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Rosemount Wireless Products

Pressure

Rosemount 3051S Series of Instrumentation

- World's only Scalable SuperModule® Platform enables best integrated pressure, flow and level solutions
- Increase plant productivity with highest field performance, reliability and safety
- Technology innovation advancements include multivariable, wireless and advanced diagnostics

Rosemount 3051S Scalable MultiVariable™ Mass Flow Transmitter

- Dynamically calculate mass or volumetric, energy and totalized flow
- Real-time compensation for over 25 variables
- Customize application compensation with the Scalable Platform
- Easily configure flow and device parameters with Engineering Assistant™ Software

Rosemount 3051 Pressure Transmitter

- Proven industry standard with over 4 million installations
- Reduce engineering and installed costs with flexible Coplanar design
- Installation ready integral manifolds, flowmeters and level solutions
- Meet your application needs with extensive product offering

Rosemount 2051 Pressure Transmitter

- Differential, gage, absolute, flow or level measurements
- Selection of protocols, wetted materials and fill fluids
- Maximize installation flexibiity with Coplanar Platform

Rosemount 2088 Pressure Transmitter

- Reliable and accurate gage or absolute measurement
- Lightweight, compact design enables easy installation

Rosemount 4600 Oil & Gas Panel Transmitter

- Available for pressure measurements up to 20,000 psi (1380 bar)
- All-welded Stainless Steel design for harsh environments

Rosemount 2090F Hygienic Pressure Transmitter

- Supports CIP/SIP service up to 284 °F (140 °C)
- Design conforms to 3-A Sanitary Standards

Rosemount 2090P Pulp & Paper Pressure Transmitter

- Available process connections include threaded or flush mount PMC
- Features compact size and rugged construction

Rosemount 3095 MultiVariable Mass Flow Transmitter

- Real-time fully-compensated mass flow based on three-in-one differential pressure, inline pressure and temperature measurements
- Improve performance and reduce maintenance costs with Ultra for Flow option
- Complies with ISO, AGA, ASME and API flow measurement standards

Rosemount Pressure Manifolds

- Enable “flangeless” valve integration with flexible Coplanar™ design
- Reduce costs with integral manifolds – factory assembled, leak-tested and calibrated
- Achieve 50% fewer possible leak points than conventional manifold/transmitter assemblies

Rosemount Innovative, Integrated DP Flowmeters

- Fully assembled and leak tested for out-of-the-box installation
- Lower installed costs with one integrated flowmeter
- Reduce straight pipe requirements
- Lower permanent pressure loss
- Achieve accurate measurement in small line sizes

Rosemount Liquid Level Transmitters and 1199 Seal Systems

- Reduce installed cost, improve performance and achieve better response time
- Comprehensive process connection, fill fluid, materials and direct mount or capillary connections offering
- Optimize and quantify total system performance with QZ option
- Operate at higher temperatures and harder vacuums

Pressure Product Selection Chart

Emerson provides a complete Rosemount pressure measurement family. Use the product selection chart below to evaluate and select the best solution for your application. Refer to the Flow Product Selection Chart or Level Product Selection Chart for more detailed product selection considerations.

Table Pressure-1. Pressure Product Selection Chart

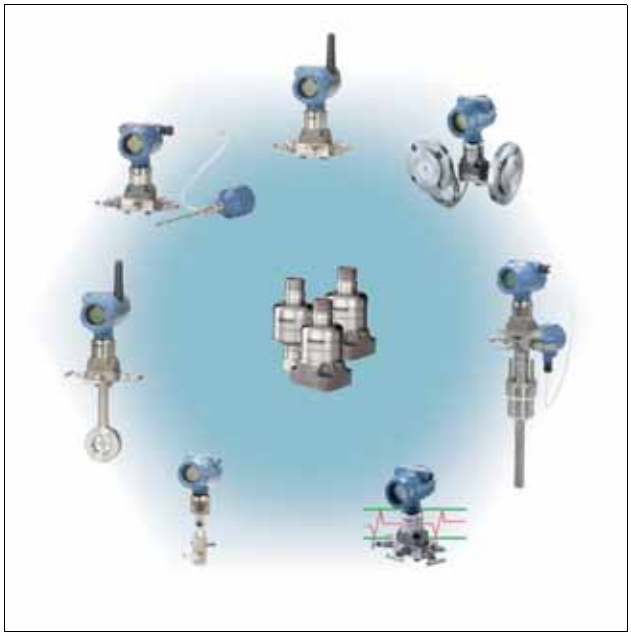
	Product Model	3051S	3051SMV	3051	2051	2088		4600	2090F	2090P	3095
Performance	Accuracy (% of Span)	0.025%	0.04%	0.04%	0.075%	0.075%	Industry Solutions	0.25%	0.2%	0.2%	0.05%
	Stability	10 yr	10 yr	5 yr	2 yr	1 yr		3 yr	1 yr	1yr	10 yr
	Extended Warranty	12 yr	12 yr								12 yr
	Rangedown	200:1	200:1	100:1	100:1	20:1		40:1	20:1	20:1	100:1
	Ultra for Flow (% Reading)	0.04%	0.04%								0.05%
Functionality	Scalable Platform	●	●								
	MultiVariable		●								●
	Mass Flow Calculations		●								●
	Advanced Diagnostics	●									
	Safety Certification	●		●							
	Data Logging										●
Output	HART / 4-20mA	●	●	●	●	●		●	●	●	●
	WirelessHART - Integrated	●									
	FOUNDATION fieldbus	●		●	●						●
	Profibus			●							
	Low Power (1-5V)			●	●	●					
	MODBUS										●
Application Solutions	Manifolds	●	●	●	●	●					●
	Integrated Flowmeters	●	●	●	●						●
	Liquid Level Configuration	●		●	●						
	Remote Seals	●	●	●	●	●					●
	Oil & Gas Panel Transmitter							●			
	Hygienic Connections	●	●	●	●	●			●		
	Pulp & Paper Connections	●	●	●	●	●				●	

Selection Table Key	
●	Recommended
●	Suitable – Requires 1199 remote seal

Product Data Sheet
00813-0100-4801, Rev MA
April 2010

Rosemount 3051S Series of Instrumentation
Scalable Pressure, Flow, and Level Solutions

- *3051S Series delivers highest field performance and reliability*
- *SuperModule® Platform provides a foundation for integrated pressure, flow, and level solutions*
- *WirelessHART™ Protocol enables cost effective installations*
- *MultiVariable™ technology enables fully compensated mass and energy flow*
- *Advanced Diagnostics provides coverage from the process to the host system*
- *Innovative DP Flowmeters integrate a primary element and transmitter into a single device*
- *Tuned-System™ Assemblies and Liquid Level Transmitters provide cost efficient, optimized level measurement*



WirelessHART HART COMMUNICATION PROTOCOL FOUNDATION CE

Contents

Achieve More with Rosemount 3051S Series of Instrumentation

The Foundation for Pressure, Flow, and Level Measurement

- SuperModule® Platform delivers the highest field reliability with all-welded hermetic SST design
- Ultra and Ultra for Flow provide industry leading performance, 10-year stability and a 12-year limited warranty
- Simplify compliance with IEC 61508 safety certification

The World's Only Scalable Platform

- Optimize performance, functionality and process connections for your application
- MultiVariable, Advanced Diagnostics and enhanced FOUNDATION™ fieldbus capabilities enable better plant performance
- Seamless integration of flanges, manifolds, remote mount seals and flow elements

Industry Leading Capabilities Extended To WirelessHART

- Cost effectively implement wireless on the proven SuperModule platform
- Realize a decade of virtually maintenance-free performance
- Optimize safety with the industry's only intrinsically safe Power Module
- Implement wireless using existing tools and practices
- Installation-ready integrated wireless pressure, flow and level solutions

Advanced Diagnostics Provides Coverage from the Process to the Host

- Proactively monitor for loop wiring and power supply issues
- Predict and prevent abnormal process conditions
- Log process characteristics and device health
- Extend diagnostic coverage to Safety Instrumented Systems

Advanced MultiVariable Technology

- Dynamically calculate mass or volumetric, energy, and totalized flow through real time compensation of over 25 variables
- Customize the level of compensation with the scalable platform
- Easily configure flow and device parameters with Engineering Assistant™ software.
- Achieve up to ±0.65% flow accuracy over a 14:1 flow turndown

Innovative, Integrated DP Flowmeters

- Fully assembled and leak tested for out-of-the-box installation
- Lower installed costs by replacing 10 devices with one integrated flowmeter
- Reduce straight pipe requirements, lower permanent pressure loss and achieve accurate measurement in small line sizes
- Measure up to 14:1 flow turndown with % of reading performance

Proven, Reliable, and Innovative DP Level Technologies

- 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
- Operate at higher temperature and in vacuum applications
- Optimize level measurement with cost efficient Tuned-System Assemblies

Instrument Manifolds – Quality, Convenient, and Easy

- Designed and engineered for optimal performance with Rosemount transmitters
- Save installation time and money with factory assembled manifolds
- Offers a variety of styles, materials, and configurations
- Enable “flange-less” valve integration with Coplanar™ design

Rosemount 3051S Scalable Coplanar Pressure Transmitter

3051S Scalable Coplanar Pressure Transmitter

Rosemount 3051S Scalable Coplanar Pressure transmitters are the industry leader for Differential, Gage, and Absolute pressure measurement. The coplanar platform allows seamless integration with manifolds, primary elements and seal solutions. Capabilities include:

- Ultra, Ultra for Flow, and Classic Performance
- HART/4-20 mA, WirelessHART, FOUNDATION fieldbus protocols
- Safety Certification (Option Code QT)
- Advanced Diagnostics (Option Code DA2)
- Remote Display and Interface (Option Code M7, M8, or M9))

Additional Information
Specifications: page 50
Certifications: page 68
Dimensional Drawings: page 78

Table 1. Rosemount 3051S Scalable Coplanar Pressure 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**			
3051S	Scalable Pressure Transmitter			
Performance Class				
Standard				**Standard**
1	Ultra: 0.025 percent span accuracy, 200:1 rangedown, 10-yr stability, 12-yr limited warranty			★
3[(1)]	Ultra for Flow: 0.04 percent reading accuracy, 200:1 turndown, 10-yr stability, 12-yr ltd warranty			★
2	Classic: 0.055 percent span accuracy, 100:1 rangedown, 5-yr stability			★
Connection Type				
Standard				**Standard**
C	Coplanar			★
Measurement Type[(2)]				
Standard				**Standard**
D	Differential			★
G	Gage			★
Expanded				
A	Absolute			
Pressure Range				
	Differential	**Gage**	**Absolute**	
Standard				**Standard**
1A	-25 to 25 inH_2O (-62,2 to 62,2 mbar)	-25 to 25 inH_2O (-62,2 to 62,2 mbar)	0 to 30 psia (0 to 2,06 bar)	★
2A	-250 to 250 inH_2O (-623 to 623 mbar)	-250 to 250 inH_2O (-623 to 623 mbar)	0 to 150 psia (0 to 10,34 bar)	★
3A	-1000 to 1000 inH_2O (-2,5 to 2,5 bar)	-393 to 1000 inH_2O (-0,98 to 2,5 bar)	0 to 800 psia (0 to 55,2 bar)	★
4A	-300 to 300 psi (-20,7 to 20,7 bar)	-14.2 to 300 psig (-0,98 to 21 bar)	0 to 4000 psia (0 to 275,8 bar)	★
5A	-2000 to 2000 psi (-137,9 to 137,9 bar)	-14.2 to 2000 psig (-0,98 to 137,9 bar)	N/A	★
Expanded				
0A[(3)]	-3 to 3 inH_2O (-7,47 to 7,47 mbar)	N/A	0 to 5 psia (0 to 0,34 bar)	
Isolating Diaphragm				
Standard				**Standard**
2[(4)]	316L SST			★
3[(4)]	Alloy C-276			★
Expanded				
4	Alloy 400			
5[(5)]	Tantalum			
6	Gold-Plated Alloy 400 (includes Graphite-Filled PTFE o-ring)			
7	Gold-plated 316L SST			

Table 1. Rosemount 3051S Scalable Coplanar Pressure 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	Materials of Construction			
			Flange Material	Drain Vent	Bolting	
Standard						**Standard**
000	None					★
A11[6]	Assemble to Rosemount 305 Integral Manifold					★
A12[6]	Assemble to Rosemount 304 or AMF Manifold and SST traditional flange					★
B11[6][7][8]	Assemble to one Rosemount 1199 Seal					★
B12[6][7][8]	Assemble to two Rosemount 1199 Seals					★
C11[6]	Assemble to Rosemount 405 Primary Element					★
D11[6]	Assemble to Rosemount 1195 integral orifice and Rosemount 305 Integral Manifold					★
EA2[6]	Assemble to Rosemount Annubar® Primary Element with Coplanar flange		SST	316 SST		★
EA3[6]	Assemble to Rosemount Annubar Primary Element with Coplanar flange		Cast C-276	Alloy C-276		★
EA5[6]	Assemble to Rosemount Annubar Primary Element with Coplanar flange		SST	Alloy C-276		★
E11	Coplanar flange	1/4–18 NPT	CS	316 SST		★
E12	Coplanar flange	1/4–18 NPT	SST	316 SST		★
E13[4]	Coplanar flange	1/4–18 NPT	Cast C-276	Alloy C-276		★
E14	Coplanar flange	1/4–18 NPT	Cast Alloy 400	Alloy 400/K-500		★
E15[4]	Coplanar flange	1/4–18 NPT	SST	Alloy C-276		★
E16[4]	Coplanar flange	1/4–18 NPT	CS	Alloy C-276		★
E21	Coplanar flange	RC 1/4	CS	316 SST		★
E22	Coplanar flange	RC 1/4	SST	316 SST		★
E23[4]	Coplanar flange	RC 1/4	Cast C-276	Alloy C-276		★
E24	Coplanar flange	RC 1/4	Cast Alloy 400	Alloy 400/K-500		★
E25[4]	Coplanar flange	RC 1/4	SST	Alloy C-276		★
E26[4]	Coplanar flange	RC 1/4	CS	Alloy C-276		★
F12	Traditional flange	1/4–18 NPT	SST	316 SST		★
F13[4]	Traditional flange	1/4–18 NPT	Cast C-276	Alloy C-276		★
F14	Traditional flange	1/4–18 NPT	Cast Alloy 400	Alloy 400/K-500		★
F15[4]	Traditional flange	1/4–18 NPT	SST	Alloy C-276		★
F22	Traditional flange	RC 1/4	SST	316 SST		★
F23[4]	Traditional flange	RC 1/4	Cast C-276	Alloy C-276		★
F24	Traditional flange	RC 1/4	Cast Alloy 400	Alloy 400/K-500		★
F25[4]	Traditional flange	RC 1/4	SST	Alloy C-276		★
F52	DIN-compliant traditional flange	1/4–18 NPT	SST	316 SST	7/16-in. bolting	★
G11	Vertical mount level flange	2-in. ANSI class 150	SST	316 SST		★
G12	Vertical mount level flange	2-in. ANSI class 300	SST	316 SST		★
G21	Vertical mount level flange	3-in. ANSI class 150	SST	316 SST		★
G22	Vertical mount level flange	3-in. ANSI class 300	SST	316 SST		★
G31	Vertical mount level flange	DIN- DN 50 PN 40	SST	316 SST		★
G41	Vertical mount level flange	DIN- DN 80 PN 40	SST	316 SST		★
Expanded						
F32	Bottom vent traditional flange	1/4–18 NPT	SST	316 SST		
F42	Bottom vent traditional flange	RC 1/4	SST	316 SST		
F62	DIN-compliant traditional flange	1/4–18 NPT	SST	316 SST	M10 bolting	
F72	DIN-compliant traditional flange	1/4–18 NPT	SST	316 SST	M12 bolting	
Transmitter Output						
Standard						**Standard**
A	4–20 mA with digital signal based on HART® protocol					★
F[9]	FOUNDATION™ fieldbus protocol					★
X[10]	Wireless (Requires wireless options and wireless PlantWeb housing)					★

Table 1. Rosemount 3051S Scalable Coplanar Pressure 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 Style		**Material**	**Conduit Entry Size**	
Standard				**Standard**
00	None (SuperModule spare part, order output code A)			★
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	★
5A	Wireless PlantWeb housing	Aluminum	1/2–14 NPT	★
5J	Wireless PlantWeb housing	SST	1/2–14 NPT	★
2A	Junction Box housing	Aluminum	1/2–14 NPT	★
2B	Junction Box housing	Aluminum	M20 x 1.5	★
2J	Junction Box housing	SST	1/2–14 NPT	★
2E	Junction Box Housing with output for remote display and interface	Aluminum	1/2–14 NPT	★
2F	Junction Box Housing with output for remote display and interface	Aluminum	M20 x 1.5	★
2M	Junction Box Housing with output for remote display and interface	SST	1/2–14 NPT	★
7J[11]	Quick Connect (A size Mini, 4-pin male termination)	SST		★
Expanded				
1C	PlantWeb housing	Aluminum	G1/2	
1L	PlantWeb housing	SST	G1/2	
2C	Junction Box housing	Aluminum	G1/2	
2G	Junction Box Housing with output for remote display and interface	Aluminum	G1/2	

Wireless Options (Requires option code X and wireless PlantWeb housing)

Update Rate		
Standard		**Standard**
WA	User Configurable Update Rate	★
Operating Frequency and Protocol		
Standard		**Standard**
3	2.4 GHz DSSS, WirelessHART	★
Omnidirectional Wireless Antenna		
Standard		**Standard**
WK	Long Range, Integral Antenna	★
WM	Extended Range, Integral Antenna	★
SmartPower™		
Standard		**Standard**
1[12]	Power Module Adapter, Intrinsically Safe (Power Module separate)	★

Other Options (Include with selected model number)

PlantWeb Control Functionality		
Standard		**Standard**
A01[13]	FOUNDATION fieldbus Advanced Control Function Block Suite	★
PlantWeb Diagnostic Functionality		
Standard		**Standard**
D01[13]	FOUNDATION fieldbus Diagnostics Suite	★
DA2[13][14]	Advanced HART Diagnostics Suite	★
PlantWeb Enhanced Measurement Functionality		
Standard		**Standard**
H01[13][15]	FOUNDATION fieldbus Fully Compensated Mass Flow Block	★
Mounting Bracket[16]		
Standard		**Standard**
B4	Coplanar flange bracket, all SST, 2-in. pipe and panel	★
B1	Traditional flange bracket, CS, 2-in. pipe	★
B2	Traditional flange bracket, CS, panel	★
B3	Traditional flange flat bracket, CS, 2-in. pipe	★
B7	Traditional flange bracket, B1 with SST bolts	★
B8	Traditional flange bracket, B2 with SST bolts	★
B9	Traditional flange bracket, B3 with SST bolts	★

Table 1. Rosemount 3051S Scalable Coplanar Pressure 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.

BA	Traditional flange bracket, B1, all SST	★
BC	Traditional flange bracket, B3, all SST	★
Software Configuration		
Standard		**Standard**
C1[17]	Custom software configuration (Requires Configuration Data Sheet)	★
C2	Custom flow configuration (Requires H01 and Configuration Data Sheet)	★
Gage Pressure Calibration		
Standard		**Standard**
C3	Gage pressure calibration on Rosemount 3051S_CA4 only	★
Alarm Limit		
Standard		**Standard**
C4[13][17]	NAMUR alarm and saturation levels, high alarm	★
C5[13][17]	NAMUR alarm and saturation levels, low alarm	★
C6[13][17]	Custom alarm and saturation signal levels, high alarm (Requires C1 and Configuration Data Sheet)	★
C7[13][17]	Custom alarm and saturation signal levels, low alarm (Requires C1 and Configuration Data Sheet)	★
C8[13][17]	Low alarm (standard Rosemount alarm and saturation levels)	★
Hardware Adjustments		
Standard		**Standard**
D1[13][17][18]	Hardware adjustments (zero, span, alarm, security)	★
Flange Adapter		
Standard		**Standard**
D2[16]	1/2-14 NPT flange adapter	★
Expanded		
D9[16]	RC1/2 SST flange adapter	
Custody Transfer		
Standard		**Standard**
D3[19]	Measurement Canada Accuracy Approval	★
Ground Screw		
Standard		**Standard**
D4	External ground screw assembly	★
Drain/Vent Valve		
Standard		**Standard**
D5[16]	Delete transmitter drain/vent valves (install plugs)	★
Expanded		
D7[16]	Coplanar flange without drain/vent ports	
Conduit Plug		
Standard		**Standard**
DO[20]	316 SST Conduit Plug	★
Product Certifications[21]		
Standard		**Standard**
E1	ATEX Flameproof	★
I1	ATEX Intrinsic Safety	★
IA	ATEX FISCO Intrinsic Safety (FOUNDATION™ fieldbus protocol only)	★
N1	ATEX Type n	★
K1	ATEX Flameproof, Intrinsic Safety, Type n, Dust	★
ND	ATEX Dust	★
E4	TIIS Flameproof	★
I4[22]	TIIS Intrinsic Safety	★
E5	FM Explosion-proof, Dust Ignition-proof	★
I5	FM Intrinsically Safe, Division 2	★
IE	FM FISCO Intrinsically Safe (FOUNDATION™ fieldbus protocol only)	★
K5	FM Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
E6[23]	CSA Explosion-proof, Dust Ignition-proof, Division 2	★
I6	CSA Intrinsically Safe	★
IF	CSA FISCO Intrinsically Safe (FOUNDATION™ fieldbus protocol only)	★
K6[23]	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
E7	IECEx Flameproof, Dust Ignition-proof	★
I7	IECEx Intrinsic Safety	★

Table 1. Rosemount 3051S Scalable Coplanar Pressure 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.

IG	IECEx FISCO Intrinsic Safety (FOUNDATION™ fieldbus protocol only)	★
N7	IECEx Type n	★
K7	IECEx Flameproof, Dust Ignition-proof, Intrinsic Safety, Type n	★
E2	INMETRO Flameproof	★
I2	INMETRO Intrinsic Safety	★
K2	INMETRO Flameproof, Intrinsic Safety	★
E3	China Flameproof	★
I3	China Intrinsic Safety	★
KA[23]	ATEX and CSA Flameproof, Intrinsically Safe, Division 2	★
KB[23]	FM and CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
KC	FM and ATEX Explosion-proof, Intrinsically Safe, Division 2	★
KD[23]	FM, CSA, and ATEX Explosion-proof, Intrinsically Safe	★
Sensor Fill Fluid		
Standard		**Standard**
L1[24]	Inert sensor fill fluid	★
O-ring		
Standard		**Standard**
L2	Graphite-filled PTFE o-ring	★
Bolting Material		
Standard		**Standard**
L4[16]	Austenitic 316 SST bolts	★
L5[4][16]	ASTM A 193, Grade B7M bolts	★
L6[16]	Alloy K-500 bolts	★
L7[4][16]	ASTM A453, Class D, Grade 660 bolts	★
L8[16]	ASTM A193, Class 2, Grade B8M bolts	★
Display Type[25]		
Standard		**Standard**
M5	PlantWeb LCD Display	★
M7[13][26][27]	Remote mount LCD display and interface, PlantWeb housing, no cable, SST bracket	★
M8[13][26]	Remote mount LCD display and interface, PlantWeb housing, 50 ft. (15 m) cable, SST bracket	★
M9[13][26]	Remote mount LCD display and interface, PlantWeb housing, 100 ft. (31 m) cable, SST bracket	★
Pressure Testing		
Expanded		
P1[28]	Hydrostatic testing with certificate	
Special Cleaning		
Expanded		
P2[16]	Cleaning for special services	
P3[16]	Cleaning for less than 1PPM chlorine/fluorine	
Maximum Static Line Pressure		
Standard		**Standard**
P9	4500 psig (310 bar) static pressure limit (Rosemount 3051S_CD only)	★
P0[29]	6092 psig (420 bar) static pressure limit (Rosemount 3051S2CD only)	★
Calibration Certification		
Standard		**Standard**
Q4	Calibration certificate	★
QP	Calibration certificate and tamper evident seal	★
Material Traceability Certification		
Standard		**Standard**
Q8	Material traceability certification per EN 10204 3.1	★
Quality Certification for Safety		
Standard		**Standard**
QS[13][17]	Prior-use certificate of FMEDA Data	★
QT[30]	Safety-certified to IEC 61508 with certificate of FMEDA data	★
Transient Protection		
Standard		**Standard**
T1[31][32]	Transient terminal block	★

Table 1. Rosemount 3051S Scalable Coplanar Pressure Transmitter Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.
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Drinking Water Approval		
Standard		**Standard**
DW(33)	NSF Drinking Water Approval	★
Surface Finish Certification		
Standard		**Standard**
Q16	Surface finish certification for sanitary remote seals	★
Toolkit Total System Performance Reports		
Standard		**Standard**
QZ	Remote Seal System Performance Calculation Report	★
Conduit Electrical Connector		
Standard		**Standard**
GE(34)	M12, 4-pin, Male Connector (eurofast®)	★
GM(34)	A size Mini, 4-pin, Male Connector (minifast®)	★
Typical Model Number: 3051S1CD 2A 2 E12 A 1A DA2 B4 M5		

(1) This option is only available with range codes 2A and 3A, 316L SST or Alloy C-276 isolating diaphragm and silicone fill fluid.

(2) Performance Class code 3 is available with Measurement Type code D only.

(3) 3051S_CD0 is only available with traditional flange, 316L SST diaphragm material, and Bolting option L4.

(4) 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.

(5) Tantalum diaphragm material is only available for ranges 2A - 5A, differential and gage.

(6) "Assemble to" items are specified separately and require a completed model number. Process connection option codes B12, C11, D11, EA2, EA3, and EA5 are only available on differential Measurement Type, code D.

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

(8) Not available with performance class code 3.

(9) Requires PlantWeb housing.

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

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

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

(13) Not available with output code X.

(14) Requires PlantWeb housing and output code A. Includes Hardware Adjustments as standard.

(15) Requires Rosemount Engineering Assistant to configure.

(16) Not available with process connection option code A11.

(17) Not available with output code F.

(18) Not available with housing style codes 00, 2E, 2F, 2G, 2M, 5A, 5J, or 7J.

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

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

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

(22) Only available with output code X.

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

(24) Only available on differential and gage measurement types. Silicone fill fluid is standard.

(25) Not available with Housing code 7J.

(26) Not available with output code F, option code DA2, or option code QT.

(27) See the 3051S Reference Manual (document number 00809-0100-4801) for cable requirements. Contact an Emerson Process Management representative for additional information.

(28) P1 is not available with 3051S_CA0.

(29) Requires 316L SST, Alloy C-276, or Gold-plated 316L SST diaphragm material, assemble to Rosemount 305 integral manifold or DIN-compliant traditional flange process connection, and bolting option L8. Limited to Pressure Range (Differential), ranges 2A – 5A.

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

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

(32) 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.

(33) Requires 316L SST diaphragm material, glass-filled PTFE O-ring (standard), and Process Connection code E12 or F12.

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

Rosemount 3051S Scalable In-Line Pressure Transmitter

3051S Scalable In-Line Pressure Transmitter

Rosemount 3051S Scalable In-line Pressure transmitters are the industry leader for Gage and Absolute pressure measurement. The in-line, compact design allows the transmitter to be connected directly to a process for quick, easy and cost effective installation. Capabilities include:

- Ultra and Classic Performance
- HART/4-20 mA, WirelessHART, FOUNDATION fieldbus protocols
- Safety Certification (Option Code QT)
- Advanced Diagnostics (Option Code DA2)
- Remote Display and Interface (Option Code M7, M8, or M9)

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Table 2. Rosemount 3051S Scalable In-Line Pressure 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**		
3051S	Scalable Pressure Transmitter		
Performance Class			
Standard			**Standard**
1	Ultra: 0.025 percent span accuracy, 200:1 rangedown, 10-yr stability, 12-yr limited warranty		★
2	Classic: 0.055 percent span accuracy, 100:1 rangedown, 5-yr stability		★
Connection Type			
Standard			**Standard**
T	In-Line		★
Measurement Type			
Standard			**Standard**
G	Gage		★
A	Absolute		★
Pressure Range			
	Gage	**Absolute**	
Standard			**Standard**
1A	-14.7 to 30 psi (-1,0 to 2,1 bar)	0 to 30 psia (2,1 bar)	★
2A	-14.7 to 150 psi (-1,0 to 10,3 bar)	0 to 150 psia (10,3 bar)	★
3A	-14.7 to 800 psi (-1,0 to 55 bar)	0 to 800 psia (55 bar)	★
4A	-14.7 to 4000 psi (-1,0 to 276 bar)	0 to 4000 psia (276 bar)	★
5A	-14.7 to 10000 psi (-1,0 to 689 bar)	0 to 10000 psia (689 bar)	★
Isolating Diaphragm			
Standard			**Standard**
2[(1)]	316L SST		★
3[(1)]	Alloy C-276		★
Process Connection			
Standard			**Standard**
A11[(2)]	Assemble to Rosemount 306 Integral Manifold		★
B11[(2)(3)]	Assemble to one Rosemount 1199 Seal		★
E11	1/2–14 NPT female		★
G11	G1/2 A DIN 16288 male (Range 1-4 only)		★
Expanded			
F11	Non-threaded instrument flange (I-flange) (Range 1-4 only)		

Table 2. Rosemount 3051S Scalable In-Line Pressure 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 Output				
Standard				**Standard**
A	4–20 mA with digital signal based on HART® protocol			★
F[4]	FOUNDATION™ fieldbus protocol			★
X[5]	Wireless (Requires wireless options and wireless PlantWeb housing)			★
Housing Style		**Material**	**Conduit Entry Size**	
Standard				**Standard**
00	None (SuperModule spare part, order output code A)			★
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	★
5A	Wireless PlantWeb housing	Aluminum	1/2–14 NPT	★
5J	Wireless PlantWeb housing	SST	1/2–14 NPT	★
2A	Junction Box housing	Aluminum	1/2–14 NPT	★
2B	Junction Box housing	Aluminum	M20 x 1.5	★
2J	Junction Box housing	SST	1/2–14 NPT	★
2E	Junction Box Housing with output for remote display and interface	Aluminum	1/2–14 NPT	★
2F	Junction Box Housing with output for remote display and interface	Aluminum	M20 x 1.5	★
2M	Junction Box Housing with output for remote display and interface	SST	1/2–14 NPT	★
7J[6]	Quick Connect (A size Mini, 4-pin male termination)	SST		★
Expanded				
1C	PlantWeb housing	Aluminum	G1/2	
1L	PlantWeb housing	SST	G1/2	
2C	Junction Box housing	Aluminum	G1/2	
2G	Junction Box Housing with output for remote display and interface	Aluminum	G1/2	

Wireless Options (Requires option code X and wireless PlantWeb housing)

Update Rate		
Standard		**Standard**
WA	User Configurable Update Rate	★
Operating Frequency and Protocol		
Standard		**Standard**
3	2.4 GHz DSSS, WirelessHART™	★
Omnidirectional Wireless Antenna		
Standard		**Standard**
WK	Long Range, Integral Antenna	★
WM	Extended Range, Integral Antenna	★
SmartPower™		
Standard		**Standard**
1[7]	Power Module Adapter, Intrinsically Safe (Power Module separate)	★

Other Options (Include with selected model number)

PlantWeb Control Functionality		
Standard		**Standard**
A01[8]	FOUNDATION™ fieldbus Advanced Control Function Block Suite	★
PlantWeb Diagnostic Functionality		
Standard		**Standard**
D01[8]	FOUNDATION™ fieldbus Diagnostics Suite	★
DA2[8][9]	Advanced HART® Diagnostics Suite	★
Mounting Bracket[10]		
Standard		**Standard**
B4	Bracket, all SST, 2-in. pipe and panel	★
Software Configuration		
Standard		**Standard**
C1[11]	Custom software configuration (Requires Configuration Data Sheet)	★

Table 2. Rosemount 3051S Scalable In-Line Pressure Transmitter Ordering Information

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

Alarm Limit		
Standard		**Standard**
C4[8][11]	NAMUR alarm and saturation levels, high alarm	★
C5[8][11]	NAMUR alarm and saturation levels, low alarm	★
C6[8][11]	Custom alarm and saturation signal levels, high alarm (Requires C1 and Configuration Data Sheet)	★
C7[8][11]	Custom alarm and saturation signal levels, low alarm (Requires C1 and Configuration Data Sheet)	★
C8[8][11]	Low alarm (standard Rosemount alarm and saturation levels)	★
Hardware Adjustments		
Standard		**Standard**
D1[8][11][12]	Hardware adjustments (zero, span, alarm, security)	★
Custody Transfer		
Standard		**Standard**
D3[13]	Measurement Canada Accuracy Approval	★
Ground Screw		
Standard		**Standard**
D4	External ground screw assembly	★
Conduit Plug		
Standard		**Standard**
DO[14]	316 SST Conduit Plug	★
Product Certifications[15]		
Standard		**Standard**
E1	ATEX Flameproof	★
I1	ATEX Intrinsic Safety	★
IA	ATEX FISCO Intrinsic Safety (FOUNDATION™ fieldbus protocol only)	★
N1	ATEX Type n	★
K1	ATEX Flameproof, Intrinsic Safety, Type n, Dust	★
ND	ATEX Dust	★
E4	TIIS Flameproof	★
I4[16]	TIIS Intrinsic Safety	★
E5	FM Explosion-proof, Dust Ignition-proof	★
I5	FM Intrinsically Safe, Division 2	★
IE	FM FISCO Intrinsically Safe (FOUNDATION™ fieldbus protocol only)	★
K5	FM Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
E6[17]	CSA Explosion-proof, Dust Ignition-proof, Division 2	★
I6	CSA Intrinsically Safe	★
IF	CSA FISCO Intrinsically Safe (FOUNDATION™ fieldbus protocol only)	★
K6[17]	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
E7	IECEx Flameproof, Dust Ignition-proof	★
I7	IECEx Intrinsic Safety	★
IG	IECEx FISCO Intrinsic Safety (FOUNDATION™ fieldbus protocol only)	★
N7	IECEx Type n	★
K7	IECEx Flameproof, Dust Ignition-proof, Intrinsic Safety, Type n	★
E2	INMETRO Flameproof	★
I2	INMETRO Intrinsic Safety	★
K2	INMETRO Flameproof, Intrinsic Safety	★
E3	China Flameproof	★
I3	China Intrinsic Safety	★
KA[17]	ATEX and CSA Flameproof, Intrinsically Safe, Division 2	★
KB[17]	FM and CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
KC	FM and ATEX Explosion-proof, Intrinsically Safe, Division 2	★
KD[17]	FM, CSA, and ATEX Explosion-proof, Intrinsically Safe	★
Sensor Fill Fluid		
Standard		**Standard**
L1[18]	Inert sensor fill fluid	★

Table 2. Rosemount 3051S Scalable In-Line Pressure 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.

Display Type(19)		
Standard		**Standard**
M5	PlantWeb LCD Display	★
M7(8)(20)(21)	Remote mount LCD display and interface, PlantWeb housing, no cable, SST bracket	★
M8(8)(20)	Remote mount LCD display and interface, PlantWeb housing, 50 ft. (15 m) cable, SST bracket	★
M9(8)(20)	Remote mount LCD display and interface, PlantWeb housing, 100 ft. (31 m) cable, SST bracket	★
Pressure Testing		
Expanded		
P1	Hydrostatic testing with certificate	
Special Cleaning		
Expanded		
P2(10)	Cleaning for special services	
P3(10)	Cleaning for less than 1PPM chlorine/fluorine	
Calibration Certification		
Standard		**Standard**
Q4	Calibration certificate	★
QP	Calibration certificate and tamper evident seal	★
Material Traceability Certification		
Standard		**Standard**
Q8	Material traceability certification per EN 10204 3.1	★
Quality Certification for Safety		
Standard		**Standard**
QS(8)(11)	Prior-use certificate of FMEDA Data	★
QT(22)	Safety-certified to IEC 61508 with certificate of FMEDA data	★
Transient Protection		
Standard		**Standard**
T1(23)(24)	Transient terminal block	★
Drinking Water Approval		
Standard		**Standard**
DW(25)	NSF Drinking Water Approval	★
Surface Finish Certification		
Standard		**Standard**
Q16	Surface finish certification for sanitary remote seals	★
Toolkit Total System Performance Reports		
Standard		**Standard**
QZ	Remote Seal System Performance Calculation Report	★
Conduit Electrical Connector		
Standard		**Standard**
GE(26)	M12, 4-pin, Male Connector (eurofast®)	★
GM(25)	A size Mini, 4-pin, Male Connector (minifast®)	★
Typical Model Number: 3051S1TG 2A 2 E11 A 1A DA2 B4 M5		

(1) 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.

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

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

(4) Requires PlantWeb housing.

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

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

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

(8) Not available with output code X.

(9) Requires PlantWeb housing and output code A. Includes Hardware Adjustments as standard.

(10) Not available with process connection option code A11.

(11) Not available with output code F.

(12) Not available with housing style codes 00, 01, 2E, 2F, 2G, 2M, 5A, 5J, or 7J.

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

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

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

(16) Only available with output code X.

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

(18) Silicone fill fluid is standard.

(19) Not available with Housing code 7J.

(20) Not available with output code F, option code DA2, or option code QT.

(21) See the 3051S Reference Manual (document number 00809-0100-4801) for cable requirements. Contact an Emerson Process Management representative for additional information.

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

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

(24) 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.

(25) Requires 316L SST diaphragm material and Process Connection code E11 or G11.

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

Rosemount 3051S Scalable MultiVariable Transmitter

3051S Scalable MultiVariable Transmitter

The Rosemount 3051S Scalable MultiVariable Transmitter delivers unprecedented performance and capabilities by providing superior flow calculations including fully compensated mass or volume, energy, and totalized flow. Specify the level of compensation that best matches the application:

- Gas, natural gas, and steam measurement: Utilize full compensation (differential pressure, line pressure, and temperature measurement)
- Saturated steam: Utilize differential and line pressure, or differential pressure and temperature measurement
- Liquids: Utilize differential pressure and temperature measurement
- Liquids at stable temperatures: Utilize differential pressure measurement

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Table 3. Rosemount 3051S Scalable MultiVariable 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	
3051SMV	Scalable MultiVariable Transmitter	
Performance Class		
Standard		**Standard**
3051SMV MultiVariable SuperModule, Measurement Types 1 and 2		
3(1)	Ultra for Flow: 0.04% reading DP accuracy, 200:1 rangedown,10-year stability, 12-year limited warranty	★
5	Classic MV: 0.04% span DP accuracy, 100:1 rangedown, 5-year stability	★
3051SMV Single Variable SuperModule, Measurement Types 3 and 4		
1(2)	Ultra: 0.025% span DP accuracy, 200:1 rangedown, 10-year stability, 12-year limited warranty	★
2	Classic: 0.055% span DP accuracy, 100:1 rangedown, 5-year stability	★
3(1)	Ultra for Flow: 0.04% reading DP accuracy, 200:1 rangedown,10-year stability, 12-year limited warranty	★
MultiVariable Type		
Standard		**Standard**
M	MultiVariable Measurement with Fully Compensated Mass and Energy Flow	★
P	MultiVariable Measurement with Direct Process Variable Output	★
Measurement Type		
Standard		**Standard**
1	Differential Pressure, Static Pressure, and Temperature	★
2	Differential Pressure and Static Pressure	★
3	Differential Pressure and Temperature	★
4	Differential Pressure	★
Differential Pressure Range		
Standard		**Standard**
0(2)(3)	-3 to 3 inH_2O (-7,47 to 7,47 mbar)	★
1	-25 to 25 inH_2O (-62,2 to 62,2 mbar)	★
2	-250 to 250 inH_2O (-623 to 623 mbar)	★
3	-1000 to 1000 inH_2O (-2,5 to 2,5 bar)	★
4(2)	-300 to 300 psi (-20,7 to 20,7 bar)	★
5(2)	-2000 to 2000 psi (-137,9 to 137,9 bar)	★

Table 3. Rosemount 3051S Scalable MultiVariable 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.

Static Pressure Type						
Standard						**Standard**
N[4]	None					★
A	Absolute					★
G	Gage					★
Static Pressure Range		**Absolute**	**Gage**			
Standard						**Standard**
N[4]	None					★
3	Range 3	0.5 to 800 psia (0,03 to 55,2 bar)	-14.2 to 800 psig (-0,98 to 55,2 bar)			★
4[5]	Range 4	0.5 to 3626 psia (0,03 to 250 bar)	-14.2 to 3626 psig (-0,98 to 250 bar)			★
Temperature Input						
Standard						**Standard**
N[6]	None					★
R[7]	RTD Input (Type Pt 100, -328 to 1562 °F (-200 to 850 °C))					★
Isolating Diaphragm						
Standard						**Standard**
2[8]	316L SST					★
3[8]	Alloy C-276					★
Expanded						
5[9]	Tantalum					
7	Gold-Plated 316L SST					
Process Connection		**Size**	**Material Type**			
			Flange Material	**Drain Vent**	**Bolting**	
Standard						**Standard**
000	None					★
A11[10]	Assemble to Rosemount 305/306 Integral Manifold					★
A12[10]	Assemble to Rosemount 304 or AMF Manifold with SST Traditional Flange					★
B11[10][11]	Assemble to one Rosemount 1199 Seal					★
B12[10][11]	Assemble to two Rosemount 1199 Seals					★
C11[10]	Assemble to Rosemount 405 Primary Element					★
D11[10]	Assemble to Rosemount 1195 Integral Orifice and Rosemount 305 Integral Manifold					★
EA2[10]	Assemble to Rosemount Annubar Primary Element with Coplanar flange		SST	316 SST		★
EA3[10]	Assemble to Rosemount Annubar Primary Element with Coplanar flange		Cast C-276	Alloy C-276		★
EA5[10]	Assemble to Rosemount Annubar Primary Element with Coplanar flange		SST	Alloy C-276		★
E11	Coplanar flange	1/4–18 NPT	Carbon Steel	316 SST		★
E12	Coplanar flange	1/4–18 NPT	SST	316 SST		★
E13[8]	Coplanar flange	1/4–18 NPT	Cast C-276	Alloy C-276		★
E14	Coplanar flange	1/4–18 NPT	Cast Alloy 400	Alloy 400/K-500		★
E15[8]	Coplanar flange	1/4–18 NPT	SST	Alloy C-276		★
E16[8]	Coplanar flange	1/4–18 NPT	Carbon Steel	Alloy *C-276*		★
E21	Coplanar flange	RC 1/4	Carbon Steel	316 SST		★
E22	Coplanar flange	RC 1/4	SST	316 SST		★
E23[8]	Coplanar flange	RC 1/4	Cast C-276	Alloy C-276		★
E24	Coplanar flange	RC 1/4	Cast Alloy 400	Alloy 400/K-500		★
E25[8]	Coplanar flange	RC 1/4	SST	Alloy C-276		★
E26[8]	Coplanar flange	RC 1/4	Carbon Steel	Alloy C-276		★

Table 3. Rosemount 3051S Scalable MultiVariable 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.

