
Ci = 0 (Transmitter Output Option F)
Li = 0
For remote display, Ci = 0, Li = 60 ì H
IP66
CE

**Special conditions for safe use (x)**

The apparatus is not capable of withstanding the 500 V insulation test required by Clause 6.8.1 of EN 60079-15. This must be taken into account when installing the apparatus.

**Note**
RTD Assembly is not included with the 3051SFx Type n Approval.

**ND** ATEX Dust
Certificate No.: BAS01ATEX1374X ⟨Ex⟩ II 1 D
Ex tD A20 IP66 T105°C (-20 °C ≤ $T_{amb}$ ≤ 85 °C)
$V_{max}$ = 42.4 volts max
IP66
CE 1180

**Special conditions for safe use (x)**

1. Cable entries must be used which maintain the ingress protection of the enclosure to at least IP66.
2. Unused cable entries must be filled with suitable blanking plugs which maintain the ingress protection of the enclosure to at least IP66.
3. Cable entries and blanking plugs must be suitable for the ambient range of the apparatus and capable of withstanding a 7J impact test.
4. The 3051S SuperModule must be securely screwed in place to maintain the ingress protection of the enclosure. (The 3051S SuperModule must be properly assembled to the 3051S housing to maintain ingress protection.)

**E1** ATEX Flameproof
Certificate No.: KEMA00ATEX2143X ⟨Ex⟩ II 1/2 G
Ex d IIC T6 (-50 °C ≤ $T_{amb}$ ≤ 65 °C)
Ex d IIC T5 (-50 °C ≤ $T_{amb}$ ≤ 80 °C)
$V_{max}$ = 42.4 V
CE 1180

**Special conditions for safe use (x)**

1. The Ex d blanking elements, cable glands, and wiring shall be suitable for a temperature of 90 °C.
2. The 3051S SuperModule contains a thin wall diaphragm. Installation, maintenance and use shall take into account the environmental conditions to which the diaphragm will be subjected. The manufacturer's instructions for maintenance shall be followed in detail to assure safety during its expected lifetime.
3. In case of repair, contact the manufacturer for information on the dimensions of the flameproof joints.

### Japanese Certifications

**E4** TIIS Flameproof
Ex d IIC T6

| Certificate | Description |
|---|---|
| TC15682 | Coplanar with Junction Box Housing |
| TC15683 | Coplanar with PlantWeb Housing |
| TC15684 | Coplanar with PlantWeb Housing and LCD Display |
| TC15685 | In-Line SST with Junction Box Housing |
| TC15686 | In-Line Alloy C-276 with Junction Box Housing |
| TC15687 | In-Line SST with PlantWeb Housing |
| TC15688 | In-Line Alloy C-276 with PlantWeb Housing |
| TC15689 | In-Line SST with PlantWeb Housing and LCD Display |
| TC15690 | In-Line Alloy C-276 with PlantWeb Housing and LCD Display |
| TC17102 | Remote Display |
| TC17099 | 3051SFA/C/P SST/Alloy C-276 with PlantWeb Housing and LCD Display |
| TC17100 | 3051SFA/C/P SST/Alloy C-276 with Junction Box Housing |
| TC17101 | 3051SFA/C/P SST/Alloy C-276 with PlantWeb Housing and Remote Display |

**China Certifications**

**E3** China Flameproof, Dust Ignition-proof
NEPSI Certificate No. (manufactured in Chanhassen, MN): GYJ091035
Certificate No. (manufactured in Beijing, China and Singapore): GYJ111400X
Certificate No. (3051SFx RTC, BMMC, SMMC): GYJ071086
Ex d IIC T5/T6
DIP A20 $T_a$ 105C IP66

**Note**
Refer to Appendix B of the 3051S Reference Manual (document number 00809-0100-4801) for Special Conditions for Safe Use.

**I3** China Intrinsic Safety, Dust Ignition-proof
NEPSI Certificate No. (manufactured in Chanhassen, MN): GYJ081078
Certificate No. (manufactured in Beijing, China and Singapore): GYJ111401X
Certificate No. (3051SFx RTC, BMMC, SMMC): GYJ071293
Ex ia IIC T4
DIP A21 $T_A$ T4 IP66

**Note**
Refer to Appendix B of the 3051S Reference Manual (document number 00809-0100-4801) for Special Conditions for Safe Use.

**Table 55. Input Parameters**

| Loop / Power | Groups |
|---|---|
| $U_i$ = 30 V | HART / FOUNDATION fieldbus / Remote Display / Quick Connect / HART Diagnostics |
| $I_i$ = 300 mA | HART / FOUNDATION fieldbus / Remote Display / Quick Connect / HART Diagnostics |
| $P_i$ = 1.0 W | HART / Remote Display / Quick Connect / HART Diagnostics |
| $P_i$ = 1.3 W | FOUNDATION fieldbus |
| $C_i$ = 38 nF | SuperModule Platform |
| $C_i$ = 11.4 nF | HART / HART Diagnostics / Quick Connect |
| $C_i$ = 0 | FOUNDATION fieldbus / Remote Display |
| $L_i$ = 0 | SuperModule Platform / FOUNDATION fieldbus |
| $L_i$ = 2.4 µH | HART / Quick Connect / HART Diagnostics |
| $L_i$ = 58.2 µH | Remote Display |
| **RTD Assembly (3051SFx Option T or R)** | |
| $U_i$ = 5 Vdc | |
| $I_i$ = 500 mA | |
| $P_i$ = 0.63 W | |

**N3** China Type n - Energy Limited
NEPSI Certificate No.: GYJ101112X
Ex nL IIC T5 (-40 °C ≤ Ta ≤ 70 °C)
IP66

| Loop / Power | Transmitter Output |
|---|---|
| $U_i$ = 30 V | HART / FOUNDATION fieldbus |
| $I_i$ = 300 mA | HART / FOUNDATION fieldbus |
| $P_i$ = 1.0 W | HART |
| $P_i$ = 1.3 W | FOUNDATION fieldbus |
| $C_i$ = 11.4 nF | HART |
| $C_i$ = 0 nF | FOUNDATION fieldbus |
| $L_i$ = 0 µH | HART(1) / FOUNDATION fieldbus |

(1) For remote meter option (M7, M8, M9), $L_i$ = 60 µH.

**Note**
Refer to Appendix B of the 3051S Reference Manual (document number 00809-0100-4801) for Special Conditions for Safe Use.

**Brazil certifications**

**I2** INMETRO Intrinsic Safety

Certificate number: CEPEL-EX-0722/05X
(manufacturing in Chanhassen, MN and Singapore)
Certificate number: CEPEL-EX-1414/07X
(manufacturing in Brazil)
INMETRO Marking: BR-Ex ia IIC T4 IP66W

**Special conditions for safe use (x)**

The apparatus, excluding the Types 3051S-T and 3051S-C (In-line and Coplanar SuperModule Platforms respectively), is not capable of withstanding the 500 V test as defined in Clause 6.3.12 of IEC60079-11. This must be considered during installation.

**E2** INMETRO Flameproof
Certificate number: CEPEL-EX-140/2003X
(manufacturing in Chanhassen, MN and Singapore)
Certificate number: CEPEL-EX-1413/07X
(manufacturing in Brazil)
INMETRO Marking: BR-Ex d IIC T5/T6 IP66W

**Special conditions for safe use (x)**

1. This device contains a thin wall diaphragm. Installation, maintenance, and use shall take into account the environmental conditions to which the diaphragm will be subjected. The manufacturer's instructions for installation and maintenance shall be followed in detail to assure safety during its expected lifetime.
2. For ambient temperature above 60 °C, cable wiring must have minimum isolation temperature of 90 °C, to be in accordance to equipment operation temperature.
3. The accessory of cable entries or conduit must be certified as flameproof and needs to be suitable for use conditions.
4. Where electrical entry is via conduit, the required sealing device must be assembled immediately close to enclosure.

**IECEx Certifications**

**E7** IECEx Flameproof and Dust (each listed separately)

IECEx Flameproof
Certificate No.: IECExKEM08.0010X
Ex d IIC T5 or T6 Ga/Gb
T6 (-50 °C ≤ $T_{amb}$ ≤ 65 °C)
T5 (-50 °C ≤ $T_{amb}$ ≤ 80 °C)
$V_{max}$ = 42.4 V

**Special conditions for safe use (x)**

1. The Ex d blanking elements, cable glands, and wiring shall be suitable for a temperature of 90 °C.
2. The 3051S SuperModule contains a thin wall diaphragm. Installation, maintenance, and use shall take into account the environmental conditions to which the diaphragm will be subjected. The manufacturer's instructions for maintenance shall be followed in detail to assure safety during its expected lifetime.
3. In case of repair, contact the manufacturer for information on the dimensions of the flameproof joints.

IECEx Dust
Certificate No. IECExBAS09.0014X
Ex tD A20 IP66 T105 °C (-20 °C ≤ $T_a$ ≤ 85 °C)
Vmax = 42.4 V
A = 22 mA
IP66

**Special conditions for safe use (x)**

1. Cable entries must be used which maintain the ingress protection of the enclosure to at least IP66.
2. Unused cable entries must be filled with suitable blanking plugs which maintain the ingress protection of the enclosure to at least IP66.
3. Cable entries and blanking plugs must be suitable for the ambient range of the apparatus and capable of withstanding a 7J impact test.
4. The 3051S SuperModule must be securely screwed in place to maintain the ingress protection of the enclosure. (The 3051S SuperModule must be properly assembled to the 3051S housing to maintain ingress protection.)

**I7/IG** IECEx Intrinsic Safety
Certificate No.: IECExBAS04.0017X
Ex ia IIC T4 ($T_a$ = -60 °C to 70 °C) -HART/Remote Display/Quick Connect/HART Diagnostics
Ex ia IIC T4 ($T_a$ = -60 °C to 70 °C) -FOUNDATION fieldbus
Ex ia IIC T4 ($T_a$ = -60 °C to 40 °C) -FISCO
IP66

**Table 56. Input Parameters**

| Loop / Power | Groups |
|---|---|
| $U_i$ = 30 V | HART / FOUNDATION fieldbus/ Remote Display / Quick Connect / HART Diagnostics |
| $U_i$ = 17.5 V | FISCO |
| $I_i$ = 300 mA | HART / FOUNDATION fieldbus/ Remote Display / Quick Connect / HART Diagnostics |
| $I_i$ = 380 mA | FISCO |
| $P_i$ = 1.0 W | HART / Remote Display / Quick Connect / HART Diagnostics |
| $P_i$ = 1.3 W | FOUNDATION fieldbus |
| $P_i$ = 5.32 W | FISCO |
| $C_i$ = 30 nF | SuperModule Platform |
| $C_i$ = 11.4 nF | HART / HART Diagnostics / Quick Connect |
| $C_i$ = 0 | FOUNDATION fieldbus / Remote Display / FISCO |
| $L_i$ = 0 | HART / FOUNDATION fieldbus/ FISCO / Quick Connect / HART Diagnostics |
| $L_i$ = 60 µH | Remote Display |
| **RTD Assembly (3051SFx Option T or R)** | |
| $U_i$ = 5 Vdc | |
| $I_i$ = 500 mA | |
| $P_i$ = 0.63 W | |

**Special conditions for safe use (x)**

1. The 3051S HART 4-20 mA, 3051S FOUNDATION fieldbus, and 3051S FISCO are not capable of withstanding the 500 V test as defined in clause 6.3.12 of IEC 60079-11. This must be taken into account during installation.
2. The terminal pins of the Types 3051S-T and 3051S-C must be protected to IP20 minimum.

**N7** IECEx Type n
Certificate No.: IECExBAS04.0018X
Ex nC IIC T4 (-40 °C ≤ $T_a$ ≤ +70 °C)
$U_i$ = 45 Vdc Max
IP66
Special conditions for safe use (x)
The apparatus is not capable of withstanding the 500 V insulation test required by Clause 8 of IEC 60079-15:1987.

**Combinations of certifications**

Stainless steel certification tag is provided when optional approval is specified. Once a device labeled with multiple approval types is installed, it should not be reinstalled using any other approval types. Permanently mark the approval label to distinguish it from unused approval types.

**K1** Combination of E1, I1, N1, and ND

**K2** Combination of E2 and I2

**K5** Combination of E5 and I5

**K6** Combination of E6 and I6

**K7** Combination of E7, I7, and N7

**KA** Combination of E1, I1, E6, and I6

**KB** Combination of E5, I5, I6, and E6

**KC** Combination of E5, E1, I5, and I1

**KD** Combination of E5, I5, E6, I6, E1, and I1

# 3051S ERS System Certifications

## Approved Manufacturing Locations

Rosemount Inc. – Chanhassen, Minnesota, USA

Emerson Process Management GmbH & Co. – Wessling, Germany

Emerson Process Management Asia Pacific Private Limited – Singapore

Beijing Rosemount Far East Instrument Co., LTD – Beijing, China

## Ordinary Location Certification for FM Approvals

As standard, the transmitter has been examined and tested to determine that the design meets basic electrical, mechanical, and fire protection requirements by FM, a nationally recognized testing laboratory (NRTL) as accredited by the Federal Occupational Safety and Health Administration (OSHA).

## European Directive Information

The EC declaration of conformity for all applicable European directives for this product can be found at www.rosemount.com. A hard copy may be obtained by contacting an Emerson Process Management representative.

***ATEX Directive (94/9/EC)***

Emerson Process Management complies with the ATEX Directive.

***European Pressure Equipment Directive (PED) (97/23/EC)***

Models 3051S_CA4; 3051S_CD2, 3, 4, 5; (also with P9 option)

Pressure Transmitters — QS Certificate of Assessment - EC No. 59552-2009-CE-HOU-DNV, Module H Conformity Assessment

All other Model 3051S Pressure Transmitters — Sound Engineering Practice

Transmitter Attachments: Diaphragm Seal - Process Flange - Manifold — Sound Engineering Practice

Primary Elements, Flowmeter — See appropriate Primary Element QIG

***Electro Magnetic Compatibility (EMC) (2004/108/EC)***

EN 61326-1:2006
EN 61326-2-3:2006

## Hazardous Locations Certifications

### North American Certifications

***FM Approvals***

**E5** Explosion-proof for Class I, Division 1, Groups B, C, and D; Dust Ignition-proof for Class II and Class III, Division 1, Groups E, F, and G; hazardous locations; enclosure Type 4X, conduit seal not required.

**I5** Intrinsically Safe for use in Class I, Division 1, Groups A, B, C, and D; Class II, Division 1, Groups E, F, and G; Class III, Division 1; Class I, Zone 0 AEx ia IIC when connected in accordance with Rosemount drawing 03151-1306; Non-Incendive for Class I, Division 2, Groups A, B, C, and D Enclosure Type 4X

For entity parameters see control drawing 03151-1306.

***Canadian Standards Association (CSA)***

All CSA hazardous approved transmitters are certified per ANSI/ISA 12.27.01-2003.

**E6** Explosion-proof for Class I, Division 1, Groups B, C, and D; Dust Ignition-Proof for Class II and Class III, Division 1, Groups E, F, and G; suitable for Class I, Division 2, Groups A, B, C, and D, CSA Enclosure Type 4X; conduit seal not required; Dual Seal.

**I6** Intrinsically Safe for Class I, Division 1, Groups A, B, C, and D when connected in accordance with Rosemount Drawings 03151-1316; Dual Seal.

For entity parameters see control drawing 03151-1316.

### European Certifications

**I1** ATEX Intrinsic Safety
Certificate No.: BAS01ATEX1303X ⟨Ex⟩ II 1G
Ex ia IIC T4 ($T_a$ = -60 °C to 70 °C)
CE 1180

**Table 57. Input Parameters**

| Loop / Power |
|---|
| $U_i$ = 30 V |
| $I_i$ = 300 mA |
| $P_i$ = 1 W |
| $C_i$ = 12 nF |
| $L_i$ = 33 µ H |

**Special Conditions for Safe Use (X)**

The apparatus is not capable of withstanding the 500 V test as defined in Clause 6.3.12 of EN 60079-11. This must be considered during installation.

**N1** ATEX Type n
Certificate No.: BAS01ATEX3304X ⟨Ex⟩ II 3 G
Ex nL IIC T4 ($T_a$ = -40 °C TO 70 °C)
Ui = 45 Vdc max
IP66
CE

**Special conditions for safe use (x)**

The apparatus is not capable of withstanding the 500 V insulation test required by Clause 6.8.1 of EN 60079-15.
This must be taken into account when installing the apparatus.

**ND** ATEX Dust
Certificate No.: BAS01ATEX1374X ⟨Ex⟩ II 1 D
Ex tD A20 IP66 T105 °C (-20 °C ≤ $T_{amb}$ ≤ 85 °C)
$V_{max}$ = 42.4 V max
IP66
CE 1180

**Special Conditions for safe use (X):**

1. Cable entries must be used which maintain the ingress protection of the enclosure to at least IP66.
2. Unused cable entries must be filled suitable blanking plugs which maintain the ingress protection of the enclosure to at least IP66.
3. Cable entries and blanking plugs must be suitable for the ambient range of the apparatus and capable of withstanding a 7J impact test.
4. Each 3051S ERS transmitter must be securely screwed in place to maintain the ingress protection of the enclosure. (The 3051S Super Module must be properly assembled to the 3051S housing to maintain ingress protection.)

**E1** ATEX Flameproof
Certificate No.: KEMA00ATEX2143X ⟨Ex⟩ II 1/2 G
Ex d IIC T6 (-50 °C ≤ $T_{amb}$ ≤ 65 °C)
Ex d IIC T5 (-50 °C ≤ $T_{amb}$ ≤ 80 °C)
$V_{max}$ = 42.4 V
CE 1180

**Special Conditions for safe use (X):**

1. The Ex d blanking elements, cable glands and wiring shall be suitable for a temperature of 90 °C.
2. Transmitter Model 3051S contains a thin wall diaphragm. Installation, maintenance, and use shall take into account the environmental conditions to which the diaphragm will be subjected. The manufacturer's instructions for maintenance shall be followed in detail to assure safety during its expected lifetime.
3. In case of repair, contact the manufacturer for information on the dimensions of the flameproof joints.

### Japanese Certifications

**E4** TIIS Flameproof: Consult factory for availability

### INMETRO Certifications

**E2** INMETRO Flameproof: Consult factory for availability

**I2** INMETRO Intrinsic Safety: Consult factory for availability

### China Certifications

**E3** China Flameproof, Dust Ignition-proof
NEPSI Certificate No. (manufactured in Beijing, China):
GYJ101345X
Ex d II CT5/T6

| | |
|---|---|
| T5 | (-50 °C ≤ $T_a$ ≤ 80 °C) |
| T6 | (-50 °C ≤ $T_a$ ≤ 65 °C) |

**Note**
Refer to Appendix B of the 3051S ERS Reference Manual (document number 00809-0100-4804) for Special Conditions for Safe Use.

**I3** China Intrinsic Safety, Dust Ignition-proof
NEPSI Certificate No. (manufactured in Beijing, China):
GYJ111265X
Ex ia IIC T4

| Maximum input voltage: $U_i$ (V) | Maximum input current: $I_i$ (mA) | Maximum input power: $P_i$ (W) | Maximum internal parameters: | |
|---|---|---|---|---|
| | | | $C_i$ (nF) | $L_i$ (μ H) |
| 30 | 300 | 1 | 12 | 33 |

**Note**
Refer to Appendix B of the 3051S ERS Reference Manual (document number 00809-0100-4804) for Special Conditions for Safe Use.

### IECEx Certifications

**I7** IECEx Intrinsic Safety
Certificate No.: IECExBAS04.0017X
Ex ia IIC T4 ($T_a$ = -60 °C to 70 °C) -HART/Remote Display/Quick Connect/HART Diagnostics
IP66

**Table 58. Input Parameters**

| Loop / Power |
|---|
| $U_i$ = 30 V |
| $I_i$ = 300 mA |
| $P_i$ = 1 W |
| $C_i$ = 12 nF |
| $L_i$ = 33 μ H |

**Special conditions for safe use (X)**

The apparatus is not capable of withstanding the 500 V test as defined in clause 6.3.12 of IEC 60079-11. This must be taken into account during installation.

**N7** IECEx Type n
Certificate No.: IECExBAS04.0018X
Ex nC IIC T4 (-40 °C ≤ $T_a$ ≤ +70 °C)
$U_i$ = 45 Vdc Max
IP66

**Special conditions for safe use (X)**

The apparatus is not capable of withstanding the 500 V insulation test required by Clause 8 of IEC 60079-15:1987.

**E7** IECEx Flameproof and Dust (each listed separately)

IECEx Flameproof
Certificate No.: IECExKEM08.0010X
Ex d IIC T6 (-50 °C ≤ $T_{amb}$ ≤ 65 °C)
Ex d IIC T5 (-50 °C ≤ $T_{amb}$ ≤ 80 °C)
$V_{max}$ = 42.4 V

**Special conditions for safe use (X)**

1. The Ex d blanking elements, cable glands and wiring shall be suitable for a temperature of 90 °C.
2. Transmitter Model 3051S contains a thin wall diaphragm. Installation, maintenance, and use shall take into account the environmental conditions to which the diaphragm will be subjected. The manufacturer's instructions for maintenance shall be followed in detail to assure safety during its expected lifetime.
3. In case of repair, contact the manufacturer for information on the dimensions of the flameproof joints.

IECEx Dust
Certificate No. IECExBAS09.0014X
Ex tD A20 IP66 T105 °C (-20 °C ≤ $T_{amb}$ ≤ 85 °C)
Vmax = 42.4 V
A = 22 mA
IP66

**Special conditions for safe use (X)**

1. Cable entries must be used which maintain the ingress protection of the enclosure to at least IP66.
2. Unused cable entries must be filled with suitable blanking plugs which maintain the ingress protection of the enclosure to at least IP66.
3. Cable entries and blanking plugs must be suitable for the ambient range of the apparatus and capable of withstanding a 7J impact test.
4. Each 3051S ERS sensor must be securely screwed in place to maintain the ingress protection of the enclosure. (Each sensor module must be properly assembled to the housing to maintain ingress protection.)

## Combinations of certifications

Stainless steel certification tag is provided when optional approval is specified. Once a device labeled with multiple approval types is installed, it should not be reinstalled using any other approval types. Permanently mark the approval label to distinguish it from unused approval types.

**K1** Combination of E1, I1, N1, and ND

**K2** Combination of E2 and I2

**K5** Combination of E5 and I5

**K6** Combination of E6 and I6

**K7** Combination of E7, I7, and N7

**KA** Combination of E1, E6, I1, and I6

**KB** Combination of E5, E6, I1, and I6

**KC** Combination of E5, E1, I5, and I1

**KD** Combination of E5, E6, E1, I5, I6, and I1

# 3051L Product Certifications

## Approved Manufacturing Locations

Rosemount Inc. — Chanhassen, Minnesota USA
Emerson Process Management GmbH & Co. — Wessling, Germany
Emerson Process Management Asia Pacific Private Limited — Singapore
Beijing Rosemount Far East Instrument Co., LTD — Beijing, China

## European Directive Information

The EC declaration of conformity for all applicable European directives for this product can be found on the Rosemount website at www.rosemount.com. A hard copy may be obtained by contacting an Emerson Process Management representative.

***ATEX Directive (94/9/EC)***
All 3051 transmitters comply with the ATEX Directive.

***European Pressure Equipment Directive (PED) (97/23/EC)***
3051CA4; 3051CG2, 3, 4, 5; 3051CD2, 3, 4, 5 *(also with P9 option)*; 3051HD2, 3, 4, 5; 3051HG2, 3, 4, 5; 3051PD2, 3; and 3051PG2, 3, 4, 5 Pressure Transmitters
— QS Certificate of Assessment -
EC No. 59552-2009-CE-HOU-DNV
Module H Conformity Assessment

***All other 3051/3001 Pressure Transmitters***
— Sound Engineering Practice

***Transmitter Attachments: Diaphragm Seal - Process Flange - Manifold***
— Sound Engineering Practice

***Electro Magnetic Compatibility (EMC) (2004/108/EC)***
All 3051 Pressure Transmitters meet all of the requirements of EN61326-1:2006 EN61326-2-3: 2006 and NAMUR NE-21

***Ordinary Location Certification for Factory Mutual***
As standard, the transmitter has been examined and tested to determine that the design meets basic electrical, mechanical, and fire protection requirements by FM, a nationally recognized testing laboratory (NRTL) as accredited by the Federal Occupational Safety and Health Administration (OSHA).

# 3051L HART Protocol

## Hazardous Locations Certifications

### North American Certifications

***FM Approvals***

**E5** Explosion-Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition-Proof for Class II, Division 1, Groups E, F, and G. Dust-Ignition-Proof for Class III, Division 1.
Factory Sealed, Enclosure Type 4X

**I5** Intrinsically Safe for use in Class I, Division 1, Groups A, B, C, and D; Class II, Division 1, Groups E, F, and G; Class III, Division 1 when connected per Rosemount drawing 03031-1019; Non-incendive for Class I, Division 2, Groups A, B, C, and D.
Temperature Code:T4 (Ta = 40 °C), T3 (Ta = 85 °C),
Enclosure Type 4X
For input parameters see control drawing 03031-1019.

