Product Data Sheet
November 2016
00813-0100-4016, Rev RC

Rosemount™ DP Level Transmitters and 1199 Diaphragm Seal System

Applications

- Level, flow, pressure, interface, density
- Extreme hot and cold temperatures
- Corrosive, clogging, or viscous processes
- Hygienic requirements
- Special process connections

Proven, reliable, and innovative DP level technologies

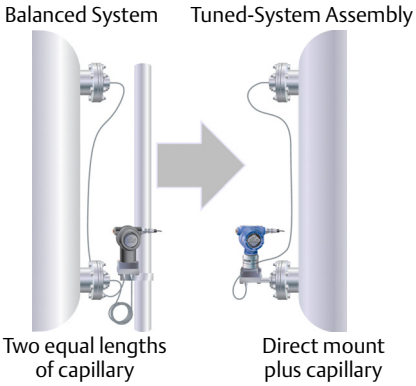
To meet your application requirements, Rosemount DP Level technologies deliver an unsurpassed product offering that is easy to specify, order, and install. The offering includes a wide variety of process connections, direct mount or capillary connections, and materials of construction to address almost 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



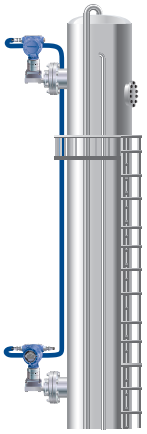
Rosemount Tuned-System™ Assemblies optimize results

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

Contents

Rosemount 3051S Electronic Remote Sensor (ERS)™ System

The Rosemount 3051S ERS System is a digital DP Level architecture that links two Rosemount 3051S Pressure Sensors together electronically. The pressure sensors are synchronized on a single power loop where the differential pressure, level, and volume are calculated and transmitted using a standard two-wire 4–20mA HART® signal.



A digital upgrade to a proven technology

- 90 percent 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

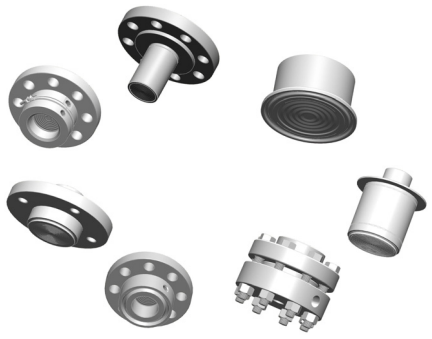
Rosemount 1199 Seal Systems

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
- Variety of fill fluids applications including cold temperature, hot temperature, and hygienic and food grade
- Three different capillary diameters allow for optimization of accuracy and time response.



Reliable system construction

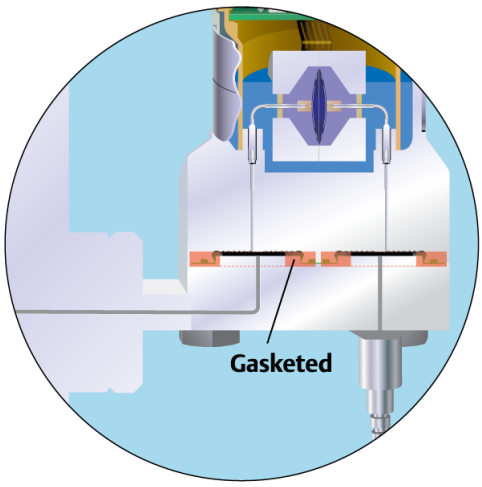
- Welded design with no threaded connections
- 100% helium leak tested
- Advanced manufacturing techniques ensure air-free, leak-tight system that is stable over time
- Reliable operation in full vacuum applications

Robust seal design

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

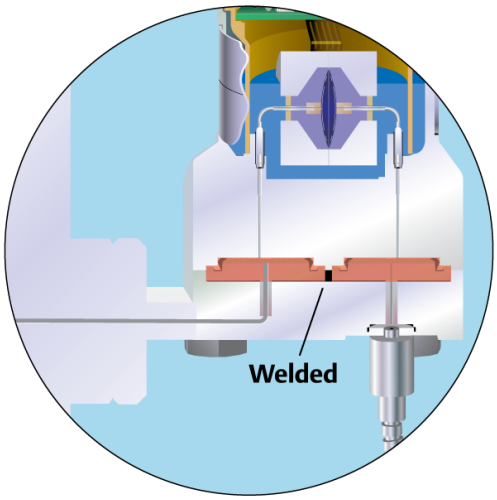
Figure 1. Rosemount Seal System Construction Options

Welded-repairable construction



- All connection pointed welded except gasket between sensor module and transmitter flange
- Transmitter can be re-used if repair work is required

All welded (vacuum) construction



- All connection points welded including welded disk over sensor module isolators
- Ideal for vacuum applications (< 6 psia, 400 mbar-a)
- Seal system and transmitter are not repairable

Rosemount 3051S Electronic Remote Sensor (ERS) System

1 **Rosemount 3051SAM** Secondary

Coplanar In-Line

Rosemount 3051SAL

Coplanar In-Line

2 Primary

3 3051SAL1PG4AA1A1020DFF71DA00M5
3051SAM1ST2A2E11A2A

The Rosemount 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 Rosemount 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 Rosemount 3051S ERS System can deliver:

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

How to order

1. Select two Rosemount 3051S ERS transmitter models. These may be any combination of Rosemount 3051SAM and 3051SAL models.
2. Decide which model will be the ERS Primary (4–20 mA loop termination and optional LCD display) 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 126
Certifications: page 140
Dimensional drawings: page 164

Rosemount 3051SAM Transmitter for ERS Applications

- Coplanar and in-line sensor module platforms
- Variety of process connections including threaded NPT, flanges, manifolds, and Rosemount 1199 Remote seals
- Available with 15-year stability and 15-year limited warranty

Specification and selection of product materials, options, or components must be made by the purchaser of the equipment. See page 135 for more information on material selection.

Table 1. Rosemount 3051SAM Transmitter for ERS Applications 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	
3051SAM	Scalable advanced measurement transmitter	
Performance class[(1)]		
1	Ultra: 0.025% span accuracy, 200:1 rangedown, 15-year stability, 15-year limited warranty	★
2	Classic: 0.035% span accuracy, 150:1 rangedown, 15-year stability	★
4	Enhanced ERS System performance, 15-year stability, 15-year limited warranty	★
Configuration type		
P	Electronic remote sensor - primary	★

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

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S	Electronic remote sensor - secondary				★
Pressure module type		**Pressure sensor type**			
G	Coplanar	Gage			★
T	In-Line	Gage			★
E	In-Line	Absolute			★
A	Coplanar	Absolute			
Pressure range[2]					
	Coplanar gage	**In-Line gage**	**In-Line absolute**	**Coplanar absolute**	
1A	N/A	–14.7 to 30 psig (–1,01 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 inH_2O (–621,60 to 621,60 mbar)	–14.7 to 150 psig (–1,01 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 inH_2O (–0,97 to 2,48 bar)	–14.7 to 800 psig (–1,01 to 55,15 bar)	0 to 800 psia (0 to 55,15 bar)	0 to 800 psia (0 to 55,15 bar)	★
4A	–14.2 to 300 psig (–0,97 to 20,68 bar)	–14.7 to 4000 psig (–1,01 to 275,79 bar)	0 to 4000 psia (0 to 275,79 bar)	0 to 4000 psia (0 to 275,79 bar)	★
5A	–14.2 to 2000 psig (–0,97 to 137,89 bar)	–14.7 to 10000 psig (–1,01 to 689,47 bar)	0 to 10000 psia (0 to 689,47 bar)	N/A	★
Isolating diaphragm					
2[3]	316L SST				★
3[3]	Alloy C-276				★
4[3][4]	Alloy 400				
5[4][5]	Tantalum				
6[3][4]	Gold-plated alloy 400 (includes graphite-filled PTFE O-ring)				
7[3][4]	Gold-plated 316L SST				
Process connection					
	Coplanar module type		**In-Line module type**		
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		Assemble AMF Manifold to 1/2–14 NPT female process connection		★
A15[6]	Assemble to Rosemount 304 or AMF manifold to SST traditional flange with Alloy C-276 drain vents		N/A		★
A22[6]	Assemble AMF manifold to SST coplanar flange		N/A		★
B11[6][7]	Assemble to one Rosemount 1199 Remote Diaphragm Seal with SST transmitter flange		Assemble to one Rosemount 1199 Remote Diaphragm		★
E11	Coplanar flange (CS), 1/4–18 NPT, 316 SST drain vents		1/2–14 NPT female process connection		★

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

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Process connection			
	Coplanar module type	**In-Line module type**	
E12	Coplanar flange (SST), 1/4–18 NPT, 316 SST drain vents	N/A	★
E13[3]	Coplanar flange (cast C-276), 1/4–18 NPT, alloy C-276 drain vents	N/A	★
E14	Coplanar flange (cast Alloy 400), 1/4–18 NPT, alloy 400/K–500 drain vents	N/A	★
E15[3]	Coplanar flange (SST), 1/4–18 NPT, Alloy C-276 drain vents	N/A	★
E16[3]	Coplanar flange (CS), 1/4–18 NPT, Alloy C-276 drain vents	N/A	★
E21	Coplanar flange (CS), RC 1/4, 316 SST drain vents	N/A	★
E22	Coplanar flange (SST), RC 1/4, 316 SST drain vents	N/A	★
E23[3]	Coplanar flange (Cast C-276), RC 1/4, alloy C-276 drain vents	N/A	★
E24	Coplanar flange (Cast Alloy 400), RC 1/4, alloy 400/K–500 drain vents	N/A	★
E25[3]	Coplanar flange (SST), RC 1/4, alloy C-276 drain vents	N/A	★
E26[3]	Coplanar flange (CS), RC 1/4, 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 1/4, 316 SST drain vents	N/A	★
F23[3]	Traditional flange (Cast C-276), RC 1/4, alloy C-276 drain vents	N/A	★
F24	Traditional flange (Cast Alloy 400), RC 1/4, alloy 400/K500 drain vents	N/A	★
F25[3]	Traditional flange (SST), RC 1/4, alloy C-276 drain vents	N/A	★
F52	DIN-compliant traditional flange (SST), 1/4–18 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	G1/2 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	★

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

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Process connection				
	Coplanar module type	**In-line module type**		
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		★
P11	N/A	Level flange (SST), 2-in. ANSI Class 150		★
P12	N/A	Level flange (SST), 2-in. ANSI Class 300		★
P21	N/A	Level flange (SST), 3-in. ANSI Class 150		★
P22	N/A	Level flange (SST), 3-in. ANSI Class 300		★
P31	N/A	Level flange (SST), DIN-DN 50 PN 40		★
F11	Traditional flange (CS), 1/4–18 NPT, 316 SST drain vents	Non-threaded instrument flange (I-Flange)		
F32	Bottom vent traditional flange (SST), 1/4–18 NPT, 316 SST drain vents	N/A		
F42	Bottom vent traditional flange (SST), RC 1/4, 316 SST drain vents	N/A		
F62	DIN-compliant traditional flange (316 SST), 1/4–18 NPT, 316 drain vents, M10 bolting	N/A		
F72	DIN-compliant traditional flange (316 SST), 1/4–18 NPT, 316 drain vents, M12 bolting	N/A		
Transmitter output				
A	4–20 mA with digital signal based on HART protocol			★
Housing style		**Material**	**Conduit entry size**	
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	★
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				
2A	Junction box	Aluminum	1/2–14 NPT	★
2B	Junction box	Aluminum	M20 x 1.5 (CM 20)	★

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2J	Junction box	SST	1/2–14 NPT	★
2C	Junction box	Aluminum	G1/2	

Options (include with selected model number)

Extended product warranty		
WR3	3-year limited warranty	★
WR5	5-year limited warranty	★
Electronic remote sensor connection cable		
R02	25 ft. (7,62 m) spool of Electronic Remote Sensor cable (gray color)	
R05	50 ft. (15,2 m) spool of Electronic Remote Sensor cable (gray color)	★
R10	100 ft. (30,5 m) spool of Electronic Remote Sensor cable (gray color)	★
R15	150 ft. (45,7 m) spool of Electronic Remote Sensor cable (gray color)	★
R20[8]	200 ft. (60,96 m) spool of Electronic Remote Sensor cable (gray color)	
R22[9]	225 ft. (68,58 m) spool of Electronic Remote Sensor cable (gray color)	
R30	300 ft. (91,44 m) spool of Electronic Remote Sensor cable (gray color)	
R40	200 ft. (60,96 m) spool of Electronic Remote Sensor cable (gray color)	
R50	200 ft. (60,96 m) spool of Electronic Remote Sensor cable (gray color)	
H02	25 ft. (7,62 m) spool of Electronic Remote Sensor cable (blue color)	
H05	50 ft. (15,2 m) spool of Electronic Remote Sensor cable (blue color)	
H10	100 ft. (30,5 m) spool of Electronic Remote Sensor cable (blue color)	
H15	150 ft. (45,7 m) spool of Electronic Remote Sensor cable (blue color)	
H20[8]	200 ft. (60,96 m) spool of Electronic Remote Sensor cable (blue color)	
H22[9]	225 ft. (68,58 m) spool of Electronic Remote Sensor cable (blue color)	
J02	25 ft. (7,62 m) spool of Electronic Remote Sensor armored cable	
J05	50 ft. (15,2 m) spool of Electronic Remote Sensor armored cable	
J07	75 ft. (22,8 m) spool of Electronic Remote Sensor armored cable	
J10	100 ft. (30,5 m) spool of Electronic Remote Sensor armored cable	
J12[9]	125 ft. (38,1 m) spool of Electronic Remote Sensor armored cable	
Mounting bracket		
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	★

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BA[4]	Traditional flange bracket, B1, all SST	★
BC[4]	Traditional flange bracket, B3, all SST	★
Special configuration (software)		
C1[10]	Customer software configuration (requires Configuration Data Sheet)	★
C3	Gage pressure calibration on Rosemount 3051SAM_ _A4 only	★
C4[10]	NAMUR alarm and saturation levels, high alarm	★
C5[10]	NAMUR alarm and saturation levels, low alarm	★
C6[10]	Custom alarm and saturation levels, high alarm (requires C1 and Configuration Data Sheet)	★
C7[10]	Custom alarm and saturation levels, low alarm (requires C1 and Configuration Data Sheet)	★
C8[10]	Low alarm (standard Rosemount alarm and saturation levels)	★
Special configuration (hardware)		
D2[11]	1/2–14 NPT flange adapters	★
D4[12]	External ground screw assembly	★
D5[11]	Delete transmitter drain/vent valves (install plugs)	★
D7[11]	Coplanar flange without drain/vent ports	
D9[11]	RC 1/2 flange adapters	
Product certifications		
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; Nonincendive	★
K5	FM Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
E6[13]	CSA Explosion-proof, Dust Ignition-proof, Division 2	★
I6	CSA Intrinsically Safe	★
K6[13]	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	★

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K2	INMETRO Flameproof, Intrinsic Safety, Type n	★
E3	China Flameproof	★
I3	China Intrinsic Safety, Dust Ignition-proof	★
EP	Korea Flameproof	★
IP	Korea Intrinsic Safety	★
KP	Korea Flameproof, Intrinsic Safety	★
EM	Technical Regulations Customs Union (EAC) Flameproof	★
IM	Technical Regulations Customs Union (EAC) Intrinsic Safety	★
KM	Technical Regulations Customs Union (EAC) Flameproof, Intrinsic Safety	★
KA[13]	ATEX and CSA Flameproof, Intrinsically Safe, Division 2	★
KB[13]	FM and CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
KC	FM and ATEX Explosion-proof, Intrinsically Safe, Division 2	★
KD[13]	FM, CSA, and ATEX Explosion-proof, Intrinsically Safe	★
Shipboard approvals		
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	★
Calibration certification		
Q4	Calibration certificate	★
QP	Calibration certificate and tamper evident seal	★
Material traceability certification		
Q8	Material traceability certification per EN 10204 3.1	★
Quality certification for safety		
QS	Prior-use certificate of FMEDA Data	★
QT	Safety certified to IEC 61508 with certificate of FMEDA data	★
Surface finish certification[14]		
Q16	Surface finish certification for hygienic remote seals	★
Toolkit performance reports[15]		
QZ	Remote seal system performance calculation report	★
Terminal blocks[10]		
T1	Transient terminal block	★
Sensor fill fluid[16]		
L1	Inert sensor fill fluid	★

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O-ring		
L2	Graphite-filled PTFE O-ring	★
Bolting material(11)		
L4	Austenitic 316 SST bolts	★
L5(3)	ASTM A 193, Grade B7M bolts	★
L6	Alloy K–500 bolts	★
L7(3)	ASTM A 453, class D, grade 660 bolts	★
L8	ASTM A 193, class 2, grade B8M bolts	★
Display type (ERS primary only)(10)		
M5	PlantWeb LCD display	★
M7(17)	Remote mount LCD display and interface, PlantWeb housing, no cable, SST bracket	★
M8	Remote mount LCD display and interface, PlantWeb housing, 50 ft. (15,2 m) cable, SST bracket	★
M9	Remote mount LCD display and interface, PlantWeb housing, 100 ft. (30,5 m) cable, SST bracket	★

Pressure testing		
P1	Hydrostatic testing with certificate	
Special cleaning(11)		
P2	Cleaning for special services	
P3	Cleaning for less than 1 PPM chlorine/fluorine	
NACE certificate(3)		
Q15	Certificate of compliance to NACE® MR0175/ISO 15156 for wetted materials	★
Q25	Certificate of compliance to NACE MR0103 for wetted materials	★
Typical model number: 3051SAM 1 S T 2A 2 E11 A 2A		

1. For detailed specifications see "Specifications" on page 126. The Rosemount 3051S ERS System offers three performance class options; Classic, Ultra, and Enhanced ERS System Performance. The Classic and Ultra performance classes are suited to lower static pressure and stable temperature conditions. The Enhanced ERS System Performance class provides better performance across temperature (–40 to 185 °F) with improved performance at higher static pressure.
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. Order with Q15 or Q25 to receive a NACE certificate.
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. Maxium cable distance for SIS installations. See Rosemount 3051S ERS Reference Manual for more information.
9. Maxium cable distance for IS (Intrinsically safe) installations. Other options may not be valid at longer distances.
10. Not available with Configuration Type code S.
11. Not available with Process Connection code A11.
12. This assembly is included with options E1, N1, K1, ND, E4, E7, N7, K7, E2, KA, KC, KD, K2, T1, EP, and KP.
13. Not available with M20 or G $^1/_2$ conduit entry size.

14. Q16 is only available when the diaphragm seal has surface finish options.
15. 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).
16. Silicone fill fluid is standard.
17. See the Rosemount 3051S Reference Manual for cable requirements. Contact an Emerson representative for additional information.

Rosemount 3051SAL Transmitter for ERS Applications

- Integrated transmitter and direct mount diaphragm seal system in a single model number
- Variety of process connections including flanged, threaded, and hygienic remote seals
- Available with 15-year limited warranty

Specification and selection of product materials, options, or components must be made by the purchaser of the equipment. See page 135 for more information on material selection.

A Rosemount 3051SAL Scalable ERS Level Transmitter consists of three parts. First, specify the transmitter model codes found on page 14. Then, specify a direct mount seal found on page 34. Finish the model number by specifying all desired options on page 17.

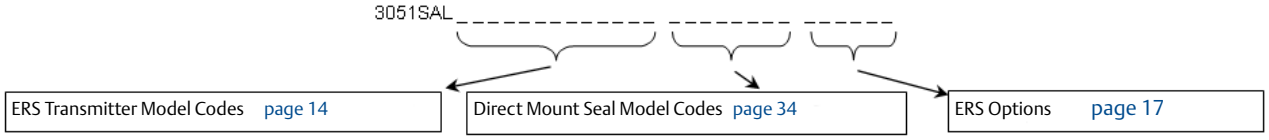


Table 2. Rosemount 3051SAL Transmitter for ERS Applications Ordering Information

★ 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				
3051SAL	Scalable advanced level transmitter				
Performance class[1]					
1	Ultra: 0.055% span accuracy, 150:1 rangedown, 15-year limited warranty				★
2	Classic: 0.065% span accuracy, 150:1 rangedown				★
4	Enhanced ERS System performance, 15-year limited warranty				★
Configuration type					
P	Electronic remote sensor - primary				★
S	Electronic remote sensor - secondary				★
Pressure module type		**Pressure sensor type**			
G	Coplanar	Gage			★
T	In-line	Gage			★
E	In-line	Absolute			★
A	Coplanar	Absolute			
Pressure range[2]					
	Coplanar gage	**In-line gage**	**In-line absolute**	**Coplanar absolute**	
1A	N/A	–14.7 to 30 psig (–1.01 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 inH_2O (–621.60 to 621.60 mbar)	–14.7 to 150 psig (–1.01 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 inH_2O (–0.97 to 2.48 bar)	–14.7 to 800 psig (–1.01 to 55.15 bar)	0 to 800 psia (0 to 55.15 bar)	0 to 800 psia (0 to 55.15 bar)	★
4A	–14.2 to 300 psig (–0.97 to 20.68 bar)	–14.7 to 4000 psig (–1.01 to 275.79 bar)	0 to 4000 psia (0 to 275.79 bar)	0 to 4000 psia (0 to 275.79 bar)	★
5A	–14.2 to 2000 psig (–0.97 to 137.89 bar)	–14.7 to 10000 psig (–1.01 to 689.47 bar)	0 to 10000 psia (0 to 689.47 bar)	N/A	★

Table 2. Rosemount 3051SAL Transmitter for ERS Applications 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 output				
A	4–20 mA with digital signal based on HART protocol			★
Housing style		**Material**	**Conduit entry size**	
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	★
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				
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	★
2C	Junction box	Aluminum	G1/2	
Seal system type				
Coplanar pressure module type				
1	Single direct mount seal system		Welded-repairable	★
2	Single direct mount seal system		All welded	★
In-line pressure module type				
1	Single direct mount seal system		All welded	★
High side connection type				
Single direct mount seal system (between transmitter and remote seal)				
0	No extension			★
2	2-in. (50 mm) extension			★
4	4-in. (100 mm) extension			★
6[(3)]	Thermal range expander - Silicone 200 secondary fill fluid			★
7[(4)(3)]	Thermal range expander - SYLTHERM™ XLT secondary fill fluid			★

Table 2. Rosemount 3051SAL Transmitter for ERS Applications 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.

Low side connection type (reference pressure connection)							
Single direct mount seal system							
00	None (In-line pressure module type only)						★
20	316L SST Isolator/SST transmitter flange						★
30	Alloy C-276 Isolator/SST transmitter flange						★
Seal fill fluid		**Specific gravity at 77 °F (25 °C)**	**Temperature limits[5]**				
			No extension	**2-in. (50 mm) extension**	**4-in. (100 mm) extension**	**Thermal range expander (process temperature)[6]**	
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)	N/A	★
F	Silicone 200 for vacuum applications	0.93	For use in vacuum applications below 14.7 psia (1 bar-a), refer to vapor pressure curves in Rosemount DP Level Fill Fluid Specification Technical Note				★
L	Silicone 704	1.07	32 to 401 °F[3] (0 to 205 °C)	32 to 464 °F[3] (0 to 240 °C)	32 to 500 °F[3] (0 to 260 °C)	Up to 599 °F (315 °C)	★
C	Silicone 704 for vacuum applications	1.07	For use in vacuum applications below 14.7 psia (1 bar-a), refer to vapor pressure curves in Rosemount DP Level Fill Fluid Specification Technical Note				★
R	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)	Up to 698 °F (370 °C)	★
V	Silicone 705 for vacuum applications	1.09	For use in vacuum applications below 14.7 psia (1 bar-a), refer to vapor pressure curves in Rosemount DP Level Fill Fluid Specification Technical Note				★
A	SYLTHERM XLT	0.85	–157 to 293 °F (–105 to 145 °C)	–157 to 293 °F (–105 to 145 °C)	–157 to 293 °F (–105 to 145 °C)	N/A	★
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)	N/A	★
G[7][8]	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)	N/A	★
N[7]	Neobee® M-20	0.92	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)	N/A	★
P[7][8]	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)	N/A	★
Y[9]	UltraTherm™ 805	1.20	N/A	N/A	N/A	Up to 770 °F (410 °C)	★
Z[9]	UltraTherm 805 for Vacuum Applications	1.20	For use in vacuum applications below 14.7 psia (1 bar-a), refer to vapor pressure curves in Rosemount DP Level Fill Fluid Specification Technical Note				★

Table 2. Rosemount 3051SAL Transmitter for ERS Applications 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.

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

	page 82	FF flush flanged seal	Process connections: 2-in./DN 50/50A 3-in./DN 80/80A 4-in./DN 100/100A
	page 90	EF extended flanged seal	3-in./DN 80/80A 4-in./DN 100/100A
	page 86	RF remote flanged seal	1/2-in. 3/4-in. 1-in./DN 25/25A 1 1/2-in./DN 40/40A
	page 96	FC flush flanged seal - ring type joint (RTJ) gasket surface	2-in. 3-in.
	page 98	RC ring type joint (RTJ) flanged seal	1/2-in. 3/4-in. 1-in. 1 1/2-in.
	page 103	RT remote threaded seal	1/4–18 NPT 1/2–14 NPT 3/4–14 NPT 1–11.5 NPT 1 1/4–11.5 NPT
	page 108	SC hygienic Tri Clamp seal	1.5-in. 2-in. 3-in.
	page 110	SS hygienic tank spud seal	4-in.

Options (include with selected model number)

Extended product warranty		
WR3	3-year limited warranty	★
WR5	5-year limited warranty	★
Electronic remote sensor connection cable[10]		
R02	25 ft. (7,62 m) spool of Electronic Remote Sensor cable (gray color)	
R05	50 ft. (15,2 m) spool of Electronic Remote Sensor cable (gray color)	★
R10	100 ft. (30,5 m) spool of Electronic Remote Sensor cable (gray color)	★
R15	150 ft. (45,7 m) spool of Electronic Remote Sensor cable (gray color)	★

Table 2. Rosemount 3051SAL Transmitter for ERS Applications 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.**

R20[11]	200 ft. (60,96 m) spool of Electronic Remote Sensor cable (gray color)	
R22[12]	225 ft. (68,58 m) spool of Electronic Remote Sensor cable (gray color)	
R30	300 ft. (91,44 m) spool of Electronic Remote Sensor cable (gray color)	
R40	200 ft. (60,96 m) spool of Electronic Remote Sensor cable (gray color)	
R50	200 ft. (60,96 m) spool of Electronic Remote Sensor cable (gray color)	
H02	25 ft. (7,62 m) spool of Electronic Remote Sensor cable (blue color)	
H05	50 ft. (15,2 m) spool of Electronic Remote Sensor cable (blue color)	
H10	100 ft. (30,5 m) spool of Electronic Remote Sensor cable (blue color)	
H15	150 ft. (45,7 m) spool of Electronic Remote Sensor cable (blue color)	
H20[8]	200 ft. (60,96 m) spool of Electronic Remote Sensor cable (blue color)	
H22[9]	225 ft. (68,58 m) spool of Electronic Remote Sensor cable (blue color)	
J02	25 ft. (7,62 m) spool of Electronic Remote Sensor armored cable	
J05	50 ft. (15,2 m) spool of Electronic Remote Sensor armored cable	
J07	75 ft. (22,8 m) spool of Electronic Remote Sensor armored cable	
J10	100 ft. (30,5 m) spool of Electronic Remote Sensor armored cable	
J12[9]	125 ft. (38,1 m) spool of Electronic Remote Sensor armored cable	
Software configuration[13]		
C1	Custom software configuration (requires Configuration Data Sheet)	★
Gage pressure calibration		
C3	Gage pressure calibration on Rosemount 3051SAL_ _A4 only	★
Alarm limit[13]		
C4	NAMUR alarm and saturation levels, high alarm	★
C5	NAMUR alarm and saturation levels, low alarm	★
C6	Custom alarm and saturation levels, high alarm (requires C1 and Configuration Data Sheet)	★
C7	Custom alarm and saturation levels, low alarm (requires C1 and Configuration Data Sheet)	★
C8	Low alarm (standard Rosemount alarm and saturation levels)	★
Ground screw[14]		
D4	External ground screw assembly	★
Conduit plug		
DO	316 SST conduit plug	★
Product certifications		
E1	ATEX Flameproof	★
I1	ATEX Intrinsic Safety	★
N1	ATEX Type n	★

Table 2. Rosemount 3051SAL Transmitter for ERS Applications 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.

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; Nonincendive	★
K5	FM Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
E6[15]	CSA Explosion-proof, Dust Ignition-proof, Division 2	★
I6	CSA Intrinsically Safe	★
K6[15]	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
E7	IECEx Flameproof	★
I7	IECEx Intrinsic Safety	★
N7	IECEx Type n	★
Product certifications		
K7	IECEx Flameproof, Intrinsic Safety, Type n	★
E2	INMETRO Flameproof	★
I2	INMETRO Intrinsically Safe	★
K2	INMETRO Flameproof, Intrinsic Safety	★
EP	Korea Flameproof	★
Product certifications		
E3	China Flameproof	★
I3	China Intrinsic Safety	★
IP	Korea Intrinsic Safety	★
KP	Korea Flameproof, Intrinsic Safety	★
EM	Technical Regulations Customs Union (EAC) Flameproof	★
IM	Technical Regulations Customs Union (EAC) Intrinsic Safety	★
KM	Technical Regulations Customs Union (EAC) Flameproof, Intrinsic Safety	★
KA[15]	ATEX and CSA Flameproof, Intrinsically Safe, Division 2	★
KB[15]	FM and CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
KC	FM and ATEX Explosion-proof, Intrinsically Safe, Division 2	★
KD[15]	FM, CSA, and ATEX Explosion-proof, Intrinsically Safe	★
Shipboard approvals		
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 2. Rosemount 3051SAL Transmitter for ERS Applications 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.**

Sensor fill fluid[16]		
L1	Inert sensor fill fluid	★
O-ring		
L2	Graphite-filled PTFE O-ring	★
Bolting material		
L4	Austenitic 316 SST bolts	★
Display type (ERS primary only)[13]		
M5	PlantWeb LCD display	★
M7[17]	Remote mount LCD display and Interface, PlantWeb housing, No Cable, SST bracket	★
M8	Remote mount LCD display and Interface, PlantWeb housing, 50 ft. (15,2 m) Cable, SST bracket	★
M9	Remote mount LCD display and Interface, PlantWeb housing, 100 ft. (30,5 m) Cable, SST bracket	★
Pressure testing		
P1	Hydrostatic testing with certificate	
Special cleaning		
P2	Cleaning for special services	
P3	Cleaning for less than 1 PPM chlorine/fluorine	
Calibration certification		
Q4	Calibration certificate	★
QP	Calibration certificate with tamper evident seal	★
Material traceability certification		
Q8	Material traceability certification per EN 10204 3.1	★
Quality certification for safety		
QS	Prior-use certificate of FMEDA data	★
QT	Safety certified to IEC 61508 with certificate of FMEDA data	★
Toolkit performance reports[18]		
QZ	Remote seal system performance calculation report	★
Transient protection[13]		
T1	Transient terminal block	★

Table 2. Rosemount 3051SAL Transmitter for ERS Applications 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.

NACE certificate[19]		
Q15	Certificate of Compliance to NACE MR0175/ISO 15156 for wetted materials	★
Q25	Certificate of Compliance to NACE MR0103 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. For detailed specifications see "Specifications" on page 126. The Rosemount 3051S ERS System offer three performance class options; Classic, Ultra, and Enhanced ERS System Performance. The Classic and Ultra performance classes are suited to lower static pressure and stable temperature conditions. The Enhanced ERS System Performance class provides better performance across temperature (–40 to 185 °F) with improved performance at higher static pressure.
2. Not suitable for vacuum applications.
3. Maximum working pressure (MWP) of the Thermal Range Expander is 1500 psi (103,4 bar).
4. Thermal Range Expander with SYLTHERM XLT secondary fill fluid is not recommended for use in vacuum applications below 6 psia (400 mbar-a).
5. 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.
6. For complete process and ambient temperature limits, see Thermal Range Expander temperature operating range on page 134.
7. This is a food grade fill fluid.
8. Not suitable for vacuum applications.
9. Only available with Thermal Range Expander.
10. The pressure range should be specified based on the maximum static pressure, not differential pressure.
11. Maxium cable distance for SIS installations. See Rosemount 3051S ERS Reference Manual for more information.
12. Maxium cable distance for IS (Intrinsically safe) installations. Other options may not be valid at longer distances.
13. Not available with Configuration Type code S.
14. This assembly is included with options EP, KP, E1, N1, K1, ND, E4, E7, N7, K7, E2, KA, KC, KD, K2, T1, E3, EM, KM.
15. Not available with M20 or G^1/2 conduit entry size.
16. Silicone fill fluid is standard.
17. See the Rosemount 3051S Reference Manual for cable requirements. Contact an Emerson representative for additional information.
18. 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).
19. 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.

Rosemount 3051S Scalable™ Level Transmitter

Rosemount 3051SAL In-Line with "FF" Flanged Seal

Rosemount 30 51SAL Coplanar™ with "SS" Hygienic Tank Spud Seal

Rosemount 3051SAL Tuned-System Assembly with Thermal Range Expander

Rosemount 3051SAL Balanced System

Rosemount 3051S Level Transmitters combine the features and benefits of a high-performance Rosemount 3051S Pressure Transmitter with the durability and reliability of diaphragm seals all in a single model number.

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 126

Dimensional drawings: page 164

Rosemount 3051SAL Scalable Level Transmitter

Specification and selection of product materials, options, or components must be made by the purchaser of the equipment. See page 135 for more information on material selection.

A Rosemount 3051SAL Scalable Level Transmitter consists of three parts. First, specify the transmitter model codes found on page 22. Then, specify a direct mount seal found on page 34. Finish the model number by specifying all desired options on page 29.

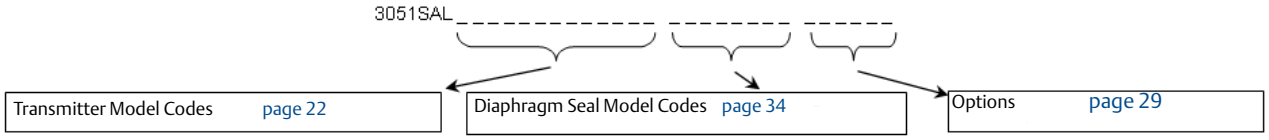


Table 3. Rosemount 3051SAL Scalable Level Transmitter Ordering Information

★ 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	
3051SAL	Scalable level transmitter	
Performance class[1]		
1	Ultra: 0.055% span accuracy, 150:1 rangedown, 15-year limited warranty	★
2	Classic: 0.065% span accuracy, 150:1 rangedown	★
Configuration type		
C	Liquid level transmitter	★

Table 3. Rosemount 3051SAL Scalable 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.

Pressure module type						
D	Coplanar	Differential				★
G	Coplanar	Gage				★
T	In-line	Gage				★
E	In-line	Absolute				★
A	Coplanar	Absolute				
Pressure range						
	Coplanar DP	**Coplanar gage**	**In-line gage**	**In-line absolute**	**Coplanar absolute**	
1A	N/A	N/A	-14.7 to 30 psig (-1,01 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 inH_2O (−621,60 to 621,60 mbar)	−250 to 250 inH_2O (−621,60 to 621,60 mbar)	−14.7 to 150 psig (−1,01 to 10,34 bar)	0 to 150 psia (0 to 10,34 bar)	0 to 150 psia (0 to 10,34 bar)	★
3A	−1000 to 1000 inH_2O (−2,48 to 2,48 bar)	−393 to 1000 inH_2O (−0,97 to 2,48 bar)	−14.7 to 800 psig (−1,01 to 55,15 bar)	0 to 800 psia (0 to 55,15 bar)	0 to 800 psia (0 to 55,15 bar)	★
4A	−300 to 300 psi (−20,68 to 20,68 bar)	−14.2 to 300 psig (−0,97 to 20,68 bar)	−14.7 to 4000 psig (−1,01 to 275,79 bar)	0 to 4000 psia (0 to 275,79 bar)	0 to 4000 psia (0 to 275,79 bar)	★
5A	−2000 to 2000 psi (−137,89 to 137,89 bar)	−14.2 to 2000 psig (−0,97 to 137,89 bar)	−14.7 to 10000 psig (−1,01 to 689,47 bar)	0 to 10000 psia (0 to 689,47 bar)	N/A	★
Transmitter output						
A	4–20 mA with digital signal based on HART protocol					★
F[2]	FOUNDATION Fieldbus protocol					★
X[3]	Wireless (requires wireless options and wireless PlantWeb housing)					★
Housing style				**Material**	**Conduit entry**	
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[4]	Wireless PlantWeb housing			Aluminum	1/2–14 NPT	★
5J[4]	Wireless PlantWeb housing			SST	1/2–14 NPT	★

Table 3. Rosemount 3051SAL Scalable 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.

7J[5]	Quick connect (A size mini, 4-pin male termination)		SST	N/A	★
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	
Seal system type					
Coplanar pressure module type			**In-line pressure module type**		
1	Direct mount single seal system	Welded-repairable	Direct mount single seal system	Welded-repairable	★
2	Direct mount single seal system	All welded	N/A	N/A	★
3[6]	Tuned-system assembly - one direct mount and one remote mount seal with capillary	Welded-repairable	N/A	N/A	★
4[6]	Tuned-system assembly - one direct mount and one remote mount seal with capillary	All welded	N/A	N/A	★
5[6]	Balanced system - two remote mount seals with equal lengths of capillary	Welded-repairable	N/A	N/A	★
6[6]	Balanced system - two remote mount seals with equal lengths of capillary	All welded	N/A	N/A	★
7	Remote mount single seal system with capillary - 316L low side transmitter isolator	Welded-repairable	Remote mount single seal system with capillary	All welded	★
8	Remote mount single seal system with capillary - 316L low side transmitter isolator	All welded	N/A	N/A	★
9	Remote mount single seal system with capillary - Alloy C-276 low side transmitter isolator	Welded-repairable	N/A	N/A	★
A	Remote mount single seal system with capillary - Alloy C-276 low side transmitter isolator	All welded	N/A	N/A	★

High side connection type [select based on seal system type chosen]							
	Single seal system				**Dual seal system**		
	Direct mount		**Remote mount with capillary**		**Tuned-system assembly**	**Balanced system**	
	Coplanar	**In-line**	**Coplanar**	**In-line**	**Coplanar**	**Coplanar**	
0	No extension	No extension	Standard	Standard	No extension/ Standard	Standard	★
2	2-in. (50 mm) extension	N/A	N/A	N/A	2-in. (50 mm) extension	N/A	★

Table 3. Rosemount 3051SAL Scalable 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.

4	4-in. (100 mm) extension	N/A	N/A	N/A	4-in. (100 mm) extension	N/A	★
6[7]	Thermal Range Expander - Silicone 200 secondary fill	Thermal Range Expander - Silicone 200 secondary fill	Thermal Range Expander - Silicone 200 secondary fill fluid single capillary	Thermal Range Expander - Silicone 200 secondary fill single capillary	Thermal Range Expander - Silicone 200 secondary fill with low side capillary	Thermal Range Expander - Silicone 200 secondary fill with low side capillary	★
High side connection type [select based on seal system type chosen]							
	Single seal system				**Dual seal system**		
	Direct mount		**Remote mount with capillary**		**Tuned-system assembly**	**Balanced system**	
7[7]	Thermal Range Expander - SYLTHERM XLT secondary fill fluid	Thermal Range Expander - SYLTHERM XLT secondary fill fluid	Thermal Range Expander - SYLTHERM XLT secondary fill fluid single capillary	Thermal Range Expander - SYLTHERM XLT secondary fill fluid single capillary	Thermal Range Expander - SYLTHERM XLT secondary fill with low side capillary	Thermal Range Expander - SYLTHERM XLT secondary fill with low side capillary	★
Low side connection type or capillary I.D							
	Material for low side reference connection		**Capillary I.D.**				
	Direct mount		**Remote mount with capillary**		**Tuned-system assembly**	**Balanced system**	
	Coplanar	**In-line**	**Coplanar or in-line**		**Coplanar**	**Coplanar**	
0	N/A	No reference connection	N/A		N/A	N/A	★
1[8][9]	Assemble to one Rosemount 1199 Remote seal	N/A	N/A		N/A	N/A	★
2	316L SST isolator and SST transmitter flange	N/A	N/A		N/A	N/A	★
3	Alloy C-276 isolator and SST transmitter flange	N/A	N/A		N/A	N/A	★
B	N/A	N/A	0.03-in. (0,711 mm) ID capillary		0.03-in. (0,711 mm) ID capillary	0.03-in. (0,711 mm) ID capillary	★
C	N/A	N/A	0.04-in. (1,092 mm) ID capillary		0.04-in. (1,092 mm) ID capillary	0.04-in. (1,092 mm) ID capillary	★
D	N/A	N/A	0.075-in. (1,905 mm) ID capillary		0.075-in. (1,905 mm) ID capillary	0.075-in. (1,905 mm) ID capillary	★

Table 3. Rosemount 3051SAL Scalable 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.

E	N/A	N/A	0.03-in. (0,711 mm) ID capillary, PVC coated with closed end	0.03-in. (0,711 mm) ID capillary, PVC coated with closed end	0.03-in. (0,711 mm) ID capillary, PVC coated with closed end	★
F	N/A	N/A	0.04-in. (1,092 mm) ID capillary, PVC coated with closed end	0.04-in. (1,092 mm) ID capillary, PVC coated with closed end	0.04-in. (1,092 mm) ID capillary, PVC coated with closed end	★
G	N/A	N/A	0.075-in. (1,905 mm) ID capillary, PVC coated with closed end	0.075-in. (1,905 mm) ID capillary, PVC coated with closed end	0.075-in. (1,905 mm) ID capillary, PVC coated with closed end	★
Capillary length[(10)]						
0	No capillary (required for direct mount single seal system)					★
A	1 ft. (0,3 m)					★
B	5 ft. (1,5 m)					★
C	10 ft. (3,0 m)					★
D	15 ft. (4,5 m)					★
E	20 ft. (6,1 m)					★
F	25 ft. (7,6 m)					★
G	30 ft. (9,1 m)					★
H	35 ft. (10,7 m)					★
J	40 ft. (12,2 m)					★
K	45 ft. (13,7 m)					★
L	50 ft. (15,2 m)					★
M	0,5 m (1.6 ft.)					★
N	1,0 m (3.3 ft.)					★
P	1,5 m (4.9 ft.)					★
R	2,0 m (6.6 ft.)					★
T	2,5 m (8.2 ft.)					★
U	3,0 m (9.8 ft.)					★
V	3,5 m (11.5 ft.)					★
W	4,0 m (13.1 ft.)					★
Y	5,0 m (16.4 ft.)					★
Z	6,0 m (19.7 ft.)					★
1	7,0 m (23 ft.)					★

Table 3. Rosemount 3051SAL Scalable 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.

2	8,0 m (26.2 ft.)	★
3	9,0 m (29.5 ft.)	★
4	10,0 m (32.8 ft.)	★
5	11,0 m (36.1 ft.)	★
6	12,0 m (39.4 ft.)	★
7	13,0 m (42.6 ft.)	★
8	14,0 m (45.9 ft.)	★
9	15,0 m (49.2 ft.)	★

Seal fill fluid		Specific gravity at 77 °F (25 °C)	Temperature limits[11]				
			No extension	2-in. (50 mm) extension	4-in. (100 mm) extension	Thermal range expander (process temperature)[12]	
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)	N/A	★
F	Silicone 200 for vacuum applications	0.93	For use in vacuum applications below 14.7 psia (1 bar-a), refer to vapor pressure curves in Rosemount DP Level Fill Fluid Specification Technical Note.				★
L	Silicone 704	1.07	32 to 401 °F (0 to 205 °C)	32 to 464 °F (0 to 240 °C)	32 to 500 °F (0 to 260 °C)	Up to 599 °F (315 °C)	★
C	Silicone 704 for vacuum applications	1.07	For use in vacuum applications below 14.7 psia (1 bar-a), refer to vapor pressure curves in Rosemount DP Level Fill Fluid Specification Technical Note.				★
R	Silicone 705	1.09	68 to 401 °F (20 to 205 °C)	68 to 464 °F (20 to 240 °C)	68 to 500 °F (20 to 260 °C)	Up to 698 °F (370 °C)	★
V	Silicone 705 for vacuum applications	1.09	For use in vacuum applications below 14.7 psia (1 bar-a), refer to vapor pressure curves in Rosemount DP Level Fill Fluid Specification Technical Note.				★
Y[13]	UltraTherm 805	1.20	N/A	N/A	N/A	Up to 770 °F (410 °C)	★
Z[13]	UltraTherm 805 for vacuum applications	1.20	For use in vacuum applications below 14.7 psia (1 bar-a), refer to vapor pressure curves in Rosemount DP Level Fill Fluid Specification Technical Note.				★
A	SYLTHERM XLT	0.85	–157 to 293 °F (–105 to 145 °C)	–157 to 293 °F (–105 to 145 °C)	–157 to 293 °F (–105 to 145 °C)	N/A	★
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)	N/A	★
N[14]	Neobee M-20	0.92	5 to 401 °F (–15 to 205 °C)	5 to 437 °F (–15 to 225 °C)	5 to 437 °F (–15 to 225 °C)	N/A	★
G[9][14]	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)	N/A	★
P[9][14]	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)	N/A	★

Table 3. Rosemount 3051SAL Scalable 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.

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

Seal style			Process connections
	page 34	FF flush flanged seal	2-in./DN 50/ 50A 3-in./DN 80/80A 4-in./DN 100/100A
	page 37	EF extended flanged seal	3-in./DN 80/80A 4-in./DN 100/100A
	page 39	RF remote flanged seal	1/2-in. 3/4-in. 1-in./DN 25/25A 1 1/2-in./DN 40/40A
	page 42	PF pancake seal	2-in./DN 50/50A 3-in./DN 80/80A
	page 45	FC flush flanged seal - ring type joint (RTJ) gasket surface	2-in. 3-in.
	page 47	RC remote flange seal - ring type joint (RJT) gasket surface	1/2-in 3/4-in 1-in. 1 1/2-in.
	page 49	RT remote threaded seal	1/4–18 NPT 1/2–14 NPT 3/4–14 NPT 1–11.5 NPT 1 1/4–11.5 NPT
	page 51	SC hygienic Tri Clamp seal	1 1/2-in. 2-in. 3-in.
	page 52	SS hygienic tank spud Seal	4-in.

Table 3. Rosemount 3051SAL Scalable 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.

Wireless options (requires option code X and wireless PlantWeb housing)

Update rate[4]		
WA	User configurable update rate	★
Operating frequency and protocol		
3	2.4 GHz DSSS, IEC 62591 (*Wireless*HART®)	★
Omni-directional wireless antenna		
WK[4]	External antenna	★
WM[4]	Extended range, external antenna	★
WN	High-gain, remote antenna	
SmartPower[15][16]		
1	Adapter for Black Power Module (I.S. Power Module sold separately)	★

Options (include with selected model number)

Extended product warranty		
WR3	3-year limited warranty	★
WR5	5-year limited warranty	★
PlantWeb control functionality[16][17][18]		
A01	FOUNDATION Fieldbus advanced control function block suite	★
PlantWeb diagnostic functionality		
D01[16][17]	FOUNDATION Fieldbus diagnostics suite	★
DA2[19]	Advanced HART diagnostics suite	★
Mounting bracket		
B4	Bracket, all SST, 2-in. pipe panel	★
Software configuration[20]		
C1	Custom software configuration (requires Configuration Data Sheet)	★
Gage pressure calibration		
C3	Gage pressure calibration on Rosemount 3051SAL_ _A4 only	★
Alarm limit[17][20]		
C4	NAMUR alarm and saturation levels, high alarm	★
C5	NAMUR alarm and saturation levels, low alarm	★
C6	Custom alarm and saturation signal levels, high alarm (requires C1 and Configuration Data Sheet)	★
C7	Custom alarm and saturation signal levels, low alarm (requires C1 and Configuration Data Sheet)	★
C8	Low alarm (standard Rosemount alarm and saturation levels)	★

Table 3. Rosemount 3051SAL Scalable 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.

Hardware adjustments[17][20][21]		
D1	Hardware adjustments (zero, span, alarm, security)	★
Flange adapter		
D2	1/2-14 NPT flange adapter	★
D9	RC 1/2 SST flange adapter	
Ground screw[22]		
D4	External ground screw assembly	★
Drain/vent valve		
D5	Delete transmitter drain/vent valves (install plugs)	★
Conduit plug[23]		
DO	316 SST conduit plug	★
Product certifications[24]		
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; Nonincendive	★
IE	FM FISCO Intrinsically Safe (FOUNDATION Fieldbus protocol only)	★
K5	FM Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
E6[25]	CSA Explosion-proof, Dust Ignition-proof, Division 2	★
I6	CSA Intrinsically Safe	★
IF	CSA FISCO Intrinsically Safe (FOUNDATION Fieldbus protocol only)	★
K6[25]	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
D3[26]	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	★

Table 3. Rosemount 3051SAL Scalable 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.

I2	INMETRO Intrinsic Safety	★
IB	INMETRO FISCO Intrinsic Safety	★
K2	INMETRO Flameproof, Intrinsic Safety	★
E3	China Flameproof	★
I3	China Intrinsic Safety, Dust Ignition-proof	★
EP	Korea Flameproof	★
IP	Korea Intrinsic Safety	★
KP	Korea Flameproof, Intrinsic Safety	★
EM	Technical Regulations Customs Union (EAC) Flameproof	★
IM	Technical Regulations Customs Union (EAC) Intrinsic Safety	★
KM	Technical Regulations Customs Union (EAC) Flameproof, Intrinsic Safety	★
KA[25]	ATEX and CSA Flameproof, Intrinsically Safe, Division 2	★
KB[25]	FM and CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
KC	FM and ATEX Explosion-proof, Intrinsically Safe, Division 2	★
KD[25]	FM, CSA, and ATEX Explosion-proof, Intrinsically Safe	★
Shipboard approvals		
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	★
Sensor fill fluid[27]		
L1	Inert sensor fill fluid	★
O-ring		
L2	Graphite-filled PTFE O-ring	★
Bolting material		
L4	Austenitic 316 SST bolts	★
L5[28]	ASTM A193, Grade B7M bolts	★
L6	Alloy K–500 bolts	★
L7[28]	ASTM A453, Class D, Grade 660 bolts	★
L8	ASTM A193, Class 2, Grade B8M bolts	★
Display type[17][29][30]		
M5[31]	PlantWeb LCD display	★
M7	Remote mount LCD display and interface, PlantWeb housing, no cable, SST bracket	★
M8	Remote mount LCD display and interface, PlantWeb housing, 50 ft. (15 m) cable, SST bracket	★
M9	Remote mount LCD display and interface, PlantWeb housing, 100 ft. (31 m) cable, SST bracket	★

Table 3. Rosemount 3051SAL Scalable 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.