F12	Traditional flange	1/4–18 NPT	SST	316 SST		★
F13(8)	Traditional flange	1/4–18 NPT	Cast C-276	Alloy C-276		★
F14	Traditional flange	1/4–18 NPT	Cast Alloy 400	Alloy 400/K-500		★
F15(8)	Traditional flange	1/4–18 NPT	SST	Alloy C-276		★
F22	Traditional flange	RC 1/4	SST	316 SST		★
F23(8)	Traditional flange	RC 1/4	Cast C-276	Alloy C-276		★
F24	Traditional flange	RC 1/4	Cast Alloy 400	Alloy 400/K-500		★
F25(8)	Traditional flange	RC 1/4	SST	Alloy C-276		★
F52	DIN-compliant traditional flange	1/4–18 NPT	SST	316 SST	7/16-in. bolting	★
G11	Vertical mount level flange	2-in. ANSI class 150	SST			★
G12	Vertical mount level flange	2-in. ANSI class 300	SST			★
G14(8)	Vertical mount level flange	2-in. ANSI class 150	Cast C-276			★
G15(8)	Vertical mount level flange	2-in. ANSI class 300	Cast C-276			★
G21	Vertical mount level flange	3-in. ANSI class 150	SST			★
G22	Vertical mount level flange	3-in. ANSI class 300	SST			★
G31	Vertical mount level flange	DIN- DN 50 PN 40	SST			★
Expanded						
EB6	Assemble to Primary Element with Manifold and Coplanar Flange, CS, Alloy C-276					
F32	Bottom vent traditional flange	1/4–18 NPT	SST	316 SST		
F42	Bottom vent traditional flange	RC 1/4	SST	316 SST		
F62	DIN-compliant traditional flange	1/4–18 NPT	SST	316 SST	M10 bolting	
F72	DIN-compliant traditional flange	1/4–18 NPT	SST	316 SST	M12 bolting	
G41	Vertical mount level flange	DIN- DN 80 PN 40	SST			
Transmitter Output						
Standard						**Standard**
A	4–20 mA with digital signal based on HART protocol					★
Housing Style			**Material**	**Conduit Entry Size**		
Standard						**Standard**
1A	PlantWeb housing		Aluminum	1/2–14 NPT		★
1B	PlantWeb housing		Aluminum	M20 x 1.5		★
1J	PlantWeb housing		SST	1/2–14 NPT		★
1K	PlantWeb housing		SST	M20 x 1.5		★
Expanded						
1C	PlantWeb housing		Aluminum	G1/2		
1L	PlantWeb housing		SST	G1/2		

Options (Include with selected model number)

RTD Cable (RTD Sensor must be ordered separately)		
Standard		**Standard**
C12	RTD Input with 12 ft. (3.66 m) of Shielded Cable	★
C13	RTD Input with 24 ft. (7.32 m) of Shielded Cable	★
C14	RTD Input with 75 ft. (22.86 m) of Shielded Cable	★
C20(12)	RTD Input with 27 in. (69 cm) of Armored Shielded Cable	★
C21	RTD Input with 4 ft. (1.22 m) of Armored Shielded Cable	★
C22	RTD Input with 12 ft. (3.66 m) of Armored Shielded Cable	★
C23	RTD Input with 24 ft. (7.32 m) of Armored Shielded Cable	★
C24	RTD Input with 75 ft. (22.86 m) of Armored Shielded Cable	★
C30(12)	RTD Input with 25 in. (64 cm) of ATEX/IECEx Flameproof Cable	★
C32	RTD Input with 12 ft. (3.66 m) of ATEX/IECEx Flameproof Cable	★
C33	RTD Input with 24 ft. (7.32 m) of ATEX/IECEx Flameproof Cable	★
C34	RTD Input with 75 ft. (22.86 m) of ATEX/IECEx Flameproof Cable	★
C40(12)	RTD Input with 34 in. (86.36 cm) Shielded Cable and 24 in. (60.96 cm) FM Approved Coupling Flex	★
C41(12)	RTD Input with 40 in. (101.60 cm) Shielded Cable and 30 in. (76.20 cm) FM Approved Coupling Flex	★

Table 3. Rosemount 3051S Scalable MultiVariable 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 Brackets[13]		
Standard		**Standard**
B4	Coplanar flange bracket, all SST, 2-in. pipe and panel	★
B1	Traditional flange bracket, Carbon Steel, 2-in. pipe	★
B2	Traditional flange bracket, Carbon Steel, panel	★
B3	Traditional flange flat bracket, Carbon Steel, 2-in. pipe	★
B7	Traditional flange bracket, B1 with SST bolts	★
B8	Traditional flange bracket, B2 with SST bolts	★
B9	Traditional flange bracket, B3 with SST bolts	★
BA	Traditional flange bracket, B1, all SST	★
BC	Traditional flange bracket, B3, all SST	★
Software Configuration		
Standard		**Standard**
C1	Custom software configuration *Note: A Configuration Data Sheet must be completed, see document number 00806-0100-4803.*	★
C2	Custom flow configuration *Note: A Custom Fluid Data Sheet must be completed, see document number 00806-0200-4803.*	★
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	★
C7	Custom alarm and saturation signal levels, low alarm	★
C8	Low alarm (standard Rosemount alarm and saturation levels)	★
Special Configuration		
Standard		**Standard**
D2[13]	1/2-14 NPT flange adapter	★
D4	External ground screw assembly	★
D5[13]	Delete transmitter drain/vent valves (install plugs)	★
Expanded		
D9[13]	RC 1/2 SST flange adapter	
D3	Measurement Canada Accuracy Approval	
D7[13]	Coplanar flange without drain/vent ports	
Product Certifications		
Standard		**Standard**
E1	ATEX Flameproof	★
I1	ATEX Intrinsic Safety	★
N1	ATEX Type n	★
ND	ATEX Dust	★
K1	ATEX Flameproof, Intrinsic Safety, Type n, Dust (combination of E1, I1, N1, and ND)	★
E4	TIIS Flameproof	★
K4	TIIS Flameproof and Intrinsic Safety (combination E4 and I4)	★
E5	FM Explosion-proof, Dust Ignition-proof	★
I5	FM Intrinsically Safe, Division 2	★
K5	FM Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E5 and I5)	★
E6[14]	CSA Explosion-proof, Dust Ignition-proof, Division 2	★
I6	CSA Intrinsically Safe	★
K6[14]	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E6 and I6)	★
E7	IECEx Flameproof, Dust Ignition-proof	★
I7	IECEx Intrinsic Safety	★
N7	IECEx Type n	★
K7	IECEx Flameproof, Dust Ignition-proof, Intrinsic Safety, and Type n (combination of E7, I7, and N7)	★
E2	INMETRO Flameproof	★
I2	INMETRO Intrinsic Safety	★
E3	China Flameproof	★
I3	China Intrinsic Safety	★

Table 3. Rosemount 3051S Scalable MultiVariable 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.

KA[14][15]	ATEX and CSA Explosion-proof, Intrinsically Safe, Division 2 (combination of E1, E6, I1, and I6)	★
KB[14][15]	FM and CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E5, E6, I5, and I6)	★
KC	FM and ATEX Explosion-proof, Intrinsically Safe, Division 2 (combination of E5, E1, I5, and I1)	★
KD[14][15]	FM, CSA, and ATEX Explosion-proof, Intrinsically Safe (combination of E5, E6, E1, I5, I6, and I1)	★
DW[16]	NSF Drinking Water Certification	★
Alternate Materials of Construction		
Standard		**Standard**
L1	Inert sensor fill fluid (Differential and Gage sensors only) *Note: Silicone fill fluid is standard.*	★
L2	Graphite-filled PTFE O-ring	★
L4[13]	Austenitic 316 SST bolts	★
L5[8][13]	ASTM A193, Grade B7M bolts	★
L6[13]	Alloy K-500 bolts	★
L7[8][13]	ASTM A453, Class D, Grade 660 bolts	★
L8[13]	ASTM A193, Class 2, Grade B8M bolts	★
Digital Display		
Standard		**Standard**
M5	PlantWeb LCD Display	★
Special Procedures		
Standard		**Standard**
P1[17]	Hydrostatic testing with certificate	★
P9[2]	4500 psig (310 bar) static pressure limit	★
P0[2][18]	6092 psig (420 bar) static pressure limit	★
Expanded		
P2[13]	Cleaning for special services	
P3[13]	Cleaning for less than 1PPM chlorine/fluorine	
Special Certifications		
Standard		**Standard**
Q4	Calibration Certificate	★
QG	Calibration Certificate and GOST Verification Certificate	★
QP	Calibration Certificate and Tamper Evident Seal	★
Q8	Material Traceability Certification per EN 10204 3.1	★
Q16	Surface Finish Certification for Sanitary Remote Seals	★
QZ	Remote Seal System Performance Calculation Report	★
Transient Protection		
Standard		**Standard**
T1	Transient terminal block	★
Conduit Electrical Connector		
Standard		**Standard**
GE[19]	M12, 4-pin, Male Connector (eurofast®)	★
GM[19]	A size Mini, 4-pin, Male Connector (minifast®)	★
Cold Temperature		
Standard		**Standard**
BRR	-60 °F (-51 °C) Cold Temperature Start-up	★
Typical Model Number: 3051SMV 3 M 1 2 G 4 R 2 E12 A 1A B4 C2 M5		

(1) Only available with DP range codes 2 and 3, 316L SST or Alloy C-276 isolating diaphragm and silicone fill fluid.

(2) Only available with Measurement Type codes 3 and 4.

(3) DP Range 0 is only available with traditional flange, 316L SST diaphragm material, and Bolting option L4.

(4) Required for Measurement Type codes 3 and 4.

(5) For Measurement Type 1 and 2 with DP range 1. Absolute limits are 0.5 to 2000 psi (0,03 to 137,9 bar) and gage limits are -14.2 to 2000 psig (-0,98 to 137,9 bar).

(6) Required for Measurement Type codes 2 and 4.

(7) Required for Measurement Type codes 1 and 3. RTD Sensor must be ordered separately.

(8) 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.

(9) Tantalum diaphragm material is only available for DP ranges 2-5.

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

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

(12) For use with Flowmeters with integral RTDs.

(13) Not available with process connection option code A11.

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

(15) RTD cable not available with this option.

(16) Requires 316L SST diaphragm material, glass-filled PTFE O-ring (standard), and Process Connection code E12 or F12.

(17) Not available with DP range 0.

(18) Requires 316L SST or Alloy C-276 diaphragm material, assemble to Rosemount 305 Integral Manifold or DIN-compliant traditional flange process connection, and bolting option L8. Limited to differential pressure ranges 2-5.

(19) Available with Intrinsically Safe approvals only. For FM Intrinsically Safe, Non-Incendive approval (option code I5), install in accordance with Rosemount drawing 03151-1009 to maintain outdoor rating (NEMA 4X and IP66).

Rosemount 3051SF DP Flowmeters

Rosemount 3051SF Flowmeters integrate industry leading transmitters with industry leading primary elements. Capabilities include:

- Flowmeters are factory configured to meet your application needs (Configuration Data Sheet required)
- MultiVariable capabilities allow scalable flow compensation (Measurement Types 1-7)
- HART 4-20, WirelessHART, and FOUNDATION fieldbus protocols
- Ultra for Flow for improved flow performance across wider flow ranges
- Integral temperature measurement (T option)
- Direct or remote mount configurations available

Additional Information
Specifications: page 50
Dimensional Drawings: page 83.

Rosemount 3051SFA Annubar Flowmeter

- Annubar flowmeters reduce permanent pressure loss by creating less blockage in the pipe
- Ideal for large line size installations when cost, size and weight of the flowmeter are concerns

Table 4. Rosemount 3051SFA Annubar Flowmeter 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	Measurement Type		• = Available — = Unavailable
		D	1-7	
3051SFA	Annubar Flowmeter	•	•	
Measurement Type				
Standard				**Standard**
1	MultiVariable (Fully Compensated Mass & Energy Flow) – Differential & Static Pressures w/ Temperature	—	•	★
2	MultiVariable (Compensated Flow) – Differential & Static Pressures	—	•	★
3	MultiVariable (Compensated Flow) – Differential Pressure & Temperature	—	•	★
4	MultiVariable (Compensated Flow) – Differential Pressure	—	•	★
5	MultiVariable (Direct Measurement) – Differential & Static Pressures with Temperature	—	•	★
6	MultiVariable (Direct Measurement) – Differential & Static Pressures	—	•	★
7	MultiVariable (Direct Measurement) – Differential Pressure & Temperature	—	•	★
D	Differential Pressure	•	—	★
Fluid Type				
Standard				**Standard**
L	Liquid	•	•	★
G	Gas	•	•	★
S	Steam	•	•	★

Table 4. Rosemount 3051SFA Annubar Flowmeter Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.
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Line Size		**D**	**1-7**	
Standard				**Standard**
020	2-in. (50 mm)	•	•	★
025	2 1/2-in. (63.5 mm)	•	•	★
030	3-in. (80 mm)	•	•	★
035	3 1/2-in. (89 mm)	•	•	★
040	4-in. (100 mm)	•	•	★
050	5-in. (125 mm)	•	•	★
060	6-in. (150 mm)	•	•	★
070	7-in. (175 mm)	•	•	★
080	8-in. (200 mm)	•	•	★
100	10-in. (250 mm)	•	•	★
120	12-in. (300 mm)	•	•	★
Expanded				
140	14-in. (350 mm)	•	•	
160	16-in. (400 mm)	•	•	
180	18-in. (450 mm)	•	•	
200	20-in. (500 mm)	•	•	
240	24-in. (600 mm)	•	•	
300	30-in. (750 mm)	•	•	
360	36-in. (900 mm)	•	•	
420	42-in. (1066 mm)	•	•	
480	48-in. (1210 mm)	•	•	
600	60-in. (1520 mm)	•	•	
720	72-in. (1820 mm)	•	•	
780	78-in (1950 mm)	•	•	
840	84-in. (2100 mm)	•	•	
900	90-in. (2250 mm)	•	•	
960	96-in (2400 mm)	•	•	
Pipe I.D. Range				
Standard				**Standard**
C	Range C from the Pipe I.D. table	•	•	★
D	Range D from the Pipe I.D. table	•	•	★
Expanded				
A	Range A from the Pipe I.D. table	•	•	
B	Range B from the Pipe I.D. table	•	•	
E	Range E from the Pipe I.D. table	•	•	
Z	Non-standard Pipe I.D. Range or Line Sizes greater than 12-in. (300 mm)	•	•	
Pipe Material / Mounting Assembly Material				
Standard				**Standard**
C	Carbon steel (A105)	•	•	★
S	316 Stainless Steel	•	•	★
0(1)	No Mounting (Customer Supplied)	•	•	★
Expanded				
G	Chrome-Moly Grade F-11	•	•	
N	Chrome-Moly Grade F-22	•	•	
J	Chrome-Moly Grade F-91	•	•	
Piping Orientation				
Standard				**Standard**
H	Horizontal Piping	•	•	★
D	Vertical Piping with Downwards Flow	•	•	★
U	Vertical Piping with Upwards Flow	•	•	★

Table 4. Rosemount 3051SFA Annubar Flowmeter Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.
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Annubar Type				**D**	**1-7**	
Standard						**Standard**
P	Pak-Lok			•	•	★
F	Flanged with opposite side support			•	•	★
Expanded						
L	Flange-Lok			•	•	
G	Gear-Drive Flo-Tap			•	•	
M	Manual Flo-Tap			•	•	
Sensor Material						
Standard						**Standard**
S	316 Stainless Steel			•	•	★
Expanded						
H	Alloy C-276			•	•	
Sensor Size						
Standard						**Standard**
1	Sensor size 1 — Line sizes 2-in. (50 mm) to 8-in. (200 mm)			•	•	★
2	Sensor size 2 — Line sizes 6-in. (150 mm) to 96-in. (2400 mm)			•	•	★
3	Sensor size 3 — Line sizes greater than 12-in. (300 mm)			•	•	★
Mounting Type						
Standard						**Standard**
T1	Compression or Threaded Connection			•	•	★
A1	150# RF ANSI			•	•	★
A3	300# RF ANSI			•	•	★
A6	600# RF ANSI			•	•	★
D1	DN PN16 Flange			•	•	★
D3	DN PN40 Flange			•	•	★
D6	DN PN100 Flange			•	•	★
Expanded						
A9[(2)]	900# RF ANSI			•	•	
AF[(2)]	1500# RF ANSI			•	•	
AT[(2)]	2500 # RF ANSI			•	•	
R1	150# RTJ Flange			•	•	
R3	300# RTJ Flange			•	•	
R6	600# RTJ Flange			•	•	
R9[(2)]	900# RTJ Flange			•	•	
RF[(2)]	1500# RTJ Flange			•	•	
RT[(2)]	2500# RTJ Flange			•	•	
Opposite Side Support or Packing Gland						
Standard						**Standard**
0	No opposite side support or packing gland (Required for Pak-Lok and Flange-Lok models)			•	•	★
	Opposite Side Support – Required for Flanged Models					
C	NPT Threaded Opposite Support Assembly – Extended Tip			•	•	★
D	Welded Opposite Support Assembly – Extended Tip			•	•	★
Expanded						
	Packing Gland – Required for Flo-Tap Models					
	Packing Gland Material	*Rod Material*	*Packing Material*			
J	Stainless Steel Packing Gland / Cage Nipple	Carbon Steel	PTFE	•	•	
K	Stainless Steel Packing Gland / Cage Nipple	Stainless Steel	PTFE	•	•	
L	Stainless Steel Packing Gland / Cage Nipple	Carbon Steel	Graphite	•	•	
N	Stainless Steel Packing Gland / Cage Nipple	Stainless Steel	Graphite	•	•	
R	Alloy C-276 Packing Gland / Cage Nipple	Stainless Steel	Graphite	•	•	

Table 4. Rosemount 3051SFA Annubar Flowmeter Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.
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Isolation Valve for Flo-Tap Models				**D**	**1-7**	
Standard						**Standard**
0[1]	Not Applicable or Customer Supplied			•	•	★
Expanded						
1	Gate Valve, Carbon Steel			•	•	
2	Gate Valve, Stainless Steel			•	•	
5	Ball Valve, Carbon Steel			•	•	
6	Ball Valve, Stainless Steel			•	•	
Temperature Measurement						
Standard						**Standard**
T[3]	Integral RTD – not available with Flanged model greater than class 600#			•	•	★
0[4]	No Temperature Sensor			•	•	★
Expanded						
R[3]	Remote Thermowell and RTD			•	•	
Transmitter Connection Platform						
Standard						**Standard**
3	Direct-mount, Integral 3-valve Manifold– not available with Flanged model greater than class 600			•	•	★
5	Direct -mount, 5-valve Manifold – not available with Flanged model greater than class 600			•	•	★
7	Remote-mount NPT Connections ($^1/_2$-in. FNPT)			•	•	★
Expanded						
6	Direct-mount, High Temperature 5-valve Manifold – not available with Flanged model greater than class 600			•	•	
8	Remote-mount SW Connections ($^1/_2$-in.)			•	•	
Differential Pressure Range						
Standard						**Standard**
1	0 to 25 in H_2O (0 to 62,3 mbar)			•	•	★
2	0 to 250 in H_2O (0 to 623 mbar)			•	•	★
3	0 to 1000 in H_2O (0 to 2,5 bar)			•	•	★
Static Pressure Range						
Standard						**Standard**
A[5]	None			•	•	★
D	Absolute 0.5 to 800 psia (0,033 to 55,2 bar)			—	•	★
E[6]	Absolute 0.5 to 3626 psia (0,033 to 250 bar)			—	•	★
J	Gage -14.2 to 800 psig (-0,979 to 55,2 bar)			—	•	★
K[6]	Gage -14.2 to 3626 psig (-0,979 to 250 bar)			—	•	★
Transmitter Output						
Standard						**Standard**
A	4–20 mA with digital signal based on HART protocol			•	•	★
F	FOUNDATION fieldbus protocol (requires PlantWeb housing)			•	—	★
X[7]	Wireless (Requires wireless options and Wireless Plantweb housing)			•	—	★
Transmitter Housing Style		**Material**	**Conduit Entry Size**			
Standard						**Standard**
00	None (Customer-supplied electrical connection)			•	—	★
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 housing with output for remote display and interface	Aluminum	$^1/_2$-14 NPT	•	—	★

Table 4. Rosemount 3051SFA Annubar Flowmeter Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.
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2F	Junction Box housing with output for remote display and interface	Aluminum	M20 x 1.5	•	—	★
2J	Junction Box Housing	SST	1/2-14 NPT	•	—	★
2M	Junction Box housing with output for remote display and interface	SST	1/2-14 NPT	•	—	★
5A	Wireless PlantWeb housing	Aluminum	1/2-14 NPT	•	—	★
5J	Wireless PlantWeb housing	SST	1/2-14 NPT	•	—	★
7J[7][8]	Quick Connect (A size Mini, 4-pin male termination)			•	—	★
Expanded						
1C	PlantWeb Housing	Aluminum	G1/2	•	•	
1L	PlantWeb Housing	SST	G1/2	•	•	
2C	Junction Box Housing	Aluminum	G1/2	•	—	
2G	Junction Box housing with output for remote display and interface	Aluminum	G1/2	•	—	
Transmitter Performance Class				**D**	**1-7**	
Standard						**Standard**
3051S MultiVariable SuperModule, Measurement Types 1, 2, 5, and 6						
3	Ultra for Flow: 0.8% flow rate accuracy, 14:1 flow turndown, 10-year stability. limited 12-year warranty			•	•	★
5	Classic MV: 0.85% flow rate accuracy, 8:1 flow turndown, 5-yr. stability			—	•	★
3051S Single Variable SuperModule, Measurement Types 3, 4, 7, and D						
1	Ultra: up to 0.9% flow rate accuracy, 8:1 flow turndown, 10-year stability, limited 12-year warranty			•	—	★
2	Classic: up to 1.1% flow rate accuracy, 8:1 flow turndown, 5-year stability			•	—	★
3[9]	Ultra for Flow: 0.8% flow rate accuracy, 14:1 flow turndown, 10-year stability. limited 12-year warranty			•	•	★

Wireless Options (Requires option code X and wireless PlantWeb housing)

Update Rate, Operating Frequency and Protocol				
Standard				**Standard**
WA	User Configurable Update Rate	•	—	★
Operating Frequency and Protocol				
Standard				
3	2.4 GHz DSSS, WirelessHART	•	—	★
Omnidirectional Wireless Antenna				
Standard				
WK[10]	Long Range, Integral Antenna	•	—	★
SmartPower™				
Standard				
1[11]	Power Module Adapter, Intrinsically Safe (Power Module separate)	•	—	★

Other Options (Include with selected model number)

Pressure Testing				
Expanded				
P1[12]	Hydrostatic Testing with Certificate	•	•	
PX[12]	Extended Hydrostatic Testing	•	•	
Special Cleaning				
Expanded				
P2	Cleaning for Special Services	•	•	
PA	Cleaning per ASTM G93 level D (section 11.4)	•	•	
Material Testing				
Expanded				
V1	Dye Penetrant Exam	•	•	

Table 4. Rosemount 3051SFA Annubar Flowmeter Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.
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Material Examination		**D**	**1-7**	
Expanded				
V2	Radiographic Examination	•	•	
Flow Calibration				
Expanded				
W1	Flow Calibration (Average K)	•	•	
Special Inspection				
Standard				**Standard**
QC1	Visual and Dimensional Inspection with Certificate	•	•	★
QC7	Inspection and Performance Certificate	•	•	★
Surface Finish				
Standard				**Standard**
RL	Surface finish for Low Pipe Reynolds Number in Gas and Steam	•	•	★
RH	Surface finish for High Pipe Reynolds Number in Liquid	•	•	★
Material Traceability Certification				
Standard				**Standard**
Q8[13]	Material Traceability Certificate per EN 10204:2004 3.1	•	•	★
Code Conformance				
Expanded				
J2[14]	ANSI B31.1	•	•	
J3[14]	ANSI B31.3	•	•	
Material Conformance				
Expanded				
J5[15]	NACE MR-0175 / ISO 15156	•	•	
Country Certification				
Standard				**Standard**
J6	European Pressure Directive (PED)	•	•	★
Expanded				
J1	Canadian Registration	•	•	
Installed in Flanged Pipe Spool Section				
Expanded				
H3	150# Flanged Connection with Rosemount Standard Length and Schedule	•	•	
H4	300# Flanged Connection with Rosemount Standard Length and Schedule	•	•	
H5	600# Flanged Connection with Rosemount Standard Length and Schedule	•	•	
Instrument Connections for Remote Mount Option				
Standard				**Standard**
G2	Needle Valves, Stainless Steel	•	•	★
G6	OS&Y Gate Valve, Stainless Steel	•	•	★
Expanded				
G1	Needle Valves, Carbon Steel	•	•	
G3	Needle Valves, Alloy C-276	•	•	
G5	OS&Y Gate Valve, Carbon Steel	•	•	
G7	OS&Y Gate Valve, Alloy C-276	•	•	
Special Shipment				
Standard				**Standard**
Y1	Mounting Hardware Shipped Separately	•	•	★
Special Dimensions				
Expanded				
VM	Variable Mounting	•	•	
VT	Variable Tip	•	•	
VS	Variable length Spool Section	•	•	

Table 4. Rosemount 3051SFA Annubar Flowmeter Ordering Information

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Transmitter Calibration Certification				
Standard				**Standard**
Q4	Calibration Certificate for Transmitter	•	•	★
Quality Certification For Safety		**D**	**1-7**	
Standard				**Standard**
QS	Certificate of FMEDA data	•	—	★
QT[14][17][26]	Safety certified to IEC 61508 with certificate of FMEDA data	•	—	★
Product Certifications				
Standard				**Standard**
E1	ATEX Flameproof	•	•	★
I1	ATEX Intrinsic Safety	•	•	★
IA	ATEX FISCO Intrinsic Safety; for FOUNDATION fieldbus protocol only	•	—	★
N1	ATEX Type n	•	•	★
ND	ATEX Dust	•	•	★
K1	ATEX Flameproof, Intrinsic Safety, Type n, Dust (combination of E1, I1, N1, and ND)	•	•	★
E4	TIIS Flameproof	•	•	★
E5	FM Explosion-proof, Dust Ignition-proof	•	•	★
I5	FM Intrinsically Safe, Division 2	•	•	★
K5	FM Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E5 and I5)	•	•	★
E6[16]	CSA Explosion-proof, Dust Ignition-proof, Division 2	•	•	★
I6	CSA Intrinsically Safe	•	•	★
K6[14]	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E6 and I6)	•	•	★
E7	IECEx Flameproof, Dust Ignition-proof	•	•	★
I7	IECEx Intrinsic Safety	•	•	★
K7	IECEx Flameproof, Dust Ignition-proof, Intrinsic Safety, Type n (combination of E7, I7, and N7)	•	•	★
E3	China Flameproof	•	•	★
I3	China Intrinsic Safety	•	•	★
KA[14]	ATEX and CSA Explosion-proof, Intrinsically Safe, Division 2 (combination of E1, I1, E6, and I6)	•	•	★
KB[14]	FM and CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E5, E6, I5, and I6)	•	•	★
KC	FM and ATEX Explosion-proof, Intrinsically Safe, Division 2 (combination of E5, E1, I5, and I1)	•	•	★
KD[14]	FM, CSA, and ATEX Explosion-proof, Intrinsically Safe (combination of E5, I5, E6, I6, E1, and I1)	•	•	★
Alternate Transmitter Material of Construction				
Standard				**Standard**
L1	Inert Sensor Fill Fluid *Note: Silicone fill fluid is standard.*	•	•	★
L2	Graphite-Filled (PTFE) O-ring	•	•	★
LA	Inert Sensor Fill Fluid and Graphite-Filled (PTFE) O-ring	•	•	★
Digital Display[17]				
Standard				**Standard**
M5	PlantWeb LCD display (Requires PlantWeb housing)	•	•	★
M7[18][19]	Remote mount LCD display and interface, no cable; PlantWeb housing, SST bracket	•	•	★
M8[18][26][20]	Remote mount LCD display and interface, 50 ft. (15 m) cable; PlantWeb housing, SST bracket	•	•	★
M9[18][26][20]	Remote mount LCD display and interface, 100 ft. (31 m) cable; PlantWeb housing, SST bracket	•	•	★
Transient Protection				
Standard				**Standard**
T1[21]	Transient terminal block	•	•	★
Manifold for Remote Mount Option				
Standard				**Standard**
F2	3-Valve Manifold, Stainless Steel	•	•	★
F6	5-Valve Manifold, Stainless Steel	•	•	★

Table 4. Rosemount 3051SFA Annubar Flowmeter Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.
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Expanded				
F1	3-Valve Manifold, Carbon Steel	•	•	
F3	3-Valve Manifold, Alloy C-276	•	•	
F5	5-Valve Manifold, Carbon Steel	•	•	
F7	5-Valve Manifold, Alloy C-276	•	•	
PlantWeb Control Functionality		**D**	**1-7**	
Standard				**Standard**
A01	FOUNDATION fieldbus Advanced Control Function Block Suite	•	—	★
PlantWeb Diagnostic Functionality				
Standard				**Standard**
D01	FOUNDATION fieldbus Diagnostics Suite	•	—	★
DA2(22)	Advanced HART Diagnostic Suite	•	—	★
PlantWeb Enhanced Measurement Functionality				
Standard				**Standard**
H01(23)	FOUNDATION fieldbus Fully Compensated Mass Flow Block	•	—	★
Cold Temperature				
Standard				**Standard**
BRR	-60 °F (-51 °C) Cold Temperature Start-up	•	•	★
Alarm Limit(18)(24)				
Standard				**Standard**
C4	NAMUR Alarm and Saturation Levels, High Alarm	•	•	★
C5	NAMUR Alarm and Saturation Levels, Low Alarm	•	•	★
C6	Custom Alarm and Saturation Levels, High Alarm	•	•	★
C7	Custom Alarm and Saturation Levels, Low Alarm	•	•	★
C8	Low Alarm (Standard Rosemount Alarm and Saturation Levels)	•	•	★
Hardware Adjustments and Ground Screw				
Standard				**Standard**
D1	Hardware Adjustments (zero, span, alarm, security)	•	—	★
D4	External Ground Screw Assembly	•	•	★
DA	Hardware Adjustments (zero, span, alarm, security) and External Ground Screw Assembly	•	—	★
Conduit Electrical Connector				
Standard				**Standard**
GE(25)	M12, 4-pin, Male Connector (*eurofast*®)	•	•	★
GM(34)	A size Mini, 4-pin, Male Connector (*minifast*®)	•	•	★
Typical Model Number: 3051SFA D L 060 D C H P S 2 T1 0 0 0 3 2A A 1A 3				

(1) Provide the "A" dimension for Flanged, Flange-Lok, and Threaded Flo-Tap models. Provide the "B" dimension for Flange Flo-Tap models.

(2) Available in remote mount applications only.

(3) Temperature Measurement Option code T or R is required for Measurement Type codes 1, 3, 5, and 7.

(4) Required for Measurement Type codes 2, 4, 6, and D.

(5) Required for Measurement Type codes 3, 4, 7, and D.

(6) For Measurement Type 1, 2, 5, and 6 with DP range 1, absolute limits are 0.5 to 2000 psi (0,03 to 137,9 bar) and gage limits are -14.2 to 2000 psig (-0,98 to 137,9 bar).

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

(8) Available with output code A only.

(9) This option is only available with differential pressure ranges 2 and 3, and silicone fill fluid.

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

(11) Long-life Power Module must be shipped separately, order Part No. 00753-9220-0001.

(12) Applies to assembled flowmeter only, mounting not tested.

(13) Instrument Connections for Remote Mount Options and Isolation Valves for Flo-tap Models are not included in the Material Traceability Certification.

(14) Not available with Transmitter Connection Platform 6.

(15) Materials of Construction comply with metallurgical requirements 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.

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

(17) Not available with housing code 7J.

(18) Not available with output code X.

(19) Not available with output code F, option code DA2, or option code QT.

(20) Cable supplied is Belden 3084A, rated for ambient temperatures up to 167°F (75°C).

(21) Not available with Housing code 00, 5A, or 7J. External ground screw assembly (option code D4) is included with the T1 option. The T1 option is not needed with FISCO Product Certifications, transient protection is included with the FISCO Product Certification code IA.

(22) Includes Hardware Adjustments (option code D1) as standard. Not available with output code X.

(23) Requires Rosemount Engineering Assistant version 5.5.1 to configure.

(24) Not available with Output Protocol code F.

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

Rosemount 3051SFC Compact Orifice Flowmeter

- Compact Conditioning flowmeters reduce straight piping requirements to 2D upstream and 2D downstream from a flow disturbance
- Simple installation of Compact flowmeters between any existing raised-face flanges

Table 5. Rosemount 3051SFC Compact Orifice Flowmeter 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	Measurement Type		• = Available — = Unavailable
		D	1-7	
3051SFC	Compact Orifice Flowmeter	•	•	
Transmitter Feature Board Measurement Type				
Standard				**Standard**
1	MultiVariable (Fully Compensated Mass & Energy Flow) – Differential & Static Pressures w/ Temperature	—	•	★
2	MultiVariable (Compensated Flow) – Differential and Static Pressures	—	•	★
3	MultiVariable (Compensated Flow) – Differential Pressure and Temperature	—	•	★
4	MultiVariable (Compensated Flow) – Differential Pressure	—	•	★
5	MultiVariable (Direct Measurement) – Differential and Static Pressures with Temperature	—	•	★
6	MultiVariable (Direct Measurement) – Differential and Static Pressures	—	•	★
7	MultiVariable (Direct Measurement) – Differential Pressure and Temperature	—	•	★
D	Differential Pressure	•	—	★
Primary Element Technology				
Standard				**Standard**
C	Conditioning Orifice Plate	•	•	★
P	Orifice Plate	•	•	★
Material Type				
Standard				**Standard**
S	316 SST	•	•	★
Line Size				
Standard				**Standard**
005(1)	1/2-in. (15 mm)	•	•	★
010(1)	1-in. (25 mm)	•	•	★
015(1)	1 1/2-in. (40 mm)	•	•	★
020	2-in. (50 mm)	•	•	★
030	3-in. (80 mm)	•	•	★
040	4-in. (100 mm)	•	•	★
060	6-in. (150 mm)	•	•	★
080	8-in. (200 mm)	•	•	★
100	10-in. (250 mm)	•	•	★
120	12-in. (300 mm)	•	•	★
Primary Element Style				
Standard				**Standard**
N	Square Edged	•	•	★
Primary Element Type				
Standard				**Standard**
040	0.40 Beta Ratio (β)	•	•	★
065(2)	0.65 Beta Ratio (β)	•	•	★
Temperature Measurement				
Standard				**Standard**
T(4)	Integral RTD	—	•	★
0(3)	No Temperature Sensor	•	•	★

Table 5. Rosemount 3051SFC Compact Orifice Flowmeter Ordering Information

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

Expanded						
R[4]	Remote Thermowell and RTD			•	•	
Transmitter Connection Platform				**D**	**1-7**	
Standard						**Standard**
3	Direct-mount, 3-valve Integral Manifold, SST			•	•	★
7	Remote-mount, 1/4-in. NPT Connections			•	•	★
Differential Pressure Range						
Standard						**Standard**
1	0 to 25 inH_2O (0 to 62,3 mbar)			•	•	★
2	0 to 250 inH_2O (0 to 623 mbar)			•	•	★
3	0 to 1000 inH_2O (0 to 2,5 bar)			•	•	★
Static Pressure Range						
Standard						**Standard**
A[5]	None			•	•	★
D	Absolute 0.5 to 800 psia (0,033 to 55,2 bar)			—	•	★
E[6]	Absolute 0.5 to 3626 psia (0,033 to 250 bar)			—	•	★
J	Gage -14.2 to 800 psig (-0,979 to 55,2 bar)			—	•	★
K[6]	Gage -14.2 to 3626 psig (-0,979 to 250 bar)			—	•	★
Transmitter Output						
Standard						**Standard**
A	4–20 mA with digital signal based on HART protocol			•	•	★
F	FOUNDATION fieldbus protocol (Requires PlantWeb housing)			•	—	★
X[7]	Wireless (Requires wireless options and wireless PlantWeb housing)			•	—	★
Transmitter Housing Style		**Material**	**Conduit Entry Size**			
Standard						**Standard**
1A	PlantWeb Housing	Aluminum	1/2-14 NPT	•	•	★
1B	PlantWeb Housing	Aluminum	M20 x 1.5	•	•	★
1J	PlantWeb Housing	SST	1/2-14 NPT	•	•	★
1K	PlantWeb Housing	SST	M20 x 1.5	•	•	★
2A	Junction Box Housing	Aluminum	1/2-14 NPT	•	—	★
2B	Junction Box Housing	Aluminum	M20 x 1.5	•	—	★
2E	Junction Box housing with output for remote display and interface	Aluminum	1/2-14 NPT	•	—	★
2F	Junction Box housing with output for remote display and interface	Aluminum	M20 x 1.5	•	—	★
2J	Junction Box Housing	SST	1/2-14 NPT	•	—	★
2M	Junction Box housing with output for remote display and interface	SST	1/2-14 NPT	•	—	★
5A	Wireless PlantWeb housing	Aluminum	1/2-14 NPT	•	—	★
5J	Wireless PlantWeb housing	SST	1/2-14 NPT	•	—	★
7J[7][8]	Quick Connect (A size Mini, 4-pin male termination)			•	—	★
Expanded						
1C	PlantWeb Housing	Aluminum	G1/2	•	•	
1L	PlantWeb Housing	SST	G1/2	•	•	
2C	Junction Box Housing	Aluminum	G1/2	•	—	
2G	Junction Box housing with output for remote display and interface	Aluminum	G1/2	•	—	

Table 5. Rosemount 3051SFC Compact Orifice Flowmeter 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 Performance Class				
Standard				**Standard**
3051S MultiVariable SuperModule, Measurement Types 1, 2, 5, and 6		•	•	
3	Ultra for Flow: 0.55% flow rate accuracy, 14:1 flow turndown, 10-yr stability. limited 12-yr warranty	•	•	★
5	Classic MV: 0.6% flow rate accuracy, 8:1 flow turndown, 5-yr stability	—	•	★
Standard				**Standard**
3051S Single Variable SuperModule, Measurement Types 3, 4, 7, and D		•	•	
1	Ultra: 0.85% flow rate accuracy, 8:1 flow turndown, 10-yr stability, limited 12-yr warranty	•	—	★
2	Classic: 1.05% flow rate accuracy, 8:1 flow turndown, 5-yr stability	•	—	★
3(9)	Ultra for Flow: 0.55% flow rate accuracy, 14:1 flow turndown, 10-yr stability. limited 12-yr warranty	•	•	★

Wireless Options (Requires option code X and wireless PlantWeb housing)

Update Rate, Operating Frequency and Protocol				
Standard				**Standard**
WA	User Configurable Update Rate	•	—	★
Operating Frequency and Protocol				
Standard				
3	2.4 GHz DSSS, WirelessHART	•	—	★
Omnidirectional Wireless Antenna				
Standard				
WK(10)	Long Range, Integral Antenna	•	—	★
SmartPower™				
Standard				
1(11)	Power Module Adapter, Intrinsically Safe (Power Module separate)	•	—	★

Other Options (Include with selected model number)

Installation Accessories				
Standard				**Standard**
A	ANSI Alignment Ring (150#) (Only required for 10-in. (250 mm) and 12-in. (300mm) line sizes)	•	•	★
C	ANSI Alignment Ring (300#) (Only required for 10-in. (250 mm) and 12-in. (300mm) line sizes)	•	•	★
D	ANSI Alignment Ring (600#) (Only required for 10-in. (250 mm) and 12-in. (300mm) line sizes)	•	•	★
G	DIN Alignment Ring (PN 16)	•	•	★
H	DIN Alignment Ring (PN 40)	•	•	★
J	DIN Alignment Ring (PN 100)	•	•	★
Expanded				
B	JIS Alignment Ring (10K)	•	•	
R	JIS Alignment Ring (20K)	•	•	
S	JIS Alignment Ring (40K)	•	•	
Remote Adapters				
Standard				**Standard**
E	Flange adapters 316 SST (1/2-in. NPT)	•	•	★
High Temperature Applications				
Expanded				
T	Graphite Valve Packing (Tmax = 850 °F)	•	•	
Flow Calibration				
Expanded				
WC	Discharge Coefficient Verification (3 point)	•	•	
WD	Discharge Coefficient Verification (10 point)	•	•	
Pressure Testing				
Expanded				
P1	Hydrostatic Testing with Certificate	•	•	

Table 5. Rosemount 3051SFC Compact Orifice Flowmeter 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.

Special Cleaning				
Expanded				
P2	Cleaning for special with Certificate	•	•	
PA	Cleaning per ASTM G93 Level D (section 11.4)	•	•	
Special Inspection				
Standard				**Standard**
QC1	Visual and Dimensional Inspection with Certificate	•	•	★
QC7	Inspection and Performance Certificate	•	•	★
Transmitter Calibration Certification				
Standard				**Standard**
Q4	Calibration Certificate for Transmitter	•	•	★
QP	Calibration Certificate and Tamper Evident Seal	•	•	★
Quality Certification for Safety		**D**	**1-7**	
Standard				**Standard**
QS[(12)(13)]	Certificate of FMEDA data	•	—	★
QT[(12)(13)(16)]	Safety Certified to IEC 61508 with certificate of FMEDA data	•	—	★
Material Traceability Certifications				
Standard				**Standard**
Q8	Material Traceability Certification per EN 10204:2004 3.1	•	•	★
Code Conformance				
Expanded				
J2	ANSI / ASME B31.1	•	•	
J3	ANSI / ASME B31.3	•	•	
J4	ANSI / ASME B31.8	•	•	
Material Conformance				
Expanded				
J5[(14)]	NACE MR-0175-91 / ISO 15156	•	•	
Country Certification				
Expanded				
J1	Canadian Registration	•	•	
Product Certifications				
Standard				**Standard**
E1	ATEX Flameproof	•	•	★
I1	ATEX Intrinsic Safety	•	•	★
IA	ATEX FISCO Intrinsic Safety; for FOUNDATION fieldbus protocol only	•	—	★
N1	ATEX Type n	•	•	★
ND	ATEX Dust	•	•	★
K1	ATEX Flameproof, Intrinsic Safety, Type n, Dust (combination of E1, I1, N1, and ND)	•	•	★
E4	TIIS Flameproof	•	•	★
E5	FM Explosion-proof, Dust Ignition-proof	•	•	★
I5	FM Intrinsically Safe, Division 2	•	•	★
K5	FM Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E5 and I5)	•	•	★
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 (combination of E6 and I6)	•	•	★
E7	IECEx Flameproof, Dust Ignition-proof	•	•	★
I7	IECEx Intrinsic Safety	•	•	★
N7	IECEx Type n	•	•	★
K7	IECEx Flameproof, Dust Ignition-proof, Intrinsic Safety, Type n (combination of E7, I7, and N7)	•	•	★
E3	China Flameproof	•	•	★
I3	China Intrinsic Safety	•	•	★
KA[(15)]	ATEX and CSA Flameproof, Intrinsically Safe, Division 2 (combination of E1, I1, E6, and I6)	•	•	★
KB[(15)]	FM and CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E5, E6, I5, and I6)	•	•	★
KC	FM and ATEX Explosion-proof, Intrinsically Safe, Division 2 (combination of E5, E1, I5, and I1)	•	•	★
KD[(15)]	FM, CSA, and ATEX Explosion-proof, Intrinsically Safe (combination of E5, I5, E6, I6, E1, and I1)	•	•	★

Table 5. Rosemount 3051SFC Compact Orifice Flowmeter 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.

Alternative Transmitter Material of Construction		**D**	**1-7**	
Standard				**Standard**
L1	Inert Sensor Fill Fluid (not available with Differential Pressure range code 1A)	•	•	★
L2	Graphite-filled (PTFE) O-ring	•	•	★
LA	Inert sensor fill fluid and graphite-filled (PTFE) O-ring	•	•	★
Digital Display(16)				
Standard				**Standard**
M5	PlantWeb LCD display	•	•	★
M7(13)(17)	Remote mount LCD display and interface, PlantWeb housing, no cable, SST bracket	•	•	★
M8(13)(17)(18)	Remote mount LCD display and interface, PlantWeb housing, 50 foot cable, SST bracket	•	•	★
M9(13)(17)(18)	Remote mount LCD display and interface, PlantWeb housing, 100 foot cable, SST bracket	•	•	★
Transient Protection				
Standard				**Standard**
T1(19)	Transient terminal block	•	•	★
Manifold for Remote Mount Option				
Standard				**Standard**
F2	3-Valve Manifold, SST	•	•	★
F6	5-Valve Manifold, SST	•	•	★
PlantWeb Control Functionality				
Standard				**Standard**
A01	FOUNDATION fieldbus Advanced Control Function Block Suite	•	—	★
PlantWeb Diagnostic Functionality				
Standard				**Standard**
D01	FOUNDATION fieldbus Diagnostics Suite	•	—	★
DA2(20)	Advanced HART Diagnostic Suite	•	—	★
PlantWeb Enhanced Measurement Functionality				
Standard				**Standard**
H01(21)	FOUNDATION fieldbus Fully Compensated Mass Flow Block	•	—	★
Cold Temperature				
Standard				**Standard**
BRR	-60 °F (-51 °C) Cold Temperature Start-up	•	•	★
Alarm Limit(12)(13)				
Standard				**Standard**
C4	NAMUR alarm and saturation levels, high alarm	•	•	★
C5	NAMUR alarm and saturation levels, low alarm	•	•	★
C6	Custom alarm and saturation levels, high alarm	•	•	★
C7	Custom alarm and saturation levels, low alarm	•	•	★
C8	Low alarm (standard Rosemount alarm and saturation levels)	•	•	★
Hardware Adjustments and Ground Screw				
Standard				**Standard**
D1(17)	Hardware Adjustments (zero, span, alarm, security).	•	—	★
D4	External ground screw assembly	•	•	★
DA(17)	Hardware adjustments (zero, span, alarm, security) and external ground screw assembly	•	—	★
Conduit Electrical Connector				
Standard				**Standard**
ZE(22)	M12, 4-pin, Male Connector (eurofast)	•	•	★
ZM(22)	A size Mini, 4-pin, Male Connector (minifast)	•	•	★
Typical Model Number: 3051SFC 1 C S 060 N 065 T 3 2 J A 1A 3				

(1) Not available for Primary Element Technology code C.

(2) For 2-in. (50 mm) line sizes the Primary Element Type is 0.6 for Primary Element Technology Code C.

(3) Required for Measurement Type codes 2, 4, 6, and D.

(4) Only available with Transmitter Feature Board Measurement Type: 1, 3, 5, 7.

(5) Required for Measurement Type codes 3, 4, 7, and D.

(6) For Measurement Type 1, 2, 5, and 6 with DP range 1, absolute limits are 0.5 to 2000 psi (0,03 to 137,9 bar) and gage limits are -14.2 to 2000 psig (-0,98 to 137,9 bar).

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

(8) Available with output code A only.

(9) This option is only available with differential pressure ranges 2 and 3, and silicone fill fluid.

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

(11) Long-life Power Module must be shipped separately, order Part No. 00753-9220-0001.

(12) Not available with Output Protocol code F.

(13) Not available with output code X.

(14) Materials of Construction comply with metallurgical requirements within NACE MR0175/ISO 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.

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

(16) Not available with housing code 7J.

(17) Not available with output code F, option code DA2, or option code QT.