***Canadian Standards Association (CSA)***

All CSA hazardous approved transmitters are certified per ANSI/ISA 12.27.01-2003.

**E6** Explosion-Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition-Proof for Class II and Class III, Division 1, Groups E, F, and G. Suitable for Class I, Division 2 Groups A, B, C, and D for indoor and outdoor hazardous locations.
Enclosure type 4X, factory sealed

**C6** Explosion-Proof and intrinsically safe approval. Intrinsically safe for Class I, Division 1, Groups A, B, C, and D when connected in accordance with Rosemount drawings 03031-1024. Temperature Code T3C.
Explosion-Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition-Proof for Class II and Class III, Division 1, Groups E, F, and G. Suitable for Class I, Division 2 Groups A, B, C, and D hazardous locations. Enclosure type 4X, factory sealed
For input parameters see control drawing 03031-1024.

### European Certifications

**I1** ATEX Intrinsic Safety and Dust
Certification No.: BAS 97ATEX1089X Ⓔx II 1 GD
Ex ia IIC T4 (–60 ≤ $T_a$ ≤ +70 °C)
Dust Rating: Ex tD A20 T80 °C (–20 ≤ $T_a$ ≤ 40 °C) IP66
CE 1180

**Table 59. Input Parameters**

| |
|---|
| $U_i$ = 30 V |
| $I_i$ = 200 mA |
| $P_i$ = 0.9 W |
| $C_i$ = 0.012 µF |

**Table 60. RTD Assembly (3051CFx Option T or R)**

| |
|---|
| $U_i$ = 5 Vdc |
| $I_i$ = 500 mA |
| $P_i$ = 0.63 W |

**Special Conditions for Safe Use (X):**
When the optional transient protection terminal block is installed, the apparatus is not capable of withstanding the 500 V insulation test required by Clause 6.3.12 of EN60079-11. This must be taken into account when installing the apparatus.
The enclosure may be made of aluminium alloy and given a protective polyurethane paint finish; however, care should be taken to protect it from impact or abrasion if located in Zone 0.

**N1** ATEX Type n and Dust
Certification No.: BAS 00ATEX3105X ⟨Ex⟩ II 3 GD
$U_i$ = 55 Vdc max
Ex nA nL T5 (–40 °C ≤ $T_{amb}$ ≤ 70 °C)
Dust rating: Ex tD A22 T80 °C (–20 ≤ $T_a$ ≤ 40 °C) IP66
CE

**Special Conditions for Safe Use (X):**
When the optional transient protection terminal block is installed, the apparatus is not capable of withstanding a 500 V r.m.s. test to case. This must be taken into account on any installation in which it is used, for example, by assuring that the supply to the apparatus is galvanically isolated.

**E8** ATEX Flame-Proof and Dust
Certification No.: KEMA 00ATEX2013X ⟨Ex⟩ II 1/2 GD
Ex d IIC T6 (–50 ≤ $T_a$ ≤ 65 °C)
T5 (–50 ≤ $T_a$ ≤ 80 °C)
Dust rating: Ex tD A20/A21 T90 °C, IP66
CE 1180
Vmax = 55 Vdc

**Special Conditions for Safe Use (X):**
This device contains a thin wall diaphragm. Installation, maintenance, and use shall take into account the environmental conditions to which the diaphragm will be subjected. The manufacturer's instructions for installation and maintenance shall be followed in detail to assure safety during its expected lifetime.
In case of repair, contact Rosemount for dimensions of the flameproof joints.

**Japanese Certifications**

**E4** TIIS Flame-Proof
Ex d IIC T6

| Certificate | Description |
|---|---|
| C15850 | 3051C/D/1 4–20 mA HART — no display |
| C15851 | 3051C/D/1 4–20 mA HART — with display |

**IECEx Certifications**

**I7** IECEx Intrinsic Safety
Certification No.: IECEx BAS 09.0076X
Ex ia IIC T4 (–60 °C ≤ $T_a$ ≤ 70 °C)
IP66

**Table 61. Input Parameters**

| |
|---|
| $U_i$ = 30 V |
| $I_i$ = 200 mA |
| $P_i$ = 0.9 W |
| $C_i$ = 0.012 µF |

**Table 62. RTD Assembly (3051CFx Option T or R)**

| |
|---|
| $U_i$ = 5 Vdc |
| $I_i$ = 500 mA |
| $P_i$ = 0.63 W |

**Special Conditions for Safe Use (X):**
When the optional transient protection terminal block is installed, the apparatus is not capable of withstanding the 500 V insulation test required by Clause 6.3.12 of IEC 60079-11. This must be taken into account when installing the apparatus.
The enclosure may be made of aluminium alloy and given a protective polyurethane paint finish; however care should be taken to protect it from impact or abrasion located in Zone 0.

**E7** IECEx Explosion-Proof (Flame-Proof)
Certification No.: IECEx KEM 09.0034X
Ga/Gb Ex d IIC T6 or T5
Ex tD A20/A21 IP66 T90 °C
IP66

**Special Conditions for Safe Use (X):**
This device contains a thin wall diaphragm. Installation, maintenance, and use shall take into account the environmental conditions to which the diaphragm will be subjected. The manufacturer's instructions for installation and maintenance shall be followed in detail to assure safety during its expected lifetime.

For information on the dimensions of the flameproof joints the manufacturer shall be contacted.

**N7** IECEx Type n
Certification No.: IECEx BAS 09.0077X
Ex nA nL IIC T5 (–40 °C ≤ $T_a$ ≤ 70 °C)
IP66

**Special Conditions for Safe Use (X):**

The apparatus is not capable of withstanding the 500 V insulation test required by clause 6.8.1 of IEC 60079-15. This must be taken into account when installing the apparatus.

**Combinations of Certifications**

Stainless steel certification tag is provided when optional approval is specified. Once a device labeled with multiple approval types is installed, it should not be reinstalled using any other approval types. Permanently mark the approval label to distinguish it from unused approval types.

**K5** E5 and I5 combination

**KB** K5 and C6 combination

**KD** K5, C6, I1, and E8 combination

**K6** C6, I1, and E8 combination

**K8** E8 and I1 combination

**K7** E7, I7, and N7 combination

# 3051L Fieldbus Protocol

## Hazardous Locations Certifications

### North American Certifications

***FM Approvals***

**E5** Explosion-Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition-Proof for Class II, Division 1, Groups E, F, and G. Dust-Ignition-Proof for Class III, Division 1. Factory sealed. Enclosure Type 4X.

**I5** Intrinsically Safe for use in Class I, Division 1, Groups A, B, C, and D; Class II, Division 1, Groups E, F, and G; Class III, Division 1 when connected per Rosemount drawing 03031-1019; Non-incendive for Class I, Division 2, Groups A, B, C, and D.

Temperature Code: T4 (Ta = 60 °C), Enclosure Type 4X
For input parameters see control drawing 03031-1019.

***Canadian Standards Association (CSA)***

All CSA hazardous approved transmitters are certified per ANSI/ISA 12.27.01-2003.

**E6** Explosion-Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition-Proof for Class II and Class III, Division 1, Groups E, F, and G. Suitable for Class I, Division 2 Groups A, B, C, and D for indoor and outdoor hazardous locations. Enclosure type 4X, factory sealed

**C6** Explosion-Proof and intrinsically safe approval. Intrinsically safe for Class I, Division 1, Groups A, B, C, and D when connected in accordance with Rosemount drawings 03031-1024. Temperature Code T3C.
Explosion-Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition-Proof for Class II and Class III, Division 1, Groups E, F, and G. Suitable for Class I, Division 2 Groups A, B, C, and D hazardous locations. Enclosure type 4X, factory sealed
For input parameters see control drawing 03031-1024.

**European Certifications**

**I1** ATEX Intrinsic Safety and Dust
Certification No.: BAS 98ATEX1355X ⟨Ex⟩ II 1 GD
Ex ia IIC T4 ($T_{amb}$ = –60 to +60 °C)
Dust Rating: Ex tD A20 T70 °C ($T_{amb}$ –20 to 40 °C) IP66
CE 1180

**Table 63. Input Parameters**

| |
|---|
| $U_i$ = 30 V |
| $I_i$ = 300 mA |
| $P_i$ = 1.3 W |
| $C_i$ = 0 µF |

**Table 64. RTD Assembly (3051CFx Option T or R)**

| |
|---|
| $U_i$ = 5 Vdc |
| $I_i$ = 500 mA |
| $P_i$ = 0.63 W |

**Special Conditions for Safe Use (X):**

The device is not capable of withstanding the 500 V insulation test required by Clause 6.3.12 of EN60079-11. This must be taken into account when installing the apparatus.
The enclosure may be made of aluminium alloy and given a protective polyurethane paint finish; however, care should be taken to protect it from impact or abrasion if located in Zone 0.

**IA** ATEX FISCO Intrinsic Safety
Certification No.: BAS 98ATEX1355X ⟨Ex⟩ II 1 G
Ex ia IIC T4 ($T_{amb}$ = –60 to +60 °C)
IP66
CE 1180

**Table 65. Input Parameters**

| |
|---|
| $U_i$ = 17.5 V |
| $I_i$ = 380 mA |
| $P_i$ = 5.32 W |
| $C_i$ = ≤ 5 µF |
| $L_i$ = ≤ 10 µH |

**Special Conditions for Safe Use (X):**
The device is not capable of withstanding the 500 V insulation test required by Clause 6.3.12 of EN60079-11. This must be taken into account when installing the apparatus.
The enclosure may be made of aluminium alloy and given a protective polyurethane paint finish; however, care should be taken to protect it from impact or abrasion if located in Zone 0.

**N1** ATEX Type n and Dust
Certification No.: BAS 98ATEX3356X ⟨Ex⟩ II 3 GD
$U_i$ = 40 Vdc max
Ex nL IIC T5 ($T_a$ = –40 °C to 70 °C)
Dust rating: Ex tD A22 T80 °C ($T_{amb}$ = –20 to 40 °C) IP66

**Special Conditions for Safe Use (X):**
The device is not capable of withstanding the 500 V insulation test required by Clause 6.8.1 of EN60079-15. This must be taken into account when installing the apparatus.

**E8** ATEX Flame-Proof and Dust
Certification No.: KEMA 00ATEX2013X ⟨Ex⟩ II $^1/_2$ GD
Ex d IIC T6 ($T_{amb}$ = –50 to 65 °C)
T5 ($T_{amb}$ = –50 to 80 °C)
Dust rating: Ex tD A20/21 T90 °C, IP66
CE 1180
Vmax = 55 Vdc

**Special Conditions for Safe Use (X):**
This device contains a thin wall diaphragm. Installation, maintenance, and use shall take into account the environmental conditions to which the diaphragm will be subjected. The manufacturer's instructions for installation and maintenance shall be followed in detail to assure safety during its expected lifetime.
In case of repair, contact Rosemount for dimensions of the flameproof joints.

**Japanese Certifications**

**E4** TIIS Flame-Proof
Ex d IIC T6

| Certificate | Description |
|---|---|
| C15852 | 3051C/D/1 FOUNDATION Fieldbus — no display |
| C15853 | 3051C/D/1 FOUNDATION Fieldbus — with display |

**IECEx Certifications**

**I7** IECEx Intrinsic Safety
Certification No.: IECEx BAS 09.0076X
Ex ia IIC T4 (–60 °C ≤ $T_a$ ≤ 60 °C)
IP66

**Table 66. Input Parameters**

| |
|---|
| $U_i$ = 30 V |
| $I_i$ = 300 mA |
| $P_i$ = 1.3 W |
| $C_i$ = 0 µF |
| $L_i$ = 0 µH |

**Table 67. RTD Assembly (3051CFx Option T or R)**

| |
|---|
| $U_i$ = 5 Vdc |
| $I_i$ = 500 mA |
| $P_i$ = 0.63W |

**Special Conditions for Safe Use (X):**
1. If the apparatus is fitted with an optional 90 V transient suppressor, it is not capable of withstanding the 500 V insulation test required by clause 6.3.12 of IEC 60079-11. This must be taken into account when installing the apparatus.
2. The enclosure may be made of aluminium alloy and given a protective polyurethane paint finish; however, care should be taken to protect it from impact or abrasion if located in Zone 0.

**E7** IECEx Explosion-Proof (Flame-Proof)
Certification No.: IECEx KEM 09.0034X
Ga/Gb Ex d IIC T6 or T5
Ex tD A20/A21 IP66 T90 °C
IP66

**Special Conditions for Safe Use (X):**
This device contains a thin wall diaphragm. Installation, maintenance, and use shall take into account the environmental conditions to which the diaphragm will be subjected. The manufacturer's instructions for installation and maintenance shall be followed in detail to assure safety during its expected lifetime.

For information on the dimensions of the flameproof joints the manufacturer shall be contacted.

**N7** IECEx Type n
Certification No.: IECEx BAS 09.0077X
Ex nA nL IIC T5 (–40 °C ≤ $T_a$ ≤ 70 °C)
IP66

**Special Conditions for Safe Use (X):**
The apparatus is not capable of withstanding the 500 V insulation test required by clause 6.8.1 of IEC 60079-15. This must be taken into account when installing the apparatus.

### Combinations of Certifications

Stainless steel certification tag is provided when optional approval is specified. Once a device labeled with multiple approval types is installed, it should not be reinstalled using any other approval types. Permanently mark the approval label to distinguish it from unused approval types.

**K5** E5 and I5 combination

**KB** K5 and C6 combination

**KD** K5, C6, I1, and E8 combination

**K6** C6, I1, and E8 combination

**K8** E8 and I1 combination

**K7** E7, I7, and N7 combination

# 2051L Product Certifications

## Approved Manufacturing Locations

Rosemount Inc. — Chanhassen, Minnesota USA
Emerson Process Management GmbH & Co. — Wessling, Germany
Emerson Process Management Asia Pacific Private Limited — Singapore
Beijing Rosemount Far East Instrument Co., LTD — Beijing, China

## European Directive Information

The EC declaration of conformity for all applicable European directives for this product can be found on the Rosemount website at www.rosemount.com. A hard copy may be obtained by contacting an Emerson Process Management representative.

***ATEX Directive (94/9/EC)***
All 2051 transmitters comply with the ATEX Directive.

***European Pressure Equipment Directive (PED) (97/23/EC)***
2051CG2, 3, 4, 5; 2051CD2, 3, 4, 5 (also with P9 option)
— QS Certificate of Assessment -
EC No. 59552-2009-CE-HOU-DNV
Module H Conformity Assessment

***All other 2051 Pressure Transmitters***
— Sound Engineering Practice

***Transmitter Attachments: Diaphragm Seal - Process Flange - Manifold***
— Sound Engineering Practice

***Electro Magnetic Compatibility (EMC) (2004/108/EC)***
All 2051 Pressure Transmitters meet all of the requirements of EN61326:2006 and NAMUR NE-21.

***Ordinary Location Certification for Factory Mutual***
As standard, the transmitter has been examined and tested to determine that the design meets basic electrical, mechanical, and fire protection requirements by FM, a nationally recognized testing laboratory (NRTL) as accredited by the Federal Occupational Safety and Health Administration (OSHA).

# 2051L HART Protocol

## Hazardous Locations Certifications

### North American Certifications

***FM Approvals***

**E5** Explosion-Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition-Proof for Class II, Division 1, Groups E, F, and G. Dust-Ignition-Proof for Class III, Division 1.
T5 (Ta = 85 °C), Factory Sealed, Enclosure Type 4X

**I5** Intrinsically Safe for use in Class I, Division 1, Groups A, B, C, and D; Class 1, Zone 0 AEx ia T4; Class II, Division 1, Groups E, F, and G; Class III, Division 1 when connected per Rosemount drawing 02051-1009; Non-incendive for Class I, Division 2, Groups A, B, C, and D.
Temperature Code:T4 (Ta = 70 °C),
Enclosure Type 4X
For input parameters see control drawing 02051-1009.

***Canadian Standards Association (CSA)***

All CSA hazardous approved transmitters are certified per ANSI/ISA 12.27.01-2003.

**E6** Explosion-Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition-Proof for Class II and Class III, Division 1, Groups E, F, and G. Suitable for Class I, Division 2 Groups A, B, C, and D for indoor and outdoor hazardous locations. Enclosure type 4X, factory sealed

**I6** Intrinsically safe approval. Intrinsically safe for Class I, Division 1, Groups A, B, C, and D when connected in accordance with Rosemount drawing 02051-1008.
Temperature Code T3C; Ex ia IIC T3C.
Dust-Ignition-Proof for Class II and Class III, Division 1, Groups E, F, and G. Suitable for Class I, Division 2 Groups A, B, C, and D hazardous locations. Enclosure type 4X, factory sealed
For input parameters see control drawing 02051-1008.

### European Certifications

**I1** ATEX Intrinsic Safety
Certification No. Baseefa08ATEX0129X ⟨Ex⟩ II 1 G
Ex ia IIC T4 (–60 ≤ $T_a$ ≤ +70 °C)
IP66 IP68
CE 1180

**Table 68. Input Parameters**

| |
|---|
| $U_i$ = 30 V |
| $I_i$ = 200 mA |
| $P_i$ = 1.0 W |
| $C_i$ = 0.012 µF |
| $L_i$ = 10 µH |

**Table 69. RTD Assembly (2051CFx Option T or R)**

| |
|---|
| $U_i$ = 5 Vdc |
| $I_i$ = 500 mA |
| $P_i$ = 0.63 W |

**Special Conditions for Safe Use (X):**
When the optional transient protection terminal block is installed, the apparatus is not capable of withstanding the 500 V insulation test required by Clause 6.3.12 of EN60079-11. This must be taken into account when installing the apparatus.

**N1** ATEX Type n
Certification No. Baseefa08ATEX0130X ⟨Ex⟩ II 3 G
Ex nAnL IIC T4 (–40 ≤ $T_a$ ≤ +70 °C)
$U_i$ = 42.4 Vdc max
IP66
CE

**Special Conditions for Safe Use (X):**
When the optional transient protection terminal block is installed, the apparatus is not capable of withstanding a 500 V r.m.s. test to case. This must be taken into account on any installation in which it is used, for example by assuring that the supply to the apparatus is galvanically isolated.

**E1** ATEX Flame-Proof
Certification No. KEMA 08ATEX0090X ⟨Ex⟩ II 1/2 G
Ex d IIC T6 (–50 ≤ $T_a$ ≤ 65 °C)
Ex d IIC T5 (–50 ≤ $T_a$ ≤ 80 °C)
IP66
CE 1180
Vmax = 42.4 Vdc

**Special Conditions for Safe Use (X):**
This device contains a thin wall diaphragm. Installation, maintenance, and use shall take into account the environmental conditions to which the diaphragm will be subjected. The manufacturer's instructions for installation and maintenance shall be followed in detail to assure safety during its expected lifetime.
The Ex d blanking elements, cable glands, and wiring shall be suitable for a temperature of 90 °C.
In case of repair, contact the manufacturer for information on the dimensions of the flameproof joints.

**ND** ATEX Dust
Certification No. Baseefa08ATEX0182X ⟨Ex⟩ II 1 D
Dust Rating: II 1 D Ex tD A20 T115 °C (-20 °C ≤ $T_a$ ≤ 85 °C)
IP66 IP68
Vmax = 42.4 Vdc
A = 22 mA
CE 1180

**Special Conditions for Safe Use (X):**
1. The user must ensure that the maximum rated voltage and current (42.4 V, 22 mA, DC) are not exceeded. All connections to other apparatus or associated apparatus shall have control over this voltage and current equivalent to a category "ib" circuit according to EN 60079-1.
2. Cable entries must be used which maintain the ingress protection of the enclosure to at least IP66.
3. Unused cable entries must be filled with suitable blanking plugs which maintain the ingress protection of the enclosure to at least IP66.
4. Cable entries and blanking plugs must be suitable for the ambient range of the apparatus and capable of withstanding a 7J impact test.

**IECEx Certifications**

**I7** IECEx Intrinsic Safety
Certification No. IECExBAS08.0045X II 1 G
Ex ia IIC T4 (–60 ≤ $T_a$ ≤ +70 °C)
CE 1180

**Table 70. Input Parameters**

| |
|---|
| $U_i$ = 30 V |
| $I_i$ = 200 mA |
| $P_i$ = 1.0 W |
| $C_i$ = 0.012 µF |
| $L_i$ = 10 µH |

**Table 71. RTD Assembly (2051CFx Option T or R)**

| |
|---|
| $U_i$ = 5 Vdc |
| $I_i$ = 500 mA |
| $P_i$ = 0.63 W |

**Special Conditions for Safe Use (X):**
When the optional transient protection terminal block is installed, the apparatus is not capable of withstanding the 500 V insulation test required by Clause 6.3.12 of IEC60079-11. This must be taken into account when installing the apparatus.

**E7** IECEx Explosion-Proof (Flame-Proof)
Certification No. IECEx KEM 08.0024X II 1/2 G
Ex d IIC T6 (–50 ≤ $T_a$ ≤ 65 °C)
Ex d IIC T5 (–50 ≤ $T_a$ ≤ 80 °C)
CE 1180
Vmax = 42.4 Vdc

**Special Conditions for Safe Use (X):**
This device contains a thin wall diaphragm. Installation, maintenance, and use shall take into account the environmental conditions to which the diaphragm will be subjected. The manufacturer's instructions for installation and maintenance shall be followed in detail to assure safety during its expected lifetime.
The Ex d blanking elements, cable glands, and wiring shall be suitable for a temperature of 90 °C.
In case of repair, contact the manufacturer for information on the dimensions of the flameproof joints.

**N7** IECEx Type n
Certification No. IECExBAS08.0046X II 3 G
Ex nAnL IIC T4 (–40 ≤ $T_a$ ≤ +70 °C)
$U_i$ = 42.4 Vdc max
CE

**Special Conditions for Safe Use (X):**

When the optional transient protection terminal block is installed, the apparatus is not capable of withstanding a 500 V r.m.s. test to case. This must be taken into account on any installation in which it is used, for example by assuring that the supply to the apparatus is galvanically isolated.

**TIIS Certifications**

**E4** TIIS Flame-Proof
Ex d IIC T6

| | |
|---|---|
| TC18872 | Coplanar with Display |
| TC18873 | Coplanar no display |

**Inmetro Certifications**

**E2** Flame-Proof
Certificate No. CEPEL EX-1767/09X
BR-Ex d IIC T6/T5

**I2** Intrinsic Safety
Certificate No. CEPEL EX-1768/09X
BR-Ex ia IIC T4

**Table 72. Input Parameters**

| |
|---|
| $U_i$ = 30 V |
| $I_i$ = 200 mA |
| $P_i$ = 1.0 W |
| $C_i$ = 0.012 µF |
| $L_i$ = 10 µH |

**Table 73. RTD Assembly (2051CFx Option T or R)**

| |
|---|
| $U_i$ = 5 Vdc |
| $I_i$ = 500 mA |
| $P_i$ = 0.63 W |

**Special Conditions for Safe Use (X):**
When the optional transient protection terminal block is installed, the apparatus is not capable of withstanding the 500 V insulation test required by Clause 6.3.12 of IEC60079-11. This must be taken into account when installing the apparatus.

**GOST - Russia Certifications**

**IM** Intrinsic Safety
Consult factory for availability

**EM** Flame-Proof
Consult factory for availability

**China (NEPSI) Certifications**

**Note**
Refer to Appendix B of the 3051S Reference Manual (document number 00809-0100-4801) for Special Conditions for Safe Use.

**E3** Flame-Proof
Certificate No.: GYJ081230
Ex d IIC T5/T6

**I3** Intrinsic Safety
Certificate No.: GYJ081231X
Ex ia IIC T4

**Table 74. Input Parameters**

| |
|---|
| $U_i$ = 30 V |
| $I_i$ = 200 mA |
| $P_i$ = 1.0 W |
| $C_i$ = 0.012 µF |
| $L_i$ = 10 µH |

**CCoE Certifications**

**IW** Intrinsic Safety
Ex ia IIC T4

**EW** Flame-Proof
Ex d IIC T5 or T6

**Combinations of certifications**

Stainless steel certification tag is provided when optional approval is specified. Once a device labeled with multiple approval types is installed, it should not be reinstalled using any other approval types. Permanently mark the approval label to distinguish it from unused approval types.