Pressure testing		
P1	Hydrostatic testing with certificate	
Special cleaning		
P2	Cleaning for special services	
P3	Cleaning for less than 1PPM chlorine/fluorine	
Calibration certification		
Q4	Calibration certificate	★
QP	Calibration certificate and tamper evident seal	★
Material traceability certification		
Q8	Material traceability certification per EN 10204 3.1	★
Quality certification for safety		
QS[17][20]	Prior-use certificate of FMEDA Data	★
QT[32]	Safety-certified to IEC 61508 with certificate of FMEDA data	★
Toolkit performance reports		
QZ	Remote seal system performance calculation report	★
Transient protection[33][34]		
T1	Transient terminal block	★
Conduit electrical connector[35]		
GE	M12, 4-pin, male connector (eurofast®)	★
GM	A size Mini, 4-pin, male connector (minifast®)	★
NACE certificate[28]		
Q15	Certificate of Compliance to NACE MR0175/ISO 15156 for wetted materials	★
Q25	Certificate of Compliance to NACE MR0103 for wetted materials	★
Typical model number: 3051SAL 1 C G 2A A 1A 10 20 D FF G 1 DA 0 0		

1. For detailed specifications see "Specifications" on page 126. The Rosemount 3051S ERS System offers three performance class options; Classic, Ultra, and Enhanced ERS System Performance. The Classic and Ultra performance classes are suited to lower static pressure and stable temperature conditions. The Enhanced ERS System Performance class provides better performance across temperature (–40 to 185 °F) with improved performance at higher static pressure.
2. Requires PlantWeb housing.
3. Only intrinsically safe approval codes apply.
4. Only available with output code X.
5. Available with output code A only. Available approvals are FM Intrinsically Safe; Nonincendive (option code I5), CSA Intrinsically Safe (option code I6), ATEX Intrinsic Safety (option code I1), or IECEx Intrinsic Safety (option code I7). Contact an Emerson Process Management representative for additional information.
6. Low side seal identical to high side seal.
7. Maximum working pressure (MWP) of the Thermal Range Expander is 1500 psi (103,4 bar).
8. Requires separate Rosemount 1199 model number to be selected. With option code 1, user must select Seal Location Option code M (low side of transmitter) in the Rosemount 1199 Remote Mount Seal System Model.
9. Not suitable for vacuum applications.

10. Capillary Length applies to both high and low side for Balanced Systems. Applies to Low Side Only For Tuned-System Assemblies. Applies to High Side Only for Remote Mount Single Seal Systems with Capillary.
11. 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.
12. For complete process and ambient temperature limits, see "Thermal Range Expander Temperature Operating Range" on page 134.
13. Only available with Thermal Range Expander.
14. This is a food grade fill fluid.
15. Long-Life Power Module must be shipped separately, order Power Module 701PBKKF.
16. Not available with output code A.
17. Not available with output code X.
18. With option code 10, user must select Seal Location option code M in Table 18 on page 76.
19. Requires PlantWeb housing and Output code A. Includes Hardware Adjustments as standard.
20. Not available with output code F.
21. Not available with housing style codes 2E, 2F, 2G, 2M, 5A, 5J, or 7J.
22. This assembly is included with options EP, KP, E1, N1, K1, ND, E4, E7, N7, K7, E2, E3, KA, KC, KD. IA, IB, IE. IF, IG, K2, T1, EM, and KM.
23. Transmitter is shipped with 316 SST conduit plug (uninstalled) in place of carbon steel conduit plug.
24. Valid when SuperModule™ Platform and housing have equivalent approvals.
25. Not available with M20 or G $^1/_2$ conduit entry size.
26. Requires PlantWeb housing and Hardware Adjustments option code D1. Limited availability depending on transmitter type and range. Contact an Emerson representative for additional information.
27. Silicone fill fluid is standard.
28. 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 MR0103 for sour refining environments. Order with Q15 or Q25 to receive a NACE certificate.
29. Not available with housing code 01 or 7J.
30. Not available with output code F, option code DA2, or option code QT.
31. See the 3051S Reference Manual for cable requirements. Contact an Emerson representative for additional information.
32. Not available with output code F or X. Not available with housing code 7J.
33. The T1 option is not needed with FISCO Product Certifications; transient protection is included in the FISCO product certification codes IA, IB, IE, IF, and IG.
34. Not available with Housing code 5A, 5J, or 7J.
35. Not available with Housing code 5A, 5J, or 7J. Available with Intrinsically Safe approvals only. For FM Intrinsically Safe; Nonincendive (option code I5) or FM FISCO Intrinsically Safe (option code IE), install in accordance with Rosemount drawing 03151-1009.

Diaphragm seals for Rosemount 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)

Specification and selection of product materials, options, or components must be made by the purchaser of the equipment. See page 135 for more information on material selection.

Table 4. Flush Flanged (FF) 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.

Model	Process connection			
FF	Flush flanged seal			
Process connection size				
	ANSI/ASME B16.5	**EN 1092-1/GOST 12815-80**	**JIS B2238**	
G	2-in.	DN 50	50 A	★
7	3-in.	N/A	80 A	★
J	N/A	DN 80	N/A	★
9	4-in.	DN 100	100 A	★
Flange/pressure rating				
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			★
5	ANSI/ASME B16.5 Class 900			
6	ANSI/ASME B16.5 Class 1500			
7	ANSI/ASME B16.5 Class 2500			
H	PN 63 per EN 1092-1			
J	PN 100 per EN 1092-1			
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**	
CA	316L SST	316L SST	CS	★
DA	316L SST	316L SST	316 SST	★
CB[(1)]	Alloy C-276	316L SST	CS	★

Table 4. Flush Flanged (FF) 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.

Materials of construction				
DB[(1)]	Alloy C-276	316L SST	316 SST	★
CC	Tantalum	316L SST	CS	★
DC	Tantalum	316L SST	316 SST	★
Flushing connection ring (lower housing)				
0	None			★
A[(2)]	316 SST			★
B[(2)]	Alloy C-276			★
Flushing connection quantity and size				
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			★

Options (include with selected model number)

Cold temperature remote seal applications		
RB	Extra fill fluid for cold temperature applications	
Remote seal diaphragm thickness [(3)]		
SC	0.006-in. (150 µm) diaphragm thickness	
Flushing connection ring plugs		
SF	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)	★
Lower housing alignment clamp		
SA	Lower housing alignment clamp	★
Flushing connection ring gaskets		
S0	No gasket for lower housing	★
SY	Thermo-tork TN-9000	★
SJ	PTFE gasket	★
SK	Barium sulfate-filled PTFE gasket	
SN	GRAFOIL® gasket	

Table 4. Flush Flanged (FF) 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.

Remote seal diaphragm coating		
SZ[3]	0.0002-in. (5 µm) gold plated diaphragm	
SV	PTFE coated diaphragm for non-stick purposes	

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

page 14	ERS transmitter options	
page 22	Scalable level transmitter options	

1. Not available with option code SC.
2. Supplied with Thermo-tork TN-9000 gasket if no other flushing connection ring gasket option is selected.
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

Specification and selection of product materials, options, or components must be made by the purchaser of the equipment. See page 135 for more information on material selection.

Table 5. Extended Flanged (EF) 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.

Model	Process connection				
EF	Extended flanged seal				
Process connection size					
	ANSI/ASME B16.5	**EN 1092-1/GOST 12815-80**	**JIS B2238**	**Extension diameters**	
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)	★
Flange/pressure rating					
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				★
5	ANSI/ASME B16.5 Class 900				
6	ANSI/ASME B16.5 Class 1500				
7	ANSI/ASME B16.5 Class 2500				
H	PN 63 per EN 1092-1				
J	PN 100 per EN 1092-1				
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**		
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					
20	2-in. (50 mm)				★

Table 5. Extended Flanged (EF) 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.

40	4-in. (100 mm)	★
60	6-in. (150 mm)	★

Options (include with selected model number)

Cold temperature remote seal applications		
RB	Extra fill fluid for cold temperature applications	★
Remote seal diaphragm thickness		
SC	0.006-in. (150 µm) diaphragm thickness	
Remote seal diaphragm coating		
SZ	0.0002-in. (5 µm) gold plated diaphragm	
SV	PTFE coated diaphragm for non-stick purposes	

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

page 14	ERS transmitter options	
page 22	Scalable level transmitter options	

Remote flanged (RF) seal

- Designed to improve performance on smaller process connections
- Easy installation on flanged connections ranging from 1- to 1.5-in. (DN 25–DN 40)
- Lower housing/flushing ring required.

Specification and selection of product materials, options, or components must be made by the purchaser of the equipment. See page 126 for more information on material selection.

Table 6. Remote Flanged (RF) 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.

Model	Process connection			
RF	Remote flanged seal			
Process connection size				
	ANSI/ASME B16.5	**EN 1092-1/GOST 12815-80**	**JIS B2238**	
2	1-in.	N/A	25A	★
4	1 1/2.-in.	N/A	40A	★
D	N/A	DN 25	N/A	★
F	N/A	DN 40	N/A	★
1	1/2-in.	N/A	N/A	
A	3/4-in.	N/A	N/A	
Flange/pressure rating				
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			★
5	ANSI/ASME B16.5 Class 900			
6	ANSI/ASME B16.5 Class 1500			
7	ANSI/ASME B16.5 Class 2500			
A	10K per JIS B2238			
B	20K per JIS B2238			
D	40K per JIS B2238			
Materials of construction				
	Isolating diaphragm	**Upper housing**	**Flange**	
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 6. Remote Flanged (RF) 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)[1]		
A	316L SST	★
B	Alloy C-276	★
Flushing connection quantity and size		
5	None	★
1	One 1/4–18 NPT flushing connection	★
3	Two 1/4–18 NPT flushing connections	★
Flushing connection quantity and size		
7	One 1/2–14 NPT flushing connection	
9	Two 1/2–14 NPT flushing connections	

Options (include with selected model number)

Cold temperature remote seal application		
RB	Extra fill fluid for cold temperature applications	★
Remote seal diaphragm thickness[2]		
SC	0.006-in. (150 µm) diaphragm thickness	
Flushing connection ring plugs		
SF	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)	★
Flushing ring connection gaskets		
SY	C-4401 gasket	★
SJ	PTFE gasket	★
SR	Ethylene propylene gasket	
SN	GRAFOIL gasket	
S6	TopChem 2000	
SK	Barium sulfate-filled PTFE gasket	
Remote seal bolt material		
S3	304 SST bolts	★
S4	316 SST bolts	
Remote seal diaphragm coating		
SZ[2]	0.0002-in. (5 µm) gold plated diaphragm	
SV	PTFE coated diaphragm for non-stick purposes	

Table 6. Remote Flanged (RF) 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.

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

page 14	ERS transmitter options	
page 22	Scalable level transmitter options	

1. Supplied with C-4401 Aramid fiber gasket if no other remote seal gasket material is selected.
2. Not available with Tantalum diaphragms (Material of Construction codes CC and DC).

PF pancake seal

Table 7. PF 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.**

Model	Process connection		
PF	Pancake seal		★
Process connection size			
	ANSI	**EN 1092-1/GOST 12815-80**	
G	2-in.	DN 50	★
7	3-in.	N/A	★
J	N/A	DN 80	★
Flange/pressure rating			
	ANSI	**EN 1092-1/GOST 12815-80**	
0	No flanged supplied, seal MWP based on customer supplied flange	N/A	★
9	N/A	No flanged supplied, seal MWP based on customer supplied flange	★
1	Class 150	N/A	★
2	Class 300	N/A	★
4	Class 600	N/A	★
G	N/A	PN40	★
5	Class 900	N/A	
6	Class 1500	N/A	
7	Class 2500	N/A	
H	N/A	PN63	
J	N/A	PN100	

Diaphragm and wetted, upper housing, flange material				
	Diaphragm and wetted	**Upper housing**	**Flange**	
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	★
BB	Alloy C-276, seam welded	Alloy C-276	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 7. PF 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 (lower housing)		
0	None	★
A[2]	316 SST	★
B[2]	Alloy C-276	★
Flushing connection quantity and size		
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	★

Options (include with selected model number)

Lower housing alignment clamp		
SA	Lower housing alignment clamp	★
Flushing connection ring gaskets[2]		
S0	No gasket for lower housing	★
SY	Thermo-tork TN-9000	★
SJ	PTFE gasket	★
SK	Barium sulfate-filled PTFE gasket	
SN	GRAFOIL gasket	
Flushing connection ring plugs		
SF	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)	★
Remote seal diaphragm thickness[3]		
SC	0.006-in. (150 µm) diaphragm thickness	
Cold temperature remote seal applications		
RB	Extra fill fluid for cold temperature applications	
Remote seal diaphragm coating		
SZ[3]	0.0002-in. (5 µm) gold plated diaphragm	
SV	PTFE coated diaphragm for non-stick purposes	

Table 7. PF 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.

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

page 22	Scalable level transmitter options	

1. For use with customer supplied spiral metallic gaskets.
2. Supplied with Thermo-tork TN-9000 gasket if no other flushing connection ring gasket option is selected.
3. Not available with Tantalum diaphragms (Material of Construction codes CC and DC).

FC flush flanged seal - ring type joint (RTJ) gasket surface

Table 8. FC Flush Flanged Seal - Ring Type Joint (RTJ) Gasket Surface 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	Process connection			
FC	Flush flanged seal - ring type joint gasket surface			
Process connection size				
G	2-in.			
7	3-in.			
9	4-in.			
Flange/pressure rating				
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**	
DA	316L SST	316L SST	316 SST	
KB	Alloy C-276	316L SST	316 SST	
MB	Alloy C-276	316L SST	CS	
CA	316L SST	316L SST	CS	
Flushing connection ring material (lower housing)				
0	None			
A	316 SST			
B	Alloy C-276			
Flushing connection quantity and size				
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 8. FC Flush Flanged Seal - Ring Type Joint (RTJ) Gasket Surface 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)

Flushing ring connection plugs		
SF	Alloy C-276 plug(s) for flushing connection(s)	
SG	316 SST plug(s) for flushing connection(s)	
SH	316 SST drain vent for flushing connection(s)	
Remote seal diaphragm thickness		
SC	0.006-in. (150 µm) available with 316L SST, Alloy C-276, and duplex 2507 SST for abrasive applications	
Cold temperature remote seal application		
RB	Extra fill for cold temp application	
Remote seal diaphragm coating(1)		
SZ	0.002-in. (5 µm) gold plated diaphragm	
SV	PTFE coated diaphragm for nonstick purposes only	

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

page 14	ERS transmitter options	
page 22	Scalable level transmitter options	

1. Only available on 316LSST and Alloy C-276.

RC ring type joint (RTJ) flanged seal

Table 9. RC Ring Type Joint 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.

Model	Process connection			
RC	Flush flanged seal - ring type joint gasket surface			
Process connection size				
1	1/2-in. (Class 150 to 1500 includes mounting ring bolts and mounting studs)			
A	3/4-in. (Class 150 includes mounting ring bolts and mounting studs)			
2	1-in.			
4	1 1/2-in.			
Flange/pressure rating				
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**	
DA	316L SST	316L SST	316 SST	
DB	Alloy C-276	316L SST	316 SST	
DC	Tantalum	316L SST	316 SST	
Flushing connection ring material (lower housing)(1)				
A	316L SST			
B	Alloy C-276			
F	304L SST			
H	Titanium grade 4			
2	Duplex 2205 SST			
V	Alloy 400			
Flushing ring connection and size				
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 9. RC Ring Type Joint 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.

Options (include with selected model number)

Flushing connection ring gaskets		
SY	C-4401 gasket	★
SJ	PTFE gasket	★
SR	Ethylene propylene gasket	
SN	GRAFOIL gasket	
S6	TopChem 2000	
SK	Barium sulfate-filled PTFE gasket	
Flushing connection ring plugs		
SF	Alloy C-276 plug(s) for flushing connection(s)	
SG	316 SST plug(s) for flushing connection(s)	
SH	316 SST vent/drain for flushing connection(s)	
Remote seal diaphragm thickness		
SC	0.006-in. (150 µm) available with 316L SST, Alloy C-276, and duplex 2507 SST for abrasive applications	
Remote seal bolt material		
S3[2]	304 SST bolts (only available for stud bolt design)	
S4	316 SST bolts (only available for stud bolt design)	★
Cold temperature remote seal application		
RB	Extra fill for cold temp application	
Remote seal diaphragm coating[3]		
SZ	0.002-in. (5 µm) gold plated diaphragm	
SV	PTFE coated diaphragm for nonstick purposes only	

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

page 14	ERS transmitter options	
page 22	Scalable level transmitter options	

1. Supplied with C-4401 Aramid fiber gasket if no other remote seal gasket material is selected.
2. Standard stud bolts are carbon steel.
3. Only available on 316LSST and Alloy C-276.

Remote threaded (RT) seal

- For use with threaded process connections (1/4–18 to 1–11 1/2 NPT)
- Rated for use in high-pressure applications (up to 2500 PSI)
- Optional flushing connections available

Table 10. RT 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.

Process connection style				
RT	Remote threaded seal			★
Process connection size				
3	1/2–14 NPT			★
4	3/4–14 NPT			★
5	1–11 1/2 NPT			★
1	1/4–18 NPT			
6	1 1/4 –11 1/2 NPT			
Pressure rating				
0	2500 psi			★
Isolating diaphragm material		**Upper housing material**	**Flange**	
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)]				
A	316L SST			★
B	Alloy C-276			★
Flushing ring connection quantity and size				
1	One 1/4-in. flushing connection			★
3	Two 1/4-in. flushing connections			★
5	None			★
7	One 1/2–14 NPT flushing connection			★
9	Two 1/2–14 NPT flushing connections			★

Table 10. RT 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.

Options (include with selected model number)

Cold temperature remote seal application		
RB	Extra fill fluid for cold temperature applications	★
Remote seal diaphragm thickness[3]		
SC	0.006-in. (150 µm) diaphragm thickness	
Remote seal flushing plug, drain/vent		
SF	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		
SY	C-4401 gasket (for use with flushing connection ring)	★
SJ	PTFE gasket (for use with flushing connection ring)	★
SR	Ethylene propylene gasket (for use with flushing connection ring)	★
SN	GRAFOIL gasket (for use with flushing connection ring)	★
S6	TopChem 2000 (for use with flushing connection ring)	
SK	Barium sulfate-filled PTFE gasket (for use with flushing connection ring)	
Remote seal bolt		
S3	304 SST bolts	★
S4	316 SST bolts	
Remote seal diaphragm coating		
SZ[3]	0.0002-in. (5 µm) gold plated diaphragm	
SV	PTFE coated diaphragm for non-stick purposes	
Special threads in lower housing		
R9	Male lower housing threads	

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

page 14	ERS transmitter options	
page 22	Scalable level transmitter options	

1. Supplied with C-4401 aramid fiber gasket if no other remote seal gasket material is selected.
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- to 3-in.)
- Conforms to 3-A® Standard 74-03

Table 11. SC 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.

Process connection[1]			
SC	Tri Clover style Tri Clamp seal		★
Process connection size			
3[2]	1 1/2-in.		★
5[3]	2-in.		★
7	3-in.		★
Maximum working pressure			
0	1000 PSI		★
Isolating diaphragm material		**Upper housing material**	
LA00	316L SST	316L SST	★
LB00	Alloy C-276	316L SST	

Options (include with selected model number)

Remote seal diaphragm polishing		
R6	Electropolishing	
Remote seal diaphragm surface finish		
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[4]		
Q16	Surface finish certification for hygienic remote seals	★

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

page 14	ERS transmitter options
page 22	Scalable level transmitter options

1. Clamp and gasket furnished by user. The maximum working pressure is dependent upon the clamp pressure rating.
2. Minspan is 1000 inH_2O or 2490 mbar for 1 1/2-in. Tri Clamp seal.
3. Minspan is 150 inH_2O or 373 mbar for 2-in. Tri Clamp Seal.
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 12. SS 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.

Process connection[1]			
SS	Hygienic tank spud seal		★
Process connection size			
A	4-in. Sch. 5 Tri Clamp		★
Maximum working pressure (clamp rating)			
0	600 PSI (41,37 bar)		★
Upper housing			
A	316L SST		★
Diaphragm and wetted		**Extension material**	
AL[2]	316L SST	316L SST	★
BB	Alloy C-276	316L SST	
Extension length			
2	2-in. (50 mm) extension		★
6	6-in. (150 mm) extension		★

Options (include with selected model number)

Remote seal diaphragm thickness		
SC	0.006-in. (150 µm) diaphragm thickness	
Tank spud included with shipment		
S1	Tank Spud Included with shipment	★
Remote seal diaphragm polishing		
R6	Electropolishing	
Remote seal diaphragm surface finish		
RH	20 µin. (0.5 µm) R_a diaphragm surface finish	
RG[3]	15 µin. (0.375 µm) R_a diaphragm surface finish	
Surface finish certification[4]		
Q16	Surface finishing certification for hygienic remote seals	★

Table 12. SS 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.

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

page 14	ERS transmitter options
page 22	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 Transmitter

The Rosemount 3051L Level Transmitter combines the performance and capabilities of Rosemount 3051 Transmitters with the reliability and quality of a direct mount seal in one model number. Rosemount 3051L Level Transmitters offer a variety of process connections, configurations, and fill fluid types to meet a breadth of level applications. Capabilities of a Rosemount 3051L Level Transmitter include:

- Quantify and optimize total system performance (Option code QZ)
- Tuned-System Assembly (Option code S1)
- Power Advisory can proactively detect degraded electrical loop integrity issues (Option Code DA0)
- Local Operator Interface with straightforward menus and built-in configuration buttons (Option Code M4)

Additional information:
Specifications: page 126
Certifications: page 149
Dimensional Drawings: page 164

See Specifications and options for more details on each configuration. Specification and selection of product materials, options, or components must be made by the purchaser of the equipment. See page 135 for more information on material selection.

Table 13. 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.

Transmitter type[1]			
3051L	Level transmitter		
Pressure range			
2	–250 to 250 inH_2O (–621,60 to 621,60 mbar)		★
3	–1000 to 1000 inH_2O (–2,48 to 2,48 bar)		★
4	–300 to 300 psi (–20,68 to 20,68 bar)		★
Transmitter output			
A[2]	4–20 mA with digital signal based on HART protocol		★
F	FOUNDATION Fieldbus protocol		★
W[3]	PROFIBUS® PA protocol		★
X[4]	Wireless (requires wireless options and engineered polymer housing)		★
M[5]	Low-power 1–5 Vdc with digital signal based on HART protocol		
Process connection size, diaphragm material (high side)			
Code	**Process connection size**	**Diaphragm**	
G[6]	2-in./DN 50	316L SST	★
H[6]	2-in./DN 50	Alloy C-276	★
J	2-in./DN 50	Tantalum	★

Table 13. 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.

Process connection size, diaphragm material (high side)				
A[6]	3-in./DN 80	316L SST		★
B[6]	4-in./DN 100	316L SST		★
C[6]	3-in./DN 80	Alloy C-276		★
D[6]	4-in./DN 100	Alloy C-276		★
E	3-in./DN 80	Tantalum		★
F	4-in./DN 100	Tantalum		★
Seal extension length (high side)				
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**	
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[6]	2-in.	ANSI/ASME B16.5 Class 150	316 SST	★
F[6]	3-in.	ANSI/ASME B16.5 Class 150	316 SST	★
G[6]	4-in.	ANSI/ASME B16.5 Class 150	316 SST	★
Y[6]	2-in.	ANSI/ASME B16.5 Class 300	316 SST	★
H[6]	3-in.	ANSI/ASME B16.5 Class 300	316 SST	★
J[6]	4-in.	ANSI/ASME B16.5 Class 300	316 SST	★
Z[6]	2-in.	ANSI/ASME B16.5 Class 600	316 SST	★
L[6]	3-in.	ANSI/ASME B16.5 Class 600	316 SST	★
Q	DN 50	PN 10–40 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[6]	DN 50	PN 10–40 per EN 1092-1	316 SST	★

Table 13. 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.

Mounting flange size, rating, material (high side)				
T[6]	DN 80	PN 40 per EN 1092-1	316 SST	★
U[6]	DN 100	PN 40 per EN 1092-1	316 SST	★
W[6]	DN 100	PN 10/16 per EN 1092-1	316 SST	★
7[6]	4-in.	ANSI/ASME B16.5 Class 600	316 SST	★
1	N/A	10K per JIS B2238	CS	
2	N/A	20K per JIS B2238	CS	
3	N/A	40K per JIS B2238	CS	
4[6]	N/A	10K per JIS B2238	316 SST	
5[6]	N/A	20K per JIS B2238	316 SST	
6[6]	N/A	40K per JIS B2238	316 SST	

Seal fill fluid (high side)		**Specific gravity**	**Temperature limits[7]**	
D	Silicone 200	0.93	–49 to 401 °F (–45 to 205 °C)	★
F	Silicone 200 for vacuum applications	0.93	For use in vacuum applications below 14.7 psia (1 bar-a), refer to vapor pressure curves in Rosemount DP Level Fill Fluid Specification Technical Note.	★
L[8]	Silicone 704	1.07	32 to 401 °F (0 to 205 °C)	★
C	Silicone 704 for vacuum applications	1.07	For use in vacuum applications below 14.7 psia (1 bar-a), refer to vapor pressure curves in Rosemount DP Level Fill Fluid Specification Technical Note.	★
A	SYLTHERM XLT	0.85	–157 to 293 °F (–105 to 145 °C)	★
H	Inert (Halocarbon)	1.85	–49 to 320 °F (–45 to 160 °C)	★
G[9][10]	Glycerine and water	1.13	5 to 203 °F (–15 to 95 °C)	★
N[8][9]	Neobee M-20	0.92	5 to 401 °F (–15 to 205 °C)	★
P[9][10]	Propylene Glycol and water	1.02	5 to 203 °F (–15 to 95 °C)	★

Low pressure side					
	Configuration	**Flange adapter**	**Diaphragm material**	**Sensor fill fluid**	
11[6]	Gage	SST	316L SST	Silicone	★
21	Differential	SST	316L SST	Silicone	★
22[6]	Differential	SST	Alloy C-276	Silicone	★
2A[11]	Differential	SST	316L SST	Inert (Halocarbon)	★
2B[6][11]	Differential	SST	Alloy *C-276*	Inert (Halocarbon)	★
31[6]	Tuned-System Assembly with Remote Seal	None	316L SST	Silicone (requires Option Code S1)	★

Table 13. 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.

O-ring			
A	Glass-filled PTFE		★
Housing material		**Conduit entry size**	
A	Aluminum	1/2–14 NPT	★
B	Aluminum	M20 x 1.5	★
J	SST	1/2–14 NPT	★
K	SST	M20 x 1.5	★
P[12]	Engineered polymer	No conduit entries	★
D[13]	Aluminum	G1/2	
M[13]	SST	G1/2	

Wireless options (requires Wireless Output Code X and Engineered Polymer Housing Code P)

Wireless transmit rate, operating frequency, and protocol		
WA3	User configurable transmit rate, 2.4 GHz *Wireless*HART	★
Antenna and SmartPower		
WP5	Internal antenna, compatible with green power module (I.S. Power Module sold separately)	★

HART Revision configuration[2] (requires HART Protocol Output Code A)

HR5	Configured for HART Revision 5	★
HR7	Configured for HART Revision 7	★

Options (include with selected model number)

Extended product warranty		
WR3	3-year limited warranty	★
WR5	5-year limited warranty	★
PlantWeb control functionality		
A01[14]	FOUNDATION Fieldbus Control Function Block Suite	★
DA0[22]	Power Advisory HART Diagnostic	★
D01[14]	FOUNDATION Fieldbus Diagnostics Suite	★
Seal assemblies[15]		
S1	Assembled to one Rosemount 1199 Seal	★
Product certifications		
E8	ATEX Flameproof and Dust Certification	★
I1[16]	ATEX Intrinsic Safety and Dust	★
IA	ATEX FISCO Intrinsic Safety; for FOUNDATION Fieldbus or PROFIBUS PA protocols only	★

Table 13. 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.

N1	ATEX Type n Certification and Dust	★
K8	ATEX Flameproof, Intrinsic Safety, Type n, Dust (combination of E8, I1 and N1)	★
E4[17]	TIIS Flameproof	★
Product certifications		
E5	FM Explosion-proof, Dust Ignition-proof	★
I5[18]	FM Intrinsically Safe, Nonincendive	★
IE	FM FISCO Intrinsically Safe; for FOUNDATION Fieldbus or PROFIBUS PA protocols only	★
K5	FM Explosion-proof, Dust Ignition-Proof, Intrinsically Safe, and Division 2	★
C6	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, and Division 2	★
I6[12]	CSA Intrinsic Safety	★
K6	CSA and ATEX Explosion-proof, Intrinsically Safe, and Division 2 (combination of C6, E8, and I1)	★
E7	IECEx Flameproof, Dust Ignition-proof	★
I7	IECEx Intrinsic Safety	★
N7	IECEx Type n Certification	★
K7	IECEx Flameproof, Dust Ignition-proof, Intrinsic Safety, and Type n (combination of I7, N7 and E7)	★
E2	INMETRO Flameproof	★
I2	INMETRO Intrinsic Safety	★
IB	INMETRO FISCO intrinsically safe; for FOUNDATION Fieldbus or PROFIBUS PA protocols only	★
K2	INMETRO Flameproof, Intrinsic Safety	★
E3	China Flameproof	★
I3	China Intrinsic Safety	★
N3	China Type n	★
EM	Technical Regulations Customs Union (EAC) Flameproof	★
IM	Technical Regulations Customs Union (EAC) Intrinsic Safety	★
KM	Technical Regulations Customs Union (EAC) Flameproof and Intrinsic Safety	★
KB	FM and CSA Explosion-proof, Dust Ignition Proof, Intrinsically Safe, and Division 2 (combination of K5 and C6)	★
KD	FM, CSA, and ATEX Explosion-proof, Intrinsically Safe (combination of K5, C6, I1, and E8)	★
Shipboard approvals		
SBS[11]	American Bureau of Shipping	★
SBV[7][19]	Bureau Veritas (BV)	
SDN[7]	Det Norske Veritas	
SLL[7][19]	Lloyds Register (LR)	
Bolting material		
L4	Austenitic 316 SST Bolts	★
L5	ASTM A 193, Grade B7M Bolts	★

Table 13. 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.

L6	Alloy K–500 bolts	★
L8	ASTM A 193 Class 2, Grade B8M bolts	★
Display and interface options		
M4[20]	LCD display with Local Operator Interface	★
M5	LCD display	★
Calibration certification		
Q4	Calibration Certificate	★
QP	Calibration Certificate and tamper evident seal	★
QG[21]	Calibration Certificate and GOST Verification Certificate	★
Material traceability certification		
Q8	Material Traceability Certification per EN 10204 3.1	★
Quality certification for safety[22]		
QS	Prior-use certificate of FMEDA data	★
QT	Safety certified to IEC 61508 with certificate of FMEDA	★
Toolkit total system performance reports		
QZ	Seal System Performance Calculation Report	★
Conduit electrical connector[11]		
GE	M12, 4-pin, male connector (eurofast)	★
GM	A size mini, 4-pin, male connector (minifast)	★
Configuration buttons		
D4[22]	Analog zero and span	★
DZ[23]	Digital zero trim	★
Transient protection[11][24]		
T1	Transient protection	★
Software configuration[23]		
C1	Custom software configuration (completed Rosemount 3051 Configuration Data Sheet for wired and Rosemount 3051 Wireless Configuration Data Sheet for wireless required with order)	★
Low power output		
C2	0.8–3.2 Vdc Output with digital signal based on HART protocol (available with Output code M only)	
Alarm levels[22]		
C4	NAMUR alarm and saturation levels, high alarm	★
CN	NAMUR alarm and saturation levels, low alarm	★
CR	Custom alarm and saturation signal levels, high alarm (requires C1 and Configuration Data Sheet)	★

Table 13. 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.

CS	Custom alarm and saturation signal levels, low alarm (requires C1 and Configuration Data Sheet)			★
CT	Rosemount standard low alarm			★
Conduit plug[11]				
DO	316 SST conduit plug			★
Ground screw[11][25]				
V5	External ground screw assembly			★
Lower housing flushing connection options[26]				
	Ring material	**Number**	**Size (NPT)**	
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	★
Lower housing alignment clamp				
SA	Lower housing alignment clamp			★
Lower housing intermediate gasket material				
S0	No gasket for lower housing			★
SY	Thermo-Tork TN-9000			★
NACE certificate[27]				
Q15	Certificate of compliance to NACE MR0175/ISO 15156 for wetted materials			★
Q25	Certificate of compliance to NACE MR0103 for wetted materials			★
Typical model number: 3051L 2 A A0 D 21 A A F1				

1. Select Configuration Buttons (option code D4 or DZ) or Local Operator Interface (option code M4) if local configuration buttons are required.
2. Option HR5 configures the HART output to HART Revision 5. Option HR7 configures the HART output to HART Revision 7. The device can be field configured to HART Revision 5 or 7 if desired. HART Revision 5 is the default HART output.
3. Option code M4 - LCD Display with Local Operator Interface required for local addressing and configuration.
4. Requires wireless options and engineered polymer housing. Available approvals are FM Intrinsically Safe, (option code I5), CSA Intrinsically Safe (option code I6), ATEX Intrinsic Safety (option code I1), IECEx Intrinsic Safety (option code I7) and EAC Intrinsic Safety (option code IM).
5. Only available with C6, E2, E5, I5, K5, KB and E8 approval. Not available with GE, GM, SBS, DA0, M4, D4, DZ, QT, HR5, HR7, CR, CS, CT.
6. 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 MR0103 for sour refining environments.
7. 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.
8. Maximum process temperature is limited by heat transfer to the transmitter and must be further derated if ambient, temperature exceeds 70 °F (21 °C).
9. This is a food grade fill fluid.
10. Not suitable for vacuum applications.

11. Not available with Wireless output(output code X).
12. Only available with Wireless output(output code X).
13. Not available with Product certifications options E8, K8, E5, K5, C6, K6, E7, K7, E2, K2, E3, KB, KD.
14. Only valid with FOUNDATION Fieldbus output(output code F).
15. "Assemble-to" items are specified separately and require a completed model number.
16. Dust approval not applicable to output code X. See "Rosemount 3051" on page 149 for wireless approvals.
17. Only available with output codes A - 4–20mA HART, F - FOUNDATION Fieldbus, and W - PROFIBUS PA. Also only available with G1/2 housing thread types.
18. Nonincendive certification not provided with Wireless output option code (X).
19. Only available with product certifications E7, E8, I1, I7, IA, K7, K8, KD, N1, N7.
20. Not available with FOUNDATION Fieldbus (Output Code F) or Wireless output (output code X) or Low Power (output code M).
21. Contact an Emerson representative for availability.
22. Only available with HART 4–20 mA output(output code A).
23. Only available with 4–20 mA HART output (output code A) and Wireless output (output code X).
24. The T1 option is not needed with FISCO Product Certifications; transient protection is included in the FISCO product certification codes IA, IB, and IE.
25. The V5 option is not needed with the T1 option; external ground screw assembly is included with the T1 option.
26. Supplied with C-4401 aramid fiber gasket.
27. NACE compliant wetted materials are identified by Footnote 6.

Rosemount 2051L Liquid Level Transmitter

Rosemount 2051L Liquid Level Transmitter

Configuration	Transmitter output code
4–20 mA HART Rosemount 2051 Rosemount 2051 with Selectable HART(1)	A
Lower power Rosemount 2051 Rosemount 2051 with Selectable HART(1)	M
FOUNDATION Fieldbus	F
PROFIBUS	W
Wireless	X

1. The 4–20mA with Selectable HART device can be ordered with Transmitter Output option code A plus any of the following options codes: M4, QT, DZ, CR, CS, CT, HR5, HR7.

Additional information

Specifications: page 126
Certifications: page 155
Dimensional Drawings: page 164

See Specifications and options for more details on each configuration. Specification and selection of product materials, options, or components must be made by the purchaser of the equipment. See page 135 for more information on material selection.

Table 14. Rosemount 2051L Liquid 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	Liquid Level Transmitter	★
Pressure range		
2	–250 to 250 inH_2O (–0,6 to 0,6 bar)	★
3	–1000 to 1000 inH_2O (–2,5 to 2,5 bar)	★
4	–300 to 300 psi (–20,7 to 20,7 bar)	★
Transmitter output		
A(1)	4–20 mA with Digital Signal Based on HART Protocol	★
F	FOUNDATION Fieldbus Protocol	★
W	PROFIBUS PA Protocol	★
X	Wireless	★
M	Low-power, 1–5 Vdc with Digital Signal Based on HART Protocol	
Process connection size, diaphragm material (high side)		
Code	**Process connection size**	**Diaphragm**
G(2)	2-in./DN 50	316L SST ★
H(2)	2-in./DN 50	Alloy C-276 ★
J	2-in./DN 50	Tantalum ★

Table 14. Rosemount 2051L Liquid 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.

Process connection size, diaphragm material (high side)			
Code	**Process connection size**	**Diaphragm**	
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	★
D[(2)]	4-in./DN 100	Alloy C-276	★
E	3-in./DN 80	Tantalum	★
F	4-in./DN 100	Tantalum	★
Seal extension length (high side)			
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**	
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	SST	★
F[(2)]	3-in.	ANSI/ASME B16.5 Class 150	SST	★
G[(2)]	4-in.	ANSI/ASME B16.5 Class 150	SST	★
Y[(2)]	2-in.	ANSI/ASME B16.5 Class 300	SST	★
H[(2)]	3-in.	ANSI/ASME B16.5 Class 300	SST	★
J[(2)]	4-in.	ANSI/ASME B16.5 Class 300	SST	★
Q	DN50	PN 10–40 per EN 1092-1	CS	★
R	DN80	PN 40 per EN 1092-1	CS	★
K[(2)]	DN50	PN 10–40 per EN 1092-1	SST	★
T[(2)]	DN80	PN 40 per EN 1092-1	SST	★

Table 14. Rosemount 2051L Liquid 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.

Seal fill fluid (high side)		**Specific gravity at 77 °F (25 °C)**	**Temperature limits[3]**	
D	Silicone 200	0.93	–49 to 401 °F (–45 to 205 °C)	★
F	Silicone 200 for vacuum applications	0.93	For use in vacuum applications below 14.7 psia (1 bar-a), refer to vapor pressure curves in Rosemount DP Level Fill Fluid Specification Technical Note.	
L	Silicone 704 for vacuum applications	1.07	For use in vacuum applications below 14.7 psia (1 bar-a), refer to vapor pressure curves in Rosemount DP Level Fill Fluid Specification Technical Note.	
C[4]	Silicone 704	1.07	32 to 401 °F (0 to 205 °C)	★
A	SYLTHERM XLT	0.85	–157 to 293 °F (–105 to 145 °C)	★
H	Inert (Halocarbon)	1.85	–49 to 320 °F (–15 to 160 °C)	★
G[5][6]	Glycerin and water	1.13	5 to 203 °F (–15 to 95 °C)	★
N[4][5]	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		**Flange adapter**	
1	Gage		SST	★
2	Differential		SST	★
3[7]	Tuned-System with remote seal		None	★
Sensor module diaphragm material, sensor fill fluid (low side)				
	Diaphragm material		**Sensor fill fluid**	
1	316L SST		Silicone	★
2	Alloy C-276 (SST Valve seat)		Silicone	★
7	Alloy C-276 (Alloy C-276 Valve seat)		Silicone	★
A[8]	316L SST		Inert (Halocarbon)	★
B[2][4]	Alloy C-276 (SST Valve seat)		Inert (Halocarbon)	★
G[4]	Alloy C-276 (Alloy C-276 Valve seat)		Inert (Halocarbon)	★
O-ring				
A	Glass-filled PTFE			★
Housing material			**Conduit entry size**	
A	Aluminum		1/2–14 NPT	★
B	Aluminum		M20 x 1.5	★
J	SST		1/2–14 NPT	★
K[9]	SST		M20 x 1.5	★
P[10]	Engineered polymer		No conduit entries	★

Table 14. Rosemount 2051L Liquid 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.

Housing material		Conduit entry size	
D	Aluminum	G1/2	
M[5]	SST	G1/2	

Wireless options (requires Wireless output code X and Engineered Polymer housing code P)

Wireless transmit rate, operating frequency and protocol		
WA3	User configurable transmit rate, 2.4 GHz *Wireless*HART	★
Antenna and SmartPower		
WP5	Internal antenna, compatible with Green Power Module (I.S. Power Module sold separately)	★

Options (include with selected model number)

Extended product warranty		
WR3	3-year limited warranty	★
WR5	5-year limited warranty	★
PlantWeb control functionality[11]		
A01	FOUNDATION Fieldbus advanced control function block suite	★
Seal assemblies[12]		
S1	Assemble to one Rosemount 1199 Seal (requires Rosemount 1199M)	★
Product certifications		
E1[5]	ATEX Flameproof	★
E2[5]	INMETRO Flameproof	★
E3[5]	China Flameproof	★
E4	TIIS Flameproof	★
E5	FM Explosion-proof, Dust Ignition-proof	★
E6	CSA Explosion-proof, Dust Ignition-proof, Division 2	★
E7[5]	IECEx Flameproof	★
EW[5]	India (CCOE) Flameproof Approval	★
I1[5]	ATEX Intrinsic Safety	★
I2[5]	INMETRO Intrinsically Safe	★
I3[5]	China Intrinsic Safety	★
I4[5][6]	TIIS Intrinsic Safety	★
I5	FM Intrinsically Safe, Division 2	★
I6	CSA Intrinsically Safe	★
I7[5]	IECEx Intrinsic Safety	★
IA[7]	ATEX FISCO Intrinsic Safety	★

Table 14. Rosemount 2051L Liquid 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.

Product certifications		
IE[7]	FM FISCO Intrinsically Safe	★
IF[7]	CSA FISCO Intrinsically Safe	★
IG[7]	IECEx FISCO Intrinsically Safe	★
IW[5]	India (CCOE) Intrinsically Safety Approval	★
K1[5]	ATEX Flameproof, Intrinsic Safety, Type n, Dust	★
K2	INMETRO Flameproof and Intrinsic Safety	★
K5	FM Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
K6	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
K7[5]	IECEx Flameproof, Intrinsic Safety, Type n and Dust	★
KA[5]	ATEX and CSA Flameproof, Intrinsically Safe, Division 2	★
KB	FM and CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
KC[5]	FM and ATEX Explosion-proof, Intrinsically Safe, Division 2	★
KD[5]	FM, CSA, and ATEX Explosion-proof, Intrinsically Safe	★
N1[5]	ATEX Type n	★
N7[5]	IECEx Type n	★
ND[5]	ATEX Dust	★
EM	Technical Regulations Customs Union (EAC) Flameproof	★
IM	Technical Regulations Customs Union (EAC) Intrinsic Safety	★
KM	Technical Regulations Customs Union (EAC) Flameproof and Intrinsic Safety	★
Shipboard approvals[4]		
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	★
Display and interface options[13]		
M4	LCD display with Local Operator Interface	★
M5	LCD display	★
Hardware adjustments		
D4[14]	Zero and span configuration buttons	★
DZ[15]	Digital zero trim	★
Flange adapters[16]		
DF	1/2–14 NPT flange adapters	★

Table 14. Rosemount 2051L Liquid 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.

Conduit plug[4][17]				
DO	316 SST conduit plug			★
Ground screw[4][18]				
V5	External ground screw assembly			★
Transient protection[4][19]				
T1	Transient terminal block			★
Software configuration[11]				
C1	Custom software configuration (requires completed Configuration Data Sheet)			★
Alarm limit[10]				
C4[20]	NAMUR alarm and saturation levels, high alarm			★
CN[16]	NAMUR alarm and saturation levels, low alarm			★
CR	Custom alarm and saturation signal levels, high alarm (requires C1 and Configuration Data Sheet)			★
CS	Custom alarm and saturation signal levels, low alarm (requires C1 and Configuration Data Sheet)			★
CT	Low alarm (standard Rosemount alarm and saturation levels)			★
Calibration certification				
Q4	Calibration certificate			★
QG	Calibration certificate and GOST Verification Certificate			★
GP	Calibration certificate and tamper evident seal			★
Material traceability certification				
Q8	Material Traceability Certification per EN 10204 3.1			★
Quality certification for safety				
QS[21]	Prior-use certificate of FMEDA data			★
QT[17]	Safety certified to IEC 61508 with certificate of FMEDA			★
Toolkit total system performance reports				
QZ	Remote seal system performance calculation report			★
Conduit electrical connector[4]				
GE	M12, 4-pin, male connector (eurofast)			★
GM	A size mini, 4-pin, male connector (minifast)			★
Lower housing flushing connection options[22]				
	Ring material	**Number**	**Size (NPT)**	
F1	316 SST	1	1/4–18 NPT	★
F2	316 SST	2	1/4–18 NPT	★

Table 14. Rosemount 2051L Liquid 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.

F3[23]	Alloy C-276	1	1/4–18 NPT	★
F4[19]	Alloy C-276	2	1/4–18 NPT	★
F7	316 SST	1	1/2–14 NPT	★
Lower housing alignment clamp				
SA	Lower housing alignment clamp			★
Lower housing flushing connection options[22]				
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	★
Lower housing intermediate gasket material				
S0	No gasket for lower housing			★
SY	Thermo-Tork TN-9000			★
NACE certificate				
Q15[24]	Certificate of compliance to NACE MR0175/ISO 15156 for wetted materials			★
Q25[18]	Certificate of compliance to NACE MR0103 for wetted materials			★
Typical model number: 2051L 2 A A0 X D 21 A A B4 M5 F1				

1. HART Revision 5 is the default HART output. The Rosemount 2051 with Selectable HART can be factory or field configured to HART Revision 7. To order HART Revision 7 factory configured, add option code HR7.
2. 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 MR0103 for sour refining environments. Order with Q15 or Q25 to receive a NACE certificate.
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.
4. Maximum process temperature is limited by heat transfer to the transmitter and must be further derated if ambient, temperature exceeds 70 °F (21 °C).
5. This is a food grade fill fluid.
6. Not suitable for vacuum applications.
7. Requires option code S1.
8. Not available with output code X.
9. Not available with Low Power output code m
10. Only available with output code X.
11. Only valid with FOUNDATION Fieldbus output code F.
12. “Assemble-to” items are specified separately and require a completed model number.
13. Not valid with FOUNDATION Fieldbus output code F and Wireless Output Code X.
14. Only available with 4–20 mA HART (output codes A and M).
15. Only available with HART 4–20 mA output(output codes A) and Wireless output(output code X).
16. Not available with Remote Mount Seal Assembly option S1.
17. Transmitter is shipped with 316 SST conduit plug (uninstalled) in place of standard carbon steel conduit plug.
18. The V5 option is not needed with the T1 option; external ground screw assembly is included with the T1 option.
19. 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.
20. NAMUR-Compliant operation is pre-set at the factory.
21. Only available with HART 4–20 mA output(output code A).
22. Supplied with C-4401 aramid fiber gasket.
23. Not available with Option Codes A0, B0, and G0.
24. NACE Compliant wetted materials are identified by Footnote 2.

Rosemount 1199 Direct Mount Seal Systems

Tuned-System Assembly Comprised of Rosemount 1199 Direct Mount Seal combined with Rosemount 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 126
Dimensional Drawings: page 164

Rosemount 1199 Direct Mount Seal

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

Specification and selection of product materials, options, or components must be made by the purchaser of the equipment. See page 135 for more information on material selection.

When ordering Rosemount 1199 Direct and Remote Mount Seals, add the correct seal system ordering code to the transmitter or gage model.

Table 15. Direct Mount Seal Attach To Code Per Transmitter or Gage Model

Model	Two seals	One seal
3051S_C	B12	B11
3051C	S2	S1
2051C	S2	S1
3051S_T	N/A	B11
3051T, 2051T, 2088	N/A	S1
WPG	N/A	S1

A Rosemount 1199 Direct Mount Seal consists of two parts. First, specify the direct mount connection model codes found on page 70. Then, specify a remote seal found on page 72.

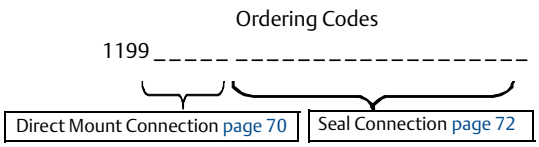


Table 16. Rosemount 1199 Direct Mount Seal Systems Ordering Information

★ 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**		
All coplanar devices (Rosemount 3051S_C, 3051C, 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 devices (Rosemount 3051S_T, 3051T, 2051T, 2088, and WPG)							
W	All welded		One seal system		N/A		★
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**	
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)	★
F	Silicone 200 for vacuum applications	0.93	For use in vacuum applications below 14.7 psia (1 bar-a), refer to vapor pressure curves in Rosemount DP Level Fill Fluid Specification Technical Note.				★
L	Silicone 704	1.07	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)	★
C	Silicone 704 for vacuum applications	1.07	For use in vacuum applications below 14.7 psia (1 bar-a), refer to vapor pressure curves in Rosemount DP Level Fill Fluid Specification Technical Note.				★
R	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 (20 to 370 °C)	★
V	Silicone 705 for vacuum applications	1.09	For use in vacuum applications below 14.7 psia (1 bar-a), refer to vapor pressure curves in Rosemount DP Level Fill Fluid Specification Technical Note.				★
A	SYLTHERM XLT	0.85	–157 to 293 °F (–105 to 145 °C)	–157 to 293 °F (–105 to 145 °C)	–157 to 293 °F (–105 to 145 °C)	–157 to 293 °F (–105 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[4][5]	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[4]	Neobee M-20	0.92	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)	★
P[4][5]	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)	★

Table 16. Rosemount 1199 Direct Mount Seal Systems Ordering Information

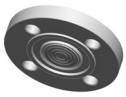
★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery. The Expanded offering is subject to additional delivery lead time.

Seal connection type				
A	Direct mount			★
Direct mount connection type				
	Extension length	**Seal system**	**Connection type**	
All coplanar devices (Rosemount 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 devices (Rosemount 3051S_T, 3051T, 2051T, 2088, and WPG)				
95	Direct mount, no extension	One seal system	All welded	★
D5	Thermal optimizer	One seal system	All welded	★

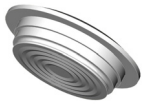
1. All welded system connection types require either a 316L SST or Alloy C-276 isolating diaphragm in the pressure transmitter model codes.
2. At ambient pressure of 14.7 psia (1 bar-a) and ambient temperature of 70 °F (21 °C).
3. Maximum process temperature is limited by heat transfer to the transmitter and must be further derated if ambient temperature exceeds 70 °F (21 °C).
4. This is a food grade fill fluid.
5. Not suitable for vacuum applications.

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

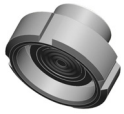
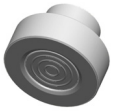
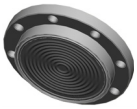
★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery. The Expanded offering is subject to additional delivery lead time.

Flanged seal assemblies			● = Transmitter availability – = Unavailable					
			In-Line	Coplanar extensions			Process connections	
				0-in.	2-in.	4-in.		
	page 82	FFW flush flanged seal	●	(1)	●	●	2-in./DN 50/50A 3-in./DN 80/80A 4-in./DN 100/100A	★
	page 86	RFW remote flanged seal	●	–	●	●	1/2-in./DN 15 3/4-in. 1-in./DN 25/25A 1 1/2-in./DN 40/40A	★
	page 90	EFW extended flanged seal	●	(1)	●	●	1 1/2-in./DN 40/40A 2-in./DN 50/50A 3-in./Headbox/DN 80/80A 4-in./Headbox/DN 100/100A	★
	page 96	FCW flush flanged seal - ring type joint (RTJ) gasket surface	●	(1)	●	●	2-in. 3-in.	
	page 98	RCW Remote Flanged Seal - Ring Type Joint (RTJ) Gasket Surface	●	–	●	●	1/2-in. 3/4-in. 1-in. 1 1/2-in.	
	page 101	FUW and FVW flush flanged type seals	●	(2)	●	●	DN 50 DN 80	

★ 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.