(18) Cable supplied is Belden 3084A, rated for ambient temperatures up to 167°F (75°C).

(19) Not available with Housing code 00, 5A, or 7J. External ground screw assembly (option code D4) is included with the T1 option. The T1 option is not needed with FISCO Product Certifications, transient protection is included with the FISCO Product Certification code IA.

(20) Includes Hardware Adjustments (option code D1) as standard. Not available with output code X.

(21) Requires Rosemount Engineering Assistant version 5.5.1 to configure.

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

Rosemount 3051SFP Integral Orifice Flowmeter

- Precision honed pipe section for increased accuracy in small line sizes
- Self-centering plate design prevents alignment errors that magnify measurement inaccuracies in small line sizes

Table 6. Rosemount 3051SFP Integral Orifice Flowmeter 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	Measurement Type		• = Available — = Unavailable
		D	1-7	
3051SFP	Integral Orifice Flowmeter	•	•	
Measurement Type				
Standard				**Standard**
1	MultiVariable (Fully Compensated Mass & Energy Flow) – Differential & Static Pressures w/ Temperature	—	•	★
2	MultiVariable (Compensated Flow) – Differential and Static Pressures	—	•	★
3	MultiVariable (Compensated Flow) – Differential Pressure and Temperature	—	•	★
4	MultiVariable (Compensated Flow) – Differential Pressure	—	•	★
5	MultiVariable (Direct Measurement) – Differential and Static Pressures with Temperature	—	•	★
6	MultiVariable (Direct Measurement) – Differential and Static Pressures	—	•	★
7	MultiVariable (Direct Measurement) – Differential Pressure and Temperature	—	•	★
D	Differential Pressure	•	—	★
Body Material				
Standard				**Standard**
S	316 SST	•	•	★
Line Size				
Standard				**Standard**
005	1/2-in. (15 mm)	•	•	★
010	1-in. (25 mm)	•	•	★
015	1 1/2-in. (40 mm)	•	•	★
Process Connection				
Standard				**Standard**
T1	NPT Female Body (Not Available with Remote Thermowell and RTD)	•	•	★
S1(1)	Socket Weld Body (Not Available with Remote Thermowell and RTD)	•	•	★
P1	Pipe Ends: NPT threaded	•	•	★
P2	Pipe Ends: Beveled	•	•	★
D1	Pipe Ends: Flanged, DIN PN16, slip-on	•	•	★
D2	Pipe Ends: Flanged, DIN PN40, slip-on	•	•	★
D3	Pipe Ends: Flanged, DIN PN100, slip-on	•	•	★
W1	Pipe Ends: Flanged, ANSI Class 150, weld-neck	•	•	★
W3	Pipe Ends: Flanged, ANSI Class 300, weld-neck	•	•	★
W6	Pipe Ends: Flanged, ANSI Class 600, weld-neck	•	•	★
Expanded				
A1	Pipe Ends: Flanged, RF, ANSI Class 150, slip-on	•	•	
A3	Pipe Ends: Flanged, RF, ANSI Class 300, slip-on	•	•	
A6	Pipe Ends: Flanged, RF, ANSI Class 600, slip-on	•	•	
R1	Pipe Ends: Flanged, RTJ, ANSI Class 150, slip-on	•	•	
R3	Pipe Ends: Flanged, RTJ, ANSI Class 300, slip-on	•	•	
R6	Pipe Ends: Flanged, RTJ, ANSI Class 600, slip-on	•	•	
P9	Special Process Connection	•	•	
Orifice Plate Material				
Standard				**Standard**
S	316 SST	•	•	★

Table 6. Rosemount 3051SFP Integral Orifice Flowmeter Ordering Information

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

Expanded				
H	Alloy C-276	•	•	
M	Alloy 400	•	•	
Bore Size Option		**D**	**1-7**	
Standard				**Standard**
0066	0.066-in. (1,68 mm) for 1/2-in. pipe	•	•	★
0109	0.109-in. (2,77 mm) for 1/2-in. pipe	•	•	★
0160	0.160-in. (4,06 mm) for 1/2-in. pipe	•	•	★
0196	0.196-in. (4,98 mm) for 1/2-in. pipe	•	•	★
0260	0.260-in. (6,60 mm) for 1/2-in. pipe	•	•	★
0340	0.340-in. (8,64 mm) for 1/2-in. pipe	•	•	★
0150	0.150-in. (3,81 mm) for 1-in. pipe	•	•	★
0250	0.250-in. (6,35 mm) for 1-in. pipe	•	•	★
0345	0.345-in. (8,76 mm) for 1-in. pipe	•	•	★
0500	0.500-in. (12,70 mm) for 1-in. pipe	•	•	★
0630	0.630-in. (16,00 mm) for 1-in. pipe	•	•	★
0800	0.800-in. (20,32 mm) for 1-in. pipe	•	•	★
0295	0.295-in. (7,49 mm) for 1 1/2-in. pipe	•	•	★
0376	0.376-in. (9,55 mm) for 1 1/2-in. pipe	•	•	★
0512	0.512-in. (13,00 mm) for 1 1/2-in. pipe	•	•	★
0748	0.748-in. (19,00 mm) for 1 1/2-in. pipe	•	•	★
1022	1.022-in. (25,96 mm) for 1 1/2-in. pipe	•	•	★
1184	1.184-in. (30,07 mm) for 1 1/2-in. pipe	•	•	★
Expanded				
0010	0.010-in. (0,25 mm) for 1/2-in. pipe	•	•	
0014	0.014-in. (0,36 mm) for 1/2-in. pipe	•	•	
0020	0.020-in. (0,51 mm) for 1/2-in. pipe	•	•	
0034	0.034-in. (0,86 mm) for 1/2-in. pipe	•	•	
Transmitter Connection Platform				
Standard				**Standard**
D3	Direct-mount, 3-valve Manifold, SST	•	•	★
D5	Direct-mount, 5-valve Manifold, SST	•	•	★
R3	Remote-mount, 3-valve Manifold, SST	•	•	★
R5	Remote-mount, 5-valve Manifold, SST	•	•	★
Expanded				
D4	Direct-mount, 3-valve Manifold, Alloy C-276	•	•	
D6	Direct-mount, 5-valve Manifold, Alloy C-276	•	•	
D7	Direct-mount, High Temperature, 5-valve Manifold, SST	•	•	
R4	Remote-mount, 3-valve Manifold, Alloy C-276	•	•	
R6	Remote-mount, 5-valve Manifold, Alloy C-276	•	•	
Differential Pressure Range				
Standard				**Standard**
1	0 to 25 in H_2O (0 to 62,3 mbar)	•	•	★
2	0 to 250 in H_2O (0 to 623 mbar)	•	•	★
3	0 to 1000 in H_2O (0 to 2,5 bar)	•	•	★
Static Pressure Range				
Standard				**Standard**
A[(2)]	None	•	•	★
D	Absolute 0.5 to 800 psia (0,033 to 55,2 bar)	—	•	★
E[(3)]	Absolute 0.5 to 3626 psia (0,033 to 250 bar)	—	•	★
J	Gage -14.2 to 800 psig (-0,979 to 55,2 bar)	—	•	★
K[(3)]	Gage -14.2 to 3626 psig (-0,979 to 250 bar)	—	•	★

Table 6. Rosemount 3051SFP Integral Orifice Flowmeter 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				**D**	**1-7**	
Standard						**Standard**
A	4–20 mA with digital signal based on HART protocol			•	•	★
F	FOUNDATION fieldbus (Requires PlantWeb housing)			•	—	★
X[4]	Wireless (Requires wireless options and wireless PlantWeb housing)			•	—	★
Transmitter Housing Style		**Material**	**Conduit Entry Size**			
Standard						**Standard**
00	None (Customer-supplied electrical connection)			•	—	★
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 Housing with output for remote display and interface	Aluminum	1/2-14 NPT	•	—	★
2F	Junction Box Housing with output for remote display and interface	Aluminum	M20 x 1.5	•	—	★
2J	Junction Box Housing	SST	1/2-14 NPT	•	—	★
2M	Junction Box Housing with output for remote display and interface	SST	1/2-14 NPT	•	—	★
5A	Wireless PlantWeb Housing	Aluminum	1/2–14 NPT	•	—	★
5J	Wireless PlantWeb Housing	SST	1/2–14 NPT	•	—	★
7J[4][5]	Quick Connect (A size Mini, 4-pin male termination)			•	—	★
Expanded						
1C	PlantWeb Housing	Aluminum	G1/2	•	•	
1L	PlantWeb Housing	SST	G1/2	•	•	
2C	Junction Box Housing	Aluminum	G1/2	•	—	
2G	Junction Box Housing with output for remote display and interface	Aluminum	G1/2	•	—	
Transmitter Performance Class						
Standard						**Standard**
3051S MultiVariable SuperModule, Measurement Types 1, 2, 5, and 6						
3[6]	Ultra for Flow: 0.80% flow rate accuracy, 14:1 flow turndown, 10-year stability, limited 12-year warranty			•	•	★
5	Classic 2: 0.85% flow rate accuracy, 8:1 flow turndown, 5-year stability			—	•	★
3051S Single Variable SuperModule, Measurement Types 3, 4, 7, and D						
1	Ultra: 1.05% flow rate accuracy, 8:1 flow turndown, 10-year stability, limited 12-year warranty			•	•	★
2	Classic: 1.20% flow rate accuracy, 8:1 flow turndown, 5-year stability			•	•	★
3[6]	Ultra for Flow: 0.80% flow rate accuracy, 14:1 flow turndown, 10-year stability. limited 12-year warranty			•	•	★

Wireless Options (Requires option code X and wireless PlantWeb housing)

Update Rate, Operating Frequency and Protocol				
Standard				**Standard**
WA	User Configurable Update Rate	•	—	★
Operating Frequency and Protocol				
Standard				
3	2.4 GHz DSSS, WirelessHART	•	—	★
Omnidirectional Wireless Antenna				
Standard				
WK[7]	Long Range, Integral Antenna	•	—	★

Table 6. Rosemount 3051SFP Integral Orifice Flowmeter 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.

SmartPower™				
Standard				
1[8]	Power Module Adapter, Intrinsically Safe (Power Module separate)	•	—	★

Other Options (Include with selected model number)

Transmitter / Body Bolt Material		**D**	**1-7**	
Expanded				
G	High temperature Option (850 °F (454 °C))	•	•	
Temperature Sensor				
Standard				**Standard**
T[9]	Thermowell and RTD	•	•	★
Optional Connection				
Standard				**Standard**
G1	DIN 19231 Transmitter Connection	•	•	★
Pressure Testing				
Expanded				
P1[10]	Hydrostatic Testing with Certificate	•	•	
Special Cleaning				
Expanded				
P2	Cleaning for Special Services	•	•	
PA	Cleaning per ASTM G93 Level D (Section 11.4)	•	•	
Material Testing				
Expanded				
V1	Dye Penetrant Exam	•	•	
Material Examination				
Expanded				
V2	Radiographic Examination (available only with Process Connection code W1, W3, and W6)	•	•	
Flow Calibration				
Expanded				
WD[11]	Discharge Coefficient Verification	•	•	
WZ[11]	Special Calibration	•	•	
Special Inspection				
Standard				**Standard**
QC1	Visual and Dimensional Inspection with Certificate	•	•	★
QC7	Inspection and Performance Certificate	•	•	★
Material Traceability Certification				
Standard				**Standard**
Q8	Material certification per EN 10204:2004 3.1	•	•	★
Code Conformance				
Expanded				
J2[12]	ANSI / ASME B31.1	•	•	
J3[12]	ANSI / ASME B31.3	•	•	
J4[12]	ANSI / ASME B31.8	•	•	
Materials Conformance				
Expanded				
J5[13]	NACE MR-0175 / ISO 15156	•	•	
Country Certification				
Standard				**Standard**
J6	European Pressure Directive (PED)	•	•	★
Expanded				
J1	Canadian Registration	•	•	
Transmitter Calibration Certification				
Standard				**Standard**
Q4	Calibration Certificate for Transmitter	•	•	★

Table 6. Rosemount 3051SFP Integral Orifice Flowmeter 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.

Quality Certification for Safety				
Standard				**Standard**
QS[14][15]	Certificate of FMEDA data	•	—	★
QT[14][15][17]	Safety-certified to IEC 61508 with Certificate of FMEDA data	•	—	★
Product Certifications		**D**	**1-7**	
Standard				**Standard**
E1	ATEX Flameproof	•	•	★
I1	ATEX Intrinsic Safety	•	•	★
IA	ATEX FISCO Intrinsic Safety; for FOUNDATION fieldbus protocol only	•	—	★
N1	ATEX Type n	•	•	★
ND	ATEX Dust	•	•	★
K1	ATEX Flameproof, Intrinsic Safety, Type n, Dust (combination of E1, I1, N1, and ND)	•	•	★
E4	TIIS Flameproof	•	•	★
E5	FM Explosion-proof, Dust Ignition-proof	•	•	★
I5	FM Intrinsically Safe, Division 2	•	•	★
K5	FM Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E5 and I5)	•	•	★
E6[16]	CSA Explosion-proof, Dust Ignition-proof, Division 2	•	•	★
I6	CSA Intrinsically Safe	•	•	★
K6[16]	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E6 and I6)	•	•	★
E7	IECEx Flameproof	•	•	★
I7	IECEx Intrinsic Safety	•	•	★
K7	IECEx Flameproof, Intrinsic Safety, Type n (combination of E7, I7, and N7)	•	•	★
E3	China Flameproof	•	•	★
I3	China Intrinsic Safety	•	•	★
KA[16]	ATEX and CSA Flameproof, Intrinsically Safe, Division 2 (combination of E1, I1, E6, and I6)	•	•	★
KB[16]	FM and CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E5, E6, I5, and I6)	•	•	★
KC	FM and ATEX Explosion-proof, Intrinsically Safe, Division 2 (combination of E5, E1, I5, and I1)	•	•	★
KD[16]	FM, CSA, and ATEX Explosion-proof, Intrinsically Safe (combination of E5, I5, E6, I6, E1, and I1)	•	•	★
Alternative Transmitter Material of Construction				
Standard				**Standard**
L1	Inert Sensor Fill Fluid	•	•	★
L2	Graphite-filled (PTFE) O-ring	•	•	★
LA	Inert sensor fill fluid and graphite-filled (PTFE) O-ring	•	•	★
Digital Display[17]				
Standard				**Standard**
M5	PlantWeb LCD display (Requires PlantWeb housing)	•	•	★
M7	Remote mount LCD display and interface, PlantWeb housing, no cable, SST bracket	•	—	★
M8[14][18][19]	Remote mount LCD display and interface, PlantWeb housing, 50 foot cable, SST bracket	•	—	★
M9[14][18][19]	Remote mount LCD display and interface, PlantWeb housing, 100 foot cable, SST bracket	•	—	★
Transient Protection				
Standard				**Standard**
T1[20]	Transient terminal block	•	•	★
PlantWeb Control Functionality				
Standard				**Standard**
A01	FOUNDATION fieldbus Advanced Control Function Block Suite	•	—	★
PlantWeb Diagnostic Functionality				
Standard				**Standard**
D01	FOUNDATION fieldbus Diagnostics Suite	•	—	★
DA2[21]	Advanced HART Diagnostics Suite	•	—	★
PlantWeb Enhanced Measurement Functionality				
Standard				**Standard**
H01[22]	FOUNDATION fieldbus Fully Compensated Mass Flow Block	•	—	★

Table 6. Rosemount 3051SFP Integral Orifice Flowmeter Ordering Information

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

Cold Temperature				
Standard				**Standard**
BRR	-60 °F (-51 °C) Cold Temperature Start-up	•	•	★
Alarm Limit(14)(15)		**D**	**1-7**	
Standard				**Standard**
C4	NAMUR Alarm and Saturation Levels, High Alarm	•	•	★
C5	NAMUR Alarm and Saturation Levels, Low Alarm	•	•	★
C6	Custom Alarm & Saturation Levels, High Alarm	•	•	★
C7	Custom Alarm & Saturation Levels, Low Alarm	•	•	★
C8	Low Alarm (Standard Rosemount Alarm & Saturation Levels)	•	•	★
Hardware Adjustments and Ground Screw				
Standard				**Standard**
D1(17)	Hardware Adjustments (zero, span, alarm, security)	•	—	★
D4	External ground screw assembly	•	•	★
DA(17)	Hardware adjustments (zero, span, alarm, security) and external ground screw assembly	•	—	★
Conduit Electrical Connector				
Expanded				
GE (23)	M12, 4-pin, Male Connector (*eurofast*®)	•	•	
GM(23)	A size Mini, 4-pin, Male Connector (*minifast*®)	•	•	
Typical Model Number: 3051SFP 1 S 010 W3 S 0150 D3 1 J A 1A 3				

(1) To improve pipe perpendicularity for gasket sealing, socket diameter is smaller than standard pipe O.D.

(2) Required for Measurement Type codes 3, 4, 7, and D.

(3) For Measurement Type 1, 2, 5, and 6 with DP range 1, absolute limits are 0.5 to 2000 psi (0,03 to 137,9 bar) and gage limits are -14.2 to 2000 psig (-0,98 to 137,9 bar).

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

(5) Only available with output code A.

(6) This option is only available with differential pressure ranges 2 and 3, and silicone fill fluid.

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

(8) Long-life Power Module must be shipped separately, order Part No. 00753-9220-0001.

(9) Thermowell material is the same as the body material.

(10) Does not apply to Process Connection codes T1 and S1.

(11) Not available for bore sizes 0010, 0014, 0020, or 0034.

(12) Not available with DIN Process Connection codes D1, D2, or D3.

(13) Materials of Construction comply with metallurgical requirements within NACE MR0175/ISO 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.

(14) Not available with output code X.

(15) Not available with Output Protocol code F.

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

(17) Not available with housing code 7J.

(18) Not available with output code F, option code DA2, or option code QT.

(19) Cable supplied is Belden 3084A, rated for ambient temperatures up to 167°F (75°C).

(20) Not available with Housing code 00, 5A or 7J. The T1 option is not needed with FISCO Product Certifications, transient protection is included with the FISCO Product Certification code IA.

(21) Includes Hardware Adjustments (option code D1) as standard. Not available with output code X.

(22) Requires Rosemount Engineering Assistant version 5.5.1 to configure.

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

Rosemount 3051S Liquid Level Transmitter

3051S Liquid Level Transmitter

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

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

Product features and capabilities include:

- Variety of process connections
- Quantified performance for the entire transmitter / seal assembly (QZ option)
- HART, FOUNDATION fieldbus, and WirelessHART protocols

Additional Information
Specifications: page 50
Certifications: page 68
Dimensional Drawings: page 78

Table 7. Rosemount 3051S 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**			
3051S	Liquid Level Transmitter			
Performance Class				
Standard				**Standard**
1	Ultra: 0.065% span accuracy, 100:1 rangedown, 12-year limited warranty			★
2	Classic: 0.065% span accuracy, 100:1 rangedown			★
Connection Type				
Standard				**Standard**
L	Level			★
Measurement Type				
Standard				**Standard**
D	Differential			★
G	Gage			★
A	Absolute			★
Pressure Range				
	Differential (LD)	**Gage (LG)**	**Absolute (LA)**	
Standard				**Standard**
2A	-250 to 250 inH_2O (-623 to 623 mbar)	-250 to 250 inH_2O (-623 to 623 mbar)	0 to 150 psia (10 bar)	★
3A	-1000 to 1000 inH_2O (-2,5 to 2,5 bar)	-393 to 1000 inH_2O (-0,98 to 2,5 bar)	0 to 800 psia (55 bar)	★
4A	-300 to 300 psi (-20,7 to 20,7 bar)	-14.2 to 300 psig (-0,98 to 21 bar)	0 to 4000 psia (276 bar)	★
5A	-2000 to 2000 psi (-137,9 to 137,9 bar)	-14.2 to 2000 psig (-0,98 to 137,9 bar)	N/A	★
Transmitter Output				
Standard				**Standard**
A	4-20 mA with digital signal based on HART protocol			★
F[1]	FOUNDATION fieldbus protocol			★
X[2]	Wireless (Requires wireless options and wireless PlantWeb housing)			★

Table 7. Rosemount 3051S 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 Style		**Material**	**Conduit Entry Size**	
Standard				**Standard**
00	None (SuperModule spare part, order output code A)			★
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 housing with output for remote interface	Aluminum	1/2–14 NPT	★
2F	Junction Box housing with output for remote interface	Aluminum	M20 x 1.5	★
2J	Junction Box housing	SST	1/2–14 NPT	★
2M	Junction Box housing with output for remote interface	SST	1/2–14 NPT	★
5A	Wireless PlantWeb housing	Aluminum	1/2–14 NPT	★
5J	Wireless PlantWeb housing	SST	1/2–14 NPT	★
7J[3]	Quick Connect (A size Mini, 4-pin male termination)	SST		★
Expanded				
1C	PlantWeb housing	Aluminum	G1/2	
1L	PlantWeb housing	SST	G1/2	
2C	Junction Box housing	Aluminum	G1/2	
2G	Junction Box housing with output for remote interface	Aluminum	G1/2	
Seal System Type				
Standard				**Standard**
1	Direct-mount seal system			★
High Pressure Side Extension (Between Transmitter Flange and Seal)				
Standard				**Standard**
0	Direct-Mount (No Extension)			★
Sensor Module Configuration (Low Side)				
Standard				**Standard**
1[4]	Tuned-System Assembly, One Capillary Remote Seal (Requires 1199 model number, see Table 7 on page 43 for seal information)			★
2	316L SST isolator / SST transmitter flange			★
3	Alloy C-276 isolator / SST transmitter flange			★
Capillary Length				
Standard				**Standard**
0	None			★
Seal Fill Fluid (High Side)		**Temperature Limits (Ambient Temperature of 70° F (21° C))**		
Standard				**Standard**
A	Syltherm XLT	-102 to 293 °F (-75 to 145 °C)		★
C	Silicone 704	32 to 401 °F (0 to 205 °C)		★
D	Silicone 200	-49 to 401 °F (-45 to 205 °C)		★
H	Inert (Halocarbon)	-49 to 320 °F (-45 to 160 °C)		★
G	Glycerine and Water	5 to 203 °F (-15 to 95 °C)		★
N	Neobee M-20	5 to 401 °F (-15 to 205 °C)		★
P	Propylene Glycol and Water	5 to 203 F (-15 to 95 °C)		★

Table 7. Rosemount 3051S 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 Style				
Standard				**Standard**
FF	Flush Flanged Seal			★
EF	Extended Flanged Seal			★
Process Connection Size (High Side)				
	Flush Flanged Seal	**Extended Flanged Seal**		
Standard				**Standard**
G	2-in./DN 50	—		★
7	3-in.	3-in./DN 80, 2.58-in. diaphragm		★
J	DN 80	—		★
9	4-in./DN 100	4-in./DN 100, 3.5-in. diaphragm		★
Flange Rating (High Side)				
Standard				**Standard**
1	ANSI/ASME B16.5 Class 150			★
2	ANSI/ASME B16.5 Class 300			★
4	ANSI/ASME B16.5 Class 600			★
G	PN 40 per EN 1092-1			★
E	PN 10/16 per EN 1092-1, Available with DN 100 only			★
Isolator, Flange Material (High Side)				
	Flush Flanged Seal Isolator	**Extended Flanged Seal Isolator and Wetted Parts**	**Flange Material**	
Standard				**Standard**
CA	316L SST	316L SST	CS	★
DA	316L SST	316L SST	SST	★
CB	Alloy C-276	Alloy C-276	CS	★
DB	Alloy C-276	Alloy C-276	SST	★
CC	Tantalum - seam welded[5]	—	CS	★
DC	Tantalum - seam welded[5]	—	SST	★
Lower Housing Material for FF, Extension Length for EF (High Side)[6]				
	Flush Flanged Seal	**Extended Flanged Seal**		
Standard				**Standard**
0	None	—		★
2	—	2-in. (50 mm)		★
4	—	4-in. (100 mm)		★
6	—	6-in. (150 mm)		★
A	316 SST	—		★
B	Alloy C-276	—		★
D	Carbon Steel	—		★
Flushing Connection Quantity and Size (Lower Housing, High Side)				
	Flush Flanged Seal	**Extended Flanged Seal**		
Standard				**Standard**
0	None	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)	—		★

Wireless Options (Requires option code X and wireless PlantWeb housing)

Update Rate		
Standard		**Standard**
WA	User Configurable Update Rate	★

Table 7. Rosemount 3051S 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.

Operating Frequency and Protocol		
Standard		**Standard**
3	2.4 GHz DSSS, WirelessHART	★
Omnidirectional Wireless Antenna		
Standard		**Standard**
WK	Long Range, Integral Antenna	★
WM	Extended Range, Integral Antenna	★
SmartPower™		
Standard		**Standard**
1(7)	Power Module Adapter, Intrinsically Safe (Power Module separate)	★

Other Options (Include with selected model number)

Diaphragm Thickness		
Expanded		
SC	0.006-in. (150 µm) available with 316L SST and Alloy C-276	
Flushing Plug, Vent/Drain Valve		
Standard		**Standard**
SD	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)	★
Gasket Material		
Standard		**Standard**
SJ	PTFE gasket (for use with flushing connection ring)	★
Expanded		
SN	Grafoil® gasket (for use with flushing connection ring)	
Code Conformance		
Standard		**Standard**
ST(8)	Wetted Materials Compliance to NACE MRO175/ISO 15156, MRO103	★
PlantWeb Control Functionality		
Standard		**Standard**
A01(11)	FOUNDATION fieldbus Advanced Control Function Block Suite	★
PlantWeb Diagnostic Functionality		
Standard		**Standard**
D01(11)	FOUNDATION fieldbus Diagnostics Suite	★
DA2(9)(11)	Advanced HART Diagnostics Suite	★
Software Configuration		
Standard		**Standard**
C1(10)	Custom software configuration (Requires Configuration Data Sheet)	★
Gage Pressure Calibration		
Standard		**Standard**
C3	Gage Pressure Calibration (3051SxLA4 only)	★
Alarm Limit		
Standard		**Standard**
C4(10)(11)	NAMUR alarm and saturation levels, high alarm	★
C5(10)(11)	NAMUR alarm and saturation levels, low alarm	★
C6(10)(11)	Custom alarm and saturation signal levels, high alarm (Requires C1 and Configuration Data Sheet)	★
C7(10)(11)	Custom alarm and saturation signal levels, low alarm (Requires C1 and Configuration Data Sheet)	★
C8(10)(11)	Low alarm (standard Rosemount alarm and saturation levels)	★
Hardware Adjustments		
Standard		**Standard**
D1(10)(11)(12)	Hardware adjustments (zero, span, alarm, security)	★

Table 7. Rosemount 3051S 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.

Flange Adapter		
Standard		**Standard**
D2	1/2-14 NPT flange adapter	★
Expanded		
D9	RC 1/2 SST flange adapter	
Custody Transfer		
Standard		**Standard**
D3(13)	Measurement Canada Accuracy Approval	★
Ground Screw		
Standard		**Standard**
D4	External ground screw assembly	★
Drain/Vent Valve		
Standard		**Standard**
D5	Delete transmitter drain/vent valves (install plugs)	★
Conduit Plug		
Standard		**Standard**
D0(14)	316 SST Conduit Plug	★
Product Certifications(15)		
Standard		**Standard**
E1	ATEX Flameproof	★
E2	INMETRO Flameproof	★
E3	China Flameproof	★
E4	TIIS Flameproof	★
E5	FM Explosion-proof, Dust Ignition-proof	★
E6(16)	CSA Explosion-proof, Dust Ignition-proof, Division 2	★
E7	IECEx Flameproof, Dust Ignition-proof	★
I1	ATEX Intrinsic Safety	★
I2	INMETRO Intrinsic Safety	★
I3	China Intrinsic Safety	★
I4(17)	TIIS Intrinsic Safety	★
I5	FM Intrinsically Safe, Division 2	★
I6	CSA Intrinsically Safe	★
I7	IECEx Intrinsic Safety	★
IA	ATEX FISCO Intrinsic Safety (FOUNDATION fieldbus protocol only)	★
IE	FM FISCO Intrinsically Safe (FOUNDATION fieldbus protocol only)	★
IF	CSA FISCO Intrinsically Safe (FOUNDATION fieldbus protocol only)	★
IG	IECEx FISCO Intrinsic Safety (FOUNDATION fieldbus protocol only)	★
K1	ATEX Flameproof, Intrinsic Safety, Type n, Dust	★
K2	INMETRO Flameproof, Intrinsic Safety	★
K5	FM Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
K6(23)	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
K7	IECEx Flameproof, Dust Ignition-proof, Intrinsic Safety, Type n	★
KA(23)	ATEX and CSA Flameproof, Intrinsically Safe, Division 2	★
KB(23)	FM and CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
KC	FM and ATEX Explosion-proof, Intrinsically Safe, Division 2	★
KD(23)	FM, CSA, and ATEX Explosion-proof, Intrinsically Safe	★
N1	ATEX Type n	★
N7	IECEx Type n	★
ND	ATEX Dust	★
Sensor Fill Fluid		
Standard		**Standard**
L1(18)	Inert sensor fill fluid	★

Table 7. Rosemount 3051S 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.

O-ring		
Standard		**Standard**
L2	Graphite-filled PTFE o-ring	★
Bolting Material		
Standard		**Standard**
L4	Austenitic 316 SST bolts	★
L5(8)	ASTM A193, Grade B7M bolts	★
L6	Alloy K-500 bolts	★
L7(8)	ASTM A453, Class D, Grade 660 bolts	★
L8	ASTM A193, Class 2, Grade B8M bolts	★
Display Type(19)		
Standard		**Standard**
M5	PlantWeb LCD Display	★
M7(11)(20)(21)	Remote mount LCD display and interface, PlantWeb housing, no cable, SST bracket	★
M8(11)(20)	Remote mount LCD display and interface, PlantWeb housing, 50 ft. (15 m) cable, SST bracket	★
M9(11)(20)	Remote mount LCD display and interface, PlantWeb housing, 100 ft. (31 m) cable, SST bracket	★
Pressure Testing		
Expanded		
P1	Hydrostatic testing with certificate	
Special Cleaning		
Expanded		
P2	Cleaning for special services	
P3	Cleaning for less than 1PPM chlorine/fluorine	
Calibration Certification		
Standard		**Standard**
Q4	Calibration certificate	★
QP	Calibration certificate and tamper evident seal	★
Material Traceability Certification		
Standard		**Standard**
Q8	Material traceability certification per EN 10204 3.1	★
Quality Certification for Safety		
Standard		**Standard**
QS(10)(11)	Prior-use certificate of FMEDA data	★
QT(22)	Safety certified to IEC 61508 with certificate of FMEDA data	★
Transient Protection		
Standard		**Standard**
T1(23)(24)	Transient terminal block	★
Toolkit Total System Performance Reports		
Standard		**Standard**
QZ	Remote Seal System Performance Calculation Report	★
Conduit Electrical Connector		
Standard		**Standard**
GE(25)	M12, 4-pin, Male Connector (eurofast®)	★
GM(25)	A size Mini, 4-pin, Male Connector (minifast®)	★
Typical Model Number for EF seal: 3051S2LD 2A A 1A 1 0 2 0 D EF 7 1 DA 2 0		

(1) Requires PlantWeb housing.

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

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

(4) With option code 1, user must select Seal Location option code M in Table 7.

(5) Not recommended for use with spiral wound metallic gaskets (see 1199 product data sheet, document 00813-0100-4016 for additional options).

(6) Standard gasket for lower housing consists of non-asbestos fiber.

(7) Long-life Power Module must be shipped separately, order Part No. 00753-9220-0001.

(8) 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.

(9) Requires PlantWeb housing and output code A. Includes Hardware Adjustments as standard.

(10) Not available with output code F.

(11) Not available with output code X.

(12) Not available with housing style codes 00, 2E, 2F, 2G, 2M, 5A, 5J, or 7J.

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

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

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

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

(17) Only available with output code X.

(18) Only available on differential and gage measurement types. Silicone fill fluid is standard.

(19) Not available with Housing 7J.

(20) Not available with output code F, option code DA1, or option code QT.

(21) See the 3051S Reference Manual (document number 00809-0100-4801) for cable requirements. Contact an Emerson Process Management representative for additional information.

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

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

(24) 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.

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

Specifications

PERFORMANCE SPECIFICATIONS

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

Conformance to Specification (±3σ (Sigma))

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

Reference Accuracy

Stated reference accuracy equations include terminal based linearity, hysteresis, and repeatability.

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

Transmitter with Coplanar Sensor Module (Single Variable)

Differential Pressure (3051S_CD) Gage Pressure (3051S_CG)			
	Ultra	**Classic**	**Ultra for Flow(1)**
Ranges 2 - 4	±0.025% of span; For spans less than 10:1, ±[0.005 + 0.0035(URL / Span)]% of span	±0.055% of span; For spans less than 10:1, ±[0.015 + 0.005(URL / Span)]% of span	±0.04% of reading up to 8:1 DP turndown from URL; ±[0.04 + 0.0023(URL / Reading)]% of reading to 200:1 DP turndown from URL
Range 5	±0.05% of span; For spans less than 10:1, ±[0.005 + 0.0045(URL / Span)]% of span	±0.065% of span; For spans less than 10:1, ±[0.015 + 0.005(URL / Span)]% of span	Not Available
Range 1	±0.09% of span; For spans less than 15:1, ±[0.015 + 0.005(URL / Span)]% of span	±0.10% of span; For spans less than 15:1, ±[0.025 + 0.005(URL / Span)]% of span	Not Available
Range 0	±0.09% of span; For spans less than 2:1, ±0.045% of URL	±0.10% of span; For spans less than 2:1, ±0.05% of URL	Not Available
Absolute Pressure (3051S_CA)			
	Ultra	**Classic**	
Ranges 1 - 4	±0.025% of span; For spans less than 10:1, ±[0.004(URL / Span)]% of span	±0.055% of span; For spans less than 10:1, ±[0.0065(URL / Span)]% of span	
Range 0	±0.075% of span; For spans less than 5:1, ±[0.025 + 0.01(URL / Span)]% of span	±0.075% of span; For spans less than 5:1, ±[0.025 + 0.01(URL / Span)]% of span	

(1) Ultra for Flow is only available for 3051S_CD ranges 2-3 and 3051SMV DP ranges 2-3. For calibrated spans from 1:1 to 2:1 of URL, add ±0.005% of span analog output error.

Transmitter with In-Line Sensor Module

Absolute Pressure (3051S_TA) Gage Pressure (3051S_TG)		
	Ultra	**Classic**
Ranges 1 - 4	±0.025% of span For spans less than 10:1, ±[0.004(URL / Span)]% of span	±0.055% of span For spans less than 10:1, ±[0.0065(URL / Span)]% of span
Range 5	±0.04% of span	±0.065% of span

Transmitter with MultiVariable Sensor Module

Differential Pressure and Static Pressure (3051SMV_ _1 or 2)		
	Classic MV	**Ultra for Flow(1)**
DP Ranges 2-3	±0.04% of span For spans less than 10:1, ±[0.01 + 0.004(URL / Span)]% of span	±0.04% of reading up to 8:1 DP turndown from URL ±[0.04 + 0.0023(URL / Reading)]% of reading to 200:1 DP turndown from URL
DP Range 1	±0.10% of span For spans less than 15:1, ±[0.025 + 0.005(URL / Span)]% of span	Not Available
AP & GP Ranges 3-4	±0.055% of span For spans less than 10:1, ±[0.0065(URL / Span)]% of span	±0.025% of span For spans less than 10:1, ±[0.004(URL / Span)]% of span

(1) Ultra for Flow is only available for 3051SMV DP ranges 2-3. For calibrated DP spans from 1:1 to 2:1 of URL, add ±0.005% of span analog output error.

Liquid Level Transmitter

3051S_L		
	Ultra	**Classic**
	±0.065% of span For spans less than 10:1, ±[0.015 + 0.005(URL / Span)]% of span	±0.065% of span For spans less than 10:1, ±[0.015 + 0.005(URL / Span)]% of span

Process Temperature RTD Interface(1)

Process Temperature (3051SMV_ _1 or 3)
±0.67 °F (0.37 °C)

(1) Specifications for process temperature are for the transmitter portion only. The transmitter is compatible with any Pt 100 (100 ohm platinum) RTD. Examples of compatible RTDs include Rosemount series 68 and 78 RTD Temperature Sensors.

Transmitter Total Performance

Total performance is based on combined errors of reference accuracy, ambient temperature effect, and line pressure effect.

Models		Ultra	Classic and Classic MV	Ultra for Flow[1]
3051S_CD	Ranges 2-3	±0.1% of span; for ±50°F (28°C) temperature changes; 0-100% relative humidity, up to 740 psi (51 bar) line pressure (DP only), from 1:1 to 5:1 rangedown	±0.15% of span; for ±50°F (28°C) temperature changes; 0-100% relative humidity, up to 740 psi (51 bar) line pressure (DP only), from 1:1 to 5:1 rangedown	±0.1% of reading; for ±50°F (28°C) temperature changes; 0-100% relative humidity, up to 740 psi (51 bar) line pressure, over 8:1 DP turndown from URL
3051S_CG	Ranges 2-5			
3051S_CA	Ranges 2-4			
3051S_T	Ranges 2-4			
3051SMV[2]	DP Ranges 2-5			
3051S_L		Use *Instrument Toolkit or the QZ Option to quantify the total performance of a remote seal assembly under operating conditions.*		

(1) Ultra for Flow is only available for 3051S_CD Ranges 2-3 and 3051SMV DP Ranges 2-3.

(2) For 3051SMV, Transmitter Total Performance specification applies to differential pressure measurement only.

MultiVariable Flow Performance[1]

Mass, Energy, Actual Volumetric, and Totalized Flow Reference Accuracy

Models	Ultra for Flow	Classic MV
3051SMV[2]		
DP Ranges 2-3	±0.65% of Flow Rate over a 14:1 flow range (200:1 DP range)	±0.70% of Flow Rate over 8:1 flow range (64:1 DP range)
DP Range 1	Not Available	±0.90% of Flow Rate over 8:1 flow range (64:1 DP range)
Annubar Flowmeter (3051SFA)		
Ranges 2-3	±0.85% of flow rate at 8:1 flow turndown	±0.80% of flow rate at 14:1 flow turndown
Compact Conditioning Orifice Flowmeter (3051SFC_C)		
Ranges 2-3		
$\beta = 0.4$	±0.60% of flow rate at 8:1 flow turndown	±0.55% of flow rate at 14:1 flow turndown
$\beta = 0.65$	±1.05% of flow rate at 8:1 flow turndown	±1.00% of flow rate at 14:1 flow turndown
Compact Orifice Flowmeter[3] (3051SFC_P)		
Ranges 2-3		
$\beta = 0.4$	±1.30% of flow rate at 8:1 flow turndown	±1.25% of flow rate at 14:1 flow turndown
$\beta = 0.65$	±1.30% of flow rate at 8:1 flow turndown	±1.25% of flow rate at 14:1 flow turndown
Integral Orifice Flowmeter (3051SFP)		
Ranges 2-3		
$\beta < 0.1$	±2.55% of flow rate at 8:1 flow turndown	±2.50% of flow rate at 14:1 flow turndown
$0.1 < \beta < 0.2$	±1.35% of flow rate at 8:1 flow turndown	±1.30% of flow rate at 14:1 flow turndown
$0.2 < \beta < 0.6$	±0.85% of flow rate at 8:1 flow turndown	±0.80% of flow rate at 14:1 flow turndown
$0.6 < \beta < 0.8$	±1.55% of flow rate at 8:1 flow turndown	±1.50% of flow rate at 14:1 flow turndown

(1) Flow performance specifications assume device is configured for full compensation of static pressure, process temperature, density, viscosity, gas expansion, discharge coefficient, and thermal correction variances over a specified operating range.

(2) Uncalibrated differential producer (0.2 < beta < 0.6 Orifice) installed per ASME MFC 3M or ISO 5167-1. Uncertainties for discharge coefficient, producer bore, tube diameter, and gas expansion factor as defined in ASME MFC 3M or ISO 5167-1. Reference accuracy does not include RTD sensor accuracy.

(3) For line sizes less than 2-in. (50mm), see the Rosemount DP Flowmeters and Primary Elements Product Data Sheet (document number 00813-0100-4485).

Uncompensated Flow Performance

Flow performance specifications assume the device only uses DP readings without pressure and temperature compensation.

Models	Ultra	Classic	Ultra for Flow
Annubar Flowmeter (3051SFA)			
Ranges 2-3	±0.85% of flow rate at 8:1 flow turndown	±0.9% of flow rate at 8:1 flow turndown	±0.80% of flow rate at 14:1 flow turndown
Compact Conditioning Orifice Flowmeter (3051SFC_C)			
Ranges 2-3			
$\beta = 0.4$	±0.85% of flow rate at 8:1 flow turndown	±1.05% of flow rate at 8:1 flow turndown	±0.80% of flow rate at 14:1 flow turndown
$\beta = 0.65$	±1.20% of flow rate at 8:1 flow turndown	±1.35% of flow rate at 8:1 flow turndown	±1.15% of flow rate at 14:1 flow turndown
Compact Orifice Flowmeter(1) (3051SFC_P)			
Ranges 2-3			
$\beta = 0.4$	±1.45% of flow rate at 8:1 flow turndown	±1.55% of flow rate at 8:1 flow turndown	±1.40% of flow rate at 14:1 flow turndown
$\beta = 0.65$	±1.45% of flow rate at 8:1 flow turndown	±1.55% of flow rate at 8:1 flow turndown	±1.40%of flow rate at 14:1 flow turndown
Integral Orifice Flowmeter (3051SFP)			
Ranges 2-3			
$\beta < 0.1$	±2.65% of flow rate at 8:1 flow turndown	±2.70% of flow rate at 8:1 flow turndown	±2.60% of flow rate at 14:1 flow turndown
$0.1 < \beta < 0.2$	±1.45% of flow rate at 8:1 flow turndown	±1.60% of flow rate at 8:1 flow turndown	±1.40% of flow rate at 14:1 flow turndown
$0.2 < \beta < 0.6$	±1.05% of flow rate at 8:1 flow turndown	±1.20% of flow rate at 8:1 flow turndown	±0.95% of flow rate at 14:1 flow turndown
$0.6 < \beta < 0.8$	±1.70% of flow rate at 8:1 flow turndown	±1.80% of flow rate at 8:1 flow turndown	±1.65% of flow rate at 14:1 flow turndown

(1) For line sizes less than 2-in. (50mm), see the Rosemount DP Flowmeters and Primary Elements Product Data Sheet (document number 00813-0100-4485).

Long Term Stability

Pressure

Models		Ultra and Ultra for Flow(1)	Classic and Classic MV
3051S_CD	Ranges 2-5	±0.20% of URL for 10 years; for ±50°F (28°C) temperature changes, up to 1000 psi (68,9 bar) line pressure	±0.125% of URL for 5 years; for ±50°F (28°C) temperature changes, up to 1000 psi (68,9 bar) line pressure
3051S_CG	Ranges 2-5		
3051S_CA	Ranges 1-4		
3051S_T	Ranges 1-5		
3051SMV	DP Ranges 2-5		
3051SF	AP & GP Ranges 3-4		

(1) Ultra is only available for 3051S, 3051SMV_ _3 and 4, 3051SF_3, 4, 7 and D. Ultra for Flow is only available on 3051S_CD ranges 2-3, 3051SMV DP ranges 2-3, and 3051SF DP ranges 2-3.

Process Temperature(1)

Models		
3051SMV **3051SF**	RTD Interface	The greater of ±0.185°F (0.103°C) or 0.1% of reading per year (excludes RTD sensor stability).

(1) Specifications for process temperature are for the transmitter portion only. The transmitter is compatible with any Pt 100 (100 ohm platinum) RTD. Examples of compatible RTDs include the Rosemount Series 68 and 78 RTD Temperature Sensors.

Warranty(1)

Models	Ultra and Ultra for Flow	Classic and Classic MV
All 3051S Products	12-year limited warranty(2)	1-year limited warranty(3)

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

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

Total Time Response at 75 °F (24 °C), includes dead time(1)

3051S_C 3051SF_D 3051S_L	3051S_T	3051SMV_ _1 or 2 3051SF_1, 2, 5, or 6	3051SMV_ _3 or 4 3051SF_3, 4, or 7
DP Ranges 2-5: 100 ms Range 1: 255 ms Range 0: 700 ms	100 ms	DP Range 1: 310 ms DP Range 2: 170 ms DP Range 3: 155 ms AP & GP: 240 ms	DP Ranges 2-5: 145 ms DP Range 1: 300 ms DP Range 0: 745 ms

(1) For FOUNDATION fieldbus (output code F), add 52 ms to stated values (not including segment macro-cycle). For option code DA2, add 45 ms (nominal) to stated values.

Dead Time(1)

3051S_C 3051S_T 3051SF_D 3051S_L	3051SMV 3051SF_1-7
45 ms (nominal)	DP: 100 ms AP & GP: 140 ms RTD Interface: 1 s

(1) For option code DA2, dead time is 90 milliseconds (nominal).