**K1** E1, I1, N1, and ND combination

**K4** E4 and I4 combination

**K5** E5 and I5 combination

**K6** I6 and E6 combination

**K7** E7, I7, and N7 combination

**KA** E1, I1, E6, and I6 combination

**KB** E5, I5, E6, and I6 combination

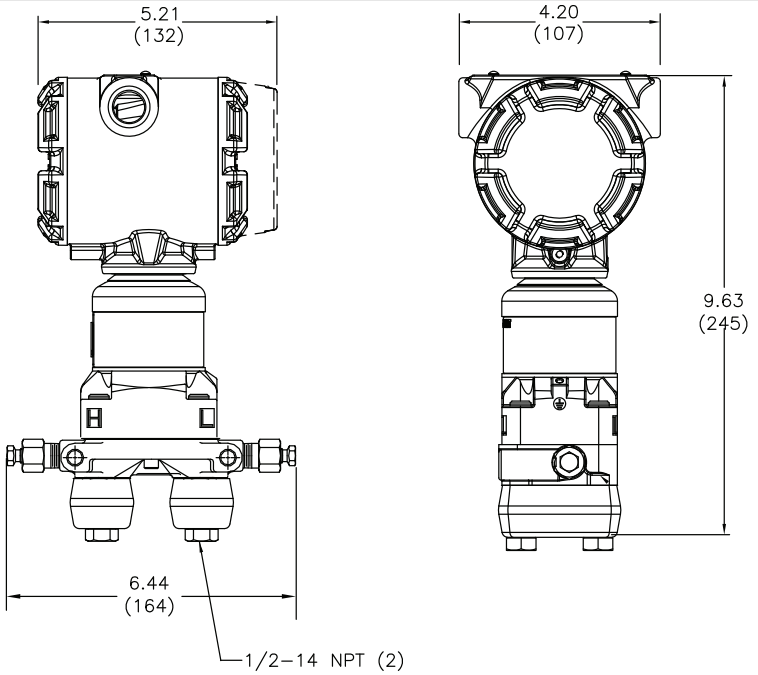
**KC** E1, I1, E5, and I5 combination

**KD** E1, I1, E5, I5, E6, and I6 combination

# Dimensional drawings

**Figure 3. Rosemount 3051S ERS Measurement Transmitter (Measurement in inches (millimeters))**

**Rosemount 3051S ERS Measurement Transmitter - Coplanar Style**




**Rosemount 3051S ERS Measurement Transmitter - In-Line Style**

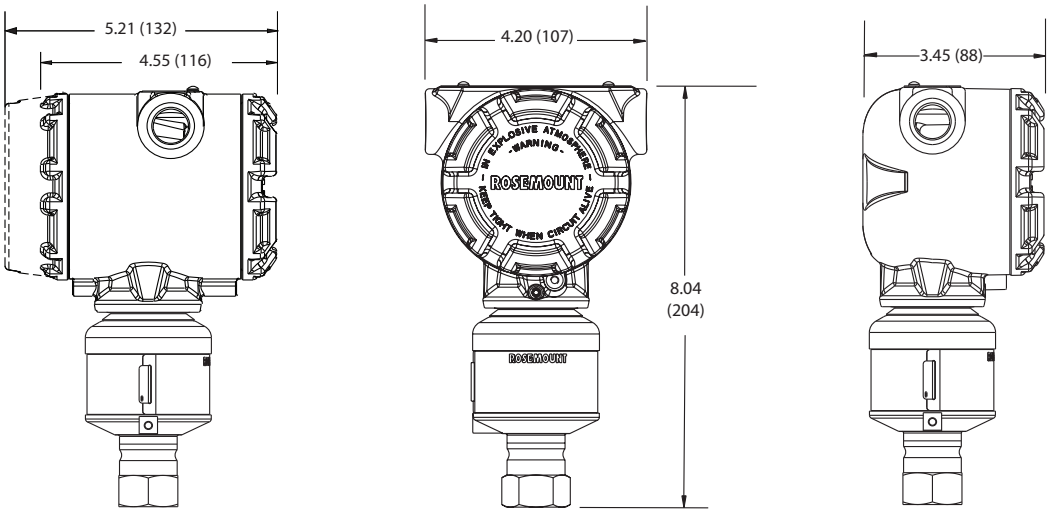
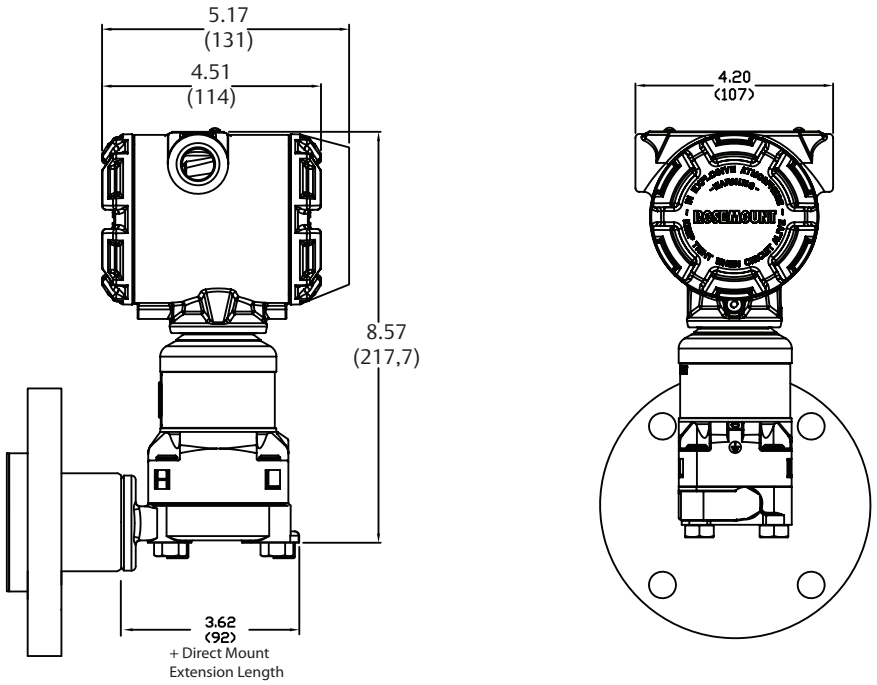
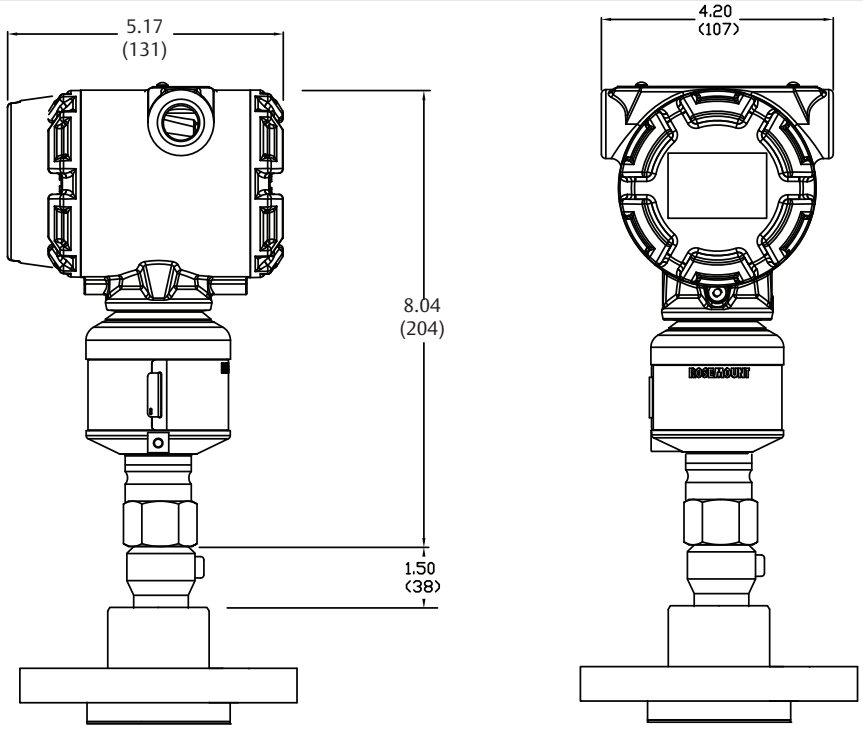


**Figure 4. Rosemount 3051S Scalable Level Transmitter with FF Seal (Measurement in inches (millimeters))**

**Rosemount 3051S Scalable Level Transmitter with FF(1)(2)- Coplanar Style**




**Rosemount 3051S Scalable Level Transmitter with FF(1)(2) - In-Line Style**

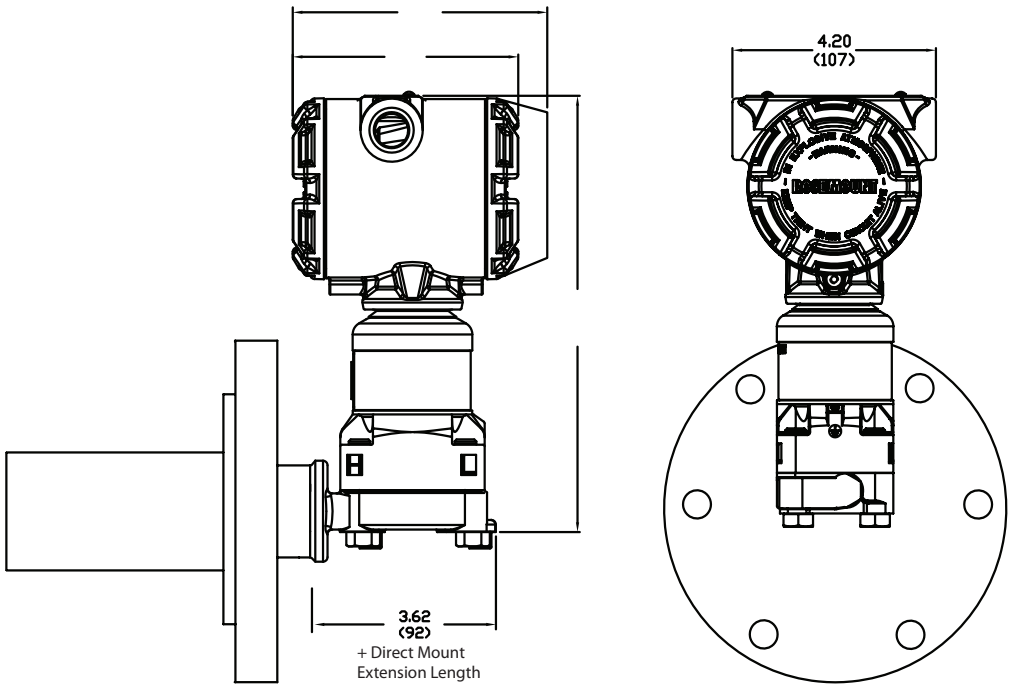



(1) FF (FFW) seal dimensions and pressure ratings can be found on page 141.

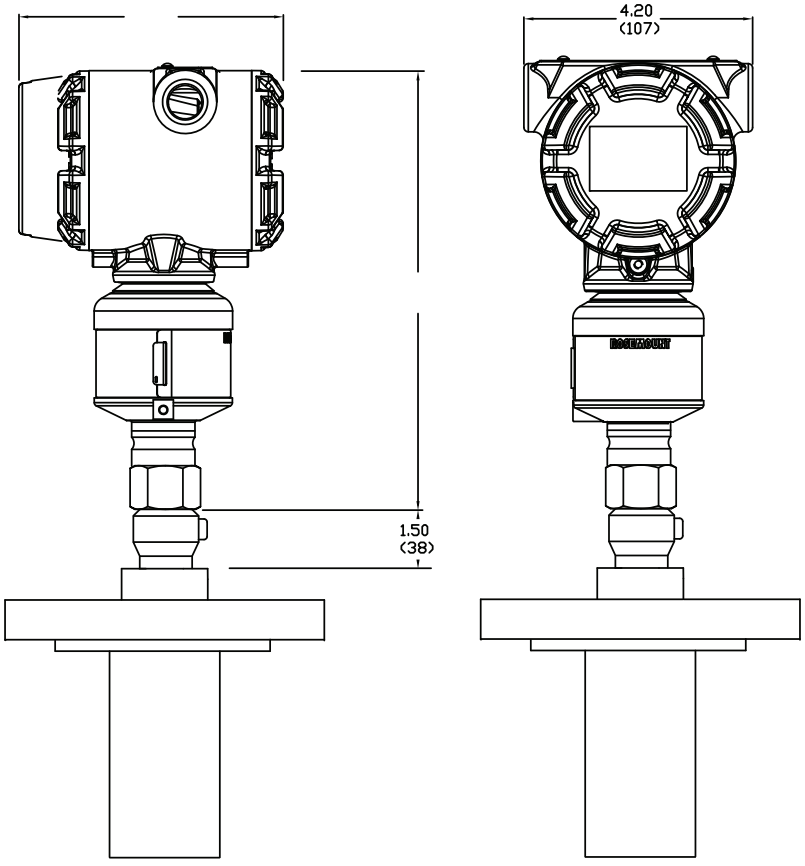
(2) Lower housing (flushing ring) is available with FFW style flange.

**Figure 5. Rosemount 3051S Scalable Level Transmitter with EF Seal (Measurement in inches (millimeters))**

**Rosemount 3051S Scalable Level Transmitter with EF(1)- Coplanar Style**



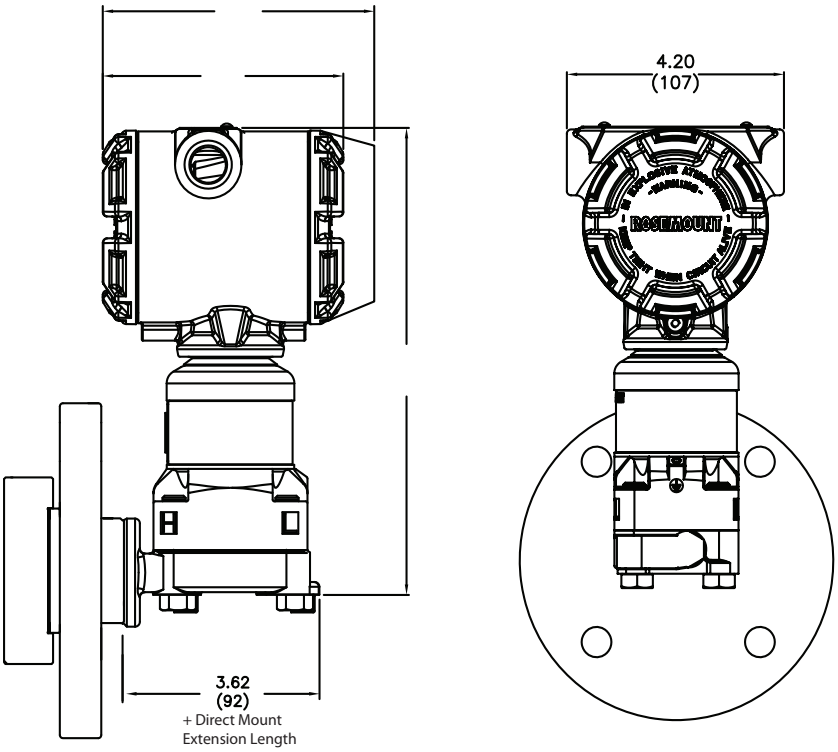

**Rosemount 3051S Scalable Level Transmitter with EF(1) - In-Line Style**



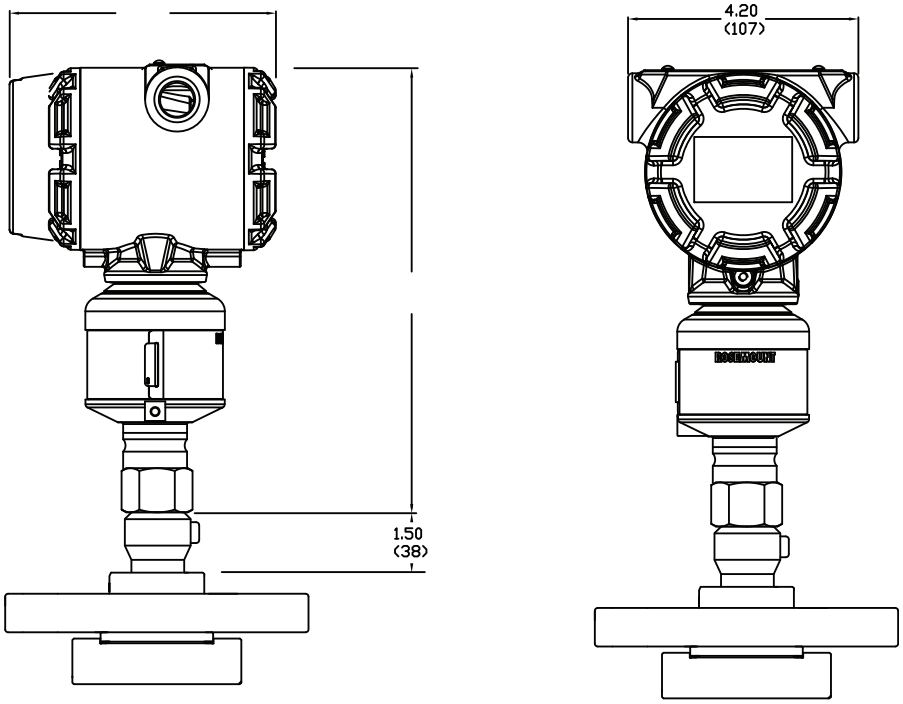

(1) EF (EFW) seal dimensions and pressure ratings can be found on page 148.

**Figure 6. Rosemount 3051S Scalable Level Transmitter with RF Seal (Measurement in inches (millimeters))**

**Rosemount 3051S Scalable Level Transmitter with RF(1)- Coplanar Style**



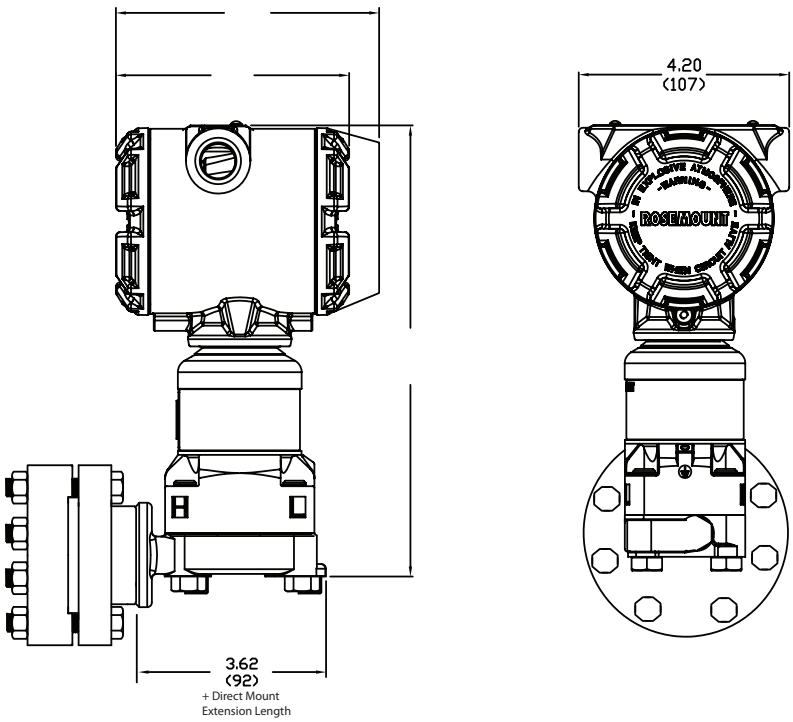

**Rosemount 3051S Scalable Level Transmitter with RF(1) - In-Line Style**



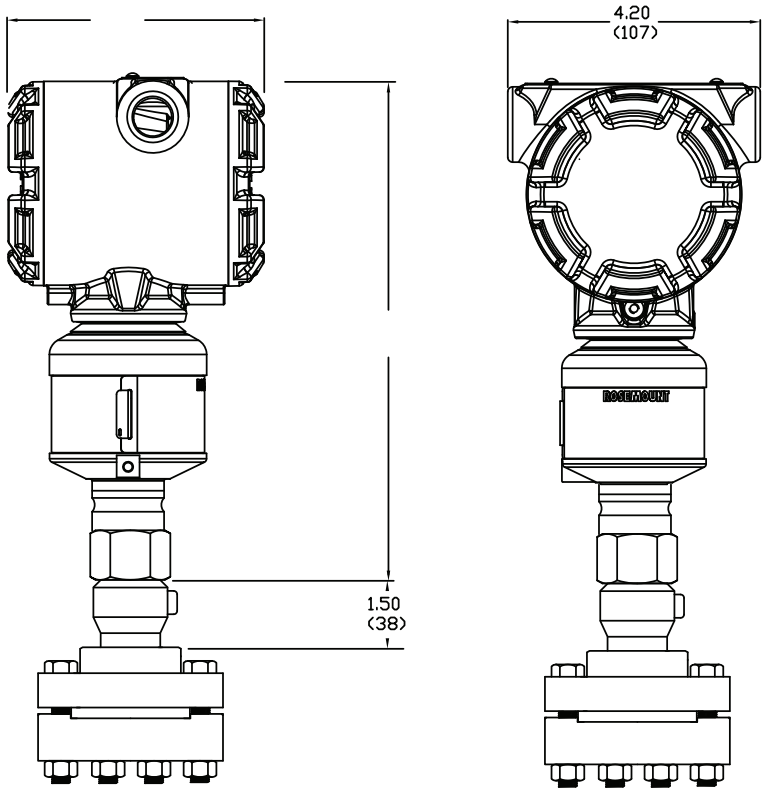

(1) RF (RFW) seal dimensions and pressure ratings can be found on page 143.

**Figure 7. Rosemount 3051S Scalable Level Transmitter with RT Seal (Measurement in inches (millimeters))**

**Rosemount 3051S Scalable Level Transmitter with RT(1)- Coplanar Style**



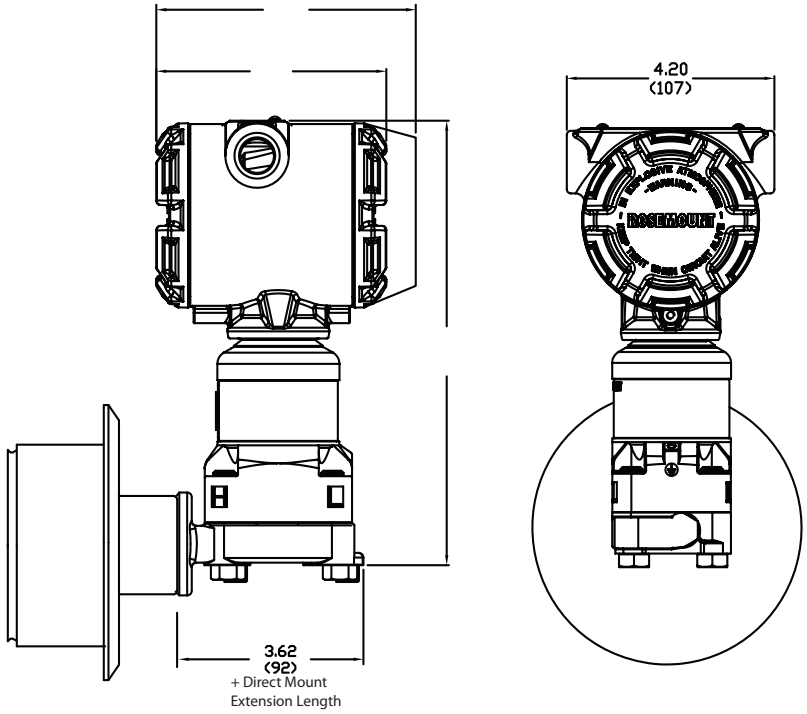

**Rosemount 3051S Scalable Level Transmitter with RT(1) - In-Line Style**



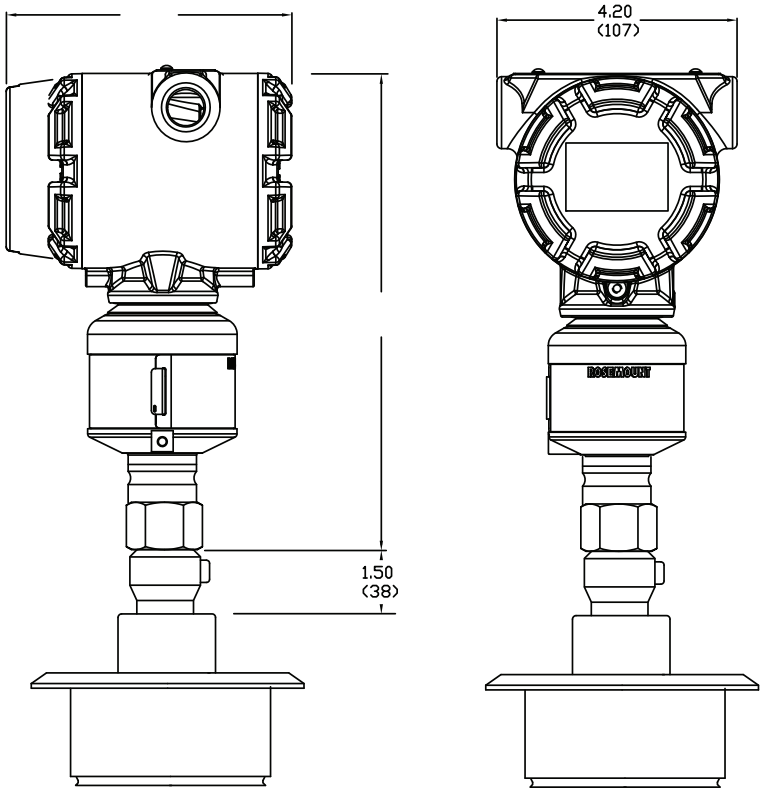

(1) RT (RTW) seal dimensions can be found on page 155.