Threaded seal assemblies			**● = Transmitter availability – = Unavailable**					
			In-Line	**Coplanar extensions**			**Process connections**	
	page 103	RTW threaded seal	●	–	●	●	1/4–18 NPT 3/8–18 NPT 1/2–14 NPT 3/4–14 NPT 1–11 1/2NPT 1 1/4–11 1/2 NPT 1 1/2–11 1/2 NPT G 1/2 A DIN 16288 R 1/2 per ISO 7/1	★
	page 107	HTS male threaded seal	●	●	●	●	G1 G1 1/2 G2 1–11 1/2 NPT 1 1/2–11 1/2 NPT 2–11 1/2 NPT	
Hygienic seal assemblies								
	page 108	SCW hygienic Tri-Clover style Tri Clamp seal	●	●	●	●	1 1/2-in. 2-in. 2 1/2-in. 3-in. 4-in.	★
	page 110	SSW hygienic tank spud seal	●	●	●	●	2-in. extension 6-in. extension	★
	page 113	STW hygienic thin wall tank spud seal	●	–	●	●	0.8-in. extension	
	page 114	EES hygienic flanged tank spud extended seal	●	●	●	●	DN 50 DN 80	
	page 115	VCS Tri Clamp in-line seal	●	–	–	–	1-in. 1 1/2-in. 2-in. 3-in. 4-in.	
	page 116	SVS VARIVENT® compatible hygienic connection seal	●	●	●	●	Tuchenhagen VARIVENT Compatible	

★ 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			● = Transmitter availability – = Unavailable					
			In-line	Coplanar extensions			Process connections	
	page 117	SHP hygienic Cherry-Burrell “I” line seal	●	–	–	–	2-in. 3-in.	
	page 118	SLS dairy process connection - female thread seal per DIN 11851	●	–	–	–	DN 40 DN 50	
Specialty seal assemblies								
	page 119	WSP saddle seal	●	–	●	●	2-in. 3-in. 4-in. or larger	
 	page 121	UCP male threaded pipe mount seals and PMW paper mill sleeve seals	●	–	–	–	1 1/2-in. with threaded knurled nut 1-in. with cap screw retainer	
	page 122	CTW chemical tee seal	●	–	●	●	Retro-fit	
	page 123	TFS wafer style in-line seal	●	–	–	–	1-in./DN 25 1 1/2-in./DN 40 2-in./DN 50 3-in./DN 80 4-in./DN 100	
	page 124	WFW flow-thru flanged seal	●	–	●	●	1-in. 2-in. 3-in.	

1. Available with ANSI Class 300 or EN 1092-1 PN 40 or JIS B2238 20K or lower flange ratings.
2. FUW and FVW with diaphragm options DA and DC are only available with one piece design (option code E)

Rosemount 1199 Remote Mount Seal Systems

Tuned-System Assembly Comprised of Rosemount 1199 Direct Mount Seal combined with Rosemount 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 126
Certifications: page 155
Dimensional Drawings: page 164

Specification and selection of product materials, options, or components must be made by the purchaser of the equipment. See page 139 for more information on material selection.

Rosemount 1199 Remote Mount Seal

The Rosemount 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.

When ordering Rosemount 1199 Direct and Remote Mount Seals, make sure to add the correct seal system ordering code to the transmitter or gage model.

Table 17. Direct Mount Seal Attach To Code Per Transmitter or Gage Model

Model	Two seals	One seal
Rosemount 3051S_C	B12	B11
Rosemount 3051C	S2	S1
Rosemount 2051C	S2	S1
Rosemount 3051S_T	N/A	B11
Rosemount 3051T, 2051T, 2088	N/A	S1
Rosemount WPG	N/A	S1

A Rosemount 1199 Remote Mount Seal consists of two parts. First, specify the capillary model codes found on page 76. Then, specify a remote seal found on page 79.

Ordering codes

1199 _

Remote Mount Connection page 76 Seal Connection page 79

Capillary/fill fluid

Note

Use Table 18 on page 76 for Capillary Type Connections. Use Table 16 on page 70 for Direct Mount Type Connections.

Table 18. 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**	
All coplanar devices (Rosemount 3051S_C, 3051C, 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 devices (Rosemount 3051S_T, 3051T, 2051T, 2088, and WPG)				
W	All welded	One seal system	N/A	★
Seal fill fluid		**Specific gravity at 77 °F (25 °C)**	**Temperature limits[2]**	
D	Silicone 200	0.93	–49 to 401 °F (–45 to 205 °C)	★
F	Silicone 200 for vacuum applications	0.93	For use in vacuum applications below 14.7 psia (1 bar-a), refer to vapor pressure curves in Rosemount DP Level Fill Fluid Specification Technical Note.	★
L[3]	Silicone 704	1.07	32 to 599 °F (0 to 315 °C)[4]	★
C[3]	Silicone 704 for vacuum applications	1.07	For use in vacuum applications below 14.7 psia (1 bar-a), refer to vapor pressure curves in Rosemount DP Level Fill Fluid Specification Technical Note.	★
R[3]	Silicone 705	1.09	68 to 698 °F (20 to 370 °C)[4]	★
V[5]	Silicone 705 for vacuum applications	1.09	For use in vacuum applications below 14.7 psia (1 bar-a), refer to vapor pressure curves in Rosemount DP Level Fill Fluid Specification Technical Note.	★
A	SYLTHERM XLT	0.85	–157 to 293 °F (–105 to 145 °C)	★
H	Inert (Halocarbon)	1.85	–49 to 320 °F (–45 to 160 °C)	★
G[6][7]	Glycerin and water	1.13	5 to 203 °F (–15 to 95 °C)	★
N[6]	Neobee M-20	0.92	5 to 437 °F (–15 to 225 °C)[4]	★
P[6][7]	Propylene Glycol and water	1.02	5 to 203 °F (–15 to 95 °)	★
Seal connection type/capillary ID, description				
B	0.03-in. (0,711 mm) ID			★
C	0.04-in. (1,092 mm) ID			★
D	0.075-in. (1,905 mm) ID			★

Table 18. 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.

E	0.03-in. (0,711 mm) ID, PVC coated with closed end	★
F	0.04-in. (1,092 mm) ID, PVC coated with closed end	★
G	0.075-in. (1,905 mm) ID, PVC coated with closed end	★
H	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	0.03-in. (0,711 mm) ID, PVC coated, 4-in. support tube with closed end	★
N	0.04-in. (1,092 mm) ID, PVC coated, 4-in. support tube with closed end	★
P	0.075-in. (1,905 mm) ID, PVC PVC coated, 4-in. support tube with closed end	★
Capillary length[8]		
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)	★
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)	
Capillary length[8]		
61	23 ft. (7,0 m)	
62	26.2 ft. (8,0 m)	
63	29.5 ft. (9,0 m)	

Table 18. Rosemount 1199 Remote Mount Seal Systems Ordering Information

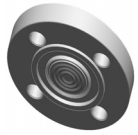
★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery. The Expanded offering is subject to additional delivery lead time.

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)	

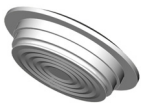
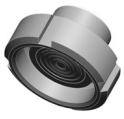
1. All welded system connection types require either a 316L SST or Alloy C-276 isolating diaphragm in the pressure transmitter model codes.
2. At ambient pressure of 14.7 psia (1 bar-a) and ambient temperature of 70 °F and must be further derated if ambient, temperature exceeds 70 °F (21 °C).
3. Only available with Seal Connection Type/Capillary ID, Description Codes C, D, F, G, J, K, N, and P.
4. Maximum process temperature is limited by heat transfer to the transmitter and must be further derated if ambient temperature exceeds 70 °F (21 °C).
5. Only available with Seal Connection Type/Capillary ID, Description Codes D, G, K, and P.
6. This is a food grade fill fluid.
7. Not suitable for vacuum applications.
8. For Submersible Seal TSM and FSM models, refer to the Rosemount 1199 Submersible Seal Product Data Sheet.

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

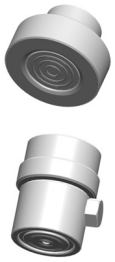
★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery. The Expanded offering is subject to additional delivery lead time.

Flanged seal assemblies			**Process connections**	
	page 82	FFW flush flanged seal	2-in./DN 50/50A 3-in./DN 80/80A 4-in./DN 100/100A	★
	page 86	RFW flanged seal	1/2-in./DN 15 3/4-in. 1-in./DN 25/25A 1 1/2-in./DN 40/40A	★
	page 90	EFW extended flanged seal	1 1/2-in./DN 40/40A 2-in./DN 50 50A 3-in./headbox/DN 80/80A 4-in./headbox/DN 100/100A	★
	page 93	PFW pancake seal	2-in./DN50 3-in./DN 80	★
	page 96	FCW flush flanged seal – ring type joint (RTJ) gasket surface	2-in. 3-in.	
	page 98	RCW ring type joint (RTJ) flanged seal	1/2-in. 3/4-in. 1-in. 1 1/2-in.	
	page 101	FUW and FVW flush flanged type seals	DN 50 DN 80	
Threaded seal assemblies			**Process connections**	
	page 103	RTW threaded seal	1/4–18 NPT 3/8–18 NPT 1/2–14 NPT 3/4–14 NPT 1–11 1/2 NPT 1 1/4–11 1/2 NPT 1 1/2 –11 1/2 NPT G 1/2 ADIN 16288 R 1/2 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.

	page 107	HTS male threaded seal	G1 G1 1/2 G2 1–11 1/2 NPT 1 1/2 –11 1/2 NPT 2–11 1/2 NPT	
Hygienic seal assemblies				
	page 108	SCW hygienic Tri-Clover style Tri Clamp seal	1 1/2-in. 2-in. 2 1/2-in. 3-in. 4-in.	★
	page 110	SSW hygienic tank spud seal	2-in. extension 6-in. extension	★
	page 113	STW hygienic thin wall tank spud seal	0.8-in. extension	
	page 114	EES hygienic flanged tank spud extended seal	DN 50 DN 80	
	page 115	VCS Tri Clamp in-line seal	1-in. 1 1/2-in. 2-in. 3-in. 4-in.	
	page 116	SVS VARIVENT compatible hygienic connection seal	Tuchenhagen VARIVENT Compatible	
	page 117	SHP hygienic Cherry-Burrell “I” line seal	2-in. 3-in.	
	page 118	SLS dairy process connection - female thread seal per DIN 11851	DN 40 DN 50	
Specialty seal assemblies				
	page 119	WSP saddle seal	2-in. 3-in. 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 121	UCP male threaded pipe mount seals and PMW paper mill sleeve seals	1 1/2-in. with threaded knurled nut 1-in. with cap screw retainer	
	page 122	CTW chemical tee seal	Retro-fit	
	page 123	TFS wafer style in-line seal	1-in./DN 25 1 1/2-in./DN 40 2-in./DN 50 3-in./DN 80 4-in./DN 100	
	page 124	WFW flow-thru flanged seal	1-in. 2-in. 3-in.	

Flanged seals

FFW flush flanged seal

Table 19. 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			
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)			★
J	JIS B2238 (Japanese Industrial Standard)			
Process connection style				
FFW	Flush flanged seal			★
Process connection size				
	ANSI/ASME B16.5	**EN 1092-1/GOST 12815-80**	**JIS B2238**	
G	2-in.	DN 50	50 A	★
7	3-in.	N/A	80 A	★
J	N/A	DN 80	N/A	★
9	4-in.	DN 100	100 A	★
Flange/pressure rating				
1	Class 150	N/A	10K	★
2	Class 300	N/A	20K	★
4	Class 600	N/A	40K	★
G	N/A	PN 40	N/A	★
E	N/A	PN 10/16 (DN 100 only)	N/A	
5	Class 900	N/A	N/A	
6	Class 1500	N/A	N/A	
7	Class 2500	N/A	N/A	
H	N/A	PN 63	N/A	
J	N/A	PN 100	N/A	
K	N/A	PN 160	N/A	
Diaphragm and wetted, upper housing, flange material				
	Diaphragm and wetted	**Upper housing**	**Flange**	
CA[(1)(2)]	316L SST	316L SST	CS	★
DA[(2)]	316L SST	316L SST	316 SST	★
CB[(1)]	Alloy C-276, seam welded	316L SST	CS	★

Table 19. 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				
DB	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	★
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	
CP	Nickel 201	316L SST	CS	
CV	Alloy 400	316L SST	CS	
CH[(6)]	Titanium Grade 4	316L SST	CS	
C5	Duplex 2507 SST	316L SST	CS	
Flushing connection ring material (lower housing)[(8)]				
0	None			★
A	316L SST			★
B	Alloy C-276			★
2	Duplex 2205 SST			
H	Titanium Grade 4			
6	Nickel 201			
V	Alloy 400			
Flushing connection options, quantity (size)				
0	None			★
1	1 (1/4–18 NPT)			★
3	2 (1/4–18 NPT)			★

Table 19. 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.

7	1 (1/2–14 NPT)	★
9	2 (1/2–14 NPT)	★

Options (Include with selected model number)

Extended product warranty		
WR3	3-year limited warranty	★
WR5	5-year limited warranty	★
Intermediate gasket material		
0	No gasket for flushing connection ring (lower housing)	★
Y	Thermo-tork TN-9000 (for use with flushing connection ring)	★
J	PTFE gasket (for use with flushing connection ring)	★
N	GRAFOIL gasket (for use with flushing connection ring)	
K	Barium sulfate filled PTFE gasket (for use with flushing connection ring)	
Lower housing alignment clamp		
SA	Lower housing alignment clamp	★
Flushing plug, vent/drain valve		
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		
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[9]		
4	Flat face, flush flanged	
NACE certificate[10]		
Q15	Certificate of Compliance to NACE MR0175/ISO 15156 for wetted materials	★
Q25	Certificate of Compliance to NACE MR0103 for wetted materials	★
Gasket surface finish		
1	Gasket surface Ra 125 Max.	
Cold temperature application		
B	Extra fill for cold temp application	★
Diaphragm coating[11]		
Z	0.0002-in. (5 μm) gold plated diaphragm	
V	PTFE coated diaphragm for nonstick purposes only	

Table 19. 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.

Capillary change		
2	Radial capillary connection	
Alternate design		
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 Thermo-tork TN-9000 if no other gasket option is selected.
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 remote flanged seal

Specification and selection of product materials, options, or components must be made by the purchaser of the equipment. See page 135 for more information on material selection.

Table 20. 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			
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)			★
J	JIS B2238 (Japanese Industrial Standard)			
Process connection style				
RFW	Flanged seal			★
Process connection size				
	ANSI/ASME B16.5	**EN 1092-1/GOST 12815-80**	**JIS B2238**	
2	1-in.	N/A	25A	★
4	1 1/2-in.	N/A	40A	★
D	N/A	DN 25	N/A	★
F	N/A	DN 40	N/A	★
1	1/2-in.	N/A	N/A	
A	3/4-in.	DN 10	10A	
B	N/A	DN 15	15A	
C	N/A	DN 20	20A	
Flange/pressure rating				
1	Class 150	N/A	10K	★
2	Class 300	N/A	20K	★
4	Class 600	N/A	40K	★
G	N/A	PN 40	N/A	★
5	Class 900	N/A	N/A	
6	Class 1500	N/A	N/A	
7	Class 2500	N/A	N/A	
C	N/A	PN 6	N/A	
H	N/A	PN 63	N/A	
J	N/A	PN 100	N/A	
K	N/A	PN 160	N/A	

Table 20. 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**	
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	★
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	
CV	Alloy 400	316L SST	CS	
CP	Nickel 201	316L SST	CS	
Flushing connection ring material (lower housing)[(2)]				
A	316L SST			★
B	Alloy C-276			★
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				
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)			

Table 20. 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.

Options (Include with selected model number)

Extended product warranty		
WR3	3-year limited warranty	
WR5	5-year limited warranty	
Intermediate gasket material		
Y	C-4401 gasket (for use with flushing connection ring)	★
J	PTFE gasket (for use with flushing connection ring)	★
N	GRAFOIL gasket (for use with flushing connection ring)	
K	Barium sulfate filled PTFE gasket (for use with flushing connection ring)	
R	Ethylene propylene gasket (for use with flushing connection ring)	
Flushing plug, vent/drain valve		
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		
C	0.006-in. (150 μm) available with 316L SST, Alloy C-276, and Duplex 2507 SST for abrasive applications	
Bolt material		
3	304 SST bolts (only available for Stud Bolt Design)	
Gasket surface finish		
1	Gasket surface Ra 125 max.	
Cold temperature application		
B	Extra fill for cold temp application	★
Diaphragm coating[(3)]		
Z	0.0002-in. (5 μm) gold plated diaphragm	
V	PTFE coated diaphragm for nonstick purposes only	
Large diaphragm size		
9	4.1-in. (104 mm) diaphragm diameter	

Table 20. 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.

NACE certificate[4]		
Q15	Certificate of compliance to NACE MR0175/ISO 15156 for wetted materials	★
Q25	Certificate of compliance to NACE MR0103 for wetted materials	★
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 C-4401 Aramid fiber gasket if no other gasket option is selected.
3. Only available on 316LSS, Alloy 400 and Alloy C-276.
4. 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.

EFW extended flanged seal

Specification and selection of product materials, options, or components must be made by the purchaser of the equipment. See page 135 for more information on material selection.

Table 21. 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	
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)				★
J	JIS B2238 (Japanese Industrial Standards)				
Process connection style					
EFW	Extended flanged seal				★
Process connection size					
	ANSI/ASME B16.5	**EN 1092-1/GOST 12815-80**	**JIS B2238**	**Extension diameters**	
7	3-in.	DN 80	80A	2.58-in. (66 mm)	★
9	4-in.	DN 100	100A	3.50-in. (89 mm)	★
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)	
Flange/pressure rating					
	ANSI/ASME B16.5	**EN 1092-1/GOST 12815-80**	**JIS B2238**		
1	Class 150	–	10K		★
2	Class 300	–	20K		★
4	Class 600	–	40K		★
G	–	PN 40	–		★
E	–	PN 10/16 (DN 100 only)	–		
5	Class 900	–	–		
6	Class 1500	–	–		
7	Class 2500	–	–		
H	–	PN 63	–		
J	–	PN 100	–		
K	N/A	PN 160	N/A		

Table 21. 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**	
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	●	●	●	●	●	●	★
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**								
2	2-in.		50 mm								★
4	4-in.		100 mm								★
6	6-in.		150 mm								★
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**								
0	0-in.		0 mm								★

Options (include with selected model number)

Extended product warranty		
WR3	3-year limited warranty	★
WR5	5-year limited warranty	★
Diaphragm thickness		
C	0.006-in. (150 μm) available with 316L SST, Alloy C-276, and Duplex 2507 SST for abrasive applications	

Table 21. 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.

NACE certificate[2]		
Q15	Certificate of compliance to NACE MR0175/ISO 15156 for wetted materials	★
Q25	Gasket surface Ra 125 maximum	★
Gasket surface finish		
1	Gasket surface Ra 125 maximum	
Cold temperature application		
B	Extra fill for cold temperature application	★
Diaphragm coating[3]		
Z	0.0002-in. (5 μm) gold plated diaphragm	
V	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, and 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

Specification and selection of product materials, options, or components must be made by the purchaser of the equipment. See page 135 for more information on material selection.

Table 22. 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			
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				
PFW	Pancake seal			★
Process connection size				
	ANSI	**EN 1092-1/GOST 12815-80**		
G	2-in.	DN 50		★
7	3-in.	N/A		★
J	N/A	DN 80		★
Flange/pressure rating				
	ANSI	**EN 1092-1/GOST 12815-80**		
0	No flange supplied, seal MWP based on customer supplied flange	N/A		★
1	Class 150	N/A		★
2	Class 300	N/A		★
4	Class 600	N/A		★
9	N/A	No flange supplied, seal MWP based on customer supplied flange		★
G	N/A	PN40		★
5	Class 900	N/A		
6	Class 1500	N/A		
7	Class 2500	N/A		
H	N/A	PN 63		
J	N/A	PN 100		
Diaphragm and wetted, upper housing, flange material				
	Diaphragm and wetted	**Upper housing**	**Flange**	
LA[(1)]	316L SST	316L SST	None	★
CA[(1)]	316L SST	316L SST	CS	★

Table 22. 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.**

DA[1]	316L SST	316L SST	316 SST	★
Diaphragm and wetted, upper housing, flange material				
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	★
Flushing connection ring material (lower housing)[2]				
0	None			★
A	316L SST			★
B	Alloy C-276			★
2	Duplex 2205 SST			
H	Titanium grade 4			
6	Nickel 201			
V	Alloy 400			
Flushing connection options, quantity (size)				
0	None			★
1	1 (1/4–14 NPT)			★
3	2 (1/4–14 NPT)			★
7	1 (1/2–14 NPT)			★
9	2 (1/2–14 NPT)			★

Options (Include with selected model number)

Extended product warranty		
WR3	3-year limited warranty	
WR5	5-year limited warranty	
Intermediate gasket material		
0	No gasket for flushing connection ring (lower housing)	★
Y	Thermo-tork TN-9000 (for use with flushing connection ring)	★
J	PTFE gasket (for use with flushing connection ring)	★
N	GRAFOIL gasket (for use with flushing connection ring)	
K	Barium sulfate filled PTFE gasket (for use with flushing connection ring)	
Lower housing alignment clamp		

Table 22. 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.

SA	Lower housing alignment clamp	
Flushing plug, vent/drain valve		
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		
C	0.006-in. (150 μm) available with 316L SST, Alloy C-276, and Duplex 2507 SST for abrasive applications	
NACE certificate[3]		
Q15	Certificate of compliance to NACE MR0175/ISO 15156 for wetted materials	★
Q25	Certificate of compliance to NACE MR0103 for wetted materials	★
Gasket surface finish		
1	Gasket surface Ra 125 maximum	
Cold temperature application		
B	Extra fill for cold temp application	★
Diaphragm coating[4]		
Z	0.0002-in. (5 μm) gold plated diaphragm	
V	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 with Thermo-tork TN-9000 gasket if no other gasket option is selected.
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

Specification and selection of product materials, options, or components must be made by the purchaser of the equipment. See page 135 for more information on material selection.

Table 23. 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		
A	ANSI/ASME B16.5 (American National Standards Institute/American Society of Mechanical Engineers)		
Process connection style			
FCW	Flush flanged seal - ring type joint gasket surface		
Process connection size			
G	2-in.		
7	3-in.		
Flange/pressure rating			
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**
DA	316L SST	316L SST	316 SST
KB[(1)]	Alloy C-276	316L SST	316 SST
K5[(1)]	Duplex 2507 SST/Duplex 2205	316L SST	316 SST
MB[(1)]	Alloy C-276	316L SST	CS
CA[(1)]	316 L SST	316L SST	CS
M5	316 L SST	316L SST	CS
Flushing connection ring material (lower housing)			
0	None		
A	316L SST		
B	Alloy C-276		
2	Duplex 2205 SST		

Table 23. 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.

Flushing connection options	
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)

Extended product warranty		
WR3	3-year limited warranty	
WR5	5-year limited warranty	
Flushing plug, vent/drain valve		
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		
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	
NACE certificate[2]		
Q15	Certificate of Compliance to NACE MR0175/ISO 15156 for wetted materials	★
Q25	Certificate of Compliance to NACE MR0103 for wetted materials	★
Cold temp application		
B	Extra fill for cold temp application	
Diaphragm coating[3]		
Z	0.0002-in. (5 µm) gold plated diaphragm	
V	PTFE coated diaphragm for nonstick purposes only	
Alternate design		
E	One-piece design	
Typical model number: 1199 W DC 1 0 A FCW 7 1 DA 0 0		

1. Not available with one-piece design (option code E)
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 316LSST and Alloy C-276.

Remote flange seal - ring type joint (RTJ) gasket surface

Specification and selection of product materials, options, or components must be made by the purchaser of the equipment. See page 135 for more information on material selection.

Table 24. RC Remote Flange Seal Ordering Information

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

Code	Industry standard			
A	ANSI/ASME B16.5 (American National Standards Institute/American Society of Mechanical Engineers)			
Process connection style				
RCW	Flanged seal - ring type joint gasket surface			
Process connection size				
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				
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**	
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	
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	

Table 24. RC Remote Flange Seal Ordering Information

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

Diaphragm, upper housing, flange material				
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	
Flushing connection ring material (lower housing)[2]				
A	316L SST			
B	Alloy C-276			
F	304L SST			
H	Titanium grade 4			
2	Duplex 2205 SST			
V	Alloy 400			
Flushing connection options				
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)

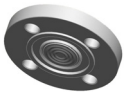
Extended product warranty		
WR3	3-year limited warranty	
WR5	5-year limited warranty	
Intermediate gasket material		
Y	C-4401 gasket (for use with flushing connection ring)	★
J	PTFE gasket (for use with flushing connection ring)	
N	GRAFOIL gasket (for use with flushing connection ring)	
K	Barium sulfate filled PTFE gasket (for use with flushing connection ring)	
R	Ethylene propylene gasket (for use with flushing connection ring)	
Flushing plug, vent/drain valve		
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 24. RC Remote Flange Seal Ordering Information

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

Diaphragm thickness		
C	0.006-in. (150 μm) available with 316L SST, Alloy C-276, and Duplex 2507 SST for abrasive applications	
Bolt material (optional)		
3	304 SST Bolts (only available for stud bolt design)	
NACE certificate[3]		
Q15	Certificate of compliance to NACE MR0175/ISO 15156 for wetted materials	
Q25	Certificate of compliance to NACE MR0103 for wetted materials	
Cold temperature application		
B	Extra fill for cold temp application	
Diaphragm coating		
Z[4]	0.0002-in. (5 μm) gold plated diaphragm	
V[3]	PTFE coated diaphragm for nonstick purposes only	
Large diaphragm size		
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. Supplied with C-4401 Aramid Fiber Gasket if no other gasket option is selected.
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.



FUW and FVW flush flanged type seals

Specification and selection of product materials, options, or components must be made by the purchaser of the equipment. See page 135 for more information on material selection.

Table 25. 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		
D	EN 1092-1 (European Standard)		
T	GOST 12815-80 (Russian Standard)		
Process connection style			
FUW	Flush flanged, EN 1092-1 Type D (groove)		
FVW	Flush flanged, EN 1092-1 Type C (tongue)		
Process connection size			
G	DN 50		
J	DN 80		
Flange/pressure rating			
G	PN 40		
Diaphragm and wetted, upper housing, flange material			
	Diaphragm and wetted	**Upper housing**	**Flange**
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)			
0	None		
Flushing connection options, quantity (size)			
0	None		

Options (include with selected model number)

Extended product warranty	
WR3	3-year limited warranty
WR5	5-year limited warranty
Cold temperature application	
B	Extra fill for cold temperature application
Alternate design	
E	One piece design

Table 25. 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.

NACE certificate[3]		
Q15	Certificate of compliance to NACE MR0175/ISO 15156 for wetted materials	★
Q25	Certificate of compliance to NACE MR0103 for wetted materials	★
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.
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.

Threaded seals

RTW remote threaded seal

Specification and selection of product materials, options, or components must be made by the purchaser of the equipment. See page 135 for more information on material selection.

Table 26. RTW Remote 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		
A	ANSI/ASME B1.20.1 (American National Standards Institute/American Society of Mechanical Engineers)		★
D	EN 10226-1 (European Standard)		★
Process connection style			
RTW	Threaded (standard thread is female, for male select Option code 9)		★
Process connection size			
	ANSI/ASME B1.20.1	**EN 10226-1**	
3	1/2–14 NPT	N/A	★
4	3/4–14 NPT	N/A	★
5	1–11 1/2 NPT	N/A	★
7(1)	1 1/2–11 1/2 NPT	N/A	★
1	1/4–18 NPT	N/A	
C	N/A	Parallel thread: G 1/2A DIN 16288	
2	3/8–18 NPT	N/A	
6(1)	1 1/4–11 1/2 NPT	N/A	
N	N/A	Tapered thread: R 1/2 per ISO 7/1	
Pressure rating			
	ANSI/ASME B1.20.1	**EN 10226-1**	
0	2500 psi	172 bar	★
2(2)	5000 psi	344 bar	
3(2)(3)	10000 psi	N/A	
8	1500 psi (4.1-in. [104 mm]) diaphragm	103 bar (4.1-in. [104 mm]) diaphragm	

Table 26. RTW Remote 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, upper housing, flange material				
	Diaphragm	**Upper housing**	**Flange**	
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	★
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]				
A	316L SST			★
B	Alloy C-276			★
D	Plated carbon steel			
2	Duplex 2205 SST			
H	Titanium grade 4			
V	Alloy 400			
F	304L SST			
Flushing connection options				
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)			

Table 26. RTW Remote 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.

Options (include with selected model number)

Extended product warranty		
WR3	3-year limited warranty	
WR5	5-year limited warranty	
Intermediate gasket material		
Y	C-4401 gasket (for use with flushing connection ring)	★
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)	★
K	Barium sulfate filled PTFE gasket (for use with flushing connection ring)	
Flushing plug, vent/drain valve		
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		
C	0.006-in. (150 μm) available with 316L SST, Alloy C-276, and Duplex 2507 SST for abrasive applications	
Bolt material		
3	304 SST bolts	★
4	316 SST bolts	
NACE certificate[8]		
Q15	Certificate of Compliance to NACE MR0175/ISO 15156 for wetted materials	★
Q25	Certificate of Compliance to NACE MR0103 for wetted materials	★
Cold temperature application		
B	Extra fill for cold temp application	★
Diaphragm coating[9]		
Z	0.0002-in. (5 μm) gold plated diaphragm	
V	PTFE coated diaphragm for nonstick purposes only	
Special threads in lower housing		
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 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 C-4401 aramid fiber gasket if no other gasket option is selected.
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

Specification and selection of product materials, options, or components must be made by the purchaser of the equipment. See page 139 for more information on material selection.

Table 27. 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	
A	ANSI/ASME B1.20.1 (American National Standards Institute/American Society of Mechanical Engineers)	
D	EN 10226-1 (European Standard)	
Process connection style		
HTS	Male threaded seal	
Process connection size, pressure rating		
	ANSI/ASME B1.20.1	**EN 10226-1**
5A[1]	1–11 1/2 NPT, 8700 psi (600 bar)	N/A
7A[2]	1 1/2–11 1/2 NPT, 6000 psi (414 bar)	N/A
9A[3]	2–11 1/2 NPT, 4000 psi (276 bar)	N/A
EA[1]	N/A	G1, 455 bar (6600 psi)
GA[2]	N/A	G1 1/2, BSP, 400 bar (5801 psi)
JA[3]	N/A	G2, BSP, 280 bar (4060 psi)
Diaphragm and wetted, upper housing material		
	Diaphragm and wetted	**Upper housing**
LA00	316L SST	316L SST
Typical model number: 1199 W DC 1 0 A HTS 7 A LA 0 0		

Options (Include with selected model number)

Extended product warranty	
WR3	3-year limited warranty
WR5	5-year limited warranty

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

Specification and selection of product materials, options, or components must be made by the purchaser of the equipment. See page 135 for more information on material selection.

Table 28. 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			
S	Hygienic seal (conforms to 3-A Standard 74-03)		★
Process connection style			
SCW(1)	Tri Clover style Tri Clamp seal		★
Process connection size			
30(2)	1 1/2-in.		★
50(3)	2-in.		★
70	3-in.		★
60	2 1/2-in.		
90	4-in.		
Diaphragm and wetted, upper housing material			
	Diaphragm and wetted	**Upper housing**	
LA00	316L SST	316L SST	★
LB00	Alloy C-276	316L SST	

Options (include with selected model number)

Extended product warranty		
WR3	3-year limited warranty	
WR5	5-year limited warranty	
Surface finish		
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		
P	Non-hygienic fill fluid (does not conform to 3-A Standard 74)	
Clamp and gasket material		
2(4)	High-Pressure Ladish™ Clamp and Nitrile butadiene (NBR) Gasket	
3	Nitrile Butadiene (NBR) Gasket	

Table 28. 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		
6	Electropolishing	
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 1000 inH_2O (2490 mbar).
3. Consult factory for calibrated spans lower than 150 inH_2O (373 mbar).
4. See Table 29 (next page).

Table 29. 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

Specification and selection of product materials, options, or components must be made by the purchaser of the equipment. See page 135 for more information on material selection.

Table 30. 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		
S	Hygienic seal (conforms to 3-A Standard 74-03)		★
Process connection style			
SSW(1)	Tank spud seal		★
Process connection size, pressure rating			
A0	600 psi (41 bar)		★
Upper housing			
A	316L SST		★
Diaphragm and wetted, extension material			
	Diaphragm and wetted	**Extension**	
AL	316L SST(2)	316L SST(2)	★
BB	Alloy C-276	316L SST	★
Extension length			
2	2-in.		★
6	6-in.		★

Options (Include with selected model number)

Extended product warranty		
WR3	3-year limited warranty	
WR5	5-year limited warranty	
Surface finish		
G(3)	15 µin. (0.375 µm) diaphragm surface finish	
H	20 µin.(0.5 µm) diaphragm surface finish	
Diaphragm thickness		
C	0.006-in. (150 µm)	
Tank spud		
1	Tank spud included with shipment	★

Table 30. 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		
P	Non-hygienic fill fluid (does not conform to 3-A Standard 74)	
Special O-rings		
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		
6	Electropolishing	
Typical model number: 1199 W NC 1 0 S SSW A 0 AA L 2		

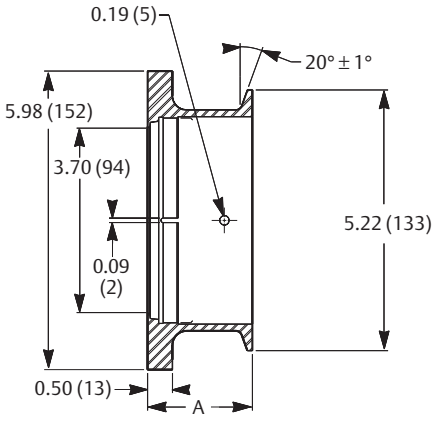
1. Ethylene Propylene O-ring (conforms to 3-A standard 74 and USP class VI) and clamp are supplied with the SSW Seal.
2. Diaphragm brazed and TIG-welded to extension.
3. Requires Option code 6, Electropolishing.

Figure 2. Sanitary Tank Spud Accessories

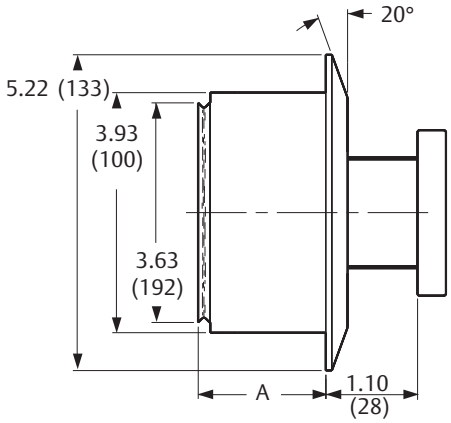
Tank spud and clamp

Rosemount 3051S with direct mount sanitary tank spud with clamp

Tank spud



Tank spud plug



Dimensions are in inches (millimeters).

Table 31. Sanitary Tank Spud Optional Accessories(1)

Model	Description
01199-0061-0001	2-in. sanitary tank spud
01199-0061-0002	6-in. sanitary tank spud

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 32. 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

Specification and selection of product materials, options, or components must be made by the purchaser of the equipment. See page 135 for more information on material selection.

Table 33. 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	
S	Hygienic seal (conforms to 3-A Standard 74-03)	
Process connection style(1)		
STW	Thin wall tank spud seal	
Process connection size, pressure rating		
B0	4-in. Tri Clamp, 600 psi (41 bar)	
Diaphragm and wetted, extension material		
	Diaphragm and wetted	**Extension**
LA00	316L SST	316L SST
BB00	Alloy C-276	Alloy C-276

Options (include with selected model number)

Extended product warranty	
WR3	3-year limited warranty
WR5	5-year limited warranty
Surface finish	
G(2)	15 µin. (0.375 µm) diaphragm surface finish
H	20 µin.(0.5 µm) diaphragm surface finish
Non-hygienic fill fluid	
P	Non-hygienic fill fluid (does not conform to 3-A Standard 74)
Polishing	
6	Electropolishing
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. Ethylene Propylene O-ring (conforms to 3-A standard 74 and USP class VI) and clamp are supplied with the STW Seal.
2. Requires Option code 6, Electropolishing.

EES hygienic flanged tank spud extended seal

Specification and selection of product materials, options, or components must be made by the purchaser of the equipment. See page 135 for more information on material selection.

Table 34. 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	
S	Hygienic seal (conforms to 3-A Standard 74-03)	
Process connection style		
EES	Flanged tank spud seal	
Process connection size, pressure rating		
GG	DN 50, PN 40	
JG	DN 80, PN 40	
Diaphragm and wetted, extension material		
	Diaphragm and wetted	**Extension**
LA	316L SST	316L SST
LB	Alloy C-276	316L SST
Extension length[1]		
10	25 mm (1-in.)	

Options (include with selected model number)

Extended product warranty	
WR3	3-year limited warranty
WR5	5-year limited warranty
Surface finish	
G[2]	15 µin. (0.375 µm) R_a surface finish
H	20 µin. (0.50 µm) R_a surface finish
Gasket material	
1	Fluorocarbon (FMK) O-ring, instead of Standard Ethylene Propylene O-ring (conforms to 3-A Standard 74).
Non-hygienic fill fluids	
P	Non-hygienic fill fluid (does not conform to 3-a standard 74)
Cold temperature application	
B	Extra fill for cold temperature application
Polishing	
6	Electropolishing
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, Electropolishing.

VCS Tri Clamp in-line seal

Specification and selection of product materials, options, or components must be made by the purchaser of the equipment. See page 135 for more information on material selection.

Table 35. VCS Tri Clamp In-Line Seal Ordering Information

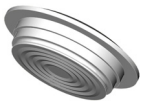
This seal is part of the Expanded offering and is subject to additional delivery lead time.

Code	Industry standard	
S	Hygienic seal (conforms to 3-A Standard 74-03)	
Process connection style (1)		
VCS	In-line Tri Clover style Tri Clamp seal	
Process connection size		
20(2)	1-in.	
30(3)	1 1/2-in.	
50	2-in.	
70	3-in.	
90	4-in.	
Diaphragm and wetted, upper housing material		
	Diaphragm and wetted	**Upper housing**
LA00	316L SST	316L SST

Options (include with selected model number)

Extended product warranty	
WR3	3-year limited warranty
WR5	5-year limited warranty
Surface finish	
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	
P	Non-hygienic fill fluid (does not conform to 3-A Standard 74)
Polishing	
6	Electropolishing
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, Electropolishing.



SVS VARIVENT compatible hygienic connection seal

Specification and selection of product materials, options, or components must be made by the purchaser of the equipment. See page 135 for more information on material selection.

Table 36. 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	
S	Hygienic seal (conforms to 3-A Standard 74-03)	
Process connection style		
SVS	Tuchenhagen VARIVENT Compatible Seal	
Process connection size[1]		
V0	VARIVENT Type N DN 40-125.	
Diaphragm and wetted, upper housing material		
	Diaphragm and wetted	**Upper housing**
LA00	316L SST	316L SST

Options (include with selected model number)

Extended product warranty	
WR3	3-year limited warranty
WR5	5-year limited warranty
Non-hygienic fill fluid	
P	Non-hygienic fill fluid (does not conform to 3-A Standard 74)
Cold temperature application	
B	Extra fill for cold temperature application
Polishing	
6	Electropolishing
Typical model number: 1199 W NC 1 0 S SVS V 0 LA 0 0	

1. Consult factory for calibrated spans lower than 5,4 psi (373 mbar).

SHP hygienic Cherry-Burrell “I” line seal

Specification and selection of product materials, options, or components must be made by the purchaser of the equipment. See page 135 for more information on material selection.

Table 37. SHP Hygienic Cherry-Burrell “I” Line Seal Ordering Information

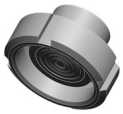
This seal is part of the Expanded offering and is subject to additional delivery lead time.

Code	Industry standard	
S	Hygienic seal (conforms to 3-A Standard 74-03)	
Process connection style(1)		
SHP	Cherry-Burrell “I” line style seal	
Process connection size		
50(2)	2-in.	
70	3-in.	
Diaphragm and wetted, upper housing material		
	Diaphragm and wetted	**Upper housing**
AA00	316L SST	316L SST

Options (include with selected model number)

Extended product warranty	
WR3	3-year limited warranty
WR5	5-year limited warranty
Non-hygienic fill fluid	
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

Specification and selection of product materials, options, or components must be made by the purchaser of the equipment. See page 135 for more information on material selection.

Table 38. 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	
S	Hygienic seal (conforms to 3-A Standard 74-03)	
Process connection style		
SLS	Dairy process connection - female thread	
Process connection size, pressure rating, material		
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**
LA00	316L SST	316L SST

Options (include with selected model number)

Extended product warranty	
WR3	3-year limited warranty
WR5	5-year limited warranty
Polishing	
6	Electropolishing
Non-hygienic fill fluids	
P	Non-hygienic fill fluid (does not conform to 3-A Standard 74)
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

Specification and selection of product materials, options, or components must be made by the purchaser of the equipment. See page 135 for more information on material selection.

Table 39. WSP Saddle Seal Ordering Information

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

Code	Industry standard	
N	Non-industry standard	
Process connection style		
WSP	Saddle seal	
Process connection size		
G	2-in. pipe size	
7	3-in. pipe size	
9	4-in. or larger pipe size	
Pressure rating		
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**
LA	316L SST	316L SST
LB	Alloy C-276	316L SST
LC	Tantalum	316L SST
L5	Duplex 2507 SST	316 SST
Lower housing material[(1)][(2)]		
00	None	
L5	316L SST	
B5	Alloy C-276	
D5	Plated carbon steel	

Options (include with selected model number)

Extended product warranty	
WR3	3-year limited warranty
WR5	5-year limited warranty

Table 39. WSP Saddle Seal Ordering Information

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

Intermediate gasket material		
Y	C-4401 gasket	
J	PTFE gasket	
N	GRAFOIL gasket	
NACE certificate[3]		
Q15	Certificate of compliance to NACE MR0175/ISO 15156 for wetted materials	★
Q25	Certificate of compliance to NACE MR0103 for wetted materials	★
Diaphragm coating		
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 C-4401 Aramid fiber gasket if no gasket option is selected.
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

Specification and selection of product materials, options, or components must be made by the purchaser of the equipment. See page 135 for more information on material selection.

Table 40. UCP and PMW Threaded Pipe Mount Seal Ordering Information

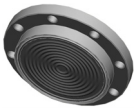
This seal is part of the Expanded offering and is subject to additional delivery lead time.

Industry standard		
N	Non-industry standard	
Process connection style		
UCP	Male threaded pipe mount seal	
PMW	Paper mill sleeve	
Process connection size, pressure rating		
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**
AA	316L SST	316L SST
BB	Alloy C-276	Alloy C-276
Lower housing material		
00	None	
A0	316L SST	
B0	Alloy C-276	

Options (include with selected model number)

Extended product warranty	
WR3	3-year limited warranty
WR5	5-year limited warranty
Diaphragm coating	
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

Specification and selection of product materials, options, or components must be made by the purchaser of the equipment. See page 135 for more information on material selection.

Table 41. 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	
N	Non-industry standard	
Process connection style		
CTW	Chemical tee seal	
Maximum working pressure (flange rating)		
20	300 psi (21 bar)	
Diaphragm and wetted, upper housing material		
	Diaphragm and wetted	**Upper housing**
AA	316L SST	316L SST
BB	Alloy C-276	Alloy C-276
Lower housing		
00	None	

Options (include with selected model number)

Extended product warranty		
WR3	3-year limited warranty	
WR5	5-year limited warranty	
NACE certificate[1]		
Q15	Certificate of compliance to NACE MR0175/ISO 15156 for wetted materials	★
Q25	Certificate of compliance to NACE MR0103 for wetted materials	★
Diaphragm coating		
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

Specification and selection of product materials, options, or components must be made by the purchaser of the equipment. See page 135 for more information on material selection.

Table 42. 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	
A	ANSI/ASME B16.5 (American National Standards Institute/American Society of Mechanical Engineers)	
D	EN 1092-1 (European Standard)	
Process connection style		
TFS	Wafer style in-line seal	
Process connection size		
	ANSI/ASME B16.5	**EN 1092-1**
G	2-in.	DN 50
7	3-in.	N/A
J	N/A	DN 80
9	4-in.	N/A
2(1)	1-in.	N/A
4(2)	1 1/2-in.	N/A
D(1)	N/A	DN 25
F(2)	N/A	DN 40
K	N/A	DN 100
Pressure rating		
0	Seal MWP based on customer supplied flange	
Diaphragm and wetted, upper housing material		
	Diaphragm and wetted	**Upper housing**
LA	316L SST	316L SST
LB	Alloy C-276	316L SST
Housing body length		
00	3.54-in. (90 mm)	

Options (include with selected model number)

Extended product warranty	
WR3	3-year limited warranty
WR5	5-year limited warranty
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

Specification and selection of product materials, options, or components must be made by the purchaser of the equipment. See page 135 for more information on material selection.

Table 43. 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	
A	ANSI/ASME B16.5 (American National Standards Institute/American Society of Mechanical Engineers)	
Process connection style[1]		
WFW	Flow-thru flanged seal	
Process connection size[2]		
G	2-in.	
7	3-in.	
2	1-in.	
Flange rating[2]		
1	Class 150	
Diaphragm, upper housing material		
	Diaphragm	**Upper housing[2]**
LA	316L SST	316L SST
LB	Alloy C-276	316L SST
LC	Tantalum	316L SST
Lower housing material[1]		
L	316L SST	
Pipe schedule[2]		
N	40/40S	

Options (include with selected model number)

Extended product warranty	
WR3	3-year limited warranty
WR5	5-year limited warranty
Gasket material	
Y	C-4401 gasket
J	PTFE O-ring
K	Barium sulfate filled PTFE gasket
N	GRAFOIL gasket
R	Ethylene propylene gasket

Table 43. WFW Flow-Thru Flanged Seal Ordering Information

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

Bolt material		
3	304 SST bolts	
NACE certificate[3]		
Q15	Certificate of compliance to NACE MR0175/ISO 15156 for wetted materials	
Q25	Certificate of compliance to NACE MR0103 for wetted materials	
Cold temperature application		
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 C-4401 Aramid fiber gasket if no other gasket option is selected.
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 (Rosemount 3051SMV, 3051S_C) or 1/2–14 NPT (Rosemount 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.

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.*

DP total accuracy for Enhanced ERS System performance[1]

Sensor type	3051SAM_ _G2, 3051SAL_ _G2 250 inH_2O (622,1 mbar)	3051SAM_ _G3, 3051SAL_ _G3 1000 inH_2O (2488,4 mbar)	3051SAM_ _T1, 3051SAL_ _T1 30 psi (2,1 bar)	3051SAM_ _T2, 3051SAL_ _T2 150 psi (10,34 bar)	3051SAM_ _G4, 3051SAL_ _G4 300 psi (20,7 bar)	3051SAM_ _T3, 3051SAL_ _T3 800 psi (41,4 bar)
Rosemount 3051SAM[2]	0.2 inH_2O (0,5 mbar)	0.6 inH_2O (1,4 mbar)	0.9 inH_2O (2,2 mbar)	1.5 inH_2O (4,0 mbar)	6.2 inH_2O (15 mbar)	7.8 inH_2O (19 mbar)
Rosemount 3051SAL with direct mount seal types and sizes below[3]: • FF, FC, PF ≥ 2-in./DN50 • EF ≥ 3-in./DN80 • All RT, RF, RC, SS • SC ≥ 2.5-in.	2.2 inH_2O (5,5 mbar)	2.3 inH_2O (6,0 mbar)	3.0 inH_2O (7,5 mbar)	3.2 inH_2O (8,0 mbar)	6.5 inH_2O (16 mbar)	8.3 inH_2O (21 mbar)
Rosemount 3051SAL with other seal types and sizes	Consult Instrument Toolkit™ for performance.					

1. Includes full ambient and temperature range from –40 to 85 °C (–40 to 185 °F) requires two transmitters with identical sensor ranges. Specification are only applicable for spans down to 10:1.
2. For Rosemount 3051SAM assembled to a Rosemount 1199 Diaphragm Seal, use Rosemount 3051SAL specification for identical seal types and sizes.
3. For Rosemount 3051SAL with direct mount seals, specification applies to process temperatures from -45 to 205 °C and excludes diaphragm option code SC, 6-mil diaphragm thickness.

For FOUNDATION Fieldbus and wireless devices, use calibrated range in place of span.

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

1. For the Rosemount 3051SAM with 1199 assemble to code B11, use 3051SAL_C specifications.

DP Reference Accuracy of Rosemount 3051S ERS System

Two coplanar gage sensors (Rosemount 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 (Rosemount 3051SAM_ _A)		
Ranges 1–4	±0.035% of DP span	±0.049% of DP span
Two in-line gage sensors (Rosemount 3051SAM_ _T) Two in-line absolute sensors (Rosemount 3051SAM_ _E)		
Ranges 1–4	±0.035% of DP span	±0.049% of DP span
Two liquid level sensors (Rosemount 3051SAL)		
Ranges 1–5	±0.092% of DP span	±0.092% of DP span

Warranty[1]

Models[1]	Ultra/Enhanced	Classic
Rosemount 3051SAM	15-year limited warranty[2]	1-year limited warranty[3]

1. Warranty details can be found in Emerson Terms and Conditions of Sale, Document 63445, Rev G (10/06).
2. Rosemount Ultra transmitter has a limited warranty of fifteen (15) years from date of shipment. All other provisions of Emerson 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

Rosemount 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

Rosemount 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 *Wireless*HART 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 inH_2O (2,49 mbar); with remote mount seal in horizontal plane, zero shift of up to ±5 inH_2O (12,45 mbar) plus extension length on extended units; all zero shifts can be zeroed; no span effect.

Vibration effect

Rosemount 3051SAM 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). For Housing Style codes 1J, 1K, 1L, 2J, and 2M: 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).
Rosemount 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.
Rosemount 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 0.21 mm 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)

Rosemount 3051SAM 3051SAL	Meets IEEE C62.41.2-2002, Location Category B 6 kV crest (0.5 µs–100 kHz) 3 kA crest (8 x 20 microseconds) 6 kV crest (1.2 x 50 microseconds)
Rosemount 3051L	Meets IEEE C62.41, Category B 6 kV crest (0.5 µs–100 kHz) 3 kV crest (8 x 20 microseconds) 6 kV crest (1.2 x 50 microseconds)
Rosemount 2051L	Meets IEEE C62.41, Location Category B 6 kV crest (0.5 µs–100 kHz) 3 kV crest (8 x 20 microseconds) 6 kV crest (1.2 x 50 microseconds)

Functional specifications

Range and sensor Limits

Table 44. Rosemount 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 inH_2O (3,11 mbar)	2.5 inH_2O (6,23 mbar)	250.0 inH_2O (0,62 bar)	–250.0 inH_2O (–0,62 bar)	–250.0 inH_2O (–0,62 bar)
3	5.0 inH_2O (12,4 mbar)	10.0 inH_2O (24,9 mbar)	1000.0 inH_2O (2,49 bar)	–393.0 inH_2O (–979 mbar)	–1000.0 inH_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 45. Rosemount 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 Rosemount 3051SAL Ultra, use Classic minimum span.

Table 46. Rosemount 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 47. 3051L Range and Sensor Limits

Range	Minimum span	Range and sensor limits		
		Upper (URL)	Lower (LRL)	
			Rosemount 3051L Differential	Rosemount 3051L Gage[1]
2	2.5 inH_2O (6,2 mbar)	250 inH_2O (0,62 bar)	–250 inH_2O (–0,62 bar)	–250 inH_2O (–0,62 bar)
3	10 inH_2O (24,9 mbar)	1000 inH_2O (2,49 bar)	–1000 inH_2O (–2,49 bar)	-393 inH_2O (-979 mbar)
4	3 psi (0,20 bar)	300 psi (20,6 bar)	–300 psi (–20,6 bar)	-14.2 psig (979 mbar)
5	20 psi (1,38 bar)	2000 psi (137,9 bar)	N/A	N/A

1. Assumes atmospheric pressure of 14.7 psig.

Table 48. 2051L Range and Sensor Limits

Range	Minimum span	Range and sensor limits		
		Upper (URL)	Lower (LRL)	
			Rosemount 2051L Differential	Rosemount 2051L Gage[1]
2	2.5 inH_2O (6,2 mbar)	250 inH_2O (0,62 bar)	–250 inH_2O (–0,62 bar)	–250 inH_2O (–0,62 bar)
3	10 inH_2O (24,9 mbar)	1000 inH_2O (2,49 bar)	–1000 inH_2O (–2,49 bar)	–393 inH_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

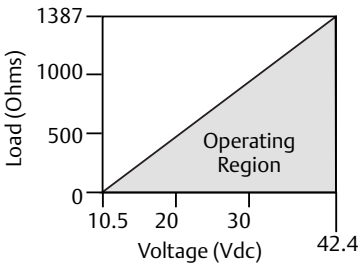
External power supply required. Standard transmitter (4–20 mA) operates on 10.5 to 42.4 Vdc with no load. The Rosemount 3051S ERS System operates on 16 to 42.4 Vdc with no load.