Update Rate(1)

3051S_C or T 3051SF_D 3051S_L	3051SMV 3051SF_1-7	
22 updates per sec.	DP: 22 updates per sec. AP & GP: 11 updates per sec. RTD Interface: 1 update per sec.	Calculated Variables: Mass / Volumetric Flow Rate: 22 updates per sec. Energy Flow Rate: 22 updates per sec. Totalized Flow: 1 update per sec.

(1) Does not apply to Wireless (output code X). See"WirelessHART" on page 62 for wireless update rate.

Ambient Temperature Effect

Transmitter with Coplanar Sensor Module (Single Variable)

Differential Pressure: (3051S_CD, 3051SMV_ _3 or 4) **Gage Pressure: (3051S_CG)**			
	Ultra **per 50 °F (28 °C)**	**Classic** **per 50 °F (28 °C)**	**Ultra for Flow(1)** **-40 to 185 °F (-40 to 85 °C)**
Ranges 2 - 5(2)	±(0.009% URL + 0.025% span) from 1:1 to 10:1; ±(0.018% URL + 0.08% span) from >10:1 to 200:1	±(0.0125% URL +0.0625% span) from 1:1 to 5:1; ±(0.025% URL + 0.125% span) from >5:1 to 100:1	±0.13% of reading up to 8:1 DP turndown from URL; ±[0.13 + 0.0187(URL/Reading)]% of reading to 100:1 DP turndown from URL
Range 0	±(0.25% URL + 0.05% span) from 1:1 to 30:1	±(0.25% URL + 0.05% span) from 1:1 to 30:1	Not Available
Range 1	±(0.1% URL + 0.25% span) from 1:1 to 50:1	±(0.1% URL + 0.25% span) from 1:1 to 50:1	Not Available
Absolute Pressure: (3051S_CA)			
	Ultra **per 50 °F (28 °C)**	**Classic** **per 50 °F (28 °C)**	
Ranges 2-4	±(0.0125% URL + 0.0625% span) from 1:1 to 5:1; ±(0.025% URL + 0.125% span) from >5:1 to 200:1	±(0.0125% URL + 0.0625% span) from 1:1 to 5:1; ±(0.025% URL + 0.125% span) from >5:1 to 100:1	
Range 0	±(0.1% URL + 0.25% span) from 1:1 to 30:1	±(0.1% URL + 0.25% span) from 1:1 to 30:1	
Range 1	±(0.0125% URL + 0.0625% span) from 1:1 to 5:1; ±(0.025% URL + 0.125% span) from >5:1 to 100:1	±(0.0125% URL + 0.0625% span) from 1:1 to 5:1; ±(0.025% URL + 0.125% span) from >5:1 to 100:1	

(1) Ultra for Flow is only available for 3051S_CD Ranges 2-3 and 3051SMV DP Ranges 2-3.

(2) Use Classic specification for 3051SMV DP Range 5 Ultra and 3051S_CD Range 5 Ultra.

Transmitter with In-Line Sensor Module

Absolute Pressure: (3051S_TA) **Gage Pressure: (3051S_TG)**			
	Ultra **per 50 °F (28 °C)**	**Classic** **per 50 °F (28 °C)**	
Ranges 2-4	±(0.009% URL + 0.025% span) from 1:1 to 10:1; ±(0.018% URL + 0.08% span) from >10:1 to 100:1	±(0.0125% URL + 0.0625% span) from 1:1 to 5:1; ±(0.025% URL + 0.125% span) from >5:1 to 100:1	
Range 5	±(0.05% URL + 0.075% span) from 1:1 to 10:1	±(0.05% URL + 0.075% span) from 1:1 to 10:1	
Range 1	±(0.0125% URL + 0.0625% span) from 1:1 to 5:1; ±(0.025% URL + 0.125% span) from >5:1 to 100:1	±(0.0125% URL + 0.0625% span) from 1:1 to 5:1; ±(0.025% URL + 0.125% span) from >5:1 to 100:1	

Ambient Temperature Effect (continued)

Transmitter with MultiVariable Sensor Module

Differential Pressure and Static Pressure (3051SMV_ _1 or 2)			
Models		**Classic MV** **Per 50 °F (28 °C)**	**Ultra for Flow** **-40 to 185 °F (-40 to 85 °C)**
DP Ranges 2-3		±(0.0125% URL + 0.0625% span) from 1:1 to 5:1; ±(0.025% URL + 0.125% span) for >5:1	±0.13 reading up to 8:1 DP turndown from URL; ±[0.13 + 0.0187(URL/Reading)]% reading to 100:1 DP turndown from URL
DP Range 1		±(0.1% URL + 0.25% span) from 1:1 to 50:1	Not available
AP & GP		±(0.0125% URL + 0.0625% span) from 1:1 to 10:1; ±(0.025% URL + 0.125% span) for >10:1	±(0.009% URL + 0.025% span) from 1:1 to 10:1; ±(0.018% URL + 0.08% span) for >10:1

Liquid Level Transmitter

3051S_L			
		Ultra	**Classic**
		See *Instrument Toolkit*	See *Instrument Toolkit*

Process Temperature RTD Interface(1)

Process Temperature (3051SMV_ _1 or 3)			
		Classic MV **Per 50 °F (28 °C)**	**Ultra for Flow** **-40 to 185 °F (-40 to 85 °C)**
		±0.39 °F (0,216 °C) per 50 °F (28 °C)	±0.39 °F (0,216 °C) per 50 °F (28 °C)

(1) Specifications for process temperature are for the transmitter portion only. The transmitter is compatible with any Pt 100 (100 ohm platinum) RTD. Examples of compatible RTDs include Rosemount series 68 and 78 RTD Temperature Sensors.

Line Pressure Effect(1)

3051S_CD **3051SMV (DP Measurement Only)**	**Ultra and Ultra for Flow**	**Classic and Classic MV**
Zero Error(2)		
Range 2-3	± 0.025% URL per 1000 psi (69 bar)	± 0.05% URL per 1000 psi (69 bar)
Range 0	± 0.125% URL per 100 psi (6,9 bar)	± 0.125% URL per 100 psi (6,9 bar)
Range 1	± 0.25% URL per 1000 psi (69 bar)	± 0.25% URL per 1000 psi (69 bar)
Span Error(3)		
Range 2-3	± 0.1% of reading per 1000 psi (69 bar)	± 0.1% of reading per 1000 psi (69 bar)
Range 0	± 0.15% of reading per 100 psi (6,9 bar)	± 0.15% of reading per 100 psi (6,9 bar)
Range 1	± 0.4% of reading per 1000 psi (69 bar)	± 0.4% of reading per 1000 psi (69 bar)

(1) For zero error specifications for line pressures above 2000 psi (137,9 bar) or line pressure effect specifications for DP Ranges 4-5, see the 3051SMV Reference Manual (document number 00809-0100-4803) or 3051S Reference Manual (document number 00809-0100-4801).

(2) Zero error can be removed by performing a zero trim at line pressure.

(3) Specifications for option code P0 are 2 times those shown above.

Mounting Position Effects

Models		Ultra, Ultra for Flow, Classic and Classic MV
3051S_CD or CG **3051SMV_ _ 3 or 4** **3051SF_3, 4, 7, or D**		Zero shifts up to ±1.25 inH_2O (3,11 mbar), which can be zeroed Span: no effect
3051S_CA **3051S_T**		Zero shifts to ±2.5 inH_2O (6,22 mbar), which can be zeroed Span: no effect
3051SMV_ _ 1 or 2 **3051SF_1, 2, 5, or 6**	DP Sensor:	Zero shifts up to ±1.25 inH_2O (3,11 mbar), which can be zeroed Span: no effect
	GP/AP Sensor:	Zero shifts to ±2.5 inH_2O (6,22 mbar), which can be zeroed Span: no effect
3051S_L		With liquid level diaphragm in vertical plane, zero shift of up to ±1 inH_2O (2,5 mbar). With diaphragm in vertical plane, zero shift of up to ±5 inH_2O (12,5 mbar) plus extension length on extended units. All zero shifts can be zeroed. Span: no effect

Vibration Effect

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).

Power Supply Effect

Less than ±0.005% of calibrated span per volt change in voltage at the transmitter terminals

Electromagnetic Compatibility (EMC)

Meets all relevant requirements of EN 61326 and NAMUR NE-21.(1)(2)

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

(2) 3051SMV and 3051SF_1, 2, 3, 4, 5, 6, 7 requires shielded cable for both temperature and loop wiring.

Transient Protection (Option T1)

Tested in accordance with IEEE C62.41.2-2002,
Location Category B

6 kV crest (0.5 μs - 100 kHz)

3 kA crest (8 × 20 microseconds)

6 kV crest (1.2 × 50 microseconds)

FUNCTIONAL SPECIFICATIONS

Range and Sensor Limits

Transmitter with Coplanar Sensor Module (Single Variable)

Range	DP Sensor[1] (3051S_CD, 3051SMV_ _3, 4, or D 3051SF_3, 4, or 7, 3051S_LD)		GP Sensor (3051S_CG, 3051S_LG)		AP Sensor[2] (3051S_CA, 3051S_LA)	
	Lower (LRL)[3]	Upper (URL)	Lower (LRL)[4]	Upper (URL)	Lower (LRL)	Upper (URL)
0	-3 inH_2O (-7,5 mbar)	3 inH_2O (7,5 mbar)	N/A	N/A	0 psia (0 bar)	5 psia (0,34 bar)
1	-25 inH_2O (-62,3 mbar)	25 inH_2O (62,3 mbar)	-25 inH_2O (-62,3 mbar)	25 inH_2O (62,3 mbar)	0 psia (0 bar)	30 psia (2,07 bar)
2	-250 inH_2O (-0,62 bar)	250 inH_2O (0,62 bar)	-250 inH_2O (-0,62 bar)	250 inH_2O (0,62 bar)	0 psia (0 bar)	150 psia (10,34 bar)
3	-1000 inH_2O (-2,49 bar)	1000 inH_2O (2,49 bar)	-393 inH_2O (-979 mbar)	1000 inH_2O (2,49 bar)	0 psia (0 bar)	800 psia (55,16 bar)
4	-300 psi (-20,7 bar)	300 psi (20,7 bar)	-14.2 psig (-979 mbar)	300 psi (20,7 bar)	0 psia (0 bar)	4000 psia (275,8 bar)
5	-2000 psi (-137,9 bar)	2000 psi (137,9 bar)	-14.2 psig (-979 mbar)	2000 psi (137,9 bar)	N/A	N/A

(1) 3051SF flowmeters only available with ranges 1, 2, and 3.

(2) Range 0 is not available for 3051S_LA.

(3) The Lower Range Limit (LRL) is 0 in$H_2$0 (0 mbar) for Ultra for Flow performance class and 3051SF flowmeters.

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

Transmitter with In-Line Sensor Module

Range	GP Sensor (3051S_TG)		AP Sensor (3051S_TA)	
	Lower (LRL)[1]	Upper (URL)	Lower (LRL)	Upper (URL)
1	-14.7 psig (-1,01 bar)	30 psig (2,07 bar)	0 psia (0 bar)	30 psia (2,07 bar)
2	-14.7 psig (-1,01 bar)	150 psig (10,34 bar)	0 psia (0 bar)	150 psia (10,34 bar)
3	-14.7 psig (-1,01 bar)	800 psig (55,16 bar)	0 psia (0 bar)	800 psia (55,16 bar)
4	-14.7 psig (-1,01 bar)	4000 psig (275,8 bar)	0 psia (0 bar)	4000 psia (275,8 bar)
5	-14.7 psig (-1,01 bar)	10000 psig (689,5 bar)	0 psia (0 bar)	10000 psia (689,5 bar)

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

Transmitter with MultiVariable Sensor Module (3051SMV_ _1, 3051SMV_ _2, 3051SF_1, 3051SF_2, 3051SF_5, and 3051SF_6)

Range	DP Sensor	
	Lower (LRL)[1]	Upper (URL)
1	-25.0 inH_2O (-62,3 mbar)	25.0 inH_2O (62,3 mbar)
2	-250.0 inH_2O (-0,62 bar)	250.0 inH_2O (0,62 bar)
3	-1000.0 inH_2O (-2,49 bar)	1000.0 inH_2O (2,49 bar)

(1) Lower (LRL) is 0 inH_2O (0 mbar) for Ultra for Flow and 3051SF_ Flowmeters.

Range	Static Pressure Sensor (GP/AP)	
	Lower (LRL)	Upper (URL)[1]
3	GP[2][3]: -14.2 psig (0,98 bar) AP: 0.5 psia (34,5 mbar)	GP: 800 psig (55,16 bar) AP: 800 psia (55,16 bar)
4	GP[2][3]: -14.2 psig (0,98 bar) AP: 0.5 psia (34,5 mbar)	GP: 3626 psig (250 bar) AP: 3626 psia (250 bar)

(1) For SP Range 4 with DP Range 1, the URL is 2000 psi (137,9 bar).

(2) Inert Fill: Minimum pressure = 1.5 psia (0,10 bar) or -13.2 psig (-0,91 bar).

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

Process Temperature RTD Interface (3051SMV_ _1 or 3, 3051SF_1, 3, 5 or 7)[1]

Lower (LRL)	Upper (URL)
-328 °F (-200 °C)	1562 °F (850 °C)

(1) Transmitter is compatible with any Pt 100 RTD sensor. Examples of compatible RTDs include Rosemount Series 68 and 78 RTD Temperature Sensors.

Minimum Span Limits

Transmitter with Coplanar Sensor Module (Single Variable)

Range	DP Sensor[1] (3051S_CD, 3051SMV_ _3 or 4, 3051SF_D, 3, 4 or 7, 3051S_LD)		GP Sensor (3051S_CG, 3051S_LG)		AP Sensor (3051S_CA, 3051S_LA)	
	Ultra & Ultra for Flow	Classic	Ultra	Classic	Ultra	Classic
0	0.1 inH_2O (0,25 mbar)	0.1 inH_2O (0,25 mbar)	N/A	N/A	0.167 psia (11,5 mbar)	0.167 psia (11,5 mbar)
1	0.5 inH_2O (1,24 mbar)	0.5 inH_2O (1,24 mbar)	0.5 inH_2O (1,24 mbar)	0.5 inH_2O (1,24 mbar)	0.3 psia (20,7 mbar)	0.3 psia (20,7 mbar)
2	1.3 inH_2O (3,11 mbar)	2.5 inH_2O (6,23 mbar)	1.3 inH_2O (3,11 mbar)	2.5 inH_2O (6,23 mbar)	0.75 psia (51,7 mbar)	1.5 psia (103,4 mbar)
3	5.0 inH_2O (12,4 mbar)	10.0 inH_2O (24,9 mbar)	5.0 inH_2O (12,4 mbar)	10.0 inH_2O (24,9 mbar)	4 psia (275,8 mbar)	8 psia (0,55 bar)
4	1.5 psi (103,4 mbar)	3.0 psi (206,8 mbar)	1.5 psig (103,4 mbar)	3.0 psig (206,8 mbar)	20 psia (275,8 mbar)	40 psia (2,76 bar)
5	10.0 psi (689,5 mbar)	20.0 psi (1,38 bar)	10.0 psig (689,5 mbar)	20.0 psig (1,38 bar)	N/A	N/A

(1) 3051SF flowmeters only available with ranges 1, 2, and 3.

Transmitter with In-Line Sensor Module

Range	GP Sensor (3051S_TG)		AP Sensor (3051S_TA)	
	Ultra	Classic	Ultra	Classic
1	0.3 psig (20,7 mbar)	0.3 psig (20,7 mbar)	0.3 psia (20,7 mbar)	0.3 psia (20,7 mbar)
2	0.75 psig (51,7 mbar)	1.5 psig (103,4 bar)	0.75 psia (51,7 mbar)	1.5 psia (103,4 bar)
3	4 psig (275,8 mbar)	8 psig (0,55 bar)	4 psia (275,8 mbar)	8 psia (0,55 bar)
4	20 psig (1,58 bar)	40 psig (2,76 bar)	20 psia (1,58 bar)	40 psia (2,76 bar)
5	1000 psig (68,9 bar)	2000 psig (137,9 bar)	1000 psia (68,9 bar)	2000 psia (137,9 bar)

Transmitter with MultiVariable Sensor Module (3051SMV_ _1 or 2, 3051SF_1, 2, 5, or 6)

Range	DP Sensor	
	Ultra for Flow	**Classic MV**
1	0.5 inH_2O (1,24 mbar)	0.5 inH_2O (1,24 mbar)
2	1.3 inH_2O (3,11 mbar)	2.5 inH_2O (6,23 mbar)
3	5.0 inH_2O (12,4 mbar)	10.0 inH_2O (24,9 mbar)
Range	**Static Pressure Sensor (GP/AP)**	
	Ultra for Flow	**Classic MV**
3	4.0 psi (276 mbar)	8.0 psi (522 mbar)
4	18.13 psi (1,25 bar)	36.26 psi (2,50 bar)

Process Temperature RTD Interface (3051SMV_ _1 or 3, 3051SF_1, 3, 5 or 7)

Minimum Span = 50 °F (28 °C)

Service

3051S, 3051SMV_P, and 3051SF_5, 6, 7, or D (Direct Process Variable Output):

Liquid, gas, and vapor applications

3051SMV_M and 3051SF_1, 2, 3, or 4 (Mass and Energy Flow Output):

Some fluid types are only supported by certain measurement types

Fluid Compatibility with Pressure and Temperature Compensation • Available — Not available

Ordering Code		Fluid Types			
	Measurement Type	**Liquids**	**Saturated Steam**	**Superheated Steam**	**Gas and Natural Gas**
1	DP / P/ T (Full Compensation)	•	•	•	•
2	DP / P	•	•	•	•
3	DP / T	•	•	—	—
4	DP only	•	•	—	—

HART / 4–20 mA

Zero and Span Adjustment

Zero and span values can be set anywhere within the range. Span must be greater than or equal to the minimum span.

Output

Two-wire 4–20 mA is 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.

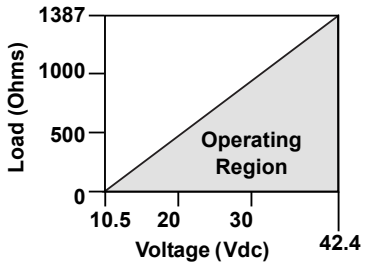
- 3051S and 3051SF_D: 10.5 to 42.4 Vdc with no load
- 3051S and 3051SF_D with Advanced HART Diagnostics Suite: 12 to 42.4 Vdc with no load
- 3051SMV and 3051SF_1-7: 12 to 42.4 Vdc with no load

Load Limitations

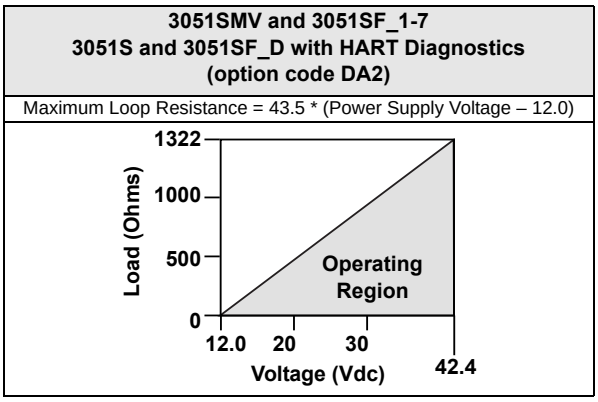
Maximum loop resistance is determined by the voltage level of the external power supply, as described by:

3051S and 3051SF_D

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



The HART communicator requires a minimum loop resistance of 250Ω for communication.



The HART communicator requires a minimum loop resistance of 250Ω for communication.

Advanced HART Diagnostics Suite (Option Code DA2)

Statistical Process Monitoring (SPM) provides statistical data (standard deviation, mean, coefficient of variation) that can be used to detect process and process equipment anomalies, including plugged impulse lines, air entrainment, pump cavitation, furnace flame instability, distillation column flooding and more. This diagnostic allows you to take preventative measures before abnormal process situations result in unscheduled downtime or rework.

Power Advisory diagnostic proactively detects and notifies you of degraded electrical loop integrity before it can affect your process operation. Example loop problems that can be detected include water in the terminal compartment, corrosion of terminals, improper grounding, and unstable power supplies.

The enhanced EDDL Device Dashboard presents the diagnostics in a graphical, task-based interface that provides single click access to critical process/device information and descriptive graphical troubleshooting.

Suite includes: Statistical Process Monitoring (SPM), Power Advisory, Status Log, Variable Log, Advanced Process Alerts, Service Alerts, and Time Stamp capability.

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)

FOUNDATION fieldbus Parameters

Schedule Entries	14 (max.)
Links	30 (max.)
Virtual Communications Relationships (VCR)	20 (max.)

Standard Function Blocks

Resource Block

- Contains hardware, electronics, and diagnostic information.

Transducer Block

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

LCD Block

- Configures the local display.

2 Analog Input Blocks

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

PID Block with Auto-tune

- Contains all logic to perform PID control in the field including cascade and feedforward. Auto-tune capability allows for superior tuning for optimized control performance.

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.

Software Upgrade in the Field

Software for the 3051S with FOUNDATION fieldbus is easy to upgrade in the field using the FOUNDATION fieldbus Common Device Software Download procedure.

PlantWeb Alerts

Enable the full power of the PlantWeb digital architecture by diagnosing instrumentation issues, communicating advisory, maintenance, and failure details, and recommending a solution.

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 Bock

- 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.

Output Splitter Block

- Splits the output of one PID or other control block so that the PID will control two valves or other actuators.

Control Selector Block

- Selects one of up to three inputs (highest, middle, or lowest) that are normally connected to the outputs of PID or other control function blocks.

Block	Execution Time
Resource	-
Transducer	-
LCD Block	-
Analog Input 1, 2	20 milliseconds
PID with Auto-tune	35 milliseconds
Input Selector	20 milliseconds
Arithmetic	20 milliseconds
Signal Characterizer	20 milliseconds
Integrator	20 milliseconds
Output Splitter	20 milliseconds
Control Selector	20 milliseconds

Fully Compensated Mass Flow Block (Option Code H01)

Calculates fully compensated mass flow based on differential pressure with external process pressure and temperature measurements over the fieldbus segment. Configuration for the mass flow calculation is easily accomplished using the Rosemount Engineering Assistant 5.5.1.

FOUNDATION fieldbus

FOUNDATION fieldbus Diagnostics Suite (Option Code D01)

Statistical Process Monitoring (SPM) provides statistical data (standard deviation and mean) that can be used to detect process and process equipment anomalies, including plugged impulse lines, air entrainment, pump cavitation, furnace flame instability, distillation column flooding and more. This diagnostic allows you to take preventative measures before abnormal process situations result in unscheduled downtime or rework.

The enhanced EDDL Device Dashboard presents the diagnostics in a graphical, task-based interface that provides single click access to critical process/device information and descriptive graphical troubleshooting.

Suite includes: Statistical Process Monitoring (SPM) and Plugged Impulse Line Detection (PIL).

WirelessHART

Output

WirelessHART, 2.4 GHz DSSS

Radio Frequency Power Output from Antenna

Long Range (WK option) antenna: Maximum of 10 mW (10 dBm) EIRP

Extended Range (WM option) antenna: Maximum of 18 mW (12.5 dBm) EIRP

Local Display

The optional seven-digit LCD can display user-selectable information such as primary variable in engineering units, percent of range, sensor module temperature, and electronics temperature. Display updates at the user-configured update rate.

Update Rate

WirelessHART, user selectable 4 sec. to 60 min.

Power Module

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

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

Overpressure Limits

Transmitters withstand the following limits without damage:

Coplanar Sensor Module (Single Variable)

Range	DP[1] & GP 3051S_CD, 3051S_CG 3051SMV_ _3 or 4 3051SF_3, 4, 7, or D	AP 3051S_CA
0	750 psi (51,7 bar)	60 psia (4,13 bar)
1	2000 psi (137,9 bar)	750 psia (51,7 bar)
2	3626 psi (250,0 bar)	1500 psia (103,4 bar)
3	3626 psi (250,0 bar)	1600 psia (110,3 bar)
4	3626 psi (250,0 bar)	6000 psia (413,7 bar)
5	3626 psi (250,0 bar)	N/A

(1) The overpressure limit of a DP Sensor with the P9 option is 4500 psig (310,3 bar). The overpressure limit of a DP Sensor with the P0 option is 6092 psig (420 bar).

In-Line Sensor Module

Range	GP 3051S_TG	AP 3051S_TA
1	750 psi (51,7 bar)	
2	1500 psi (103,4 bar)	
3	1600 psi (110,3 bar)	
4	6000 psi (413,7 bar)	
5	15000 psi (1034,2 bar)	

Coplanar MultiVariable Sensor Module (3051SMV_ _1 or 2, 3051SF_1, 2, 5, or 6)

Static Pressure	Differential Pressure		
	Range 1	Range 2	Range 3
Range 3 GP/AP	1600 psi (110,3 bar)	1600 psi (110,3 bar)	1600 psi (110,3 bar)
Range 4 GP/AP	2000 psi (137,9 bar)	3626 psi (250 bar)	3626 psi (250 bar)

Liquid Level Transmitter (3051S_L)

Overpressure limit is dependent on the flange rating or sensor rating (whichever is lower). Use *Instrument Toolkit* to ensure the seal system meets all pressure and temperature limits.

Static Pressure Limits

Coplanar Sensor Module (Single Variable)

Operates within specifications between static line pressures of:

Range	DP Sensor[1] 3051S_CD 3051SMV_ _3 or 4 3051SF_3, 4, 7, or D
0	0.5 psia to 750 psig (0,03 to 51,71 bar)
1	0.5 psia to 2000 psig (0,03 to 137,9 bar)
2	0.5 psia to 3626 psig (0,03 to 250 bar)
3	0.5 psia to 3626 psig (0,03 to 250 bar)
4	0.5 psia to 3626 psig (0,03 to 250 bar)
5	0.5 psia to 3626 psig (0,03 to 250 bar)

(1) The static pressure limit of a DP Sensor with the P9 option is 4500 psig (310,3 bar). The static pressure limit of a DP Sensor with the P0 option is 6092 psig (420 bar).

Coplanar MultiVariable Sensor Module (3051SMV_ _1 or 2, 3051SF_1, 2, 5, or 6)

Operates within specifications between static line pressures of 0.5 psia (0,03 bar) and the values in the table below:

Static Pressure	Differential Pressure		
	Range 1	Range 2	Range 3
Range 3 GP/AP	800 psi (57,91 bar)	800 psi (57,91 bar)	800 psi (57,91 bar)
Range 4 GP/AP	2000 psi (137,9 bar)	3626 psi (250 bar)	3626 psi (250 bar)

Burst Pressure Limits

Coplanar Sensor Module (3051S_C, 3051SMV, 3051SF)

10000 psig (689,5 bar)

In-Line Sensor Module (3051S_T)

- Ranges 1-4: 11000 psi (758,4 bar)
- Range 5: 26000 psi (1792,64 bar)

Temperature Limits

Ambient

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

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

Storage

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

Process Temperature Limits

At atmospheric pressures and above:

Coplanar Sensor Module 3051S_C, 3051SMV, 3051SF	
Silicone Fill Sensor(1)(2)	
with Coplanar Flange	-40 to 250 °F (-40 to 121 °C)(3)
with Traditional Flange	-40 to 300 °F (-40 to 149 °C)(3)(4)
with Level Flange	-40 to 300 °F (-40 to 149 °C)(3)
with 305 Integral Manifold	-40 to 300 °F (-40 to 149 °C)(3)(4)
Inert Fill Sensor(1)(5)	-40 to 185 °F (-40 to 85 °C)(6)(7)
In-Line Sensor Module 3051S_T	
Silicone Fill Sensor(1)	-40 to 250 °F (-40 to 121 °C)(3)
Inert Fill Sensor(1)	-22 to 250 °F (-30 to 121 °C)(3)
3051S_L Level Transmitter	
Syltherm® XLT	-102 to 293 °F (-75 to 145 °C)
Silicone 704(8)	32 to 401 °F (0 to 205 °C)
Silicone 200	-49 to 401 °F (-45 to 205 °C)
Inert (Halocarbon)	-49 to 320 °F (-45 to 160 °C)
Glycerin and Water	5 to 203 °F (-15 to 95 °C)
Neobee M-20®	5 to 401 °F (-15 to 205 °C)
Propylene Glycol and Water	5 to 203 °F (-15 to 95 °C)

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

(2) 212 °F (100 °C) is the upper process temperature limit for DP Range 0.

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

(4) -20 °F (-29 °C) is the lower process temperature limit with option code P0.

(5) 32 °F (0 °C) is the lower process temperature limit for DP Range 0.

(6) For 3051S_C, 160 ° F (71 °C) limit in vacuum service. For 3051SMV_ _ 1, 2, 140 ° F (60 °C) limit in vacuum service.

(7) Not available for 3051S_CA.

(8) Upper limit of 600 °F (315 °C) is available with 1199 seal assemblies mounted away from the transmitter with the use of capillaries and up to 500 °F (260 °C) with direct mount extension.

Humidity Limits

0–100% relative humidity

Turn-On Time(1)

When power is applied to the transmitter during startup, performance will be within specifications per the time period described below:

Transmitter	Turn-On Time (Typical)
3051S, 3051SF_D, 3051S_L	2 seconds
Diagnostics	5 seconds
3051SMV, 3051SF_1-7	5 seconds

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

Volumetric Displacement

Less than 0.005 in^3 (0,08 cm^3)

Damping(1)

Analog output response time to a step change is user-selectable from 0 to 60 seconds for one time constant. For 3051SMV, 3051SF_1-7, each variable can be individually adjusted. Software damping is in addition to sensor module response time.

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

Failure Mode Alarm

HART 4-20 mA (output option code A)

If self-diagnostics detect a gross transmitter failure, the analog signal will be driven offscale to alert the user. Rosemount standard (default), NAMUR, and custom alarm levels are available (see Alarm Configuration below).

High or low alarm signal is software-selectable or hardware-selectable via the optional switch (option D1).

Alarm Configuration

	High Alarm	Low Alarm
Default	≥ 21.75 mA	≤ 3.75 mA
NAMUR compliant(1)	≥ 22.5 mA	≤ 3.6 mA
Custom levels(2) (3)	20.2 - 23.0 mA	3.4 - 3.8 mA

(1) Analog output levels are compliant with NAMUR recommendation NE 43, see option codes C4 or C5.

(2) Low alarm must be 0.1 mA less than low saturation and high alarm must be 0.1 mA greater than high saturation.

(3) For 3051SMV and option code DA2, low alarm custom values are 3.6 - 3.8 mA.

Safety-Certified Transmitter Failure Values(1)

Safety accuracy: 2.0%(2)
Safety response time: 1.5 seconds

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

(2) A 2% variation of the transmitter mA output is allowed before a safety trip. Trip values in the DCS or safety logic solver should be derated by 2%.

PHYSICAL SPECIFICATIONS

Electrical Connections

1/2–14 NPT, G1/2, and M20 × 1.5 conduit. HART interface connections fixed to terminal block for Output code A and X.

Process Connections

Coplanar Sensor Module (3051S_C, 3051SMV, 3051SF)	
Standard	1/4-18 NPT on 2 1/8-in. centers
Flange Adapters	1/2-14 NPT and RC 1/2 on 2-in. (50.8 mm), 2 1/8-in. (54.0 mm), or 2 1/4-in. (57.2 mm) centers
In-Line Sensor Module (3051S_T)	
Standard	1/2-14 NPT Female
F11 Code	Non-threaded instrument flange (available in SST for sensor ranges 1-4 only)
G11 Code	G 1/2 A DIN 16288 Male (available in SST for sensor ranges 1-4 only)
H11 Code	Autoclave type F-250C (Pressure relieved 9/16-18 gland thread; 1/4 OD high pressure tube 60° cone; available in SST for sensor range 5 only)
Level Transmitter (3051S_L)	
FF Seal	2-in. (DN 50), 3-in. (DN 80), or 4-in. (DN 100); ANSI Class 150, 300, or 600 flange; JIS 10K, 20K, or 40K flange; PN 10/16 or PN 40 flange
EF Seal	

Process-Wetted Parts

Process Isolating Diaphragms

Coplanar Sensor Module (3051S_C, 3051SMV)
316L SST (UNS S31603), Alloy C-276 (UNS N10276), Alloy 400 (UNS N04400), Tantalum (UNS R05440), Gold-Plated Alloy 400, Gold-plated 316L SST
In-Line Sensor Module (3051S_T)
316L SST (UNS S31603), Alloy C-276 (UNS N10276)
Level Transmitter (3051S_L)
316L SST, Alloy C-276, Tantalum

Drain/Vent Valves

316 SST, Alloy C-276, or Alloy 400/K-500(1) material
(Drain vent seat: Alloy 400, Drain vent stem: Alloy K-500)

(1) Alloy 400/K-500 is not available with 3051S_L.

Process Flanges and Flange Adapters

Plated carbon steel
SST: CF-8M (Cast 316 SST) per ASTM A743
Cast C-276: CW-12MW per ASTM A494
Cast Alloy 400: M-30C per ASTM A494

Wetted O-rings

Glass-filled PTFE
(Graphite-filled PTFE with Isolating Diaphragm code 6)

3051S_L Mounting Flange

Zinc-cobalt plated CS or 316 SST

3051S_L Seal Extension

CF-3M (Cast 316L SST, material per ASTM A743) or
CW-12MW (Cast C-276, material per ASTM A494)

Non-Wetted Parts

Electronics Housing

Low-copper aluminum alloy or CF-8M (Cast 316 SST)
NEMA 4X, IP 66, IP 68 (66 ft (20 m) for 168 hours)
Note: IP 68 not available with Wireless Output.

Coplanar Sensor Module Housing

SST: CF-3M (Cast 316L SST)

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

Sensor Module Fill Fluid

Silicone or inert halocarbon (Inert is not available with 3051S_CA).
In-Line series uses Fluorinert® FC-43.

Process Fill Fluid (Liquid Level Only)

3051S_L: Syltherm XLT, Silicone 704, Silicone 200, inert, glycerin and water, Neobee M-20, propylene glycol and water.

Paint for Aluminum Housing

Polyurethane

Cover O-rings

Buna-N

Wireless Antenna

PBT/ polycarbonate (PC) integrated omnidirectional antenna

Power Module

Field replaceable, keyed connection eliminates the risk of incorrect installation, Intrinsically Safe Lithium-thionyl chloride Power Module with PBT enclosure

Shipping Weights

Sensor Module Weights

Coplanar Sensor Module[1]
3.1 lb (1,4 kg)
In-Line Sensor Module
1.4 lb (0,6 kg)

(1) Flange and bolts not included.

Transmitter Weights[1]

Transmitter with Coplanar Sensor Module (3051S_C, 3051SMV, 3051SAM_ _G or A)	
Junction Box Housing, SST Flange	6.3 lb (2,8 kg)
PlantWeb Housing, SST Flange	6.7 lb (3,1 kg)
Wireless PlantWeb Housing, SST Flange	7.3 lb (3,3 kg)
Transmitter with In-Line Sensor Module (3051S_T, 3051SAM_ _T or E)	
Junction Box Housing	3.2 lb (1,4 kg)
PlantWeb Housing	3.7 lb (1,7 kg)
Wireless PlantWeb Housing	4.2 lb (1,9 kg)

(1) Fully functional transmitter with sensor module, housing, terminal block, and covers. Does not include LCD display.

Transmitter Option Weights

Option Code	Option	Add lb (kg)
1J, 1K, 1L	SST PlantWeb Housing	3.5 (1,6)
2J	SST Junction Box Housing	3.4 (1,5)
7J	SST Quick Connect	0.4 (0,2)
2A, 2B, 2C	Aluminum Junction Box Housing	1.1 (0,5)
1A, 1B, 1C	Aluminum PlantWeb Housing	1.1 (0,5)
M5	LCD Display for Aluminum PlantWeb Housing[1], LCD Display for SST PlantWeb Housing[1]	0.8 (0,4) 1.6 (0,7)
B4	SST Mounting Bracket for Coplanar Flange	1.2 (0,5)
B1, B2, B3	Mounting Bracket for Traditional Flange	1.7 (0,8)
B7, B8, B9	Mounting Bracket for Traditional Flange with SST Bolts	1.7 (0,8)
BA, BC	SST Bracket for Traditional Flange	1.6 (0,7)
B4	SST Mounting Bracket for In-Line	1.3 (0,6)
F12, F22	SST Traditional Flange with SST Drain Vents[2]	3.2 (1,5)
F13, F23	Cast C-276 Traditional Flange with Alloy C-276 Drain Vents[2]	3.6 (1,6)
E12, E22	SST Coplanar Flange with SST Drain Vents[2]	1.9 (0,9)
F14, F24	Cast Alloy 400 Traditional Flange with Alloy 400/K-500 Drain Vents[2]	3.6 (1,6)
F15, F25	SST Traditional Flange with Alloy C-276 Drain Vents[2]	3.2 (1,5)
G21	Level Flange—3 in., 150	12.6 (5,7)
G22	Level Flange—3 in., 300	15.9 (7,2)
G11	Level Flange—2 in., 150	6.8 (3,1)
G12	Level Flange—2 in., 300	8.2 (3,7)
G31	DIN Level Flange, SST, DN 50, PN 40	7.8 (3,5)
G41	DIN Level Flange, SST, DN 80, PN 40	13.0 (5,9)

(1) Includes LCD display and display cover.

(2) Includes mounting bolts.

Item	Weight in lb. (kg)
Aluminum Standard Cover	0.4 (0,2)
SST Standard Cover	1.3 (0,6)
Aluminum Display Cover	0.7 (0,3)
SST Display Cover	1.5 (0,7)
Wireless Extended Cover	0.7 (0,3)
LCD Display(1)	0.1 (0,04)
Junction Box Terminal Block	0.2 (0,1)
PlantWeb Terminal Block	0.2 (0,1)
Power Module	0.5 (0,2)

(1) Display only.

3051S_L Weights Without SuperModule Platform, Housing, or Transmitter Options

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

Rosemount 3051S Certifications

Approved Manufacturing Locations

Rosemount Inc. — Chanhassen, Minnesota USA

Emerson Process Management GmbH & Co. — Wessling, Germany

Emerson Process Management Asia Pacific Private Limited — Singapore

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

Emerson Process Management LTDA — Sorocaba, Brazil

Emerson Process Management (India) Pvt. Ltd. — Daman, India

Ordinary Location Certification for FM

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

European Directive Information

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

ATEX Directive (94/9/EC)

Emerson Process Management complies with the ATEX Directive.

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

Models 3051S_CA4; 3051S_CD2, 3, 4, 5; *(also with P9 option)*
Pressure Transmitters — QS Certificate of Assessment - EC No. PED-H-100, Module H Conformity Assessment

All other Model 3051S Pressure Transmitters — Sound Engineering Practice

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

Primary Elements, Flowmeter — See appropriate Primary Element QIG

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

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

Radio and Telecommunications Terminal Equipment Directive (R&TTE)(1999/5/EC)

Emerson Process Management complies with the R&TTE Directive.

HART & FOUNDATION Fieldbus Hazardous Locations Certifications

North American Certifications

FM Approvals

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

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

Canadian Standards Association (CSA)

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

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

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

European Certifications

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

Input Parameters

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

Special conditions for safe use (x)

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

N1 ATEX Type n
Certificate No.: BAS01ATEX3304X ⟨Ex⟩ II 3 G
Ex nL IIC T5 (T_a = -40 °C TO 70 °C)
Ui = 45 Vdc max
Ci = 11.4 nF
Li = 0
For remote display, Ci = 0, Li = 60 µH
IP66
CE

Special conditions for safe use (x)

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

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

ND ATEX Dust
Certificate No.: BAS01ATEX1374X ⟨Ex⟩ II 1 D
Ex tD A20 T105°C (-20 °C ≤ T_{amb} ≤ 85 °C)
V_{max} = 42.4 volts max
A = 22 mA
IP66
CE 1180

Special conditions for safe use (x)

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

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

Special conditions for safe use (x)

1. Appropriate ex d blanking plugs, 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. The 3051S does not comply with the requirements of EN 60079-1 Clause 5.2, Table 2 for all joints. Contact Emerson Process Management for information on the dimensions of flameproof joints.

Japanese Certifications

E4 TIIS Flameproof
Ex d IIC T6

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

China (NEPSI) Certifications

I3 China Intrinsic Safety, Dust Ignition-proof
Certificate No. (manufactured in Chanhassen, MN): GYJ081078
Certificate No. (manufactured in Beijing, China): GYJ06367
Certificate No. (manufactured in Singapore): GYJ06365
Certificate No. (3051SFx RTC, BMMC, SMMC): GYJ071293
Ex ia IIC T4
DIP A21 T_A T4 IP66

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

Input Parameters

Loop / Power	Groups
U_i = 30 V	HART / FOUNDATION fieldbus/ Remote Display / Quick Connect / HART Diagnostics
I_i = 300 mA	HART / FOUNDATION fieldbus/ Remote Display / Quick Connect / HART Diagnostics
P_i = 1.0 W	HART / Remote Display / Quick Connect / HART Diagnostics
P_i = 1.3 W	FOUNDATION fieldbus
C_i = 38 nF	SuperModule Platform
C_i = 11.4 nF	HART / HART Diagnostics / Quick Connect
C_i = 0	FOUNDATION fieldbus / Remote Display
L_i = 0	HART / FOUNDATION fieldbus / Quick Connect / HART Diagnostics
L_i = 60 µH	Remote Display
RTD Assembly (3051SFx Option T or R)	
U_i = 5 Vdc	
I_i = 500 mA	
P_i = 0.63W	

E3 China Flameproof, Dust Ignition-proof
Certificate No. (manufactured in Chanhassen, MN): GYJ091035
Certificate No. (manufactured in Beijing, China): GYJ06366
Certificate No. (manufactured in Singapore): GYJ06364
Certificate No. (3051SFx RTC, BMMC, SMMC): GYJ071086
Ex d IIB+H_2 T3~T5
DIP A21 T_A T3~T5 IP66

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

INMETRO Certifications

I2 Brazilian Approval (INMETRO Approval) - Intrinsic Safety

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

Special conditions for safe use (x)

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

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

Special conditions for safe use (x)

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

IECEx Certifications

E7 IECEx Flameproof and Dust (each listed separately)

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

Special conditions for safe use (x)

1. Appropriate ex d blanking plugs, 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. The 3051S does not comply with the requirements of IEC 60079-1 Clause 5.2, Table 2 for all joints. Contact Emerson Process Management for information on the dimensions of flameproof joints.

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

Special conditions for safe use (x)

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

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

Input Parameters

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

Special conditions for safe use (x)

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

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

Combinations of Certifications

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

K1 Combination of E1, I1, N1, and ND
K2 Combination of E2 and I2
K5 Combination of E5 and I5
K6 Combination of E6 and I6
K7 Combination of E7, I7, and N7
KA Combination of E1, I1, E6, and I6
KB Combination of E5, I5, I6 and E6
KC Combination of E5, E1, I5 and I1
KD Combination of E5, I5, E6, I6, E1, and I1

Rosemount 3051S Wireless Certifications

Approved Manufacturing Locations

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

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 Approvals

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 and 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 20cm from all persons.

Ordinary Location Certification for FM

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

European Directive Information

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

ATEX Directive (94/9/EC)

Emerson Process Management complies with the ATEX Directive.

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

Models 3051S_CA4; 3051S_CD2, 3, 4, 5; *(also with P9 option)*
Pressure Transmitters — QS Certificate of Assessment - EC No. PED-H-100, Module H Conformity Assessment

All other Model 3051S Pressure Transmitters — Sound Engineering Practice

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

Primary Elements, Flowmeter — See appropriate Primary Element QIG

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

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

Radio and Telecommunications Terminal Equipment Directive (R&TTE)(1999/5/EC)

Emerson Process Management complies with the R&TTE Directive.

Hazardous Locations Certifications

North American Certifications

Factory Mutual (FM) Approvals

I5 FM Intrinsically Safe, Non-Incendive, and Dust Ignition-proof.
Intrinsically Safe for Class I/II/III, Division 1, Groups A, B, C, D, E, F, and G.
Zone Marking: Class I, Zone 0, AEx ia llC
Temperature Codes T4 (T_{amb} = -50 to 70° C)
Non-Incendive for Class I, Division 2, Groups A, B, C, and D.
Dust Ignition-proof for Class II/III, Division 1, Groups E, F, and G.
Ambient temperature limits: -50 to 85° C
For use with Rosemount SmartPower options 00753-9220-0001 only.
Enclosure Type 4X / IP66

CSA - Canadian Standards Association

Process Sealing

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

I6 CSA Intrinsically Safe
Intrinsically Safe for Class I, Division 1, Groups A, B, C, and D.
Temp Code T3C
Enclosure Type 4X / IP66
For use with Rosemount SmartPower options 00753-9220-0001 only.

European Certifications

I1 ATEX Intrinsic Safety
Certificate No.: BAS01ATEX1303X ⟨Ex⟩ II 1G
Ex ia IIC T4 (T_a = -60 °C to 70 °C)
IP66
For use with Rosemount SmartPower options
00753-9220-0001 only.

Special conditions for safe use (x)

The surface resistivity of the antenna is greater than one gigaohm. To avoid electrostatic charge build-up, it must not be rubbed or cleaned with solvents or a dry cloth.
CE 1180

CE ①

Country	Restriction
Bulgaria	General authorization required for outdoor use and public service
France	Outdoor use limited to 10mW e.i.r.p.
Italy	If used outside of own premises, general authorization is required.
Norway	May be restricted in the geographical area within a radius of 20 km from the center of Ny-Alesund.
Romania	Use on a secondary basis. Individual license required.