**Figure 8. Rosemount 3051S Scalable Level Transmitter with SS Seal (Measurement in inches (millimeters))**

**Rosemount 3051S Scalable Level Transmitter with SS(1)- Coplanar Style**



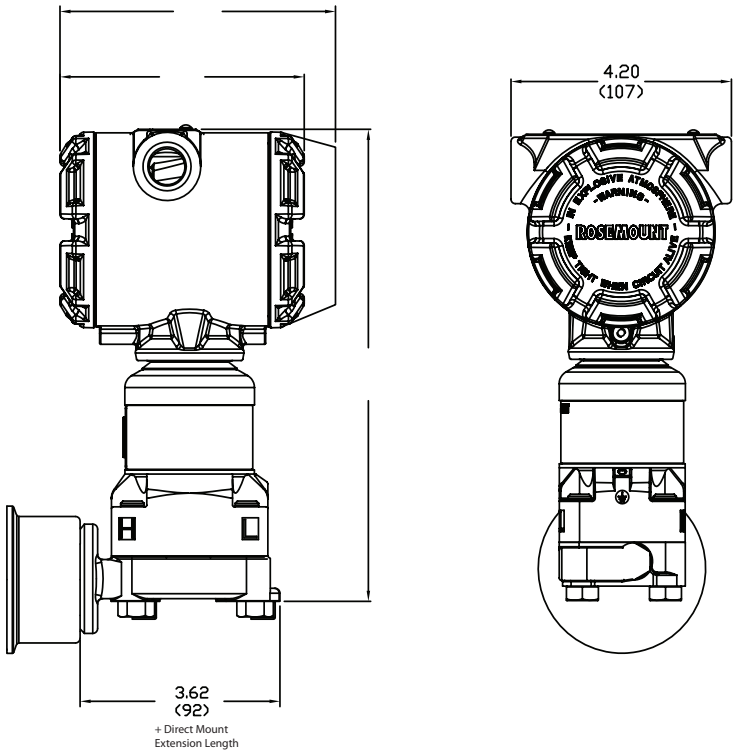

**Rosemount 3051S Scalable Level Transmitter with SS(1) - In-Line Style**



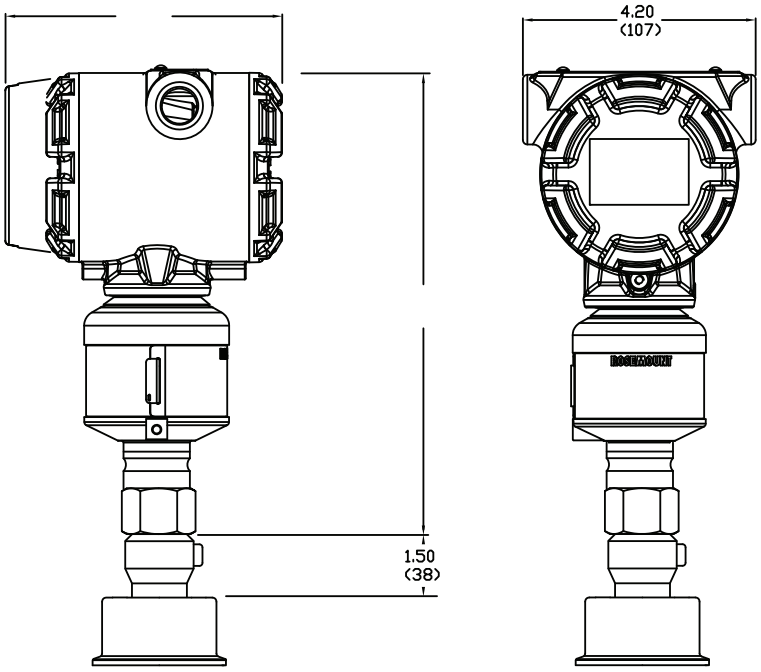

(1) SS (SSW) seal dimensions and pressure ratings can be found on page 145.

**Figure 9. Rosemount 3051S Scalable Level Transmitter with SC Seal (Measurement in inches (millimeters))**

**Rosemount 3051S Scalable Level Transmitter with SC(1)- Coplanar Style**

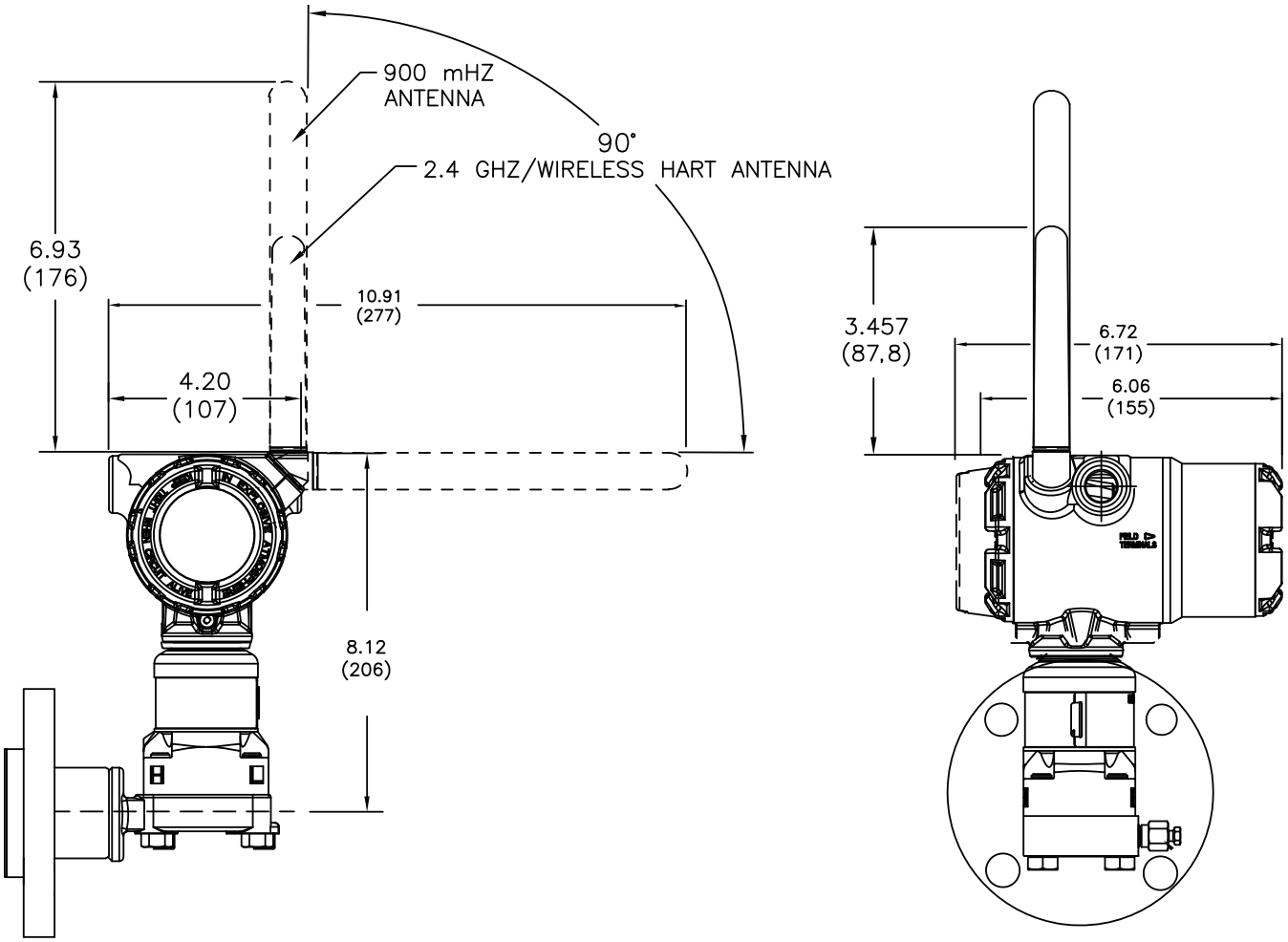



**Rosemount 3051S Scalable Level Transmitter with SC(1) - In-Line Style**




(1) SC (SCW) seal dimensions and pressure ratings can be found on page 157.

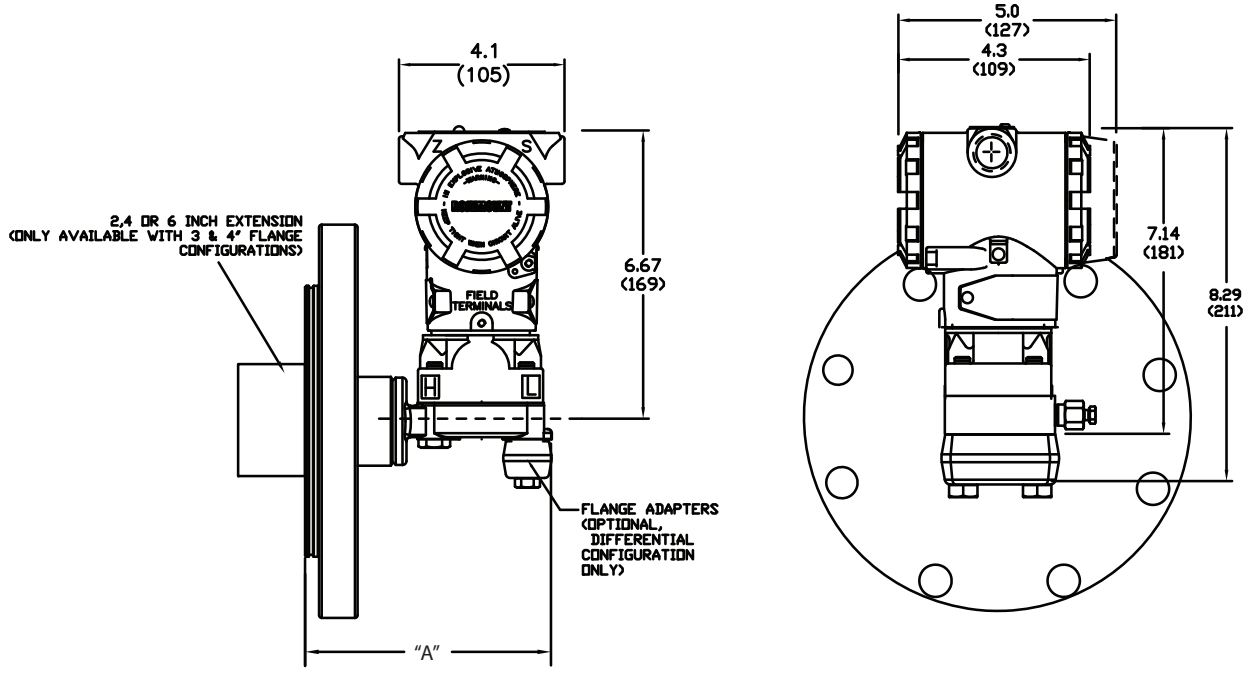
**Figure 10. Wireless Antenna on a Wireless PlantWeb Housing(1)(2) with FF Seal (Measurement in inches (millimeters))**




(1) Wireless 3051SAL_C transmitters require wireless transmitter output (option code X), the wireless PlantWeb housing (option codes 5A, 5B), an external antenna option (option codes WK, WM), as well as a SmartPower™ supply (option code 1).

(2) Antenna rotation and dimensions are equal for both Inline and Coplanar styles of transmitters.

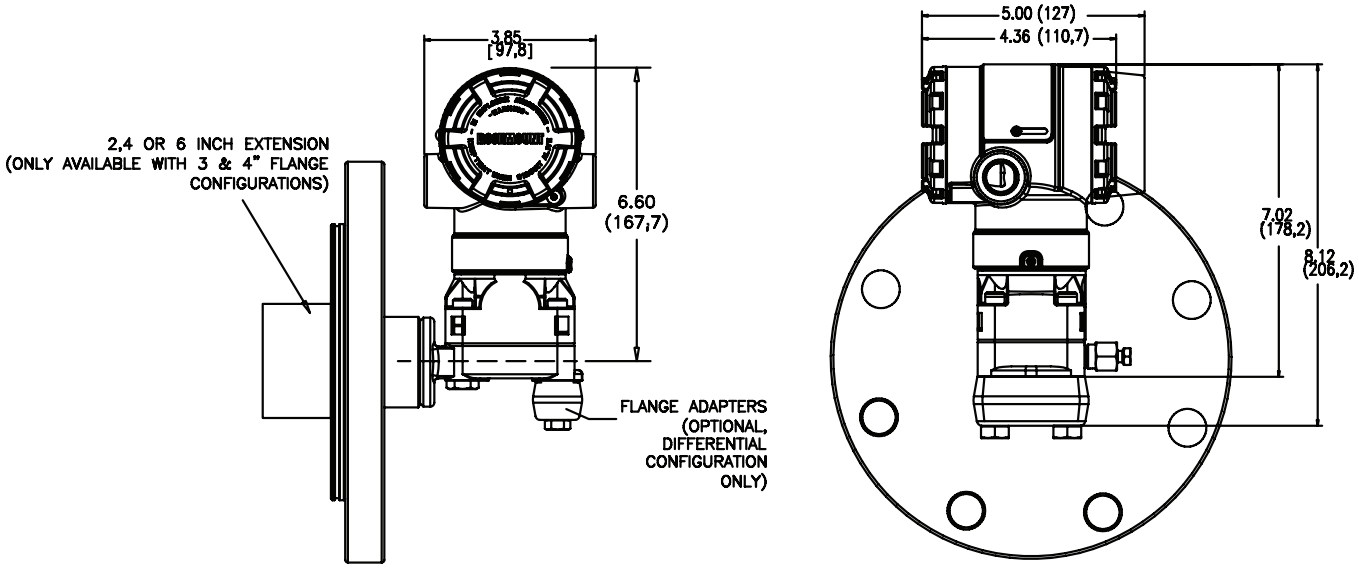
**Figure 11. Rosemount 3051L Level Transmitter with FF or EF Seal (Measurement in inches (millimeters))(1)**




(1) FF (FFW) and EF (EFW) seal and flange diameter dimensions can be viewed on page 141 and page 148.

| Transmitter Direct Mount Extension | | |
|---|---|---|
| **Flange Rating** | **Transmitter Flange Extension** | **Extension Dimension ("A")** |
| ANSI/ASME B16.5 Class 600 | 2-in. | 7.65 in. (194,3 mm) |
| All others | 0-in. | 5.65 in. (143,5 mm) |

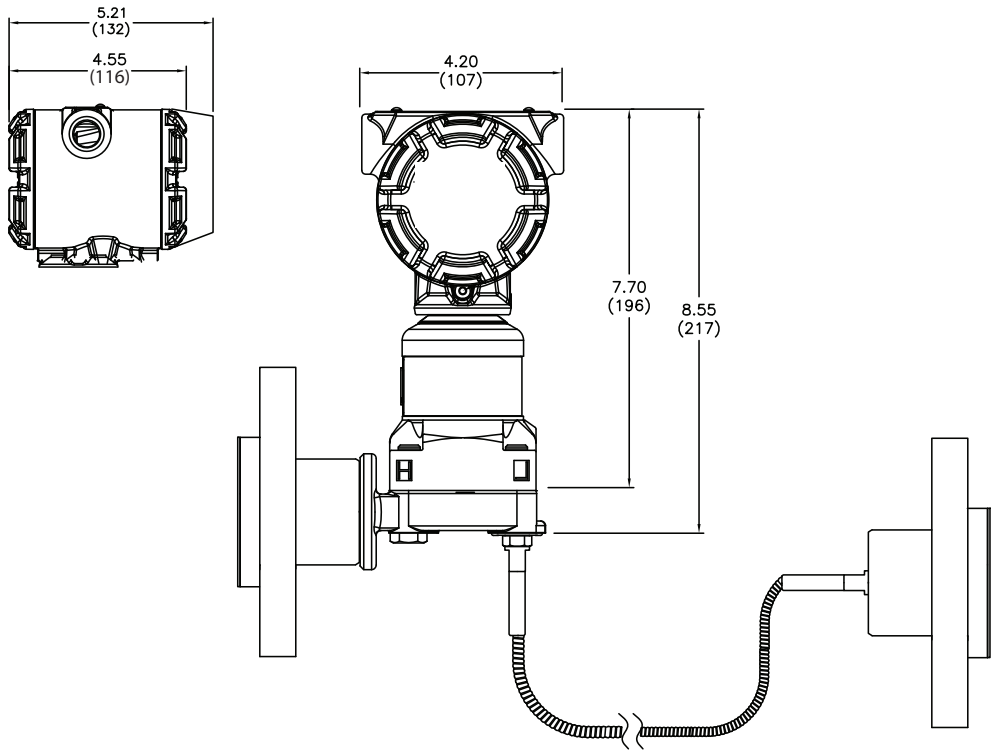
**Figure 12. Rosemount 2051L Level Transmitter with FF or EF Seal (Measurement in inches (millimeters))(1)**



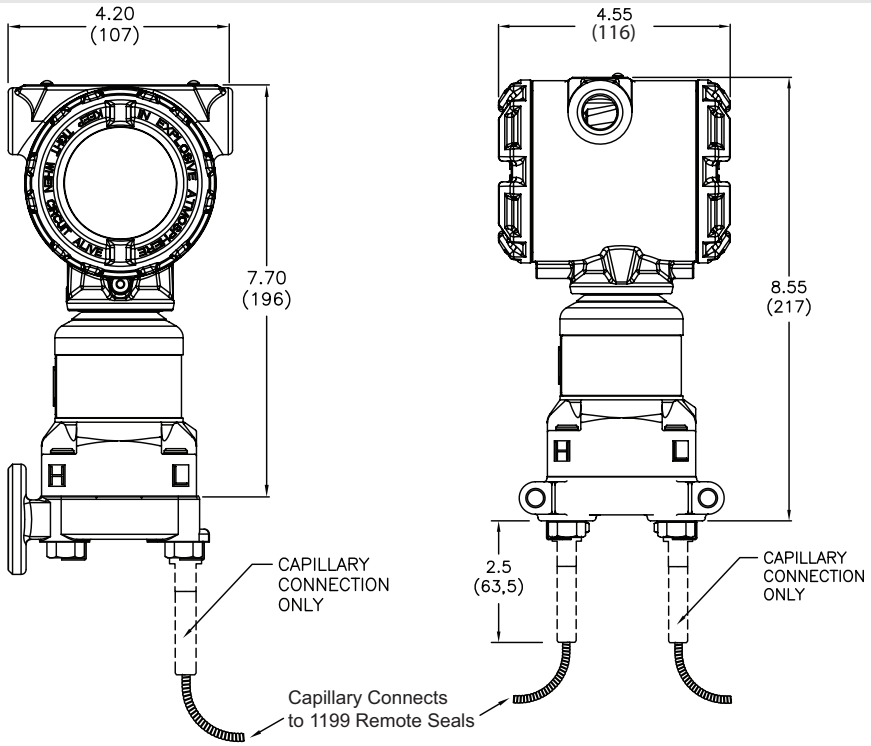

(1) FF (FFW) and EF (EFW) seal and flange diameter dimensions can be viewed on page 141 and page 148.

**Figure 13. Tuned™ System Assembly (Measurement in inches (millimeters))**

**Tuned System Assembly(1)(2) shown with Rosemount 3051S Scalable Level Transmitter**




**Rosemount 1199 Remote Seal System Assembly shown with Rosemount 3051S Scalable Transmitter**




(1) Tuned System Assemblies require specification of capillary length and addition 1199 Remote Seal.

(2) Tuned System Assemblies are available on all Level Transmitters.