Load limitations

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

Figure 3. Standard HART Transmitter

Maximum Loop Resistance = 43.5 * (Power supply voltage – 10.5)

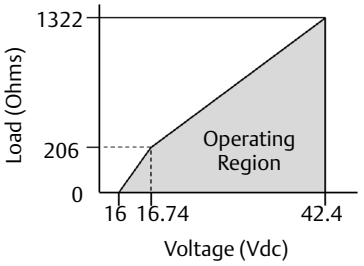


The Field Communicator requires a minimum loop resistance of 250Ω for communication.

Figure 4. Rosemount 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	N/A	N/A	N/A
Transducer	N/A	N/A	N/A
LCD Block	N/A	N/A	N/A
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.

Two 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 Rosemount 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

Rosemount 3051SAL_C Wireless self-organizing networks

Output

IEC 62591 (*Wireless*HART), 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 display 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 second to 60 minutes.

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 49. Rosemount 3051L, 2051L 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.			
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 display 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 50. Rosemount 3051SAM ERS Process Temperature Limits (Gage/Absolute Sensor)

Configuration	Coplanar gage/absolute sensor (Rosemount 3051SAM_ _G, 3051SAM_ _A)	In-line gage sensor/absolute sensor (Rosemount 3051SAM_ _T, 3051SAM_ _E)
Silicone Fill Fluid(1)	N/A	–40 to 250 °F (–40 to 121 °C)(3)
with Coplanar Flange(1)	–40 to 250 °F (–40 to 121 °C)(3)	N/A
with Traditional Flange(2)	–40 to 300 °F (–40 to 149 °C)(3)	N/A
with Level Flange(2)	–40 to 300 °F (–40 to 149 °C)(3)	N/A
with 305 Integral Manifold(1)	–40 to 300 °F (–40 to 149 °C)(3)	N/A
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) 3 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 Rosemount 3051SAM_ _A.
5. 160 °F (71 °C) limit in vacuum service.

Table 51. 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(1)				
					No extension	2-in. (50 mm) extension	4-in. (100 mm) extension	Thermal optimizer	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)
F	Silicone 200 for Vacuum Applications	0.93	N/A	N/A	For use in vacuum applications below 14.7 psia (1 bar-a), refer to vapor pressure curves in Rosemount DP Level Fill Fluid Specification Technical Note				
L	Silicone 704	1.07	0.00095	44	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)	32 to 599 °F (0 to 315 °C)

Table 51. 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[1]				
					No extension	2-in. (50 mm) extension	4-in. (100 mm) extension	Thermal optimizer	Capillary
C	Silicone 704 for Vacuum Applications	1.07	N/A	N/A	For use in vacuum applications below 14.7 psia (1 bar-a), refer to vapor pressure curves in Rosemount DP Level Fill Fluid Specification Technical Note				
R	Silicone 705	1.09	0.00077	175	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)	68 to 698 °F (20 to 370 °C)
V	Silicone 705 for Vacuum Applications	1.09	N/A	N/A	For use in vacuum applications below 14.7 psia (1 bar-a), refer to vapor pressure curves in Rosemount DP Level Fill Fluid Specification Technical Note				
Y[3]	UltraTherm 805	1.20	N/A	N/A	Up to 770 °F (410 °C)	Up to 770 °F (410 °C)	Up to 770 °F (410 °C)	Up to 770 °F (410 °C)	Up to 770 °F (410 °C)
Z[3]	UltraTherm 805 for Vacuum Applications	1.20	N/A	N/A	For use in vacuum applications below 14.7 psia (1 bar-a), refer to vapor pressure curves in Rosemount DP Level Fill Fluid Specification Technical Note				
A	SYLTHERM XLT	0.85	0.001199	1.6	–157 to 293 °F (–105 to 145 °C)	–157 to 293 °F (–105 to 145 °C)	–157 to 293 °F (–105 to 145 °C)	–157 to 293 °F (–105 to 145 °C)	–157 to 293 °F (–105 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)
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[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)	5 to 437 °F (–15 to 225 °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. Temperature limits are reduced in vacuum service. For more information on Fill Fluids see Rosemount DP Level Fill Fluid Specification Technical Note.
2. 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).
3. Only available with Thermal Range Expander.
4. Not suitable for vacuum applications.
5. This is a food grade fill fluid.

Figure 5. Thermal Range Expander Temperature Operating Range

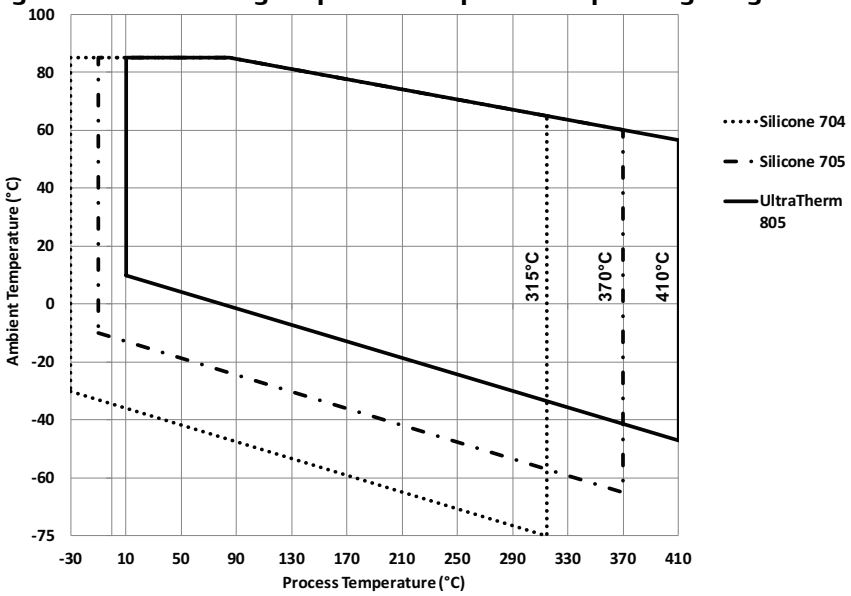


Figure 6. Thermal Optimizer with Silicone 704 Fill Fluid Temperature Limits

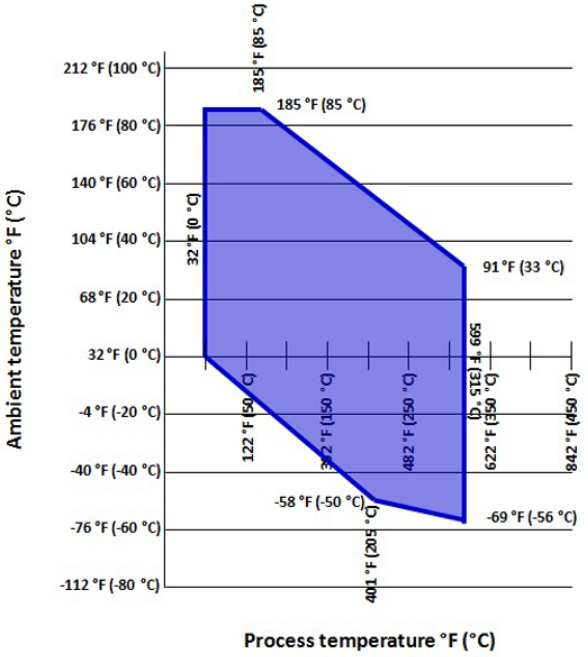
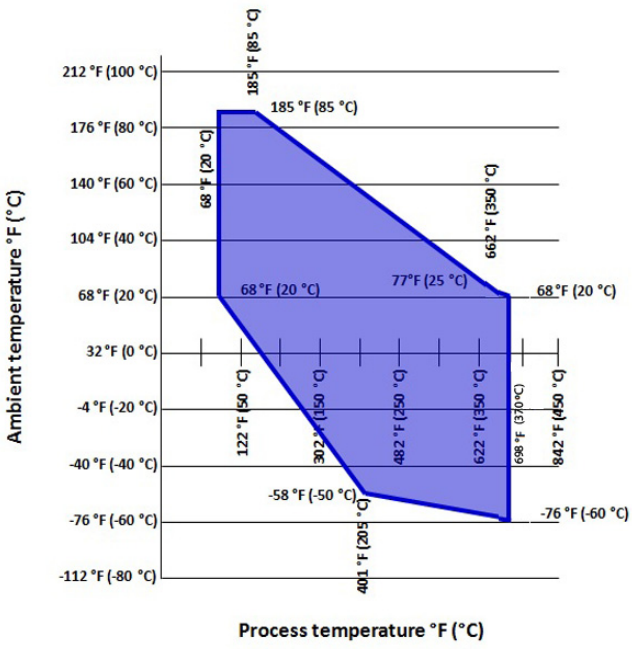


Figure 7. Thermal Optimizer with Silicone 705 Fill Fluid Temperature Limits



Humidity limits

0–100% relative humidity

Turn-on time

Rosemount 3051SAL_C	Performance within specifications less than 2.0 seconds after power is applied to the transmitter.
Rosemount 3051L	Performance within specifications less than 2.0 seconds (10.0 s for PROFIBUS protocol) after power is applied to the transmitter
Rosemount 2051L	Performance within specifications less than 2.0 seconds after power is applied to the transmitter.
Rosemount 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.

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

1. Does not apply to wireless option code X.

Physical specifications

Material selection

Emerson provides a variety of Rosemount products with various product options and configurations including materials of construction that can be expected to perform well in a wide range of applications. The Rosemount product information presented is intended as a guide for the purchaser to make an appropriate selection for the application. It is the purchaser's sole responsibility to make a careful analysis of all process parameters (such as all chemical components, temperature, pressure, flow rate, abrasives, contaminants, etc.), when specifying product materials, options, and components for the particular application. Emerson is not in a position to evaluate or guarantee the compatibility of the process fluid or other process parameters with the product options, configuration, or materials of construction selected.

Electrical connections

$^1/_2$–14 NPT, PG 13.5, G$^1/_2$, and M20 x 1.5 conduit. HART interface connections fixed to terminal block.

Non-wetted parts

Transmitter flange is CF-3M (Cast version of 316L SST, material per ASTM-A743).
Capillary Tube is 316L SST.
Capillary Armor is SST or PVC Coated SST.

	Rosemount 3051SAL	Rosemount 3051L	Rosemount 2051L
Electrical housing	Low-copper aluminum alloy or CF-8M (Cast 316 SST) NEMA 4X, IP 66, IP 68 (66 ft. [20 m] for 168 hours)(1)	Low-copper aluminum or CF-3M (Cast version of 316L SST, material per ASTM-A743). 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 Austenitic 316 SST per ASTM F593 ASTM A453, Class D, Grade 660 SST ASTM A193, Grade B7M alloy steel ASTM A193, Class 2, Grade B8M SST Alloy K–500	ASTM A449, Type 1 (zinc-cobalt plated carbon steel) ASTM F593G, Condition CW1 (Austenitic 316 SST) ASTM A193, Grade B7M (zinc plated alloy steel) Alloy K–500	ASTM A449, Type 1 (zinc-cobalt plated carbon steel) ASTM F593G, Condition CW1 (Austenitic 316 SST) ASTM A193, Grade B7M (zinc plated alloy steel)
Sensor module fill fluid	Silicone or inert halocarbon (Inert is not available with Rosemount 3051S_CA). In-Line series uses Fluorinert™ FC-43.	Silicone 200 or Fluorocarbon oil (Halocarbon or Fluorinert FC-43 for Rosemount 3051T)	Silicone 200 or Fluorocarbon oil (Halocarbon or Fluorinert FC-43 for 2051T)
Process fill fluid	SYLTHERM XLT, Silicone 705, Silicone 704, UltraThem 805, 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 omni-directional antenna Remote Antenna (WN1): Fiberglass omni-directional 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

1. IP 68 not available with Wireless Output.

Note
If a lower housing is supplied, the following gaskets are the default gaskets for each seal unless another gasket material is selected.

Rosemount 3051SAL Transmitter default gasket options

Seal	Gaskets
FF	ThermoTork TN-9000 gasket
EF	No gasket is supplied
FC	No gasket is supplied
RC	Klinger C-4401 gasket
RF	Klinger C-4401 gasket
RT	Klinger C-4401 gasket
PF	ThermoTork TN-9000 gasket
SS	Ethylene Propylene O-ring

Shipping weights

Table 52. Rosemount 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)	N/A	N/A	N/A
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)	N/A	N/A	N/A
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)	N/A	N/A	N/A
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)	N/A	N/A	N/A
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 53. Rosemount 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 l	1.1 (0,5)
M5	LCD display for aluminum PlantWeb housing(1) LCD display for SST PlantWeb housing(1) Aluminum standard cover SST standard cover Aluminum display cover SST display cover Wireless extended cover LCD display(2) Junction box terminal block PlantWeb terminal block Power module Thermal range expander	0.8 (0,4) 1.6 (0,7) 0.4 (0,2) 1.3 (0,6) 0.7 (0,3) 1.5 (0,7) 0.7 (0,3) 0.1 (0,04) 0.2 (0,1) 0.2 (0,1) 0.5 (0,2) 4.1 (1,9)

1. Includes LCD display and display cover.
2. Display only.

Table 54. Rosemount 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., Class 150	12.5 (5,7)	N/A	N/A	N/A
3-in., Class 150	17.5 (7,9)	19.5 (8,8)	20.5 (9,3)	21.5 (9,7)
4-in., Class 150	23.5 (10,7)	26.5 (12,0)	28.5 (12,9)	30.5 (13,8)
2-in., Class 300	17.5 (7,9)	N/A	N/A	N/A
3-in., Class 300	22.5 (10,2)	24.5 (11,1)	25.5 (11,6)	26.5 (12,0)
4-in., Class 300	32.5 (14,7)	35.5 (16,1)	37.5 (17,0)	39.5 (17,9)
2-in., Class 600	15.3 (6,9)	N/A	N/A	N/A
3-in., Class 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)	N/A	N/A	N/A
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 55. Rosemount 3051L Transmitter Option 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 56. Rosemount 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., Class 150	12.5 (5,7)	N/A	N/A	N/A
3-in., Class 150	17.5 (7,9)	19.5 (8,8)	20.5 (9,3)	21.5 (9,7)
4-in., Class 150	23.5 (10,7)	26.5 (12,0)	28.5 (12,9)	30.5 (13,8)
2-in., Class 300	17.5 (7,9)	N/A	N/A	N/A
3-in., Class 300	22.5 (10,2)	24.5 (11,1)	25.5 (11,6)	26.5 (12,0)
4-in., Class 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)	N/A	N/A	N/A
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 57. Rosemount 2051L Transmitter Option 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)

Rosemount 1199 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 and water and Propylene Glycol and 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 (Q15 or Q25 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 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 selection

Emerson provides a variety of Rosemount products with various product options and configurations including materials of construction that can be expected to perform well in a wide range of applications. The Rosemount product information presented is intended as a guide for the purchaser to make an appropriate selection for the application. It is the purchaser's sole responsibility to make a careful analysis of all process parameters (such as all chemical components, temperature, pressure, flow rate, abrasives, contaminants, etc.), when specifying product materials, options, and components for the particular application. Emerson is not in a position to evaluate or guarantee the compatibility of the process fluid or other process parameters with the product options, configuration, or materials of construction selected.

Note
If a lower housing is supplied, then the following gaskets are the default gaskets for each seal unless another gasket option is selected.

Wetted materials

Seal	Gaskets
FFW	ThermoTork TN-9000 gasket
EFW	No gasket is s3upplied
FCW	No gasket is supplied
FUW	No gasket is supplied
FVW	No gasket is supplied
RCW	Klinger C-4401 gasket
RFW	Klinger C-4401 gasket
RTW	Klinger C-4401 gasket
PFW	ThermoTork TN-9000 gasket
PCW	No gasket is supplied
SSW	Ethylene Propylene O-ring
STW	Ethylene Propylene O-ring
UCW	Teflon O-ring
UCP	Barium-sulfate Filled PTFE O-ring
WSP	Klinger C-4401 gasket
WBW	Klinger C-4401 gasket
WFW	Klinger C-4401 gasket
WTW	Klinger C-4401 gasket
WWW	Klinger C-4401 gasket

Tagging

The Rosemount 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.

Product Certifications

Rosemount 3051S/3051SFx/3051S ERS

Rev 1.9

European Directive Information

A copy of the EU Declaration of Conformity can be found at the end of the Quick Start Guide. The most recent revision of the EU Declaration of Conformity can be found at EmersonProcess.com/Rosemount.

Ordinary Location Certification

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

Installing Equipment in North America

The US National Electrical Code (NEC) and the Canadian Electrical Code (CEC) permit the use of Division marked equipment in Zones and Zone marked equipment in Divisions. The markings must be suitable for the area classification, gas, and temperature class. This information is clearly defined in the respective codes.

USA

E5 FM Explosionproof (XP) and Dust-Ignitionproof (DIP)
Certificate: 3008216
Standards: FM Class 3600 – 2011, FM Class 3615 – 2006, FM Class 3616-2011, 3810 – 2005, ANSI/NEMA 250 – 2003
Markings: XP CL I, DIV 1, GP B, C, D; DIP CL II, DIV 1, GP E, F, G; CL III;T5(–50 °C ≤ T_a ≤ +85 °C); Factory Sealed; Type 4X

I5 FM Intrinsic Safety (IS) and Nonincendive (NI)
Certificate: 3012350
Standards: FM Class 3600 - 2011, FM Class 3610 - 2010, FM Class 3611 - 2004, FM Class 3810 - 2005, NEMA 250 - 2003
Markings: IS CL I, DIV 1, GP A, B, C, D; CL II, DIV 1, GP E, F, G; Class III; Class 1, Zone 0 AEx ia IIC T4; NI CL 1, DIV 2, GP A, B, C, D;
T4(–50 °C ≤ T_a ≤ +70 °C) [HART];
T4(–50 °C ≤ T_a ≤ +60 °C) [Fieldbus]; when connected per Rosemount drawing 03151-1006; Type 4X

Special Conditions for Safe Use (X):

1. The Model 3051S/3051S-ERS Pressure Transmitter contains aluminum and is considered to constitute a potential risk of ignition by impact or friction. Care must be taken into account during installation and use to prevent impact and friction.

Note
Transmitters marked with NI CL 1, DIV 2 can be installed in Division 2 locations using general Division 2 wiring methods or Nonincendive Field Wiring (NIFW).
See Drawing 03151-1006.

IE FM FISCO
Certificate: 3012350
Standards: FM Class 3600 - 2011, FM Class 3610 - 2010, FM Class 3611 - 2004, FM Class 3810 - 2005, NEMA 250 - 2003
Markings: IS CL I, DIV 1, GP A, B, C, D;
T4(–50 °C ≤ T_a ≤ +70 °C); when connected per Rosemount drawing 03151-1006; Type 4X

Special Conditions for Safe Use (X):

1. The Model 3051S/3051S-ERS Pressure Transmitter contains aluminum and is considered to constitute a potential risk of ignition by impact or friction. Care must be taken into account during installation and use to prevent impact and friction.

Canada

E6 CSA Explosionproof, Dust-Ignitionproof, and Division 2
Certificate: 143113
Standards: CAN/CSA C22.2 No. 0-10, CSA Std C22.2 No. 25-1966, CSA Std C22.2 No. 30-M1986, CAN/CSA C22.2 No. 94-M91, CSA Std C22.2 No. 142-M1987, CSA Std C22.2 No. 213-M1987, ANSI/ISA 12.27.01-2003, CSA Std C22.2 No. 60529:05
Markings: Explosionproof Class I, Division 1, Groups B, C, D; Dust-Ignitionproof Class II, Division 1, Groups E, F, G; Class III; suitable for Class I, Zone 1, Group IIB+H2, T5; suitable for Class I, Division 2, Groups A, B, C, D; suitable for Class I, Zone 2, Group IIC, T5; when connected per Rosemount drawing 03151-1013; Type 4x

I6 CSA Intrinsically Safe
Certificate: 1143113
Standards: CAN/CSA C22.2 No. 0-10, CSA Std C22.2 No. 30-M1986, CAN/CSA C22.2 No. 94-M91, CSA Std C22.2 No. 142-M1987, CSA Std C22.2 No. 157-92, ANSI/ISA 12.27.01-2003, CSA Std C22.2 No. 60529:05
Markings: Intrinsically Safe Class I, Division 1; suitable for Class 1, Zone 0, IIC, T3C; when connected per Rosemount drawing 03151-1016; Type 4x

IF CSA FISCO
Certificate: 1143113
Standards: CAN/CSA C22.2 No. 0-10, CSA Std C22.2 No. 30-M1986, CAN/CSA C22.2 No. 94-M91, CSA Std C22.2 No. 142-M1987, CSA Std C22.2 No. 157-92, ANSI/ISA 12.27.01-2003, CSA Std C22.2 No. 60529:05
Markings: Intrinsically Safe Class I, Division 1; Groups A, B, C, D; suitable for Class 1, Zone 0, IIC, T3C; when connected per Rosemount drawing 03151-1016 [3051S] 03151-1313 [ERS]; Type 4X

Europe

E1 ATEX Flameproof
Certificate: KEMA 00ATEX2143X
Standards: EN 60079-0:2012, EN 60079-1: 2007, EN 60079-26:2007
(3051SFx models with RTD are certified to EN60079-0:2006)
Markings: ⟨Ex⟩ II 1/2 G Ex d IIC T6...T4 Ga/Gb, T6(–60 °C ≤ T_a ≤ +70 °C), T5/T4(–60 °C ≤ T_a ≤ +80 °C)

Temperature class	Process temperature
T6	–60 °C to +70 °C
T5	–60 °C to +80 °C
T4	–60 °C to +120 °C

Special Conditions for Safe Use (X):

1. The 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 information on the dimensions of the flameproof joints, the manufacturer shall be contacted.

I1 ATEX Intrinsic Safety
Certificate: BAS01ATEX1303X
Standards: EN 60079-0: 2012, EN 60079-11: 2012
Markings: ⟨Ex⟩ II 1 G Ex ia IIC T4 Ga, T4(–60 °C ≤ T_a ≤ +70 °C)

Model	U_i	I_i	P_i	C_i	L_i
SuperModule	30 V	300 mA	1.0 W	30 nF	0
3051S...A; 3051SF...A; 3051SAL...C	30 V	300 mA	1.0 W	12 nF	0
3051S...F; 3051SF...F	30 V	300 mA	1.3 W	0	0
3051S ...A...M7, M8, or M9; 3051SF...A...M7, M8, or M9; 3051SAL...C... M7, M8, or M9	30 V	300 mA	1.0 W	12 nF	60 µH
3051SAL or 3051SAM	30 V	300 mA	1.0 W	12 nF	33 µH
3051SAL...M7, M8, or M9 3051SAM...M7, M8, or M9	30 V	300 mA	1.0 W	12 nF	93 µH
RTD Option for 3051SF	5 V	500 mA	0.63 W	N/A	N/A

Special Conditions for Safe Use (X):

1. The Model 3051S Transmitters fitted with transient protection are not capable of withstanding the 500 V test as defined in Clause 6.3.13 of EN 60079-11:2012. This must be taken into account during installation.
2. The terminal pins of the Model 3051S SuperModule must be provided with a degree of protection of at least IP20 in accordance with IEC/EN 60529.
3. The Model 3051S enclosure may be made of aluminum alloy and given a protective polyurethane paint finish; however, care should be taken to protect it from impact or abrasion if located in a zone 0 area.

IA ATEX FISCO
Certificate: BAS01ATEX1303X
Standards: EN 60079-0: 2012, EN 60079-11: 2012
Markings: ⟨Ex⟩ II 1 G Ex ia IIC T4 Ga, T4(–60 °C ≤ Ta ≤ +70 °C)

Parameter	FISCO
Voltage U_i	17.5 V
Current I_i	380 mA
Power P_i	5.32 W
Capacitance C_i	0
Inductance L_i	0

Special Conditions for Safe Use (X):

1. The Model 3051S Transmitters fitted with transient protection are not capable of withstanding the 500 V test as defined in Clause 6.3.13 of EN 60079-11:2012. This must be taken into account during installation.
2. The terminal pins of the Model 3051S SuperModule must be provided with a degree of protection of at least IP20 in accordance with IEC/EN 60529.

3. The Model 3051S enclosure may be made of aluminum alloy and given a protective polyurethane paint finish; however, care should be taken to protect it from impact or abrasion if located in a zone 0 area.

ND ATEX Dust
Certificate: BAS01ATEX1374X
Standards: EN 60079-0: 2012, EN 60079-31: 2009
Markings: ⟨Ex⟩ II 1 D Ex ta IIIC T105 °C T_{500}95 °C Da,
(–20 °C ≤ T_a ≤ +85 °C), V_{max} = 42.4 V

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 temperature range of the apparatus and capable of withstanding a 7J impact test.
4. The SuperModule(s) must be securely screwed in place to maintain the ingress protection of the enclosure(s).

N1 ATEX Type n
Certificate: BAS01ATEX3304X
Standards: EN 60079-0: 2012, EN 60079-15: 2010
Markings: ⟨Ex⟩ II 3 G Ex nA IIC T5 Gc, (–40 °C ≤ Ta ≤ +85 °C),
V_{max} = 45 V

Special Condition for Safe Use (X):

1. The equipment is not capable of withstanding the 500 V insulation test required by clause 6.5 of EN 60079-15:2010. This must be taken into account when installing the equipment.

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

International

E7 IECEx Flameproof and Dust
Certificate: IECEx KEM 08.0010X (Flameproof)
Standards: IEC 60079-0:2011, IEC 60079-1: 2007, IEC 60079-26:2006,
(3051SFx models with RTD are certified to IEC 60079-0:2004)
Markings: Ex d IIC T6...T4 Ga/Gb,
T6(–60 °C ≤ T_a ≤ +70 °C),
T5/T4(–60 °C ≤ T_a ≤ +80 °C)

Temperature class	Process temperature
T6	–60 °C to +70 °C
T5	–60 °C to +80 °C
T4	–60 °C to +120 °C

Special Conditions for Safe Use (X):

1. The 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 information on the dimensions of the flameproof joints the manufacturer shall be contacted.

Certificate: IECEx BAS 09.0014X (Dust)
Standards: IEC 60079-0:2011, IEC 60079-31:2008
Markings: Ex ta IIIC T105 °C T_{500}95 °C Da,
(–20 °C ≤ T_a ≤ +85 °C), V_{max} = 42.4 V

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 temperature 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.

I7 IECEx Intrinsic Safety
Certificate: IECEx BAS 04.0017X
Standards: IEC 60079-0: 2011, IEC 60079-11: 2011
Markings: Ex ia IIC T4 Ga, T4(–60 °C ≤ T_a ≤ +70 °C)

Model	U_i	I_i	P_i	C_i	L_i
SuperModule	30 V	300 mA	1.0 W	30 nF	0
3051S...A; 3051SF...A; 3051SAL...C	30 V	300 mA	1.0 W	12 nF	0
3051S...F; 3051SF...F	30 V	300 mA	1.3 W	0	0
3051S ...A...M7, M8, or M9; 3051SF...A...M7, M8, or M9; 3051SAL...C... M7, M8, or M9	30 V	300 mA	1.0 W	12 nF	60 µH
3051SAL or 3051SAM	30 V	300 mA	1.0 W	12 nF	33 µH
3051SAL...M7, M8, or M9 3051SAM...M7, M8, or M9	30 V	300 mA	1.0 W	12 nF	93 µH
RTD Option for 3051SF	5 V	500 mA	0.63 W	N/A	N/A

Special Conditions for Safe Use (X):

1. The Model 3051S Transmitters fitted with transient protection are not capable of withstanding the 500 V test as defined in Clause 6.3.13 of IEC 60079-11:2011. This must be taken into account during installation.
2. The terminal pins of the Model 3051S SuperModule must be provided with a degree of protection of at least IP20 in accordance with IEC/EN 60529.

3. The Model 3051S enclosure may be made of aluminum alloy and given a protective polyurethane paint finish; however, care should be taken to protect it from impact or abrasion if located in a zone 0 area.

I7 IECEx Intrinsic Safety – Group I - Mining (I7 with special A0259)
Certificate: IECEx TSA 14.0019X
Standards: IEC 60079-0: 2011, IEC 60079-11: 2011
Markings: Ex ia I Ma (–60 °C ≤ T_a ≤ +70 °C)

Model	U_i	I_i	P_i	C_i	L_i
SuperModule	30 V	300 mA	1.0 W	30 nF	0
3051S...A; 3051SF...A; 3051SAL...C	30 V	300 mA	1.0 W	12 nF	0
3051S...F; 3051SF...F	30 V	300 mA	1.3 W	0	0
3051S ...A...M7, M8, or M9; 3051SF...A...M7, M8, or M9; 3051SAL...C... M7, M8, or M9	30 V	300 mA	1.0 W	12 nF	60 µH
3051SAL or 3051SAM	30 V	300 mA	1.0 W	12 nF	33 µH
3051SAL...M7, M8, or M9 3051SAM...M7, M8, or M9	30 V	300 mA	1.0 W	12 nF	93 µH
RTD Option for 3051SF	5 V	500 mA	0.63 W	N/A	N/A

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 6.6.13 of IEC60079-11. This must be taken into account when installing the apparatus.
2. It is a condition of safe use that the following parameters shall be taken into account during installation.
3. It is a condition of manufacture that only the apparatus fitted with housings, junction boxes, covers and sensor module housings made out of stainless steel are used in Group I applications.

IG IECEx FISCO
Certificate: IECEx BAS 04.0017X
Standards: IEC 60079-0: 2011, IEC 60079-11: 2011
Markings: Ex ia IIC T4 Ga, T4(–60 °C ≤ T_a ≤ +70 °C)

	FISCO
Voltage U_i	17.5 V
Current I_i	380 mA
Power P_i	5.32 W
Capacitance C_i	0
Inductance L_i	0

Special Conditions for Safe Use (X):

1. The Model 3051S Transmitters fitted with transient protection are not capable of withstanding the 500V test as defined in Clause 6.3.13 of EN 60079-11:2012. This must be taken into account during installation.
2. The terminal pins of the Model 3051S SuperModule must be provided with a degree of protection of at least IP20 in accordance with IEC/EN 60529.
3. The Model 3051S enclosure may be made of aluminum alloy and given a protective polyurethane paint finish; however, care should be taken to protect it from impact or abrasion if located in a zone 0 area.

IG IECEx Intrinsic Safety - Group I - Mining (IG with Special A0259)
Certificate: IECEx TSA 04.0019X
Standards: IEC 60079-0: 2011, IEC 60079-11: 2011
Markings: FISCO FIELD DEVICE Ex ia I Ma, (–60 °C ≤ T_a ≤ +70 °C)

	FISCO
Voltage U_i	17.5 V
Current I_i	380 mA
Power P_i	5.32 W
Capacitance C_i	0
Inductance L_i	0

Special Conditions for Safe Use (X):

1. If the apparatus is fitted with optional 90 V transient suppressor, it is not capable of withstanding the 500 V insulation test required by Clause 6.3.13 of IEC60079-11. This must be taken into account when installing the apparatus.
2. It is a condition of safe use that the above input parameters shall be taken into account during installation.
3. It is a condition of manufacture that only the apparatus fitted with housing, covers and sensor module housing made out of stainless steel are used in Group I applications.

N7 IECEx Type n
Certificate: IECEx BAS 04.0018X
Standards: IEC 60079-0: 2011, IEC 60079-15: 2010
Markings: Ex nA IIC T5 Gc, (–40 °C ≤ T_a ≤ +85 °C)

Special Condition for Safe Use (X):

1. The equipment is not capable of withstanding the 500 V insulation test required by clause 6.5 of IEC 60079-15:2010. This must be taken into account when installing the equipment.

Brazil

E2 INMETRO Flameproof
Certificate: UL-BR15.0393X
Standards: ABNT NBR IEC 60079-0:2008 + Corrigendum 1:2011, ABNT NBR IEC 60079-1:2009 + Corrigendum 1:2011, ABNT NBR IEC 60079-26:2008 + Corrigendum 1: 2008
Markings: Ex d IIC T* Ga/Gb, T6(–60 °C ≤ T_a ≤ +70 °C), T5/T4(–60 °C ≤ T_a ≤ +80 °C), IP66

Special Conditions for Safe Use (X):

1. The 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 information on the dimensions of the flameproofs joints, the manufacturer shall be contacted.

I2/IB INMETRO Intrinsic Safety/FISCO
Certificate: UL-BR 15.0392X
Standards: ABNT NBR IEC 60079-0:2008 + Corrigendum 1:2011, ABNT NBR IEC 60079-11:2009
Markings: Ex ia IIC T4 Ga, T4(–60 °C ≤ T_a ≤ +70 °C), IP66

Special Condition for Safe Use (X):

1. The 3051S 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 areas that requires EPL Ga.

Model	U_i	I_i	P_i	C_i	L_i
SuperModule	30 V	300 mA	1.0 W	30 nF	0
3051S...A; 3051SF...A; 3051SAL...C	30 V	300 mA	1.0 W	12 nF	0
3051S...F; 3051SF...F	30 V	300 mA	1.3 W	0	0
3051S...F...IB; 3051SF...F...IB	17.5V	380 mA	5.32 W	0	0
3051S...A...M7, M8, or M9; 3051SF...A...M7, M8, or M9; 3051SAL...C... M7, M8, or M9	30 V	300 mA	1.0 W	11.4 nF	60 µH
3051SAL or 3051SAM	30 V	300 mA	1.0 W	11.4 nF	33 µH
3051SAL...M7, M8, or M9 3051SAM...M7, M8, or M9	30 V	300 mA	1.0 W	11.4 nF	93 µH
RTD Option for 3051SF	5 V	500 mA	0.63 W	N/A	N/A

China

E3 China Flameproof and Dust Ignition-proof
Certificate: 3051S: GYJ16.1249X
3051SFx: GYJ11.1711X
3051S-ERS: GYJ15.1406X
Standards: 3051S: GB3836.1-2010, GB3836.2-2010, GB3836.20-2010, GB12476.1-2013, GB12476.5-2013
3051SFx: GB3836.1-2010, GB3836.2-2010, GB3836.20-2010, GB12476.1-2000
3051S-ERS: GB3836.1-2010, GB3836.2-2010, GB3836.20-2010
Markings: 3051S: Ex d IIC T6...T4; Ex tD A20 T105 °C; T_{500} 95 °C; IP66
3051SFx: Ex d IIC T5/T6 Ga/Gb; DIP A20 T_A105 °C; IP66
3051S-ERS: Ex d IIC T4~T6 Ga/Gb

Special Conditions for Safe Use (X):

1. Only the pressure transmitters, consisting of 3051SC Series, 3051ST Series, 3051SL Series and 300S Series, are certified.
2. The ambient temperature range is (–20 ~+60) °C.
3. The ambient temperature range for the 3051S in a dust environment is -20 °C ≤ T_a ≤ 95 °C
4. The relation between temperature class and maximum temperature of process medium is as follows:

Temperature class	Temperature of process medium (°C)
T5	≤ 95 °C
T4	≤ 130 °C
T3	≤ 190 °C

3051S

Temperature class	Ambient temperature	Process temperature
T6	–60 °C ≤ Ta ≤ +70 °C	–60 °C ≤ Ta ≤ +70 °C
T5	–60 °C ≤ Ta ≤ +80 °C	–60 °C ≤ Ta ≤ +80 °C
T4	–60 °C ≤ Ta ≤ +80 °C	–60 °C ≤ Ta ≤ +120 °C

5. The earth connection facility in the enclosure should be connected reliably.
6. During installation, use and maintenance of transmitter, observe the warning "Don't open the cover when the circuit is alive."
7. During installation, there should be no mixture harm to flameproof housing.
8. Cable entry, certified by NEPSI with type of protection Ex d IIC in accordance with GB3836.1-2000 and GB3836.2-2000, should be applied when installation in hazardous location. 5 full threads should be in engagement when the cable entry is assembled onto the transmitter. When pressure transmitter is used in the presence of combustible dust, the ingress of protection of the cable entry should be IP66.
9. The diameter of cable should observe the instruction manual of cable entry. The compressing nut should be fastened. The aging of seal ring should be changed in time.
10. Maintenance should be done in non-hazardous location.
11. End users are not permitted to change any components inside.
12. When installation, use and maintenance of transmitter, observe following standards:

    GB3836.13-1997 "Electrical apparatus for explosive gas atmospheres Part 13: Repair and overhaul for apparatus used in explosive gas atmospheres"

GB3836.15-2000 “Electrical apparatus for explosive gas atmospheres Part 15: Electrical installations in hazardous area (other than mines)”

GB50257-1996 “Code for construction and acceptance of electric device for explosion atmospheres and fire hazard electrical equipment installation engineering”

GB15577-1995 “Safe regulation for explosive dust atmospheres”

GB12476.2-2006 “Electrical apparatus for use in the presence of combustible dust – Part 1-2: Electrical apparatus protected by enclosures and surface temperature limitation – Selection, installation and maintenance”

I3 China Intrinsic Safety
Certificate: 3051S: GYJ16.1250X [Mfg USA, China, Singapore]
3051SFx: GYJ11.1707X [Mfg USA, China, Singapore]
3051S-ERS: GYJ111265X [Mfg USA, China, Singapore]
Standards: 3051S: GB3836.1-2010, GB3836.4-2010, GB3836.20-2010
3051SFx: GB3836.1/4-2010, GB3836.20-2010, GB12476.1-2000
3051S-ERS: GB3836.1-2010, GB3836.4-2010, GB3836.20-2010
Markings: 3051S, 3051SFx: Ex ia IIC T4 Ga
3051S-ERS: Ex ia IIC T4

Special Conditions for Safe Use (X):

1. Symbol “X” is used to denote specific conditions of use: For output code A and F: This apparatus is not capable of withstanding the 500 V r.m.s. insulation test required by Clause 6.4.12 of GB3836.4-2000.
2. The ambient temperature range is:

Output code	Ambient temperature
A	$-50\ °C \le T_a \le +70\ °C$
F	$-50\ °C \le T_a \le +60\ °C$

3. Intrinsically safe parameters:

Output code	Housing code	Display code	Maximum input voltage: U_i (V)	Maximum input current: I_i (mA)	Maximum input power: P_i (W)	Maximum internal parameters : C_i (nF)	Maximum internal parameters : L_i (uH)
A	=00	/	30	300	1	38	0
A	≠00	/	30	300	1	11.4	2.4
A	≠00	M7/M8 /M9	30	300	1	0	58.2
F	≠00	/	30	300	1.3	0	0
F FISCO	≠00	/	17.5	500	5.5	0	0

4. The product should be used with Ex-certified associated apparatus to establish explosion protection system that can be used in explosive gas atmospheres. Wiring and terminals should comply with the instruction manual of the product and associated apparatus.
5. The cable between this product and associated apparatus should be shielded cables (the cables must have insulated shield). The shield has to be grounded reliably in non-hazardous area.
6. The product complies to the requirements for FISCO field devices specified in IEC60079-27:2008. For the connection of an intrinsically safe circuit in accordance FISCO model, FISCO parameters of this product are as above.
7. End users are not permitted to change any components inside, but to settle the problem in conjunction with manufacturer to avoid damage to the product.
8. When installation, use and maintenance of this product, observe the following standards:

   GB3836.13-1997 “Electrical apparatus for explosive gas atmospheres Part 13: Repair and overhaul for apparatus used in explosive gas atmospheres”

   GB3836.15-2000 “Electrical apparatus for explosive gas atmospheres Part 15: Electrical installations in hazardous area (other than mines)”

   GB3836.16-2006 “Electrical apparatus for explosive gas atmospheres Part 16: Inspection and maintenance of electrical installation (other than mines)”

   GB50257-1996 “Code for construction and acceptance of electric device for explosion atmospheres and fire hazard electrical equipment installation engineering”

N3 China Type n
Certificate: 3051S: GYJ15.1106X [Mfg China]
3051SF: GYJ15.1107X [Mfg China]
Markings: Ex nA IIC T5 Gc

Special Conditions for Safe Use (X):

1. The ambient temperature range is: $-40\ °C \le T_a \le 85\ °C$.
2. Maximum input voltage: 45 V
3. Cable glands, conduit or blanking plugs, certified by NEPSI with Ex e or Ex n protection type and IP66 degree of protection provided by enclosure, should be used on external connections and redundant cable entries.
4. Maintenance should be done in non-hazardous location.
5. End users are not permitted to change any components inside, but to settle the problem in conjunction with manufacturer to avoid damage to the product.
6. When installation, use and maintenance of this product, observe following standards:

   GB3836.13-2013 “Electrical apparatus for explosive gas atmospheres Part 13: Repair and overhaul for apparatus used in explosive gas atmospheres”

GB3836.15-2000 “Electrical apparatus for explosive gas atmospheres Part 15: Electrical installations in hazardous area (other than mines)”

GB3836.16-2006 “Electrical apparatus for explosive gas atmospheres Part 16: Inspection and maintenance of electrical installation (other than mines)”

GB50257-1996 “Code for construction and acceptance of electric device for explosion atmospheres and fire hazard electrical equipment installation engineering”

EAC - Belarus, Kazakhstan, Russia

EM Technical Regulation Customs Union (EAC) Flameproof
Certificate: RU C-US.AA87.B.00094
Markings: Ga/Gb Ex d IIC T6...T4 X

IM Technical Regulation Customs Union (EAC) Intrinsic Safety
Certificate: RU C-US.AA87.B.00094
Markings: 0Ex ia IIC T4 Ga X

Japan

E4 Japan Flameproof
Certificate: TC15682, TC15683, TC15684, TC15685, TC15686, TC15687, TC15688, TC15689, TC15690, TC17099, TC17100, TC17101, TC17102, TC18876
3051ERS: TC20215, TC20216, TC20217, TC20218, TC20219, TC20220, TC20221
Markings: Ex d IIC T6

Republic of Korea

EP Republic of Korea Flameproof
Certificate: 12-KB4BO-0180X [Mfg USA], 11-KB4BO-0068X [Mfg Singapore]
Markings: Ex d IIC T5 or T6

IP Republic of Korea Intrinsic Safety
Certificate: 12-KB4BO-0202X [HART – Mfg USA], 12-KB4BO-0204X [Fieldbus – Mfg USA], 12-KB4BO-0203X [HART – Mfg Singapore], 13-KB4BO-0296X [Fieldbus – Mfg Singapore]
Markings: Ex ia IIC T4

Combinations

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, E6, and I6
KC Combination of E1, I1, E5, and I5
KD Combination of E1, I1, E5, I5, E6, and I6
KG Combination of IA, IE, IF, and IG
KM Combination of EM and IM
KP Combination of EP and IP

Additional Certifications

SBS American Bureau of Shipping (ABS) Type Approval
Certificate: 00-HS145383-6-PDA
Intended Use: Measure gauge or absolute pressure of liquid, gas or vapor applications on ABS classed vessels, marine, and offshore installations.

SBV Bureau Veritas (BV) Type Approval
Certificate: 31910 BV
Requirements: Bureau Veritas Rules for the Classification of Steel Ships
Application: Class Notations: AUT-UMS, AUT-CCS, AUT-PORT and AUT-IMS

SDN Det Norske Veritas (DNV) Type Approval
Certificate: A-14186
Intended Use: Det Norske Veritas’ Rules for Classification of Ships, High Speed and Light Craft, and Det Norske Veritas’ Offshore Standards
Application:

Location classes	
Type	3051S
Temperature	D
Humidity	B
Vibration	A
EMC	A
Enclosure	D/IP66/IP68

SLL Lloyds Register (LR) Type Approval
Certificate: 11/60002
Application: Environmental categories ENV1, ENV2, ENV3, and ENV5

D3 Custody Transfer – Measurement Canada Accuracy Approval [3051S Only]
Certificate: AG-0501, AV-2380C

Rosemount 3051S and 3051SMV Wireless

Rev 2.2

European Directive Information

A copy of the EC Declaration of Conformity can be found at the end of the Quick Start Guide. The most recent revision of the EC Declaration of Conformity can be found at EmersonProcess.com/Rosemount.

Telecommunication compliance

All wireless devices require certification to ensure that they adhere to regulations regarding the use of the RF spectrum. Nearly every country requires this type of product certification. Emerson is working with governmental agencies around the world to supply fully compliant products and remove the risk of violating country directives or laws governing wireless device usage.

FCC and IC

This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions: This device may not cause harmful interference. This device must accept any interference received, including interference that may cause undesired operation. This device must be installed to ensure a minimum antenna separation distance of 20 cm from all persons.

Ordinary Location Certification

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

Installing Equipment in North America

The US National Electrical Code (NEC) and the Canadian Electrical Code (CEC) permit the use of Division marked equipment in Zones and Zone marked equipment in Divisions. The markings must be suitable for the area classification, gas, and temperature class. This information is clearly defined in the respective codes.

USA

I5 USA Intrinsically Safe (IS), Nonincendive (NI), and Dust-Ignitionproof (DIP)
Certificate: 3027705
Standards: FM Class 3600 – 2011, FM Class 3610 – 2010, FM Class 3611 – 2004, FM Class 3810 – 2005, NEMA 250 –2003
Markings: IS CL I, DIV 1, GP A, B, C, D; CL II, DIV 1, GP E, F, G; CL III T4; CL 1, Zone 0 AEx ia IIC T4;NI CL 1, DIV 2, GP A, B, C, D T4;DIP CL II, DIV 1, GP E, F, G; CL III, T5;T4(–50 °C ≤ T_a ≤ +70 °C)/ T5(–50 °C ≤ T_a ≤ +85 °C); when connected per Rosemount drawing 03151-1000; Type 4X

Special Conditions for Safe Use (X):

1. The Model 3051S and SMV Wireless Transmitters shall only be used with the 701PBKKF Rosemount SmartPower Battery Pack or alternately the Perpetuum Intelligent Power Module Vibration Harvester.
2. The transmitter may contain more than 10% aluminum and is considered a potential risk of ignition by impact or friction.
3. The surface resistivity of the antenna is greater than 1GΩ. To avoid electrostatic charge build-up, it must not be rubbed or cleaned with solvents or a dry cloth.

Canada

I6 CSA Intrinsically Safe
Certificate: CSA 1143113
Standards: CAN/CSA C22.2 No. 0-10, CSA Std C22.2 No. 30-M1986, CAN/CSA C22.2 No. 94-M91, CSA Std C22.2 No. 142-M1987, CSA Std C22.2 No. 157-92, ANSI/ISA 12.27.01-2003, CSA Std C22.2 No. 60529:05
Markings: Intrinsically Safe Class I, Division 1; suitable for Class 1, Zone 0, IIC, T3C; when connected per Rosemount drawing 03151-1010; Type 4X

Europe

I1 ATEX Intrinsic Safety
Certificate: Baseefa13ATEX0127X
Standards: EN 60079-0: 2012, EN 60079-11: 2012
Markings: ⟨Ex⟩ II 1 G Ex ia IIC T4 Ga, T4(–60 °C ≤ T_a ≤ +70 °C)

Special Conditions for Safe Use (X):

1. The Model 3051S Wireless and Model 3051SMV Wireless enclosure may be made of aluminum alloy and given a protective polyurethane paint finish; however, care should be taken to protect it from impact or abrasion if located in a zone 0 area.
2. The surface resistivity of the antenna is greater than 1GΩ. To avoid electrostatic charge build-up, it must not be rubbed or cleaned with solvents or dry cloth.

International

I7 IECEx Intrinsic Safety
Certificate: IECEx BAS 13.0068X
Standards: IEC 60079-0: 2011, IEC 60079-11: 2011
Markings: Ex ia IIC T4 Ga, T4(–60 °C ≤ T_a ≤ +70 °C)

Special Conditions for Safe Use (X):

1. The Model 3051S Wireless and Model 3051SMV Wireless enclosure may be made of aluminum alloy and given a protective polyurethane paint finish; however, care should be taken to protect it from impact or abrasion if located in a zone 0 area.
2. The surface resistivity of the antenna is greater than 1GΩ. To avoid electrostatic charge build-up, it must not be rubbed or cleaned with solvents or dry cloth.

Brazil

I2 INMETRO Intrinsic Safety
Certificate: UL-BR 14.0760X
Standards: ABNT NBR IEC60079-0:2008, + Errata 1:2011, ABNT NBRIEC60079-11:2009,
Markings: Ex ia IIC T4 Ga,T4(–60 °C ≤ T_a ≤ +70 °C)

Special Condition for Safe Use (X):

1. See certificate.

China

I3 China Intrinsic Safety
Certificate: 3051S Wireless: GYJ161250X
3051SFx GYJ11.1707X [Flowmeters]
Standards: GB3836.1-2010, GB3836.4-2010, GB3836.20-2010
Markings: Ex ia IIC T4 Ga, T4 –60 ~ 70 °C

Special Condition for Safe Use (X):

1. See appropriate certificate.

Note
Not currently available on the Rosemount 3051S MultiVariable™ Wireless Transmitter.

Japan

I4 TIIS Intrinsically Safe
Certificate: TC18649,TC18650, TC18657
Markings: Ex ia IIC T4 (–20 ~ 60°C)

Note
Not currently available on the 3051S MultiVariable Wireless Transmitter.

EAC – Belarus, Kazakhstan, Russia

IM EAC Intrinsic Safety
Certificate: RU C-US.AA87.B.00094
Markings: 0Ex ia IIC T4 Ga X (–60 °C ≤ T_a ≤ +70 °C)

Special Condition for Safe Use (X):

1. See certificate for special conditions.

Republic of Korea

IP Korea Intrinsic Safety
Certificate: 12-KB4BO-0202X, 12-KB4BO-0203X
Markings: Ex ia IIC T4, (–60 °C ≤ T_a ≤ +70 °C)

Special Condition for Safe Use (X):

1. See certificate for special conditions.

Note
Not currently available on the Rosemount 3051S MultiVariable Wireless Transmitter.

Combinations

KQ Combination of I1, I5, and I6

Rosemount 3051

Rev 1.5

European Directive Information

A copy of the EC Declaration of Conformity can be found at the end of the Quick Start Guide. The most recent revision of the EC Declaration of Conformity can be found at EmersonProcess.com/Rosemount.

Ordinary Location Certification

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

North America

E5 FM Explosionproof (XP) and Dust-Ignitionproof (DIP)
Certificate: 0T2H0.AE
Standards: FM Class 3600 – 1998, FM Class 3615 – 2006, FM Class 3810 – 2005, ANSI/NEMA 250 – 2003
Markings: XP CL I, DIV 1, GP B, C, D; DIP CL II, DIV 1, GP E, F, G; CL III; T5(–50 °C ≤ T_a ≤ +85 °C); Factory Sealed; Type 4X

I5 FM Intrinsic Safety (IS) and Nonincendive (NI)
Certificate: 1Q4A4.AX
Standards: FM Class 3600 – 2011, FM Class 3610 – 2010, FM Class 3611 – 2004, FM Class 3810 – 2005
Markings: IS CL I, DIV 1, GP A, B, C, D; CL II, DIV 1, GP E, F, G; Class III; DIV 1 when connected per Rosemount drawing 03031-1019; NI CL 1, DIV 2, GP A, B, C, D; T4(–50 °C ≤ Ta ≤ +70 °C)
[HART], T5(–50 °C ≤ Ta ≤ +40 °C)
[HART]; T4(–50 °C ≤ Ta ≤ +60 °C)
[Fieldbus/PROFIBUS]; Type 4x

Special Conditions for Safe Use (X):

1. The Model 3051 transmitter housing contains aluminum and is considered a potential risk of ignition by impact or friction. Care must be taken into account during installation and use to prevent impact and friction.
2. The Model 3051 transmitter with the transient terminal block (Option code T1) will not pass the 500Vrms dielectric strength test and this must be taken into account during installation.