IECEx Certifications

I7 IECEx Intrinsic Safety
Certificate No.: IECEx BAS 04.0017X
Ex ia IIC T4 (Ta = -60 °C to 70 °C)
For use with Rosemount SmartPower options
00753-9220-0001 only.
IP66

Special conditions for safe use (x)

The surface resistivity of the antenna is greater than one gigaohm. To avoid electrostatic charge build-up, it must not be rubbed or cleaned with solvents or a dry cloth.

Rosemount 3051S MultiVariable Certifications

Approved Manufacturing Locations

Rosemount Inc. — Chanhassen, Minnesota USA

Emerson Process Management GmbH & Co. — Wessling, Germany

Emerson Process Management Asia Pacific Private Limited — Singapore

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

Ordinary Location Certification for FM

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

European Directive Information

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

ATEX Directive (94/9/EC)

Emerson Process Management complies with the ATEX Directive.

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

Models with Differential Pressure Ranges = 2 to 5 inclusive with Static Pressure = Range 4 only. P9 and P0 options also.
All other Model 3051SMV Pressure Transmitters
— Sound Engineering Practice

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

Primary Elements, Flowmeter
— See appropriate Primary Element QIG

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

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

Hazardous Locations Certifications

North American Certifications

FM Approvals

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

I5 Intrinsically Safe for use in Class I, Division 1, Groups A, B, C, and D; Class II, Division 1, Groups E, F, and G; Class III, Division 1; Class I, Zone 0 AEx ia IIC when connected in accordance with Rosemount drawing 03151-1206;
Non-incendive for Class I, Division 2, Groups A, B, C, and D Enclosure Type 4X
For entity parameters see control drawing 03151-1206.

Canadian Standards Association (CSA)

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

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

I6 Intrinsically Safe for Class I, Division 1, Groups A, B, C, and D when connected in accordance with Rosemount drawings 03151-1207; Dual Seal.
For entity parameters see control drawing 03151-1207.

Measurement Canada Approvals

D3 Accuracy Approval to the Electricity and Gas Inspection Act for the purchase and sale of Natural Gas.

European Certifications

I1 ATEX Intrinsic Safety
Certificate No.: Baseefa 08ATEX0064X ⟨Ex⟩ II 1G
Ex ia IIC T4 (T_a = -60 °C to 70 °C) -HART
CE 1180

Input Parameters

Loop / Power	Groups
U_i = 30 V	HART
I_i = 300 mA	HART
P_i = 1.0 W	HART
C_i = 14.8 nF	HART
L_i = 0	HART

Special conditions for safe use (x)

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

N1 ATEX Type n
Certificate No.: Baseefa 08ATEX0065X ⟨Ex⟩ II 3 G
Ex nA nL IIC T4 (T_a = -40 °C TO 70 °C)
Ui = 45 Vdc max
IP66
CE

Special conditions for safe use (x)

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

ND ATEX Dust
Certificate No.: BAS01ATEX1303X ⟨Ex⟩ II 1 D
Ex tD A20 IP66 T105°C (-20 °C ≤ T_{amb} ≤ 85 °C)
V_{max} = 42.4 volts max
A = 24 mA
IP66
CE 1180

Special conditions for safe use (x)

The user must ensure that the maximum rated voltage and current (42.4 volts, 22 milliampere, DC) are not exceeded. All connections to other apparatus or associated apparatus shall have control over this voltage and current equivalent to a category “ib” circuit according to EN 60079-11.

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

E1 ATEX Flameproof
Certificate No.: KEMA 00ATEX2143X ⟨Ex⟩ II 1/2 G
Ex d IIC T6 (-50 °C ≤ T_{amb} ≤ 65 °C)
Ex d IIC T5 (-50 °C ≤ T_{amb} ≤ 80 °C)
V_{max} = 42.4V
CE 1180

Special conditions for safe use (x)

1. Appropriate ex d blanking plugs, 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. The 3051SMV does not comply with the requirements of IEC 60079-1 Clause 5.2, Table 2 for all joints. Contact Emerson Process Management for information on the dimensions of flameproof joints.

Japanese Certifications

E4 TIIS Flameproof
Ex d IIC T6
TC19070 With RTD and LCD Display
TC19071 With LCD
TC19072 RTD without LCD Display
TC19073 Without LCD

INMETRO Certifications

E2 INMETRO Flameproof
Certificate number: NCC 5886/09X
BR-Ex d IIC T6/T6 Gb IP66W

I2 INMETRO Intrinsic Safety
Certificate No. NCC 5870/09X
BR-Ex ia IIC T4 Ga IP66W

China (NEPSI) Certifications

E3 China Flameproof
Ex d IIC T5/T6
GYJ091001

I3 China Intrinsic Safety
Ex ia IIC T4
GYJ091002X

Input Parameters

Loop / Power	Groups
U_i = 30 V	HART
I_i = 300 mA	HART
P_i = 1.0 W	HART
C_i = 14.8 nF	HART
L_i = 0	HART

IECEx Certifications

I7 IECEx Intrinsic Safety
Certificate No.: IECExBAS08.0025X
Ex ia IIC T4 (T_a = -60 °C to 70 °C) -HART
IP66

Input Parameters

Loop / Power	Groups
U_i = 30 V	HART
I_i = 300 mA	HART
P_i = 1.0 W	HART
C_i = 14.8 nF	HART
L_i = 0	HART

Special conditions for safe use (x)

The 3051SMV HART 4-20 mA is not capable of withstanding the 500V test as defined in clause 6.3.12 of IEC 60079-11. This must be taken into account during installation.

N7 IECEx Type n
Certificate No.: IECExBAS08.0026X
Ex nAnL IIC T4 (Ta = -40 °C to 70 °C)
Ui = 45 Vdc MAX
IP66

Special conditions for safe use (x)

The apparatus is not capable of withstanding the 500 V insulation test required by Clause 6.8.1 of IEC 60079-15.

E7 IECEx Flameproof
Certificate No.: IECExKEM08.0010X
Ex d IIC T6 (-50 °C ≤ T_{amb} ≤ 65 °C)
Ex d IIC T5 (-50 °C ≤ T_{amb} ≤ 80 °C)
V_{max} = 42.4V

Special conditions for safe use (x)

1. Appropriate ex d blanking plugs, 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. The 3051SMV does not comply with the requirements of IEC 60079-1 Clause 5.2, Table 2 for all joints. Contact Emerson Process Management for information on the dimensions of flameproof joints.

Combinations of Certifications

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

K1 Combination of E1, I1, N1, and ND

K4 Combination of E4 and I4

K5 Combination of E5 and I5

K6 Combination of E6 and I6

K7 Combination of E7, I7, and N7

KA Combination of E1, E6, I1, and I6

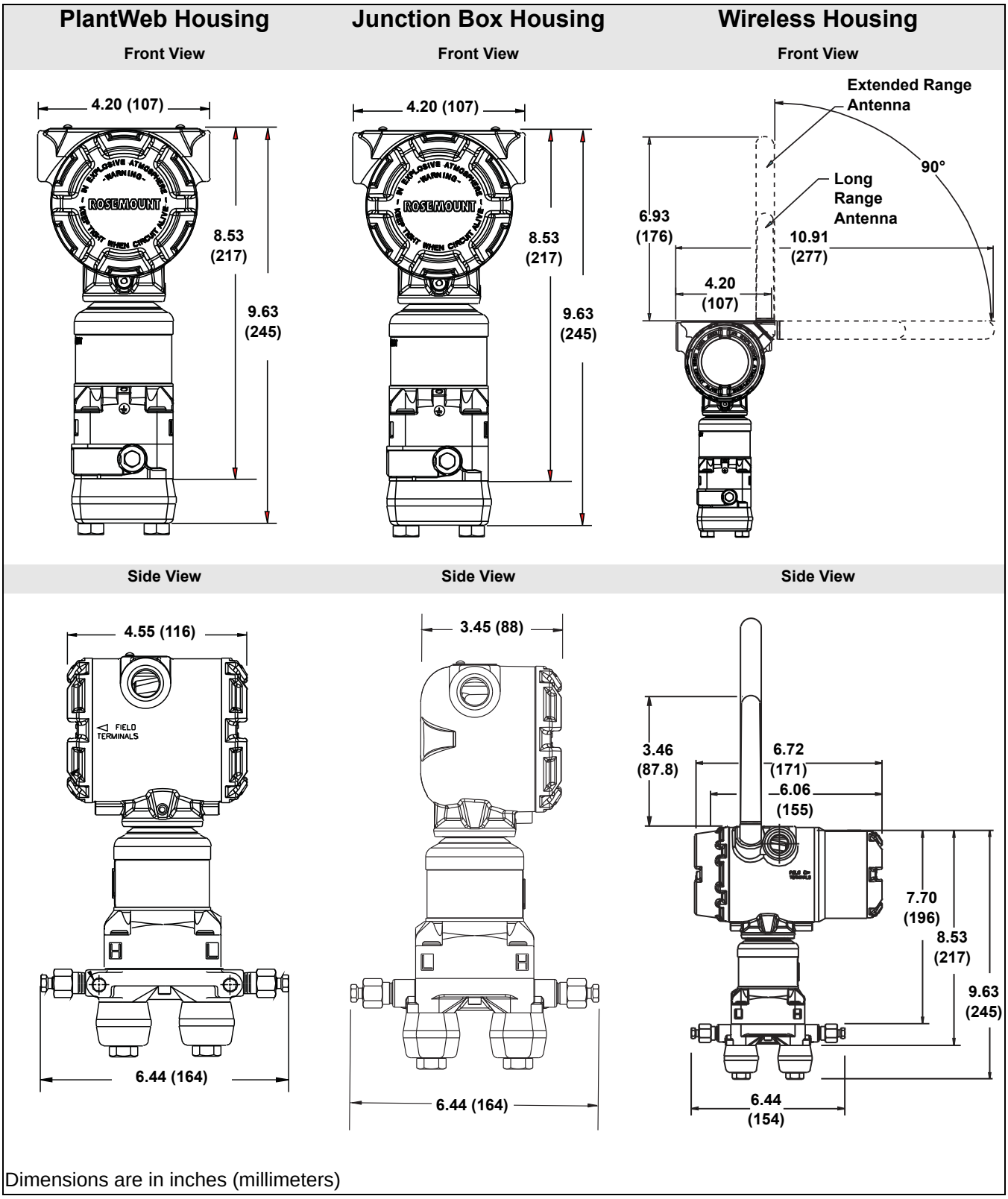
KB Combination of E5, E6, I5, and I6

KC Combination of E5, E1, I5 and I1

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

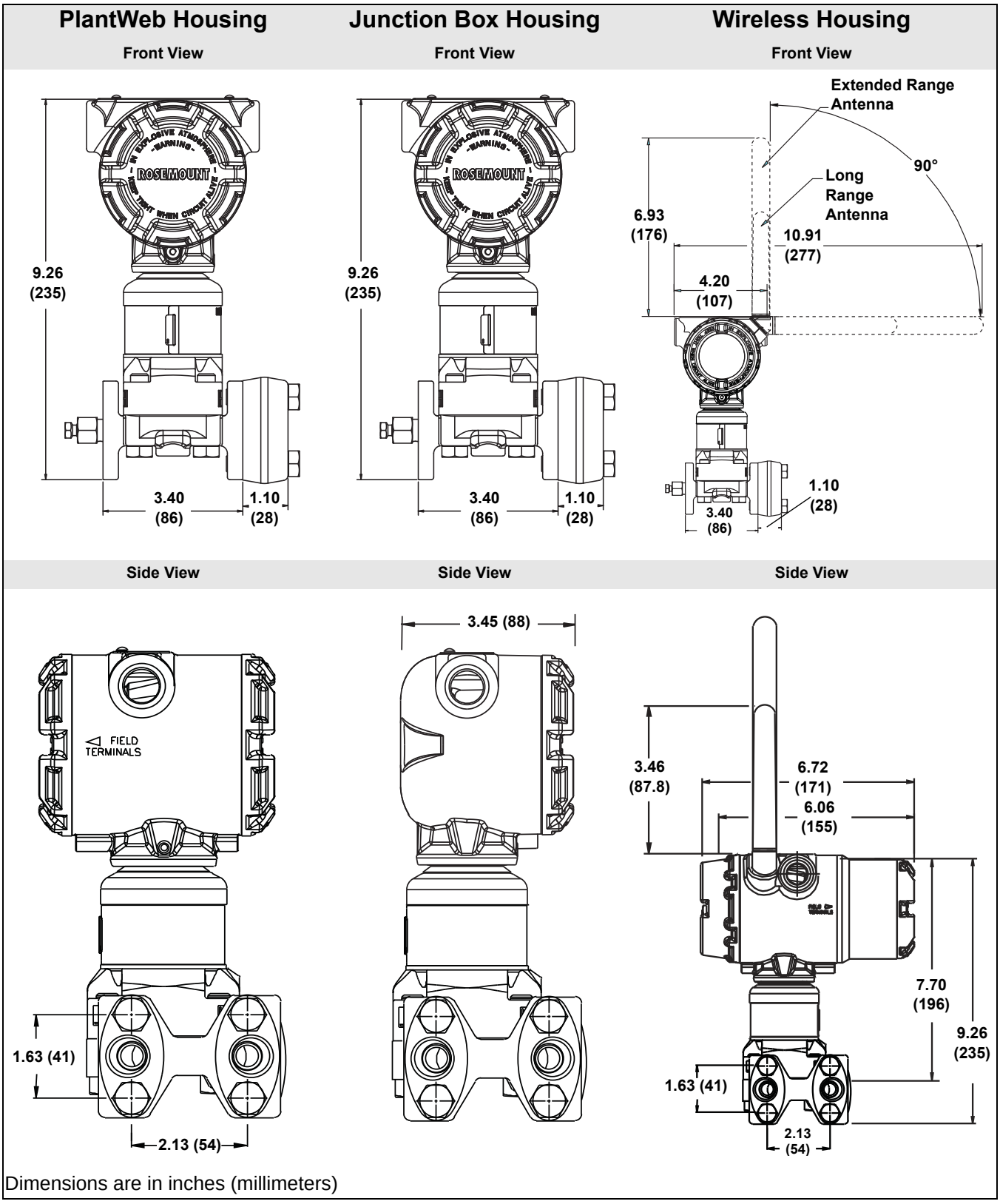
Dimensional Drawings

Figure 1. Transmitter with Coplanar Sensor Module and Flange



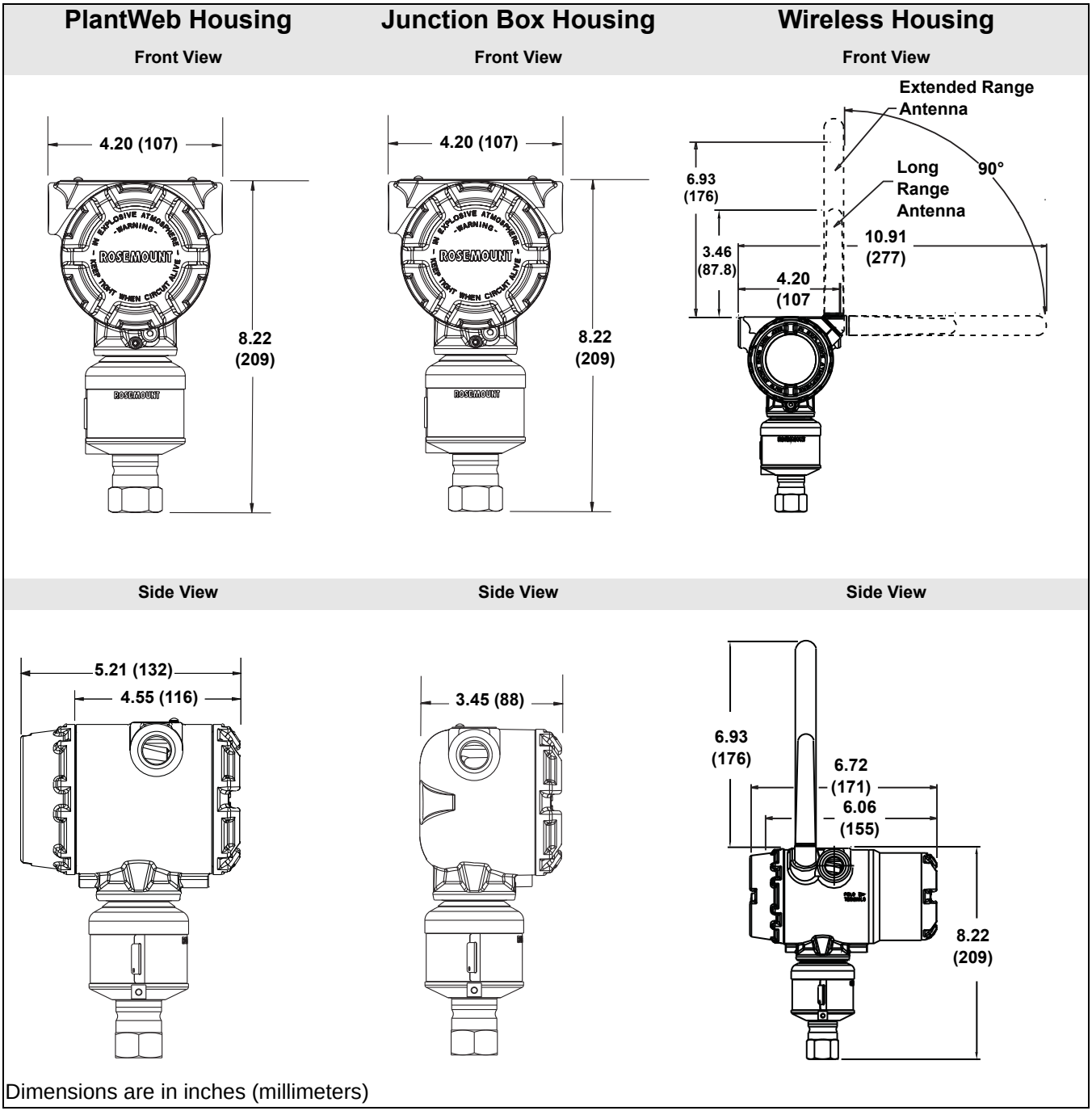
Dimensions are in inches (millimeters)

Figure 2. Transmitter with Coplanar Sensor Module and Traditional Flange



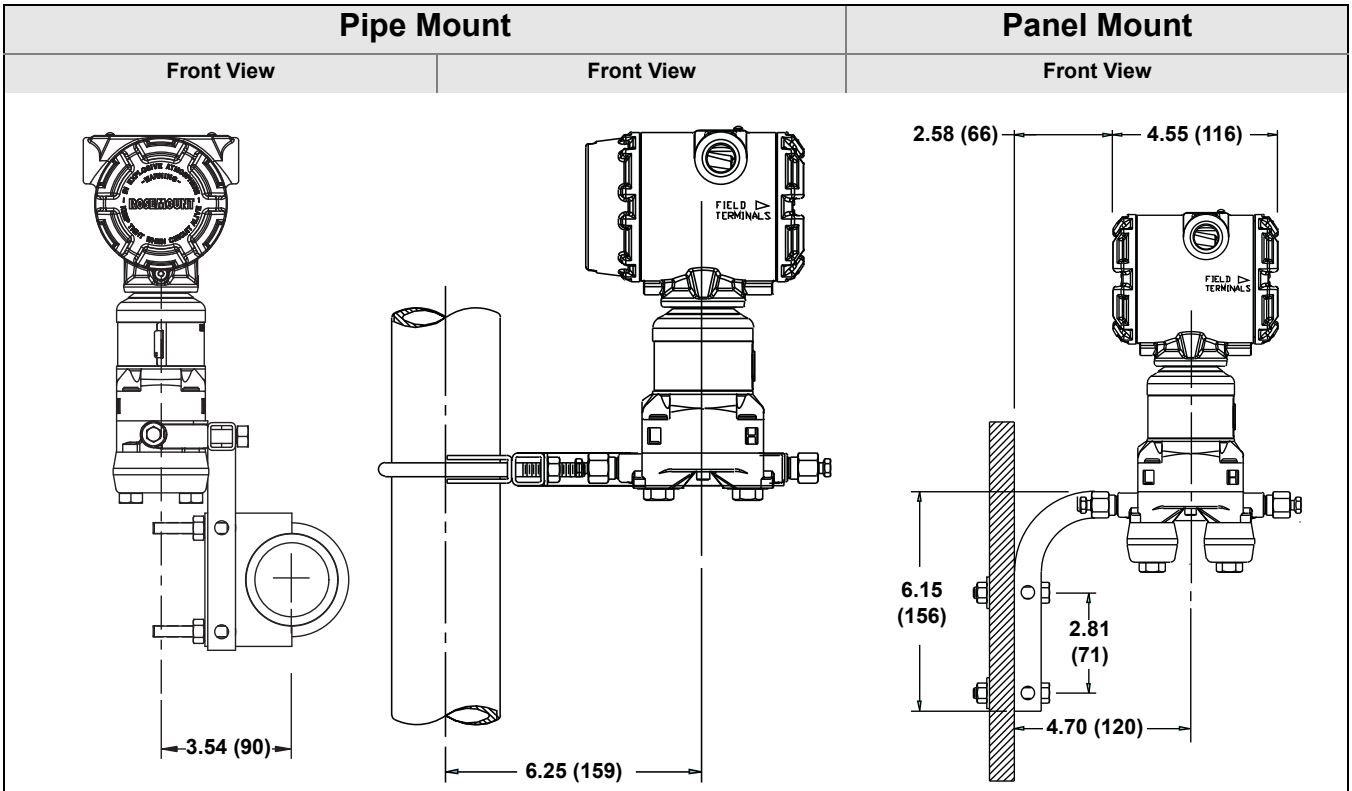
Dimensions are in inches (millimeters)

Figure 3. Transmitter with In-Line Sensor Module



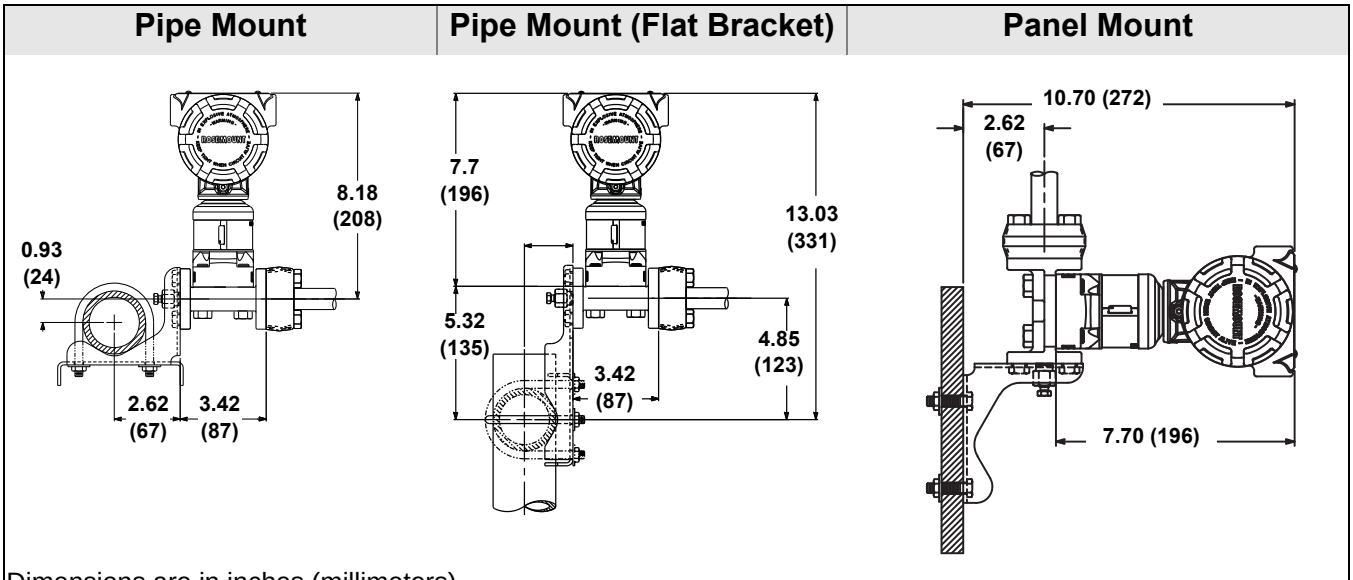
Dimensions are in inches (millimeters)

Figure 4. Coplanar Mounting Configurations (B4 Bracket)



Dimensions are in inches (millimeters)

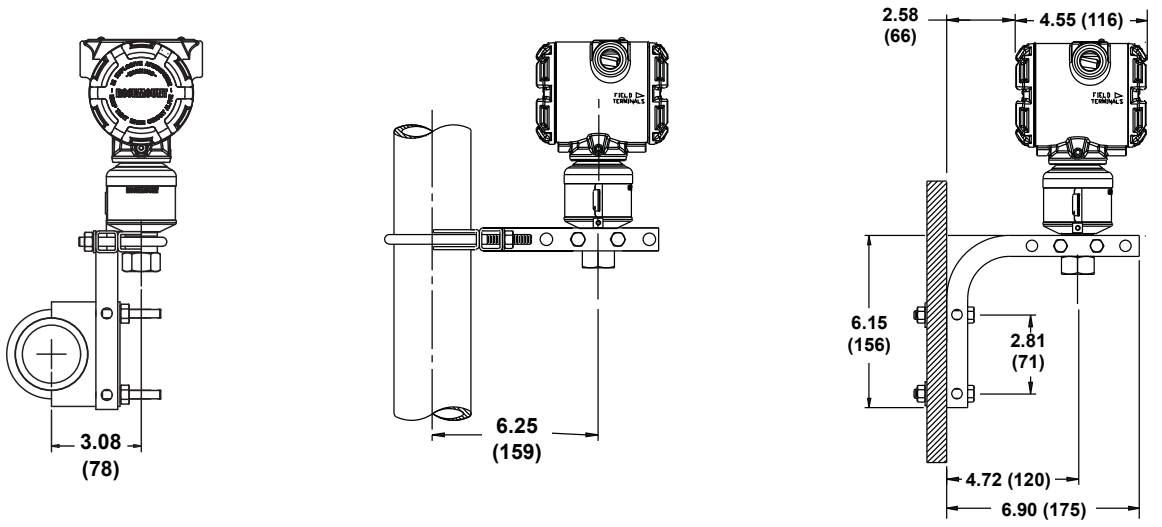
Figure 5. Traditional Mounting Configurations



Dimensions are in inches (millimeters)

Figure 6. In-Line Mounting Configurations (B4 Bracket)

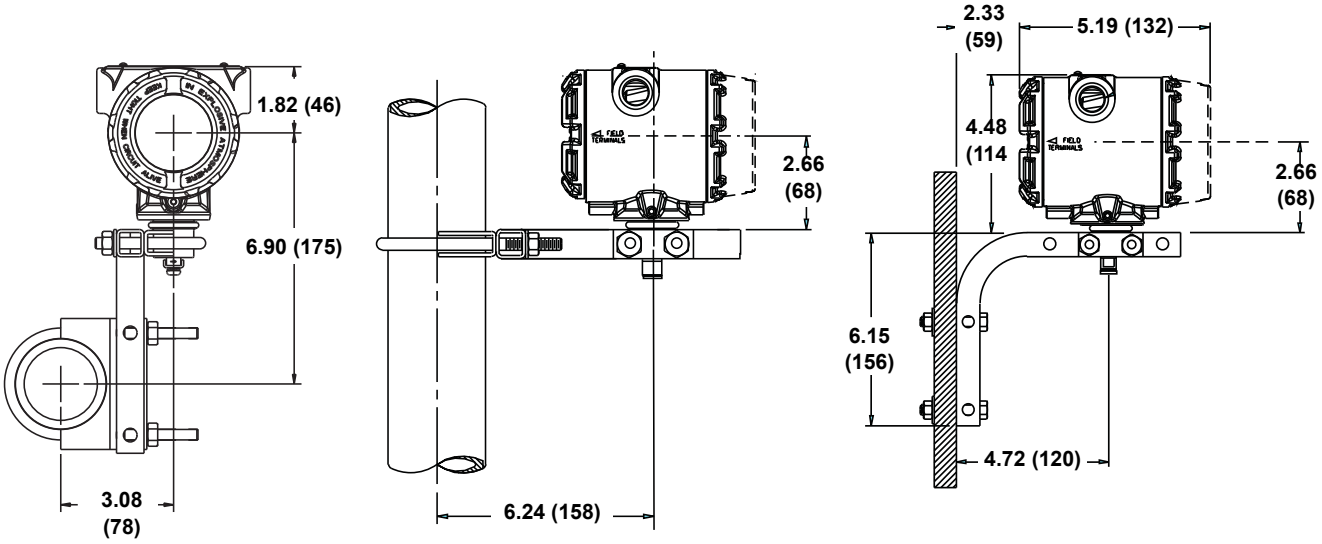
Pipe Mount		Panel Mount
Front View	Side View	



Dimensions are in inches (millimeters)

Figure 7. Remote Display Mounting Configurations (B4 Bracket)

Pipe Mount		Panel Mount
Front View	Side View	

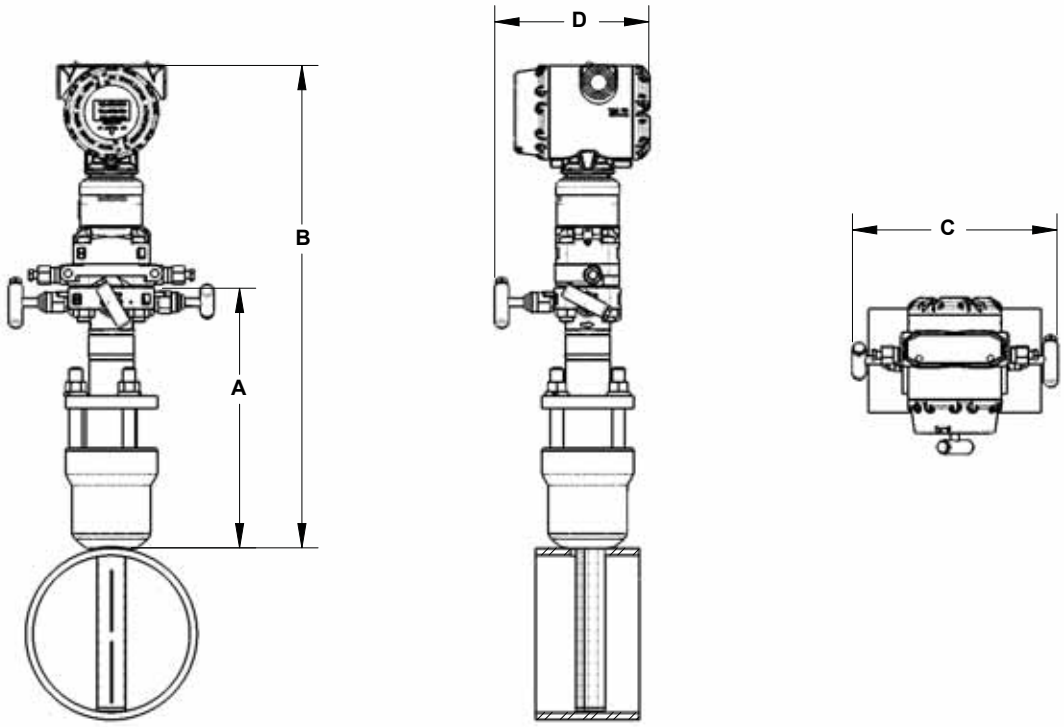


Dimensions are in inches (millimeters)

Figure 8. Rosemount 3051SFA Annubar Flowmeter

Rosemount 3051SFA Annubar Flowmeter(1)

Front View	Side View	Top View



Dimensions are in inches (millimeters)

(1) The Pak-Lok Annubar model is available up to 600# ANSI (1440 psig at 100 °F (99 bar at 38 °C)).

Table 8. 3051CFA Annubar Flowmeter Dimensional Data

Sensor Size	A (Max)	B (Max)	C (Max)	D (Max)
1	7.50 (190.5)	16.03 (407.2)	9.00 (228.6)	6.90 (175.3)
2	9.25 (235.0)	17.78 (451.6)	9.00 (228.6)	6.90 (175.3)
3	12.00 (304.8)	20.53 (521.5)	9.00 (228.6)	6.90 (175.3)
Dimensions are in inches (millimeters)				

Figure 9. Rosemount 3051SFC Compact Orifice Flowmeter

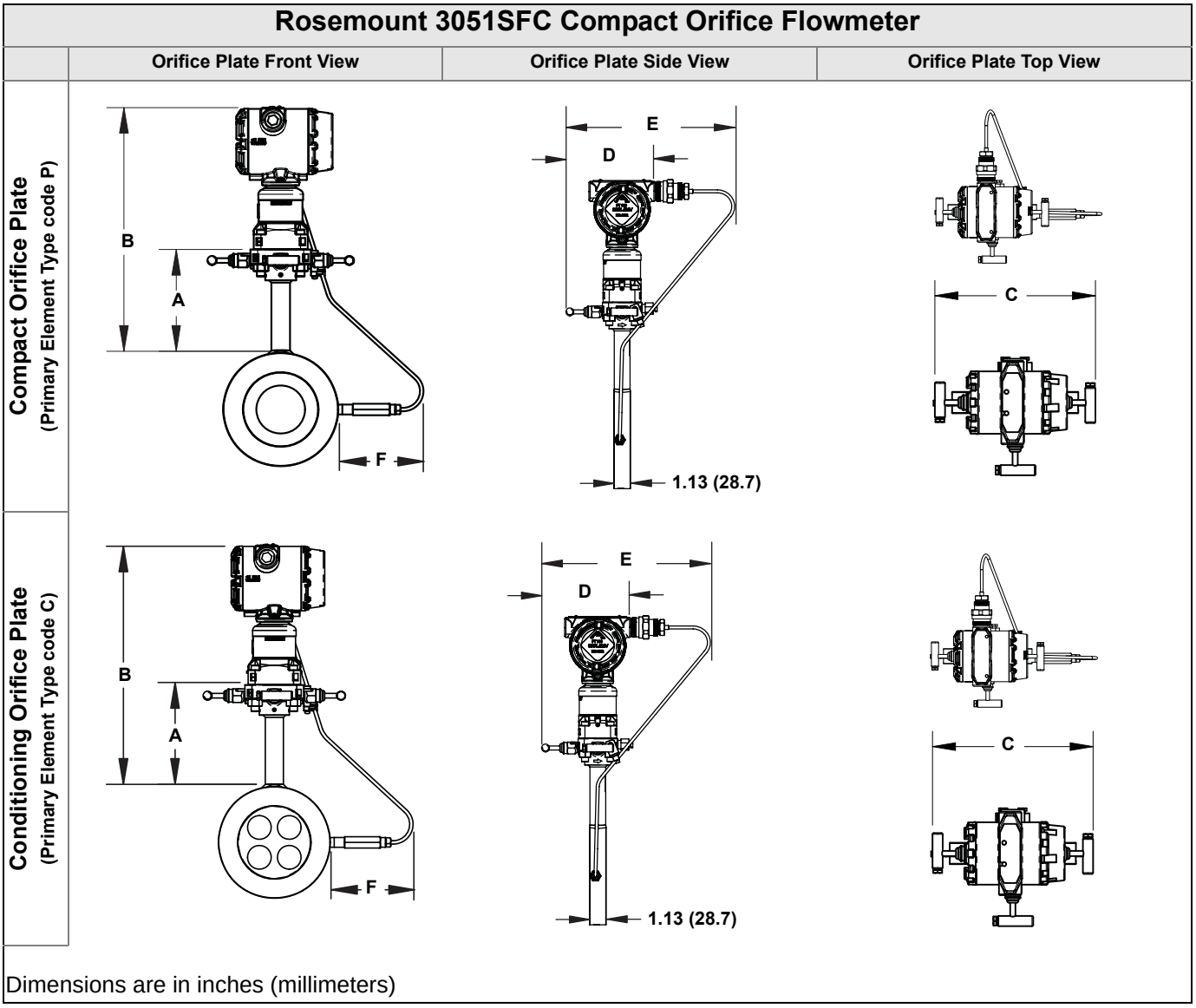


Table 9. Dimensional Drawings[1]

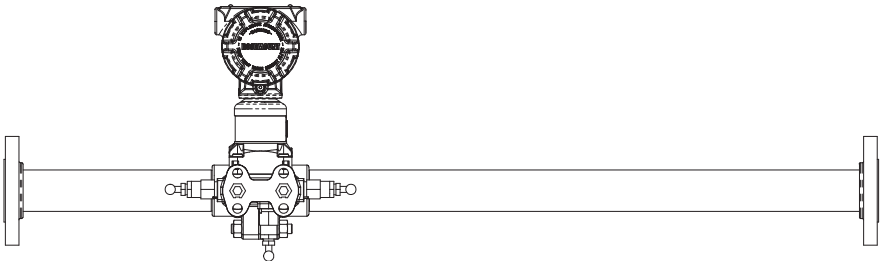
Primary[1] Element Type	A	B	Transmitter Height	C	D	E	F
Type P and C	5.62 (143)	Transmitter Height + A	7.70 (196)	7.75 (197) - closed 8.25 (210) - open	6.00 (152) - closed 6.25 (159) - open	10.2 (257.8) - closed 10.4 (264.2) - open	Max of 6.7 (71)

(1) Measurement in inches (millimeters).

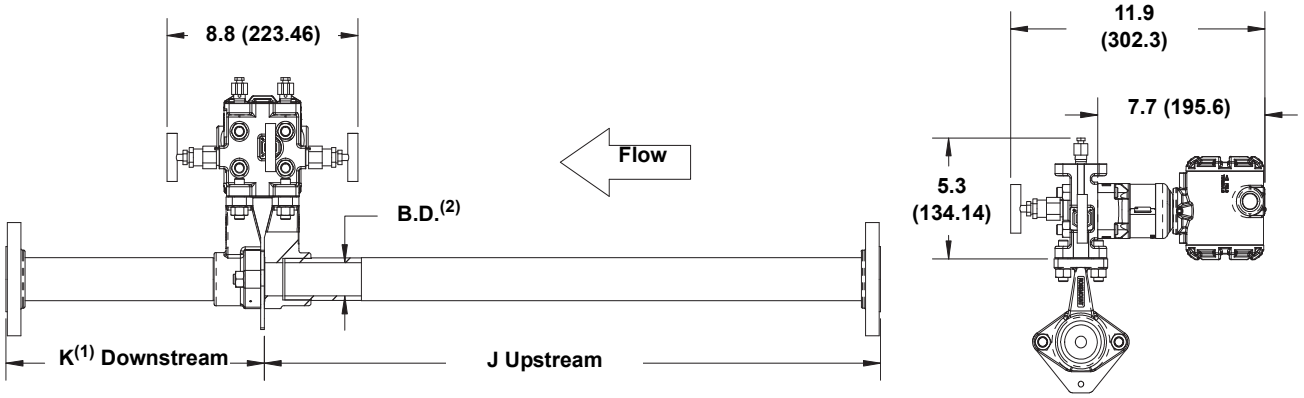
Figure 10. Rosemount 3051SFP Integral Orifice Flowmeter

Rosemount 3051SFP Integral Orifice Flowmeter

Front View



Bottom View **Side View**



Dimensions are in inches (millimeters)

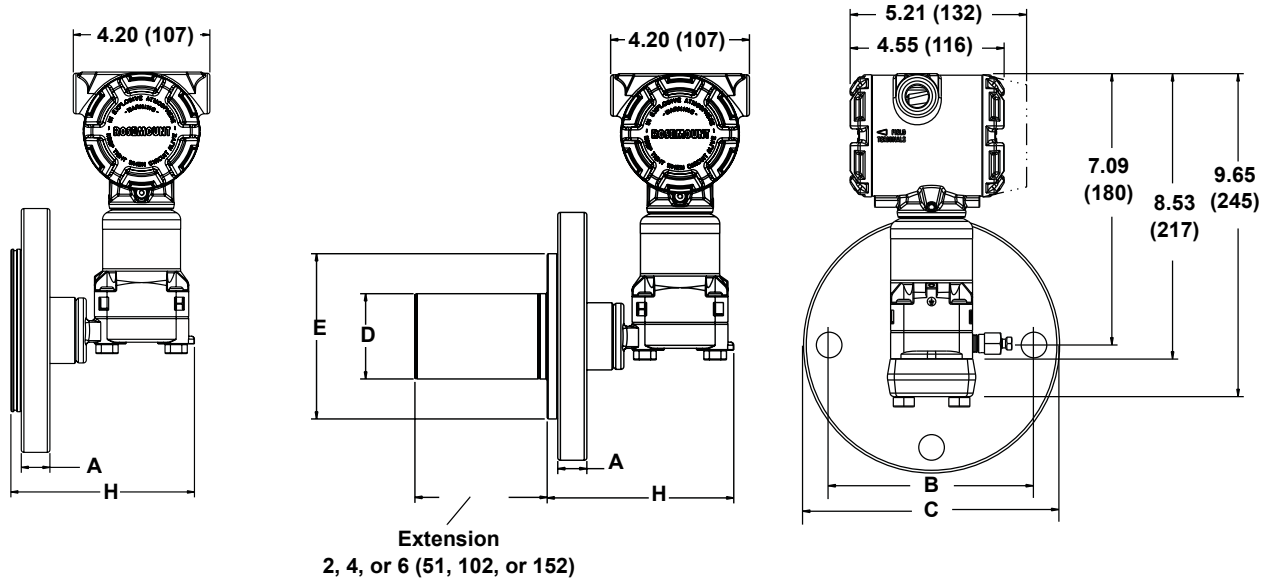
	Line Size		
Dimension	**1/2-in. (15 mm)**	**1-in. (25 mm)**	**1 1/2-in. (40 mm)**
J (Beveled/Threaded pipe ends)	12.54 (318.4)	20.24 (514.0)	28.44 (722.4)
J (RF slip-on, RTJ slip-on, RF-DIN slip on)	12.62 (320.4)	20.32 (516.0)	28.52 (724.4)
J (RF 150#, weld neck)	14.37 (364.9)	22.37 (568.1)	30.82 (782.9)
J (RF 300#, weld neck)	14.56 (369.8)	22.63 (574.7)	31.06 (789.0)
J (RF 600#, weld neck)	14.81 (376.0)	22.88 (581.0)	31.38 (797.1)
K (Beveled/Threaded pipe ends)	5.74 (145.7)	8.75 (222.2)	11.91 (302.6)
K (RF slip-on, RTJ slip-on, RF-DIN slip on)(1)	5.82 (147.8)	8.83 (224.2)	11.99 (304.6)
K (RF 150#, weld neck)	7.57 (192.3)	10.88 (276.3)	14.29 (363.1)
K (RF 300#, weld neck)	7.76 (197.1)	11.14 (282.9)	14.53 (369.2)

(1) Downstream length shown here includes plate thickness of 0.162-in. (4.11 mm).

Figure 11. Rosemount 3051S_L Liquid Level Transmitter

Side View | **Front View**

Flush Flanged Configuration | **Extended Flanged Configuration**



Dimensions are in inches (millimeters)

Class	Pipe Size	Flange Thickness A	Bolt Circle Diameter B	Outside Diameter C	No. of Bolts	Bolt Hole Diameter	Extension Diameter[1] D	E	H
ASME B16.5 (ANSI) 150	2 (51)	0.69 (18)	4.75 (121)	6.0 (152)	4	0.75 (19)	N/A	3.6 (92)	5.65 (143)
	3 (76)	0.88 (22)	6.0 (152)	7.5 (191)	4	0.75 (19)	2.58 (66)	5.0 (127)	5.65 (143)
	4 (102)	0.88 (22)	7.5 (191)	9.0 (229)	8	0.75 (19)	3.5 (89)	6.2 (158)	5.65 (143)
ASME B16.5 (ANSI) 300	2 (51)	0.82 (21)	5.0 (127)	6.5 (165)	8	0.75 (19)	N/A	3.6 (92)	5.65 (143)
	3 (76)	1.06 (27)	6.62 (168)	8.25 (210)	8	0.88 (22)	2.58 (66)	5.0 (127)	5.65 (143)
	4 (102)	1.19 (30)	7.88 (200)	10.0 (254)	8	0.88 (22)	3.5 (89)	6.2 (158)	5.65 (143)
ASME B16.5 (ANSI) 600	2 (51)	1.00 (25)	5.0 (127)	6.5 (165)	8	0.75 (19)	N/A	3.6 (92)	7.65 (194)
	3 (76)	1.25 (32)	6.62 (168)	8.25 (210)	8	0.88 (22)	2.58 (66)	5.0 (127)	7.65 (194)
DIN 2501 PN 10–40	DN 50	20 mm	125 mm	165 mm	4	18 mm	N/A	4.0 (102)	5.65 (143)
DIN 2501 PN 25/40	DN 80	24 mm	160 mm	200 mm	8	18 mm	66 mm	5.4 (138)	5.65 (143)
	DN 100	24 mm	190 mm	235 mm	8	22 mm	89 mm	6.2 (158)	5.65 (143)
DIN 2501 PN 10/16	DN 100	20 mm	180 mm	220 mm	8	18 mm	89 mm	6.2 (158)	5.65 (143)

(1) Tolerances are 0.040 (1,02), –0.020 (0,51).