**Figure 14. Thermal Optimizer (D5) with FFW (Measurement in inches (millimeters))**

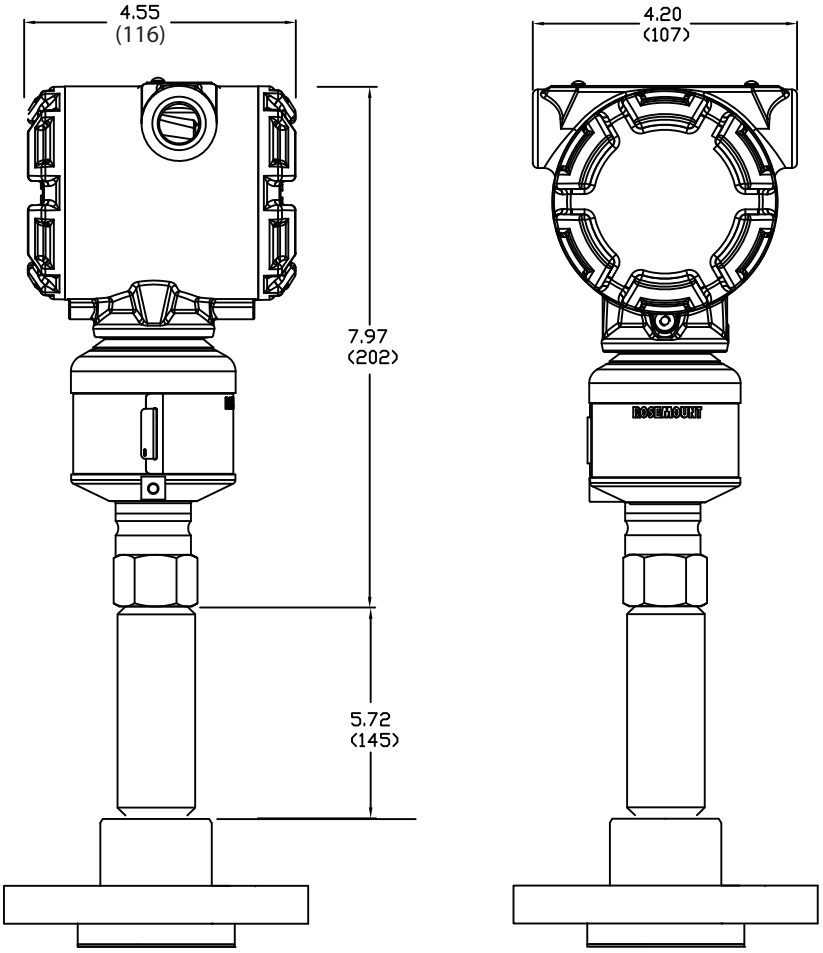


**Figure 15. FFW Flush Flanged Seal - Two-Piece Design (shown with flushing ring)**

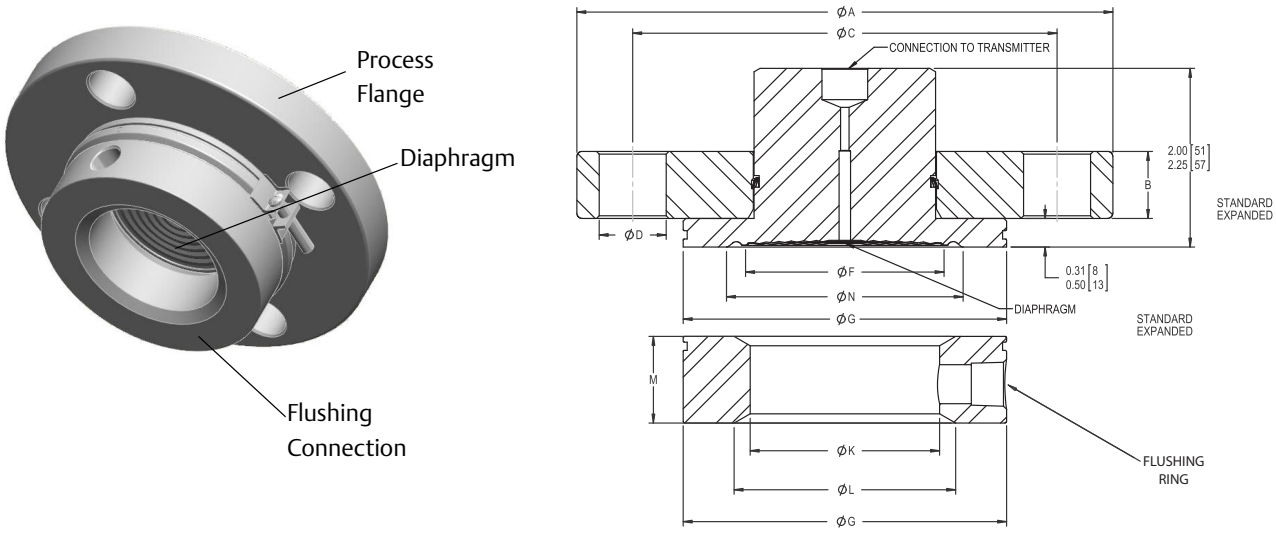



**Table 75. Dimensional Table for FFW Flush Flanged Raised Face Seals Two Piece (Upper Housing and Flange) Design[(1)]**

| | Pipe Size | Class | Flange Diameter "A" | Flange Thickness "B" | Bolt Circle "C" | # of Bolts | Bolt Hole Diameter "D" | Standard Diaphragm Diameter "F" | Raised Face Outer Diameter "G" |
|---|---|---|---|---|---|---|---|---|---|
| ANSI/ ASME | 2-in. | 150 lb. | 6.00 (152) | 0.69 (18) | 4.75 (121) | 4 | 0.75 (19) | 2.30 (58) | 3.62 (92) |
| | | 300 lb. | 6.50 (165) | 0.81 (21) | 5.00 (127) | 8 | 0.75 (19) | 2.30 (58) | 3.62 (92) |
| | | 600 lb. | 6.50 (165) | 1.00 (25) | 5.00 (127) | 8 | 0.75 (19) | 2.30 (58) | 3.62 (92) |
| | 3-in. | 150 lb. | 7.50 (191) | 0.88 (22) | 6.00 (152) | 4 | 0.75 (19) | 3.50 (89) | 5.00 (127) |
| | | 300 lb. | 8.25 (210) | 1.06 (27) | 6.62 (168) | 8 | 0.88 (22) | 3.50 (89) | 5.00 (127) |
| | | 600 lb. | 8.25 (210) | 1.25 (32) | 6.62 (168) | 8 | 0.88 (22) | 3.50 (89) | 5.00 (127) |
| | 4-in. | 150 lb. | 9.00 (229) | 0.88 (22) | 7.50 (191) | 8 | 0.75 (19) | 3.50 (89) | 6.20 (157) |
| | | 300 lb. | 10.0 (254) | 1.19 (30) | 7.88 (200) | 8 | 0.88 (22) | 3.50 (89) | 6.20 (157) |
| | | 600 lb. | 10.75 (273) | 1.50 (38) | 8.50 (216) | 8 | 1.00 (25) | 3.50 (89) | 6.20 (157) |
| | | | | | | | | | |
| EN1092-1 | DN 50 | PN 40 | 6.50 (165) | 0.79 (20) | 4.92 (125) | 4 | 0.71 (18) | 2.30 (58) | 4.00 (102) |
| | | PN 63 | 7.09 (180) | 1.02 (26) | 5.31 (135) | 4 | 0.87 (22) | 2.30 (58) | 4.00 (102) |
| | | PN 100 | 7.68 (195) | 1.10 (28) | 5.71 (145) | 4 | 1.02 (26) | 2.30 (58) | 4.00 (102) |
| | DN 80 | PN 40 | 7.87 (200) | 0.94 (24) | 6.30 (160) | 8 | 0.71 (18) | 3.50 (89) | 5.43 (138) |
| | | PN 63 | 8.46 (215) | 1.10 (28) | 6.69 (170) | 8 | 0.88 (22) | 3.50 (89) | 5.43 (138) |
| | | PN 100 | 9.06 (230) | 1.26 (32) | 7.09 (180) | 8 | 1.02 (26) | 3.50 (89) | 5.43 (138) |
| | DN 100 | PN 16 | 8.66 (220) | 0.79 (20) | 7.09 (180) | 8 | 0.71 (18) | 3.50 (89) | 6.20 (157) |
| | | PN 40 | 9.25 (235) | 0.94 (24) | 7.48 (190) | 8 | 0.87 (22) | 3.50 (89) | 6.20 (157) |
| | | PN 63 | 9.84 (250) | 1.18 (30) | 7.87 (200) | 8 | 1.02 (26) | 3.50 (89) | 6.20 (157) |
| | | | | | | | | | |
| JIS | 50A | 10K | 6.10 (155) | 0.63 (16) | 4.72 (120) | 4 | 0.75 (19) | 2.30 (58) | 3.62 (92) |
| | | 20K | 6.10 (155) | 0.71 (18) | 4.72 (120) | 8 | 0.75 (19) | 2.30 (58) | 3.62 (92) |
| | | 40K | 6.50 (165) | 1.02 (26) | 5.12 (130) | 8 | 0.75 (19) | 2.30 (58) | 4.00 (102) |
| | 80A | 10K | 7.28 (185) | 0.71 (18) | 5.91 (150) | 8 | 0.75 (19) | 3.50 (89) | 5.00 (127) |
| | | 20K | 7.87 (200) | 0.87 (22) | 6.30 (160) | 8 | 0.91 (23) | 3.50 (89) | 5.00 (127) |
| | | 40K | 8.27 (210) | 1.26 (32) | 6.69 (170) | 8 | 0.91 (23) | 3.50 (89) | 5.43 (138) |
| | 100A | 10K | 8.27 (210) | 0.71 (18) | 6.89 (175) | 8 | 0.75 (19) | 3.50 (89) | 6.20 (157) |
| | | 20K | 8.86 (225) | 0.95 (24) | 7.28 (185) | 8 | 0.91 (23) | 3.50 (89) | 6.20 (157) |
| | | 40K | 9.84 (250) | 1.42 (36) | 8.07 (205) | 8 | 0.98 (25) | 3.50 (89) | 6.20 (157) |

(1) Dimensions are in inches (millimeters).

**Table 57. Dimensional Table for FFW Flush Flanged Raised Face Seals Two Piece (Upper Housing and Flange) Design(1)**

| | Pipe Size | INNER DIAMETER "K" | BEVELED EDGE "L" | THICKNESS WITH 1/4-NPT F.C. "M" | THICKNESS WITH 1/2-NPT F.C. "M" | MINIMUM GASKET I.D. "N" |
|---|---|---|---|---|---|---|
| ANSI / ASME | 2-in. | 2.12 (54) | 2.48 (63) | 0.97 (25) | 1.30 (33) | 2.62 (67) |
| | | 2.12 (54) | 2.48 (63) | 0.97 (25) | 1.30 (33) | 2.62 (67) |
| | | 2.12 (54) | 2.48 (63) | 0.97 (25) | 1.30 (33) | 2.62 (67) |
| | 3-in. | 3.60 (91) | — | 0.97 (25) | 1.30 (33) | 3.82 (97) |
| | | 3.60 (91) | — | 0.97 (25) | 1.30 (33) | 3.82 (97) |
| | | 3.60 (91) | — | 0.97 (25) | 1.30 (33) | 3.82 (97) |
| | 4-in. | 3.60 (91) | — | 0.97 (25) | 1.30 (33) | 4.50 (113) |
| | | 3.60 (91) | — | 0.97 (25) | 1.30 (33) | 4.50 (113) |
| | | 3.60 (91) | — | 0.97 (25) | 1.30 (33) | 4.50 (113) |
| | | | | | | |
| EN1092-1 | DN 50 | 2.40 (61) | — | 0.97 (25) | 1.30 (33) | 2.62 (67) |
| | | 2.40 (61) | — | 0.97 (25) | 1.30 (33) | 2.62 (67) |
| | | 2.40 (61) | — | 0.97 (25) | 1.30 (33) | 2.62 (67) |
| | DN 80 | 3.60 (91) | — | 0.97 (25) | 1.30 (33) | 3.82 (97) |
| | | 3.60 (91) | — | 0.97 (25) | 1.30 (33) | 3.82 (97) |
| | | 3.60 (91) | — | 0.97 (25) | 1.30 (33) | 3.82 (97) |
| | DN 100 | 3.60 (91) | — | 0.97 (25) | 1.30 (33) | 4.50 (113) |
| | | 3.60 (91) | — | 0.97 (25) | 1.30 (33) | 4.50 (113) |
| | | 3.60 (91) | — | 0.97 (25) | 1.30 (33) | 4.50 (113) |
| | | | | | | |
| JIS | 50A | 2.12 (54) | 2.48 (63) | 0.97 (25) | 1.30 (33) | 2.62 (67) |
| | | 2.12 (54) | 2.48 (63) | 0.97 (25) | 1.30 (33) | 2.62 (67) |
| | | 2.40 (61) | — | 0.97 (25) | 1.30 (33) | 2.62 (67) |
| | 80A | 3.60 (91) | — | 0.97 (25) | 1.30 (33) | 3.82 (97) |
| | | 3.60 (91) | — | 0.97 (25) | 1.30 (33) | 3.82 (97) |
| | | 3.60 (91) | — | 0.97 (25) | 1.30 (33) | 3.82 (97) |
| | 100A | 3.60 (91) | — | 0.97 (25) | 1.30 (33) | 4.50 (113) |
| | | 3.60 (91) | — | 0.97 (25) | 1.30 (33) | 4.50 (113) |
| | | 3.60 (91) | — | 0.97 (25) | 1.30 (33) | 4.50 (113) |

(1) Dimensions are in inches (millimeters).

**Figure 16. FFW Flush Flanged Seal - One-Piece Design (shown with flushing ring)**

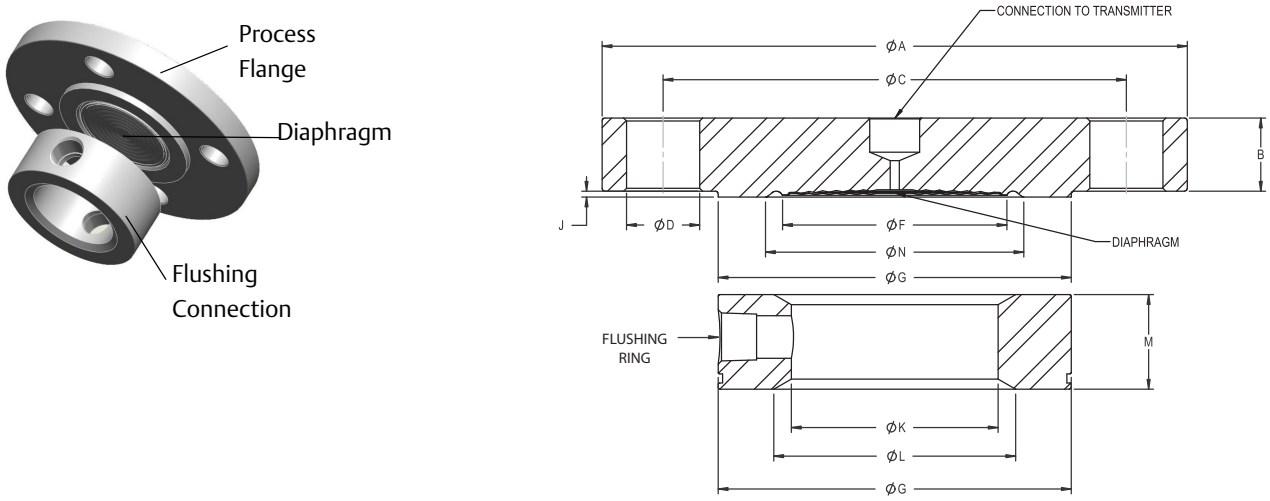



**Table 58. Dimensional Table for FFW Flush Flanged Seals One Piece (Upper Housing and Flange) Design (Option code E)(1)**

| | Pipe Size | Class | Flange Diameter "A" | Flange Thickness "B" | Bolt Circle "C" | # of Bolts | Bolt Hole Diameter "D" | Standard Diaphragm Diameter "F" | Raised Face Diameter "G" | Raised Face Height "J" | MINIMUM GASKET I.D. "N" |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ANSI / ASME | 2-in. | 150 lb. | 6.00 (152) | 0.69 (18) | 4.75 (121) | 4 | 0.75 (19) | 2.30 (58) | 3.62 (92) | 0.06 (1.5) | 2.62 (67) |
| | | 300 lb. | 6.50 (165) | 0.81 (21) | 5.00 (127) | 8 | 0.75 (19) | 2.30 (58) | 3.62 (92) | 0.06 (1.5) | 2.62 (67) |
| | | 600 lb. | 6.50 (165) | 1.00 (25) | 5.00 (127) | 8 | 0.75 (19) | 2.30 (58) | 3.62 (92) | 0.25 (6.4) | 2.62 (67) |
| | 3-in. | 150 lb. | 7.50 (191) | 0.88 (22) | 6.00 (152) | 4 | 0.75 (19) | 3.50 (89) | 5.00 (127) | 0.06 (1.5) | 3.82 (97) |
| | | 300 lb. | 8.25 (210) | 1.06 (27) | 6.62 (168) | 8 | 0.88 (22) | 3.50 (89) | 5.00 (127) | 0.06 (1.5) | 3.82 (97) |
| | | 600 lb. | 8.25 (210) | 1.25 (32) | 6.62 (168) | 8 | 0.88 (22) | 3.50 (89) | 5.00 (127) | 0.25 (6.4) | 3.82 (97) |
| | 4-in. | 150 lb. | 9.00 (229) | 0.88 (22) | 7.50 (191) | 8 | 0.75 (19) | 3.50 (89) | 6.20 (157) | 0.06 (1.5) | 4.50 (114) |
| | | 300 lb. | 10.00 (254) | 1.19 (30) | 7.88 (200) | 8 | 0.88 (22) | 3.50 (89) | 6.20 (157) | 0.06 (1.5) | 4.50 (114) |
| | | 600 lb. | 10.75 (273) | 1.50 (38) | 8.50 (216) | 8 | 1.00 (25) | 3.50 (89) | 6.20 (157) | 0.25 (6.4) | 4.50 (114) |

**Table 58. Dimensional Table for FFW Flush Flanged Seals One Piece (Upper Housing and Flange) Design (Option code E)[(1)]**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| EN1092-1 | DN 50 | PN 40 | 6.50 (165) | 0.67 (17) | 4.92 (125) | 4 | 0.71 (18) | 2.30 (58) | 4.00 (102) | 0.12 (3.0) | 2.62 (67) |
| | | PN 63 | 7.08 (180) | 0.91 (23) | 5.31 (135) | 4 | 0.87 (22) | 2.30 (58) | 4.00 (102) | 0.12 (3.0) | 2.62 (67) |
| | | PN 100 | 7.68 (195) | 0.99 (25) | 5.71 (145) | 4 | 1.02 (26) | 2.30 (58) | 4.00 (102) | 0.12 (3.0) | 2.62 (67) |
| | DN 80 | PN 40 | 7.87 (200) | 0.83 (21) | 6.30 (160) | 8 | 0.71 (18) | 3.50 (89) | 5.43 (138) | 0.12 (3.0) | 3.82 (97) |
| | | PN 63 | 8.46 (215) | 0.99 (25) | 6.69 (170) | 8 | 0.88 (22) | 3.50 (89) | 5.43 (138) | 0.12 (3.0) | 3.82 (97) |
| | | PN 100 | 9.06 (230) | 1.15 (29) | 7.09 (180) | 8 | 1.02 (26) | 3.50 (89) | 5.43 (138) | 0.12 (3.0) | 3.82 (97) |
| | DN 100 | PN 16 | 8.66 (220) | 0.67 (17) | 7.09 (180) | 8 | 0.71 (18) | 3.50 (89) | 6.20 (157) | 0.12 (3.0) | 4.50 (114) |
| | | PN 40 | 9.25 (235) | 0.83 (21) | 7.48 (190) | 8 | 0.87 (22) | 3.50 (89) | 6.20 (157) | 0.12 (3.0) | 4.50 (114) |
| | | PN 63 | 9.84 (250) | 1.07 (27) | 7.87 (200) | 8 | 1.02 (26) | 3.50 (89) | 6.20 (157) | 0.12 (3.0) | 4.50 (114) |
| | | | | | | | | | | | |
| JIS | 50A | 10K | 6.10 (155) | 0.63 (16) | 4.72 (120) | 4 | 0.75 (19) | 2.30 (58) | 3.62 (92) | 0.08 (2.0) | 2.62 (67) |
| | | 20K | 6.10 (155) | 0.71 (18) | 4.72 (120) | 8 | 0.75 (19) | 2.30 (58) | 3.62 (92) | 0.08 (2.0) | 2.62 (67) |
| | | 40K | 6.50 (165) | 1.02 (26) | 5.12 (130) | 8 | 0.75 (19) | 2.30 (58) | 3.62 (92) | 0.08 (2.0) | 2.62 (67) |
| | 80A | 10K | 7.28 (185) | 0.71 (18) | 5.91 (150) | 8 | 0.75 (19) | 3.50 (89) | 5.00 (127) | 0.08 (2.0) | 3.82 (97) |
| | | 20K | 7.87 (200) | 0.87 (22) | 6.30 (160) | 8 | 0.91 (23) | 3.50 (89) | 5.00 (127) | 0.08 (2.0) | 3.82 (97) |
| | | 40K | 8.27 (210) | 1.26 (32) | 6.69 (170) | 8 | 0.91 (23) | 3.50 (89) | 5.00 (127) | 0.08 (2.0) | 3.82 (97) |
| | 100A | 10K | 8.27 (210) | 0.71 (18) | 6.89 (175) | 8 | 0.75 (19) | 3.50 (89) | 6.20 (157) | 0.08 (2.0) | 4.50 (114) |
| | | 20K | 8.86 (225) | 0.95 (24) | 7.28 (185) | 8 | 0.91 (23) | 3.50 (89) | 6.20 (157) | 0.08 (2.0) | 4.50 (114) |
| | | 40K | 9.84 (250) | 1.42 (36) | 8.07 (205) | 8 | 0.98 (25) | 3.50 (89) | 6.20 (157) | 0.08 (2.0) | 4.50 (114) |

(1) Dimensions are in inches (millimeters).

**Figure 16. FFW Flush Flanged Seal - Flushing Connection Ring (Lower Housing)**

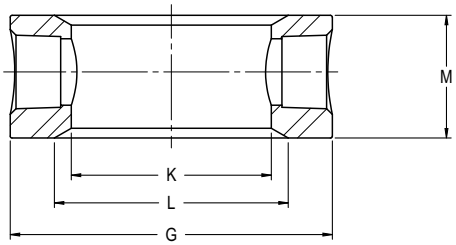



**Table 59. Dimensional Table for FFW Flushing Connection Ring (Lower Housing)(1)**

| | Pipe Size | Raised Face Diameter "G" | Inner Diameter "K" | Beveled Edge "L" | Thickness with 1/4–NPT F.C. "M" | Thickness with 1/2–NPT F.C. "M" |
|---|---|---|---|---|---|---|
| ANSI / ASME | 2-in. | 3.62 (92) | 2.12 (54) | 2.48 (63) | 0.97 (25) | 1.30 (33) |
| | | 3.62 (92) | 2.12 (54) | 2.48 (63) | 0.97 (25) | 1.30 (33) |
| | | 3.62 (92) | 2.12 (54) | 2.48 (63) | 0.97 (25) | 1.30 (33) |
| | 3-in. | 5.00 (127) | 3.60 (91) | — | 0.97 (25) | 1.30 (33) |
| | | 5.00 (127) | 3.60 (91) | — | 0.97 (25) | 1.30 (33) |
| | | 5.00 (127) | 3.60 (91) | — | 0.97 (25) | 1.30 (33) |
| | 4-in. | 6.20 (157) | 3.60 (91) | — | 0.97 (25) | 1.30 (33) |
| | | 6.20 (157) | 3.60 (91) | — | 0.97 (25) | 1.30 (33) |
| | | 6.20 (157) | 3.60 (91) | — | 0.97 (25) | 1.30 (33) |
| | | | | | | |
| EN1092-1 | DN 50 | 4.00 (102) | 2.40 (61) | — | 0.97 (25) | 1.30 (33) |
| | | 4.00 (102) | 2.40 (61) | — | 0.97 (25) | 1.30 (33) |
| | | 4.00 (102) | 2.40 (61) | — | 0.97 (25) | 1.30 (33) |
| | DN 80 | 5.43 (138) | 3.60 (91) | — | 0.97 (25) | 1.30 (33) |
| | | 5.43 (138) | 3.60 (91) | — | 0.97 (25) | 1.30 (33) |
| | | 5.43 (138) | 3.60 (91) | — | 0.97 (25) | 1.30 (33) |
| | DN 100 | 6.20 (157) | 3.60 (91) | — | 0.97 (25) | 1.30 (33) |
| | | 6.20 (157) | 3.60 (91) | — | 0.97 (25) | 1.30 (33) |
| | | 6.20 (157) | 3.60 (91) | — | 0.97 (25) | 1.30 (33) |
| | | | | | | |
| JIS | 50A | 3.62 (92) | 2.12 (54) | — | 0.97 (25) | 1.30 (33) |
| | | 3.62 (92) | 2.12 (54) | — | 0.97 (25) | 1.30 (33) |
| | | 3.62 (92) | 2.12 (54) | — | 0.97 (25) | 1.30 (33) |
| | 80A | 5.00 (127) | 3.60 (91) | — | 0.97 (25) | 1.30 (33) |
| | | 5.00 (127) | 3.60 (91) | — | 0.97 (25) | 1.30 (33) |
| | | 5.00 (127) | 3.60 (91) | — | 0.97 (25) | 1.30 (33) |
| | 100A | 6.20 (157) | 3.60 (91) | — | 0.97 (25) | 1.30 (33) |
| | | 6.20 (157) | 3.60 (91) | — | 0.97 (25) | 1.30 (33) |
| | | 6.20 (157) | 3.60 (91) | — | 0.97 (25) | 1.30 (33) |

(1) Dimensions are in inches (millimeters).

**Figure 17. RFW Flanged Seal Standard Design**

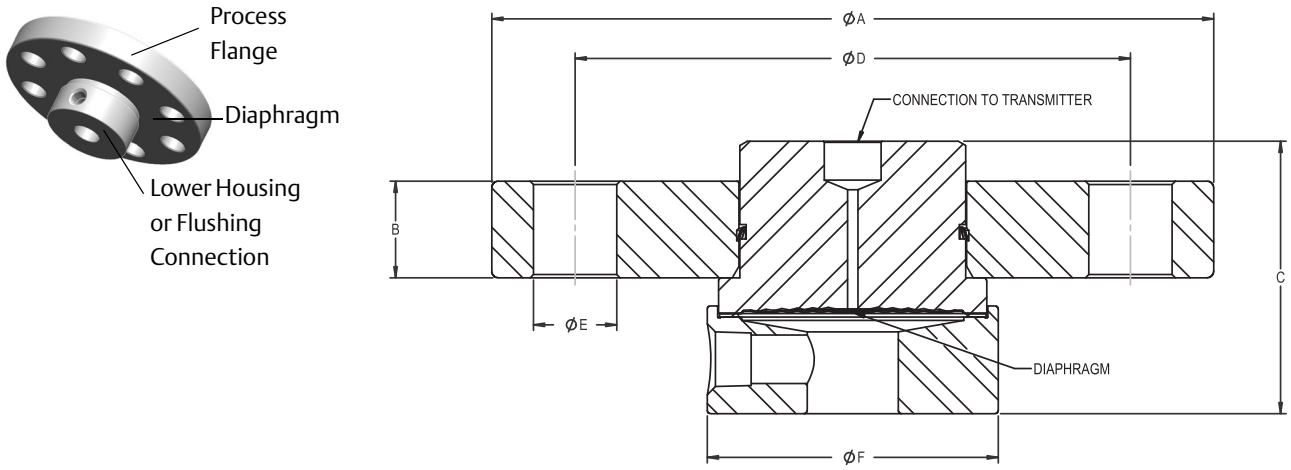


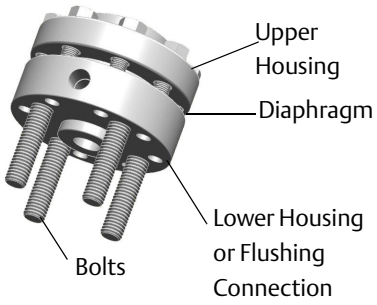

**Table 60. RFW Flanged Seal Standard Design Dimensions(1)(2)**

| | Pipe Size | Class | Flange Diameter "A" | Flange Thickness "B" | Overall Height "C" | | Bolt Circle Diameter "D" | Bolt Hole Diameter "E" | Lower Housing Diameter "F" |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | No or 1/4-in. NPT flush connection | 1/2-in. NPT flush connection | | | |
| ANSI / ASME | 1/2-in. | 2500 lb. | 5.25 (133) | 1.19 (30) | 2.45 (62) | 2.79 (71) | 3.50 (89) | 0.88 (22) | 2.62 (67) |
| | 3/4-in. | 300/600 lb. | 4.62 (117) | 0.62 (16) | 2.45 (62) | 2.79 (71) | 3.25 (83) | 0.75 (19) | 2.62 (67) |
| | 1-in. | 150 lb. | 4.25 (108) | 0.50 (13) | 2.45 (62) | 2.79 (71) | 3.12 (79) | 0.63 (16) | 2.62 (67) |
| | | 300 lb. | 4.88 (124) | 0.62 (16) | 2.45 (62) | 2.79 (71) | 3.50 (89) | 0.75 (19) | 2.62 (67) |
| | | 600 lb. | 4.88 (124) | 0.69 (18) | 2.45 (62) | 2.79 (71) | 3.50 (89) | 0.75 (19) | 2.62 (67) |
| | 1 1/2-in. | 150 lb. | 5.00 (127) | 0.62 (16) | 2.45 (62) | 2.79 (71) | 3.88 (99) | 0.63 (16) | 2.88 (73) |
| | | 300 lb. | 6.12 (155) | 0.75 (19) | 2.45 (62) | 2.79 (71) | 4.50 (114) | 0.88 (22) | 2.88 (73) |
| | | 600 lb. | 6.12 (155) | 0.88 (22) | 2.45 (62) | 2.79 (71) | 4.50 (114) | 0.88 (22) | 2.88 (73) |
| | | | | | | | | | |
| EN 1092-1 | DN 25 | PN 40 | 4.53 (115) | 0.71 (18) | 2.45 (62) | 2.79 (71) | 3.35 (85) | 0.55 (14) | 2.68 (68) |
| | DN 40 | PN 40 | 5.91 (150) | 0.71 (18) | 2.45 (62) | 2.79 (71) | 4.33 (110) | 0.71 (18) | 3.47 (88) |
| | | | | | | | | | |
| JIS | 20A | 40K | 4.72 (120) | 0.79 (20) | 2.45 (62) | 2.79 (71) | 3.35 (85) | 0.75 (19) | 2.62 (67) |
| | 25A | 10K | 4.92 (125) | 0.55 (14) | 2.45 (62) | 2.79 (71) | 3.54 (90) | 0.75 (19) | 2.62 (67) |
| | | 20K | 4.92 (125) | 0.63 (16) | 2.45 (62) | 2.79 (71) | 3.54 (90) | 0.75 (19) | 2.62 (67) |
| | | 40K | 5.12 (130) | 0.87 (22) | 2.45 (62) | 2.79 (71) | 3.74 (95) | 0.75 (19) | 2.76 (70) |
| | 40A | 10K | 5.51 (140) | 0.63 (16) | 2.45 (62) | 2.79 (71) | 4.13 (105) | 0.75 (19) | 3.19 (81) |
| | | 20K | 5.51 (140) | 0.71 (18) | 2.45 (62) | 2.79 (71) | 4.13 (105) | 0.75 (19) | 3.19 (81) |
| | | 40K | 6.30 (160) | 0.94 (24) | 2.45 (62) | 2.79 (71) | 4.72 (120) | 0.91 (23) | 3.54 (90) |

(1) Dimensions are in inches (millimeters).