IE USA FISCO
Certificate: 1Q4A4.AX
Standards: FM Class 3600 – 2011, FM Class 3610 – 2010, FM Class 3611 – 2004, FM Class 3810 – 2005
Markings: IS CL I, DIV 1, GP A, B, C, D when connected per Rosemount drawing 03031-1019
(–50 °C ≤ T_a ≤ +60 °C); Type 4x

Special Conditions for Safe Use (X):

1. The Model 3051 transmitter housing contains aluminum and is considered a potential risk of ignition by impact or friction. Care must be taken into account during installation and use to prevent impact and friction.
2. The Model 3051 transmitter with the transient terminal block (Option code T1) will not pass the 500Vrms dielectric strength test and this must be taken into account during installation.

C6 Canada Explosionproof, Dust-Ignitionproof, Intrinsic Safety and Nonincendive
Certificate: 1053834
Standards: ANSI/ISA 12.27.01-2003, CSA Std. C22.2 No. 30 -M1986, CSA Std. C22.2 No.142-M1987, CSA Std. C22.2. No.157-92, CSA Std. C22.2 No. 213 - M1987, CAN/CSA C22.2 No. 0-10, CSA Std C22.2 No. 25-1966, CAN/CSA-C22.2 No. 94-M91, CAN/CSA-E60079-0-07, CAN/CSA-E60079-1-07
Markings: Explosionproof for Class I, Division 1, Groups B, C and D; Suitable for Class I, Zone 1, Group IIB+H2, T5; Dust-Ignitionproof Class II, Division 1, Groups E, F, G; Class III Division 1; Intrinsically Safe Class I, Division 1 Groups A, B, C, D when connected in accordance with Rosemount drawing 03031–1024, Temperature Code T3C; Suitable for Class I, Zone 0; Class I Division 2 Groups A, B, C and D, T5; Suitable for Class I Zone 2, Group IIC; Type 4X; Factory Sealed; Single Seal (See drawing 03031-1053)

E6 Canada Explosionproof, Dust-Ignitionproof and Division 2
Certificate: 1053834
Standards: ANSI/ISA 12.27.01-2003, CSA Std. C22.2 No. 30 -M1986, CSA Std. C22.2 No.142-M1987, CSA Std. C22.2 No. 213 - M1987, CAN/CSA C22.2 No. 0-10, CSA Std C22.2 No. 25-1966, CAN/CSA-C22.2 No. 94-M91, CAN/CSA-C22.2 No. 157-92, CAN/CSA-E60079-0-07, CAN/CSA-E60079-1-07
Markings: Explosionproof Class I, Division 1, Groups B, C and D; Suitable for Class I, Zone 1, Group IIB+H2, T5; Dust-Ignitionproof for Class II and Class III, Division 1, Groups E, F and G; Class I, Division 2, Groups A, B, C and D; Suitable for Class I Zone 2, Group IIC; Type 4X; Factory Sealed; Single Seal (See drawing 03031-1053)

Europe

E8 ATEX Flameproof and Dust
Certificate: KEMA00ATEX2013X; Baseefa11ATEX0275X
Standards: EN60079-0:2012, +A11:2013, EN60079-1:2014,EN60079-26:2015, EN60079-31:2009

Markings: ⟨Ex⟩II 1/2 G, Ex db IIC T6...T4 Ga/Gb T6(–60 °C ≤ T_a ≤ +70 °C), T4/T5(–60 °C ≤ T_a ≤ +80 °C);
⟨Ex⟩II 1 D Ex ta IIIC T95 °C T_{500} 105 °C Da
(–20 °C ≤ T_a ≤ +85 °C)

Table 58. Process Temperature

Temperature class	Process temperature
T6	–60 °C to +70 °C
T5	–60 °C to +80 °C
T4	–60 °C to +120 °C

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. Flameproof joints are not intended for repair
3. Non-standard paint options may cause risk from electrostatic discharge. Avoid installations that could cause electrostatic build-up on painted surfaces, and only clean the painted surfaces with a damp cloth. If paint is ordered through a special option code, contact the manufacturer for more information.
4. Some variants of the equipment have reduced markings on the nameplate. Refer to the Certificate for full equipment marking.

I1 ATEX Intrinsic Safety and Dust
Certificate: BAS97ATEX1089X; Baseefa11ATEX0275X
Standards: EN60079-0:2012, EN60079-11:2012, EN60079-31:2009
Markings: HART: ⟨Ex⟩ II 1 G Ex ia IIC T5/T4 Ga
T5(–60 °C ≤ T_a ≤ +40 °C),
T4(–60 °C ≤ T_a ≤ +70 °C)
Fieldbus/PROFIBUS: ⟨Ex⟩ II 1 G Ex ia Ga IIC T4(–60°C ≤ T_a ≤ +60°C)
DUST: ⟨Ex⟩ II 1 D Ex ta IIIC T95 °C T_{500}105 °C Da
(–20 °C ≤ T_a ≤ +85 °C)

Table 59. Input Parameters

	HART	Fieldbus/PROFIBUS
Voltage U_i	30 V	30 V
Current I_i	200 mA	300 mA
Power P_i	0.9 W	1.3 W
Capacitance C_i	0.012 µF	0 µF
Inductance L_i	0 mH	0 mH

Special Conditions for Safe Use (X):

1. The apparatus is not capable of withstanding the 500 V insulation test required by clause 6.3.12 of EN60079-11:2012. This must be taken into account when installing the apparatus.
2. The enclosure may be made of aluminum 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.
3. Some variants of the equipment have reduced markings on the nameplate. Refer to the Certificate for full equipment marking.

IA ATEX FISCO
Certificate: BAS97ATEX1089X
Standards: EN60079-0:2012, EN60079-11:2009
Markings: ⟨Ex⟩ II 1 G Ex ia IIC Ga T4(–60 °C ≤ T_a ≤ +60 °C)

Table 60. Input Parameters

	FISCO
Voltage U_i	17.5 V
Current I_i	380 mA
Power P_i	5.32 W
Capacitance C_i	< 5 nF
Inductance L_i	< 10 µH

Special Conditions for Safe Use (X):

1. The apparatus is not capable of withstanding the 500 V insulation test required by EN60079-11. This must be taken into account when installing the apparatus.
2. The enclosure may be made of aluminum 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
Certificate: BAS00ATEX3105X; Baseefa11ATEX0275X
Standards: EN60079-0:2012, EN60079-15:2010, EN60079-31:2009
Markings: ⟨Ex⟩ II 3 G Ex nA IIC T5 Gc (–40 °C ≤ T_a ≤ +70 °C);
⟨Ex⟩ II 1 D Ex ta IIIC T95 °C T_{500}105 °C Da
(–20 °C ≤ T_a ≤ +85 °C)

Special Conditions for Safe Use (X):

1. This apparatus is not capable of withstanding the 500V insulation test that is required by clause 6.8.1 of EN60079-15. This must be taken into account when installing the apparatus.
2. Some variants of the equipment have reduced markings on the nameplate. Refer to the Certificate for full equipment marking.

International

E7 IECEx Flameproof and Dust
Certificate: IECEx KEM 09.0034X; IECEx BAS 10.0034X
Standards: IEC60079-0:2011, IEC60079-1:2014-06, IEC60079-26:2014-10, IEC60079-31:2008
Markings: Ex db IIC T6...T4 Ga/Gb T6(–60 °C ≤ T_a ≤ +70 °C), T4/T5(–60 °C ≤ T_a ≤ +80 °C); Ex ta IIIC T95 °C T_{500}105 °C Da (–20 °C ≤ T_a ≤ +85 °C)

Table 61. Process Temperature

Temperature class	Process temperature
T6	–60 °C to +70 °C
T5	–60 °C to +80 °C
T4	–60 °C to +80 °C

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. Flameproof joints are not intended for repair.
3. Non-standard paint options may cause risk from electrostatic discharge. Avoid installations that could cause electrostatic build-up on painted surfaces, and only clean the painted surfaces with a damp cloth. If paint is ordered through a special option code, contact the manufacturer for more information.
4. Some variants of the equipment have reduced markings on the nameplate. Refer to the Certificate for full equipment marking.

I7 IECEx Intrinsic Safety
Certificate: IECEx BAS 09.0076X
Standards: IEC60079-0:2011, IEC60079-11:2011
Markings: HART: Ex ia IIC T5/T4 Ga, T5(–60 °C ≤ T_a ≤ +40 °C), T4(–60 °C ≤ T_a ≤ +70 °C)
Fieldbus/PROFIBUS: Ex ia IIC Ga T4(–60 °C ≤ T_a ≤ +60 °C)

Table 62. Input Parameters

	HART	Fieldbus/PROFIBUS
Voltage U_i	30 V	30 V
Current I_i	200 mA	300 mA
Power P_i	0.9 W	1.3 W
Capacitance C_i	0.012 µF	0 µF
Inductance L_i	0 mH	0 mH

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 IEC60079-11. This must be taken into account when installing the apparatus.
2. The enclosure may be made of aluminum 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.

IECEx Mining (Special A0259)
Certificate: IECEx TSA 14.0001X
Standards: IEC60079-0:2011, IEC60079-11:2011
Markings: Ex ia I Ma (–60 °C ≤ T_a ≤ +70 °C)

Table 63. Input Parameters

	HART	Fieldbus/PROFIBUS	FISCO
Voltage U_i	30 V	30 V	17.5 V
Current I_i	200 mA	300 mA	380 mA
Power P_i	0.9 W	1.3 W	5.32 W
Capacitance C_i	0.012 µF	0 µF	< 5 nF
Inductance L_i	0 mH	0 mH	< 10 µH

Special Conditions for Safe Use (X):

1. If the apparatus is fitted with optional 90 V transient suppressor, it is not capable of withstanding the 500 V insulation test required by IEC60079-11. This must be taken into account when installing the apparatus.
2. It is a condition of safe use that the above input parameters shall be taken into account during installation.
3. It is a condition of manufacture that only the apparatus fitted with housing, covers and sensor module housing made out of stainless steel are used in Group I applications.

N7 IECEx Type n
Certificate: IECEx BAS 09.0077X
Standards: IEC60079-0:2011, IEC60079-15:2010
Markings: Ex nA IIC T5 Gc (–40 °C ≤ T_a ≤ +70 °C)

Special Condition for Safe Use (X):

1. The apparatus is not capable of withstanding the 500 V insulation test required by IEC60079-15. This must be taken into account when installing the apparatus.

Brazil

E2 INMETRO Flameproof
Certificate: UL-BR 13.0643X
Standards: ABNT NBR IEC60079-0:2008 + Errata 1:2011, ABNT NBR IEC60079-1:2009 + Errata 1:2011, ABNT NBR IEC60079-26:2008 + Errata 1:2008
Markings: Ex d IIC T6/T5 Ga/Gb, T6(–50 °C ≤ T_a ≤ +65 °C), T5(–50 °C ≤ T_a ≤ +80 °C)

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. In case of repair, contact the manufacturer for information on the dimensions of the flameproof joints.
3. The capacitance of the wrap around label, being 1.6nF, exceeds the limit in Table 9 of ABNT NBR IEC 60079-0. The user shall determine suitability for the specific application.

I2 INMETRO Intrinsic Safety
Certificate: UL-BR 13.0584X
Standards: ABNT NBR IEC60079-0:2008 + Errata 1:2011, ABNT NBR IEC60079-11:2009
Markings: HART: Ex ia IIC T5/T4 Ga, T5(–60 °C ≤ T_a ≤ +40 °C), T4(–60 °C ≤ T_a ≤ +70 °C)
Fieldbus/PROFIBUS: Ex ia IIC T4 Ga (–60 °C ≤ T_a ≤ +60 °C)

Table 64. Input Parameters

	HART	Fieldbus/PROFIBUS
Voltage U_i	30 V	30 V
Current I_i	200 mA	300 mA
Power P_i	0.9 W	1.3 W
Capacitance C_i	0.012 µF	0 µF
Inductance L_i	0 mH	0 mH

Special Conditions for Safe Use (X):

1. If the equipment is fitted with an optional 90 V transient suppressor, it is not capable of withstanding the 500 V insulation test required by ABNT NBR IRC 60079-11. This must be taken into account when installing the equipment.
2. The enclosure may be made of aluminum 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.

IB INMETRO FISCO
Certificate: UL-BR 13.0584X
Standards: ABNT NBR IEC60079-0:2008 + Errata 1:2011, ABNT NBR IEC60079-11:2009
Markings: Ex ia IIC T4 Ga (–60 °C ≤ T_a ≤ +60 °C)

Table 65. Input Parameters

	FISCO
Voltage U_i	17.5 V
Current I_i	380 mA
Power P_i	5.32 W
Capacitance C_i	< 5 nF
Inductance L_i	< 10 µH

Special Conditions for Safe Use (X):

1. If the equipment is fitted with an optional 90 V transient suppressor, it is not capable of withstanding the 500 V insulation test required by ABNT NBR IEC 60079-11. This must be taken into account when installing the equipment.
2. The enclosure may be made of aluminum 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.

China

E3 China Flameproof
Certificate: GYJ14.1041X
Standards: GB3836.1-2000, GB3836.2-2010, GB12476-2000, GB3836.20-2010,
Markings: Ex d IIC T6/T5 Ga/Gb, T6(–50 °C ≤ T_a ≤ +65 °C), T5(–50 °C ≤ T_a ≤ +80 °C)

Special Conditions for Safe Use (X):

1. The relation between ambient temperature arrange and temperature class is as follows:

Ta	Temperature class
–50 °C~+80 °C	T5
–50 °C~+65 °C	T6

When used in a combustible dust environment, the maximum ambient temperature is 80 °C.

2. The earth connection facility in the enclosure should be connected reliably.
3. Cable entry certified by notified body with type of protection Ex d IIC in accordance with GB3836.1-2000 and GB3836.2-2000, should be applied when installed in a hazardous location. When used in combustible dust environment, cable entry in accordance with IP66 or higher level should be applied.
4. Obey the warning "Keep tight when the circuit is alive."
5. End users are not permitted to change any internal components.
6. During installation, use and maintenance of this product, observe the following standards: GB3836.13-1997, GB3836.15-2000, GB3836.16-2006, GB50257-1996, GB12476.2-2006, GB15577-2007

I3 China Intrinsic Safety
Certificate: GYJ13.1362X
Standards: GB3836.1-2010, GB3836.4-2010, GB3836.20-2010, GB12476.1-2000
Markings: Ex ia IIC Ga T4/T5

Special Conditions for Safe Use (X):

1. Symbol "X" is used to denote specific conditions of use:
   a. If the apparatus is fitted with an optional 90 V transient suppressor, it is not capable of withstanding the 500 V insulation test for 1 minute. This must be taken into account when installing the apparatus.
   b. The enclosure may be made of aluminum 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.
2. The relation between T code and ambient temperature range is:

Model	T code	Temperature range
HART	T5	$-60\ °C \le T_a \le +40\ °C$
HART	T4	$-60\ °C \le T_a \le +70\ °C$
Fieldbus/PROFIBUS/FISCO	T4	$-60\ °C \le T_a \le +60\ °C$

3. Intrinsically Safe parameters

Table 66. Input Parameters

	HART	Fieldbus/PROFIBUS	FISCO
Voltage U_i	30 V	30 V	17.5 V
Current I_i	200 mA	300 mA	380 mA
Power P_i	0.9 W	1.3 W	5.32 W
Capacitance C_i	0.012 µF	0 µF	< 5 nF
Inductance L_i	0 mH	0 mH	< 10 µH

Note
FISCO parameters apply to both Group IIC and IIB.

[For Flowmeters] When 644 Temperature Transmitter is used, it should be used with Ex-certified associated apparatus to establish explosion protection system that can be used in explosive gas atmospheres. Wiring and terminals should comply with the instruction manual of both 644 Temperature Transmitter and associated apparatus. The cables between 644 Temperatures Transmitter and associated apparatus should be shielded cables (the cables must have insulated shield). The shielded cable has to be grounded reliably in a non-hazardous area.

4. Transmitters comply with the requirements for FISCO field devices specified in IEC60079-27:2008. For the connection of an intrinsically safe circuit in accordance with FISCO Model, FISCO parameters are listed in the table above.
5. The product should be used with Ex-certified associated apparatus to establish explosion protection system that can be used in explosive gas atmospheres. Wiring and terminals should comply with the instruction manual of the product and associated apparatus.
6. The cables between this product and associated apparatus should be shielded cables (the cables must have insulated shield). The shielded cable has to be grounded reliably in a non-hazardous area.
7. End users are not permitted to change any intern components but to settle the problem in conjunction with the manufacturer to avoid damage to the product.
8. During installation, use and maintenance of this product, observe the following standards: GB3836.13-1997, GB3836.15-2000, GB3836.16-2006, GB50257-1996, GB12476.2-2006, GB15577-2007

N3 China Type n
Certificate: GYJ15.1105X
Standards: GB3836.1-2010, GB3836.8-2003
Markings: Ex nA nL IIC T5 Gc ($-40\ °C \le T_a \le +70\ °C$)

Special Condition for Safe Use (X):

1. Symbol "X" is used to denote specific conditions of use: The apparatus is not capable of withstanding the 500V test to earth for one minute. The must be taken into consideration during installation.

Japan

E4 Japan Flameproof
Certificate: TC20577, TC20578, TC20583, TC20584 [HART]; TC20579, TC20580, TC20581, TC20582 [Fieldbus]
Markings: Ex d IIC T5

Technical Regulations Customs Union (EAC)

EM EAC Flameproof
Certificate: RU C-US.GB05.B.01197
Markings: Ga/Gb Ex d IIC T5/T6 X, T5($-60\ °C \le T_a \le +80\ °C$), T6($-60\ °C \le T_a \le +65\ °C$)

Special Condition for Safe Use (X):

1. See certificate for special conditions.

IM EAC Intrinsically Safe
Certificate: RU C-US.GB05.B.01197
Markings: HART: 0Ex ia IIC T4/T5 Ga X,
T4($-60\ °C \le T_a \le +70\ °C$),
T5($-60\ °C \le T_a \le +40\ °C$)
Fieldbus/PROFIBUS: 0Ex ia IIC T4 Ga X
($-60\ °C \le T_a \le +60\ °C$)

Special Condition for Safe Use (X):

1. See certificate for special conditions.

Combinations

K2 Combination of E2 and I2
K5 Combination of E5 and I5
K6 Combination of C6, E8, and I1
K7 Combination of E7, I7, and N7
K8 Combination of E8, I1, and N1
KB Combination of E5, I5, and C6
KD Combination of E8, I1, E5, I5, and C6
KM Combination of EM and IM

Conduit plugs and adapters

IECEx Flameproof and Increased Safety
Certificate: IECEx FMG 13.0032X
Standards: IEC60079-0:2011, IEC60079-1:2007, IEC60079-7:2006-2007
Markings: Ex de IIC Gb

ATEX Flameproof and Increased Safety
Certificate: FM13ATEX0076X
Standards: EN60079-0:2012, EN60079-1:2007, IEC60079-7:2007
Markings: Ⓔx II 2 G Ex de IIC Gb

Table 67. Conduit Plug Thread Sizes

Thread	Identification mark
M20 x 1.5	M20
1/2–14 NPT	1/2 NPT

Table 68. Thread Adapter Thread Sizes

Male thread	Identification mark
M20 x1.5–6H	M20
1/2 –14 NPT	1/2–14 NPT
3/4 –14 NPT	3/4–14 NPT
Female thread	**Identification mark**
M20 x 1.5 –6H	M20
1/2 –14 NPT	1/2–14 NPT
G 1/2	G 1/2

Special Conditions for Safe Use (X):

1. When the thread adapter or blanking plug is used with an enclosure in type of protection increased safety "e" the entry thread shall be suitably sealed in order to maintain the ingress protection rating (IP) of the enclosure.
2. The blanking plug shall not be used with an adapter.
3. Blanking Plug and Threaded Adapter shall be either NPT or Metric thread forms. G1/2 thread forms are only acceptable for existing (legacy) equipment installations.

Additional Certifications

SBS American Bureau of Shipping (ABS) Type Approval
Certificate: 09-HS446883A-5-PDA
Intended: Marine and Offshore Applications - Measurement of either gauge or absolute pressure for liquid, gas and vapor.

SBV Bureau Veritas (BV) Type Approval
Certificate: 23155
Requirements: Bureau Veritas Rules for the Classification of Steel Ships
Application: Class notations: AUT-UMS, AUT-CCS, AUT-PORT and AUT-IMS; Pressure transmitter type 3051 cannot be installed on diesel engines

SDN Det Norske Veritas (DNV) Type Approval
Certificate: TAA000004F
Intended: Det Norske Veritas' Rules for Classification of Ships, High Speed and Light Craft and Det Norske Veritas' Offshore Standards
Application:

Location classes	
Temperature	D
Humidity	B
Vibration	A
EMC	B
Enclosure	D

SLL Lloyds Register (LR) Type Approval
Certificate: 11/60002
Application: Environmental categories ENV1, ENV2, ENV3 and ENV5

C5 Custody Transfer - Measurement Canada Accuracy Approval
Certificate: AG-0226; AG-0454; AG-0477

Rosemount 2051

Rev 1.4

European Directive Information

A copy of the EC Declaration of Conformity can be found at the end of the Quick Start Guide. The most recent revision of the EC Declaration of Conformity can be found at EmersonProcess.com/Rosemount.

Ordinary Location Certification

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

North America

E5 USA Explosionproof (XP) and Dust-Ignitionproof (DIP)
Certificate: FM16US0232
Standards: FM Class 3600 – 2011, FM Class 3615 – 2006, FM Class 3616 – 2011, FM Class 3810 – 2005, ANSI/NEMA 250 –2008. ANSI/IEC 60529 2004
Markings: XP CL I, DIV 1, GP B, C, D; DIP CL II, DIV 1, GP E, F, G; CL III; T5(–50 °C ≤ T_a ≤ +85 °C); Factory Sealed; Type 4X

I5 USA Intrinsic Safety (IS) and Nonincendive (NI)
Certificate: FM16US0231X
Standards: FM Class 3600 – 2011, FM Class 3610 – 2010, FM Class 3611 – 2004, FM Class 3810 – 2005, ANSI/NEMA 250 –2008
Markings: IS CL I, DIV 1, GP A, B, C, D; CL II, DIV 1, GP E, F, G; Class III; DIV 1 when connected per Rosemount drawing 02051-1009; Class I, Zone 0; AEx ia IIC T4; NI CL 1, DIV 2, GP A, B, C, D; T4(–50 °C ≤ T_a ≤+70 °C); Type 4x

Specific Condition of Use:

1. The Model 2051 transmitter housing contains aluminum and is considered a potential risk of ignition by impact or friction. Care must be taken into account during installation and use to prevent impact and friction.

IE USA FISCO
Certificate: FM16US0231X
Standards: FM Class 3600 – 2011, FM Class 3610 – 2010, FM Class 3611 – 2004, FM Class 3810 – 2005
Markings: IS CL I, DIV 1, GP A, B, C, D when connected per Rosemount drawing 02051-1009 (–50 °C ≤ T_a ≤ +60 °C); Type 4x

Specific Condition of Use:

1. The Model 2051 transmitter housing contains aluminum and is considered a potential risk of ignition by impact or friction. Care must be taken into account during installation and use to prevent impact and friction.

E6 Canada Explosion-Proof, Dust Ignition Proof
Certificate: 2041384
Standards: CAN/CSA C22.2 No. 0-10, CSA Std C22.2 No. 25-1966, CSA Std C22.2 No. 30-M1986, CAN/CSA-C22.2 No. 94-M91, CSA Std C22.2 No.142-M1987, CAN/CSA-C22.2 No.157-92, CSA Std C22.2 No. 213-M1987, CAN/CSA-E60079-0:07, CAN/CSA-E60079-1:07, CAN/CSA-E60079-11-02, CAN/CSA-C22.2 No. 60529:05, ANSI/ISA-12.27.01–2003
Markings: Explosion-Proof for Class I, Divisions 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. Class I Zone 1 Ex d IIC T5. Enclosure type 4X, factory sealed. Single Seal

I6 Canada Intrinsic Safety
Certificate: 2041384
Standards: CSA Std. C22.2 No. 142 - M1987, CSA Std.C22.2 No. 213 - M1987, CSA Std. C22.2 No.157 - 92, CSA Std. C22.2 No. 213 - M1987, ANSI/ISA 12.27.01 – 2003, CAN/CSA-E60079-0:07, CAN/CSA-E60079-11:02
Markings: Intrinsically safe for Class I, Division 1, Groups A,B, C, and D when connected in accordance with Rosemount drawings 02051-1008. Temperature code T3C. Ex ia IIC T3C. Single Seal. Enclosure Type 4X

Europe

E1 ATEX Flameproof
Certificate: KEMA 08ATEX0090X
Standards: EN60079-0:2006, EN60079-1:2007, EN60079-26:2007
Markings: Ⓔx II 1/2 G Ex d IIC T6 IP66 (–50 °C ≤ T_a ≤ 65 °C); Ⓔx II 1/2 G Ex d IIC T5 IP66 (–50 °C ≤ T_a ≤ 80 °C)

Special Conditions for Safe Use (X):

1. The Ex d blanking elements, cable glands and wiring needs to be suitable for a temperature of 90 °C.
2. 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 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.

I1 ATEX Intrinsic Safety
Certificate: Baseefa08ATEX0129X
Standards: EN60079-0:2012, EN60079-11:2012
Markings: ⟨Ex⟩ II 1 G Ex ia IIC T4 Ga (–60 °C ≤ T_a ≤ +70 °C)

Table 69. Input Parameters

Parameters	HART	Fieldbus/PROFIBUS
Voltage U_i	30 V	30 V
Current I_i	200 mA	300 mA
Power P_i	1.0 W	1.3 W
Capacitance C_i	0.012 µF	0 µF
Inductance L_i	0 mH	0 mH

Special Condition for Safe Use (X):

1. If the equipment is fitted with an optional 90 V transient suppressor, it is incapable of withstanding the 500 V isolation from earth test and this must be taken into account during installation.
2. The enclosure may be made of aluminum alloy and given a protective polyurethane paint finish; however care should be taken to protect it from impact and abrasion when located in Zone 0.

IA ATEX FISCO
Certificate: Baseefa08ATEX0129X
Standards: EN60079-0:2012, EN60079-11:2012
Markings: ⟨Ex⟩ II 1 G Ex ia IIC T4 Ga (–60 °C ≤ T_a ≤ +60 °C)

Table 70. Input Parameters

Parameters	FISCO
Voltage U_i	17.5 V
Current I_i	380 mA
Power P_i	5.32 W
Capacitance C_i	0 µF
Inductance L_i	0 mH

Special Conditions for Safe Use (X):

1. If the equipment is fitted with an optional 90V transient suppressor, it is incapable of withstanding the 500V isolation from earth test and this must be taken into account during installation.
2. The enclosure may be made of aluminum alloy and given a protective polyurethane paint finish; however care should be taken to protect it from impact and abrasion when located in Zone 0.

N1 ATEX Type n
Certification: Baseefa08ATEX0130X
Standards: EN60079-0:2012, EN60079-15:2010
Markings: ⟨Ex⟩ II 3G Ex nA IIC T4 Gc (–40 °C ≤ T_a ≤ +70 °C)

Special Condition for Safe Use (X):

1. If the equipment is fitted with an optional 90 V transient suppressor, it is incapable of withstanding the 500 V electrical strength test as defined in clause 6.5.1 of by EN 60079-15:2010. This must be taken into account during installation.

ND ATEX Dust
Certification: Baseefa08ATEX0182X
Standards: EN60079-0:2012, EN60079-31:2009
Markings: ⟨Ex⟩ II 1 D Ex ta IIIC T95 °C T_{500} 105 °C Da (–20 °C ≤ T_a ≤ +85 °C)

Special Condition for Safe Use (X):

1. If the equipment is fitted with an optional 90 V transient suppressor, it is incapable of withstanding the 500 V isolation from earth test and this must be taken into account during installation.

International

E7 IECEx Flameproof
Certificate: IECExKEM08.0024X
Standards: IEC60079-0:2004, IEC60079-1:2007-04, IEC60079-26:2006
Markings: Ex d IIC T6/T5 IP66,
T6(–50 °C ≤ T_a ≤ +65 °C),
T5(–50 °C ≤ T_a ≤ +80 °C)

Table 71. Process Temperature

Temperature class	Process temperature
T6	–50 °C to +65 °C
T5	–50 °C to +80 °C

Special Conditions for Safe Use (X):

1. The 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 maintenance shall be followed in detail to assure safety during its expected lifetime.
2. The Ex d blanking elements, cable glands, and wiring shall be suitable for a temperature of 90 °C.
3. In case of repair, contact the manufacturer for information on the dimensions of the flameproof joints.

I7 IECEx Intrinsic Safety
Certificate: IECExBAS08.0045X
Standards: IEC60079-0:2011, IEC60079-11:2011
Markings: Ex ia IIC T4 Ga (–60 °C ≤ T_a ≤ +70 °C)

Table 72. Input Parameters

Parameters	HART	Fieldbus/PROFIBUS
Voltage U_i	30 V	30 V
Current I_i	200 mA	300 mA
Power P_i	1.0 W	1.3 W
Capacitance C_i	0.012 µF	0 µF
Inductance L_i	0 mH	0 mH

Special Condition for Safe Use (X):

1. If the equipment is fitted with an optional 90 V transient suppressor, it is incapable of withstanding the 500 V isolation from earth test and this must be taken into account during installation.
2. The enclosure may be made of aluminum alloy and given a protective polyurethane paint finish; however care should be taken to protect it from impact and abrasion when located in Zone 0.

IG IECEx FISCO
Certificate: IECExBAS08.0045X
Standards: IEC60079-0:2011, IEC60079-11:2011
Markings: Ex ia IIC T4 Ga (–60 °C ≤ T_a ≤ +60 °C)

Table 73. Input Parameters

Parameters	FISCO
Voltage U_i	17.5 V
Current I_i	380 mA
Power P_i	5.32 W
Capacitance C_i	0 µF
Inductance L_i	0 mH

Special Condition for Safe Use (X):

1. If the equipment is fitted with an optional 90 V transient suppressor, it is incapable of withstanding the 500 V isolation from earth test and this must be taken into account during installation.
2. The enclosure may be made of aluminum alloy and given a protective polyurethane paint finish; however care should be taken to protect it from impact and abrasion when located in Zone 0.

N7 IECEx Type n
Certificate: IECExBAS08.0046X
Standards: IEC60079-0:2011, IEC60079-15:2010
Markings: Ex nA IIC T4 Gc (–40 °C ≤ T_a ≤ +70 °C)

Special Condition for Safe Use (X):

1. If fitted with a 90 V transient suppressor, the equipment is not capable of withstanding the 500 V electrical strength test as defined in clause 6.5.1 of IEC60079-15:2010. This must be taken into account during installation.

Brazil

E2 INMETRO Flameproof
Certificate: UL-BR 14.0375X
Standards: ABNT NBR IEC60079-0:2008 + Errata 1:2011,
ABNT NBR IEC 60079-1:2009 + Errata 1:2011,
ABNT NBR IEC 60079-26:2008 + Errata 1:2009
Markings: Ex d IIC T6/T5 Gb IP66,
T6(–50 °C ≤ T_a ≤ +65 °C),
T5(–50 °C ≤ T_a ≤ +80 °C)

Special Condition for Safe Use (X):

1. The 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. The Ex d blanking elements, cable glands, and wiring shall be suitable for a temperature of 90 °C.
3. In case of repair, contact the manufacturer for information on the dimensions of the flameproof joints.

I2 INMETRO Intrinsic Safety
Certificate: UL-BR 14.0759X
Standards: ABNT NBR IEC60079-0:2008, +Errata 1:2011
ABNT NBR IEC60079-11:2009
Markings: Ex ia IIC T4 Ga (–60 °C ≤ T_a ≤ +70 °C)

Table 74. Input Parameters

Parameters	HART	Fieldbus/PROFIBUS
Voltage U_i	30 V	30 V
Current I_i	200 mA	300 mA
Power P_i	1 W	1.3 W
Capacitance C_i	0.012 µF	0 µF
Inductance L_i	0 mH	0 mH

Special Condition for Safe Use (X):

1. If the equipment is fitted with an optional 90 V transient suppressor, it is not capable of withstanding the 500 V insulation test required by ABNT NBR IRC 60079-11:2008. This must be taken into account when installing the equipment.
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 and abrasion when located in atmospheres that require ELP Ga.

IB INMETRO FISCO
Certificate: UL-BR 14.0759X
Standards: ABNT NBR IEC 60079-0:2008 + Errata 1:2011;
ABNT NBR IEC 60079-11:2009
Markings: Ex ia IIC T4 Ga (–60 °C ≤ T_a ≤ +60 °C)

Table 75. Input Parameters

	FISCO
Voltage U_i	17.5 V
Current I_i	380 mA
Power P_i	5.32 W
Capacitance C_i	0 µF
Inductance L_i	0 mH

Special Condition for Safe Use (X):

1. If the equipment is fitted with an optional 90 V transient suppressor, it is not capable of withstanding the 500 V insulation test required by ABNT NBR IRC 60079-11:2008. This must be taken into account when installing the equipment.
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 and abrasion when located in atmospheres that require ELP Ga.

China

E3 China Flameproof
Certificate: GYJ13.1386X
Standards: GB3836.1-2010, GB3836.2-2010
Markings: Pressure Transmitter: Ex d IIC Gb, T6(-50°C ≤ Ta ≤ +65°C), T5(-50°C ≤ Ta ≤ +80°C)

Special Condition for Safe Use (X):

1. Symbol "X" is used to denote specific conditions of use:
   a. The Ex d blanking elements, cable glands, and wiring shall be suitable for a temperature of 90°C.
   b. This device contains a thin wall diaphragm. Installation, maintenance and use shall take into account the environment conditions to which the diaphragm will be subjected.
2. The relation between T code and ambient temperature range is:

Ta	Temperature class
-50 °C ≤ Ta ≤ +80 °C	T5
-50 °C ≤ Ta ≤ +65 °C	T6

3. The earth connection facility in the enclosure should be connected reliably.
4. During installation, use and maintenance of the product, observe the warning "Don't open the cover when the circuit is alive."
5. During installation, there should be no mixture harmful to flameproof housing.
6. Cable entry and conduit, certified by NEPSI with type of protection Ex d IIC and appropriate thread form, should be applied when installed in a hazardous location. Blanking elements should be used on the redundant cable entries.
7. End users are not permitted to change any internal components, but to settle the problem in conjunction with the manufacturer to avoid damage to the product.
8. Maintenance should be done in a non-hazardous location.
9. During installation, use and maintenance of this product, observe the following standards: GB3836.13-2013, GB3836.15-2000, GB3836.16-2006, GB50257-2014

I3 China Intrinsic Safety
Certificate: GYJ12.1295X
Standards: GB3836.1-2010, GB3836.4-2010, GB3836.20-2010
Markings: Ex ia IIC Ga, T6(-60°C ≤ Ta ≤ +70°C)

Special Condition for Safe Use (X):

1. Symbol "X" is used to denote specific conditions of use:
   a. If the apparatus is fitted with an optional 90 V transient suppressor, it is not capable of withstanding the 500 V insulation test for 1 minute. This must be taken into account when installing the apparatus.
   b. The enclosure may be made of aluminum 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.
2. The relation between T code and ambient temperature range is:

Model	T Code	Temperature range
HART, Fieldbus, Profibus, and Low Power	T4	-60°C ≤ Ta ≤ +70°C

3. Intrinsically safe parameters:

	HART	Fieldbus/ PROFIBUS	FISCO
Voltage U_i	30 V	30 V	17.5 V
Current I_i	200 mA	300 mA	380 mA
Power P_i	1 W	1.3 W	5.32 W
Capacitance C_i	0.012 µF	0 µF	0 nF
Inductance L_i	0 mH	0 mH	0 µF

Note
FISCO parameters comply with the requirements for FISCO field devices in GB3836.19-2010.

[For Flowmeters] When 644 temperature transmitter is used, the 644 temperature transmitter should be used with Ex-certified associated apparatus to establish explosion protection system that can be used in explosive gas atmospheres. Wiring and terminals should comply with the instruction manual of both 644 temperature transmitter and associated apparatus. The cables between 644 temperatures transmitter and associated apparatus should be shielded cables (the cables must have insulated shield). The shielded cable has to be grounded reliably in a non-hazardous area.

4. The product should be used with Ex-certified associated apparatus to establish explosion protection system that can be used in explosive gas atmospheres. Wiring and terminals should comply with the instruction manual of the product and associated apparatus.

5. The cables between this product and associated apparatus should be shielded cables (the cables must have insulated shield). The shielded cable has to be grounded reliably in a non-hazardous area.
6. End users are not permitted to change any internal components, and needs to settle the problem in conjunction with the manufacturer to avoid damage to the product.
7. During installation, use and maintenance of this product, observe the following standards: GB3836.13-2013, GB3836.15-2000, GB3836.16-2006, GB3836.18-2010, GB50257-2014.

Japan

E4 Japan Flameproof

Certificate: RU C-US.GB05.B.01199

Markings: Ga/Gb Ex d IIC X, T5

Technical Regulations Customs Union (EAC)

EM EAC Flameproof

Certificate: RU C-US.GB05.B.01199

Markings: Ga/Gb Ex d IIC X, T5(–50 °C ≤ T_a ≤ +80 °C), T6(–50 °C ≤ T_a ≤ +65 °C)

Special Condition for Safe Use (X):

1. See certificate for special conditions.

IM EAC Intrinsically Safe

Certificate: RU C-US.GB05.B.01199

Markings: 0Ex ia IIC T4 Ga X (-60 °C ≤ T_a ≤ +70 °C)

Special Condition for Safe Use (X):

1. See certificate for special conditions.

Combinations

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, N7 and IECEx Dust

IECEx Dust

Certificate: IECExBAS08.0058X

Standards: IEC60079-0:2011, IEC60079-31:2008

Markings: Ex ta IIIC T95 °C T_{500}105 °C Da (–20 °C ≤ Ta ≤ +85 °C)

Special Condition for Safe Use (X):

1. If the equipment is fitted with an optional 90 V transient suppressor, it is incapable of withstanding a 500 V isolation from earth test and this must be taken into account during installation.

KA Combination of E1, I1, and K6

KB Combination of K5 and K6

KC Combination of E1, I1, and K5

KD Combination of K1, K5, and K6

KM Combination of EM and IM

Additional Certifications

SBS American Bureau of Shipping (ABS) Type Approval

Certificate: 09-HS446883B-3-PDA

Intended Use: Marine and Offshore Applications Measurement of either Gauge or Absolute Pressure for Liquid, Gas, and Vapor.

ABS Rules: 2013 Steel Vessels Rules 1-1-4/7.7, 1-1-Appendix 3, 4-8-3/1.7, 4-8-3/13.1

SBV Bureau Veritas (BV) Type Approval

Certificate: 23157/B0 BV

BV Rules: Bureau Veritas Rules for the Classification of Steel Ships

Application: Class notations: AUT-UMS, AUT-CCS, AUT-PORT and AUT-IMS; Pressure transmitter type 2051 cannot be installed on diesel engines.

SDN Det Norske Veritas (DNV) Type Approval

Certificate: TAA000004F

Intended Use: DNV GL Rules for Classification -Ships and offshore units

Application:

Location classes	
Type	2051
Temperature	D
Humidity	B
Vibration	A
EMC	B
Enclosure	D

SLL Lloyds Register (LR) Type Approval

Certificate: 11/60002

Application: Environmental categories ENV1, ENV2, ENV3 and ENV5

Rosemount 3051 Wireless

Rev 1.3

European Directive Information

A copy of the EC Declaration of Conformity can be found at the end of the Quick Start Guide. The most recent revision of the EC Declaration of Conformity can be found at EmersonProcess.com/Rosemount.

Telecommunication compliance

All wireless devices require certification to ensure that they adhere to regulations regarding the use of the RF spectrum. Nearly every country requires this type of product certification. Emerson is working with governmental agencies around the world to supply fully compliant products and remove the risk of violating country directives or laws governing wireless device usage.

FCC and IC

This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions: This device may not cause harmful interference. This device must accept any interference received, including interference that may cause undesired operation. This device must be installed to ensure a minimum antenna separation distance of 20 cm from all persons.

Ordinary Location Certification from FM Approvals

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

Installing in North America

The US National Electrical Code (NEC) and the Canadian Electrical Code (CEC) permit the use of Division marked equipment in Zones and Zone marked equipment in Divisions. The markings must be suitable for the area classification, gas, and temperature class. This information is clearly defined in the respective codes.

USA

I5 U.S.A. Intrinsically Safe (IS)
Certificate: FM 3046325
Standards: FM Class 3600 - 2011, FM Class 3610 - 2010, FM Class 3810 - 2005, ANSI/ISA 60079-0 - 2009, ANSI/ISA 60079-11 - 2009, NEMA 250 - 2003, ANSI/IEC 60529
Markings: IS CL I, DIV 1, GP A, B, C, D T4;
CL 1, Zone 0 AEx ia IIC T4;
T4(–40 °C ≤ T_a ≤ +70 °C) when installed per Rosemount drawing 03031-1062;
Type 4X/IP66/IP68

Special Conditions for Safe Use (X):

1. The Model 3051 Wireless Pressure Transmitter shall only be used with the 701PGNKF Rosemount SmartPower Battery Pack.
2. The inline pressure sensor may contain more than 10% aluminum and is considered a potential risk of ignition by impact or friction. Care must be taken into account during installation and used to prevent impact and friction.
3. The surface resistivity of the transmitter housing is greater than one gigaohm. To avoid electrostatic charge build-up, it must not be rubbed or cleaned with solvents or a dry cloth.

Canada

I6 Canada Intrinsically Safe
Certificate: CSA2526009
Standards: CAN/CSA C22.2 No. 0-M91, CAN/CSA C22.2 No. 94-M91, CSA Std C22.2 No. 142-M1987, CSA Std C22.2 No. 157-92, CSA Std C22.2 No. 60529:05
Markings: Intrinsically Safe for Class I, Division 1, Groups A, B, C, D, T4 when installed per Rosemount drawing 03031-1063; Type 4X/IP66/IP68

Europe

I1 ATEX Intrinsic Safety
Certificate: Baseefa12ATEX0228X
Standards: EN 60079-0: 2012, EN 60079-11: 2012
Markings: ⟨Ex⟩II 1 G Ex ia IIC T4 Ga, T4(–40 °C ≤ T_a ≤ +70 °C) IP66/IP68

Special Conditions for Safe Use (X):

1. The plastic enclosure may constitute a potential electrostatic ignition risk and must not be rubbed or cleaned with a dry cloth.
2. The Model 701PGNKF Power Module may be replaced in a hazardous area. The power module has a surface resistivity greater than 1GΩ and must be properly installed in the wireless device enclosure. Care must be taken during transportation to and from the point of installation to prevent electrostatic charge build-up.

International

I7 IECEx Intrinsic Safety
Certificate: IECEx BAS 12.0124X
Standards: IEC 60079-0: 2011, IEC 60079-11: 2011
Markings: Ex ia IIC T4 Ga, T4(–40 °C ≤ T_a ≤ +70 °C)IP66/IP68

Special Conditions for Safe Use (X)

1. The plastic enclosure may constitute a potential electrostatic ignition risk and must not be rubbed or cleaned with a dry cloth.
2. The Model 701PGNKF Power Module may be replaced in a hazardous area. The power module has a surface resistivity greater than 1GΩ and must be properly installed in the wireless device enclosure. Care must be taken during transportation to and from the point of installation to prevent electrostatic charge build-up.

Brazil

I2 INMETRO Intrinsic Safety
Certificate: UL-BR 13.0534X
Standards: ABNT NBR IEC 60079-0:2008 + Errata 1:2011, ABNT NBR IEC 60079-11:2009
Markings: Ex ia IIC T4 IP66 Ga, T4(–40 °C ≤ T_a ≤ +70 °C)

Special Condition for Safe Use (X):

1. See certificate for special conditions.

China

I3 China Intrinsic Safety
Certificate: GYJ13.1362X
GYJ15.1367X [Flowmeters]
Standards: GB3836.1-2010, GB3836.4-20100, GB3836.20-2010
Markings: Ex ia IIC T4 Ga, T4(–40 ~ +70 °C)

Special Condition for Safe Use (X):

1. See certificate for special conditions.

Japan

I4 TIIS Intrinsic Safety
Certificate: TC22022X (3051C/L)
TC22023X (3051T)
TC22024X (3051CFx)
Markings: Ex ia IIC T4 Ga, T4(–20 ~ +60 °C)

Special Condition for Safe Use (X):

1. See certificate for special conditions.

EAC - Belarus, Kazakhstan, Russia

IM Technical Regulation Customs Union (EAC) Intrinsic Safety
Certificate: RU C-US.ГБ05.B.00400
Markings: 0Ex ia IIC T4 Ga X;

Special Condition for Safe Use (X):

1. See certificate for special conditions.

Korea

IP Korea Intrinsic Safety
Certificate: 13-KB4BO-0295X
Markings: Ex ia IIC T4 (–40 °C ≤ T_a ≤ +70 °C)

Special Condition for Safe Use (X):

1. See certificate for special conditions.

Rosemount 2051 Wireless

Rev 1.1

European Directive Information

A copy of the EC Declaration of Conformity can be found at the end of the Quick Start Guide. The most recent revision of the EC Declaration of Conformity can be found at EmersonProcess.com/Rosemount.

Telecommunication compliance

All wireless devices require certification to ensure that they adhere to regulations regarding the use of the RF spectrum. Nearly every country requires this type of product certification. Emerson is working with governmental agencies around the world to supply fully compliant products and remove the risk of violating country directives or laws governing wireless device usage.

FCC and IC

This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions: This device may not cause harmful interference. This device must accept any interference received, including interference that may cause undesired operation. This device must be installed to ensure a minimum antenna separation distance of 20 cm from all persons.

Ordinary Location Certification from FM Approvals

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

Installing in North America

The US National Electrical Code (NEC) and the Canadian Electrical Code (CEC) permit the use of Division marked equipment in Zones and Zone marked equipment in Divisions. The markings must be suitable for the area classification, gas, and temperature class. This information is clearly defined in the respective codes.

USA

I5 U.S.A. Intrinsically Safe (IS)
Certificate: FM 3046325
Standards: FM Class 3600 - 2011, FM Class 3610 - 2010, FM Class 3810 - 2005, ANSI/ISA 60079-0 - 2009, ANSI/ISA 60079-11 - 2009, NEMA 250 - 2003, ANSI/IEC 60529
Markings: IS CL I, DIV 1, GP A, B, C, D T4; CL 1, Zone 0 AEx ia IIC T4; T4(–40 °C ≤ T_a ≤ +70 °C) when installed per Rosemount drawing 03031-1062; Type 4X/IP66/IP68

Special Conditions for Safe Use (X):

1. The Model 2051 Wireless Pressure Transmitter shall only be used with the 701PGNKF Rosemount SmartPower Battery Pack.
2. The inline pressure sensor may contain more than 10% aluminum and is considered a potential risk of ignition by impact or friction. Care must be taken into account during installation and used to prevent impact and friction.
3. The surface resistivity of the transmitter housing is greater than one gigaohm. To avoid electrostatic charge build-up, it must not be rubbed or cleaned with solvents or a dry cloth.

Canada

I6 Canada Intrinsically Safe
Certificate: CSA 2526009
Standards: CAN/CSA C22.2 No. 0-M91, CAN/CSA C22.2 No. 94-M91, CSA Std C22.2 No. 142-M1987, CSA Std C22.2 No. 157-92, CSA Std C22.2 No. 60529:05
Markings: Intrinsically Safe for Class I, Division 1, Groups A, B, C, D, T4 when installed per Rosemount drawing 03031-1063; Type 4X/IP66/IP68

Europe

I1 ATEX Intrinsic Safety
Certificate: Baseefa12ATEX0228X
Standards: EN 60079-0: 2012, EN 60079-11: 2012
Markings: ⟨Ex⟩ II 1 G Ex ia IIC T4 Ga, T4(–40 °C ≤ T_a ≤ +70 °C) IP66/IP68

Special Conditions for Safe Use (X):

1. The plastic enclosure may constitute a potential electrostatic ignition risk and must not be rubbed or cleaned with a dry cloth.
2. The Model 701PGNKF Power Module may be replaced in a hazardous area. The power module has a surface resistivity greater than 1GΩ and must be properly installed in the wireless device enclosure. Care must be taken during transportation to and from the point of installation to prevent electrostatic charge build-up.

International

I7 IECEx Intrinsic Safety
Certificate: IECEx BAS 12.0124X
Standards: IEC 60079-0: 2011, IEC 60079-11: 2011
Markings: Ex ia IIC T4 Ga, T4(–40 °C ≤ T_a ≤ +70 °C) IP66/IP68

Special Conditions for Safe Use (X):

1. The plastic enclosure may constitute a potential electrostatic ignition risk and must not be rubbed or cleaned with a dry cloth.
2. The Model 701PGNKF Power Module may be replaced in a hazardous area. The power module has a surface resistivity greater than 1GΩ and must be properly installed in the wireless device enclosure. Care must be taken during transportation to and from the point of installation to prevent electrostatic charge build-up.