ACCESSORIES

Rosemount Engineering Assistant (EA) Software Packages

The Rosemount Engineering Assistant software supports flow configuration for the 3051S MultiVariable and 3051S FOUNDATION fieldbus. The package is available with or without modem and connecting cables. All configurations are packaged separately.

For best performance of the EA Software, the following computer hardware and software is recommended:

- Pentium, 800MHz personal computer or above
- 512 MB RAM
- 350 MB of available hard disk space
- Microsoft ® Windows™ 2000 or XP Professional

Engineering Assistant Software Packages

Code	Product Description
EA	Engineering Assistant Software Program
Code	**Software Media**
2	EA Rev. 5 (Compatible with 3095, 3051S FOUNDATION fieldbus, and 333)
3	EA Rev. 6 (Compatible with 3051SMV only)
Code	**Language**
E	English
Code	**Modem and Connecting Cables**
0	None
H	Serial Port HART Modem and Cables
B	USB Port HART Modem and Cables
C	FOUNDATION fieldbus PCM-CIA Interface Card and Cables
Code	**License**
N1	Single PC license
N2	Site license
Typical Model Number: EA 2 E 0 N1	

Accessories

Item Description	Part Number
Serial Port HART Modem and Cables Only	03095-5105-0001
USB Port HART Modem and Cables Only(1)	03095-5105-0002
FOUNDATION fieldbus PCM-CIA Interface Card and Cables Only	03095-5108-0001
Long-life Power Module for Wireless option	00753-9220-0001

(1) Supported by Snap-On EA with AMS Device Manager version 6.2 or higher.

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Email : Enquiries@AP.EmersonProcess.com

Product Data Sheet
00813-0100-4001, Rev JA
April 2010

Rosemount 3051 Pressure Transmitter

THE PROVEN INDUSTRY LEADER IN PRESSURE MEASUREMENT

- *Best-in-Class performance with 0.04% High Accuracy option*
- *Industry first installed five-year stability*
- *Unmatched Dynamic Performance*
- *Coplanar™ platform enables integrated pressure, flow, and level solutions*
- *Advanced PlantWeb® Functionality to increase plant productivity*

Contents

Setting the Standard for Pressure Measurement

Industry's best total performance, a flexible Coplanar platform, and installed five-year stability, has made the Rosemount 3051 the standard in pressure measurement.

Industry's best-in-class total performance of ±0.15%

Total performance is the true measure of "real-world" transmitter performance. Using superior sensor technology and engineered for optimal performance, the 3051 delivers unprecedented ±0.04% reference accuracy, resulting in total operating performance of ±0.15%. Superior total performance equates to reduced variability and improved plant safety.

Installed five-year stability of ±0.125%

Transmitter stability is a critical measure of transmitter performance over time. Through aggressive simulation testing beyond standard IEC 770 testing, the 3051 has proven its ability to maintain performance over a five year period under the most demanding process conditions. Superior transmitter stability reduces calibration frequency to save operation and maintenance costs.

Unmatched dynamic performance

In dynamic applications, speed of measurement is as important as repeatability. The 3051 responds up to eight times faster than the typical pressure transmitter to detect and control variations quickly and efficiently. Superior dynamic response yields more accurate measurements to reduce variability and increase profitability.

Coplanar platform enables complete point solutions

The versatile Coplanar platform design enables the best process connection for pressure, flow and level applications. Right out of the box, the solution arrives factory calibrated, pressure-tested, and ready to install. Only the 3051 has a flexible design to reduce engineering and inventory costs.

Advanced PlantWeb Functionality

The 3051 powers the PlantWeb architecture by delivering the best sensor and transmitter, best installation practices, and best in class field intelligence. One component is the enhanced diagnostic capabilities in FOUNDATION fieldbus that provide an increase in process visibility, enabling proactive maintenance, improving process availability and plant productivity.

Rosemount Pressure Solutions

Rosemount 3051S Series of Instrumentation

Scalable pressure, flow and level measurement solutions improve installation and maintenance practices.

Rosemount 3095MV Mass Flow Transmitter

Accurately measures differential pressure, static pressure and process temperature to dynamically calculate fully compensated mass flow.

Rosemount 305 and 306 Integral Manifolds

Factory-assembled, calibrated and seal-tested manifolds reduce on-site installation costs.

Rosemount 1199 Remote Seals

Provides reliable, remote measurements of process pressure and protects the transmitter from hot, corrosive, or viscous fluids.

Orifice Plate Primary Element Systems: Rosemount 1495 and 1595 Orifice Plates, 1496 Flange Unions and 1497 Meter Sections

A comprehensive offering of orifice plates, flange unions and meter sections that is easy to specify and order. The 1595 Conditioning Orifice provides superior performance in tight fit applications.

Annubar® Flowmeter Series: Rosemount 3051SFA, 3095MFA, and 485

The state-of-the-art, fifth generation Rosemount 485 Annubar combined with the 3051S or 3095MV MultiVariable transmitter creates an accurate, repeatable and dependable insertion-type flowmeter.

Compact Orifice Flowmeter Series: Rosemount 3051SFC, 3095MFC, and 405

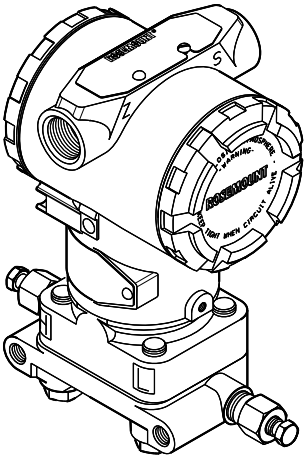
Compact Orifice Flowmeters can be installed between existing flanges, up to a Class 600 (PN100) rating. In tight fit applications, a conditioning orifice plate version is available, requiring only two diameters of straight run upstream.

ProPlate® Flowmeter Series: Rosemount ProPlate, Mass ProPlate, and 1195

These integral orifice flowmeters eliminate the inaccuracies that become more pronounced in small orifice line installations. The completely assembled, ready to install flowmeters reduce cost and simplify installation.

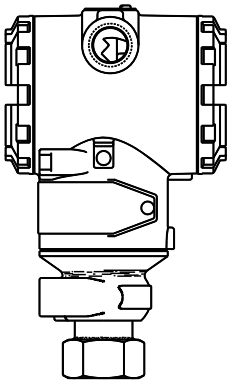
Product Offering

Rosemount 3051C Differential, Gage, and Absolute



See ordering information on page 23.

- Performance up to 0.04% accuracy
- Installed five-year stability of 0.125%
- Coplanar platform enables integrated manifold, primary element and remote seal solutions
- Calibrated spans/ranges from 0.1 inH_2O to 4000 psi (0,25 mbar to 276 bar)
- 316L SST, Alloy C-276, Monel®, Tantalum, Gold-plated Monel, or Gold-plated 316L SST process isolators

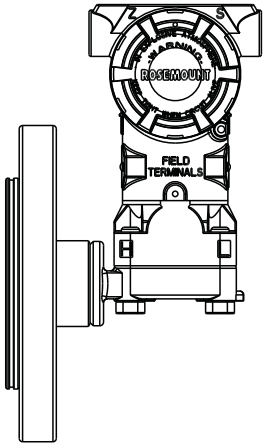


Rosemount 3051T Gage and Absolute

See ordering information on page 29.

- Performance up to 0.04% accuracy
- Installed five-year stability of 0.125%
- Calibrated spans from 0.3 to 10000 psi (10,3 mbar to 689 bar)
- Multiple process connections available
- 316L SST and Alloy C-276 process isolators

Rosemount 3051L Liquid Level



See ordering information on page 33.

- Performance up to 0.075% accuracy
- Welded fill fluid system provides best-in-class system reliability
- Flush and extended diaphragms
- Multiple fill fluids and wetted materials available

Specifications

PERFORMANCE SPECIFICATIONS

Total Performance is based on combined errors of reference accuracy, ambient temperature effect, and static pressure effect.
This product data sheet covers both HART and fieldbus protocols unless specified.

Conformance To Specification (±3σ (Sigma))

Technology leadership, advanced manufacturing techniques and statistical process control ensure specification conformance to at least ±3σ.

Reference Accuracy[1]

Models	Standard	High Accuracy Option
3051CD, 3051CG Range 0 (CD)	±0.10% of span For spans less than 2:1, accuracy = ±0.05% of URL	
Range 1	±0.10% of span For spans less than 15:1, accuracy = $\pm\left[0.025 + 0.005\left(\frac{URL}{Span}\right)\right]$% of Span	
Ranges 2-5	±0.065% of span For spans less than 10:1, accuracy = $\pm\left[0.015 + 0.005\left(\frac{URL}{Span}\right)\right]$% of Span	Ranges 2-4 High Accuracy Option, P8 ±0.04% of span For spans less than 5:1, accuracy = $\pm\left[0.015 + 0.005\left(\frac{URL}{Span}\right)\right]$% of Span
3051T Ranges 1-4	±0.065% of span For spans less than 10:1, accuracy = $\pm\left[0.0075\left(\frac{URL}{Span}\right)\right]$% of Span	Ranges 2-4 High Accuracy Option, P8 ±0.04% of span For spans less than 5:1, accuracy = $\pm\left[0.0075\left(\frac{URL}{Span}\right)\right]$% of Span
Range 5	±0.075% of span For spans less than 10:1, accuracy = $\pm\left[0.0075\left(\frac{URL}{Span}\right)\right]$% of Span	
3051CA Ranges 1-4	±0.065% of span For spans less than 10:1, accuracy = $\pm\left[0.0075\left(\frac{URL}{Span}\right)\right]$% of Span	Ranges 2-4 High Accuracy Option, P8 ±0.04% of span For spans less than 5:1, accuracy = $\pm\left[0.0075\left(\frac{URL}{Span}\right)\right]$% of Span
3051L All Ranges	±0.075% of span For spans less than 10:1, accuracy = $\pm\left[0.025 + 0.005\left(\frac{URL}{Span}\right)\right]$% of Span	

(1) For FOUNDATION fieldbus transmitters, use calibrated range in place of span. For zero based spans, reference conditions, silicone oil fill, SST materials, Coplanar flange (3051C) or 1/2 in. - 18 NPT (3051T) process connections, digital trim values set to equal range points.

Total Performance

For ±50 °F (28 °C) temperature changes, up to 1000 psi (6,9 MPa) line pressure (CD only), from 1:1 to 5:1 rangedown.

Models	Total Performance
3051C	
Ranges 2-5	±0.15% of span
3051T	
Ranges 1-4	±0.15% of span

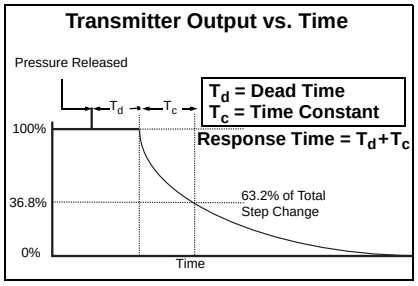
Long Term Stability

Models	Long Term Stability
3051C	
Ranges 2-5	±0.125% of URL for 5 years ±50 °F (28 °C) temperature changes, and up to 1000 psi (6,9 MPa) line pressure.
3051CD Low/Draft Range	
Ranges 0-1	±0.2% of URL for 1 year
3051T	
Ranges 1-4	±0.125% of URL for 5 years ±50 °F (28 °C) temperature changes, and up to 1000 psi (6,9 MPa) line pressure.

Dynamic Performance

	4 - 20 mA (*HART* protocol)[1]	Fieldbus protocol[3]	Typical HART Transmitter Response Time
Total Response Time (T_d + T_c)[2]:			
3051C, Ranges 2-5:	100 ms	152 ms	
Range 1:	255 ms	307 ms	
Range 0:	700 ms	752 ms	
3051T:	100 ms	152 ms	
3051L:	Consult factory	Consult factory	
Dead Time (Td)	45 ms (nominal)	97 ms	
Update Rate	22 times per second	22 times per second	

(1) Dead time and update rate apply to all models and ranges; analog output only
(2) Nominal total response time at 75 °F (24 °C) reference conditions.
(3) Transmitter fieldbus output only, segment macro-cycle not included.



Line Pressure Effect per 1000 psi (6,9 MPa)

For line pressures above 2000 psi (13,7 MPa) and Ranges 4-5, see user manual (Document number 00809-0100-4001).

Models	Line Pressure Effect
3051CD	Zero Error[1]
Range 0	±0.125% of URL/100 psi (6,89 bar)
Range 1	±0.25% of URL/1000 psi (68,9 bar)
Ranges 2-3	±0.05% of URL/1000 psi (68,9 bar) for line pressures from 0 to 2000 psi (0 to 13,7 MPa)
	Span Error
Range 0	±0.15% of reading/100 psi (6,89 bar)
Range 1	±0.4% of reading/1000 psi (68,9 bar)
Ranges 2-3	±0.1% of reading/1000 psi (68,9 bar)

(1) Can be calibrated out at line pressure.

Ambient Temperature Effect per 50°F (28°C)

Models	Ambient Temperature Effect
3051CD, 3051CG	
Range 0	±(0.25% URL + 0.05% span)
Range 1	±(0.1% URL + 0.25% span)
Ranges 2-5	±(0.0125% URL + 0.0625% span) from 1:1 to 5:1 ±(0.025% URL + 0.125% span) from 5:1 to 100:1
3051T	
Range 1	±(0.025% URL + 0.125% span) from 1:1 to 10:1 ±(0.05% URL + 0.125% span) from 10:1 to 100:1
Range 2-4	±(0.025% URL + 0.125% span) from 1:1 to 30:1 ±(0.035% URL + 0.125% span) from 30:1 to 100:1
Range 5	±(0.1% URL + 0.15% span)
3051CA	
All Ranges	±(0.025% URL + 0.125% span) from 1:1 to 30:1
	±(0.035% URL + 0.125% span) from 30:1 to 100:1
3051L	See Rosemount Inc. Instrument Toolkit® software.

Mounting Position Effects

Models	Mounting Position Effects
3051C	Zero shifts up to ±1.25 inH_2O (3,11 mbar), which can be calibrated out. No span effect.
3051L	With liquid level diaphragm in vertical plane, zero shift of up to 1 inH_2O (2,49 mbar). With diaphragm in horizontal plane, zero shift of up to 5 inH_2O (12,43 mbar) plus extension length on extended units. All zero shifts can be calibrated out. No span effect.
3051CA, 3051T	Zero shifts up to 2.5 inH_2O (6,22 mbar), which can be calibrated out. No span effect.

Vibration Effect

All Models

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.

Power Supply Effect

All Models

Less than ±0.005% of calibrated span per volt.

RFI Effects

All Models

±0.1% of span from 20 to 1000 MHz and for field strength up to 30 V/m.

Transient Protection (Option Code T1)

All Models:

Meets IEEE C62.41, Category B

6 kV crest (0.5 μs - 100 kHz)
3 kV crest (8 × 20 microseconds)
6 kV crest (1.2 × 50 microseconds)

Meets IEEE C37.90.1, Surge Withstand Capability

SWC 2.5 kV crest, 1.25 MHz wave form

General Specifications:

Response Time: < 1 nanosecond
Peak Surge Current: 5000 amps to housing
Peak Transient Voltage: 100 V dc
Loop Impedance: < 25 ohms
Applicable Standards: IEC61000-4-4, IEC61000-4-5

NOTE:
Calibrations at 68 °F (20 °C) per ASME Z210.1 (ANSI)

FUNCTIONAL SPECIFICATIONS

Range and Sensor Limits

TABLE 1. 3051CD, 3051CG, and 3051L Range and Sensor Limits

Range	Minimum Span		Range and Sensor Limits			
			Lower (LRL)			
	3051CD(1), 3051CG, 3051L	Upper (URL)	3051CD Differential	3051CG Gage	3051L Differential	3051LGage
0	0.1 inH_2O (0,25 mbar)	3.0 inH_2O (7,47 mbar)	-3.0 inH_2O (-7,47 mbar)	NA	NA	NA
1	0.5 inH_2O (1,2 mbar)	25 inH_2O (62,3 mbar)	-25 inH_2O (-62,1 mbar)	-25 inH_2O (-62,1 mbar)	NA	NA
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)	-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)	0.5 psia (34,5 mbar abs)	-1000 inH_2O (-2,49 bar)	0.5 psia (34,5 mbar abs)
4	3 psi (0,20 bar)	300 psi (20,6 bar)	-300 psi (-20,6 bar)	0.5 psia (34,5 mbar abs)	-300 psi (-20,6 bar)	0.5 psia (34,5 mbar abs)
5	20 psi (1,38 bar)	2000 psi (137,9 bar)	- 2000 psi (-137,9 bar)	0.5 psia (34,5 mbar abs)	NA	NA

(1) Range 0 only available with 3051CD. Range 1 only available with 3051CD or 3051CG.

TABLE 2. Range and Sensor Limits

Range	3051CA				Range	3051T			
		Range and Sensor Limits					Range and Sensor Limits		
	Minimum Span	Upper (URL)	Lower (LRL)			Minimum Span	Upper (URL)	Lower (LRL)	Lower(1) (LRL) (Gage)
1	0.3 psia (20,6 mbar)	30 psia (2,07 bar)	0 psia (0 bar)		1	0.3 psi (20,6 mbar)	30 psi (2,07 bar)	0 psia (0 bar)	-14.7 psig (-1,01 bar)
2	1.5 psia (0,103 bar)	150 psia (10,3 bar)	0 psia (0 bar)		2	1.5 psi (0,103 bar)	150 psi (10,3 bar)	0 psia (0 bar)	-14.7 psig (-1,01 bar)
3	8 psia (0,55 bar)	800 psia (55,2 bar)	0 psia (0 bar)		3	8 psi (0,55 bar)	800 psi (55,2 bar)	0 psia (0 bar)	-14.7 psig (-1,01 bar)
4	40 psia (2,76 bar)	4000 psia (275,8 bar)	0 psia (0 bar)		4	40 psi (2,76 bar)	4000 psi (275,8 bar)	0 psia (0 bar)	-14.7 psig (-1,01 bar)
					5	2000 psi (137,9 bar)	10000 psi (689,4 bar)	0 psia (0 bar)	-14.7 psig (-1,01 bar)

(1) Assumes atmospheric pressure of 14.7 psig.

Zero and Span Adjustment Requirements (*HART* and Low Power)

Zero and span values can be set anywhere within the range limits stated in Table 1 and Table 2.

Span must be greater than or equal to the minimum span stated in Table 1 and Table 2.

Service

Liquid, gas, and vapor applications

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.

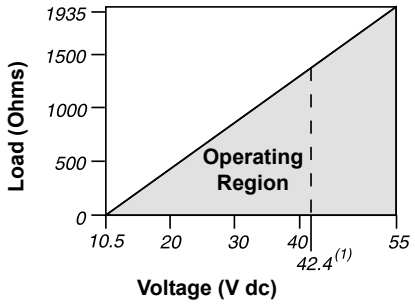
Power Supply

External power supply required. Standard transmitter (4-20 mA) operates on 10.5 to 55 V dc with no load.

Load Limitations

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

Max. Loop Resistance = 43.5 (Power Supply Voltage – 10.5)



Communication requires a minimum loop resistance of 250 ohms.

(1) For CSA approval, power supply must not exceed 42.4 V.

FOUNDATION fieldbus (output code F) and Profibus (output code W)

Power Supply

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

Current Draw

17.5 mA for all configurations (including LCD display option)

FOUNDATION fieldbus Function Block Execution Times

Block	Execution Time
Resource	-
Transducer	-
LCD Block	-
Analog Input 1, 2	30 milliseconds
PID	45 milliseconds
Input Selector	30 milliseconds
Arithmetic	35 milliseconds
Signal Characterizer	40 milliseconds
Integrator	35 milliseconds

FOUNDATION fieldbus Parameters

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

Standard Function Blocks

Resource Block

Contains hardware, electronics, and diagnostic information.

Transducer Block

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

LCD Block

Configures the local display.

2 Analog Input Blocks

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

PID Block

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

Backup Link Active Scheduler (LAS)

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

Advanced Control Function Block Suite (Option Code A01)

Input Selector Block

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

Arithmetic Block

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

Signal Characterizer Block

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

Integrator Block

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

FOUNDATION fieldbus Diagnostics Suite (Option Code D01)

The 3051C *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 3051C ASP algorithm uses these values and highly flexible configuration options for customization to many user-defined or application specific abnormal situations. The detection of plugged impulse lines is the first available predefined application.

Low Power (Output Code M)

Output

Three wire 1-5 V dc or 0.8-3.2 V dc (Option Code C2) user-selectable output. Also user selectable for linear or square root output configuration. Digital process variable superimposed on voltage signal, available to any host conforming to the *HART* protocol. Low-power transmitter operates on 6-12 V dc with no load.

Power Consumption

3.0 mA, 18-36 mW

Minimum Load Impedance

100 kΩ (V_{out} wiring)

Indication

Optional 5-digit LCD display

Overpressure Limits

Rosemount 3051CD/CG

- Range 0: 750 psi (51,7 bar)
- Range 1: 2000 psig (137,9 bar)
- Ranges 2-5: 3626 psig (250 bar)
  4500 psig (310,3 bar) for option code P9

Rosemount 3051CA

- Range 1: 750 psia (51,7 bar)
- Range 2: 1500 psia (103,4 bar)
- Range 3: 1600 psia (110,3 bar)
- Range 4: 6000 psia (413,7 bar)

Rosemount 3051TG/TA

- Range 1: 750 psi (51,7 bar)
- Range 2: 1500 psi (103,4 bar)
- Range 3: 1600 psi (110,3 bar)
- Range 4: 6000 psi (413,7 bar)
- Range 5: 15000 psi (1034,2 bar)

For 3051L or Level Flange Option Codes FA, FB, FC, FD, FP, and FQ, limit is 0 psia to the flange rating or sensor rating, whichever is lower.

TABLE 3. 3051L and Level Flange Rating Limits

Standard	Type	CS Rating	SST Rating
ANSI/ASME	Class 150	285 psig	275 psig
ANSI/ASME	Class 300	740 psig	720 psig
ANSI/ASME	Class 600	1480 psig	1440 psig
At 100 °F (38 °C), the rating decreases with increasing temperature, per ANSI/ASME B16.5.			
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 248 °F (120 °C), the rating decreases with increasing temperature, per DIN 2401.			

Static Pressure Limit

Rosemount 3051CD Only

Operates within specifications between static line pressures of 0.5 psia and 3626 psig (4500 psig (310, 3 bar) for Option Code P9).

Range 0: 0.5 psia and 750 psig (3, 4 bar and 51, 7 bar)

Range 1: 0.5 psia and 2000 psig (3, 4 bar and 137, 9 bar)

Burst Pressure Limits

Burst pressure on Coplanar or traditional process flange is 10000 psig (69 MPa).

Burst pressure for the 3051T is

Ranges 1-4: 11000 psi (75,8 MPa)

Range 5: 26000 psig (179 MPa)

Failure Mode Alarm

Output Code A

If self-diagnostics detect a gross transmitter failure, the analog signal will be driven either below 3.75 mA or to 21.75 mA to alert the user. NAMUR-compliant values are available, option code C4. High or low alarm signal is user-selectable by internal jumper.

Output Code M

If self-diagnostics detect a gross transmitter failure, the analog signal will be driven either below 0.94 V or above 5.4 V to alert the user (below 0.75 V or above 4.4 V for Option C2). High or low alarm signal is user-selectable by internal jumper.

Output Code F and W

If self-diagnostics detect a gross transmitter failure, that information gets passed as a status along with the process variable.

Temperature Limits

Ambient

-40 to 185 °F (-40 to 85 °C)

With LCD display(1): -4 to 175 °F (-20 to 80 °C)

Storage

-50 to 230 °F (-46 to 110 °C)

With LCD display: -40 to 185 °F (-40 to 85 °C)

Process

At atmospheric pressures and above. See Table 4

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

TABLE 4. 3051 Process Temperature Limits

3051CD, 3051CG, 3051CA	
Silicone Fill Sensor(1)	
with Coplanar Flange	–40 to 250 °F (–40 to 121 °C)(2)
with Traditional Flange	–40 to 300 °F (–40 to 149 °C)(2)(3)
with Level Flange	–40 to 300 °F (–40 to 149 °C)(2)
with 305 Integral Manifold	–40 to 300 °F (–40 to 149 °C)(2)
Inert Fill Sensor(1)	0 to 185 °F (–18 to 85 °C)(4)(5)
3051T (Process Fill Fluid)	
Silicone Fill Sensor(1)	–40 to 250 °F (–40 to 121 °C)(2)
Inert Fill Sensor(1)	–22 to 250 °F (–30 to 121 °C)(2)
3051L Low-Side Temperature Limits	
Silicone Fill Sensor(1)	–40 to 250 °F (–40 to 121 °C)(2)
Inert Fill Sensor(1)	0 to 185 °F (–18 to 85 °C)(2)
3051L High-Side Temperature Limits (Process Fill Fluid)	
Syltherm® XLT	–100 to 300 °F (–73 to 149 °C)
D.C. Silicone 704®	32 to 400 °F (0 to 205 °C)
D.C. Silicone 200	–40 to 400 °F (–40 to 205 °C)
Inert	–50 to 350 °F (–45 to 177 °C)
Glycerin and Water	0 to 200 °F (–18 to 93 °C)
Neobee M-20	0 to 400 °F (–18 to 205 °C)
Propylene Glycol and Water	0 to 200 °F (–18 to 93 °C)

(1) Process temperatures above 185 °F (85 °C) require derating the ambient limits by a 1.5:1 ratio.

(2) 220 °F (104 °C) limit in vacuum service; 130 °F (54 °C) for pressures below 0.5 psia.

(3) 3051CD0 process temperature limits are –40 to 212 °F (–45 to 100 °C)

(4) 160 °F (71 °C) limit in vacuum service.

(5) Not available for 3051CA.

Humidity Limits

0–100% relative humidity

Turn-On Time

Performance within specifications less than 2.0 seconds (10.0 s for Profibus protocol) after power is applied to the transmitter

Volumetric Displacement

Less than 0.005 in^3 (0,08 cm^3)

Damping

Analog output response to a step input change is user-selectable from 0 to 36 seconds for one time constant. This software damping is in addition to sensor module response time.

PHYSICAL SPECIFICATIONS

Electrical Connections

1/2–14 NPT, PG 13.5, G1/2, and M20 × 1.5 (CM20) conduit. *HART* interface connections fixed to terminal block.

Process Connections

All Models except 3051L and 3051T

1/4–18 NPT on 2 1/8-in. centers

1/2–14 NPT on 2-, 2 1/8-, or 2 1/4-in. centers

Rosemount 3051L

High pressure side: 2-, 3-, or 4-in., ASME B 16.5 (ANSI) Class 150, 300 or 600 flange; 50, 80 or 100 mm, PN 40 or 10/16 flange

Low pressure side: 1/4–18 NPT on flange 1/2–14 NPT on adapter

Rosemount 3051T

1/2–14 NPT female. A DIN 16288 Male (available in SST for Range 1–4 transmitters only), or Autoclave type F-250-C (Pressure relieved 9/16–18 gland thread; 1/4 OD high pressure tube 60° cone; available in SST for Range 5 transmitters only).

Process-Wetted Parts

Drain/Vent Valves

316 SST, Alloy C-276, or *Monel* material (*Monel* not available with 3051L)

Process Flanges and Adapters

Plated carbon steel, SST cast CF-8M (cast version of 316 SST, material per ASTM-A743), C-Type cast alloy CW12MW, or *Monel* cast alloy M30C

Wetted O-rings

Glass-filled PTFE or Graphite-filled PTFE

Process Isolating Diaphragms

Isolating Diaphragm Material	3051CD 3051CG	3051T	3051CA
316L SST	•	•	•
Alloy C-276	•	•	•
Monel	•		•
Tantalum	•		
Gold-plated *Monel*	•		•
Gold-plated SST	•		•

Rosemount 3051L Process Wetted Parts

Flanged Process Connection (Transmitter High Side)

Process Diaphragms, Including Process Gasket Surface

- 316L SST, Alloy C-276, or Tantalum

Extension

- CF-3M (Cast version of 316L SST, material per ASTM-A743), or Alloy C-276. Fits schedule 40 and 80 pipe.

Mounting Flange

- Zinc-cobalt plated CS or SST

Reference Process Connection (Transmitter Low Side)

Isolating Diaphragms

- 316L SST or Alloy C-276

Reference Flange and Adapter

- CF-8M (Cast version of 316 SST, material per ASTM-A743)

Non-Wetted Parts

Electronics Housing

Low-copper aluminum or CF-3M (Cast version of 316L SST, material per ASTM-A743). NEMA 4X, IP 65, IP 66

Coplanar Sensor Module Housing

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

Bolts

ASTM A449, Type 1 (zinc-cobalt plated carbon steel)
ASTM F593G, Condition CW1 (Austenitic 316 SST)
ASTM A193, Grade B7M (zinc plated alloy steel)
Monel K-500

Sensor Module Fill Fluid

Silicone oil (D.C. 200) or Fluorocarbon oil (Halocarbon or Fluorinert® FC-43 for 3051T)

Process Fill Fluid (3051L only)

Syltherm XLT, D.C. Silicone 704,
D.C. Silicone 200, inert, glycerin and water, Neobee M-20 or propylene glycol and water

Paint

Polyurethane

Cover O-rings

Buna-N

Shipping Weights

Refer to “Shipping Weights” on page 39.

Product Certifications

Approved Manufacturing Locations

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

European Directive Information

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

ATEX Directive (94/9/EC)

All 3051 transmitters comply with the ATEX Directive.

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

3051CA4; 3051CG2, 3, 4, 5; 3051CD2, 3, 4, 5 *(also with P9 option)*; Pressure Transmitters
— QS Certificate of Assessment - EC No. PED-H-100 Module H Conformity Assessment

All other 3051/3001 Pressure Transmitters

— Sound Engineering Practice

Transmitter Attachments: Diaphragm Seal - Process Flange - Manifold

— Sound Engineering Practice

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

All 3051 Pressure Transmitters meet all of the requirements of EN61326: 1997 - A1, A2, and A3 and NAMUR NE-21

Ordinary Location Certification for Factory Mutual

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

HART PROTOCOL

Hazardous Locations Certifications

North American Certifications

FM Approvals

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

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

Canadian Standards Association (CSA)

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

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

European Certifications

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

TABLE 5. Input Parameters

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

TABLE 6. RTD Assembly (3051CFx Option T or R)

U_i = 5 Vdc
I_i = 500 mA
P_i = 0.63W

Special Conditions for Safe Use (X):
When the optional transient protection terminal block is installed, the apparatus is not capable of withstanding the 500V insulation test required by Clause 6.4.12 of EN50020:1994. This must be taken into account when installing the apparatus.

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

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

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

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

Japanese Certifications

E4 TIIS Flame-Proof
Ex d IIC T6

Certificate	Description
C15850	3051C/D/1 4–20 mA HART — no display
C15851	3051C/D/1 4–20 mA HART — with display
C15854	3051T/G/1 4–20 mA HART, SST, Silicon — no display
C15855	3051T/G/1 4–20 mA HART, Alloy C-276, Silicon — no display
C15856	3051T/G/1 4–20 mA HART, SST, Silicon — with display
C15857	3051T/G/1 4–20 mA HART, Alloy C-276, Silicon — with display

I4 TIIS Intrinsic Safety
Ex ia IIC T4

Certificate	Description
C16406	3051CD/CG

Australian Certifications

I7 SAA Intrinsic Safety
Certification No.: AUS Ex 1249X
Ex ia IIC T4 (T_{amb} = 70 °C)
IP66
When connected per Rosemount drawing 03031-1026

TABLE 7. Input Parameters

U_i = 30V
I_i = 200 mA
I_i = 160 mA (output code A with T1)
P_i = 0.9W
C_i = 0.01 µF
C_i = 0.042 µF (output code M)
L_i = 10 µH
L_i = 1.05 mH (output code A with T1)
L_i = 0.75 mH (output code M with T1)

TABLE 8. RTD Assembly (3051CFx Option T or R)

U_i = 5 Vdc
I_i = 500 mA
P_i = 0.63W

Special Conditions for Safe Use (X):
The apparatus may only be used with a passive current limited power source Intrinsic Safety application. The power source must be such that Po ≤ (Uo * Io) / 4. Modules using transient protection in the terminal assembly (T1 transient protection models) the apparatus enclosure is to be electrically bonded to the protective earth. The conductor used for the connection shall be equivalent to a copper conductor of 4 mm^2 minimum cross-sectional area.

E7 SAA Explosion-Proof (Flame-Proof)
Certification No.: AUS Ex 03.1347X
Ex d IIC T6 (T_{amb} = 40 °C)
DIP A21 T6 (T_{amb} = 40 °C)
IP66

Special Conditions for Safe Use (X):
It is a condition of safe use for transmitter enclosures having cable entry thread other than metric conduit thread that the equipment be utilized with an appropriate certified thread adaptor.

N7 SAA Type n (Non-sparking)
Certification No.: AUS Ex 1249X
Ex n IIC T4 (T_{amb} = 70 °C)
IP66

Special Conditions for Safe Use (X):
Where the equipment is installed such that there is an unused conduit entry, it must be sealed with a suitable blanking plug to maintain the IP66 degree of protection. Any blanking plug used with the equipment shall be of a type which requires the use of a tool to effect its removal. Voltage source shall not exceed 55V dc.

Combinations of Certifications

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

K5 **E5** and **I5** combination

KB **K5** and **C6** combination

KD **K5**, **C6**, **I1**, and **E8** combination

K6 **C6**, **I1**, and **E8** combination

K8 **E8** and **I1** combination

K7 **E7**, **I7**, and **N7** combination

FIELDBUS PROTOCOL

Hazardous Locations Certifications

North American Certifications

FM Approvals

E5 Explosion-Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition-Proof for Class II, Division 1, Groups E, F, and G. Dust-Ignition-Proof for Class III, Division 1.

I5 Intrinsically Safe for use in Class I, Division 1, Groups A, B, C, and D; Class II, Division 1, Groups E, F, and G; Class III, Division 1 when connected per Rosemount drawing 03031-1019; Non-incendive for Class I, Division 2, Groups A, B, C, and D.

Temperature Code:T4 (Ta = 60 °C), T3 (Ta = 85 °C), Enclosure Type 4X
For input parameters see control drawing 03031-1019.

Canadian Standards Association (CSA)

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

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

European Certifications

I1 ATEX Intrinsic Safety and Dust
Certification No.: BAS 98ATEX1355X ⟨Ex⟩ II 1 GD
Ex ia IIC T4 (T_{amb} = –60 to +60 °C)
Dust Rating: Ex tD A20 T70 °C (T_{amb} –20 to 40 °C) IP66
CE 1180

TABLE 9. Input Parameters

U_i = 30V
I_i = 300 mA
P_i = 1.3 W
C_i = 0 µF

TABLE 10. RTD Assembly (3051CFx Option T or R)

U_i = 5 Vdc
I_i = 500 mA
P_i = 0.63W

Special Conditions for Safe Use (X):
The device is not capable of withstanding the 500V insulation test required by Clause 6.4.12 of EN50020:1994. This must be taken into account when installing the apparatus.

IA ATEX FISCO Intrinsic Safety
Certification No.: BAS 98ATEX1355X ⟨Ex⟩ II 1 G
Ex ia IIC T4 (T_{amb} = –60 to +60 °C)
IP66
CE 1180

TABLE 11. Input Parameters

U_i = 17.5 V
I_i = 380 mA
P_i = 5.32 W
C_i = ≤ 5 µF
L_i = ≤ 10 µH

Special Conditions for Safe Use (X):
The device is not capable of withstanding the 500V insulation test required by Clause 6.4.12 of EN50020:1994. This must be taken into account when installing the apparatus.

N1 ATEX Type n and Dust
Certification No.: BAS 98ATEX3356X ⟨Ex⟩ II 3 GD
U_i = 40 Vdc max
Ex nA nL IIC T5 (T_a = –40°C to 70 °C)
Dust rating: Ex tD A22 T80 °C (T_{amb} = –20 to 40 °C) IP66

Special Conditions for Safe Use (X):
The device is not capable of withstanding the 500V insulation test required by Clause 6.4.12 of EN50020:1994. This must be taken into account when installing the apparatus.

E8 ATEX Flame-Proof and Dust
Certification No.: KEMA 00ATEX2013X ⟨Ex⟩ II 1/2 GD
Ex d IIC T6 (T_{amb} = –50 to 65 °C)
Dust rating: Ex tD A20/21 T90 °C, IP66
CE 1180
Vmax = 55 V dc

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

Japanese Certifications

E4 TIIS Flame-Proof
Ex d IIC T6

Certificate	Description
C15852	3051C/D/1 FOUNDATION Fieldbus — no display
C15853	3051C/D/1 FOUNDATION Fieldbus — with display
C15858	3051T/G/1 FOUNDATION Fieldbus, SST, Silicon — no display
C15859	3051T/G/1 FOUNDATION Fieldbus, Alloy C-276, Silicon — no display
C15860	3051T/G/1 FOUNDATION Fieldbus, SST, Silicon — with display
C15861	3051T/G/1 FOUNDATION Fieldbus, Alloy C-276, Silicon — with display

Australian Certifications

I7 SAA Intrinsic Safety
Certification No.: AUS Ex 1249X
Ex ia IIC T4 (T_{amb} = 60 °C)
IP66
When connected per Rosemount drawing 03031-1026.

TABLE 12. Input Parameters

U_i = 30 V
I_i = 300 mA
P_i = 1.3 W
C_i = 0 µF
L_i = 0 µH

TABLE 13. RTD Assembly (3051CFx Option T or R)

U_i = 5 Vdc
I_i = 500 mA
P_i = 0.63W

Special Conditions for Safe Use (X):
The apparatus may only be used with a passive current limited power source Intrinsic Safety application. The power source must be such that Po ≤ (Uo * Io) / 4. Modules using transient protection in the terminal assembly (T1 transient protection models) the apparatus enclosure is to be electrically bonded to the protective earth. The conductor used for the connection shall be equivalent to a copper conductor of 4 mm2 minimum cross-sectional area.

E7 SAA Explosion-Proof (Flame-Proof)
Certification No.: AUS Ex 1347X
Ex d IIC T6 (T_{amb} = 40 °C)
DIP A21 T6 (T_{amb} = 40 °C)
IP66

Special Conditions for Safe Use (X):
It is a condition of safe use for transmitter enclosures having cable entry thread other than metric conduit thread that the equipment be utilized with an appropriate certified thread adaptor.

N7 SAA Type n (Non-sparking)
Certification No.: AUS Ex 1249X
Ex n IIC T4 (T_{amb} = 70 °C)
IP66

Special Conditions for Safe Use (X):
Where the equipment is installed such that there is an unused conduit entry, it must be sealed with a suitable blanking plug to maintain the IP40 degree of protection. Any blanking plug used with the equipment shall be of a type which requires the use of a tool to effect its removal. Voltage source shall not exceed 35V dc.

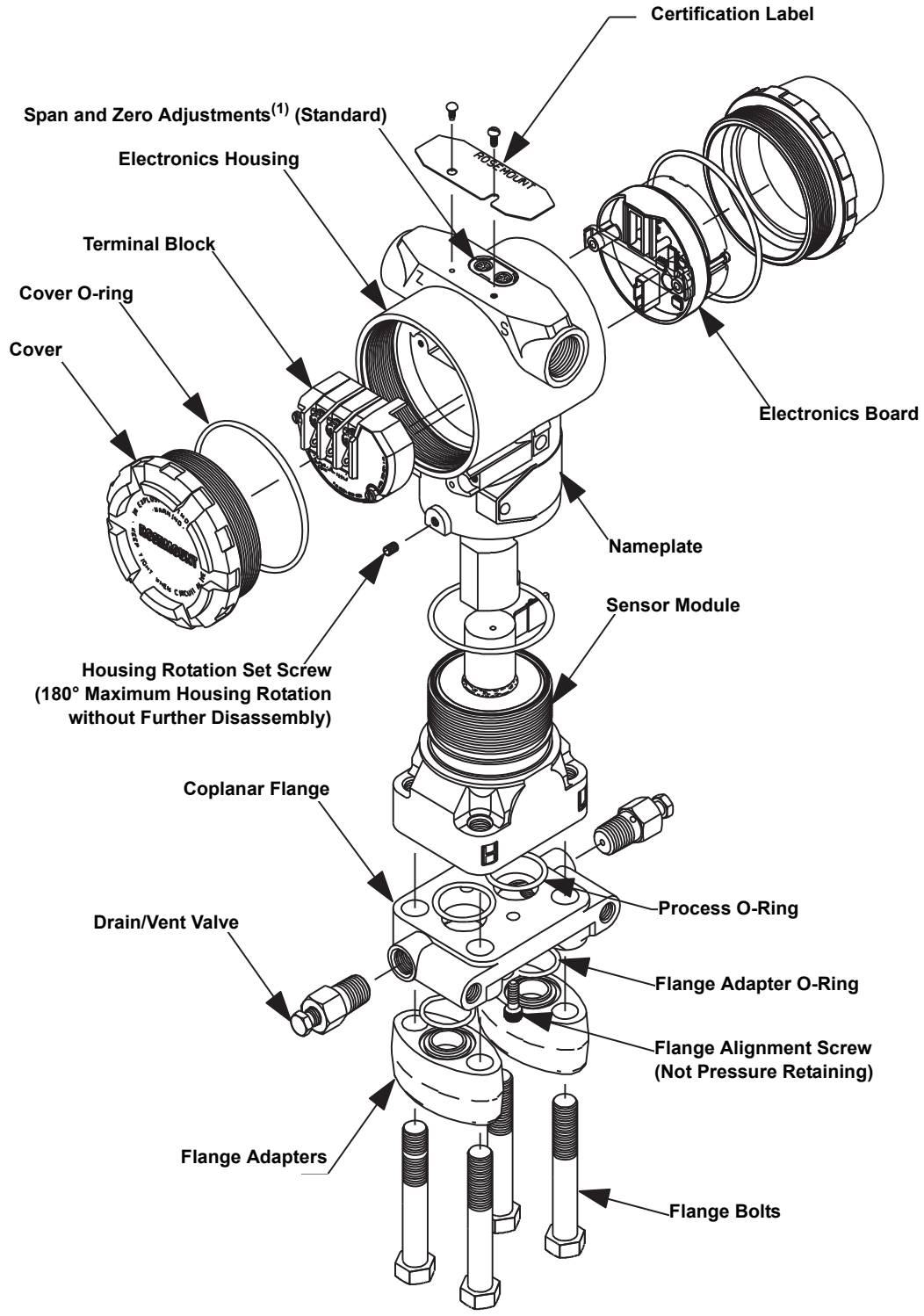
Combinations of Certifications

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

K5 **E5** and **I5** combination
KB **K5** and **C6** combination
KD **K5**, **C6**, **I1**, and **E8** combination
K6 **C6**, **I1**, and **E8** combination
K8 **E8** and **I1** combination
K7 **E7**, **I7**, and **N7** combination

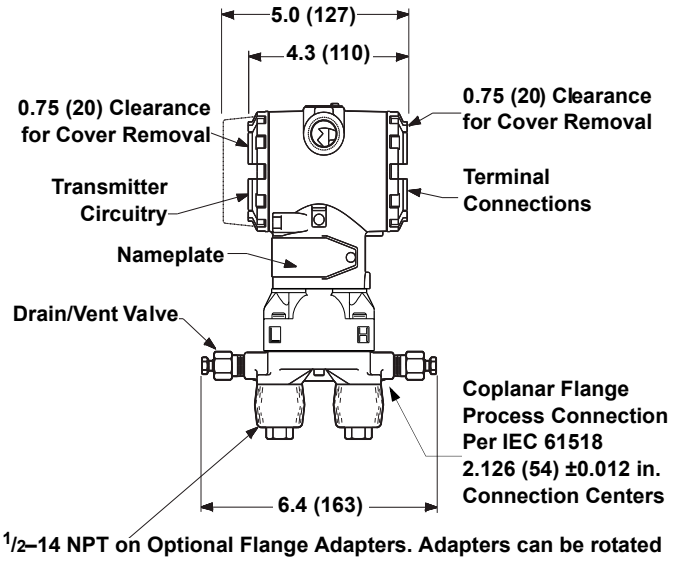
Dimensional Drawings

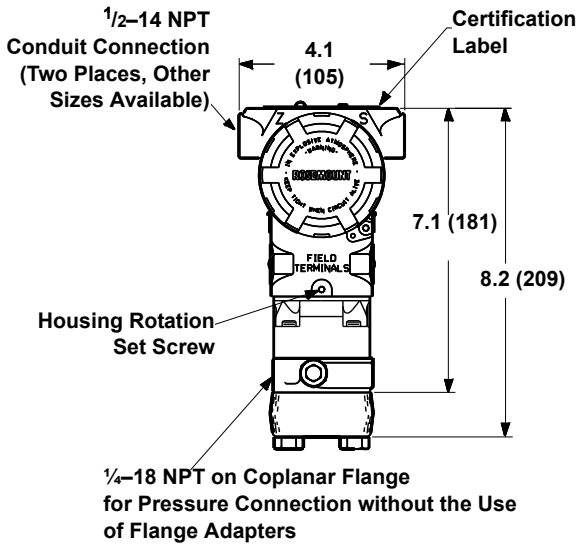
3051C Exploded View



1) Span and Zero Adjustments are not available with fieldbus or profibus protocols.