(2) Lower housing is loose on standard design, consult factory for retained lower housing options.

**Figure 18. RFW Flanged Seal Stud Bolt Design**



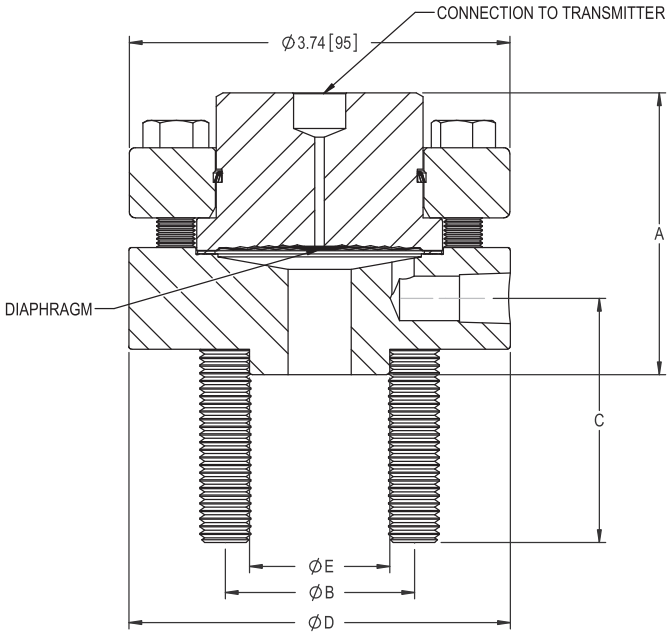




**Table 61. RFW Flanged Seal Stud Bolt Design Dimensions(1)**

| | Pipe Size | Class | Overall Height "A" | | Stud Circle Diameter "B" | Stud (Size, Length) "C" | Lower Housing Diameter "D" | Raised Face Diameter "E" |
|---|---|---|---|---|---|---|---|---|
| | | | No or 1/4-in. NPT flush connection | 1/2-in. NPT flush connection | | | | |
| ANSI / ASME | 1/2-in. | 150 lb. | 2.52 (64) | 2.82 (72) | 2.38 (61) | 1/2-13NC, 2.5-in. | 3.74 (95) | 1.38 (35) |
| | 1/2-in. | 300/600 lb. | 2.77 (70) | 2.87 (73) | 2.62 (67) | 1/2-13NC, 2.5-in. | 3.75 (95) | 1.38 (35) |
| | 3/4-in. | 150 lb. | 2.52 (64) | 2.82 (72) | 2.75 (70) | 1/2-13NC, 2.5-in. | 3.88 (99) | 1.69 (43) |
| | | | | | | | | |
| EN 1092-1 | DN 15 | PN 40 | 2.52 (64) | 2.82 (72) | 2.56 (65) | M12x1.75, 60mm | 3.74 (95) | 1.77 (45) |
| | DN 15 | PN 100/160 | 2.52 (64) | 2.82 (72) | 2.95 (75) | M12x1.75, 60mm | 4.13 (105) | 1.77 (45) |
| | DN 20 | PN 40 | 2.52 (64) | 2.82 (72) | 2.95 (75) | M12x1.75, 60mm | 4.13 (105) | 2.28 (58) |
| | | | | | | | | |
| JIS | 10A | 10K | 2.52 (64) | 2.82 (72) | 2.56 (65) | M12x1.75,60mm | 3.74 (95) | 1.81 (46) |
| | | 20K | 2.52 (64) | 2.82 (72) | 2.56 (65) | M12x1.75,60mm | 3.74 (95) | 1.81 (46) |
| | | 40K | 2.52 (64) | 2.82 (72) | 2.95 (75) | M16x2.00,70mm | 4.33 (110) | 2.05 (52) |
| | 15A | 10K | 2.52 (64) | 2.82 (72) | 2.76 (70) | M12x1.75,60mm | 3.74 (95) | 2.01 (51) |
| | | 20K | 2.52 (64) | 2.82 (72) | 2.76 (70) | M12x2.00,60mm | 3.74 (95) | 2.01 (51) |
| | | 40K | 2.52 (64) | 2.82 (72) | 3.15 (80) | M16x2.00,70mm | 4.53 (115) | 2.17 (55) |
| | 20A | 10K | 2.52 (64) | 2.82 (72) | 2.95 (75) | M12x1.75,60mm | 3.94 (100) | 2.21 (56) |
| | | 20K | 2.52 (64) | 2.82 (72) | 2.95 (75) | M12x1.75,60mm | 3.94 (100) | 2.21 (56) |

(1) Upper and lower housing installed bolt torque with CS or SST bolts is 23 ft-lbs. (31 Nm).

**Figure 19. EFW Extended Flanged Seal - Extended Flanged Assembly**

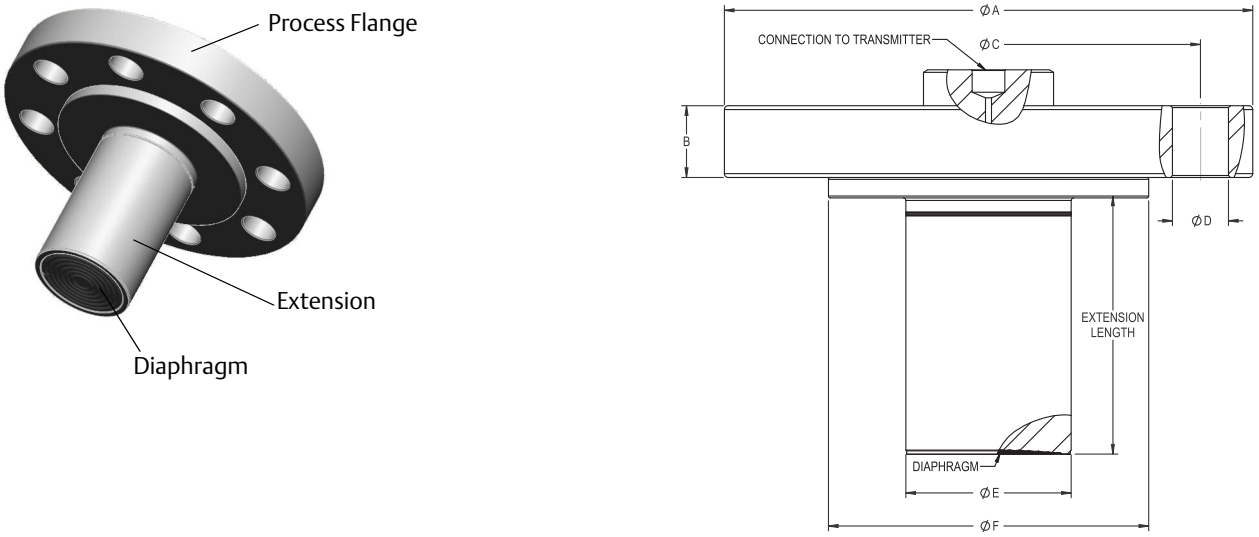



**Table 62. EFW Extended Flanged Seal Dimensions(1)**

| | Pipe Size | Class | Flange Diameter "A" | Flange Thickness "B" | Bolt Circle "C" | # of Bolts | Bolt Hole Diameter "D" | Raised Face Diameter "F" |
|---|---|---|---|---|---|---|---|---|
| ANSI / ASME | 1 1/2-in. | 150 lb. | 5.00 (127) | 0.62 (16) | 3.88 (99) | 4 | 0.63 (16) | 2.88 (73) |
| | | 300 lb. | 6.12 (156) | 0.75 (19) | 4.50 (114) | 4 | 0.88 (22) | 2.88 (73) |
| | | 600 lb. | 6.12 (156) | 0.88 (22) | 4.50 (114) | 4 | 0.88 (22) | 2.88 (73) |
| | 2-in. | 150 lb. | 6.00 (152) | 0.69 (18) | 4.75 (121) | 4 | 0.75 (19) | 3.62 (92) |
| | | 300 lb. | 6.50 (165) | 0.82 (21) | 5.00 (127) | 8 | 0.75 (19) | 3.62 (92) |
| | | 600 lb. | 6.50 (165) | 1.00 (25) | 5.00 (127) | 8 | 0.75 (19) | 3.62 (92) |
| | 3-in. | 150 lb. | 7.50 (191) | 0.88 (22) | 6.00 (152) | 4 | 0.75 (19) | 5.00 (127) |
| | | 300 lb. | 8.25 (210) | 1.06 (27) | 6.62 (168) | 8 | 0.88 (22) | 5.00 (127) |
| | | 600 lb. | 8.25 (210) | 1.25 (32) | 6.62 (168) | 8 | 0.88 (22) | 5.00 (127) |
| | 4-in. | 150 lb. | 9.00 (229) | 0.88 (22) | 7.50 (191) | 8 | 0.75 (19) | 6.20 (158) |
| | | 300 lb. | 10.00 (254) | 1.19 (30) | 7.88 (200) | 8 | 0.88 (22) | 6.20 (158) |
| | | 600 lb. | 10.75 (273) | 1.50 (38) | 8.50 (216) | 8 | 1.00 (25) | 6.20 (158) |
| EN 1092-1 | DN 50 | PN 40 | 6.50 (165) | 0.79 (20) | 4.92 (125) | 4 | 0.71 (18) | 4.02 (102) |
| | | PN 63 | 7.08 (180) | 1.02 (26) | 5.31 (135) | 4 | 0.87 (22) | 4.02 (102) |
| | | PN 100 | 7.68 (195) | 1.10 (28) | 5.71 (145) | 4 | 1.02 (26) | 4.02 (102) |
| | DN 80 | PN 40 | 7.87 (200) | 0.94 (24) | 6.30 (160) | 8 | 0.71 (18) | 5.43 (138) |
| | | PN 63 | 8.46 (215) | 1.10 (28) | 6.69 (170) | 8 | 0.88 (22) | 5.43 (138) |
| | | PN 100 | 9.06 (230) | 1.26 (32) | 7.09 (180) | 8 | 1.02 (26) | 5.43 (138) |
| | DN 100 | PN 16 | 8.66 (220) | 0.79 (20) | 7.09 (180) | 8 | 0.71 (18) | 6.20 (158) |
| | | PN 40 | 9.25 (235) | 0.94 (24) | 7.48 (190) | 8 | 0.87 (22) | 6.20 (158) |
| | | PN 63 | 9.84 (250) | 1.18 (30) | 7.87 (200) | 8 | 1.02 (26) | 6.20 (158) |
| JIS | 50A | 10K | 6.10 (155) | 0.63 (16) | 4.72 (120) | 4 | 0.75 (19) | 3.62 (92) |
| | | 20K | 6.10 (155) | 0.71 (18) | 4.72 (120) | 8 | 0.75 (19) | 3.62 (92) |
| | | 40K | 6.50 (165) | 1.02 (26) | 5.12 (130) | 8 | 0.75 (19) | 4.00 (102) |
| | 80A | 10K | 7.28 (185) | 0.71 (18) | 5.91 (150) | 8 | 0.75 (19) | 5.00 (127) |
| | | 20K | 7.87 (200) | 0.87 (22) | 6.30 (160) | 8 | 0.91 (23) | 5.00 (127) |
| | | 40K | 8.27 (210) | 1.26 (32) | 6.69 (170) | 8 | 0.91 (23) | 5.43 (138) |
| | 100A | 10K | 8.27 (210) | 0.71 (18) | 6.89 (175) | 8 | 0.75 (19) | 6.20 (158) |
| | | 20K | 8.86 (225) | 0.94 (24) | 7.28 (185) | 8 | 0.91 (23) | 6.20 (158) |
| | | 40K | 9.84 (250) | 1.42 (36) | 8.07 (205) | 8 | 0.98 (25) | 6.20 (158) |

(1) Dimensions are in inches (millimeters).

| Process Connection Size[1] | | | Diameter "E" |
|---|---|---|---|
| ANSI B16.5 | EN 1092-1 | JIS B2238 | |
| 3-in. | DN 80 | 80A | 2.58 (66) |
| 4-in. | DN 100 | 100A | 3.50 (89) |
| 1 ½-in. | DN 40 | 40A | 1.45 (37) |
| 2-in. | DN 50 | 50A | 1.90 (48) |
| 3-in. Headbox | DN 80 Headbox | — | 2.88 (73) |
| 4-in. Headbox | DN100 Headbox | — | 3.78 (96) |

(1) Dimensions are in inches (millimeters).

**Figure 20. PFW Pancake Seal**

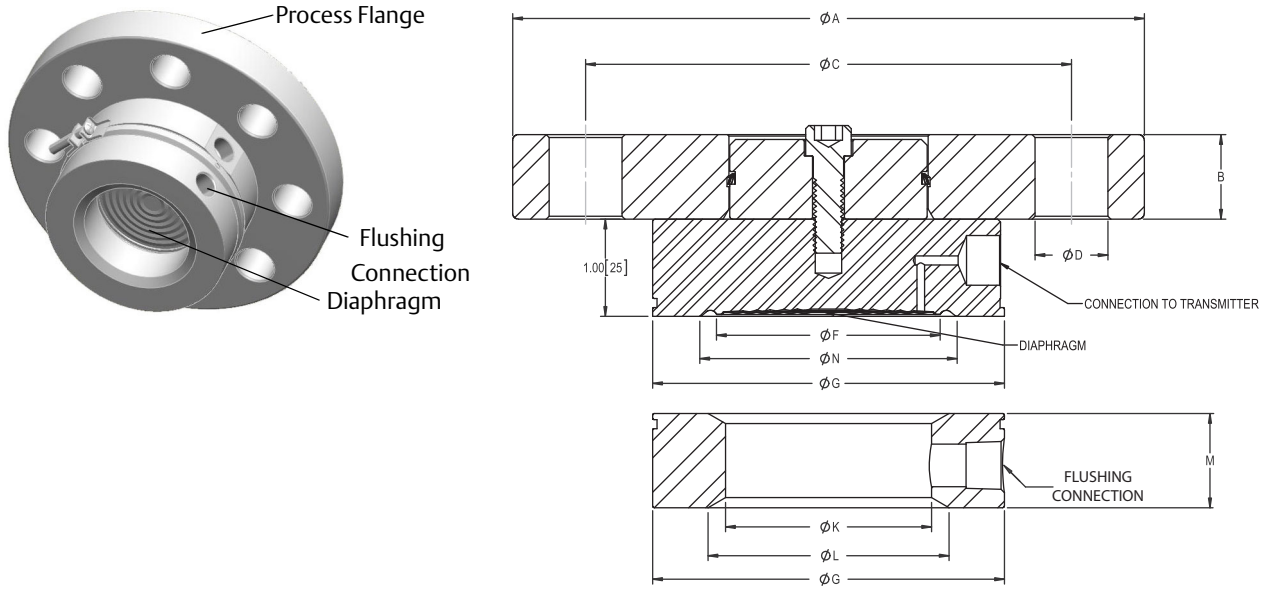



**Table 63. PFW Pancake Seal Dimensions(1)**

| | Pipe Size | Class | Flange Diameter "A" | Flange Thickness "B" | # of Bolts | Bolt Circle "C" | Bolt Hole Diameter "D" | Standard Diaphragm Diameter "F" |
|---|---|---|---|---|---|---|---|---|
| ANSI / ASME | 2-in. | 150 lb. | 6.00 (152) | 0.69 (18) | 4 | 4.75 (121) | 0.75 (19) | 2.30 (58) |
| | | 300 lb. | 6.50 (165) | 0.81 (21) | 8 | 5.00 (127) | 0.75 (19) | 2.30 (58) |
| | | 600 lb. | 6.50 (165) | 1.00 (25) | 8 | 5.00 (127) | 0.75 (19) | 2.30 (58) |
| | | 900/1500 lb. | 8.50 (216) | 1.50 (38) | 8 | 6.50 (165) | 1.00 (25) | 2.30 (58) |
| | | 2500 lb. | 9.25 (235) | 2.00 (51) | 8 | 6.75 (172) | 1.13 (29) | 2.30 (58) |
| | 3-in. | 150 lb. | 7.50 (191) | 0.88 (22) | 4 | 6.00 (152) | 0.75 (19) | 3.50 (89) |
| | | 300 lb. | 8.25 (210) | 1.06 (27) | 8 | 6.62 (168) | 0.88 (22) | 3.50 (89) |
| | | 600 lb. | 8.25 (210) | 1.25 (32) | 8 | 6.62 (168) | 0.88 (22) | 3.50 (89) |
| | | 900 lb. | 10.50 (267) | 1.50 (38) | 8 | 8.00 (203) | 1.25 (32) | 3.50 (89) |
| | | 1500 lb. | 10.50 (267) | 1.88 (48) | 8 | 8.00 (203) | 1.25 (32) | 3.50 (89) |
| | | 2500 lb | 12.00 (305) | 2.62 (67) | 8 | 9.00 (229) | 1.38 (35) | 3.50 (89) |
| | | | | | | | | |
| EN1092-1 | DN 50 | PN 40 | 6.50 (165) | 0.67 (17) | 4 | 4.92 (125) | 0.71 (18) | 2.30 (58) |
| | | PN 63 | 7.09 (180) | 0.91 (23) | 4 | 5.31 (135) | 0.87 (22) | 2.30 (58) |
| | | PN 100 | 7.68 (195) | 0.98 (25) | 4 | 5.71 (145) | 1.10 (28) | 2.30 (58) |
| | DN 80 | PN 40 | 7.87 (200) | 0.83 (21) | 8 | 6.30 (160) | 0.71 (18) | 3.50 (89) |
| | | PN 63 | 8.46 (215) | 0.98 (25) | 8 | 6.69 (170) | 0.87 (22) | 3.50 (89) |
| | | PN 100 | 9.06 (230) | 0.98 (25) | 8 | 7.09 (180) | 1.10 (28) | 3.50 (89) |

(1) Dimensions are in inches (millimeters).

| | Pipe Size | Outer Diameter “G” | Inner Diameter “K” | Beveled Diameter “L” | Thickness with 1/4-NPT F.C. “M” | Thickness with 1/2-NPT F.C. “M” | Minimum Gasket I.D. “N” |
|---|---|---|---|---|---|---|---|
| ANSI / ASME | 2-in. | 3.62 (92) | 2.12 (54) | 2.48 (63) | 0.97 (25) | 1.30 (33) | 2.62 (67) |
| | | 3.62 (92) | 2.12 (54) | 2.48 (63) | 0.97 (25) | 1.30 (33) | 2.62 (67) |
| | | 3.62 (92) | 2.12 (54) | 2.48 (63) | 0.97 (25) | 1.30 (33) | 2.62 (67) |
| | | 3.62 (92) | 2.12 (54) | — | 0.97 (25) | 1.30 (33) | 2.62 (67) |
| | | 3.62 (92) | 2.12 (54) | — | 0.97 (25) | 1.30 (33) | 2.62 (67) |
| | 3-in. | 5.00 (127) | 3.60 (91) | — | 0.97 (25) | 1.30 (33) | 3.82 (97) |
| | | 5.00 (127) | 3.60 (91) | — | 0.97 (25) | 1.30 (33) | 3.82 (97) |
| | | 5.00 (127) | 3.60 (91) | — | 0.97 (25) | 1.30 (33) | 3.82 (97) |
| | | 5.00 (127) | 3.60 (91) | — | 0.97 (25) | 1.30 (33) | 2.82 (97) |
| | | 5.00 (127) | 3.60 (91) | — | 0.97 (25) | 1.30 (33) | 2.82 (97) |
| | | 5.00 (127) | 3.60 (91) | — | 0.97 (25) | 1.30 (33) | 2.82 (97) |
| | | | | | | | |
| EN1092-1 | DN 50 | 4.00 (102) | 2.40 (61) | — | 0.97 (25) | 1.30 (33) | 2.62 (67) |
| | | 4.00 (102) | 2.40 (61) | — | 0.97 (25) | 1.30 (33) | 2.62 (67) |
| | | 4.00 (102) | 2.40 (61) | — | 0.97 (25) | 1.30 (33) | 2.62 (67) |
| | DN 80 | 5.43 (138) | 3.60 (91) | — | 0.97 (25) | 1.30 (33) | 3.82 (97) |
| | | 5.43 (138) | 3.60 (91) | — | 0.97 (25) | 1.30 (33) | 3.82 (97) |
| | | 5.43 (138) | 3.60 (91) | — | 0.97 (25) | 1.30 (33) | 3.82 (97) |

**Figure 21. FCW Flush Flanged Seal – Ring Type Joint (RTJ) Gasket Surface Two-Piece Design (shown with flushing ring)**

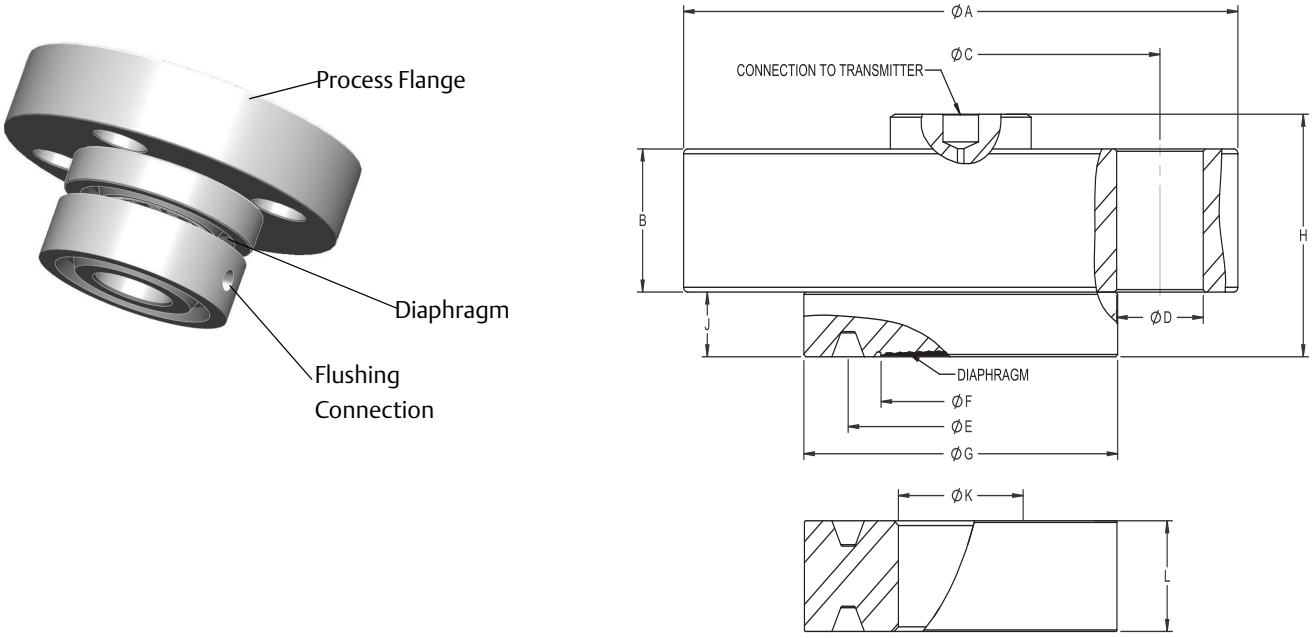



**Table 64. Dimensional Table for FCW 2-Piece Flange Type Flush Diaphragm Seal(1)**

| | Pipe Size | Class | Flange Diameter "A" | Flange Thickness "B" | Bolt Circle Diameter "C" | Bolt Hole Diameter "D" | Overall Height "H" | Raised Face Height "J" |
|---|---|---|---|---|---|---|---|---|
| ANSI / ASME | 2-in. | 150 lb. | 6.00 (152) | 0.69 (18) | 4.75 (121) | 0.75 (19) | 2.43 (62) | 0.68 (17) |
| | | 300 lb. | 6.50 (165) | 0.82 (21) | 5.00 (127) | 0.75 (19) | 2.43 (62) | 0.68 (17) |
| | | 600 lb. | 6.50 (165) | 1.00 (25) | 5.00 (127) | 0.75 (19) | 2.43 (62) | 0.68 (17) |
| | | 1500 lb. | 8.50 (216) | 1.50 (38) | 6.50 (165) | 1.00 (25) | 2.57 (65) | 0.82 (21) |
| | | 2500 lb. | 9.25 (235) | 2.00 (51) | 6.75 (171) | 1.14 (29) | 3.07 (78) | 0.82 (21) |
| | 3-in. | 150 lb. | 7.50 (191) | 0.88 (22) | 6.00 (152) | 0.75 (19) | 2.43 (62) | 0.68 (17) |
| | | 300 lb. | 8.25 (210) | 1.06 (27) | 6.62 (168) | 0.88 (22) | 2.43 (62) | 0.68 (17) |
| | | 600 lb. | 8.25 (210) | 1.25 (32) | 6.62 (168) | 0.88 (22) | 2.43 (62) | 0.68 (17) |
| | | 900 lb. | 9.50 (241) | 1.50 (38) | 7.50 (191) | 1.00 (25) | 2.57 (65) | 0.82 (21) |
| | | 1500 lb. | 10.50 (267) | 1.88 (48) | 8.00 (203) | 1.25 (32) | 3.07 (78) | 0.82 (21) |
| | | 2500 lb. | 12.00 (305) | 2.62 (67) | 9.00 (229) | 1.38 (35) | 4.07 (103) | 0.82 (21) |