Brazil

I2 INMETRO Intrinsic Safety
Certificate: UL-BR 13.0534X
Standards: ABNT NBR IEC 60079-0:2008 + Errata 1:2011, ABNT NBR IEC 60079-11:2009
Markings: Ex ia IIC T4 IP66 Ga, T4(–40 °C ≤ T_a ≤ +70 °C)

Special Conditions for Safe Use (X):

1. See certificate for special conditions.

China

I3 China Intrinsic Safety
Certificate: GYJ12.1295X
GYJ15.1365X [Flowmeters]
Standards: GB3836.1-2010, GB3836.4-2010, GB3836.20-2010
Markings: Ex ia IIC Ga T4, –40 ~ +70 °C

Special Conditions for Safe Use (X):

1. See certificate for special conditions.

EAC - Belarus, Kazakhstan, Russia

IM Technical Regulation Customs Union (EAC) Intrinsic Safety
Certificate: RU C-US.ГБ05.B.00390
Markings: 0Ex ia IIC T4 Ga X;

Special Conditions for Safe Use (X):

1. See certificate for special conditions.

Korea

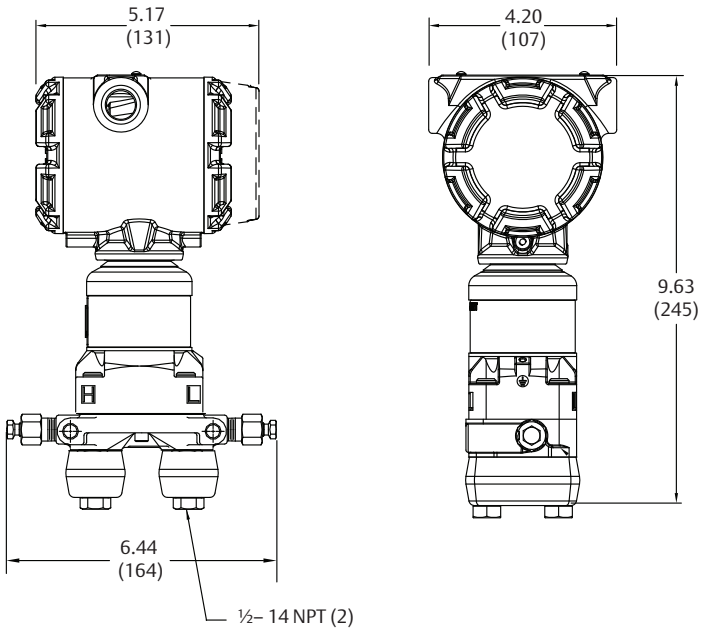
IP Korea Intrinsic Safety
Certificate: 13-KB4BO-0220X
Markings: Ex ia IIC T4 (–40 °C ≤ T_a ≤ +70 °C)

Special Condition for Safe Use (X):

1. See certificate for special conditions.

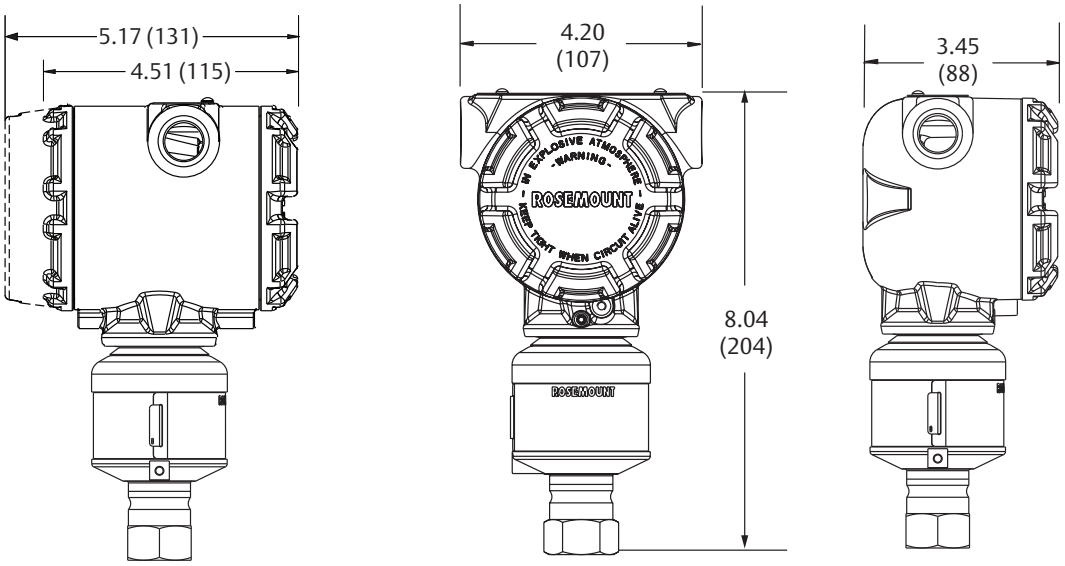
Dimensional Drawings

Figure 8. Rosemount 3051S ERS Measurement Transmitter - Coplanar Style



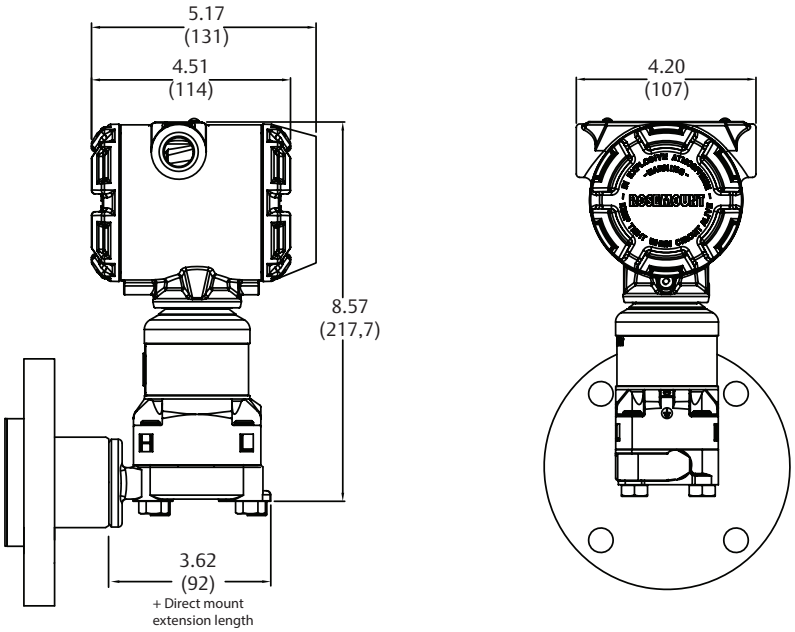
Dimensions are in inches (millimeters).

Figure 9. Rosemount 3051S ERS Measurement Transmitter - In-Line Style



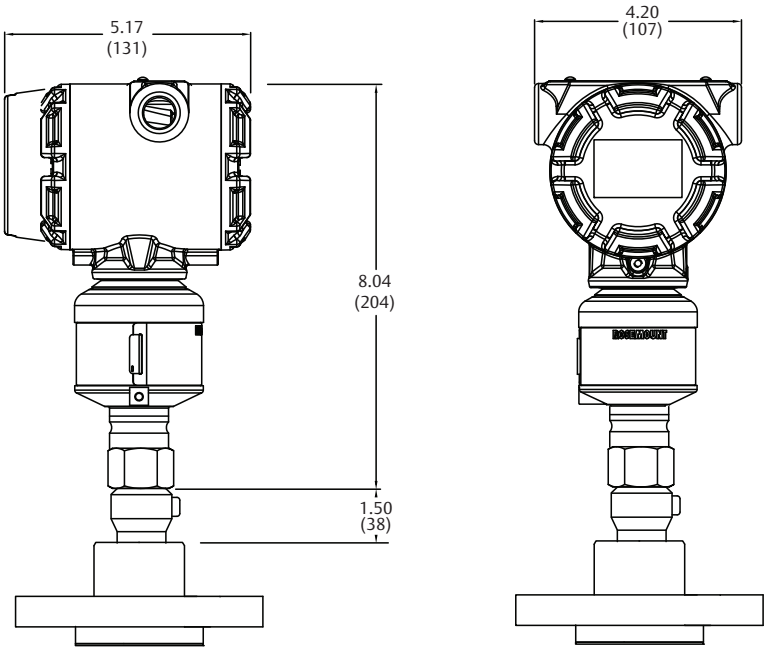
Dimensions are in inches (millimeters).

Figure 10. Rosemount 3051S Scalable Level Transmitter with FF[1][2]- Coplanar Style



Dimensions are in inches (millimeters).

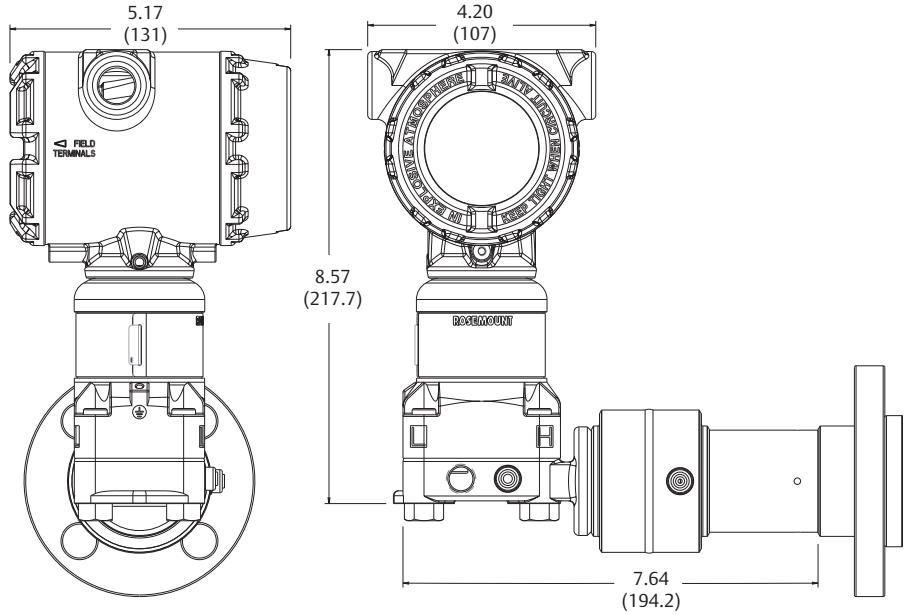
Figure 11. Rosemount 3051S Scalable Level Transmitter with FF[1][2]- In-Line Style



Dimensions are in inches (millimeters).

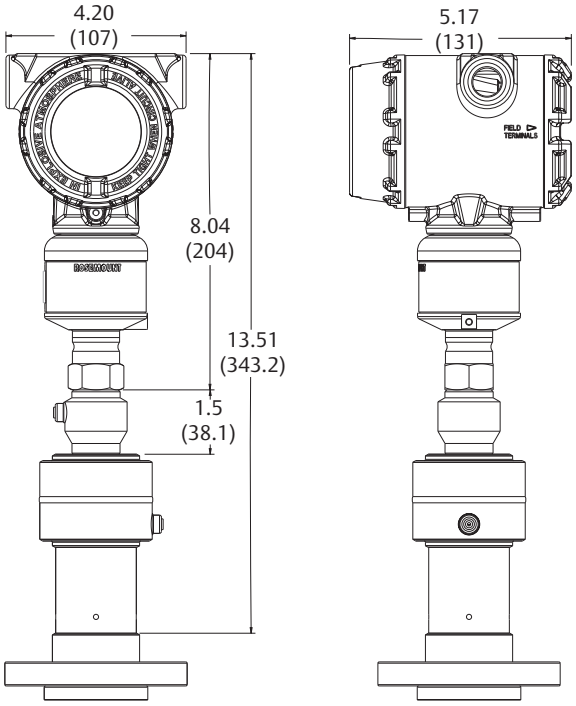
1. *FF (FFW) seal dimensions and pressure ratings can be found on page 173.*
2. *Lower housing (flushing ring) is available with FFW style flange.*

Figure 12. Rosemount 3051S Scalable Level Transmitter with Thermal Range Expander – Coplanar Style



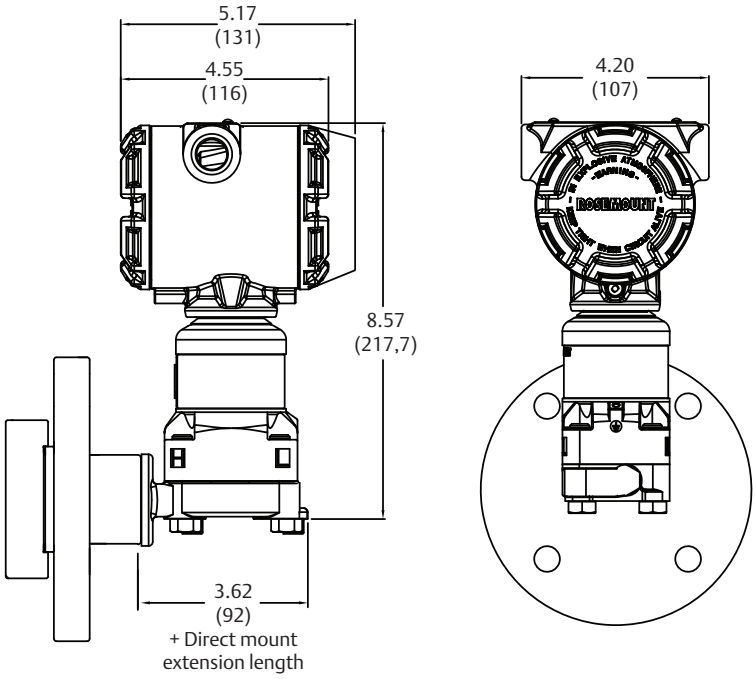
Dimensions are in inches (millimeters).

Figure 13. Rosemount 3051S Scalable Level Transmitter with Thermal Range Expander – In-Line Style



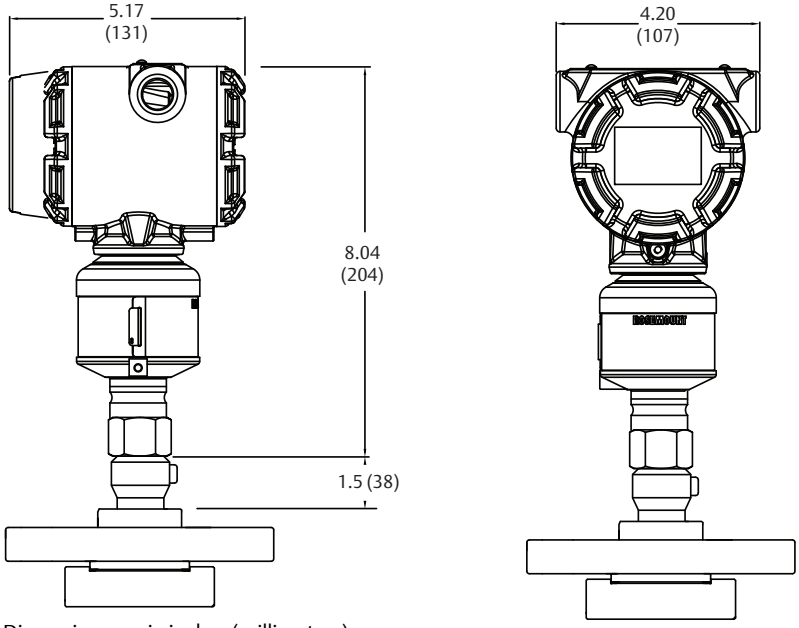
Dimensions are in inches (millimeters).

Figure 14. Rosemount 3051S Scalable Level Transmitter with RF[1]- Coplanar Style



Dimensions are in inches (millimeters).

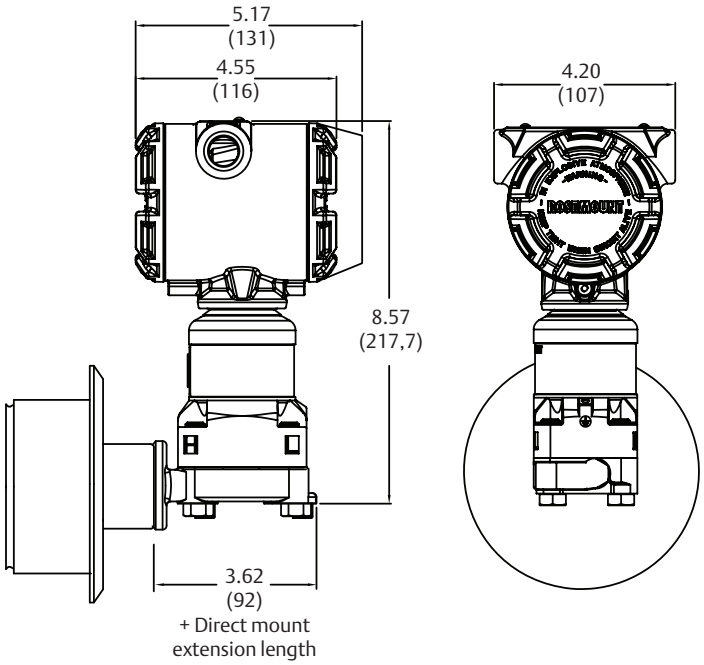
Figure 15. Rosemount 3051S Scalable Level Transmitter with RF[1]- In-Line Style



Dimensions are in inches (millimeters).

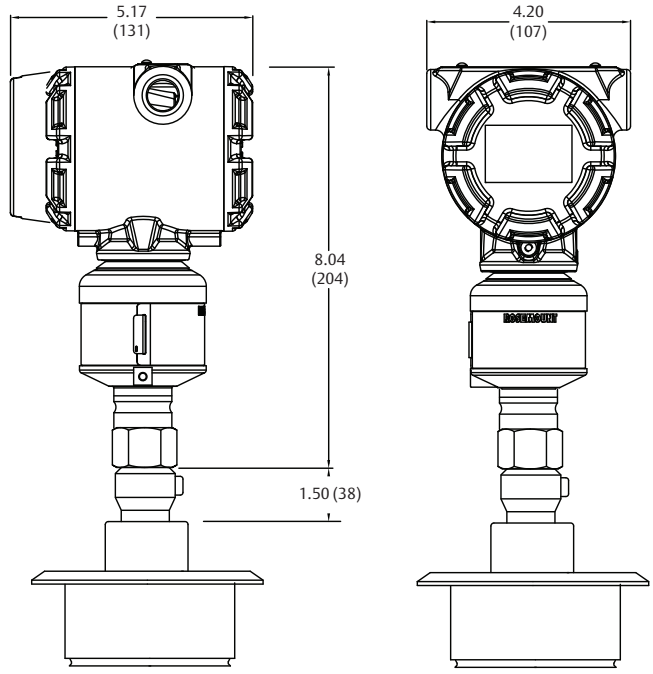
1. *RF (RFW) seal dimensions and pressure ratings can be found on page 182.*

Figure 16. Rosemount 3051S Scalable Level Transmitter with SS[1]- Coplanar Style



Dimensions are in inches (millimeters).

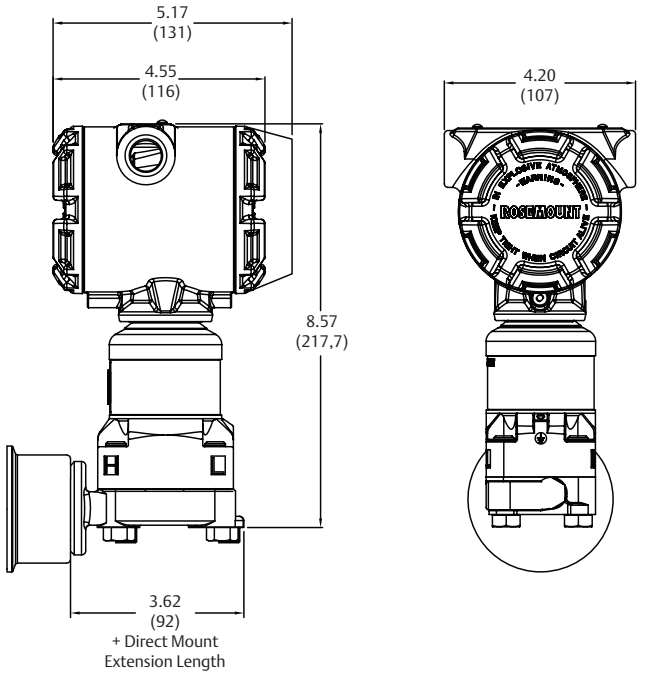
Figure 17. Rosemount 3051S Scalable Level Transmitter with SS[1] - In-Line Style



Dimensions are in inches (millimeters).

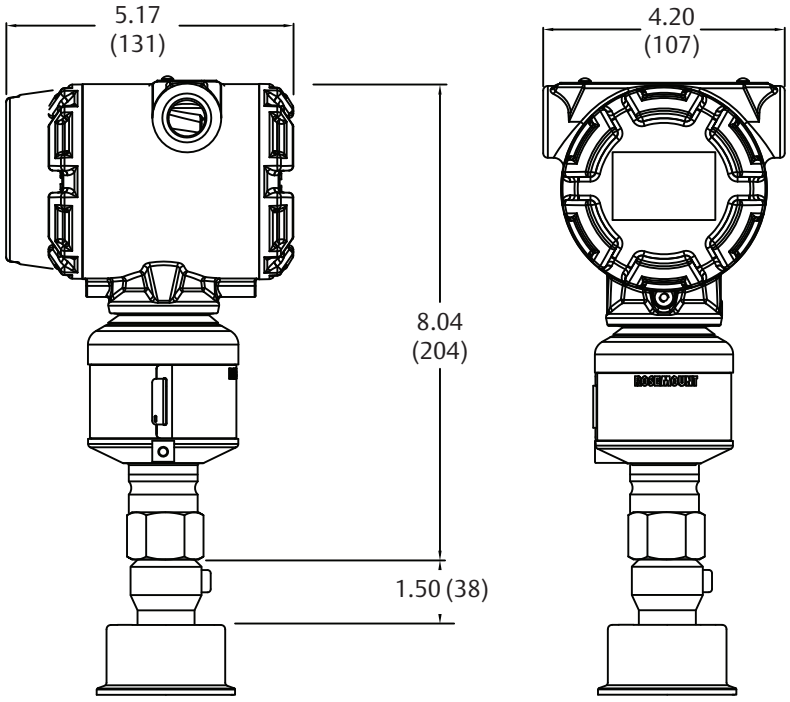
1. *SS (SSW) seal dimensions and pressure ratings can be found on page 200.*

Figure 18. Rosemount 3051S Scalable Level Transmitter with SC[1]- Coplanar Style



Dimensions are in inches (millimeters).

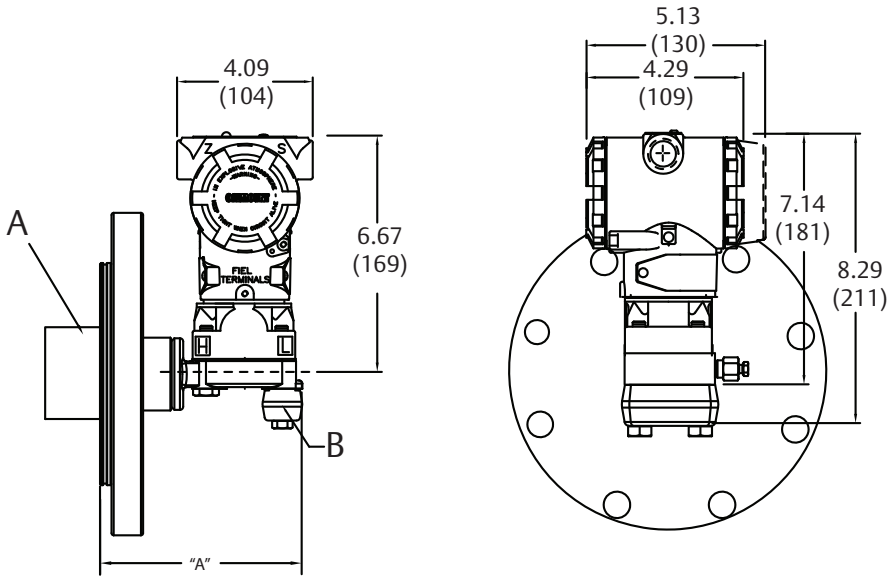
Figure 19. Rosemount 3051S Scalable Level Transmitter with SC[1] - In-Line Style



Dimensions are in inches (millimeters).

1. *SC (SCW) seal dimensions and pressure ratings can be found on page 199.*

Figure 20. Rosemount 3051L Level Transmitter with FF or EF Seal[(1)]



A. 2-, 4-, or 6-in. extension (only available with 3- and 4-in. flange configurations)

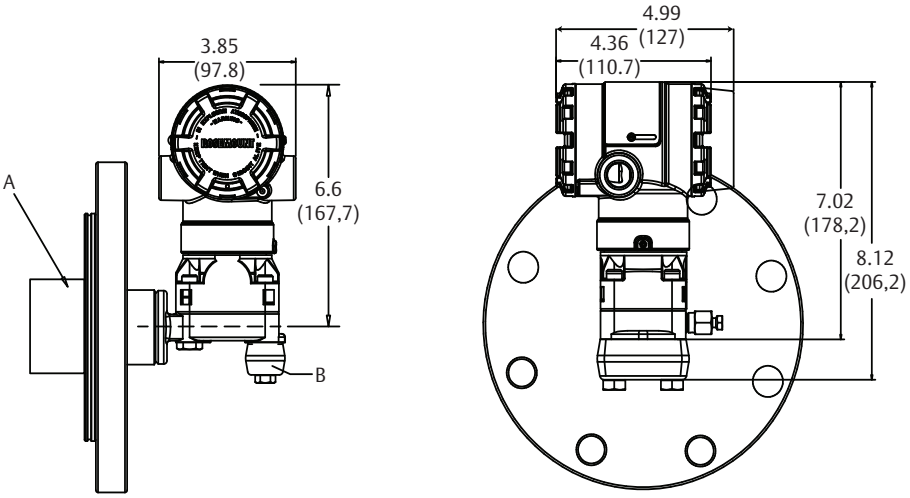
B. Flange adapters (optional, differential configuration only)

Dimensions are in inches (millimeters).

Table 76. 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 21. Rosemount 2051L Level Transmitter with FF or EF Seal[(1)]

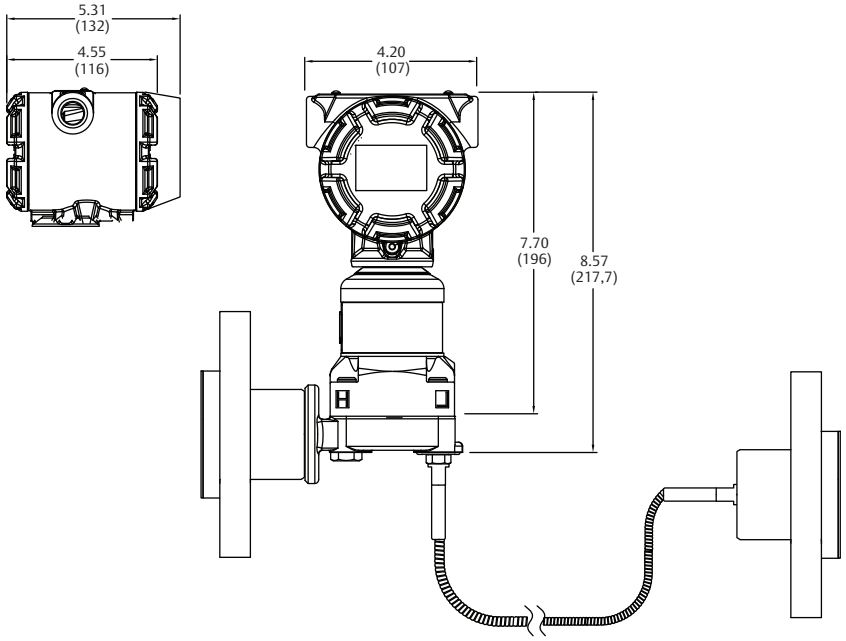


A. 2-. 4-, or 6-in. extension (only available with 3- and 4-in. flange configurations)

B. Flange adapters (optional, differential configuration only)
Dimensions are in inches (millimeters).

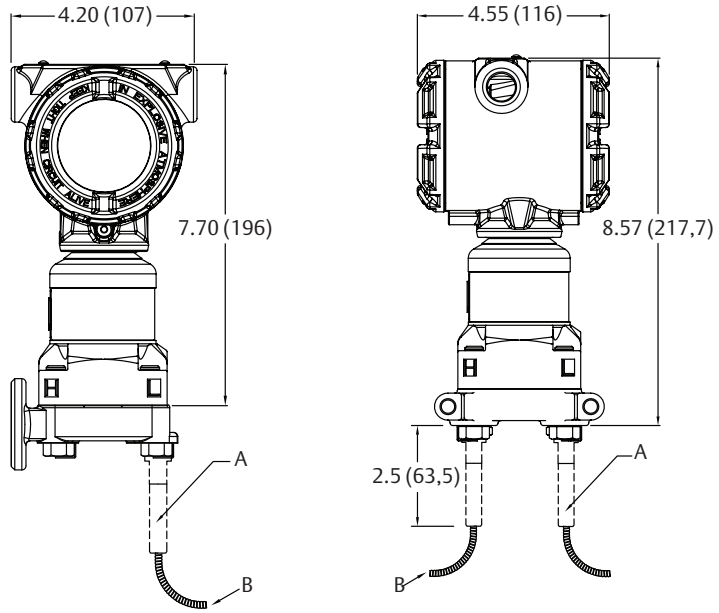
1. *FF (FFW) and EF (EFW) seal and flange diameter dimensions can be viewed on page 173 and page 189.*

Figure 22. Tuned System[1][2] Assembly shown with Rosemount 3051S Scalable Level Transmitter



Dimensions are in inches (millimeters).

Figure 23. Rosemount 1199 Remote Seal System Assembly shown with Rosemount 3051S Scalable Transmitter

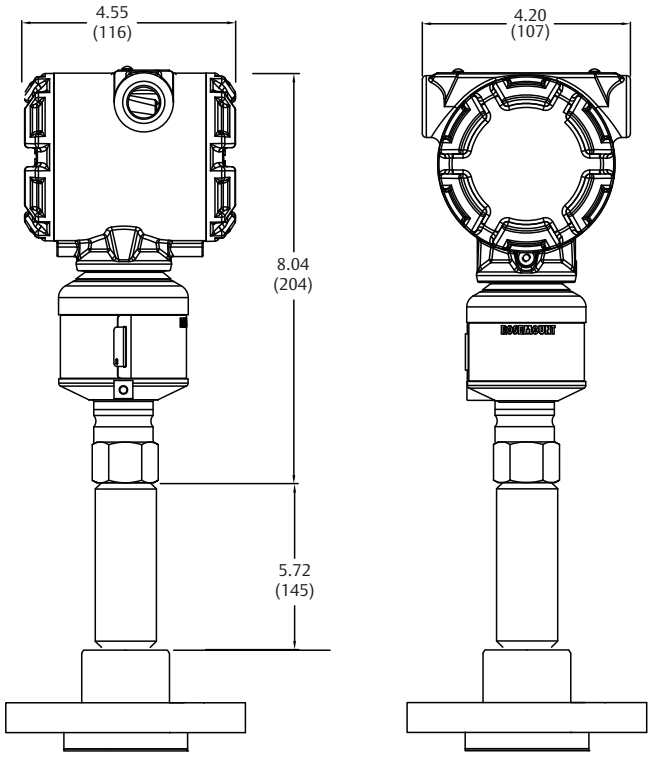


A. Capillary connection only
B. Capillary connects to Rosemount 1199 Remote seals

Dimensions are in inches (millimeters).

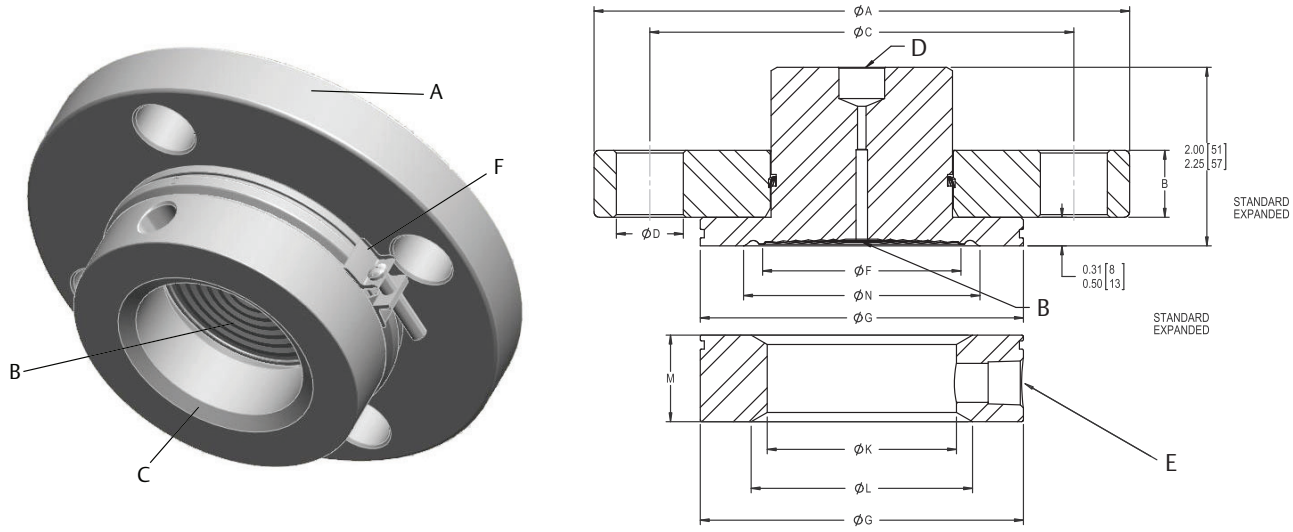
1. *Tuned System Assemblies require specification of capillary length and addition Rosemount 1199 Remote Seal.*
2. *Tuned System Assemblies are available on all Level Transmitters.*

Figure 24. Thermal Optimizer (D5) with FFW



Dimensions are in inches (millimeters).

Figure 25. FFW Flush Flanged Seal - Two-Piece Design (Shown with Flushing Ring)



A. Process flange
B. Diaphragm
C. Flushing connection
D. Connection to transmitter
E. Flushing ring
F. Lower housing alignment clamp (option code SA)

Dimensions are in inches (millimeters).

Table 77. Dimensions for FFW Flush Flanged Raised Face Seals-Two Piece (Upper Housing and Flange) Design

	Pipe size	Class	Flange diameter "A" in. (mm)	Flange thickness "B" in. (mm)	Bolt circle "C" in. (mm)	Number of bolts	Bolt hole diameter "D" in. (mm)	Standard diaphragm diameter "F" in. (mm)	Raised face outer diameter "G" in. (mm)
ANSI/ ASME	2-in.	150	6.00 (152)	0.69 (18)	4.75 (121)	4	0.75 (19)	2.30 (58)	3.62 (92)
		300	6.50 (165)	0.81 (21)	5.00 (127)	8	0.75 (19)	2.30 (58)	3.62 (92)
		600	6.50 (165)	1.00 (25)	5.00 (127)	8	0.75 (19)	2.30 (58)	3.62 (92)
		900	8.50 (216)	1.00 (25)	6.50 (165)	8	1.50 (38)	2.30 (58)	3.62 (92)
		1500	8.50 (216)	1.00 (25)	6.50 (165)	8	1.50 (38)	2.30 (58)	3.62 (92)
		2500	9.25 (235)	1.13 (29)	6.75 (172)	8	2.00 (51)	2.30 (58)	3.62 (92)
	3-in.	150	7.50 (191)	0.88 (22)	6.00 (152)	4	0.75 (19)	3.50 (89)	5.00 (127)
		300	8.25 (210)	1.06 (27)	6.62 (168)	8	0.88 (22)	3.50 (89)	5.00 (127)
		600	8.25 (210)	1.25 (32)	6.62 (168)	8	0.88 (22)	3.50 (89)	5.00 (127)
		900	9.50 (241)	1.50 (38)	7.50 (191)	8	1.00 (25)	3.50 (89)	5.00 (127)
		1500	10.50 (267)	1.88 (48)	8.00 (203)	8	1.25 (32)	3.50 (89)	5.00 (127)
		2500	12.00 (305)	2.62 (67)	9.00 (229)	8	1.38 (35)	3.50 (89)	5.00 (127)
	4-in.	150	9.00 (229)	0.88 (22)	7.50 (191)	8	0.75 (19)	3.50 (89)	6.20 (157)
		300	10.0 (254)	1.19 (30)	7.88 (200)	8	0.88 (22)	3.50 (89)	6.20 (157)
		600	10.75 (273)	1.50 (38)	8.50 (216)	8	1.00 (25)	3.50 (89)	6.20 (157)
		900	11.50 (292)	1.75 (45)	9.25 (235)	8	1.25 (32)	3.50 (89)	6.20 (157)
		1500	12.25 (311)	2.12 (54)	9.50 (241)	8	1.38 (35)	3.50 (89)	6.20 (157)
		2500	14.00 (356)	3.00 (76)	10.75(274)	8	1.63 (41)	3.50 (89)	6.20 (157)

Table 77. Dimensions for FFW Flush Flanged Raised Face Seals-Two Piece (Upper Housing and Flange) Design

	Pipe size	Class	Flange diameter "A" in. (mm)	Flange thickness "B" in. (mm)	Bolt circle "C" in. (mm)	Number of bolts	Bolt hole diameter "D" in. (mm)	Standard diaphragm diameter "F" in. (mm)	Raised face outer diameter "G" in. (mm)
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)
		PN 63	7.09 (180)	0.91 (23)	5.31 (135)	4	0.87 (22)	2.30 (58)	4.00 (102)
		PN 100	7.68 (195)	0.99 (25)	5.71 (145)	4	1.02 (26)	2.30 (58)	4.00 (102)
		PN 160	7.68 (195)	1.06 (27)	5.71 (145)	4	1.02 (26)	2.30 (58)	4.00 (102)
	DN 80	PN 40	7.87 (200)	0.83 (21)	6.30 (160)	8	0.71 (18)	3.50 (89)	5.43 (138)
		PN 63	8.46 (215)	0.99 (25)	6.69 (170)	8	0.88 (22)	3.50 (89)	5.43 (138)
		PN 100	9.06 (230)	1.15 (29)	7.09 (180)	8	1.02 (26)	3.50 (89)	5.43 (138)
		PN 160	9.06 (230)	1.30 (33)	7.09 (180)	8	1.02 (26)	3.50 (89)	5.43 (138)
	DN 100	PN 10/16	8.66 (220)	0.67 (17)	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)	0.83 (21)	7.87 (200)	8	1.02 (26)	3.50 (89)	6.20 (157)
		PN 100	10.43 (265)	1.30 (27)	8.27 (210)	8	1.18 (30)	3.50 (89)	6.20 (157)
		PN 160	10.43 (265)	1.46 (37)	8.27 (210)	8	1.18 (30)	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)

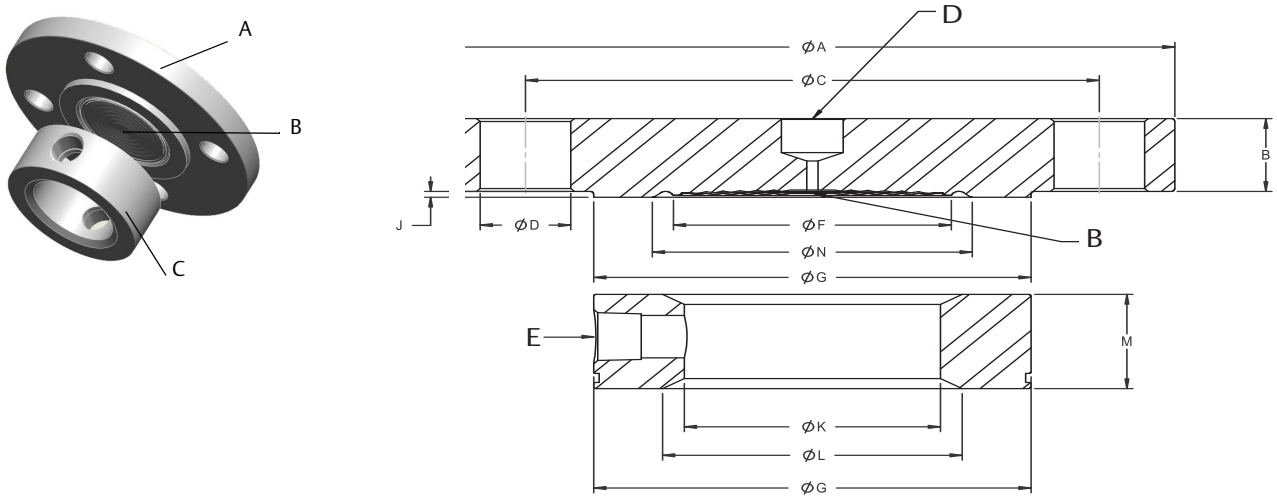
Table 78. Dimensions for FFW Flush Flanged Raised Face Seals-Two Piece (Upper Housing and Flange) Design

	Pipe size	Class	Inner diameter "K" in. (mm)	Beveled edge "L" in. (mm)	Thickness with 1/4-NPT F.C. "M" in. (mm)	Thickness with 1/2-NPT F.C. "M" in. (mm)	Minimum gasket I.D. "N" in. (mm)	Weight lb (kg)
ANSI/ASME	2-in.	150	2.12 (54)	2.48 (63)	0.97 (25)	1.30 (33)	2.50 (64)	7.40 (3,33)
		300	2.12 (54)	2.48 (63)	0.97 (25)	1.30 (33)	2.50 (64)	8.99 (4,05)
		600	2.12 (54)	2.48 (63)	0.97 (25)	1.30 (33)	2.50 (64)	10.44 (4,70)
		900	2.12 (54)	2.48 (63)	0.97 (25)	1.30 (33)	2.50 (64)	24.62 (11,08)
		1500	2.12 (54)	2.48 (63)	0.97 (25)	1.30 (33)	2.50 (64)	24.62 (11,08)
		2500	2.12 (54)	2.48 (63)	0.97 (25)	1.30 (33)	2.50 (64)	36.71 (16,52)
	3-in.	150	3.60 (91)	N/A	0.97 (25)	1.30 (33)	3.70 (94)	13.79 (6,21)
		300	3.60 (91)	N/A	0.97 (25)	1.30 (33)	3.70 (94)	17.84 (8,03)
		600	3.60 (91)	N/A	0.97 (25)	1.30 (33)	3.70 (94)	20.31 (9,14)
		900	3.60 (91)	N/A	0.97 (25)	1.30 (33)	3.70 (94)	33.21 (14,94)
		1500	3.60 (91)	N/A	0.97 (25)	1.30 (33)	3.70 (94)	46.76 (21,04)
		2500	3.60 (91)	N/A	0.97 (25)	1.30 (33)	3.70 (94)	81.34 (36,60)
	4-in.	150	3.60 (91)	N/A	0.97 (25)	1.30 (33)	3.70 (94)	19.56 (8,80)
		300	3.60 (91)	N/A	0.97 (25)	1.30 (33)	3.70 (94)	29.56 (13,30)
		600	3.60 (91)	N/A	0.97 (25)	1.30 (33)	3.70 (94)	40.73 (18,33)
		900	3.60 (91)	N/A	0.97 (25)	1.30 (33)	3.70 (94)	53.16 (23,92)
		1500	3.60 (91)	N/A	0.97 (25)	1.30 (33)	3.70 (94)	71.72 (32,27)
		2500	3.60 (91)	N/A	0.97 (25)	1.30 (33)	3.70 (94)	125.72 (56,57)

Table 78. Dimensions for FFW Flush Flanged Raised Face Seals-Two Piece (Upper Housing and Flange) Design

	Pipe size	Class	Inner diameter "K" in. (mm)	Beveled edge "L" in. (mm)	Thickness with 1/4-NPT F.C. "M" in. (mm)	Thickness with 1/2-NPT F.C. "M" in. (mm)	Minimum gasket I.D. "N" in. (mm)	Weight lb (kg)
EN1092-1	DN 50	PN 40	2.40 (61)	N/A	0.97 (25)	1.30 (33)	2.50 (64)	9.02 (4,06)
		PN 63	2.40 (61)	N/A	0.97 (25)	1.30 (33)	2.50 (64)	12.58 (5,66)
		PN 100	2.40 (61)	N/A	0.97 (25)	1.30 (33)	2.50 (64)	15.23 (6,85)
		PN 160	2.40 (61)	N/A	0.97 (25)	1.30 (33)	2.50 (64)	16.12 (7,25)
	DN 80	PN 40	3.60 (91)	N/A	0.97 (25)	1.30 (33)	3.70 (94)	15.03 (6,76)
		PN 63	3.60 (91)	N/A	0.97 (25)	1.30 (33)	3.70 (94)	18.87 (8,49)
		PN 100	3.60 (91)	N/A	0.97 (25)	1.30 (33)	3.70 (94)	23.34 (10,50)
		PN 160	3.60 (91)	N/A	0.97 (25)	1.30 (33)	3.70 (94)	25.83 (11,62)
	DN 100	PN 10/16	3.60 (91)	N/A	0.97 (25)	1.30 (33)	3.70 (94)	16.08 (7,24)
		PN 40	3.60 (91)	N/A	0.97 (25)	1.30 (33)	3.70 (94)	20.31 (9,14)
		PN 63	3.60 (91)	N/A	0.97 (25)	1.30 (33)	3.70 (94)	26.74 (12,03)
		PN 100	3.60 (91)	N/A	0.97 (25)	1.30 (33)	3.70 (94)	34.26 (15,42)
		PN 160	3.60 (91)	N/A	0.97 (25)	1.30 (33)	3.70 (94)	37.44 (16,85)
JIS	50A	10K	2.12 (54)	N/A	0.97 (25)	1.30 (33)	2.62 (67)	6.93 (3,15)
		20K	2.12 (54)	N/A	0.97 (25)	1.30 (33)	2.62 (67)	7.11 (3,20)
		40K	2.40 (61)	N/A	0.97 (25)	1.30 (33)	2.62 (67)	10.41 (4,68)
	80A	10K	3.60 (91)	N/A	0.97 (25)	1.30 (33)	3.82 (97)	10.52 (4,73)
		20K	3.60 (91)	N/A	0.97 (25)	1.30 (33)	3.82 (97)	13.61 (6,12)
		40K	3.60 (91)	N/A	0.97 (25)	1.30 (33)	3.82 (97)	20.08 (9,04)
	100A	10K	3.60 (91)	N/A	0.97 (25)	1.30 (33)	3.82 (97)	14.03 (6,31)
		20K	3.60 (91)	N/A	0.97 (25)	1.30 (33)	3.82 (97)	19.16 (8,62)
		40K	3.60 (91)	N/A	0.97 (25)	1.30 (33)	3.82 (97)	32.12 (14,45)

Figure 26. FFW Flush Flanged Seal - One-Piece Design (Shown with Flushing Ring)



A. Process flange
B. Diaphragm
C. Flushing connection
D. Connection to transmitter
E. Flushing ring

Dimensions are in inches (millimeters).

Table 79. Dimensions for FFW Flush Flanged Seals- One Piece (Upper Housing and Flange) Design (Option code E)

	Pipe size	Class	Flange diameter "A" in. (mm)	Flange thickness "B" in. (mm)	Bolt circle "C" in. (mm)	Number of bolts	Bolt hole diameter "D" in. (mm)	Standard diaphragm diameter "F" in. (mm)	Raised face diameter "G" in. (mm)	Raised face height "J" in. (mm)	Minimum gasket I.D. "N" in. (mm)	Weight lb (kg)
ANSI/ASME	2-in.	150	6.00 (152)	0.69 (18)	4.75 (121)	4	0.75 (19)	2.30 (58)	3.62 (92)	0.06 (1,50)	2.5 (64)	7.40 (3,33)
		300	6.50 (165)	0.81 (21)	5.00 (127)	8	0.75 (19)	2.30 (58)	3.62 (92)	0.06 (1,50)	2.5 (64)	8.99 (4,05)
		600	6.50 (165)	1.00 (25)	5.00 (127)	8	0.75 (19)	2.30 (58)	3.62 (92)	0.25 (6,40)	2.5 (64)	10.44 (4,70)
		900/1500	8.50 (216)	1.50 (38)	6.50 (165)	8	1.00 (25)	2.30 (58)	3.62 (92)	0.25 (6,40)	2.5 (64)	24.62 (11,08)
		2500	9.25 (235)	2.00 (51)	6.75 (172)	8	1.13 (29)	2.30 (58)	3.62 (92)	0.25 (6,40)	2.5 (64)	36.71 (16,52)
	3-in.	150	7.50 (191)	0.88 (22)	6.00 (152)	4	1.13 (25)	3.50 (89)	5.00 (127)	0.06 (1,50)	3.70 (94)	13.79 (6,21)
		300	8.25 (210)	1.06 (27)	6.62 (168)	8	0.88 (22)	3.50 (89)	5.00 (127)	0.06 (1,50)	3.70 (94)	17.84 (8,03)
		600	8.25 (210)	1.25 (32)	6.62 (168)	8	0.88 (22)	3.50 (89)	5.00 (127)	0.25 (6,40)	3.70 (94)	20.31 (9,14)
		900	9.50 (241)	1.50 (38)	7.50 (229)	8	1.00 (25)	3.50 (89)	5.00 (127)	0.25 (6,40)	3.70 (94)	33.21 (14,94)
		1500	10.50 (267)	1.88 (48)	8.00 (203)	8	1.25 (32)	3.50 (89)	5.00 (127)	0.25 (6,40)	3.70 (94)	46.76 (21,04)
		2500	12.00 (305)	2.62 (67)	9.00 (229)	8	1.38 (35)	3.50 (89)	5.00 (127)	0.25 (6,40)	3.70 (94)	81.34 (36,60)
	4-in.	150	9.00 (229)	0.88 (22)	7.50 (191)	8	0.75 (19)	3.50 (89)	6.20 (157)	0.06 (1,50)	3.70 (94)	19.56 (8,80)
		300	10.00 (254)	1.19 (30)	7.88 (200)	8	0.88 (22)	3.50 (89)	6.20 (157)	0.06 (1,50)	3.70 (94)	29.56 (8,80)
		600	10.75 (273)	1.50 (38)	8.50 (216)	8	1.00 (25)	3.50 (89)	6.20 (157)	0.25 (6.40)	3.70 (94)	40.73 (18,33)
		900	11.50 (292)	1.75 (45)	9.25 (235)	8	1.25 (32)	3.50 (89)	6.20 (157)	0.25 (6.40)	3.70 (94)	53.16 (23,92)
		1500	12.25 (311)	2.12 (54)	9.50 (241)	8	1.38 (35)	3.50 (89)	6.20 (157)	0.25 (6.40)	3.70 (94)	71.72 (32,27)
		2500	14.00 (356)	3.00 (76)	10.75 (274)	8	1.63 (41)	3.50 (89)	6.20 (157)	0.25 (6.40)	3.70 (94)	125.72 (56,57)
EN 1092-1	DN50	PN 40	6.50 (165)	0.67 (17)	4.92 (125)	4	0,71 (18)	2.30 (58)	4.00 (102)	0.12 (3,00)	2.50 (64)	9.02 (4,06)
		PN 63	7.08 (180)	0.91 (23)	5.31 (135)	4	0.87 (22)	2.30 (58)	4.00 (102)	0.12 (3,00)	2.50 (64)	12,58 (5,66)
		PN 100	7.68 (195)	0.99 (25)	5.71 (145)	4	1.02 (26)	2.30 (58)	4.00 (102)	0.12 (3,00)	2.50 (64)	15.23 (6,85)
		PN160	7.68 (195)	1.06 (27)	5.71 (145)	4	1.02 (26)	2.30 (58)	4.00 (102)	0.12 (3,00)	2.50 (64)	16.12 (7,25)

Table 79. Dimensions for FFW Flush Flanged Seals- One Piece (Upper Housing and Flange) Design (Option code E)

	Pipe size	Class	Flange diameter "A" in. (mm)	Flange thickness "B" in. (mm)	Bolt circle "C" in. (mm)	Number of bolts	Bolt hole diameter "D" in. (mm)	Standard diaphragm diameter "F" in. (mm)	Raised face diameter "G" in. (mm)	Raised face height "J" in. (mm)	Minimum gasket I.D. "N" in. (mm)	Weight lb (kg)
EN 1092-1	DN80	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)	3.70 (94)	15.03 (6,76)
		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)	3.70 (94)	18.87 (8,49)
		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)	3.70 (94)	23.34 (10,50)
		PN160	9.06 (230)	1.30 (33)	7.09 (180)	8	1.02 (26)	3.50 (89)	5.43 (138)	0.12 (3,0)	3.70 (94)	25.83 (11,62)
	DN100	PN 10/16	8.66 (220)	0.67 (17)	7.09 (180)	8	0.71 (18)	3.50 (89)	6.20 (157)	0.12 (3,0)	3.70 (94)	16.08 (7,24)
		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)	3.70 (94)	20.31 (9,14)
		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)	3.70 (94)	26.74 (1203)
		PN 100	10.43 (265)	1.30 (33)	8.27 (210)	8	1.18 (30)	3.50 (89)	6.20 (157)	0.12 (3,0)	3.70 (94)	34.26 (15,42)
		PN 160	10.43 (265)	1.46 (37)	8.27 (210)	8	1.18 (30)	3.50 (89)	6.20 (157)	0.12 (3,0)	3.70 (94)	37.44 (16,85)
JIS	50A	10K	6.1 (155)	0.63 (16)	4.72 (120)	4	0.75 (19)	2.30 (58)	3.62 (92)	0.08 (2,0)	2.50 (64)	6.93 (3,15)
		20K	6.1 (155)	0.71 (18)	4.72 (120)	8	0.75 (19)	2.30 (58)	3.62 (92)	0.08 (2,0)	2.50 (64)	7.11 (3,20)
		40K	6.5 (165)	1.02 (26)	5.12 (130)	8	0.75 (19)	2.30 (58)	4.00 (102)	0.08 (2,0)	2.50 (64)	10.41 (4,68)
	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)	3.70 (94)	10.52 (4,73)
		20K	7.87 (200)	0.87 (22)	6.3 (160)	8	0.91 (23)	3.50 (89)	5.00 (127)	0.08 (2,0)	3.70 (94)	13.61 (6,12)
		40K	8.27 (210)	1.26 (32)	6.69 (170)	8	0.91 (23)	3.50 (89)	5.43 (138)	0.08 (2,0)	3.70 (94)	20.08 (9,04)
	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)	3.70 (94)	14.03 (6,31)
		20K	8.86 (225)	0.95 (24)	7.28 (185)	8	0.91 (23)	3.50 (89)	6.20 (157)	0.08 (2,0)	3.70 (94)	19.16 (8,62)
		40K	9.84 (250)	1.42 (36)	8.07 (205)	8	0.98 (25)	3.50 (89)	6.20 (157)	0.08 (2,0)	3.70 (94)	32.12 (14,45)

Figure 27. FFW Flush Flanged Seal - Flushing Connection Ring (Lower Housing)