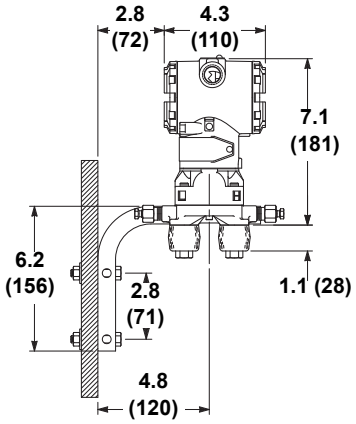
3051C Coplanar Flange Dimensional Drawing (Differential Pressure Transmitter Shown)

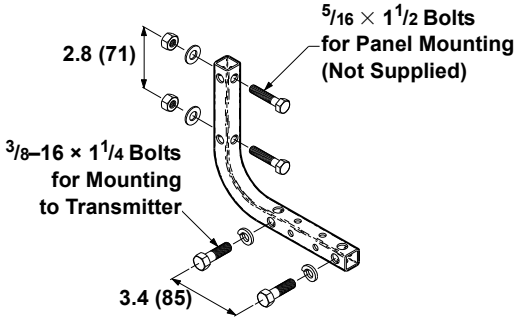




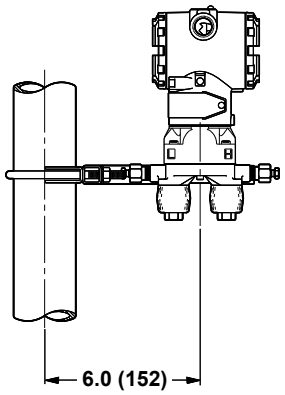
Coplanar Flange Mounting Configurations with Optional Bracket (B4) for 2-in. Pipe or Panel Mounting

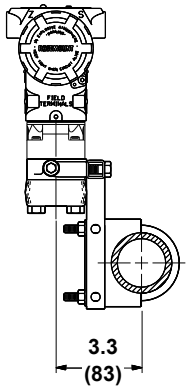
PANEL MOUNTING

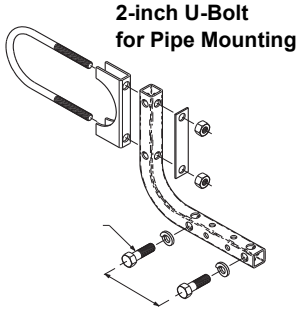




PIPE MOUNTING



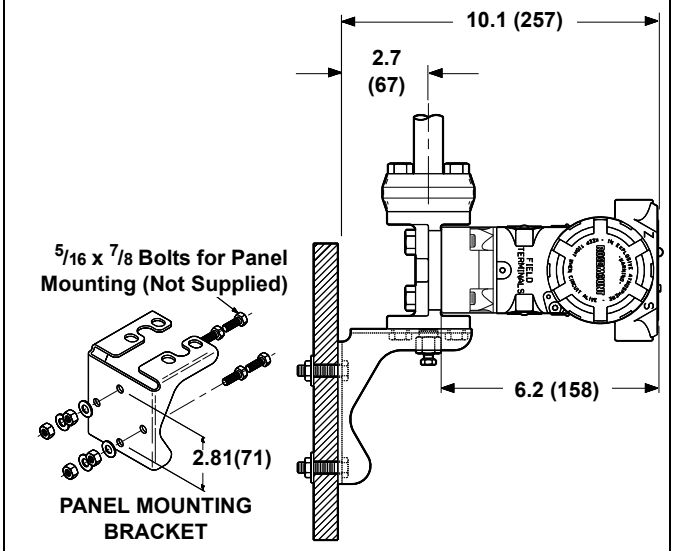




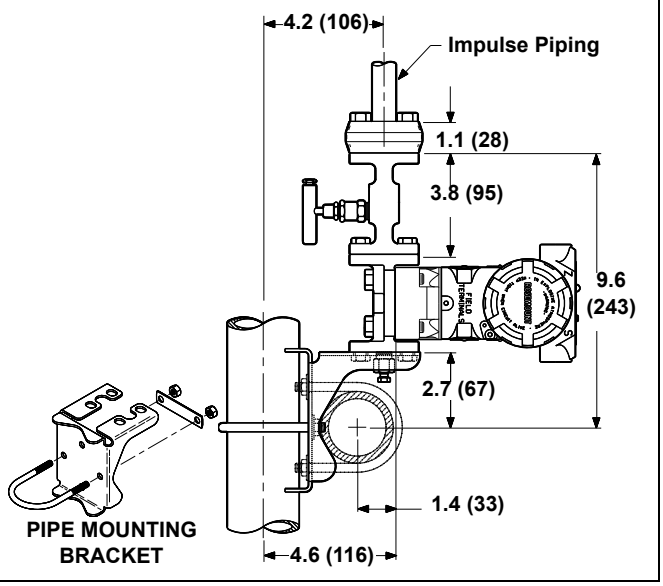
Dimensions are in inches (millimeters)

Traditional Flange Mounting Configurations with Optional Brackets for 2-in. Pipe or Panel Mounting

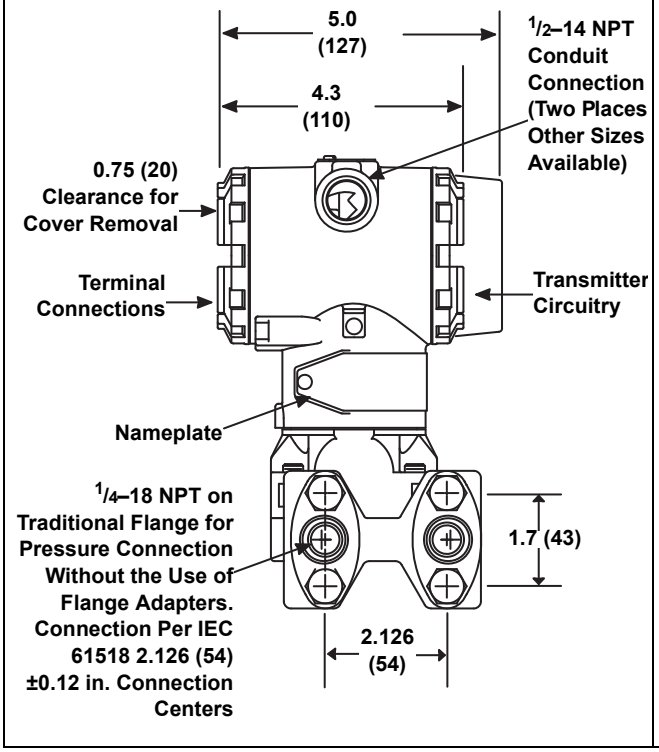
Traditional Flange Panel Mounting Bracket (option B2/B8)

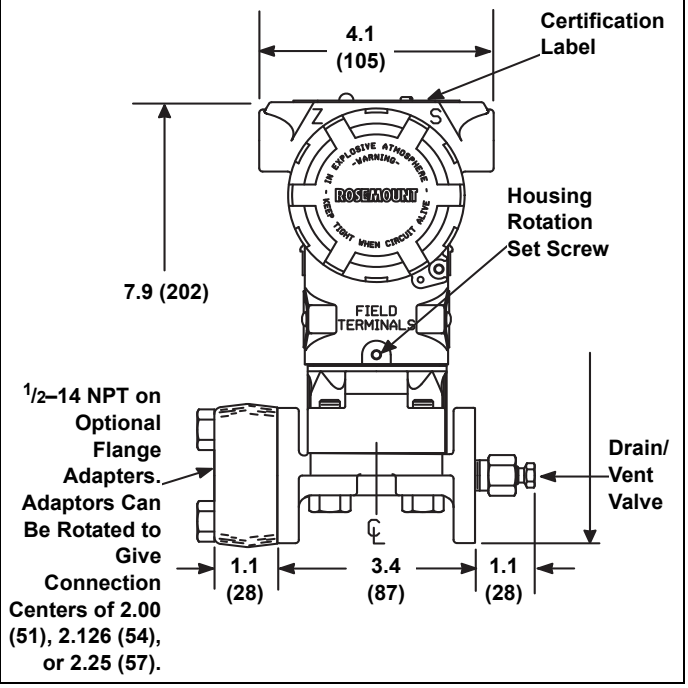


Traditional Flange 2-in. Pipe Mounting Bracket (option B1/B7/BA)



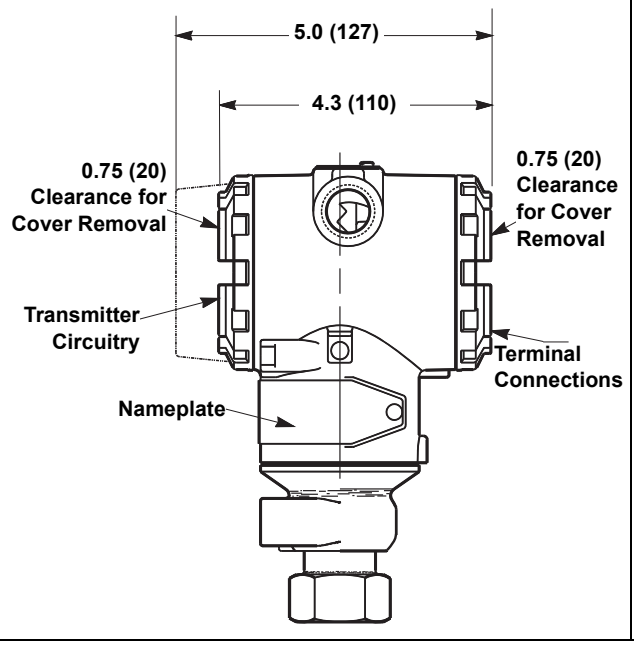
Traditional Flange (Options H2–H7) Dimensional Drawing

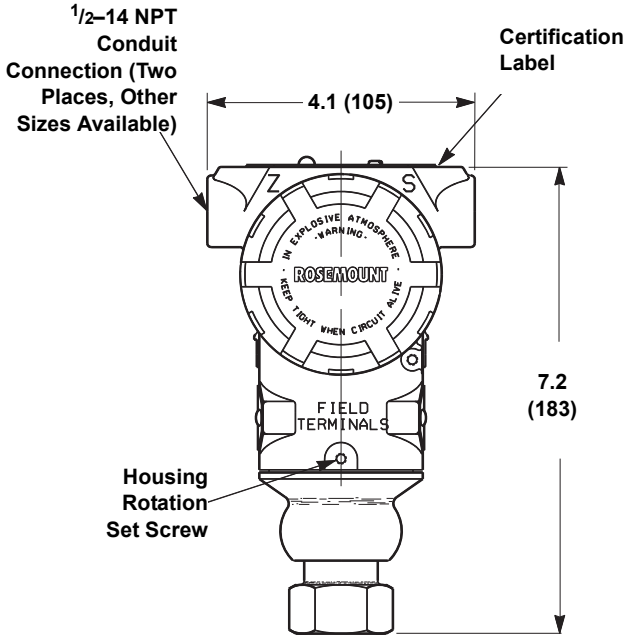




Dimensions are in inches (millimeters)

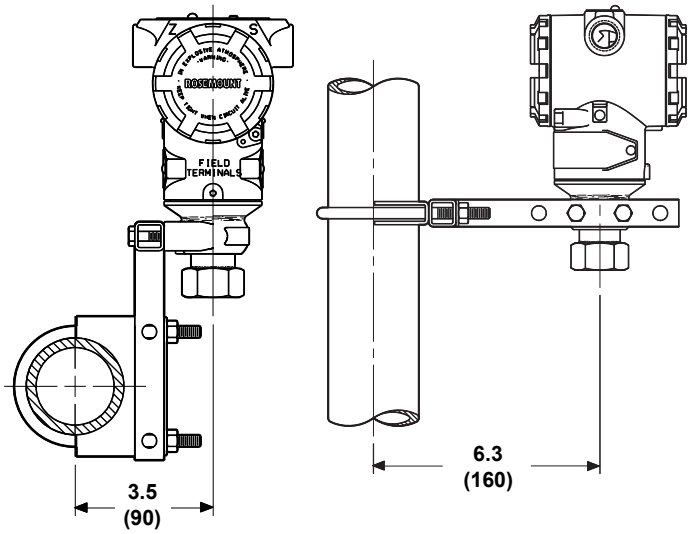
3051T Dimensional Drawings



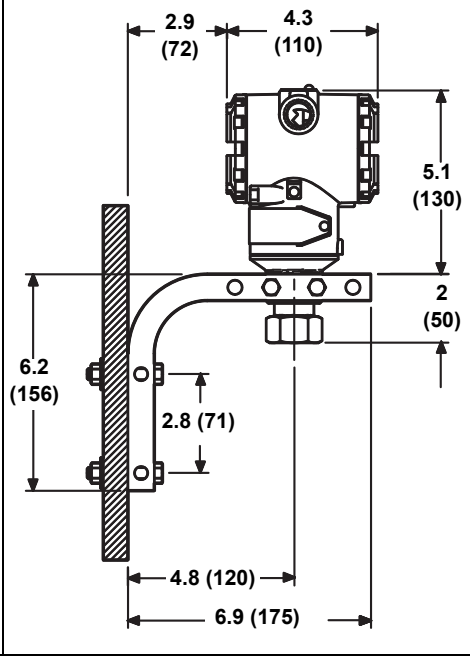


3051T Typical Mounting Configurations with Optional Mounting Bracket

Pipe Mounting



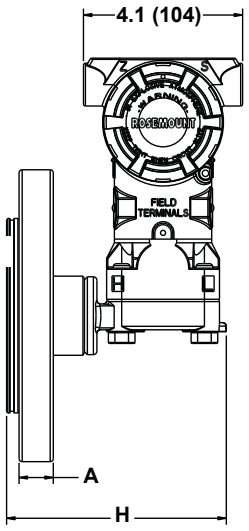
Panel Mounting



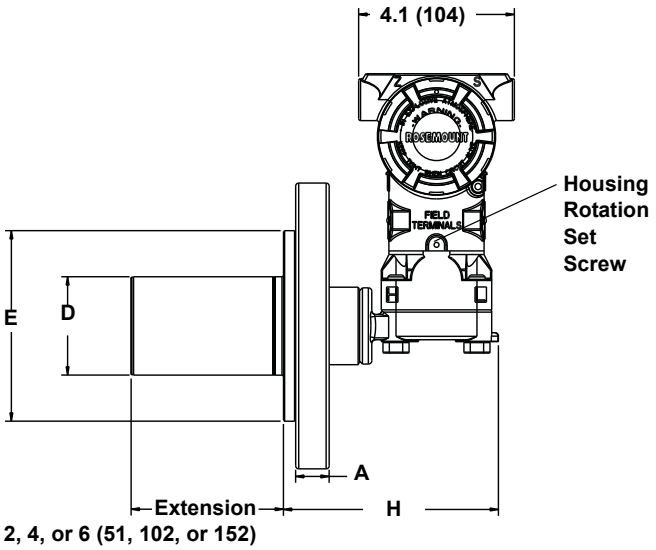
Dimensions are in inches (millimeters)

3051L Dimensional Drawings

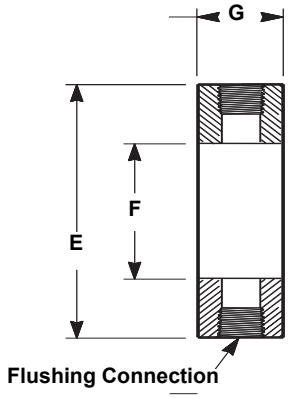
2-in. Flange Configuring (Flush Mount Only)



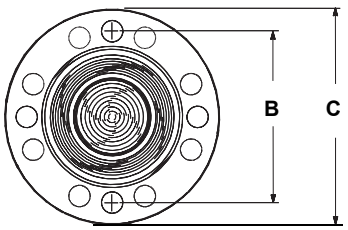
3- and 4-in. Flange Configuration

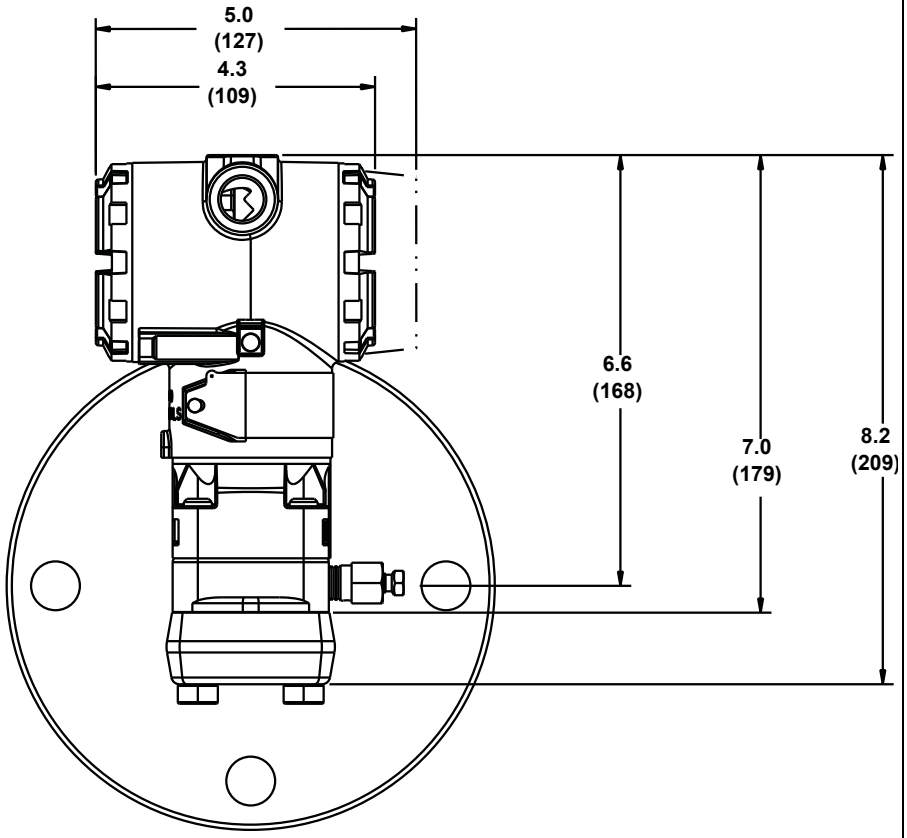


Optional Flushing Connection Ring (Lower Housing)



Diaphragm Assembly and Mounting Flange





Dimensions are in inches (millimeters)

TABLE 14. 3051L Dimensional Specifications

Except where indicated, dimensions are in inches (millimeters).

Class	Pipe Size	Flange Thickness A	Bolt Circle Diameter B	Outside Diameter C	No. of Bolts	Bolt Hole Diameter	Extension Diameter[(1)] D	O.D. Gasket Surface E
ASME B16.5 (ANSI) 150	2 (51)	0.69 (18)	4.75 (121)	6.0 (152)	4	0.75 (19)	NA	3.6 (92)
	3 (76)	0.88 (22)	6.0 (152)	7.5 (191)	4	0.75 (19)	2.58 (66)	5.0 (127)
	4 (102)	0.88 (22)	7.5 (191)	9.0 (229)	8	0.75 (19)	3.5 (89)	6.2 (158)
ASME B16.5 (ANSI) 300	2 (51)	0.82 (21)	5.0 (127)	6.5 (165)	8	0.75 (19)	NA	3.6 (92)
	3 (76)	1.06 (27)	6.62 (168)	8.25 (210)	8	0.88 (22)	2.58 (66)	5.0 (127)
	4 (102)	1.19 (30)	7.88 (200)	10.0 (254)	8	0.88 (22)	3.5 (89)	6.2 (158)
ASME B16.5 (ANSI) 600	2 (51)	1.00 (25)	5.0 (127)	6.5 (165)	8	0.75 (19)	NA	3.6 (92)
	3 (76)	1.25 (32)	6.62 (168)	8.25 (210)	8	0.88 (22)	2.58 (66)	5.0 (127)
DIN 2501 PN 10–40	DN 50	20 mm	125 mm	165 mm	4	18 mm	NA	4.0 (102)
DIN 2501 PN 25/40	DN 80	24 mm	160 mm	200 mm	8	18 mm	65 mm	5.4 (138)
	DN 100	24 mm	190 mm	235 mm	8	22 mm	89 mm	6.2 (158)
DIN 2501 PN 10/16	DN 100	20 mm	180 mm	220 mm	8	18 mm	89 mm	6.2 (158)

Class	Pipe Size	Process Side F	Lower Housing G		H
			1/4 NPT	1/2 NPT	
ASME B16.5 (ANSI) 150	2 (51)	2.12 (54)	0.97 (25)	1.31 (33)	5.65 (143)
	3 (76)	3.6 (91)	0.97 (25)	1.31 (33)	5.65 (143)
	4 (102)	3.6 (91)	0.97 (25)	1.31 (33)	5.65 (143)
ASME B16.5 (ANSI) 300	2 (51)	2.12 (54)	0.97 (25)	1.31 (33)	5.65 (143)
	3 (76)	3.6 (91)	0.97 (25)	1.31 (33)	5.65 (143)
	4 (102)	3.6 (91)	0.97 (25)	1.31 (33)	5.65 (143)
ASME B16.5 (ANSI) 600	2 (51)	2.12 (54)	0.97 (25)	1.31 (33)	7.65 (194)
	3 (76)	3.6 (91)	0.97 (25)	1.31 (33)	7.65 (194)
DIN 2501 PN 10–40	DN 50	2.4 (61)	0.97 (25)	1.31 (33)	5.65 (143)
DIN 2501 PN 25/40	DN 80	3.6 (91)	0.97 (25)	1.31 (33)	5.65 (143)
	DN 100	3.6 (91)	0.97 (25)	1.31 (33)	5.65 (143)
DIN 2501 PN 10/16	DN 100	3.6 (91)	0.97 (25)	1.31 (33)	5.65 (143)

(1) Tolerances are 0.040 (1,02), –0.020 (0,51).

Ordering Information

TABLE 15. 3051C Coplanar Pressure Transmitters 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			
3051C	Coplanar Pressure Transmitter			
Measurement Type				
Standard				**Standard**
D	Differential			★
G	Gage			★
Expanded				
A	Absolute			
Pressure Ranges (Range/Min. Span)				
	3051CD	**3051CG(1)**	**3051CA**	
Standard				**Standard**
1	–25 to 25 inH_2O/0.5 inH_2O (–62,2 to 62,2 mbar/1,2 mbar)	–25 to 25 inH_2O/0.5 inH_2O (–62,1 to 62,2 mbar/1,2 mbar)	0 to 30 psia/0.3 psia (0 to 2,1 bar/20,7 mbar)	★
2	–250 to 250 inH2O/2.5 inH_2O (–623 to 623 mbar/6,2 mbar)	–250 to 250 inH_2O/2.5 inH_2O (–621 to 623 mbar/6,2 mbar)	0 to 150 psia/1.5 psia (0 to 10,3 bar/0,1 bar)	★
3	–1000 to 1000 inH_2O/10 inH_2O (–2,5 to 2,5 bar/25 mbar)	–393 to 1000 inH_2O/10in H_2O (–0,98 to 2,5 bar/25 mbar)	0 to 800 psia/8 psia (0 to 55,2 bar/0,55 bar)	★
4	–300 to 300 psi/3 psi (–20,7 to 20,7 bar/0,2 bar)	–14.2 to 300 psi/3 psi (–0,98 to 20,7 bar/0,2 bar)	0 to 4000 psia/40 psia (0 to 275,8 bar/2,8 bar)	★
5	–2000 to 2000 psi/20 psi (–137,9 to137,9 bar/1,4 bar)	–14.2 to 2000 psig/20 psi (–0,98 to 137,9 bar/1,4 bar)	Not Applicable	★
Expanded				
0(2)	–3 to 3 inH_2O/0.1 inH_2O (–7,5 to 7,5 mbar/0,25 mbar)	Not Applicable	Not Applicable	
Output				
Standard				**Standard**
A	4–20 mA with Digital Signal Based on HART Protocol			★
F	FOUNDATION fieldbus Protocol			★
W	Profibus - PA Protocol			★
Expanded				
M(3)	Low-Power, 1–5 V dc with Digital Signal Based on HART Protocol *(See Option C2 for 0.8–3.2 V dc)*			
Materials of Construction				
	Process Flange Type	**Flange Material**	**Drain/Vent**	
Standard				**Standard**
2	Coplanar	SST	SST	★
3(4)	Coplanar	Cast C-276	Alloy C-276	★
4	Coplanar	Cast Alloy 400	Alloy 400/K-500	★
5	Coplanar	Plated CS	SST	★
7(4)	Coplanar	SST	Alloy C-276	★
8(4)	Coplanar	Plated CS	Alloy C-276	★
0	Alternate Flange—See Options on page 24			★
Isolating Diaphragm				
Standard				**Standard**
2(4)	316L SST			★
3(4)	Alloy C-276			★

TABLE 15. 3051C Coplanar Pressure Transmitters Ordering Information

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

Expanded			
4	Alloy 400		
5	Tantalum (Available on 3051CD and CG, Ranges 2–5 only. Not available on 3051CA)		
6	Gold-plated Alloy 400 (Use in combination with O-ring Option Code B.)		
7	Gold-plated SST		
O-ring			
Standard			**Standard**
A	Glass-filled PTFE		★
B	Graphite-filled PTFE		★
Sensor Fill Fluid			
Standard			**Standard**
1	Silicone		★
2	Inert fill (Differential and Gage only)		★
Housing Material		**Conduit Entry Size**	
Standard			**Standard**
A	Polyurethane-covered Aluminum	½–14 NPT	★
B	Polyurethane-covered Aluminum	M20 × 1.5 (CM20)	★
J	SST	½–14 NPT	★
K	SST	M20 × 1.5 (CM20)	★
Expanded			
D	Polyurethane-covered Aluminum	G½	
M	SST	G½	

Options (Include with selected model number)

Plantweb Control Functionality		
Standard		**Standard**
A01	FOUNDATION fieldbus Advanced Control Function Block Suite	★
Plantweb Diagnostic Functionality		
Standard		**Standard**
D01	FOUNDATION fieldbus Diagnostics Suite	★
Alternate Flange		
Standard		**Standard**
H2	Traditional Flange, 316 SST, SST Drain/Vent	★
H3(4)	Traditional Flange, Alloy C, Alloy C-276 Drain/Vent	★
H4	Traditional Flange, Monel, Monel Drain/Vent	★
H7(4)	Traditional Flange, 316 SST, Alloy C-276 Drain/Vent	★
HJ	DIN Compliant Traditional Flange, SST, 1/16 in. Adapter/Manifold Bolting	★
FA	Level Flange, SST, 2 in., ANSI Class 150, Vertical Mount	★
FB	Level Flange, SST, 2 in., ANSI Class 300, Vertical Mount	★
FC	Level Flange, SST, 3 in., ANSI Class 150, Vertical Mount	★
FD	Level Flange, SST, 3 in., ANSI Class 300, Vertical Mount	★
FP	DIN Level Flange, SST, DN 50, PN 40, Vertical Mount	★
FQ	DIN Level Flange, SST, DN 80, PN 40, Vertical Mount	★
Expanded		
HK	DIN Compliant Traditional Flange, SST, 10 mm Adapter/Manifold Bolting	
HL	DIN Compliant Traditional Flange, SST, 12mm Adapter/Manifold Bolting (Not available on 3051CD0)	

TABLE 15. 3051C Coplanar Pressure Transmitters 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.

Integral Assembly		
Standard		**Standard**
S3[5]	Assemble to Rosemount 405 Compact Orifice Plate	★
S5[5]	Assemble to Rosemount 305 Integral Manifold (specified separately, see the Rosemount 305 and 306 Integral Manifolds PDS (document number 00813-0100-4733))	★
S6[5]	Assemble to Rosemount 304 Manifold or Connection System	★
Integral Mount Primary Element		
Standard		**Standard**
S4[5]	Assemble to Rosemount Annubar or Rosemount 1195 Integral Orifice *(With the primary element installed, the maximum operating pressure will equal the lesser of either the transmitter or the primary element. Option is available for factory assembly to range 1–4 transmitters only)*	★
Seal Assemblies		
Standard		**Standard**
S1[5]	Assemble to one Rosemount 1199 seal	★
S2[5]	Assemble to two Rosemount 1199 seals	★
All-Welded Seal Assemblies (for high vacuum applications)		
Standard		**Standard**
S0[5]	One Seal, All-Welded System (Direct Mount Connection Type)	★
S7[5]	One Seal, All-Welded System (Capillary Connection Type)	★
S8[5]	Two Seals, All-Welded System (Capillary Connection Type)	★
S9[5]	Two Seals, All-Welded System (One Direct Mount and One Capillary Connection Type)	★
Mounting Bracket		
Standard		**Standard**
B1	Traditional Flange Bracket for 2-in. Pipe Mounting, CS Bolts	★
B2	Traditional Flange Bracket for Panel Mounting, CS Bolts	★
B3	Traditional Flange Flat Bracket for 2-in. Pipe Mounting, CS Bolts	★
B4	Coplanar Flange Bracket for 2-in. Pipe or Panel Mounting, all SST	★
B7	B1 Bracket with Series 300 SST Bolts	★
B8	B2 Bracket with Series 300 SST Bolts	★
B9	B3 Bracket with Series 300 SST Bolts	★
BA	SST B1 Bracket with Series 300 SST Bolts	★
BC	SST B3 Bracket with Series 300 SST Bolts	★
Product Certifications		
Standard		**Standard**
C6	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, and Division 2	★
E2	INMETRO Flameproof	★
E4[10]	TIIS Flame-proof	★
E5	FM Explosion-proof, Dust Ignition-Proof	★
E7	SAA Flameproof, Dust Ignition-proof	★
E8	ATEX Flameproof and Dust Certification	★
I1[6]	ATEX Intrinsic Safety and Dust	★
I2	INMETRO Intrinsic Safety	★
I5	FM Intrinsically Safe, Division 2	★
I7	SAA Intrinsic Safety	★
IA	ATEX FISCO Intrinsic Safety; for FOUNDATION fieldbus protocol only	★

TABLE 15. 3051C Coplanar Pressure Transmitters 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.

IE	FM FISCO Intrinsically Safe; for FOUNDATION fieldbus protocol only	★
K2	INMETRO Flameproof, Instrinsic Safety	★
K5	FM Explosion-proof, Dust Ignition-Proof, Intrinsically Safe, and Division 2	★
K6(10)	CSA and ATEX Explosion-proof, Intrinsically Safe, and Division 2 (combination of C6 and K8)	★
K7	SAA Flame-proof, Dust Ignition-proof, Intrinsic Safety, and Type n (combination of I7, N7, and E7)	★
K8(10)	ATEX Flameproof, Intrinsic Safety, Type n, Dust (combination of E8, I1 and N1)	★
KB	FM and CSA Explosion-proof, Dust Ignition Proof, Intrinsically Safe, and Division 2 (combination of K5 and C6)	★
KD(10)	FM, CSA, and ATEX Explosion-proof, Intrinsically Safe (combination of K5, C6, I1, and E8)	★
N1(10)	ATEX Type n Certification and Dust	★
N7	SAA Type N Certification	★
Custody Transfer		
Standard		**Standard**
C5(7)	Measurement Canada Accuracy Approval *(Limited availability depending on transmitter type and range. Contact an Emerson Process Management representative)*	★
Bolting Material		
Standard		**Standard**
L4	Austenitic 316 SST Bolts	★
L5	ASTM A 193, Grade B7M Bolts	★
L6	Alloy K-500 Bolts	★
Display Type		
Standard		**Standard**
M5	LCD display for Aluminum Housing (Housing Codes A, B, C, and D only)	★
M6	LCD display for SST Housing (Housing Codes J, K, L, and M only)	★
Calibration Certificate		
Standard		**Standard**
Q4	Calibration Certificate	★
QG	Calibration Certificate and GOST Verification Certificate	★
QP	Calibration certification and tamper evident seal	★
Material Traceability Certification		
Standard		**Standard**
Q8	Material Traceability Certification per EN 10204 3.1.B *(Only available for the sensor module housing and Coplanar or traditional flanges and adapters (3051C), and for the sensor module housing and low-volume Coplanar flange and adapter (3051C with Option Code S1))*	★
Quality Certification for Safety		
Standard		**Standard**
QS	Certificate of FMEDA Data	★
Zero/Span Adjustment		
Standard		**Standard**
J1(7)(8)	Local Zero Adjustment Only	★
J3(7)(8)	No Local Zero or Span Adjustment	★
Transient Protection Terminal Block		
Standard		**Standard**
T1	Transient Protection Terminal Block	★
Software Configuration		
Standard		**Standard**
C1(7)	Custom Software Configuration (Completed CDS 00806-0100-4001 required with order)	★

TABLE 15. 3051C Coplanar Pressure Transmitters 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 Power Output		
Expanded		
C2[7]	0.8–3.2 V dc Output with Digital Signal Based on HART Protocol (Output Code M only)	
Gage Pressure Calibration		
Standard		**Standard**
C3	Gage Calibration (Model 3051CA4 only)	★
Alarm Limit		
Standard		**Standard**
C4[7][9]	Analog Output Levels Compliant with NAMUR Recommendation NE 43, Alarm High	★
CN[7][9]	Analog Output Levels Compliant with NAMUR Recommendation NE 43, Alarm Low	★
Pressure Testing		
Expanded		
P1	Hydrostatic Testing with Certificate	
Cleaning Process Area		
Expanded		
P2	Cleaning for Special Service	
P3	Cleaning for <1 PPM Chlorine/Fluorine	
Pressure Calibration		
Expanded		
P4	Calibrate at Line Pressure *(Specify Q48 on order for corresponding certificate)*	
High Accuracy		
Standard		**Standard**
P8	0.04% accuracy to 5:1 turndown (Range 2-4)	★
Flange Adapters		
Standard		**Standard**
DF	1/2 -14 NPT flange adapter(s)	★
Vent/Drain Valves		
Expanded		
D7	Coplanar Flange Without Drain/Vent Ports	
Conduit Plug		
Standard		**Standard**
DO	316 SST Conduit Plug	★
RC1/4 RC1/2 Process Connection		
Expanded		
D9	JIS Process Connection—RC ¼ Flange with RC ½ Flange Adapter	
Max Static Line Pressure		
Standard		**Standard**
P9	4500 psig Static Pressure Limit (3051CD Ranges 2–5 only)	★
Ground Screw		
Standard		**Standard**
V5[10]	External Ground Screw Assembly	★
Drinking Water Approval		
Standard		**Standard**
DW	NSF drinking water approval	★

TABLE 15. 3051C Coplanar Pressure Transmitters 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.

Surface Finish		
Standard		**Standard**
Q16	Surface finish certification for sanitary remote seals	★
Toolkit Total System Performance Reports		
Standard		**Standard**
QZ	Remote Seal System Performance Calculation Report	★
Conduit Electrical Connector		
Standard		**Standard**
GE	M12, 4-pin, Male Connector (eurofast®)	★
GM	A size Mini, 4-pin, Male Connector (minifast®)	★
Typical Model Number: 3051CD 2 A 2 2 A 1 A B4		

(1) 3051CG lower range limit varies with atmospheric pressure.

(2) 3051CD0 is available only with Output Code A, Process Flange Code 0 (Alternate Flange H2, H7, HJ, or HK), Isolating Diaphragm Code 2, O-ring Code A, and Bolting Option L4.

(3) Not available with hazardous locations certification Options Codes I1, N1, E4, K6 and K8.

(4) Materials of Construction comply with recommendations per 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.

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

(6) Not available with Low Power code M.

(7) Not available with Fieldbus (output code F) or Profibus (output code W).

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

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

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

TABLE 16. 3051T Gage and Absolute Pressure 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		
3051T	Pressure Transmitter		
Pressure Type			
Standard			**Standard**
G	Gage		★
A	Absolute		★
Pressure Upper Range Limit - Configurable Description			
	3051TG(1)	**3051TA**	
Standard			**Standard**
1	30 psi (2,1 bar)	30 psia (2,1 bar)	★
2	150 psi (10,3 bar)	150 psia (10,3 bar)	★
3	800 psi (55,2 bar)	800 psia (55,2 bar)	★
4	4000 psi (275,8 bar)	4000 psia (275,8 bar)	★
5	10000 psi (689,5 bar)	10000 psia (689,5 bar)	★
Transmitter Output			
Standard			**Standard**
A	4–20 mA with Digital Signal Based on HART Protocol		★
F	FOUNDATION fieldbus Protocol		★
W	Profibus — PA		★
Expanded			
M	Low-Power 1–5 V dc with Digital Signal Based on HART Protocol		
Process Connection Style			
Standard			**Standard**
2B	1/2–14 NPT Female		★
2C	G½ A DIN 16288 Male (Available in SST for Range 1–4 only)		★
Expanded			
2F	Coned and Threaded, Compatible with Autoclave Type F-250-C *(Includes Gland and Collar, Available in SST for Range 5 only)*		
61	Non-threaded Instrument flange (Range 1-4 only)		
Isolating Diaphragm		**Process Connection Wetted Parts Material**	
Standard			**Standard**
2(2)	316L SST	316L SST	★
3(2)	Alloy C-276	Alloy C-276	★
Sensor Fill Fluid			
Standard			**Standard**
1	Silicone		★
2	Inert (Fluorinert® FC-43)		★
Housing Material		**Conduit Entry Size**	
Standard			**Standard**
A	Polyurethane-covered Aluminum	½–14 NPT	★
B	Polyurethane-covered Aluminum	M20 × 1.5 (CM20)	★
J	SST	½–14 NPT	★
K	SST	M20 × 1.5 (CM20)	★
Expanded			
D	Polyurethane-covered Aluminum	G½	
M	SST	G½	

Options (Include with selected model number)

PlantWeb Control Functionality		
Standard		**Standard**
A01	Advanced Control Function Block Suite	★

TABLE 16. 3051T Gage and Absolute Pressure 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.

PlantWeb Diagnostic Functionality		
Standard		**Standard**
D01	FOUNDATION fieldbus Diagnostics Suite	★
Integral Assembly		
Standard		**Standard**
S5[3]	Assemble to Rosemount 306 Integral Manifold	★
Seal Assemblies		
Standard		**Standard**
S1[3]	Assemble to one Rosemount 1199 seal	★
Mounting Bracket		
Standard		**Standard**
B4	Bracket for 2-in. Pipe or Panel Mounting, All SST	★
Product Certifications		
Standard		**Standard**
C6	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, and Division 2	★
E2	INMETRO Flameproof	★
E4[4]	TIIS Flameproof	★
E5	FM Explosion-proof, Dust Ignition-proof	★
E7	SAA Flameproof, Dust Ignition-proof	★
E8	ATEX Flameproof and Dust Certification	★
I1[4]	ATEX Intrinsic Safety and Dust	★
I2	INMETRO Intrinsic Safety	★
I5	FM Intrinsically Safe, Division 2	★
I7	SAA Intrinsic Safety	★
IA	ATEX Intrinsic Safety for FISCO; for *FOUNDATION* fieldbus protocol only	★
IE	FM FISCO Intrinsically Safe; for FOUNDATION fieldbus protocol only	★
K2	INMETRO Flameproof, Intrinsic Safety	★
K5	FM Explosion-proof, Dust Ignition-proof, Intrinsically Safe, and Division 2	★
K6[4]	CSA and ATEX Explosion-proof, Intrinsically Safe, and Division 2 (combination of C6 and K8)	★
K7	SAA Flameproof, Dust Ignition-proof, Intrinsic Safety, and Type n (combination of I7, N7, and E7)	★
K8[4]	ATEX Flame-proof, Intrinsic Safety, Type n, Dust (combination of E8, I1 and N1)	★
KB	FM and CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, and Division 2 (combination of K5 and C6)	★
KD[4]	FM, CSA, and ATEX Explosion-proof, Intrinsically Safe (combination of K5, C6, I1, and E8)	★
N1[4]	ATEX Type n Certification and Dust	★
N7	SAA Type n Certification	★
Custody Transfer		
Standard		**Standard**
C5	Measurement Canada Accuracy Approval *(Limited availability depending on transmitter type and range. Contact an Emerson Process Management representative)*	★
Calibration Certification		
Standard		**Standard**
Q4	Calibration Certificate	★
QG	Calibration Certificate and GOST Verification Certificate	★
QP	Calibration Certification and tamper evident seal	★
Material Traceability Certification		
Standard		**Standard**
Q8	Material Traceability Certification per EN 10204 3.1.B *NOTE: This option applies to the process connection only.*	★
Quality Certification for Safety		
Standard		**Standard**
QS	Certificate of FMEDA Data	★
QT	Safety certified to IEC 61508 with Certificate of FMEDA data	★

TABLE 16. 3051T Gage and Absolute Pressure 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.

Zero/Span Adjustment		
Standard		**Standard**
J1[5][6]	Local Zero Adjustment Only	★
J3[5][6]	No Local Zero or Span Adjustment	★
Expanded		
D1	Hardware adjustments (zero, span, alarm, security)	
Display Type		
Standard		**Standard**
M5	LCD display	★
M6	LCD display for SST Housing (Housing Codes J, K, L and M only)	★
Conduit Plug		
Standard		**Standard**
DO	316 SST Conduit Plug	★
Transient Terminal Block		
Standard		**Standard**
T1	Transient Protection Terminal Block	★
Software Configuration		
Standard		**Standard**
C1[5]	Custom Software Configuration (Completed CDS 00806-0100-4001 required with order)	★
Expanded		
C2[5]	0.8–3.2 V dc Output with Digital Signal Based on *HART* Protocol (Output Code M only)	
Alarm Limit		
Standard		**Standard**
C4[5][7]	Analog Output Levels Compliant with NAMUR Recommendation NE 43, Alarm High	★
CN[5][7]	Analog Output Levels Compliant with NAMUR Recommendation NE 43, Low Alarm	★
CR	Custom alarm and saturation signal levels, high alarm	★
CS	Custom alarm and saturation signal levels, low alarm	★
CT	Low alarm (standard Rosemount alarm and saturation levels)	★
Pressure Testing		
Expanded		
P1	Hydrostatic Testing with Certificate	
Cleaning Process Area		
Expanded		
P2	Cleaning for Special Service	
P3	Cleaning for <1 PPM Chlorine/Fluorine	
High Accuracy		
Standard		**Standard**
P8	0.04% accuracy to 5:1 turndown (Range 2-4)	★
Ground Screw		
Standard		**Standard**
V5[8]	External Ground Screw Assembly	★
Drinking Water Approval		
Standard		**Standard**
DW	NSF drinking water approval	★
Surface Finish		
Standard		**Standard**
Q16	Surface finish certification for sanitary remote seals	★
Toolkit Total System Performance Reports		
Standard		**Standard**
QZ	Remote Seal System Performance Calculation Report	★

TABLE 16. 3051T Gage and Absolute Pressure 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 Electrical Connector		
Standard		**Standard**
GE	M12, 4-pin, Male Connector (eurofast®)	★
GM	A size Mini, 4-pin, Male Connector (minifast®)	★
Typical Model Number:	**3051T G 5 F 2A 2 1 A B4**	

(1) 3051TG lower range limit varies with atmospheric pressure.

(2) Materials of Construction comply with recommendations per 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.

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

(4) Not available with low-power Option Code M.

(5) Not available with fieldbus (output code F) or Profibus protocols (output code W).

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

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

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

Table 17. Rosemount 3051L 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**			
3051L	Liquid Level Transmitter			
Pressure Range				
Standard				**Standard**
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				
Standard				**Standard**
A	4–20 mA with Digital Signal Based on *HART* Protocol			★
F	FOUNDATION fieldbus Protocol			★
W	Profibus – PA Protocol			★
Expanded				
M(1)	Low-Power 1–5 V dc with Digital Signal Based on *HART* Protocol (See Option Code C2 for 0.8–3.2 V dc Output)			
Process Connection Size, Material, Extension length (High Side)				
Standard				**Standard**
Code	**Process Connection Size**	**Material**	**Extension Length**	★
G0(2)	2-in./DN 50	316L SST	Flush Mount Only	★
H0(2)	2-in./DN 50	Alloy C-276	Flush Mount Only	★
J0	2-in./DN 50	Tantalum	Flush Mount Only	★
A0(2)	3-in./DN 80	316L SST	Flush Mount	★
A2(2)	3-in./DN 80	316L SST	2-in./50 mm	★
A4(2)	3-in./DN 80	316L SST	4-in./100 mm	★
A6(2)	3-in./DN 80	316L SST	6-in./150 mm	★
B0(2)	4-in./DN 100	316L SST	Flush Mount	★
B2(2)	4-in./DN 100	316L SST	2-in./50 mm	★
B4(2)	4-in./DN 100	316L SST	4-in./100 mm	★
B6(2)	4-in./DN 100	316L SST	6-in./150 mm	★
C0(2)	3-in./DN 80	Alloy C-276	Flush Mount	★
C2(2)	3-in./DN 80	Alloy C-276	2-in./50 mm	★
C4(2)	3-in./DN 80	Alloy C-276	4-in./100 mm	★
C6(2)	3-in./DN 80	Alloy C-276	6-in./150 mm	★
D0(2)	4-in./DN 100	Alloy C-276	Flush Mount	★
D2(2)	4-in./DN 100	Alloy C-276	2-in./50 mm	★
D4(2)	4-in./DN 100	Alloy C-276	4-in./100 mm	★
D6(2)	4-in./DN 100	Alloy C-276	6-in./150 mm	★
E0	3-in./DN 80	Tantalum	Flush Mount Only	★
F0	4-in./DN 100	Tantalum	Flush Mount Only	★

Table 17. Rosemount 3051L 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.