(1) Dimensions are in inches (millimeters).

| | Pipe Size | RTJ Diameter "E" | Diaphragm Diameter "F" | Raised Face Diameter "G" | Inner Diameter "K" | Thickness with 1/4-NPT F.C. "L" | Thickness with 1/2-NPT F.C. "L" |
|---|---|---|---|---|---|---|---|
| ANSI / ASME | 2-in. | 3.25 (83) | 2.30 (58) | 4.00 (102) | 2.12 (54) | 1.40 (36) | 1.70 (43) |
| | | 3.25 (83) | 2.30 (58) | 4.25 (108) | 2.12 (54) | 1.40 (36) | 1.70 (43) |
| | | 3.25 (83) | 2.30 (58) | 4.25 (108) | 2.12 (54) | 1.40 (36) | 1.70 (43) |
| | | 3.75 (95) | 2.30 (58) | 4.88 (124) | 2.12 (54) | 1.40 (36) | 1.70 (43) |
| | | 4.00 (102) | 3.50 (89) | 5.25 (133) | 2.12 (54) | 1.40 (36) | 1.70 (43) |
| | 3-in. | 4.50 (114) | 3.50 (89) | 5.25 (133) | 3.60 (91) | 1.50 (38) | 1.80 (46) |
| | | 4.88 (124) | 3.50 (89) | 5.75 (146) | 3.60 (91) | 1.50 (38) | 1.80 (46) |
| | | 4.88 (124) | 3.50 (89) | 5.75 (146) | 3.60 (91) | 1.50 (38) | 1.80 (46) |
| | | 4.88 (124) | 3.50 (89) | 6.12 (155) | 3.60 (91) | 1.50 (38) | 1.80 (46) |
| | | 5.38 (137) | 3.50 (89) | 6.62 (168) | 3.60 (91) | 1.50 (38) | 1.80 (46) |
| | | 5.00 (127) | 3.50 (89) | 6.62 (168) | 3.60 (91) | 1.50 (38) | 1.80 (46) |

**Figure 22. RCW Flanged Remote Seal Ring Type Joint (RTJ) and Flushing Connection Ring**

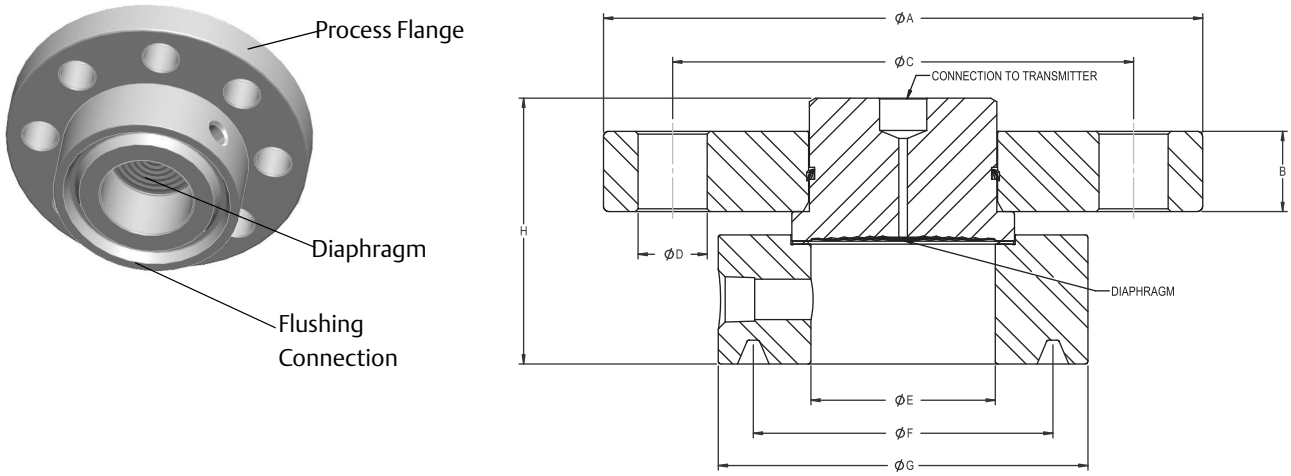



**Table 65. RCW Flanged Remote Seal Dimensions(1)**

| | Pipe Size | Class | Flange Diameter "A" | Flange Thickness "B" | Bolt Circle Diameter "C" | Bolt Hole Diameter "D" | Lower Housing Inner Diameter "E" | RTJ Groove Diameter "F" | Lower Housing Outer Diameter "G" | Overall Height "H" | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | No or 1/4-in. NPT flush connection | 1/2-in. NPT flush connection |
| ANSI / ASME | 1/2-in. | 2500 lb. | 5.25 (133) | 1.19 (30) | 3.50 (89) | 0.88 (22) | 0.62 (16) | 1.69 (43) | 2.64 (67) | 2.88 (73) | 3.18 (81) |
| | 3/4-in. | 300/600 lb. | 4.62 (117) | 0.62 (16) | 3.25 (83) | 0.75 (19) | 0.82 (21) | 1.69 (43) | 2.64 (67) | 2.88 (73) | 3.18 (81) |
| | 3/4-in. | 900/1500 lb. | 5.12 (130) | 1.00 (25) | 3.50 (89) | 0.88 (22) | 0.82 (21) | 1.75 (45) | 2.64 (67) | 2.88 (73) | 3.18 (81) |
| | 3/4-in. | 2500 lb. | 5.50 (140) | 1.25 (32) | 3.75 (95) | 0.88 (22) | 0.82 (21) | 2.00 (51) | 2.90 (74) | 2.88 (73) | 3.18 (81) |
| | 1-in. | 150 lb. | 4.25 (108) | 0.50 (13) | 3.12 (79) | 0.63 (16) | 1.05 (27) | 1.88 (48) | 2.64 (67) | 2.88 (73) | 3.18 (81) |
| | 1-in. | 300 lb. | 4.88 (124) | 0.62 (16) | 3.50 (89) | 0.75 (19) | 1.05 (27) | 2.00 (51) | 2.77 (70) | 2.88 (73) | 3.18 (81) |
| | 1-in. | 600 lb. | 4.88 (124) | 0.69 (18) | 3.50 (89) | 0.75 (19) | 1.05 (27) | 2.00 (51) | 2.77 (70) | 2.88 (73) | 3.18 (81) |
| | 1-in. | 900/1500 lb. | 5.88 (149) | 1.12 (29) | 4.00 (102) | 1.00 (25) | 1.05 (27) | 2.00 (51) | 2.83 (72) | 2.88 (73) | 3.18 (81) |
| | 1-in. | 2500 lb. | 6.25 (159) | 1.38 (35) | 4.25 (108) | 1.00 (25) | 1.05 (27) | 2.38 (60) | 3.27 (83) | 2.88 (73) | 3.18 (81) |
| | 1 1/2-in. | 150 lb. | 5.00 (127) | 0.62 (16) | 3.88 (98) | 0.63 (16) | 1.61 (41) | 2.56 (65) | 3.27 (83) | 2.88 (73) | 3.18 (81) |
| | 1 1/2-in. | 300 lb. | 6.12 (156) | 0.75 (19) | 4.50 (114) | 0.88 (22) | 1.61 (41) | 2.69 (68) | 3.58 (91) | 2.88 (73) | 3.18 (81) |
| | 1 1/2-in. | 600 lb. | 6.12 (156) | 0.88 (22) | 4.50 (114) | 0.88 (22) | 1.61 (41) | 2.69 (68) | 3.58 (91) | 2.88 (73) | 3.18 (81) |
| | 1 1/2-in. | 900/1500 lb. | 7.00 (178) | 1.25 (32) | 4.88 (124) | 1.12 (28) | 1.61 (41) | 2.69 (68) | 3.64 (93) | 2.88 (73) | 3.18 (81) |
| | 1 1/2-in. | 2500 lb. | 8.00 (203) | 1.75 (45) | 5.75 (146) | 1.25 (32) | 1.61 (41) | 3.25 (83) | 4.52 (115) | 2.88 (73) | 3.18 (81) |

(1) Dimensions are in inches (millimeters).

**Figure 23. FUW Flush Flanged Type Seal - EN1092-1 Type D**

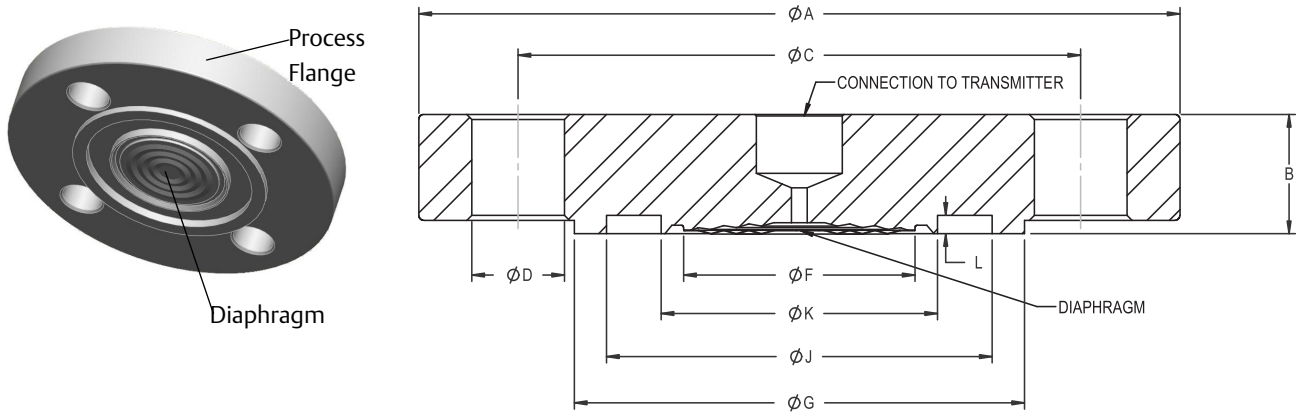



**Table 66. FUW Flush Flanged Type Seal Dimensions[(1)]**

| | Pipe Size | Class | Flange Diameter "A" | Flange Thickness "B" | Bolt Circle "C" | Bolt Hole Diameter "D" | # of Bolts | Standard Diaphragm Diameter "F" | Raised Face Diameter "G" | Groove O.D. "J" | Groove I.D. "K" | Groove Depth "L" |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EN 1092-1 | DN 50 | PN 40 | 6.50 (165) | 0.79 (20) | 4.92 (125) | 0.71 (18) | 4 | 2.30 (58) | 4.00 (102) | 3.46 (88) | 2.83 (72) | 0.16 (4.0) |
| | DN 80 | PN 40 | 7.87 (200) | 0.94 (24) | 6.30 (160) | 0.71 (18) | 8 | 3.50 (89) | 5.43 (138) | 4.76 (121) | 4.13 (105) | 0.16 (4.0) |

(1) Measurement in inches (millimeters).

**Figure 24. FVW Flush Flanged Type Seal - EN1092-1 Type C**

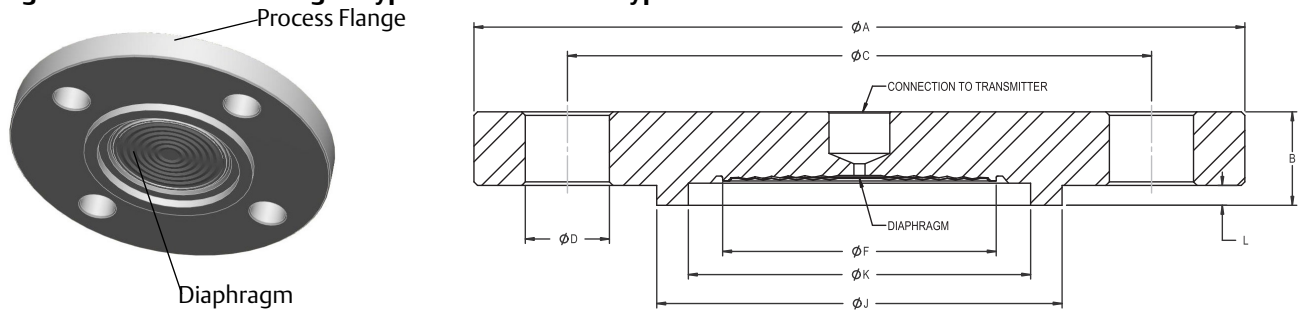



**Table 67. FVW Flush Flanged Type Seal Dimensions[(1)]**

| | Pipe Size | Class | Flange Diameter "A" | Flange Thickness "B" | Bolt Circle "C" | Bolt Hole Diameter "D" | # of Bolts | Standard Diaphragm Diameter "F" | Groove O.D. "J" | Tongue I.D. "K" | Tongue Depth "L" |
|---|---|---|---|---|---|---|---|---|---|---|---|
| EN 1092-1 | DN 50 | PN 40 | 6.50 (165) | 0.79 (20) | 4.92 (125) | 0.71 (18) | 4 | 2.30 (58) | 3.43 (87) | 2.87 (73) | 0.18 (4.5) |
| | DN 80 | PN 40 | 7.87 (200) | 0.94 (24) | 6.30 (160) | 0.71 (18) | 8 | 3.50 (89) | 4.72 (120) | 4.17 (106) | 0.18 (4.5) |

(1) Measurement in inches (millimeters).

**Figure 25. RTW Threaded Seal**

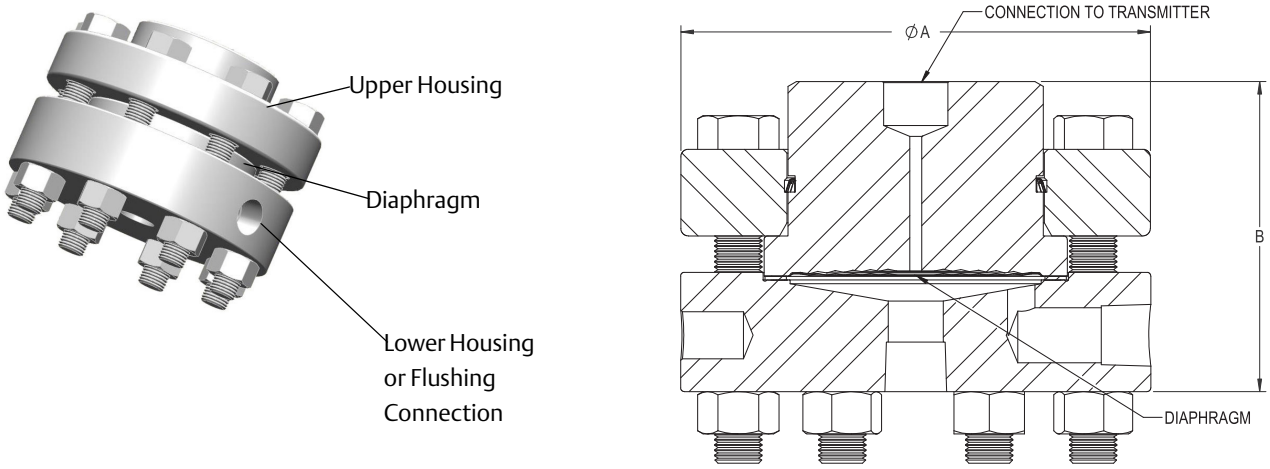



**Table 68. RTW Threaded Seal Dimensions(1)**

| Rating | Overall Diameter 'A' | Overall Height "B" | |
|---|---|---|---|
| | | No or 1/4-in. NPT flush connection | 1/2-in. NPT flush connection |
| 2500 psi (173 bar) | 3.74 (95) | 2.47 (63) | 2.82 (72) |
| 5000 psi (345 bar) | 3.74 (95) | 1.95 (50) | 2.31 (59) |
| 10000 psi (690 bar) | 4.00 (102) | 1.95 (50) | — |

(1) Dimensions are in inches (millimeters).

**Figure 26. HTS Male Threaded Seal**

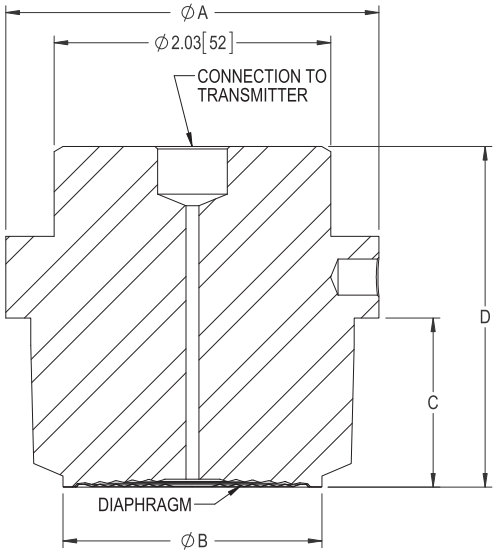
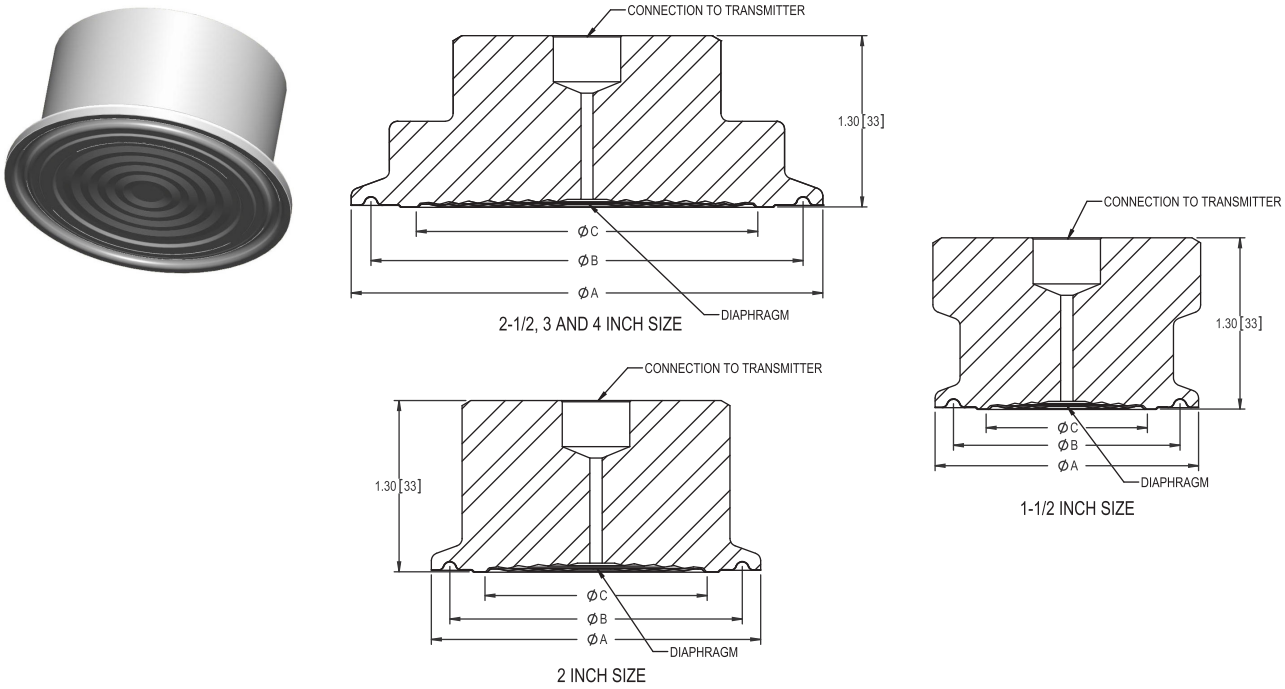



**Table 69. HTS Male Threaded Seal Dimensions(1)**

| Process Type | Connection Size | Outer Diameter "A" | Diaphragm Diameter "B" | Length "C" | Overall Height "D" |
|---|---|---|---|---|---|
| ANSI NPT | 1-in. NPT | 2.03 (51.6) | 1.09 (27.9) | 1.24 (31.5) | 2.50 (63.5) |
| | 1 1/2-in. NPT | 2.36 (59.9) | 1.70 (43.2) | 1.24 (31.5) | 2.50 (63.5) |
| | 2-in. NPT | 2.74 (69.6) | 1.90 (48.3) | 1.24 (31.5) | 2.50 (63.5) |
| EN 10226 BSP | G1 BSP | 2.03 (51.6) | 1.09 (27.9) | 0.87 (22.0) | 2.15 (54.6) |
| | G1 1/2 BSP | 2.36 (59.9) | 1.70 (43.2) | 0.98 (24.9) | 2.24 (56.9) |
| | G2 BSP | 2.74 (69.6) | 1.90 (48.3) | 1.24 (31.5) | 2.50 (63.5) |

(1) Dimensions are in inches (millimeters).

**Figure 27. SCW Tri-Clamp Seal**



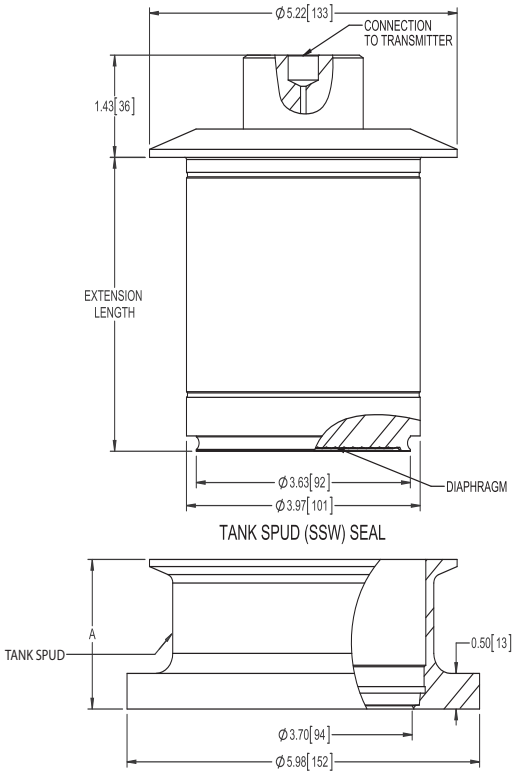

Dimensions are in inches (millimeters)

**Table 70. SCW Tri-Clamp Seal Dimensions(1)**

| Pipe Size | Outer Diameter "A" | O-rIng Groove Diameter "B" | Diaphragm Diameter "C" |
|---|---|---|---|
| 1 1/2-in. | 2.00 (51) | 1.72 (44) | 1.21 (31) |
| 2-in. | 2.50 (64) | 2.22 (56) | 1.68 (43) |
| 2 1/2-in. | 3.05 (77) | 2.78 (71) | 2.07 (53) |
| 3-in. | 3.58 (91) | 3.28 (83) | 2.58 (66) |
| 4-in. | 4.68 (119) | 4.35 (110) | 3.66 (93) |

(1) Dimensions are in inches (millimeters).

**Figure 15. SSW Tank Spud Seal**



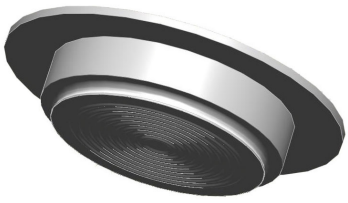

Dimensions are in inches (millimeters)

**Table 71. SSW Tank Spud Seal Dimensions(1)**

| Pipe Size | Extension Length | "A" |
|---|---|---|
| 4-in. SCH 5 | 2-in. Long | 2.10 (53) |
| | 6-in. Long | 6.10 (155) |

(1) Dimensions are in inches (millimeters).