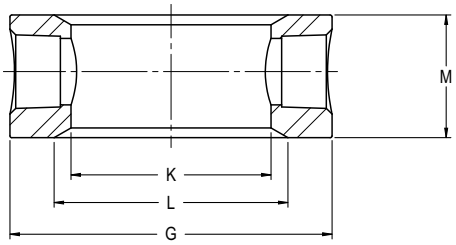


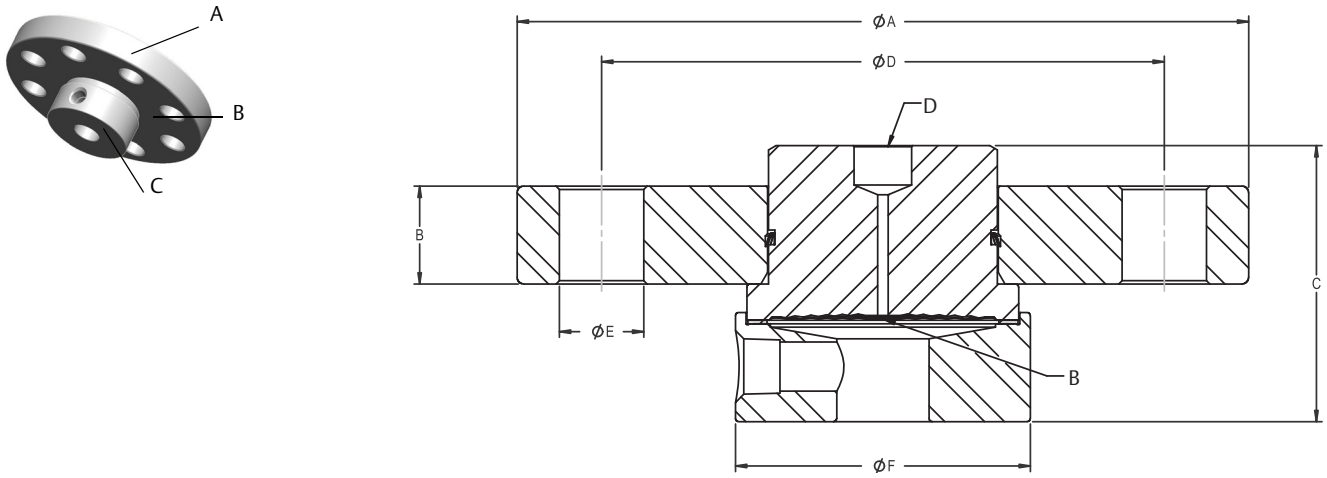
Table 80. Dimensions for FFW Flushing Connection Ring (Lower Housing)

	Pipe size	Class	Raised face diameter "G" in. (mm)	Inner diameter "K" in. (mm)	Beveled edge "L" in. (mm)	Thickness with 1/4 NPT F.C. "M" in. (mm)	Thickness with 1/2 NPT F.C. "M" in. (mm)	Weight lb (kg)
ANSI/ASME	2-in.	150	3.62 (92)	2.12 (54)	2.48 (63)	0.97 (25)	1.30 (33)	7.41 (3,33)
		300	3.62 (92)	2.12 (54)	2.48 (63)	0.97 (25)	1.30 (33)	8.99 (4,05)
		600	3.62 (92)	2.12 (54)	2.48 (63)	0.97 (25)	1.30 (33)	10.44 (4,70)
		900/1500	3.62 (92)	2.12 (54)	2.48 (63)	0.97 (25)	1.30 (33)	24.62 (11,08)
		2500	3.62 (92)	2.12 (54)	2.48 (63)	0.97 (25)	1.30 (33)	36.71 (16,52)
	3-in.	150	5.00 (127)	3.60 (91)	N/A	0.97 (25)	1.30 (33)	13.79 (6,21)
		300	5.00 (127)	3.60 (91)	N/A	0.97 (25)	1.30 (33)	17.84 (8,03)
		600	5.00 (127)	3.60 (91)	N/A	0.97 (25)	1.30 (33)	20.31 (9,14)
		900	5.00 (127)	3.60 (91)	N/A	0.97 (25)	1.30 (33)	33.21 (14,94)
		1500	5.00 (127)	3.60 (91)	N/A	0.97 (25)	1.30 (33)	46.76 (21,04)
		2500	5.00 (127)	3.60 (91)	N/A	0.97 (25)	1.30 (33)	81.34 (36,60)
	4-in.	150	6.20 (157)	3.60 (91)	N/A	0.97 (25)	1.30 (33)	19.56 (8,80)
		300	6.20 (157)	3.60 (91)	N/A	0.97 (25)	1.30 (33)	29.56 (13,30)
		600	6.20 (157)	3.60 (91)	N/A	0.97 (25)	1.30 (33)	40.73 (18,33)
		900	6.20 (157)	3.60 (91)	N/A	0.97 (25)	1.30 (33)	53.16 (23,92)
		1500	6.20 (157)	3.60 (91)	N/A	0.97 (25)	1.30 (33)	71.72 (32,27)
		2500	6.20 (157)	3.60 (91)	N/A	0.97 (25)	1.30 (33)	125.72 (56,57)
EN1092-1	DN 50	PN 40	4.00 (102)	2.40 (61)	N/A	0.97 (25)	1.30 (33)	9.02 (4,06)
		PN 63	4.00 (102)	2.40 (61)	N/A	0.97 (25)	1.30 (33)	12.58 (5,66)
		PN 100	4.00 (102)	2.40 (61)	N/A	0.97 (25)	1.30 (33)	15.23 (6.85)
		PN 160	4.00 (102)	2.40 (61)	N/A	0.97 (25)	1.30 (33)	16.12 (7,25)
	DN 80	PN 40	5.43 (138)	3.60 (91)	N/A	0.97 (25)	1.30 (33)	15.03 (6,76)
		PN 63	5.43 (138)	3.60 (91)	N/A	0.97 (25)	1.30 (33)	18.87 (8,49)
		PN 100	5.43 (138)	3.60 (91)	N/A	0.97 (25)	1.30 (33)	23.34 (10.50)
		PN 160	5.43 (138)	3.60 (91)	N/A	0.97 (25)	1.30 (33)	25.83 (11,62)
	DN 100	PN 10/16	6.20 (157)	3.60 (91)	N/A	0.97 (25)	1.30 (33)	16.08 (7,24)
		PN 40	6.20 (157)	3.60 (91)	N/A	0.97 (25)	1.30 (33)	20.31 (9,14)
		PN 63	6.20 (157)	3.60 (91)	N/A	0.97 (25)	1.30 (33)	26.74 (12,03)
		PN 100	6.20 (157)	3.60 (91)	N/A	0.97 (25)	1.30 (33)	34.26 (15,42)
		PN 160	6.20 (157)	3.60 (91)	N/A	0.97 (25)	1.30 (33)	37.44 (16,85)

Table 80. Dimensions for FFW Flushing Connection Ring (Lower Housing)

	Pipe size	Class	Raised face diameter "G" in. (mm)	Inner diameter "K" in. (mm)	Beveled edge "L" in. (mm)	Thickness with 1/4 NPT F.C. "M" in. (mm)	Thickness with 1/2 NPT F.C. "M" in. (mm)	Weight lb (kg)
JIS	50A	10K	3.62 (92)	2.12 (54)	N/A	0.97 (25)	1.30 (33)	6.93 (3,15)
		20K	3.62 (92)	2.12 (54)	N/A	0.97 (25)	1.30 (33)	7.11 (3,20)
		40K	4.00 (102)	2.40 (61)	N/A	0.97 (25)	1.30 (33)	10.41 (4,68)
	80A	10K	5.00 (127)	3.60 (91)	N/A	0.97 (25)	1.30 (33)	10.52 (4,73)
		20K	5.00 (127)	3.60 (91)	N/A	0.97 (25)	1.30 (33)	13.61 (6,12)
		40K	5.43 (138)	3.60 (91)	N/A	0.97 (25)	1.30 (33)	20.08 (9,04)
	100A	10K	6.20 (157)	3.60 (91)	N/A	0.97 (25)	1.30 (33)	14.03 (6,31)
		20K	6.20 (157)	3.60 (91)	N/A	0.97 (25)	1.30 (33)	19.16 (8,62)
		40K	6.20 (157)	3.60 (91)	N/A	0.97 (25)	1.30 (33)	32.12 (14,45)

Figure 28. RFW Flanged Seal Standard Design



A. Process flange
B. Diaphragm
C. Lower housing or flushing connection
D. Connection to transmitter

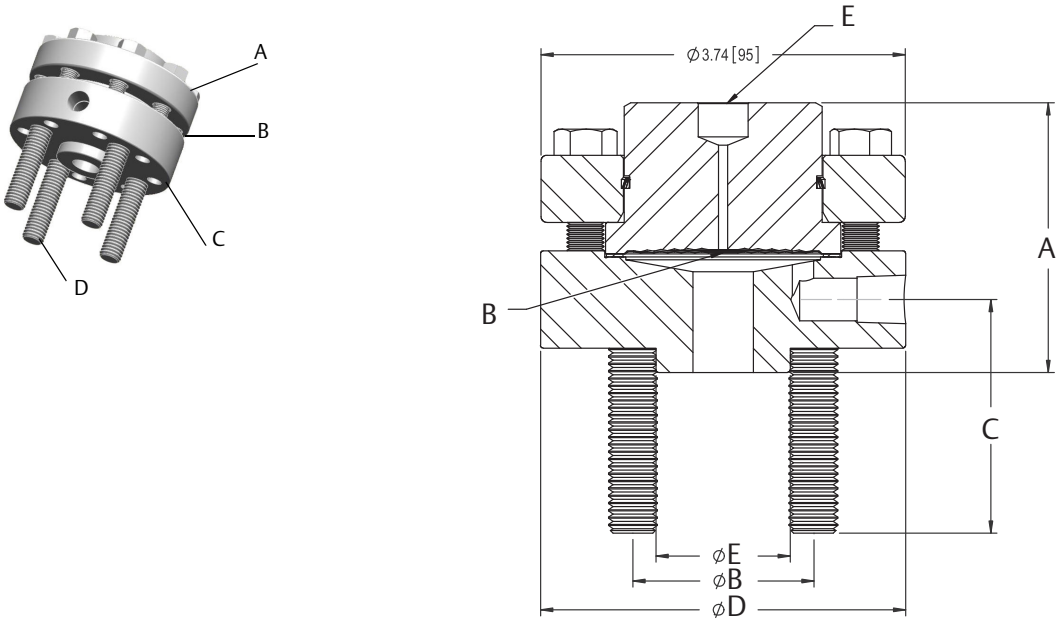
Dimensions are in inches (millimeters).

Table 81. RFW Flanged Seal Standard Design Dimensions(1)

	Pipe size	Class	Flange diameter "A" in. (mm)	Flange thickness "B" in. (mm)	Overall height "C" in. (mm)		Bolt circle diameter "D" in. (mm)	Bolt hole diameter "E" in. (mm)	Lower housing diameter "F" in. (mm)	Weight lb (kg)
					No or 1/4-in. NPT flush connection	1/2-in. NPT flush connection				
ANSI/ASME	1/2-in.	2500	5.25 (133)	1.19 (30)	2.45 (62)	2.79 (71)	3.25 (83)	0.75 (19)	2.62 (67)	8.49 (3,82)
	3/4-in.	300/600	4.62 (117)	0.62 (16)	2.45 (62)	2.79 (71)	3.50 (89)	0.88 (22)	2.62 (67)	4.99 (2,25)
		900/1500	5.12 (130)	1.00 (25)	2.45 (62)	2.79 (71)	3.50 (89)	0.88 (22)	2.62 (67)	7.25 (3,26)
		2500	5.50 (140)	1.25 (32)	2.45 (62)	2.79 (71)	3.75 (95)	0.88 (22)	2.62 (67)	9.52 (4,28)
	1-in.	150	4.25 (108)	0.50 (13)	2.45 (62)	2.79 (71)	3.25 (83)	0.75 (19)	2.62 (67)	4.19 (1,89)
		300	4.88 (124)	0.62 (16)	2.45 (62)	2.79 (71)	3.12 (79)	0.63 (16)	2.62 (67)	5.30 (2,39)
		600	4.88 (124)	0.69 (18)	2.45 (62)	2.79 (71)	3.50 (89)	0.75 (19)	2.62 (67)	5.58 (2,51)
		900/1500	5.88 (150)	1.12 (29)	2.45 (62)	2.79 (71)	4.00 (102)	1.00 (25)	2.62 (67)	9.68 (4,36)
		2500	6.25 (159)	1.38 (35)	2.45 (62)	2.79 (71)	4.25 (108)	1.00 (25)	2.87 (73)	13.68 (6,16)
	1 1/2-in.	150	5.00 (127)	0.62 (16)	2.45 (62)	2.79 (71)	3.50 (89)	0.63 (22)	2.62 (67)	5.63 (2,53)
		300	6.12 (155)	0.75 (19)	2.45 (62)	2.79 (71)	3.88 (99)	0.75 (19)	2.88 (73)	8.20 (3.69)
		600	6.12 (155)	0.88 (22)	2.45 (62)	2.79 (71)	4.50 (114)	0.88 (22)	2.88 (73)	9.09 (4,09)
		900	7.00 (178)	1.25 (32)	2.45 (62)	2.79 (71)	4.50 (114)	0.88 (22)	2.88 (73)	14.48 (6,52)
		1500	7.00 (178)	1.25 (32)	2.45 (62)	2.79 (71)	4.88 (124)	1.13 (29)	2.88 (73)	14.48 (6,62)
		2500	8.00 (203)	1.75 (45)	2.45 (62)	2.79 (71)	5.75 (146)	1.25 (32)	2.88 (73)	25.34 (11,40)
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)	5.09 (2,29)
	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)	8.04 (3,62)
JIS	20A	40K	4.72 (120)	0.79 (20)	2.45 (62)	2.79 (71)	3.35 (85)	0.75 (19)	2.62 (67)	5.59 (2,52)
	25A	10K	4.92 (125)	0.55 (14)	2.45 (62)	2.79 (71)	3.54 (90)	0.75 (19)	2.62 (67)	5.00 (2,25)
		20K	4.92 (125)	0.63 (16)	2.45 (62)	2.79 (71)	3.54 (90)	0.75 (19)	2.62 (67)	5.31 (2,39)
		40K	5.12 (130)	0.87 (22)	2.45 (62)	2.79 (71)	3.74 (95)	0.75 (19)	2.76 (70)	6.86 (3,09)
	40A	10K	5.51 (140)	0.63 (16)	2.45 (62)	2.79 (71)	4.13 (105)	0.75 (19)	3.19 (81)	6.20 (2,79)
		20K	5.51 (140)	0.71 (18)	2.45 (62)	2.79 (71)	4.13 (105)	0.75 (19)	3.19 (81)	7.36 (3,31)
		40K	6.30 (160)	0.94 (24)	2.45 (62)	2.79 (71)	4.72 (120)	0.91 (23)	3.54 (90)	11.06 (4,98)

1. Lower housing is loose on standard design, consult factory for retained lower housing options.

Figure 29. RFW Flanged Seal Stud Bolt Design



A. Upper housing
B. Diaphragm
C. Lower housing or flushing connection
D. Bolts
E. Connection to transmitter

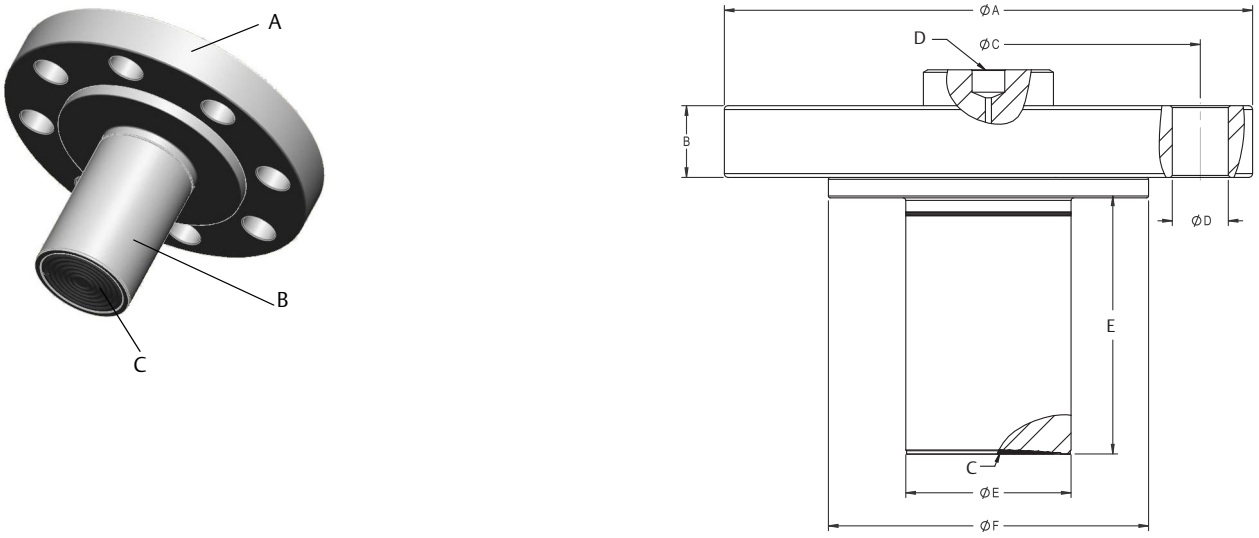
Dimensions are in inches (millimeters).

Table 82. RF/RFW Flanged Seal Standard Design Dimensions[(1)]

	Pipe size	Class	Overall height "A" in. (mm)		Stud circle diameter "B" in. (mm)	Stud (size, length) "C" in. (mm)	Lower housing diameter "D" in. (mm)	Raised face diameter "E" in. (mm)	Weight lb (kg)
			No or 1/4-in. NPT flush connection	1/2-in. NPT flush connection					
ANSI/ASME	1/2-in.	150	2.52 (64)	2.82 (72)	2.38 (61)	1/2–13NC, 2.5-in.	3.74 (95)	1.38 (35)	6.28 (2,83)
		300/600	2.77 (70)	2.87 (73)	2.62 (67)	1/2–13NC, 2.5-in.	3.75 (95)	1.38 (35)	6.53 (2,94)
	3/4-in.	150	2.52 (64)	2.82 (72)	2.75 (70)	1/2–13NC, 2.5-in.	3.88 (99)	1.69 (43)	6.46 (2,91)
EN 1092-1	DN 15	PN 40	2.52 (64)	2.82 (72)	2.56 (65)	M12 x 1.75, 60 mm	3.74 (95)	1.77 (45)	6.27 (2,82)
		PN 100/160	2.52 (64)	2.82 (72)	2.95 (75)	M12 x 1.75, 60 mm	4.13 (105)	1.77 (45)	6.92 (3,11)
	DN 20	PN 40	2.52 (64)	2.82 (72)	2.95 (75)	M12 x 1.75, 60 mm	4.13 (105)	2.28 (58)	6.90 (3,11)
JIS	10A	10/20K	2.52 (64)	2.82 (72)	2.56 (65)	M12 x 1.75, 60 mm	3.74 (95)	1.81 (46)	6.30 (2,84)
		40K	2.52 (64)	2.82 (72)	2.95 (75)	M16 x 2.00, 70 mm	4.33 (110)	2.05 (52)	7.70 (3,47)
	15A	10K	2.52 (64)	2.82 (72)	2.76 (70)	M12 x 1.75, 60 mm	3.74 (95)	2.01 (51)	6.39 (2,88)
		20K	2.52 (64)	2.82 (72)	2.76 (70)	M12 x 2.00, 60 mm	3.74 (95)	2.01 (51)	6.39 (2,88)
		40K	2.52 (64)	2.82 (72)	3.15 (80)	M16 x 2.00, 70 mm	4.53 (115)	2.17 (55)	8.26 (3,72)
	20A	10/20K	2.52 (64)	2.82 (72)	2.95 (75)	M12 x 1.75, 60 mm	3.94 (100)	2.21 (56)	6.68 (3,01)

1. Lower housing is loose on standard design, consult factory for retained lower housing options.

Figure 30. EFW Extended Flanged Seal - Extended Flanged Assembly



A. Process flange
B. Extension
C. Diaphragm
D. Connection to transmitter
E. Extension length

Dimensions are in inches (millimeters).

Table 83. EFW Extended Flanged Seal Dimensions

	Pipe size	Class	Flange diameter "A" in. (mm)	Flange thickness "B" in. (mm)	Bolt circle "C" in. (mm)	Number of bolts	Bolt hole diameter "D" in. (mm)	Raised face diameter "F" in. (mm)
ANSI/ASME	1 1/2-in.	150	5.00 (127)	0.62 (16)	0.63 (16)	4	3.88 (99)	2.88 (73)
		300	6.12 (156)	0.75 (19)	0.88 (22)	4	4.50 (114)	2.88 (73)
		600	6.12 (156)	0.88 (22)	0.88 (22)	4	4.50 (114)	2.88 (73)
		900/1500	7.00 (178)	1.25 (32)	1.13 (28)	4	4.88 (124)	2.88 (73)
		2500	8.00 (203)	1.75 (45)	1.25 (32)	4	5.75 (146)	2.88 (73)
	2-in.	150	6.00 (152)	0.69 (18)	0.75 (19)	4	4.75 (121)	3.62 (92)
		300	6.50 (165)	0.82 (21)	0.75(19)	8	5.00 (127)	3.62 (92)
		600	6.50 (165)	1.00 (25)	0.75 (19)	8	5.00 (127)	3.62 (92)
		900/1500	8.50(216)	1.50 (38)	1.00 (25)	8	6.50 (165)	3.62 (92)
		2500	9.25(235)	2.00 (51)	1.13 (29)	8	6.75 (172)	3.62(92)
	3-in.	150	7.50(191)	0.88 (22)	0.75 (19)	4	6.00 (152)	5.00 (127)
		300	8.25(210)	1.06 (27)	0.88 (22)	8	6.62 (168)	5.00 (127)
		600	8.25(210)	1.25 (32)	0.88 (22)	8	6.62 (168)	5.00 (127)
		900	9.50(241)	1.50 (38)	1.00 (25)	8	7.50 (191)	5.00 (127)
		1500	10.50(267)	1.88 (48)	1.25(32)	8	8.00 (203)	5.00 (127)
		2500	12.00(305)	2.62 (67)	1.38 (35)	8	9.00 (229)	5.00 (127)
	4-in.	150	9.00(229)	0.88 (22)	0.75 (19)	8	7.50 (191)	6.20 (158)
		300	10.00(254)	1.19 (30)	0.88 (22)	8	7.88 (200)	6.20 (158)
		600	10.75(273)	1.50 (38)	1.00 (25)	8	8.50 (216)	6.20 (158)
		900	11.50(292)	1.75 (45)	1.25 (32)	8	9.25 (235)	6.20 (158)
		1500	12.25(311)	2.12 (54)	1.38 (35)	8	9.50 (241)	6.20 (158)
		2500	14.00 (356)	3.00 (76)	1.63 (41)	8	10.75 (274)	6.20 (158)

Table 83. EFW Extended Flanged Seal Dimensions

	Pipe size	Class	Flange diameter "A" in. (mm)	Flange thickness "B" in. (mm)	Bolt circle "C" in. (mm)	Number of bolts	Bolt hole diameter "D" in. (mm)	Raised face diameter "F" in. (mm)
EN 1092-1	DN 50	PN 40	6.50 (165)	0.67 (17)	0.71 (18)	4	4.92 (125)	4.02 (102)
		PN 63	7.08 (180)	0.91 (23)	0.87 (22)	4	5.31 (135)	4.02 (102)
		PN 100	7.68 (195)	0.98 (25)	1.02 (26)	4	5.71 (145)	4.02 (102)
		PN 160	7.68 (195)	1.06 (27)	1.02 (26)	4	5.71 (145)	4.02 (102)
	DN 80	PN 40	7.87 (200)	0.83 (21)	0.71 (18)	8	6.30 (160)	5.43 (138)
		PN 63	8.46 (215)	0.98 (25)	0.88 (22)	8	6.69 (170)	5.43 (138)
		PN 100	9.06 (230)	1.14 (29)	1.02 (26)	8	7.09 (180)	5.43 (138)
		PN 160	9.06 (230)	1.30 (33)	1.02 (26)	8	7.09 (180)	5.43 (138)
	DN 100	PN 10/16	8.66 (220)	0.67 (17)	0.71 (18)	8	7.09 (180)	6.20 (158)
		PN 40	9.25 (235)	0.83 (21)	0.87 (22)	8	7.48 (190)	6.20 (158)
		PN 63	9.84 (250)	1.06 (27)	1.02 (26)	8	7.87 (200)	6.20 (158)
		PN 100	10.43 (265)	1.30 (33)	1.18 (30)	8	8.27 (210)	6.20 (158)
		PN 160	10.43 (265)	1.46 (37)	1.18 (30)	8	8.27 (210)	6.20 (158)
JIS	50A	10K	6.10 (155)	0.63 (16)	0.75 (19)	4	4.72 (120)	3.62 (92)
		20K	6.10 (155)	0.71 (18)	0.75 (19)	8	4.72 (120)	3.62 (92)
		40K	6.50 (165)	1.02 (26)	0.75 (19)	8	5.12 (130)	4.00 (102)
	80A	10K	7.28 (185)	0.71 (18)	0.75 (19)	8	5.91 (150)	5.00 (127)
		20K	7.87 (200)	0.87 (22)	0.91 (23)	8	6.30 (160)	5.00 (127)
		40K	8.27 (210)	1.26 (32)	0.91 (23)	8	6.69 (170)	5.43 (138)
	100A	10K	8.27 (210)	0.71 (18)	0.75 (19)	8	6.89 (175)	6.20 (158)
		20K	8.86 (225)	0.94 (24)	0.91 (23)	8	7.28 (185)	6.20 (158)
		40K	9.84 (250)	1.42 (36)	0.98 (25)	8	8.07 (205)	6.20 (158)

Table 84. EFW Extended Flanged Seal Dimensions

Process connection size			Diameter "E" in. (mm)
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 1/2-in.	DN 40	40A	1.45 (37)
2-in.	DN 50	50A	1.90 (48)
3-in. Headbox	DN 80 Headbox	N/A	2.88 (73)
4-in. Headbox	DN100 Headbox	N/A	3.78 (96)

Table 85. EFW Extended Flanged Seal Weights Pounds (Kilograms)

	Pipe size	Class	Extension length								
			1-in. (25 mm)	2-in. (51 mm)	3-in. (76 mm)	4-in. (102 mm)	5-in. (127 mm)	6-in. (152 mm)	7-in. (178 mm)	8-in. (203 mm)	9-in. (229 mm)
ANSI/ASME	1 1/2-in.	150	5.53 (2,49)	5.99 (2,70)	6.46 (2,91)	6.92 (3,11)	7.38 (3,32)	7.85 (3,53)	8.31 (3,74)	8.78 (3,95)	7.47 (3,36)
		300	8.11 (3,65)	8.57 (3,86)	9.04 (4,07)	9.50 (4,28)	9.96 (4,48)	10.43 (4,69)	10.89 (4,90)	11.36 (5,11)	10.05 (4,52)
		600	9.00 (4,05)	9.46 (4,56)	9.93 (4,47)	10.39 (4,68)	10.86 (4,89)	11.32 (5,09)	11.78 (5,30)	12.25 (5,51)	10.94 (4,92)
		900/1500	15.19 (6,86)	15.66 (7,05)	16.12 (7,25)	16.59 (7,47)	17.05 (7,67)	17.51 (7,88)	17.98 (8,09)	18.44 (8,30)	18.70 (8,42)
		2500	25.38 (11,42)	25.84 (11,63)	26.31 (11,84)	26.77 (12,05)	27.23 (12,25)	27.70 (12,47)	28.16 (12,67)	28.63 (12,88)	28.89 (13,00)

Table 85. EFW Extended Flanged Seal Weights Pounds (Kilograms)

	Pipe size		Class	Extension length								
				1-in. (25 mm)	2-in. (51 mm)	3-in. (76 mm)	4-in. (102 mm)	5-in. (127 mm)	6-in. (152 mm)	7-in. (178 mm)	8-in. (203 mm)	9-in. (229 mm)
ANSI/ASME	2-in.		150	8.22 (3,70)	8.80 (3,96)	9.41 (4,23)	10.00 (4,50)	10.60 (4,77)	11.19 (5,04)	11.79 (5,31)	12.38 (5,57)	11.16 (5,02)
			300	9.81 (4,41)	10.39 (4,68)	11.00 (4,95)	11.60 (5,22)	12.19 (5,49)	12.79 (5,76)	13.38 (6,02)	13.98 (6,29)	12.75 (5,74)
			600	11.26 (5,07)	11.84 (5,33)	12.44 (5,60)	13.05 (5,87)	13.64 (6,14)	14.23 (6,40)	14.83 (6,67)	15.42 (6,94)	14,20 (6.39)
			900/1500	25.50 (11,48)	26.31 (11,84)	27.12 (12,20)	27.92 (12,56)	28.73 (12,93)	29.54 (13,29)	30.34 (13,65)	31.15 (14,02)	31.32 (14,09)
			2500	36.58 (16,46)	37.38 (16,82)	38.19 (17,19)	39.00 (17,55)	39.80 (17,91)	40.61 (18,27)	41.42 (18,64)	42.22 (19,00)	42.40 (19,08)
	3-in.		150	15.89 (7,15)	17.64 (7,94)	19.48 (8,77)	21.27 (9,57)	23.08 (10,39)	24.88 (11,20)	26.69 (12,01)	28.50 (12,83)	22.47 (10,11)
			300	19.94 (8,97)	21.69 (9,76)	23.53 (10,59)	25.32(11,39)	27.13 (12,21)	28.93 (13,02)	30.74 (13,83)	32.54 (14,64)	26.52 (11,93)
			600	22.43 (10,09)	24.18 (10,88)	26.02 (11,71)	27.81 (12,51)	29.62 (13,33)	31.42 (14,14)	33.23 (14,95)	35.03 (15,76)	29.01 (13,05)
			900	33.26 (14,97)	35.10 (15,80)	36.90 (16,61)	38.71 (17,42)	40.51 (18,23)	42.32 (19,04)	44.12 (19,85)	45.93 (20,67)	48.80 (21,96)
			1500	47.88 (21,55)	49.71 (22,37)	51.52 (23,18)	53.33 (24,00)	55.13 (24,81)	56.94 (25,62)	58.74 (26,43)	60.55 (27,25)	63.42 (28,54)
			2500	83.46 (37,56)	85.30 (38,39)	87.10 (39,20)	88.91 (40,01)	90.71 (40,82)	92.52 (41,63)	94.33 (42,45)	96.13 (43,26)	99.00 (44,55)
	3-in.	Headbox	150	15.76 (7,09)	17.40 (7,83)	19.07 (8,58)	20.90 (9,41)	22.40 (10,08)	24.07 (10,83)	25.74 (11,58)	27.41 (12,33)	23.24 (10,46)
			300	19.81 (8,91)	21.45 (9,65)	23.12 (10,40)	24.95 (11,23)	26.45 (11,90)	28.12 (12,65)	29.79 (13,41)	31.45 (14,15)	27.29 (12,28)
			600	22.30 (10,04)	23.94 (10,77)	25.61 (11,52)	27.44 (12,35)	28.94 (13,02)	30.61 (13,77)	32.28 (14,53)	33.94 (15,27)	29.78 (13,40)
			900	33.13 (14,91)	34.83 (15,67)	36.50 (16,53)	38.17 (17,18)	39.84 (17,93)	41.51 (18,68)	43.15 (19,42)	44.85 (20,18)	47.58 (21,41)
			1500	47.75 (21,49)	49.45 (22,25)	51.12 (23,00)	52.79 (23,76)	54.46 (24,51)	56.13 (25,26)	57.76 (25,99)	59.46 (26,76)	62.20 (27,99)
			2500	83.33 (37,50)	85.03 (38,26)	86.70 (39,02)	88.37 (39,77)	90.04 (40,52)	91.71 (41,27)	93.35 (42,01)	95.05 (42,77)	97.78 (44,00)
	4-in.		150	28.61 (12,87)	39.17 (17,63)	49.62 (22,33)	60.07 (27,03)	70.52 (31,73)	80.94 (36,42)	91.42 (41,14)	101.88 (45,85)	31.74 (14,28)
			300	38.62 (17,38)	49.18 (22,13)	59.63 (26,83)	70.08 (31,54)	80.54 (36,24)	90.96 (40,93)	101.44 (45,65)	111.89 (50,35)	41.75 (18,79)
			600	48.37 (21,77)	58.93 (26,52)	69.38 (31,22)	79.83 (35,92)	90.28 (40,63)	100.70 (45,32)	111.19 (50,04)	121.64 (54,74)	51.50 (23,18)
			900	55.27 (24,87)	58.50 (26,33)	61.73 (27,78)	64.96 (29,23)	67.31 (30,29)	70.34 (31,65)	73.36 (33,01)	76.38 (34,37)	80.30 (36,14)
			1500	72.28 (32,53)	75.51 (33,98)	78.74 (35,43)	81.97 (36,89)	84.33 (37,95)	87.35 (39,31)	90.37 (40,67)	93.39 (42,03)	97.31 (43,79)
			2500	126.52 (56,93)	129.75 (58,39)	132.98 (59,84)	136.20 (61,29)	138.57 (62,36)	141.59 (63,72)	144.61 (65,07)	147.63 (66,43)	151.55 (68,20)

Table 85. EFW Extended Flanged Seal Weights Pounds (Kilograms)

	Pipe size		Class	Extension length								
				1-in. (25 mm)	2-in. (51 mm)	3-in. (76 mm)	4-in. (102 mm)	5-in. (127 mm)	6-in. (152 mm)	7-in. (178 mm)	8-in. (203 mm)	9-in. (229 mm)
ANSI/ASME	4-in. Headbox		150	22.84 (10,28)	25.85 (11,63)	28.90 (13,01)	31.99 (14,40)	35.00 (15,75)	38.06 (17,13)	41.11 (18,50)	44.13 (19,86)	32.00 (14,40)
			300	32.85 (14,78)	35.87 (16,14)	38.92 (17,51)	42.00 (18,90)	45.02 (20,26)	48.07 (21,63)	51.12 (23,00)	54.14 (24,36)	42.02 (18,91)
			600	42.60 (19,17)	45.62 (20,53)	48.67 (21,90)	51.75 (23,29)	54.77 (24,65)	57.82 (26,02)	60.8 7(27,39)	63.89 (28,75)	51.7 7 (23,30)
			900	55.24 (24,86)	58.32 (26,24)	61.37 (27,62)	64.41 (28,98)	67.47 (30,36)	70.52 (31,73)	73.5 7(33,11)	76.62 (34,48)	80.74 (36,33)
			1500	72.25 (32,51)	75.33 (33,90)	78.38 (35,27)	81.43 (36,64)	84.48 (38,02)	87.53 (39,39)	90.58 (40,76)	93.63 (42,13)	97.75 (43,99)
			2500	126.49 (56,92)	129.57 (58,31)	132.62 (59,68)	135.67 (61,05)	138.72 (62,42)	141.78 (63,80)	144.83 (65,17)	147.88 (66,55)	152.00 (68,4)
EN 1092 - 1	DN 40		PN 40	7.46 (3,36)	7.92 (3,56)	8.38 (3,77)	8.85 (3,98)	9.31 (4,19)	9.77 (4,40)	10.24 (4,61)	10.70 (4,82)	9.39 (4,23)
			PN 63/100	11.52 (5,18)	11.98 (5,39)	12.44 (5,60)	12.91 (5,81)	13.37 (6,23)	13.84 (6,34)	14.30 (6,44)	14.76 (6,64)	13.45 (6,05)
			PN 160	13.17 (5,93)	13.63 (6,13)	14.10 (6,35)	14.56 (6,55)	15.03 (6,76)	15.49 (6,97)	15.95 (7,18)	16.42 (7,39)	16.83 (7,57)
	DN 50		PN 40	9.87 (4,44)	10.45 (4,70)	11.06 (5,00)	11.66 (5,25)	12.25 (5,51)	12.84 (5,78)	13.44 (6,05)	14.03 (6,31)	12.81 (5,76)
			PN 63	13.37 (6,02)	13.96 (6,28)	14.56 (6,55)	15.16 (6,82)	15.75 (7,09)	16.35 (7,36)	16.94 (7,62)	17.54 (7,89)	16.31 (7,34)
			PN 100	16.05 (7,22)	16.63 (7,48)	17.23 (7,75)	17.83 (8,02)	18.43 (8,29)	19.02 (8,56)	19.61 (8,82)	20.21 (9,09)	18.99 (8,55)
			PN 160	18.14 (8,16)	18.95 (8,53)	19.76 (8,89)	20.56 (9,25)	21.37 (9,62)	22.18 (9,98)	22.98 (10,34)	23.79 (10,71)	23.96 (10,78)
	DN 80	Schedule 40	PN 40	16.85 (7,58)	18.47 (8,31)	20.08 (9,04)	21.70 (9,77)	23.32 (10,49)	24.94 (11,22)	26.56 (11,95)	28.18 (12,68)	23.97 (10,79)
			PN 63	20.70 (9,32)	22.32 (10,04)	23.93 (10,77)	25.55 (11,50)	27.17 (12,23)	28.79 (12,96)	30.41 (13,68)	32.03 (14,41)	27.82 (12,52)
			PN 100	25.29 (11,38)	26.90 (12,11)	28.51 (12,83)	30.13 (13,56)	31.75 (14,29)	33.37 (15,02)	34.99 (15,75)	36.61 (16,47)	32.40 (14,58)
			PN 160	29.45 (13,25)	31.10 (14,00)	32.72 (14,72)	34.33 (15,45)	35.95 (16,18)	37.57 (16,91)	39.17 (17,64)	40.81 (18,36)	43.50 (19,58)
		Schedule 80	PN 40	16.53 (7,44)	17.76 (7,99)	19.07 (8,58)	20.36 (9,16)	21.65 (9,74)	22.93 (10,32)	24.22 (10,90)	25.51 (11,48)	21.12 (9,50)
			PN 63	20.38 (9,17)	21.61 (9,72)	22.92 (10,31)	24.21 (10,89)	25.50 (11,48)	26.78 (12,05)	28.07 (12,63)	29.36 (13,21)	24.97 (11,24)
			PN 100	24.97 (11,24)	26.20 (11,79)	27.51 (12,38)	28.79 (12,96)	30.08 (13,54)	31.37 (14,12)	32.65 (14,69)	33.94 (15,27)	29.56 (13,30)
			PN160	29.17 (13,13)	30.67 (13,80)	32.17 (17,48)	33.67 (15,15)	35.17 (15,83)	36.66 (16,50)	38.16 (17,17)	39.66 (17,85)	40.51 (18,23)
		Headbox	PN 40	16.92 (7,61)	18.56 (8,35)	20.23 (9,10)	22,06 (9,93)	23.56 (10,60)	25.23 (11,35)	26.90 (12,11)	28.56 (12,85)	24.40 (10,98)
			PN 63	20.77 (9,35)	22.41 (10,08)	24.08 (10,84)	25.91 (11,66)	27.41 (12,33)	29.08 (13,09)	30.75 (13,84)	32.41 (14,58)	28.25 (12,71)
			PN 100	25.35 (11,41)	26.99 (12,15)	28.66 (12,90)	30.49 (13,72)	31.99 (14,40)	33.66 (15,15)	35.33 (15,90)	37.00 (16,65)	32.84 (14,78)
			PN 160	29.49 (13,27)	31.19 (14,04)	32.86 (14,79)	34.53 (15,54)	36.20 (16,29)	37.87 (17,04)	39.50 (17,78)	41.20 (18,54)	43.94 (19,77)

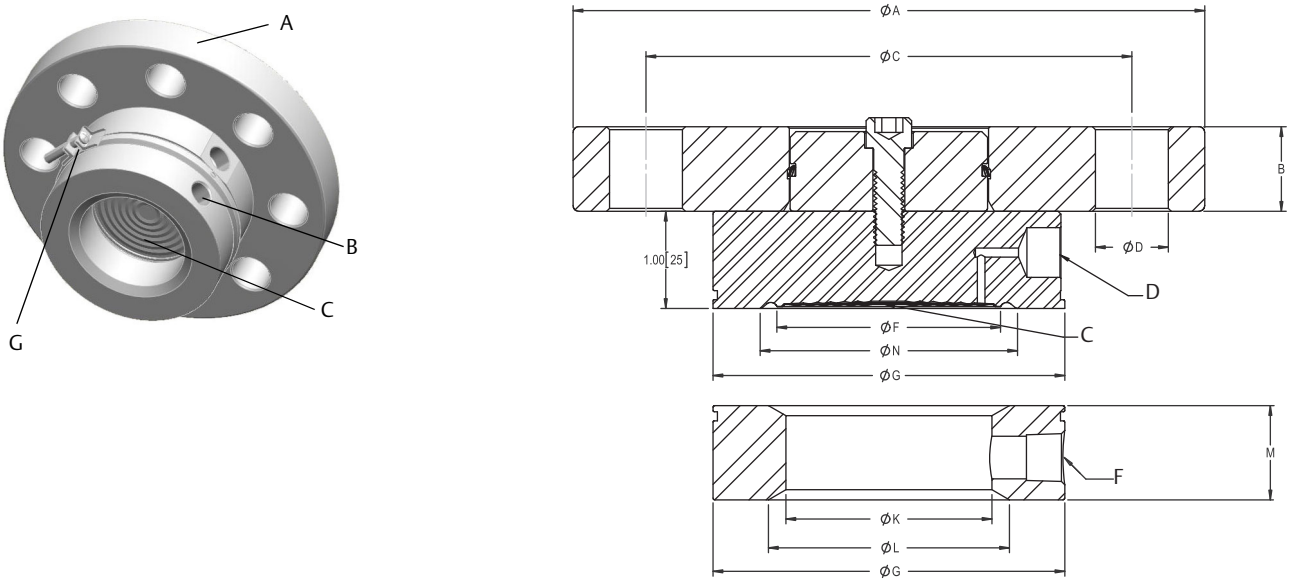
Table 85. EFW Extended Flanged Seal Weights Pounds (Kilograms)

	Pipe size		Class	Extension length								
				1-in. (25 mm)	2-in. (51 mm)	3-in. (76 mm)	4-in. (102 mm)	5-in. (127 mm)	6-in. (152 mm)	7-in. (178 mm)	8-in. (203 mm)	9-in. (229 mm)
EN 1092 - 1	DN 100	Schedule 40	PN 10/16	19.23 (8,65)	22.07 (9,93)	24.95 (11,23)	27.85 (12,53)	30.73 (13,83)	33.62 (15,13)	36.50 (16,43)	39.39 (17,73)	29.81 (13,41)
			PN 40	23.32 (10,50)	26.16 (11,77)	29.05 (13,07)	31.94 (14,37)	34.83 (15,67)	37.71 (16,97)	40.60 (18,27)	43.48 (19,57)	33.90 (15,26)
			PN 63	29.83 (13,42)	32.67 (14,70)	35.56 (16,00)	38.45 (17,30)	41.34 (18,60)	44.22 (19,90)	47.11 (21,20)	50.00 (22,50)	40.41 (18,18)
			PN 100	37.37 (16,82)	40.21 (18,09)	43.10 (19,40)	45.99 (20,70)	48.88 (22,00)	51.76 (23,29)	54.65 (24,59)	57.53 (25,89)	47.95 (21,58)
			PN 160	42,48 (19,12)	45.4 (20,43)	48.29 (21,73)	51.17 (23,03)	54.05 (24,32)	56.94 (25,62)	59.82 (26,92)	52.71 (28,22)	66.63 (29,98)
		Schedule 80	PN 16	18.85 (8,48)	21.43 (9,64)	23.98 (10,79)	26.53 (11,94)	29.08 (13,09)	31.66 (14,25)	34.17 (15,38)	36.72 (16,52)	26.81 (12,06)
			PN 40	22.95 (10,33)	25.53 (11,49)	28.07 (12,63)	30.62 (13,78)	33.17 (14,93)	35.75 (16,09)	38.27 (17,22)	40.82 (18,37)	30.90 (13,91)
			PN 63	29.46 (13,26)	32.04 (14,42)	34.58 (15,56)	37.13 (16,71)	39.68 (17,86)	42.26 (19,02)	44.78 (20,15)	47.33 (21,30)	37.41 (16,83)
			PN 100	36.99 (16,65)	39.57 (17,81)	42.12 (18,95)	44.67 (20,10)	47.22 (21,25)	49.80 (22,41)	52.32 (23,54)	84.87 (24,69)	44.95 (20,23)
			PN 160	42.18 (18,98)	44.73 (20,13)	47.30 (21,29)	49.85 (22,43)	52.40 (23,58)	54.94 (24,72)	57.49 (25,87)	60.03 (27,01)	63.62 (28,63)
	DN 100	Headbox	PN 16	19.38 (8,72)	22.40 (10,08)	25.45 (11,45)	28.53 (12,84)	31.55 (14,20)	34.60 (15,57)	37.65 (16,94)	40.67 (18,30)	28.55 (12,85)
			PN 40	23.48 (10,57)	26.49 (11,92)	29.54 (13,29)	32.63 (14,68)	35.65 (16,04)	38.70 (17,42)	41.75 (18,79)	44.77 (20,15)	32.64 (14,69)
			PN 63	29.99 (13,50)	33.00 (14,85)	36.05 (16,22)	39.14 (17,61)	42.16 (18,97)	45.21 (20,34)	48.26 (21,72)	51.28 (23,08)	39.15 (17,62)
			PN 100	37.52 (16,88)	40.54 (18,24)	43.59 (19,62)	46.68 (21,01)	49.69 (22,36)	52.74 (23,73)	55.80 (25,11)	58.81 (26,46)	46.69 (21,01)
			PN 160	42.68 (19,21)	45.76 (20,59)	48.81 (21,96)	51.86 (23,34)	54.91 (24,71)	57.96 (26,08)	61.01 (27,45)	64.06 (28,83)	68.15 (30,67)

Table 85. EFW Extended Flanged Seal Weights Pounds (Kilograms)

	Pipe size		Class	Extension length								
				1-in. (25 mm)	2-in. (51 mm)	3-in. (76 mm)	4-in. (102 mm)	5-in. (127 mm)	6-in. (152 mm)	7-in. (178 mm)	8-in. (203 mm)	9-in. (229 mm)
JIS	40A		10K	6.09 (2,74)	6.55 (2,95)	7.01 (3,15)	7.48 (3,37)	7.94 (3,57)	8.41 (3,78)	8.87 (3,99)	9.33 (4,20)	8.02 (3,61)
			20K	6.52 (2,93)	6.98 (3,14)	7.45 (3,35)	7.91 (3,56)	8.38 (3,77)	8.84 (3,98)	9,30 (4,19)	9.33 (4,20)	8.02 (3,81)
			40k	9.64 (4,34)	10.10 (4,55)	10.57 (4,76)	11.03 (4,96)	11.50 (5,18)	11.96 (5,38)	12.43 (5,59)	12.89 (5,80)	11.85 (5,21)
	50A		10K	7.73 (3.48)	8,31 (3.74)	8,91 (4.01)	9,51 (4.28)	10,11 (4,55)	10.70 (4,82)	11.30 (5,08)	11.89 (5,35)	10.67 (4,80)
			20K	7.91 (3,56)	8.49 (3,82)	9.10 (4,10)	9.70 (4,37)	10.29 (4,63)	10.89 (4,90)	11,48 (5,17)	12.07 (5,43)	10,85 (4,88)
			40K	11.18 (5,03)	11.76 (5,29)	12.37 (5,57)	13.00 (5,85)	13.56 (6,10)	14.16 (6,37)	14.75 (6,64)	15.35 (6,91)	14.12 (6,35)
	80A	Schedule 40	10K	12.41 (5,58)	14.02 (6,31)	15.63 (7,03)	17.25 (7,76)	18.87 (8,49)	20.49 (9,22)	22.11 (9,95)	23.73 (10,68)	19.52 (8,78)
			20K	15.51 (6,98)	17.12 (7,70)	18.73 (8,43)	20.35 (9,16)	21.97 (9,89)	23.59 (10,62)	25.21 (11,34)	26.83 (12,07)	22.62 (10,18)
			40K	21.92 (9,86)	23.53 (10,59)	25.15 (11,32)	26.77 (12,05)	28.39 (12,78)	30.00 (13,50)	31.62 (14,23)	33.24 (14,96)	29.04 (13,07)
		Schedule 80	10K	12.09 (5,44)	13.32 (5,99)	14.63 (6,58)	15.91 (7,16)	17.20 (7,74)	18.49 (8,32)	19.78 (8,90)	21.06 (9,48)	16.68 (7,51)
			20K	15.19 (6,84)	16.42 (7,39)	17.73 (7,98)	19.01 (8,55)	20.30 (9,14)	21.59 (9,72)	22.88 (10,30)	24.16 (10,87)	19.78 (8,90)
			40K	21.60 (9,72)	22.83 (10,27)	24.14 (10,86)	25.43 (11,44)	26.72 (12,02)	28.00 (12,60)	29.29 (13,18)	30.58 (13,76)	26.19 (11,79)
	100A	Schedule 40	10K	17.15 (7,72)	19.99 (9,00)	22.87 (10,29)	25.77 (11,60)	28.65 (12,89)	31.54 (14,19)	34.42 (15,49)	37.31 (16,79)	27.73 (12,48)
			20K	22.16 (9,97)	24.99 (11,25)	27.88 (12,55)	30.78 (13,85)	33.66 (15,15)	36.55 (16,45)	39.43 (17,74)	42.31 (19,04)	32.73 (14,73)
			40K	35.21 (15,84)	38.05 (17,12)	40.94 (18,42)	43.83 (19,72)	46.72 (21,02)	49.60 (22,32)	52.49 (23,62)	55.37 (24,92)	45.79 (20,61)
		Schedule 80	10K	16.77 (7,55)	19.35 (8,71)	21.90 (9,86)	24.45 (11,00)	27.00 (12,15)	29.58 (13,31)	32.09 (14,44)	34.64 (15,59)	24.73 (11,13)
			20K	21.78 (9,80)	24.36 (10,96)	26.91 (12,11)	29.46 (13,26)	32.00 (14,40)	34.59 (15,57)	37.10 (16,70)	39.65 (17,84)	29.73 (13,38)
			40K	34.83 (15,67)	37.41 (16,83)	39.96 (17,98)	42.51 (19,13)	45.06 (20,28)	47.64 (21,44)	50.16 (22,57)	52.71 (23,72)	42.79 (19,26)

Figure 31. PFW Pancake Seal



A. Process flange
B. Flushing connection
C. Diaphragm
D. Connection to transmitter
F. Flushing connection
G. Lower housing alignment clamp (option code SA)
Dimensions are in inches (millimeters).