**Figure 16. STW Hygienic Thin Wall Tank Spud Seal**



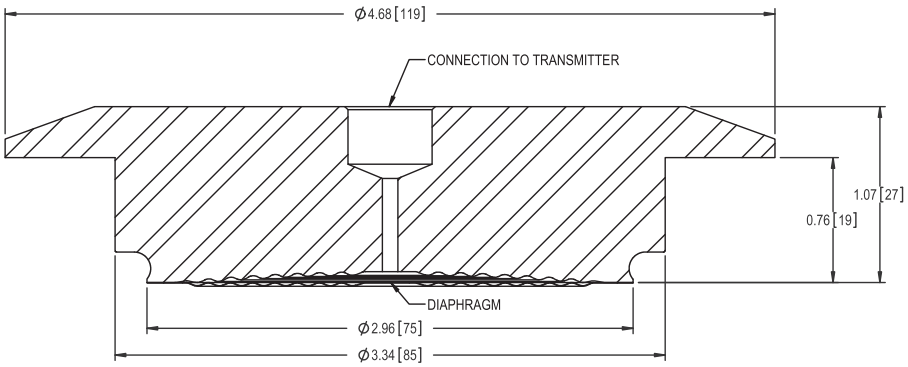


**Figure 17. EES Hygienic Flanged Tank Spud Extended Seal**

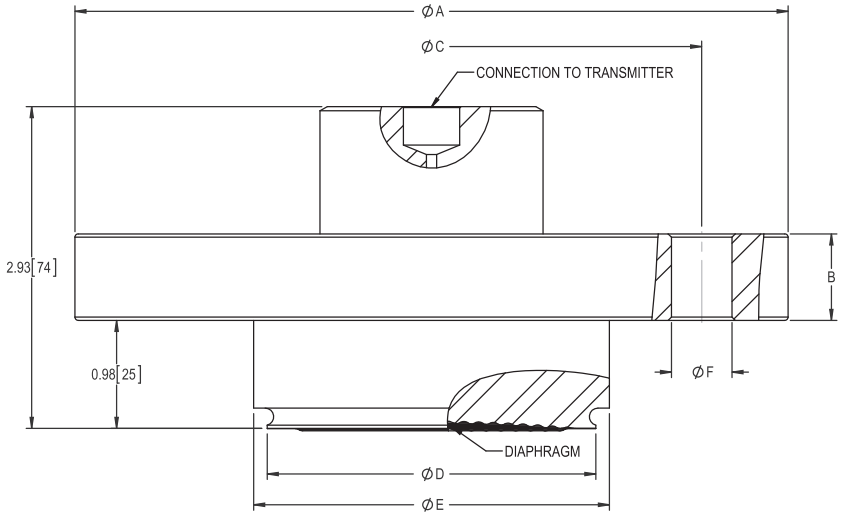



**Table 72. EES Hygienic Flanged Tank Spud Extended Seal Dimensions(1)**

| Pipe Size | Flange Diameter "A" | Flange Thickness "B" | # of Bolts | Bolt Circle Diameter "C" | Standard Diaphragm Diameter "D" | Extension Diameter "E" | Bolt Hole Diameter "F" |
|---|---|---|---|---|---|---|---|
| DN50 | 6.50 (165) | 0.79 (20) | 4 | 4.92 (125) | 2.99 (76) | 3.24 (82) | 0.55 (14) |
| DN80 | 7.87 (200) | 0.94 (24) | 8 | 6.30 (160) | 4.04 (102) | 4.24 (108) | 0.55 (14) |

**Figure 18. VCS Tri-clamp In-Line Seal**

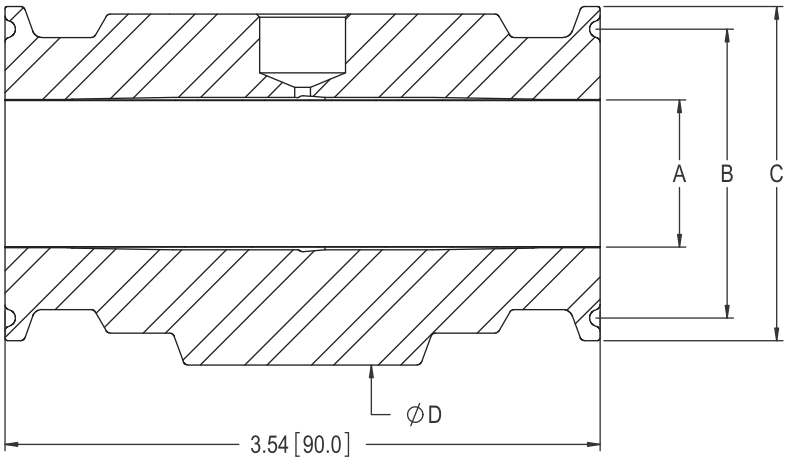


**Table 73. VCS Tri-clamp In-Line Seal Dimensions**

| Pipe Size | Inner Diameter "A" | Groove Diameter "B" | Flange Diameter "C" | Outer Diameter "D" |
|---|---|---|---|---|
| 1-in. | 0.87 (22) | 1.72 (44) | 1.99 (51) | 2.33 (59) |
| 1½-in. | 1.37 (35) | 1.72 (44) | 1.99 (51) | 2.73 (69) |
| 2-in. | 1.87 (48) | 2.22 (56) | 2.52 (64) | 3.19 (81) |
| 3-in. | 2.87 (73) | 3.28 (83) | 3.58 (91) | 4.14 (105) |
| 4-in. | 3.82 (97) | 4.35 (110) | 4.69 (119) | 5.06 (129) |

**Figure 19. SVS Varivent Compatible Connection Seal**

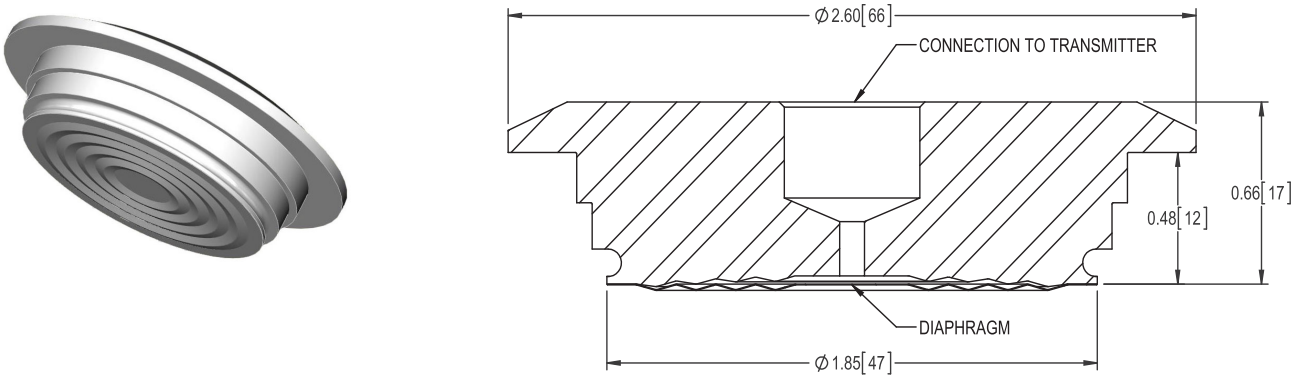



**Figure 20. SHP Cherry-Burrell "I" Line Seal**

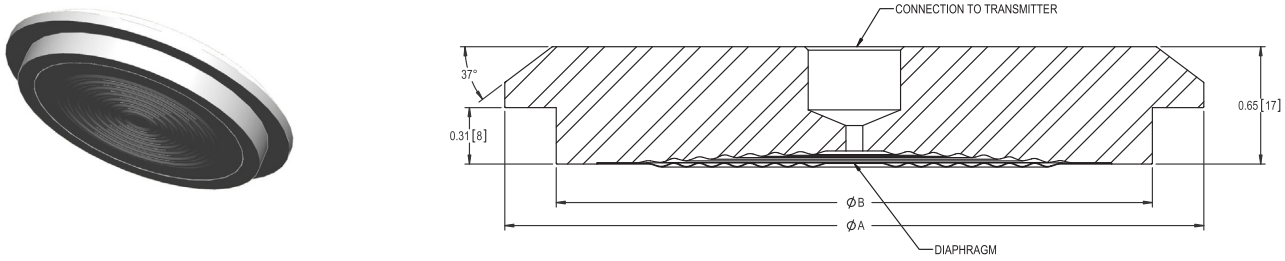



**Table 74. SHP Cherry-Burrell "I" Line Seal Dimensions(1)**

| Size | Outer Diameter "A" | Extension Diameter "B" |
|---|---|---|
| 2-in.(1) | 2.64 (67) | 2.24 (57) |
| 3-in. | 3.88 (98) | 3.31 (84) |

(1) Dimensions are in inches (millimeters).

**Figure 21. SLS Hygienic Dairy Process Connection Female Thread Seal per DIN 11851**

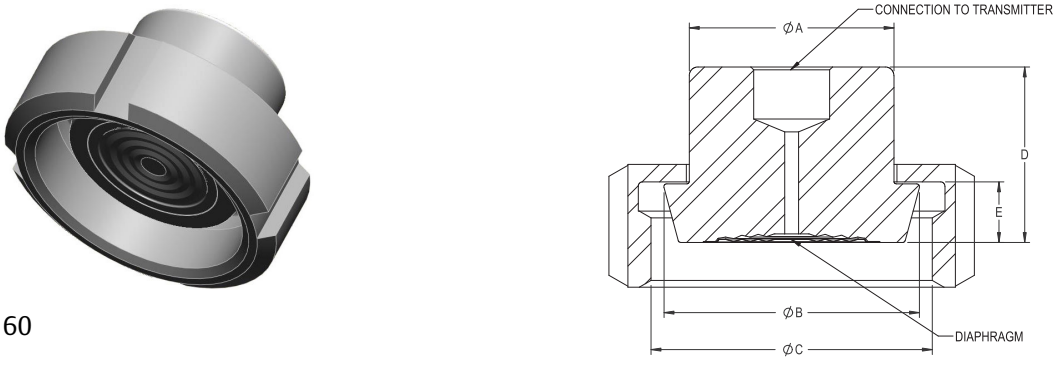


**Table 75. SLS Hygienic Dairy Process Connection Female Thread Seal per DIN 11851 Dimensions**

| Female Thread | Process Size / Rating | Hub Diameter "A" | "B" | Thread Diameter "C" | Hub Height "D" | "E" |
|---|---|---|---|---|---|---|
| DIN 11851 | DN 40 PN 40 | 1.89 (48)[(1)] | 2.20 (56) | Rd 65 X 1/6-in. | 1.18 (30) | 0.39 (10) |
| | DN 50 PN 25 | 2.40 (61) | 2.70 (69) | Rd 78 X 1/6-in. | 1.22 (31) | 0.43 (11) |

(1) Dimensions are in inches (millimeters).

**Figure 22. WSP Saddle Seal**

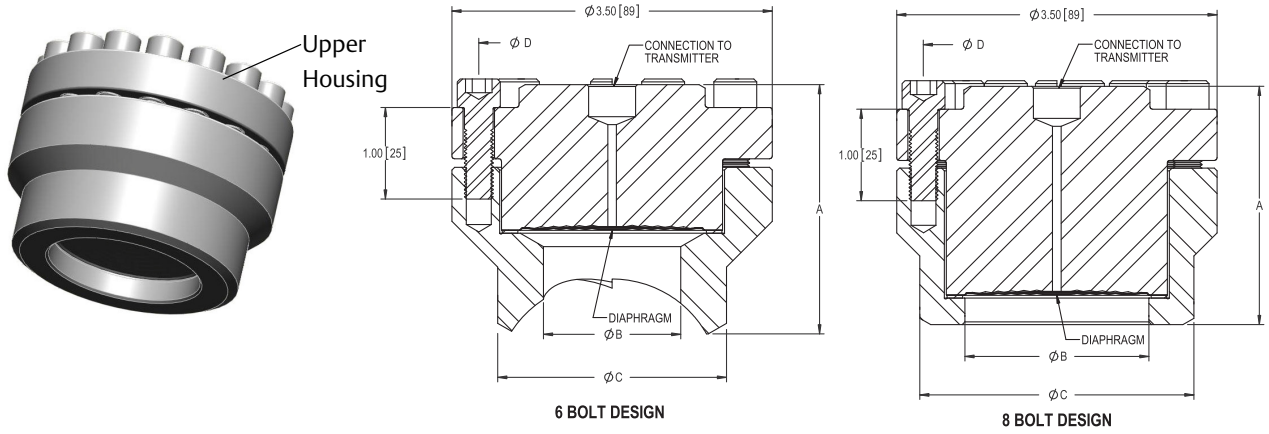
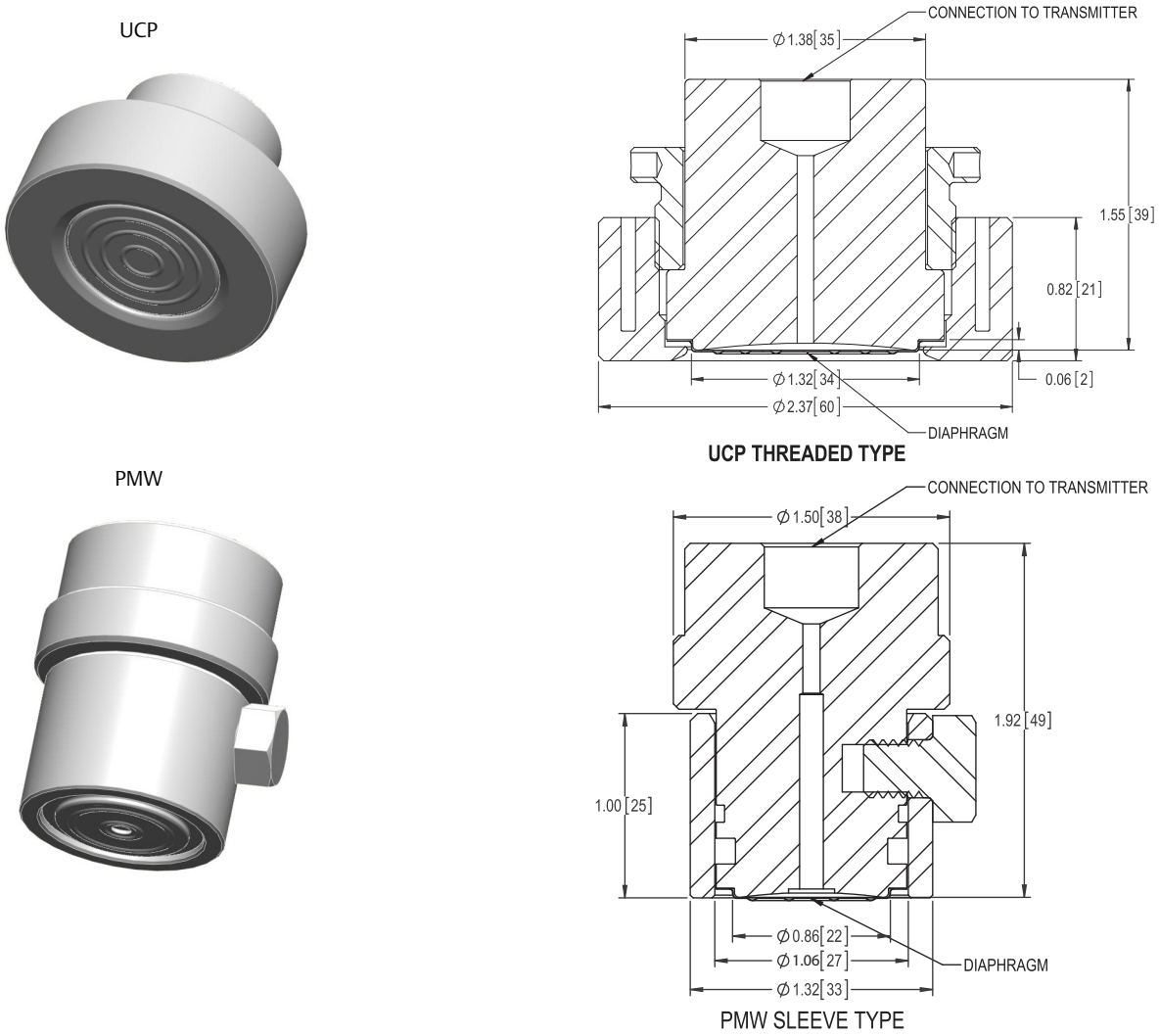



**Table 76. WSP Saddle Seal Dimensions[(1)]**

| Size | Overall Height "A" | Inner Diameter "B" | Outer Diameter "C" | Bolt Circle Diameter "D" | |
|---|---|---|---|---|---|
| | | | | 6 Bolts | 8 Bolts |
| 2-in. [(1)] | 2.72 (69) | 1.50 (38) | 2.50 (64) | 2.99 (76) | 2.91 (74) |
| 3-in. | 2.46 (63) | 2.01 (51) | 3.02 (77) | 2.99 (76) | 2.91 (74) |
| 4-in. and larger | 2.60 (66) | 2.01 (51) | 3.00 (76) | 2.99 (76) | 2.91 (74) |

(1) Dimensions are in inches (millimeters).

**Figure 23. UCP and PMW Threaded Pipe Mount Seals**

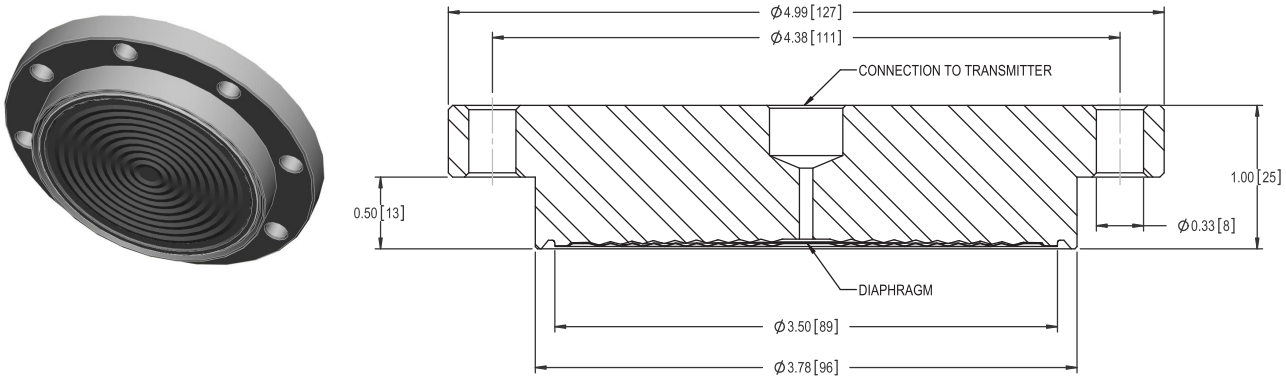



Dimensions are in inches (millimeters)

**Table 77. UCP and PMW Threaded Pipe Mount Seals Dimensions(1)**

| Size | Overall Diameter "A" | Diameter "B" | Diaphragm Diameter "C" | Sleeve Inner Diameter "D" | # of Bolts |
|---|---|---|---|---|---|
| Sleeve 1-in. Pipe | 1.50 (38) | 1.32 (34) | 0.84 (21) | 1.04 (26) | 1 |
| Threaded M44 X 1.25 | 2.37 (60) | 1.38 (35) | 1.32 (32) | — | — |

**Figure 24. CTW Chemical Tee Seal**




Dimensions are in inches (millimeters)

**Figure 25. TFS Wafer Style In-Line Seal**

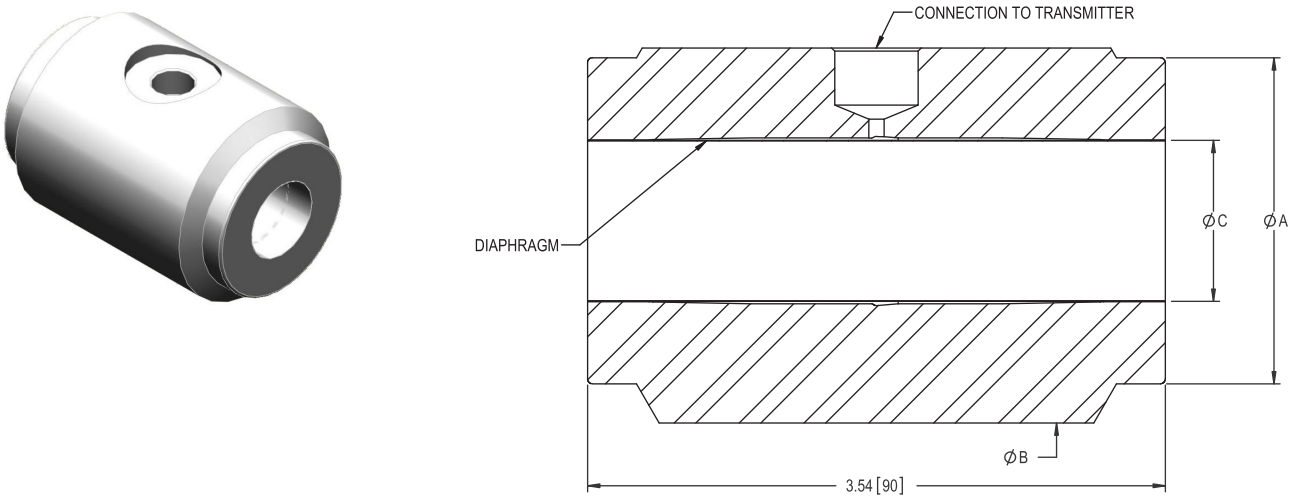



**Table 78. TFS Wafer Style In-Line Seal Dimensions**(1)

| Pipe Size | Flange Face Diameter "A" | Outer Diameter "B" | Inner Diameter "C" |
|---|---|---|---|
| 1-in.(1) | 2.00 (51) | 2.64 (67) | 1.090 (28) |
| 1 1/2-in. | 2.88 (73) | 3.23 (82) | 1.61 (41) |
| 2-in. | 3.62 (92) | 3.74 (95) | 2.07 (52) |
| 2 1/2-in. | 4.12 (105) | 4.21 (107) | 2.48 (63) |
| 3-in. | 5.00 (127) | 5.00 (127) | 3.07 (78) |
| 4-in. | 6.19 (157) | 6.19 (157) | 4.00 (102) |
| DN25 | 2.68 (68) | 2.72 (69) | 1.09 (28) |
| DN40 | 3.46 (88) | 3.46 (88) | 1.61 (41) |
| DN50 | 4.02 (102) | 4.09 (104) | 1.99 (51) |
| DN80 | 5.43 (138) | 5.47 (139) | 3.24 (82) |
| DN100 | 6.38 (162) | 6.46 (164) | 4.22 (107) |

(1) Dimensions are in inches (millimeters).

**Figure 26. WFW Flow-Thru Flanged Seal**

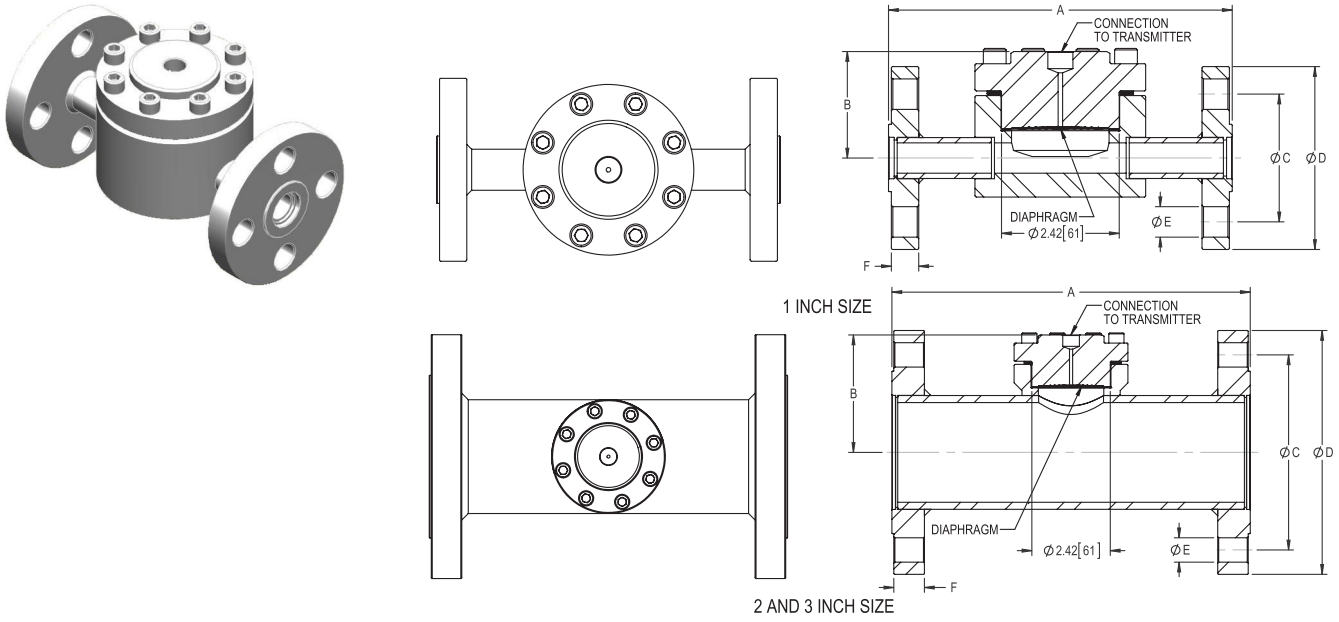



**Table 79. WFW Flow-Thru Flanged Seal Dimensions(1)**

| Class | Nominal Pipe Size | Overall Length "A" | Upper to Centerline Height "B" | Bolt Circle Diameter "C" | Outside Diameter "D" | Bolt Hole Diameter "E" | Flange Thickness "F" |
|---|---|---|---|---|---|---|---|
| 150 lb. | 1-in. | 7.00 (178)(1) | 2.40 (61.0) | 3.12 (79) | 4.25 (108) | 0.62 (16) | 0.50 (13) |
| | 2-in. | 9.00 (229) | 3.31 (84) | 4.75 (121) | 6.00 (152) | 0.75 (19) | 0.69 (18) |
| | 3-in. | 11.00 (279) | 3.61 (92) | 6.00 (152) | 7.50 (191) | 0.75 (19) | 0.88 (22) |

(1) Dimensions are in inches (millimeters).

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