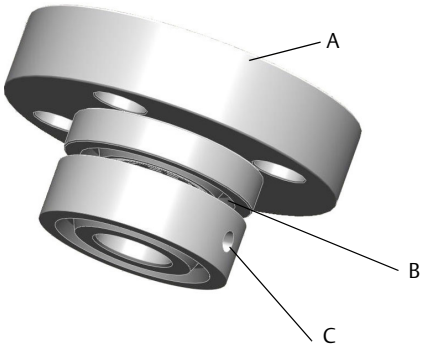
Table 86. PFW Pancake Seal Dimensions

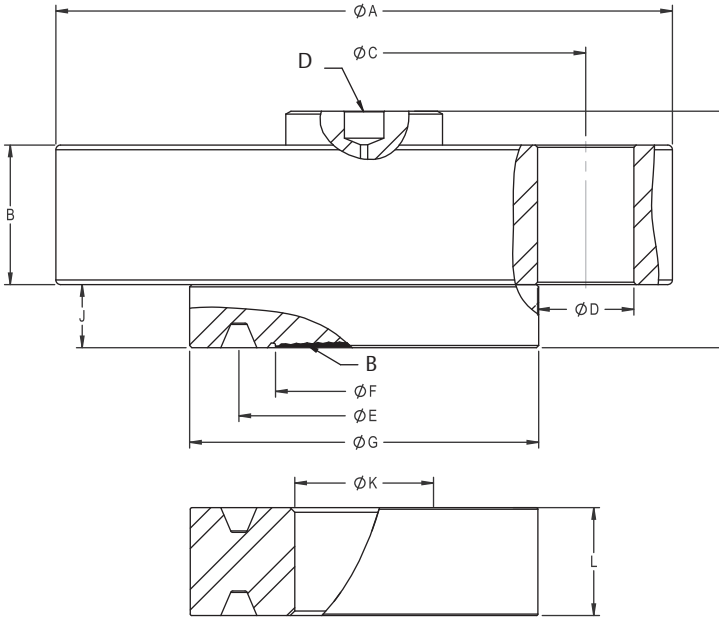
	Pipe size	Class	Flange diameter "A" in. (mm)	Flange thickness "B" in. (mm)	Number of bolts	Bolt circle "C" in. (mm)	Bolt hole diameter "D" in. (mm)	Standard diaphragm diameter "F" in. (mm)
ANSI/ASME	2-in.	150	6.00 (152)	0.69 (18)	4	4.75 (121)	0.75 (19)	2.30 (58)
		300	6.50 (165)	0.81 (21)	8	5.00 (127)	0.75 (19)	2.30 (58)
		600	6.50 (165)	1.00 (25)	8	5.00 (127)	0.75 (19)	2.30 (58)
		900/1500	8.50 (216)	1.50 (38)	8	6.50 (165)	1.00 (25)	2.30 (58)
		2500	9.25 (235)	2.00 (51)	8	6.75 (172)	1.13 (29)	2.30 (58)
	3-in.	150	7.50 (191)	0.88 (22)	4	6.00 (152)	0.75 (19)	3.50 (89)
		300	8.25 (210)	1.06 (27)	8	6.62 (168)	0.88 (22)	3.50 (89)
		600	8.25 (210)	1.25 (32)	8	6.62 (168)	0.88 (22)	3.50 (89)
		900	10.50 (267)	1.50 (38)	8	8.00 (203)	1.25 (32)	3.50 (89)
		1500	10.50 (267)	1.88 (48)	8	8.00 (203)	1.25 (32)	3.50 (89)
		2500	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)

Table 87. PFW Pancake Seal Dimensions

	Pipe size	Outer diameter "G" in. (mm)	Inner diameter "K" in. (mm)	Beveled diameter "L" in. (mm)	Thickness with 1/4 NPT F.C. "M" in. (mm)	Thickness with 1/2 NPT F.C. "M" in. (mm)	Minimum gasket I.D. "N" in. (mm)	Weight lb (kg)
ANSI/ASME	2-in.	3.62 (92)	2.12 (54)	2.48 (63)	0.97 (25)	1.30 (33)	2.5 (64)	8.61 (3,87)
		3.62 (92)	2.12 (54)	2.48 (63)	0.97 (25)	1.30 (33)	2.5 (64)	10.20 (4,59)
		3.62 (92)	2.12 (54)	2.48 (63)	0.97 (25)	1.30 (33)	2.5 (64)	11.65 (5,24)
		3.62 (92)	2.12 (54)	N/A	0.97 (25)	1.30 (33)	2.5 (64)	24.84 (11,18)
		3.62 (92)	2.12 (54)	N/A	0.97 (25)	1.30 (33)	2.5 (64)	36.92 (16,61)
	3-in.	5.00 (127)	3.60 (91)	N/A	0.97 (25)	1.30 (33)	3.7 (94)	16.83 (7,57)
		5.00 (127)	3.60 (91)	N/A	0.97 (25)	1.30 (33)	3.7 (94)	20.88 (9,40)
		5.00 (127)	3.60 (91)	N/A	0.97 (25)	1.30 (33)	3.7 (94)	23.35 (10,51)
		5.00 (127)	3.60 (91)	N/A	0.97 (25)	1.30 (33)	3.7 (94)	33.83 (15,22)
		5.00 (127)	3.60 (91)	N/A	0.97 (25)	1.30 (33)	3.7 (94)	47.39 (19,98)
		5.00 (127)	3.60 (91)	N/A	0.97 (25)	1.30 (33)	3.7 (94)	81.97 (36,89)
EN1092-1	DN 50	4.00 (102)	2.40 (61)	N/A	0.97 (25)	1.30 (33)	2.5 (64)	10.67 (4,80)
		4.00 (102)	2.40 (61)	N/A	0.97 (25)	1.30 (33)	2.5 (64)	14.24 (6,41)
		4.00 (102)	2.40 (61)	N/A	0.97 (25)	1.30 (33)	2.5 (64)	16.89 (7,60)
	DN 80	5.43 (138)	3.60 (91)	N/A	0.97 (25)	1.30 (33)	3.7 (94)	18.76 (8,44)
		5.43 (138)	3.60 (91)	N/A	0.97 (25)	1.30 (33)	3.7 (94)	22.60 (10,17)
		5.43 (138)	3.60 (91)	N/A	0.97 (25)	1.30 (33)	3.7 (94)	27.07 (12,18)

Figure 32. FCW Flush Flanged Seal – Ring Type Joint (RTJ) Gasket Surface Two-Piece Design (Shown with Flushing Ring)





A. Process flange
B. Diaphragm
C. Flushing connection
D. Connection to transmitter

Dimensions are in inches (millimeters).

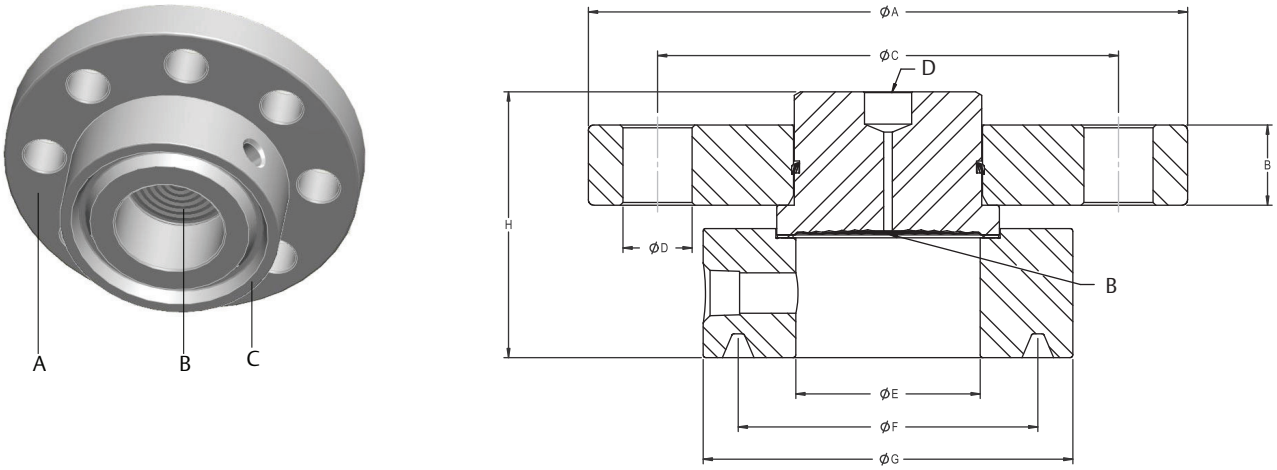
Table 88. Dimensions for FCW 2-Piece Flange Type Flush Diaphragm Seal

	Pipe size	Class	Flange diameter "A" in. (mm)	Flange thickness "B" in. (mm)	Bolt circle diameter "C" in. (mm)	Bolt hole diameter "D" in. (mm)	Overall height "H" in. (mm)	Raised face height "J" in. (mm)
ANSI/ASME	2-in.	150	6.00 (152)	0.69 (18)	4.75 (121)	0.75 (19)	2.43 (62)	0.68 (17)
		300	6.50 (165)	0.82 (21)	5.00 (127)	0.75 (19)	2.43 (62)	0.68 (17)
		600	6.50 (165)	1.00 (25)	5.00 (127)	0.75 (19)	2.43 (62)	0.68 (17)
		1500	8.50 (216)	1.50 (38)	6.50 (165)	1.00 (25)	2.57 (65)	0.82 (21)
		2500	9.25 (235)	2.00 (51)	6.75 (171)	1.14 (29)	3.07 (78)	0.82 (21)
	3-in.	150	7.50 (191)	0.88 (22)	6.00 (152)	0.75 (19)	2.43 (62)	0.68 (17)
		300	8.25 (210)	1.06 (27)	6.62 (168)	0.88 (22)	2.43 (62)	0.68 (17)
		600	8.25 (210)	1.25 (32)	6.62 (168)	0.88 (22)	2.43 (62)	0.68 (17)
		900	9.50 (241)	1.50 (38)	7.50 (191)	1.00 (25)	2.57 (65)	0.82 (21)
		1500	10.50 (267)	1.88 (48)	8.00 (203)	1.25 (32)	3.07 (78)	0.82 (21)
		2500	12.00 (305)	2.62 (67)	9.00 (229)	1.38 (35)	4.07 (103)	0.82 (21)

Table 89. Dimensional Table for FCW 2-Piece Flange Type Flush Diaphragm Seal

	Pipe size	RTJ diameter "E" in. (mm)	Diaphragm diameter "F" in. (mm)	Raised face diameter "G" in. (mm)	Inner diameter "K" in. (mm)	Thickness with 1/4 NPT F.C. "L" in. (mm)	Thickness with 1/2 NPT F.C. "L" in. (mm)	Weight lb (kg)
ANSI/ASME	2-in.	3.25 (83)	2.30 (58)	4.00 (102)	2.12 (54)	1.40 (36)	1.70 (43)	8.78 (3,95)
		3.25 (83)	2.30 (58)	4.25 (108)	2.12 (54)	1.40 (36)	1.70 (43)	10.56 (4,75)
		3.25 (83)	2.30 (58)	4.25 (108)	2.12 (54)	1.40 (36)	1.70 (43)	12.01 (5,40)
		3.75 (95)	2.30 (58)	4.88 (124)	2.12 (54)	1.40 (36)	1.70 (43)	26.81 (12,06)
		4.00 (102)	3.50 (89)	5.25 (133)	2.12 (54)	1.40 (36)	1.70 (43)	39.98 (17,99)
	3-in.	4.50 (114)	3.50 (89)	5.25 (133)	3.60 (91)	1.50 (38)	1.80 (46)	16.04 (7,22)
		4.88 (124)	3.50 (89)	5.75 (146)	3.60 (91)	1.50 (38)	1.80 (46)	20.72 (9,32)
		4.88 (124)	3.50 (89)	5.75 (146)	3.60 (91)	1.50 (38)	1.80 (46)	23.19 (10,44)
		4.88 (124)	3.50 (89)	6.12 (155)	3.60 (91)	1.50 (38)	1.80 (46)	35.56 (16,00)
		5.38 (137)	3.50 (89)	6.62 (168)	3.60 (91)	1.50 (38)	1.80 (46)	50.72 (22,82)
		5.00 (127)	3.50 (89)	6.62 (168)	3.60 (91)	1.50 (38)	1.80 (46)	86.12 (38,75)

Figure 33. RCW Flanged Remote Seal Ring Type Joint (RTJ) and Flushing Connection Ring



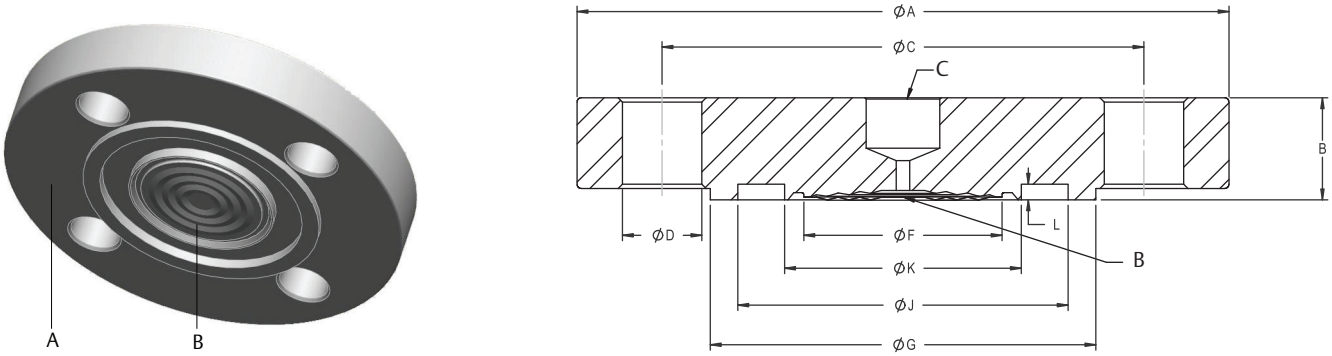
A. Process flange
B. Diaphragm
C. Flushing connection
D. Connection to transmitter

Dimensions are in inches (millimeters).

Table 90. RCW Flanged Remote Seal Dimensions

	Pipe size	Class	Flange diameter "A" in. (mm)	Flange thickness "B" in. (mm)	Bolt circle diameter "C" in. (mm)	Bolt hole diameter "D" in. (mm)	Lower housing inner diameter "E" in. (mm)	RTJ groove diameter "F" in. (mm)	Lower housing outer diameter "G" in. (mm)	Overall height "H" in. (mm)		Weight lb (kg)
										No or 1/4-in. NPT flush connection	1/2-in. NPT flush connection	
ANSI/ ASME	1/2-in.	2500	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)	1.49 (0,67)
	3/4-in.	300/600	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)	5.22 (2,35)
		900/1500	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)	7.45 (3,35)
		2500	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)	10.11 (4,55)
	1-in.	150	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)	4.38 (1,97)
		300	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)	5.67 (2,55)
		600	4.88 (124)	0.69 (183)	3.50 (89)	0.75 (19)	1.05 (27)	2.00 (51)	2.77 (70)	2.88 (73)	3.18 (81)	5.95 (2,68)
		900/1500	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)	10.15 (4,57)
		2500	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)	14.55 (6,55)
	1 1/2-in.	150	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)	6.78 (3,05)
		300	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)	10.01 (4,50)
		600	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)	10.90 (4,91)
		900/1500	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)	16.43 (7,39)
		2500	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)	29.39 (13,23)

Figure 34. FUW Flush Flanged Type Seal - EN1092-1 Type D



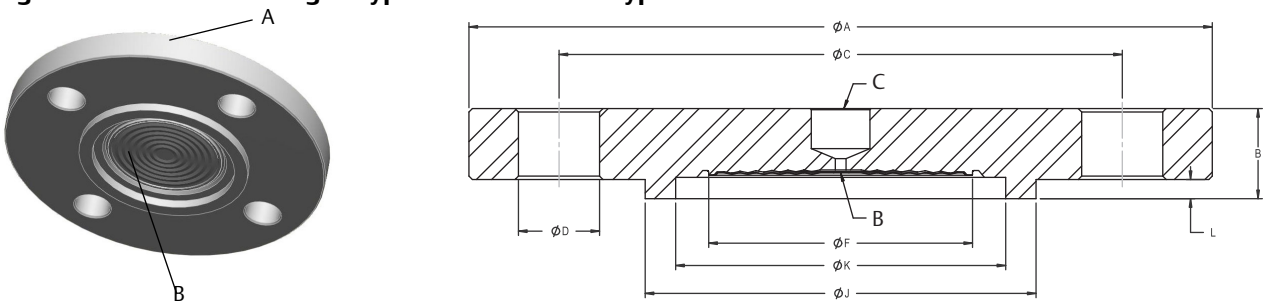
A. Process flange
B. Diaphragm
C. Connection to transmitter

Dimensions are in inches (millimeters).

Table 91. FUW Flush Flanged Type Seal Dimensions

	Pipe size	Class	Flange diameter "A" in. (mm)	Flange thickness "B" in. (mm)	Bolt circle "C" in. (mm)	Bolt hole diameter "D" in. (mm)	Number of bolts	Standard diaphragm diameter "F" in. (mm)	Raised face diameter "G" in. (mm)	Groove O.D. "J"	Groove I.D. "K"	Groove depth "L"	Weight lb (kg)
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 (4,00)	6.29 (2,83)
	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 (4,00)	11.29 (5,08)

Figure 35. FVW Flush Flanged Type Seal - EN1092-1 Type C



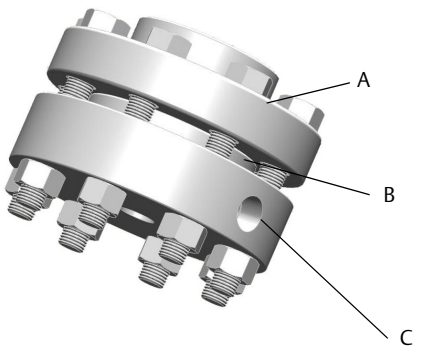
A. Process flange
B. Diaphragm
C. Connection to transmitter

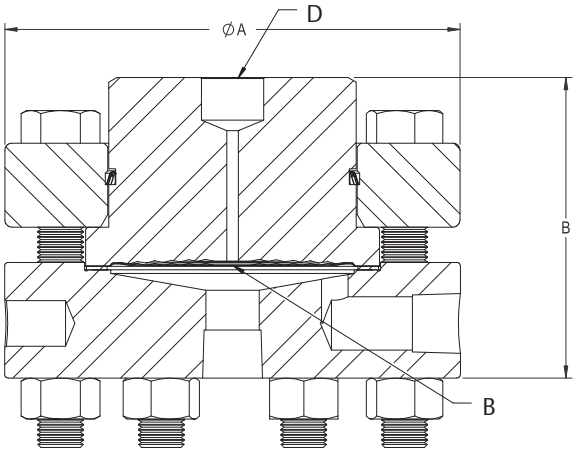
Dimensions are in inches (millimeters).

Table 92. FVW Flush Flanged Type Seal Dimensions

	Pipe size	Class	Flange diameter "A" in. (mm)	Flange thickness "B" in. (mm)	Bolt circle "C" in. (mm)	Bolt hole diameter "D" in. (mm)	Number of bolts	Standard diaphragm diameter "F" in. (mm)	Groove O.D. "J" in. (mm)	Tongue I.D. "K" in. (mm)	Tongue depth "L" in. (mm)	Weight lb (kg)
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 (4,50)	5.52 (2.48)
	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 (4,50)	10.01 (4,50)

Figure 36. RTW Threaded Seal





A. Upper housing
B. Diaphragm
C. Lower housing or flushing connection
D. Connection to transmitter

Dimensions are in inches (millimeters).

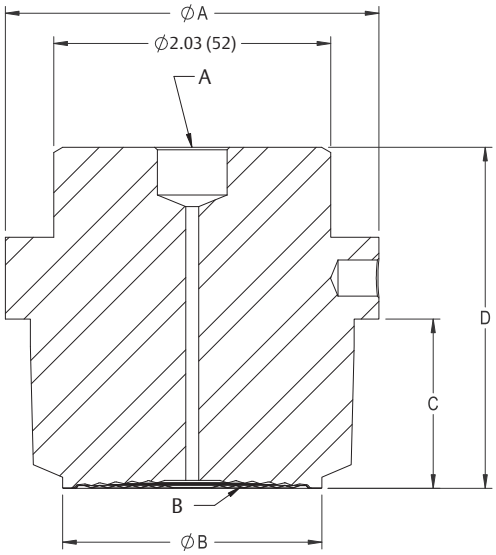
Table 93. RTW Threaded Seal Dimensions

Rating	Overall diameter 'A' in. (mm)	Overall height "B" in. (mm)	
		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)	N/A

Table 94. RTW Threaded Seal Weights Pounds (Kilograms)

	Pipe size	Class						
		1500 psi	2500 psi	5000 psi	10000 psi	103 bar	172 bar	344 bar
ANSI/ASME	1/4–18 NPT	10.73 (4,83)	6.15 (2,77)	5.72 (2,57)	6.95 (3,13)	N/A	N/A	N/A
	3/8–18 NPT	10.72 (4,82)	6.13 (2,76)	5.70 (2,57)	6.93 (3,12)	N/A	N/A	N/A
	1/2–14 NPT	10.67 (4,80)	6.09 (2,74)	5.66 (2,55)	6.89 (3,10)	N/A	N/A	N/A
	3/4–14 NPT	10.62 (4,78)	6.03 (2,71)	5.60 (2,52)	6.83 (3,07)	N/A	N/A	N/A
	1–11.5 NPT	10.52 (4,73)	5.93 (2,67)	5.50 (2,48)	6.73 (3,03)	N/A	N/A	N/A
	1 1/4–11.5 NPT	10.38 (4,67)	5.76 (2,59)	5.33 (2,40)	6.56 (2,95)	N/A	N/A	N/A
	1 1/2–11.5 NPT	10.23 (4,60)	5.61 (2,52)	5.18 (2,33)	6.41 (2,88)	N/A	N/A	N/A
EN 1092 - 1	Parallel thread: G1/2A DIN 16288	N/A	N/A	N/A	N/A	12.93 (5,82)	7.07 (3,18)	6.64 (3,00)
	Tapered thread: R1/2 per ISO 7/1	N/A	N/A	N/A	N/A	10.67 (4,80)	6.10 (2,75)	5.67 (2,55)

Figure 37. HTS Male Threaded Seal



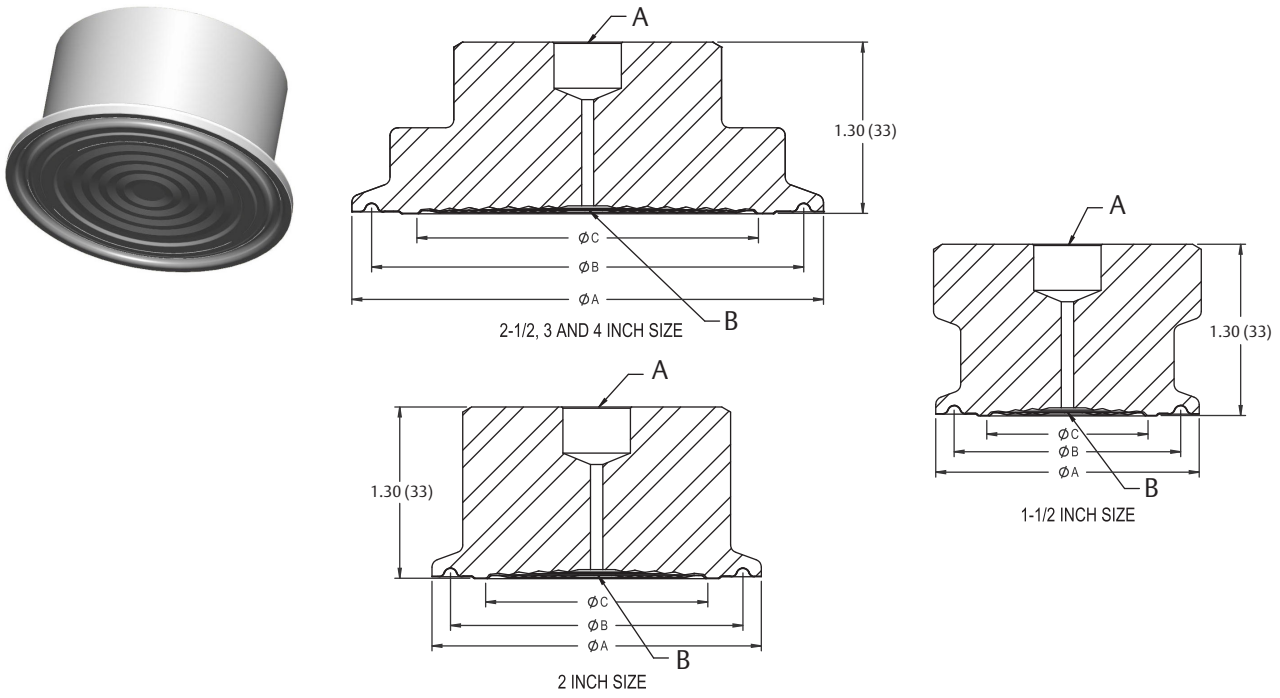
A. Connection to transmitter
B. Diaphragm

Dimensions are in inches (millimeters).

Table 95. HTS Male Threaded Seal Dimensions

Process type	Connection size	Outer diameter "A" in. (mm)	Diaphragm diameter "B" in. (mm)	Length "C" in. (mm)	Overall height "D" in. (mm)	Weight lb (kg)
ANSI NPT	1-in. NPT	2.03 (51,6)	1.09 (27,9)	1.24 (31,5)	2.50 (63,5)	1.60 (0,72)
	1 1/2-in. NPT	2.36 (59,9)	1.70 (43,2)	1.24 (31,5)	2.50 (63,5)	2.32 (1,04)
	2-in. NPT	2.74 (69,6)	1.90 (48,3)	1.24 (31,5)	2.50 (63,5)	3.09 (1,39)
EN 10226 BSP	G1 BSP	2.03 (51,6)	1.09 (27,9)	0.87 (22,0)	2.15 (54,6)	1.48 (0,67)
	G1 1/2 BSP	2.36 (59,9)	1.70 (43,2)	0.98 (24,9)	2.24 (56,9)	2.10 (0,95)
	G2 BSP	2.74 (69,6)	1.90 (48,3)	1.24 (31,5)	2.50 (63,5)	3.06 (1,38)

Figure 38. SCW Tri Clamp Seal



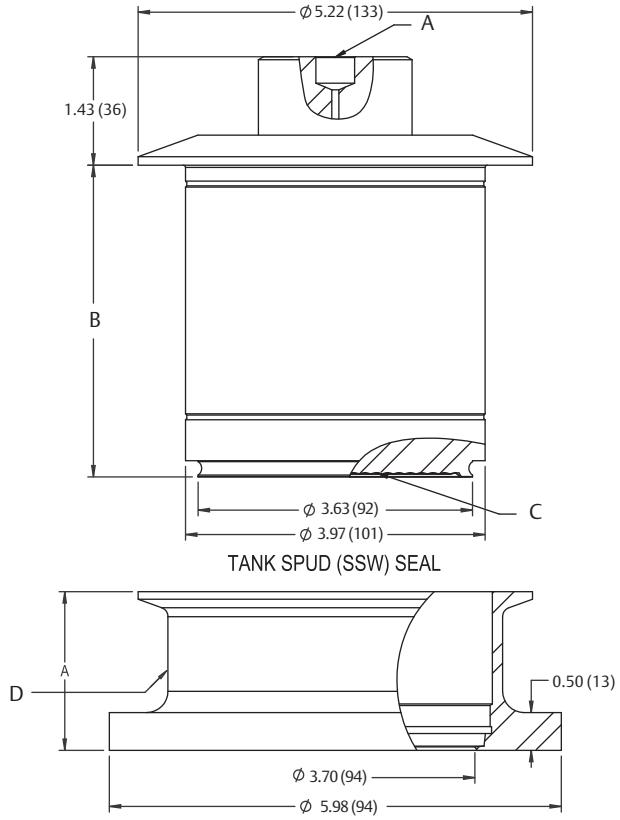
A. Connection to transmitter
B. Diaphragm

Dimensions are in inches (millimeters).

Table 96. SCW Tri Clamp Seal Dimensions

Pipe size	Outer diameter "A" in. (mm)	O-ring groove diameter "B" in. (mm)	Diaphragm diameter "C" in. (mm)	Weight lb (kg)
1 1/2-in.	2.00 (51)	1.72 (44)	1.21 (31)	0.97 (0,44)
2-in.	2.50 (64)	2.22 (56)	1.68 (43)	1.23 (0,55)
2 1/2-in.	3.05 (77)	2.78 (71)	2.07 (53)	1.56 (0,70)
3-in.	3.58 (91)	3.28 (83)	2.58 (66)	1.98 (0,89)
4-in.	4.68 (119)	4.35 (110)	3.66 (93)	3.02 (1,36)

Figure 39. SSW Tank Spud Seal



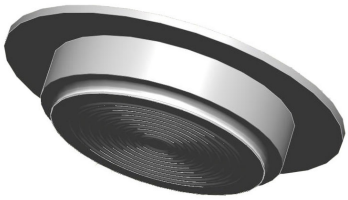
A.Connection to transmitter
B. Extension length
C. Diaphragm
D. Tank spud

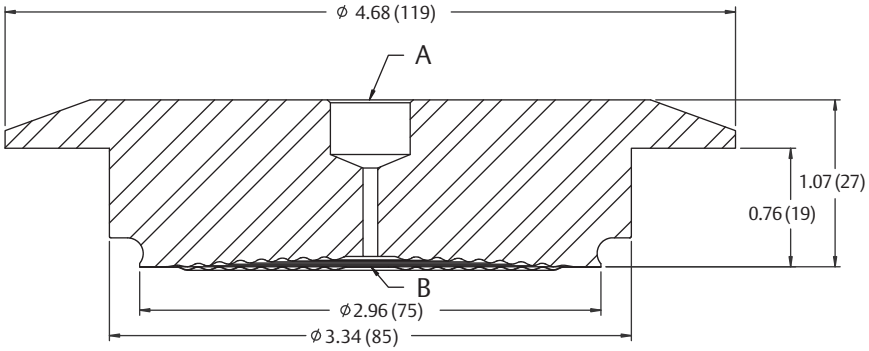
Dimensions are in inches (millimeters).

Table 97. SSW Tank Spud Seal Dimensions

Pipe size	Extension length	"A" in. (mm)	Weight lb (kg)
4-in. SCH 5	2-in.	2.10 (53)	9.20 (4,14)
	6-in.	6.10 (155)	12.66 (5,70)

Figure 40. STW Hygienic Thin Wall Tank Spud Seal



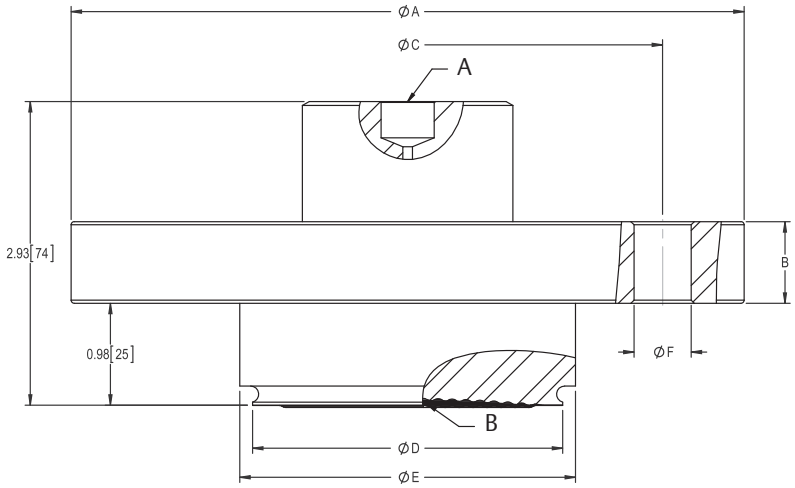


Weight lb (kg): 3.09 (1,39)

A. Connection to transmitter
B. Diaphragm

Dimensions are in inches (millimeters).

Figure 41. EES Hygienic Flanged Tank Spud Extended Seal



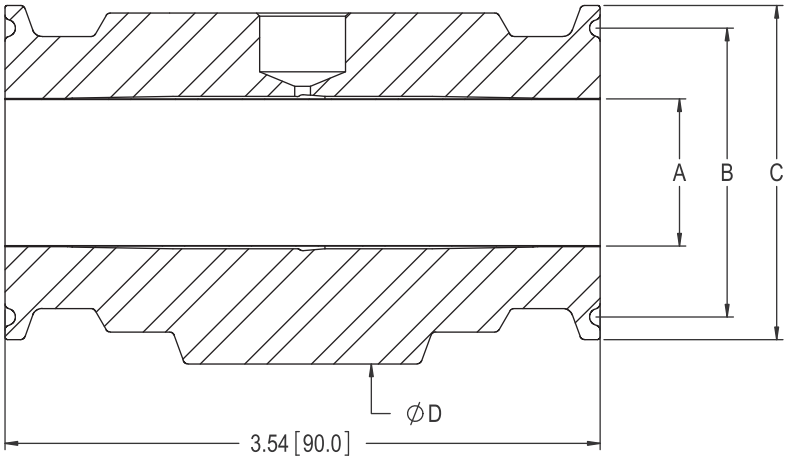
A. Connection to transmitter
B. Diaphragm

Dimensions are in inches (millimeters).

Table 98. EES Hygienic Flanged Tank Spud Extended Seal Dimensions

Pipe size	Flange diameter "A" in. (mm)	Flange thickness "B" in. (mm)	Number of bolts	Bolt circle diameter "C" in. (mm)	Standard diaphragm diameter "D" in. (mm)	Extension diameter "E" in. (mm)	Bolt hole diameter "F" in. (mm)	Weight lb (kg)
DN50	6.50 (165)	0.79 (20)	4	4.92 (125)	2.99 (76)	3.24 (82)	0.55 (14)	10.48 (4,72)
DN80	7.87 (200)	0.94 (24)	8	6.30 (160)	4.04 (102)	4.24 (108)	0.55 (14)	17.34 (7,80)

Figure 42. VCS Tri Clamp In-Line Seal



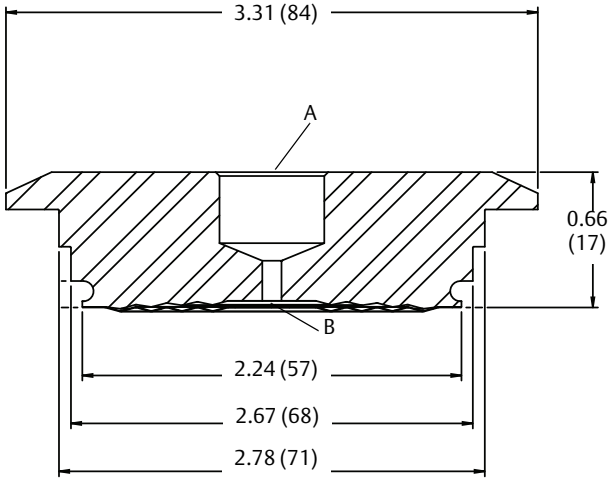
Dimensions are in inches (millimeters).

Table 99. VCS Tri Clamp In-Line Seal Dimensions

Pipe size	Inner diameter "A" in. (mm)	Groove diameter "B" in. (mm)	Flange diameter "C" in. (mm)	Outer diameter "D" in. (mm)	Weight lb (kg)
1-in.	0.87 (22)	1.72 (44)	1.99 (51)	2.33 (59)	2.67 (1,20)
1 1/2-in.	1.37 (35)	1.72 (44)	1.99 (51)	2.73 (69)	2.69 (1,21)
2-in.	1.87 (48)	2.22 (56)	2.52 (64)	3.19 (81)	3.43 (1,54)
3-in.	2.87 (73)	3.28 (83)	3.58 (91)	4.14 (105)	4.76 (2,14)
4-in.	3.82 (97)	4.35 (110)	4.69 (119)	5.06 (129)	6.24 (2,81)

Figure 43. SVS VARIVENT Compatible Connection Seal

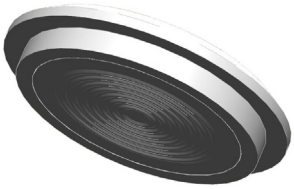
Weight lb (kg): 1.13 (0,51)

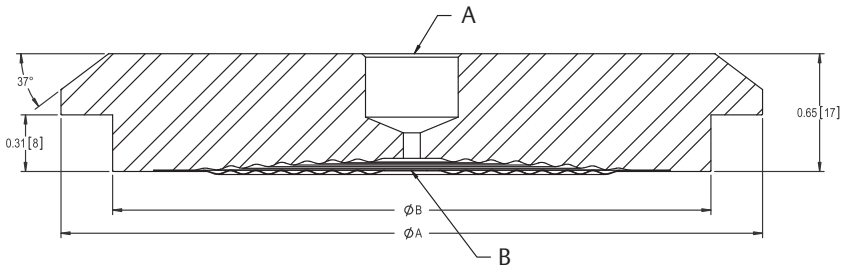


A. Connection to transmitter
b. Diaphragm

Dimensions are in inches (millimeters).

Figure 44. SHP Cherry-Burrell "I" Line Seal





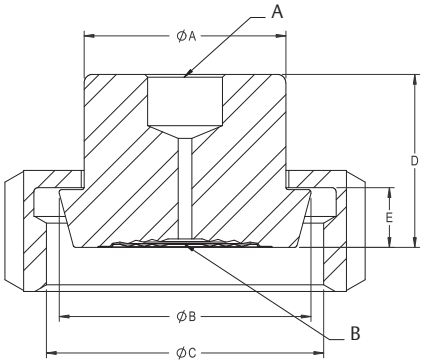
A. Connection to transmitter
B. Diaphragm

Dimensions are in inches (millimeters).

Table 100. SHP Cherry-Burrell "I" Line Seal Dimensions

Size	Outer diameter "A" in. (mm)	Extension diameter "B" in. (mm)	Weight lb (kg)
2-in.	2.64 (67)	2.24 (57)	0.74 (0,33)
3-in.	3.88 (98)	3.31 (84)	1.76 (0,79)

Figure 45. SLS Hygienic Dairy Process Connection Female Thread Seal per DIN 11851



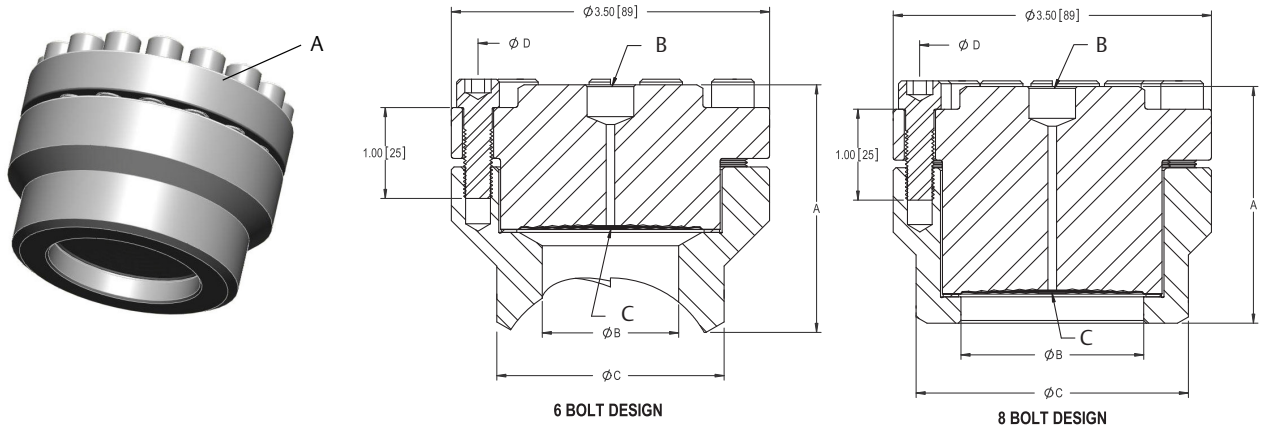
A. Connection to transmitter
B. Diaphragm

Dimensions are in inches (millimeters)

Table 101. SLS Hygienic Dairy Process Connection Female Thread Seal per DIN 11851 Dimensions

Female thread	Process size/ rating	Hub diameter "A" in. (mm)	"B" in. (mm)	Thread diameter "C" in. (mm)	Hub height "D" in. (mm)	"E" in. (mm)	Weight lb (kg)
DIN 11851	DN 40 PN 40	1.89 (48)	2.20 (56)	Rd 65 x 1/6-in.	1.18 (30)	0.39 (10)	1.61 (0,72)
	DN 50 PN 25	2.40 (61)	2.70 (69)	Rd 78 x 1/6-in.	1.22 (31)	0.43 (11)	2.32 (1,04)

Figure 46. WSP Saddle Seal



A. Upper housing
B. Connection to transmitter
C. Diaphragm

Dimensions are in inches (millimeters).

Table 102. WSP Saddle Seal Dimensions

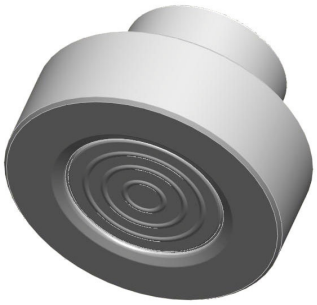
Size	Overall height "A" in. (mm)	Inner diameter "B" in. (mm)	Outer diameter "C" in. (mm)	Bolt circle diameter "D" in. (mm)	
				6-Bolt	8-Bolt
2-in.	2.72 (69)	1.50 (38)	2.50 (64)	2.99 (76)	2.91 (74)
3-in.	2.46 (63)	2.01 (51)	3.02 (77)	2.99 (76)	2.91 (74)
4-in. and larger	2.60 (66)	2.01 (51)	3.00 (76)	2.99 (76)	2.91 (74)

Table 103. WSP Saddle Seal Weights

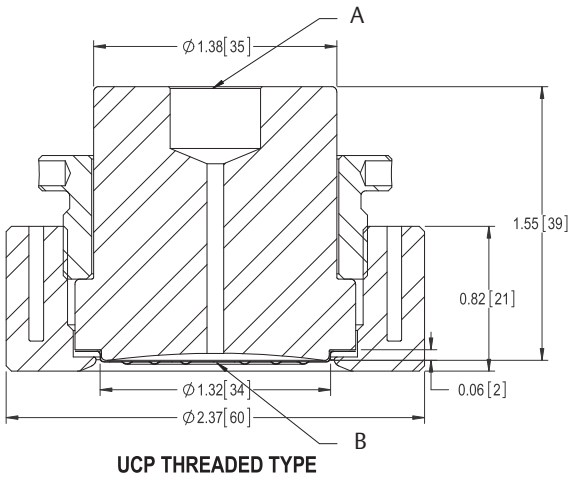
	Pipe size	Class	Weights lb (kg)
ANSI/ASME	2-in.	1250 psig	4.61 (2,09)
		1500 psig	4.63 (2,10)
	3-in.	1250 psig	4.36 (1,98)
		1500 psig	4.38 (1,99)
	4-in.	1250 psig	5.46 (5,48)
		1500 psig	5.60 (2,54)

Figure 47. UCP and PMW Threaded Pipe Mount Seals

UCP

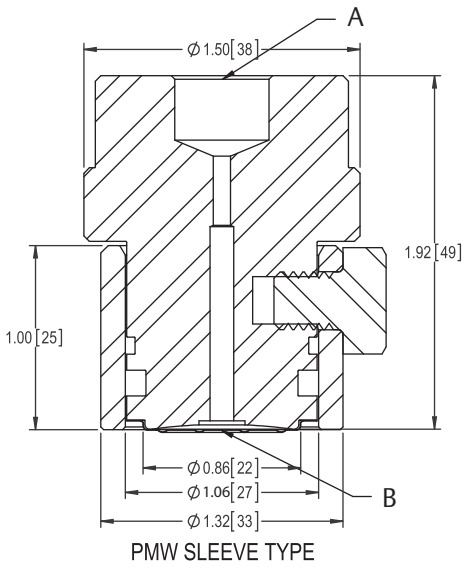


Weights lb (kg): 1.33 (0,60)



PMW

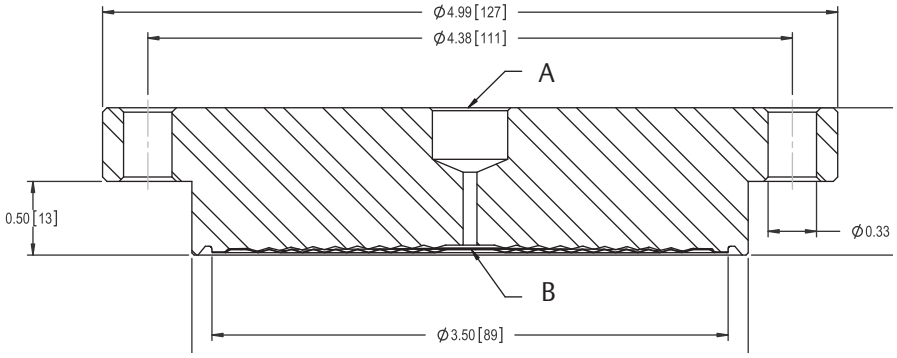
Weight lb (kg): 0.77 (0,35)



A. Connection to transmitter
B. Diaphragm

Dimensions are in inches (millimeters).

Figure 48. CTW Chemical Tee Seal

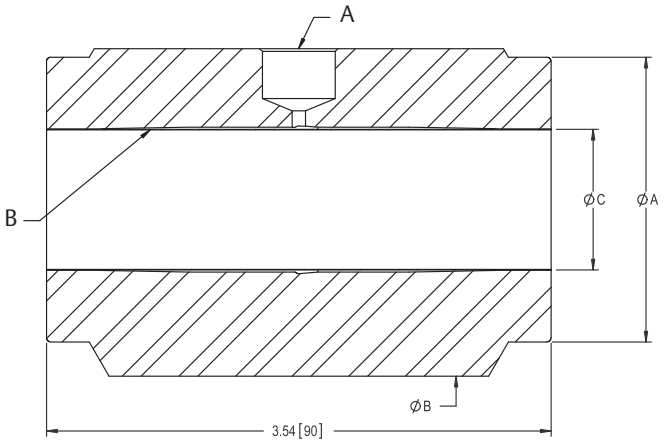


Weight lb (kg): 4.18 (1,88)

A. Connection to transmitter
B. Diaphragm

Dimensions are in inches (millimeters).

Figure 49. TFS Wafer Style In-Line Seal



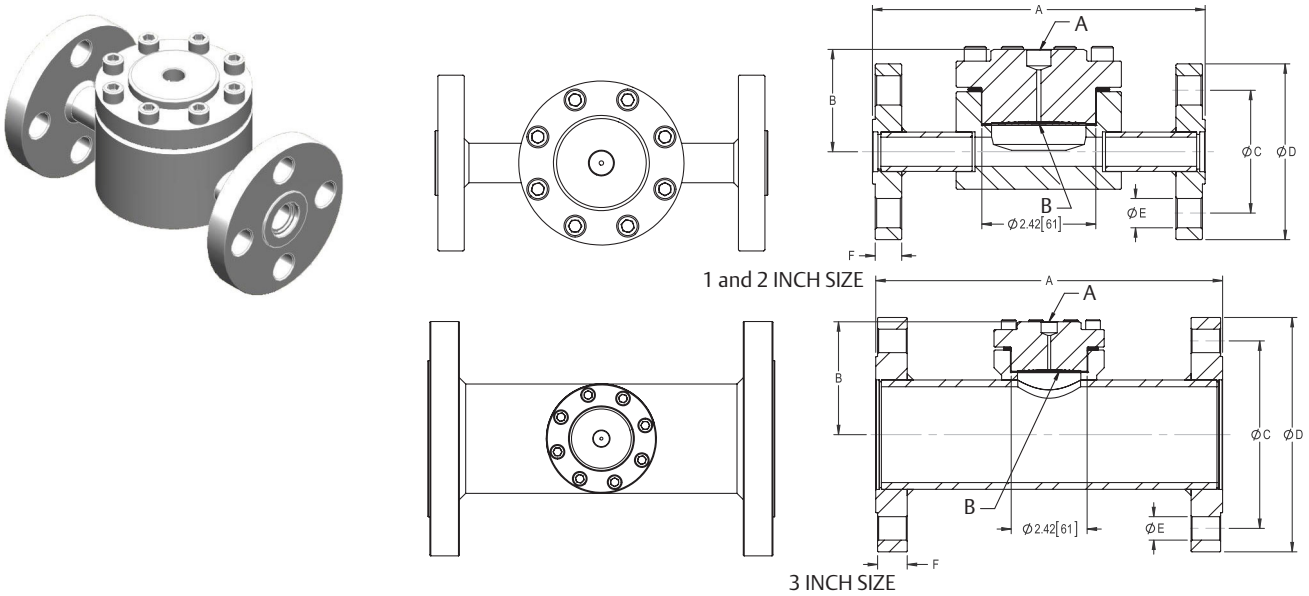
A. Connection to transmitter
B. Diaphragm

Dimensions are in inches (millimeters).

Table 104. TFS Wafer Style In-Line Seal Dimensions

Pipe size	Flange face diameter "A" in. (mm)	Outer diameter "B" in. (mm)	Inner diameter "C" in. (mm)	Weight lb (kg)
1-in.	2.00 (51)	2.64 (67)	1.090 (28)	3.91 (1,76)
1 1/2-in.	2.88 (73)	3.23 (82)	1.61 (41)	5.73 (2,58)
2-in.	3.62 (92)	3.74 (95)	2.07 (52)	7.42 (3,34)
3-in.	5.00 (127)	5.00 (127)	3.07 (78)	12.20 (5,49)
4-in.	6.19 (157)	6.19 (157)	4.00 (102)	17.56 (7,90)
DN25	2.68 (68)	2.72 (69)	1.09 (28)	4.76 (2,14)
DN40	3.46 (88)	3.46 (88)	1.61 (41)	7.35 (3,31)
DN50	4.02 (102)	4.09 (104)	1.99 (51)	9.97 (4,49)
DN80	5.43 (138)	5.47 (139)	3.24 (82)	15.24 (6,86)
DN100	6.38 (162)	6.46 (164)	4.22 (107)	18.69 (8,41)

Figure 50. WFW Flow-Thru Flanged Seal



A. Connection to transmitter
B. Diaphragm

Dimensions are in inches (millimeters).

Table 105. WFW Flow-Thru Flanged Seal Dimensions

Nominal pipe size	ANSI Class	Overall length "A" in. (mm)	Upper to centerline height "B" in. (mm)	Bolt circle diameter "C" in. (mm)	Outside diameter "D" in. (mm)	Bolt hole diameter "E" in. (mm)	Flange thickness "F" in. (mm)	Weight lb (kg)
1-in.	150	7.00 (178)	2.40 (61)	3.12 (79)	4.25 (108)	0.62 (16)	0.50 (13)	11.80 (5,31)
2-in.		9.00 (229)	3.31 (84)	4.75 (121)	6.00 (152)	0.75 (19)	0.69 (18)	23.66 (10,73)
3-in.		11.00 (279)	3.61 (92)	6.00 (152)	7.50 (191)	0.75 (19)	0.88 (22)	29.08 (13,09)

Table 106. Capillary and Support Tube Weights Measured per Foot (.30 m) of Capillary

Part	Weight lb (kg)
0.03-in. ID, SST armor	0.095 (0,043)
0.04-in. ID, SST armor	0.091 (0,041)
0.075-in. ID, SST armor	0.100 (0,045)
0.03-in. ID, PVC armor	0.105 (0,048)
0.04-in. ID, PVC armor	0.100 (0,045)
0.075-in. ID, PVC armor	0.110 (0,050)
Capillary adapter	0.085 (0,039)
2-in. support tube	0.035 (0,016)
4-in. support tube	0.090 (0,041)

Global Headquarters
Emerson Automation Solutions
6021 Innovation Blvd.
Shakopee, MN 55379, USA
+1 800 999 9307 or +1 952 906 8888
+1 952 949 7001
RFQ.RMD-RCC@EmersonProcess.com

North America Regional Office
Emerson Automation Solutions
8200 Market Blvd.
Chanhassen, MN 55317, USA
+1 800 999 9307 or +1 952 906 8888
+1 952 949 7001
RMT-NA.RCCRFQ@Emerson.com

Latin America Regional Office
Emerson Automation Solutions
1300 Concord Terrace, Suite 400
Sunrise, FL 33323, USA
+1 954 846 5030
+1 954 846 5121
RFQ.RMD-RCC@EmersonProcess.com

Europe Regional Office
Emerson Automation Solutions Europe GmbH
Neuhofstrasse 19a P.O. Box 1046
CH 6340 Baar
Switzerland
+41 (0) 41 768 6111
+41 (0) 41 768 6300
RFQ.RMD-RCC@EmersonProcess.com

Asia Pacific Regional Office
Emerson Automation Solutions Asia Pacific Pte Ltd
1 Pandan Crescent
Singapore 128461
+65 6777 8211
+65 6777 0947
Enquiries@AP.EmersonProcess.com

Middle East and Africa Regional Office
Emerson Automation Solutions
Emerson FZE P.O. Box 17033,
Jebel Ali Free Zone - South 2
Dubai, United Arab Emirates
+971 4 8118100
+971 4 8865465
RFQ.RMTMEA@Emerson.com

Linkedin.com/company/Emerson-Automation-Solutions

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