Mounting Flange Size, Rating, Material (High Side)				
	Size	**Rating**	**Material**	
Standard				**Standard**
M	2-in.	ANSI/ASME B16.5 Class 150	CS	★
A	3-in.	ANSI/ASME B16.5 Class 150	CS	★
B	4-in.	ANSI/ASME B16.5 Class 150	CS	★
N	2-in.	ANSI/ASME B16.5 Class 300	CS	★
C	3-in.	ANSI/ASME B16.5 Class 300	CS	★
D	4-in.	ANSI/ASME B16.5 Class 300	CS	★
P	2-in.	ANSI/ASME B16.5 Class 600	CS	★
E	3-in.	ANSI/ASME B16.5 Class 600	CS	★
X[(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	★
Z[(2)]	2-in.	ANSI/ASME B16.5 Class 600	SST	★
L[(2)]	3-in.	ANSI/ASME B16.5 Class 600	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[(2)]	DN 50	PN 10-40 per EN 1092-1	SST	★
T[(2)]	DN 80	PN 40 per EN 1092-1	SST	★
U[(2)]	DN 100	PN 40 per EN 1092-1	SST	★
W[(2)]	DN 100	PN 10/16 per EN 1092-1	SST	★
7[(2)]	4 in.	ANSI/ASME B16.5 Class 600	SST	★
Expanded				
1	—	10K per JIS B2238	CS	
2	—	20K per JIS B2238	CS	
3	—	40K per JIS B2238	CS	
4[(2)]	—	10K per JIS B2238	316 SST	
5[(2)]	—	20K per JIS B2238	316 SST	
6[(2)]	—	40K per JIS B2238	316 SST	

Process Fill-High Pressure Side		**Specific Gravity**	**Temperature Limits (Ambient Temperature of 70° F (21° C))**	
Standard				**Standard**
A	Syltherm XLT	0.85	-102 to 293 °F (-75 to 145 °C)	★
C	Silicone 704	1.07	32 to 401 °F (0 to 205 °C)	★
D	Silicone 200	0.93	-49 to 401 °F (-45 to 205 °C)	★
H	Inert (Halocarbon)	1.85	-49 to 320 °F (-45 to 160 °C)	★
G	Glycerine and Water	1.13	5 to 203 °F (-15 to 95 °C)	★
N	Neobee M-20	0.92	5 to 401 °F (-15 to 205 °C)	★
P	Propylene Glycol and Water	1.02	5 to 203 F (-15 to 95 °C)	★

Table 17. Rosemount 3051L 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.

Low Pressure Side					
	Configuration	**Flange Adapter**	**Diaphragm Material**	**Sensor Fill Fluid**	
Standard					**Standard**
11[2]	Gage	SST	316L SST	Silicone	★
21[2]	Differential	SST	316L SST	Silicone	★
22[2]	Differential	SST	Alloy C-276	Silicone	★
2A[2]	Differential	SST	316L SST	Inert (Halocarbon)	★
2B[2]	Differential	SST	Alloy C-276	Inert (Halocarbon)	★
31[2]	Tuned-System Assembly with Remote Seal	None	316L SST	Silicone *(Requires Option Code S1)*	★
O-ring					
Standard					**Standard**
A	Glass-filled PTFE				★
Housing Material			**Conduit Entry Size**		
Standard					**Standard**
A	Aluminum		½–14 NPT		★
B	Aluminum		M20 × 1.5		★
J	SST		½–14 NPT		★
K	SST		M20 × 1.5		★
Expanded					
D	Aluminum		G½		
M	SST		G½		

Options (Include with selected model number)

PlantWeb Control Functionality		
Standard		**Standard**
A01	FOUNDATION fieldbus Advanced Control Function Block Suite	★
PlantWeb Diagnostic Functionality		
Standard		**Standard**
D01	FOUNDATION fieldbus Diagnostics Suite	★
Seal Assemblies		
Standard		**Standard**
S1[3]	Assembled to One Rosemount 1199 Seal (Requires 1199M)	★
Product Certifications		
Standard		**Standard**
E5	FM Explosion-proof, Dust Ignition-proof	★
I5	FM Intrinsically Safe, Division 2	★
K5	FM Explosion-proof, Dust Ignition-proof, Intrinsically Safe, and Division 2	★
I1[4]	ATEX Intrinsic Safety and Dust	★
N1[4]	ATEX Type n Certification and Dust	★
E8	ATEX Flameproof and Dust Certification	★
E4[4]	TIIS Flameproof	★
C6	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, and Division 2	★
K6[4]	CSA and ATEX Explosion-proof, Intrinsically Safe, and Division 2 (combination of C6 and K8)	★
KB	FM and CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, and Division 2 (combination of K5 and C6)	★
K7	SAA Flameproof, Dust Ignition-proof, Intrinsic Safety, and Type n (combination of I7, N7 and E7)	★
K8[4]	ATEX Flame-proof and Intrinsic Safety Approvals (combination of I1 and E8)	★
KD[4]	FM, CSA, and ATEX Explosion-proof, Intrinsically Safe (combination of K5, C6, I1, and E8)	★

Table 17. Rosemount 3051L 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.

I7	SAA Intrinsic Safety	★
E7	SAA Flameproof, Dust Ignition-proof	★
N7	SAA Type n Certification	★
IA	ATEX FISCO Intrinsic Safety	★
IE	FM FISCO Intrinsically Safe	★
E2	INMETRO Flameproof	★
I2	INMETRO Intrinsic Safety	★
K2	INMETRO Flameproof, Intrinsic Safety	★
Bolting Material		
Standard		**Standard**
L4	Austenitic 316 SST Bolts	★
L5	ASTM A 193, Grade B7M bolts	★
L6	Alloy K-500 Bolts	★
L8	ASTM A 193 Class 2, Grade B8M Bolts	★
Display Type		
Standard		**Standard**
M5	LCD Display for Aluminum Housing (Housing Codes A, B, C, and D only)	★
M6	LCD Display for SST Housing (Housing Codes J, K, L, and M only)	★
Calibration Certification		
Standard		**Standard**
Q4	Calibration Certificate	★
QP	Calibration Certificate and tamper evident seal	★
QG	Calibration Certificate and GOST Verification Certificate	★
Material Traceability Certification		
Standard		**Standard**
Q8	Material Traceability Certification per EN 10204 3.1	★
Quality Certification for Safety		
Standard		**Standard**
QS[5]	Prior-use certificate of FMEDA data	★
Toolkit Total System Performance Reports		
Standard		**Standard**
QZ	Remote Seal System Performance Calculation Report	★
Conduit Electrical Connector		
Standard		**Standard**
GE	M12, 4-pin, Male Connector (eurofast®)	★
GM	A size Mini, 4-pin, Male Connector (minifast®)	★
Hardware Adjustments		
Standard		**Standard**
J1[6][7]	Local Zero Adjustment Only	★
J3[6][7]	No Local Zero or Span Adjustment	★
Transient Protection		
Standard		**Standard**
T1[8]	Transient Protection Terminal Block	★
Software Configuration		
Standard		**Standard**
C1[6]	Custom Software Configuration (Completed CDS 00806-0100-4001 required with order)	★

Table 17. Rosemount 3051L 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.

Low Power Output				
Standard				**Standard**
C2[6]	0.8–3.2 V dc Output with Digital Signal Based on HART Protocol (Available with Output code M only)			★
Alarm Limit				
Standard				**Standard**
C4[6][9]	NAMUR alarm and saturation levels, high alarm			★
CN[6][9]	NAMUR alarm and saturation levels, low alarm			★
CR	Custom alarm and saturation signal levels, high alarm			★
CS	Custom alarm and saturation signal levels, low alarm			★
CT	Low alarm (standard Rosemount alarm and saturation levels)			★
Conduit Plug				
Standard				**Standard**
D0	316 SST Conduit Plug			★
Ground Screw				
Standard				**Standard**
V5[10]	External Ground Screw Assembly			★
Lower Housing Flushing Connection Options				
	Ring Material	**Number**	**Size (NPT)**	
Standard				**Standard**
F1	316 SST	1	1/4-18 NPT	★
F2	316 SST	2	1/4-18 NPT	★
F3	Alloy C-276	1	1/4-18 NPT	★
F4	Alloy C-276	2	1/4-18 NPT	★
F7	316 SST	1	1/2-14 NPT	★
F8	316 SST	2	1/2-14 NPT	★
F9	Alloy C-276	1	1/2-14 NPT	★
F0	Alloy C-276	2	1/2-14 NPT	★
Typical Model Number: 3051L 2 A A0 D 21 A A F1				

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

(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.

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

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

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

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

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

(8) 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.

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

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

OPTIONS

Standard Configuration

Unless otherwise specified, transmitter is shipped as follows:

ENGINEERING UNITS	
***Differential/Gage*:**	inH_2O (Range 0, 1, 2, and 3) psi (Range 4 and 5)
***Absolute/3051TA*:**	psi (all ranges)
4 mA (1 V dc)[1]:	0 (engineering units above)
20 mA (5 V dc):	Upper range limit
Output:	Linear
Flange type:	Specified model code option
Flange material:	Specified model code option
O-ring material:	Specified model code option
Drain/vent:	Specified model code option
Integral meter:	Installed or none
Alarm[1]:	Upscale
Software tag:	(Blank)

(1) Not applicable to fieldbus.

Custom Configuration *HART* protocol only[1]

If Option Code C1 is ordered, the customer may specify the following data in addition to the standard configuration parameters.

- Output Information
- Transmitter Information
- LCD display Configuration
- Hardware Selectable Information
- Signal Selection

Refer to the “HART Protocol C1 Option Configuration Data Sheet” document number 00806-0100-4001.

Tagging (3 options available)

- Standard SST hardware tag is wired to the transmitter. Tag character height is 0.125 in. (3,18 mm), 56 characters maximum.
- Tag may be permanently stamped on transmitter nameplate upon request, 56 characters maximum.
- Tag may be stored in transmitter memory (30 characters maximum). Software tag is left blank unless specified.

Commissioning tag (fieldbus only)

A temporary commissioning tag is attached to all transmitters. The tag indicates the device ID and allows an area for writing the location.

Optional Rosemount 304, 305 or 306 Integral Manifolds

Factory assembled to 3051C and 3051T transmitters. Refer to the following Product Data Sheet (document number 00813-0100-4839 for Rosemount 304 and 00813-0100-4733 for Rosemount 305 and 306) for additional information.

Other Seals

Refer to Product Data Sheet 00813-0100-4016 or 00813-0201-4016. for additional information.

Output Information[1]

Output range points must be the same unit of measure. Available units of measure include:

inH2O	inH2O@4 °C[1]	psi	Pa
inHg	ftH2O	bar	kPa
mmH2O	mmH2O@4 °C[1]	mbar	torr
mmHg	g/cm2	kg/cm2	atm

(1) Not available on low power or previous versions.

LCD display

M5 Digital Display, 5-Digit, 2-Line LCD

- Direct reading of digital data for higher accuracy
- Displays user-defined flow, level, volume, or pressure units
- Displays diagnostic messages for local troubleshooting
- 90-degree rotation capability for easy viewing

M6 Digital Display with 316 Stainless Steel Cover

- For use with stainless steel housing option (housing codes J, K, and L)

Local Span and Zero Adjustment[2]

Transmitters ship with local span and zero adjustments standard unless otherwise specified.

- Non-interactive external zero and span adjustments ease calibration
- Magnetic switches replace standard potentiometer adjustments to optimize performance

J1 Local Zero Adjustment Only[1]

J3 No Local Zero or Span Adjustment[1]

(1) Not applicable to fieldbus.

(2) Not applicable to fieldbus.

Transient Protection

T1 Integral Transient Protection Terminal Block

- Integral transient protection terminal block
- Meets IEEE Standard 587, Category B
  1 kV crest (10 × 1 000 microseconds)
  3 kV crest (8 × 20 microseconds)
  6 kV crest (1.2 × 50 microseconds)
- Meets IEEE Standard 472,
  Surge Withstand Capability
  SWC 2,5 kV crest, 1 MHz wave form
- Applicable standards: IEC 801-4, 801-5

Bolts for Flanges and Adapters

- Options permit bolts for flanges and adapters to be obtained in various materials
- Standard material is plated carbon steel per ASTM A449, Type 1

L4 Austenitic 316 Stainless Steel Bolts

L5 ASTM A 193, Grade B7M Bolts

L6 *Monel* Bolts

Rosemount 3051C Coplanar Flange and 3051T Bracket Option

B4 Bracket for 2-in. Pipe or Panel Mounting

- For use with the standard Coplanar flange configuration
- Bracket for mounting of transmitter on 2-in. pipe or panel
- Stainless steel construction with stainless steel bolts

Traditional Flange Bracket Options

B1 Bracket for 2-in. Pipe Mounting

- For use with the traditional flange option
- Bracket for mounting on 2-in. pipe
- Carbon steel construction with carbon steel bolts
- Coated with polyurethane paint

B2 Bracket for Panel Mounting

- For use with the traditional flange option
- Bracket for mounting transmitter on wall or panel
- Carbon steel construction with carbon steel bolts
- Coated with polyurethane paint

B3 Flat Bracket for 2-in. Pipe Mounting

- For use with the traditional flange option
- Bracket for vertical mounting of transmitter on 2-in. pipe
- Carbon steel construction with carbon steel bolts
- Coated with polyurethane paint

B7 B1 Bracket with SST Bolts

- Same bracket as the B1 option with Series 300 stainless steel bolts

B8 B2 Bracket with SST Bolts

- Same bracket as the B2 option with Series 300 stainless steel bolts

B9 B3 Bracket with SST Bolts

- Same bracket as the B3 option with Series 300 stainless steel bolts

BA Stainless Steel B1 Bracket with SST Bolts

- B1 bracket in stainless steel with Series 300 stainless steel bolts

BC Stainless Steel B3 Bracket with SST Bolts

- B3 bracket in stainless steel with Series 300 stainless steel bolts

Shipping Weights

TABLE 18. Transmitter Weights without Options

Transmitter	Add Weight In lb (kg)
3051C	6.0 (2,7)
3051T	3.0 (1,4)
3051L	Table 19 on page 39

TABLE 19. 3051L Weights without Options

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

TABLE 20. Transmitter Options Weights

Code	Option	Add lb (kg)
J, K, L, M	Stainless Steel Housing(T)	3.9 (1,8)
J, K, L, M	Stainless Steel Housing (C, L, H, P)	3.1 (1,4)
M5	LCD display for Aluminum Housing	0.5 (0,2)
M6	LCD display for SST Housing	1.25 (0,6)
B4	SST Mounting Bracket for Coplanar Flange	1.0 (0,5)
B1, B2, B3	Mounting Bracket for Traditional Flange	2.3 (1,0)
B7, B8, B9	Mounting Bracket for Traditional Flange	2.3 (1,0)
BA, BC	SST Bracket for Traditional Flange	2.3 (1,0)
H2	Traditional Flange	2.4 (1,1)
H3	Traditional Flange	2.7 (1,2)
H4	Traditional Flange	2.6 (1,2)
H7	Traditional Flange	2.5 (1,1)
FC	Level Flange—3 in., 150	10.8 (4,9)
FD	Level Flange—3 in., 300	14.3 (6,5)
FA	Level Flange—2 in., 150	10.7 (4,8)
FB	Level Flange—2 in., 300	14.0 (6,3)
FP	DIN Level Flange, SST, DN 50, PN 40	8.3 (3,8)
FQ	DIN Level Flange, SST, DN 80, PN 40	13.7 (6,2)

3051C Differential/Gage Pressure Transmitter Range Limits										
	Range 1 Span		Range 2 Span		Range 3 Span		Range 4 Span		Range 5 Span	
Units	**min**	**max**	**min**	**max**	**min**	**max**	**min**	**max**	**min**	**max**
inH_2O	0.5	25	2.5	250	10	1000	83.040	8304	553.60	55360
inHg	0.03678	1.8389	0.18389	18.389	0.73559	73.559	6.1081	610.81	40.720	4072.04
ftH_2O	0.04167	2.08333	0.20833	20.8333	0.83333	83.3333	6.9198	691.997	46.13	4613.31
mmH_2O	12.7	635.5	63.553	6355	254	25421	2110.95	211095	14073	1407301
mmHg	0.93416	46.7082	4.67082	467.082	18.6833	1868.33	155.145	15514.5	1034.3	103430
psi	0.01806	0.903	0.0902	9.03183	0.36127	36.127	3	300	20	2000
bar	0.00125	0.06227	0.00623	0.62272	0.02491	2.491	0.20684	20.6843	1.37895	137.895
mbar	1.2454	62.2723	6.22723	622.723	24.9089	2490.89	206.843	20684.3	1378.95	137895
g/cm^2	1.26775	63.3875	6.33875	633.875	25.355	2535.45	210.547	21054.7	1406.14	140614
kg/cm^2	0.00127	0.0635	0.00635	0.635	0.0254	2.54	0.21092	21.0921	1.40614	140.614
Pa	124.545	6227.23	622.723	62160.6	2490.89	249089	20684.3	2068430	137895	13789500
kPa	0.12545	6.2272	0.62272	62.2723	2.49089	249.089	20.6843	2068.43	137.895	13789.5
torr	0.93416	46.7082	4.67082	467.082	18.6833	1868.33	155.145	15514.5	1034.3	103430
atm	0.00123	0.06146	0.00615	0.61460	0.02458	2.458	0.20414	20.4138	1.36092	136.092
When using a HART communicator, ±5% adjustment is allowed on the sensor limit to allow for unit conversions.										

3051L Pressure Transmitter Range Limits								
	Range 2 Span		Range 3 Span		Range 4 Span		Range 5 Span	
Units	**min**	**max**	**min**	**max**	**min**	**max**	**min**	**max**
inH_2O	2.5	250	10	1000	83.040	8304	553.60	55360
inHg	0.18389	18.389	0.73559	73.559	6.1081	610.81	40.720	4072.04
ftH_2O	0.20833	20.8333	0.83333	83.3333	6.9198	691.997	46.13	4613.31
mmH_2O	63.553	6355	254	25421	2110.95	211095	14073	1407301
mmHg	4.67082	467.082	18.6833	1868.33	155.145	15514.5	1034.3	103430
psi	0.0902	9.03183	0.36127	36.127	3	300	20	2000
bar	0.00623	0.62272	0.02491	2.491	0.20684	20.6843	1.37895	137.895
mbar	6.22723	622.723	24.9089	2490.89	206.843	20684.3	1378.95	137895
g/cm^2	6.33875	633.875	25.355	2535.45	210.547	21054.7	1406.14	140614
kg/cm^2	0.00635	0.635	0.0254	2.54	0.21092	21.0921	1.40614	140.614
Pa	622.723	62160.6	2490.89	249089	20684.3	2068430	137895	13789500
kPa	0.62272	62.2723	2.49089	249.089	20.6843	2068.43	137.895	13789.5
torr	4.67082	467.082	18.6833	1868.33	155.145	15514.5	1034.3	103430
atm	0.00615	0.61460	0.02458	2.458	0.20414	20.4138	1.36092	136.092
When using a HART communicator, ±5% adjustment is allowed on the sensor limit to allow for unit conversions.								

3051T Gage and Absolute Pressure Transmitter Range Limits										
	Range 1 Span		Range 2 Span		Range 3 Span		Range 4 Span		Range 5 Span	
Units	**min**	**max**	**min**	**max**	**min**	**max**	**min**	**max**	**min**	**max**
inH_2O	8.30397	831.889	41.5198	4159.45	221.439	22143.9	1107.2	110720	55360	276799
inHg	0.61081	61.0807	3.05403	305.403	16.2882	1628.82	81.441	8144.098	4072.04	20360.2
ftH_2O	0.69199	69.3241	3.45998	345.998	18.4533	1845.33	92.2663	9226.63	4613.31	23066.6
mmH_2O	211.10	21130	1054.60	105460.3	5634.66	563466	28146.1	2814613	1407301	7036507
mmHg	15.5145	1551.45	77.5723	7757.23	413.72	41372	2068.6	206860.0	103430	517151
psi	0.3	30	1.5	150	8	800	40	4000	2000	10000
bar	0.02068	3.06843	0.10342	10.3421	0.55158	55.1581	2.75791	275.7905	137.895	689.476
mbar	20.6843	2068.43	103.421	10342.11	551.581	55158.1	2757.91	275790.5	137895	689476
g/cm^2	21.0921	2109.21	105.461	10546.1	561.459	56145.9	2807.31	280730.6	140614	703067
kg/cm^2	0.02109	2.10921	0.10546	10.5461	0.56246	56.2456	2.81228	281.228	140.614	701.82
Pa	2068.43	206843	10342.1	1034212	55158.1	5515811	275791	27579054	13789500	68947600
kPa	2.06843	206.843	10.3421	1034.21	55.1581	5515.81	275.791	27579.05	13789.5	68947.6
torr	15.5145	1551.45	77.5726	7757.26	413.721	413721	2068.6	206859.7	103430	517151
atm	0.02041	2.04138	0.10207	10.2069	0.54437	54.4368	2.72184	272.1841	136.092	680.46
When using a HART communicator, ±5% adjustment is allowed on the sensor limit to allow for unit conversions.										

3051C Absolute Pressure Transmitter Range Limits								
	Range 1 Span		Range 2 Span		Range 3 Span		Range 4 Span	
Units	**min**	**max**	**min**	**max**	**min**	**max**	**min**	**max**
inH_2O	8.30397	831.889	41.5198	4151.98	221.439	22143.9	1107.2	110720
inHg	0.61081	61.0807	3.05403	305.403	16.2882	1628.82	81.441	8144.098
ftH_2O	0.69199	69.3241	3.45998	345.998	18.4533	1845.33	92.2663	9226.63
mmH_2O	211.10	21130	6.35308	635.308	5634.66	563466	28146.1	2814613
mmHg	15.5145	1551.45	1055.47	105547	413.72	41372	2068.6	206860.0
psi	0.3	30	1.5	150	8	800	40	4000
bar	0.02068	2.06843	0.10342	10.342	0.55158	55.1581	2.75791	275.7905
mbar	20.6843	2068.43	103.421	10342.1	551.581	55158.1	2757.91	275790.5
g/cm^2	21.0921	2109.21	105.27	105.27	561.459	56145.9	2807.31	280730.6
kg/cm^2	0.02109	2.10921	0.10546	10.546	0.56246	56.2456	2.81228	281.228
Pa	2068.43	206843	10342.1	1034210	55158.1	5515811	275791	27579054
kPa	2.06843	206.843	10.3421	1034.21	55.1581	5515.81	275.791	27579.05
torr	15.5145	1551.45	77.5726	7757.26	413.721	413721	2068.6	206859.7
atm	0.02041	2.04138	0.10207	10.207	0.54437	54.4368	2.72184	272.1841
When using a HART communicator, ±5% adjustment is allowed on the sensor limit to allow for unit conversions.								

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EMERSON™
Process Management

Product Data Sheet
00813-0100-4101, Rev DA
April 2010

Rosemount 2051 Pressure Transmitter

- *Reference Accuracy of 0.075%*
- *Rangeability of 100:1*
- *Protocols available include 4-20 mA HART®, FOUNDATION™ fieldbus, 1-5 Vdc HART Low Power*
- *Coplanar™ platform enables integration of primary elements, manifolds, and remote seal solutions*
- *Complete pressure transmitter family to meet your pressure, level, and flow needs*

Contents

Measure Pressure with Confidence

Confidence Begins with Reliable Measurement

The 2051 capabilities are designed to meet a wide range of applications. Combining 0.075% reference accuracy, 100:1 rangedown, and extended two-year stability provides confidence in your pressure measurements.

Integrate With Any Host

The 2051 is available in 4-20mA HART, 1-5 Vdc HART Low Power, or FOUNDATION fieldbus output protocols. Easily integrate the 2051 into existing or new installations.

Reduce Engineering and Installed Cost with Flexible Coplanar Design

The versatile Coplanar platform design enables the best process connection for pressure, flow, and level applications. The final 2051 assembly arrives factory calibrated, pressure-tested, and ready to install. The flexible design reduces engineering and inventory costs.

Meet Your Application Needs with a Complete Offering

The 2051 family of pressure transmitters offers differential, gage, and absolute pressure measurements. The complete offering ensures the 2051 meets your measurement needs.

Rosemount Pressure Solutions

Rosemount 3051S Series of Instrumentation
Highest performing scalable pressure, flow and level measurement solutions drive better plant efficiency and more productivity. Innovative features include wireless, advanced diagnostics, and multivariable technologies.

Rosemount 3095 Mass Flow Transmitter
Accurately measures differential pressure, static pressure and process temperature to dynamically calculate fully compensated mass flow.

Rosemount 3051 Pressure Transmitter Family
Proven industry standard performance and reliability to increase plant profitability. Includes the most comprehensive offering to meet all application needs.

Rosemount 305, 306 and 304 Manifolds
Factory-assembled, calibrated and seal-tested transmitter-to-manifold assemblies reduce installation costs.

Rosemount 1199 Remote Seals
Provides reliable, remote measurements of process pressure and protects the transmitter from hot, corrosive, or viscous fluids.

Orifice Plate Primary Element Systems: Rosemount 1495 and 1595 Orifice Plates, 1496 Flange Unions and 1497 Meter Sections
A comprehensive offering of orifice plates, flange unions and meter sections that are easy to specify and order. The 1595 Conditioning Orifice provides superior performance in tight fit applications.

Annubar® Flowmeter Series: Rosemount 3051SFA ProBar®, 3095MFA Mass ProBar, and 485
The state-of-the-art, fifth generation Rosemount 485 Annubar combined with the 3051S or 3095 MultiVariable transmitter creates an accurate, repeatable and dependable insertion-type flowmeter.

Compact Orifice Flowmeter Series: Rosemount 3051SFC, 3095MFC, and 405
Compact Orifice Flowmeters can be installed between existing flanges, up to a Class 600 (PN100) rating. In tight fit applications, a conditioning orifice plate version is available, requiring only two diameters of straight run upstream and two downstream.

ProPlate® Flowmeter Series: Rosemount 3051SFP ProPlate, 3095MFP Mass ProPlate, and 1195
These integral orifice flowmeters eliminate the inaccuracies that become more pronounced in small orifice line installations. The completely assembled, ready to install flowmeters reduce cost and simplify installation.

Product Offering

Rosemount 2051C Differential and Gage

See ordering information on page 26.

- Performance of 0.075% accuracy, optional 0.065%
- Two-year stability of 0.10%, optional five-year stability
- Coplanar platform enables integrated manifold, primary element and remote seal solutions
- Calibrated spans/ranges from 0.5 inH_2O to 2000 psi (1,2 mbar to 138 bar)
- 316L SST, Alloy C-276 and tantalum process wetted parts

Rosemount 2051T Gage and Absolute

See ordering information on page 31.

- Performance of 0.075% accuracy, optional 0.065%
- Two-year stability of 0.10%, optional five-year stability
- Calibrated spans/ranges from 0.3 to 10000 psi (10,3 mbar to 689 bar)
- Multiple process connections available
- 316L SST and Alloy C-276 process wetted parts

Rosemount 2051L Liquid Level

See ordering information on page 35.

- Performance of 0.075% accuracy
- Welded fill fluid system provides best-in-class system reliability
- Flush and extended diaphragms
- Multiple fill fluids and process wetted materials available

Specifications

PERFORMANCE SPECIFICATIONS

For zero based spans, reference conditions, silicone oil fill, SST materials, Coplanar flange (2051C) or $^1/_2$ in. - 14 NPT (2051T) process connections, digital trim values set to equal range points. Applicable to 4-20 mA HART output only unless otherwise noted.

Conformance To Specification (±3σ (Sigma))

Technology leadership, advanced manufacturing techniques and statistical process control ensure specification conformance to at least ±3σ.

Reference Accuracy(1)

Models(1)	Standard	Performance Option, P8	
2051C			
Ranges 2-5	±0.075% of span For spans less than 10:1, accuracy = $\pm\left[0.025 + 0.005\left(\frac{URL}{Span}\right)\right]$% of Span	Ranges 2-5	High Accuracy Option, P8 ±0.065% of span For spans less than 10:1, accuracy = $\pm\left[0.015 + 0.005\left(\frac{URL}{Span}\right)\right]$% of Span
Range 1	±0.10% of span For spans less than 15:1, accuracy = $\pm\left[0.025 + 0.005\left(\frac{URL}{Span}\right)\right]$% of Span		
2051T			
Ranges 1-4	±0.075% of span For spans less than 10:1, accuracy = $\pm\left[0.0075\left(\frac{URL}{Span}\right)\right]$% of Span	Ranges 1-4	High Accuracy Option, P8 ±0.065% of span For spans less than 10:1, accuracy = $\pm\left[0.0075\left(\frac{URL}{Span}\right)\right]$% of Span
Range 5	±0.075% of span for spans greater than 5:1		
2051L			
Ranges 2-4	±0.075% of span For spans less than 10:1, accuracy = $\pm\left[0.025 + 0.005\left(\frac{URL}{Span}\right)\right]$% of Span		

(1) For FOUNDATION fieldbus transmitters, use calibrated range in place of span.

Long Term Stability

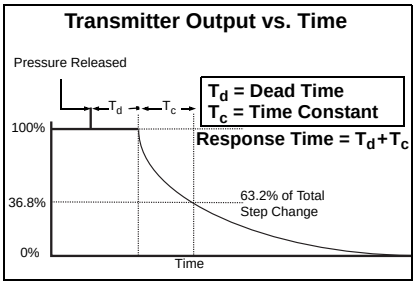
Models	Standard	Performance Option, P8
2051CD, CG		
Range 1 (CD)	±0.2% of URL for 1 year, Reference Stability	
Ranges 2-5	±0.1% of URL for 2 years, Operating Stability	±0.125% of URL for 5 years, Operating Stability
2051T		
Ranges 1-5	±0.1% of URL for 2 years, Operating Stability	±0.125% of URL for 5 years, Operating Stability
2051L		
Ranges 2-4	Not Specified	

Dynamic Performance

	4-20 mA HART[1] 1-5 Vdc HART Low Power	Fieldbus[3]
Total Response Time (T_d + T_c)[2]:		
2051C, Range 3-5:	115 milliseconds	152 milliseconds
Range 1:	270 milliseconds	307 milliseconds
Range 2:	130 milliseconds	152 milliseconds
2051T:	100 milliseconds	152 milliseconds
2051L:	See *Instrument Toolkit*®	See *Instrument Toolkit*
Dead Time (Td)	60 milliseconds (nominal)	97 milliseconds
Update Rate	22 times per second	22 times per second

(1) Dead time and update rate apply to all models and ranges; analog output only
(2) Nominal total response time at 75 °F (24 °C) reference conditions.
(3) Transmitter fieldbus output only, segment macro-cycle not included.

Typical HART Transmitter Response Time



Line Pressure Effect per 1000 psi (6,9 MPa)

For line pressures above 2000 psi (13,7 MPa) and Ranges 4-5, see user manual (Rosemount publication number 00809-0100-4101).

Models	Line Pressure Effect
2051CD	Zero Error[1]
Ranges 2-3	±0.1% of URL/1000 psi (68,9 bar) for line pressures from 0 to 2000 psi (0 to 13,7 MPa)
Range 1	±0.5% of URL/1000 psi (68,9 bar)
	Span Error
Ranges 2-3	±0.1% of reading/1000 psi (68,9 bar)
Range 1	±0.4% of reading/1000 psi (68,9 bar)

(1) Can be calibrated out at line pressure.

Ambient Temperature Effect per 50°F (28°C)

Models	Ambient Temperature Effect
2051C	
Ranges 2-5	±(0.025% URL + 0.125% span) from 1:1 to 5:1 ±(0.05% URL + 0.25% span) from 5:1 to 100:1
Range 1	±(0.2% URL + 0.5% span) from 1:1 to 50:1
2051T	
Range 2-4	±(0.05% URL + 0.25% span) from 1:1 to 30:1 ±(0.07% URL + 0.25% span) from 30:1 to 100:1
Range 1	±(0.05% URL + 0.25% span) from 1:1 to 10:1 ±(0.10% URL + 0.25% span) from 10:1 to 100:1
Range 5	±(0.2% URL + 0.3% span)
2051L	See *Instrument Toolkit*

Mounting Position Effects

Models	Mounting Position Effects
2051C	Zero shifts up to ±1.25 inH_2O (3,1 mbar), which can be calibrated out. No span effect.
2051T	Zero shifts up to ±2.5 inH_2O (6,2 mbar), which can be calibrated out. No span effect.
2051L	With liquid level diaphragm in vertical plane, zero shift of up to 1 inH_2O (2,49 mbar). With diaphragm in horizontal plane, zero shift of up to 5 inH_2O (12,43 mbar) plus extension length on extended units. Zero shifts can be calibrated out. No span effect.

Vibration Effect

Less than ±0.1% of URL when tested per the requirements of IEC60770-1 field or pipeline with high vibration level (10-60 Hz 0.21mm displacement peak amplitude / 60-2000 Hz 3g).

Power Supply Effect

Less than ±0.005% of calibrated span per volt.

Electromagnetic Compatibility (EMC)

Meets all relevant requirements of EN 61326 and NAMUR NE-21.

Transient Protection (Option Code T1)

Meets IEEE C62.41, Category Location B

6 kV crest (0.5 μs - 100 kHz)
3 kV crest (8 × 20 microseconds)
6 kV crest (1.2 × 50 microseconds)

FUNCTIONAL SPECIFICATIONS

Range and Sensor Limits

Range	2051CD, 2051CG, 2051L					
		Range and Sensor Limits				
			Lower (LRL)			
	Minimum Span	Upper (URL)	2051C Differential	2051C Gage(1)	2051L Differential	2051L Gage(1)
1	0.5 inH_2O (1,2 mbar)	25 inH_2O (62,3 mbar)	–25 inH_2O (–62,1 mbar)	–25 inH_2O (–62,1 mbar)	N/A	N/A
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)	–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)	–1000 inH_2O (–2,49 bar)	–393 inH_2O (–979 mbar)
4	3 psi (0,207 bar)	300 psi (20,6 bar)	-300 psi (-20,6 bar)	–14.2 psig (–979 mbar)	–300 psi (–20,7 bar)	–14.2 psig (–979 mbar)
5	20 psi (1,38 bar)	2000 psi (137,9 bar)	-2000 psi (-137,9 bar)	–14.2 psig (–979 mbar)	N/A	N/A

(1) Assumes atmospheric pressure of 14.7 psig.

Range	2051T			
		Range and Sensor Limits		
	Minimum Span	Upper (URL)	Lower (LRL) (Abs)	Lower(1) (LRL) (Gage)
1	0.3 psi (20,6 mbar)	30 psi (2,06 bar)	0 psia (0 bar)	–14.7 psig (–1,01 bar)
2	1.5 psi (0,103 bar)	150 psi (10,3 bar)	0 psia (0 bar)	–14.7 psig (–1,01 bar)
3	8 psi (0,55 bar)	800 psi (55,2 bar)	0 psia (0 bar)	–14.7 psig (–1,01 bar)
4	40 psi (2,76 bar)	4000 psi (275,8 bar)	0 psia (0 bar)	–14.7 psig (–1,01 bar)
5	2000 psi (137,9 bar)	10000 psi (689,4 bar)	0 psia (0 bar)	–14.7 psig (–1,01 bar)

(1) Assumes atmospheric pressure of 14.7 psig.

Service

Liquid, gas, and vapor applications

Protocols

4–20 mA HART (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 operates on 10.5 to 42.4 V dc with no load.

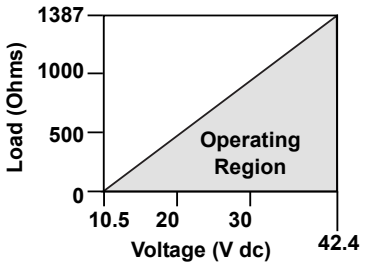
Turn-On Time

Performance within specifications less than 2.0 seconds after power is applied to the transmitter.

Load Limitations

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

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



The HART 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 V dc transmitter terminal voltage.

Current Draw

17.5 mA for all configurations (including LCD display option)

Turn-On Time

Performance within specifications less than 20.0 seconds after power is applied to the transmitter.

***FOUNDATION* fieldbus Function Block Execution Times**

Block	Execution Time
Resource	-
Transducer	-
LCD Block	-
Analog Input 1, 2	30 milliseconds
PID	45 milliseconds

FOUNDATION fieldbus Parameters

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

Standard Function Blocks

Resource Block

- Contains hardware, electronics, and diagnostic information.

Transducer Block

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

LCD Block

- Configures the local display.

2 Analog Input Blocks

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

PID Block

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

Backup Link Active Scheduler (LAS)

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

1-5 Vdc HART Low Power (Output Code M)

Output

Three wire 1–5 Vdc output, user-selectable for linear or square root output. Digital process variable superimposed on voltage signal, available to any host conforming to the *HART* protocol.

Power Supply

External power supply required. Standard transmitter operates on 9 to 28 Vdc with no load.

Power Consumption

3.0 mA, 27–84 mW

Output Load

100 kΩ or greater

Turn-On Time

Performance within specifications less than 2.0 seconds after power is applied to the transmitter.

Overpressure Limits

Transmitters withstand the following limits without damage:

2051C

- Ranges 2–5: 3626 psig (250 bar)
  4500 psig (310,3 bar) for option code P9
- Range 1: 2000 psig (137,9 bar)

2051T

- Range 1: 750 psi (51,7 bar)
- Range 2: 1500 psi (103,4 bar)
- Range 3: 1600 psi (110,3 bar)
- Range 4: 6000 psi (413,7 bar)
- Range 5: 15000 psi (1034,2 bar)

2051L

Limit is flange rating or sensor rating, whichever is lower (see Table 1).

Table 1. 2051L Flange Rating

Standard	Type	CS Rating	SST Rating
ANSI/ASME	Class 150	285 psig	275 psig
ANSI/ASME	Class 300	740 psig	720 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
At 248 °F (120 °C), the rating decreases with increasing temperature, per DIN 2401.			

Static Pressure Limit

2051CD

- Operates within specifications between static line pressures of -14.2 psig (0.034 bar) and 3626 psig (250 bar)
  - For Option Code P9, 4500 psig (310,3 bar)
- Range 1: 0.5 psia to 2000 psig (34 mbar and 137,9 bar)

Burst Pressure Limits

2051C Coplanar or traditional process flange

- 10000 psig (689,5 bar)

2051T

- Ranges 1–4: 11000 psi (758,4 bar)
- Range 5: 26000 psi (1792,64 bar)

Temperature Limits

Ambient(1)

–40 to 185 °F (–40 to 85 °C)

With LCD display(2): –40 to 175 °F (–40 to 80 °C)

Storage(1)

–50 to 230 °F (–46 to 110 °C)

With LCD display: –40 to 185 °F (–40 to 85 °C)

(1) Limits for silicone fill fluid only.

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

Process Temperature Limits

At atmospheric pressures and above.

Table 2. 2051 Process Temperature Limits

2051C	
Silicone Fill Sensor(1)	
with Coplanar Flange	–40 to 250 °F (–40 to 121 °C)(2)
with Traditional Flange	–40 to 300 °F (–40 to 149 °C)(2)
with Level Flange	–40 to 300 °F (–40 to 149 °C)(2)
with 305 Integral Manifold	–40 to 300 °F (–40 to 149 °C)(2)
Inert Fill Sensor(1)	–40 to 185 °F (–40 to 85 °C)(3)
2051T (Process Fill Fluid)	
Silicone Fill Sensor(1)	–40 to 250 °F (–40 to 121 °C)(2)
Inert Fill Sensor(1)	–22 to 250 °F (–30 to 121 °C)(2)
2051L Low-Side Temperature Limits	
Silicone Fill Sensor(1)	–40 to 250 °F (–40 to 121 °C)(2)
Inert Fill Sensor(1)	0 to 185 °F (–18 to 85 °C)(2)
2051L High-Side Temperature Limits (Process Fill Fluid)	
Syltherm® XLT	–102 to 293 °F (–75 to 145 °C)
D.C. Silicone 704®	32 to 599 °F (0 to 315 °C)
D.C. Silicone 200	–49 to 401 °F(–45 to 205 °C)
Inert	–49 to 320 °F(–45 to 160 °C)
Glycerin and Water	5 to 203 °F (-15 to 95 °C)
Neobee M-20	5 to 437 °F (-15 to 225 °C)
Propylene Glycol and Water	5 to 203 °F (-15 to 95 °C)

(1) Process temperatures above 185 °F (85 °C) require derating the ambient limits by a 1.5:1 ratio.

(2) 220 °F (104 °C) limit in vacuum service; 130 °F (54 °C) for pressures below 0.5 psia.

(3) 160 °F (71 °C) limit in vacuum service.

Humidity Limits

0–100% relative humidity

Volumetric Displacement

Less than 0.005 in^3 (0,08 cm^3)

Damping

Analog output response to a step input change is user-selectable from 0 to 25.6 seconds for one time constant. This software damping is in addition to sensor module response time.

Failure Mode Alarm

If self-diagnostics detect a sensor or microprocessor failure, the analog signal is driven either high or low to alert the user. High or low failure mode is user-selectable with a jumper on the transmitter. The values to which the transmitter drives its output in failure mode depend on whether it is factory-configured to *standard* or *NAMUR-compliant* operation. The values for each are as follows:

Standard Operation			
Output Code	**Linear Output**	**Fail High**	**Fail Low**
A	3.9 ≤ I ≤ 20.8	I ≥ 21.75 mA	I ≤ 3.75 mA
M	0.97 ≤ V ≤ 5.2	V ≥ 5.4 V	V ≤ 0.95V

NAMUR-Compliant Operation			
Output Code	**Linear Output**	**Fail High**	**Fail Low**
A	3.8 ≤ I ≤ 20.5	I ≥ 22.5 mA	I ≤ 3.6 mA

Output Code F

If self-diagnostics detect a gross transmitter failure, that information gets passed as a status along with the process variable.

PHYSICAL SPECIFICATIONS

Electrical Connections

1/2–14 NPT, G1/2, and M20 × 1.5 (CM20) conduit.

Process Connections

2051C

- 1/4–18 NPT on 2 1/8-in. centers
- 1/2–14 NPT and RC 1/2 on 2-in.(50.8mm), 2 1/8-in. (54.0 mm), or 2 1/4-in. (57.2mm) centers (process adapters)

2051T

- 1/2–14 NPT female
- G1/2 A DIN 16288 Male (available in SST for Range 1–4 transmitters only)
- Autoclave type F-250-C (Pressure relieved 9/16–18 gland thread; 1/4 OD high pressure tube 60° cone; available in SST for Range 5 transmitters only)

2051L

- High pressure side: 2-in.(50.8mm), 3-in. (72 mm), or 4-in. (102mm), ASME B 16.5 (ANSI) Class 150 or 300 flange; 50, 80 or 100 mm, DIN 2501 PN 40 or 10/16 flange
- Low pressure side: 1/4–18 NPT on flange, 1/2–14 NPT on process adapter

2051C Process Wetted Parts

Drain/Vent Valves

316 SST or Alloy C-276

Process Flanges and Adapters

Plated carbon steel, SST CF-8M (cast version of 316 SST, material per ASTM-A743), or CW12MW (cast version of Alloy C-276)

Wetted O-rings

Glass-filled PTFE or Graphite-filled PTFE

Process Isolating Diaphragms

316L SST, Alloy C-276, or Tantalum

2051T Process Wetted Parts

Process Connections

- 316L SST or Alloy C-276

Process Isolating Diaphragms

- 316L SST or Alloy C-276

2051L Process Wetted Parts

Flanged Process Connection (Transmitter High Side)

Process Diaphragms, Including Process Gasket Surface

- 316L SST, Alloy C-276, or Tantalum

Extension

- CF-3M (Cast version of 316L SST, material per ASTM-A743), or Cast C-276. Fits schedule 40 and 80 pipe.

Mounting Flange

- Zinc-cobalt plated CS or SST

Reference Process Connection (Transmitter Low Side)

Isolating Diaphragms

- 316L SST or Alloy C-276

Reference Flange and Adapter

- CF-8M (Cast version of 316 SST, material per ASTM-A743)

Non-Wetted Parts for 2051C/T/L

Electronics Housing

Low-copper aluminum or CF-8M (Cast version of 316 SST).
Enclosure Type 4X, IP 65, IP 66, IP68

Coplanar Sensor Module Housing

CF-3M (Cast version of 316L SST)

Bolts

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 oil (D.C. 200) or Fluorocarbon oil (Halocarbon or Fluorinert® FC-43 for 2051T)

Process Fill Fluid (2051L only)

Syltherm XLT, D.C. Silicone 704,
D.C. Silicone 200, inert, glycerin and water, Neobee M-20 or propylene glycol and water

Paint

Polyurethane

Cover O-rings

Buna-N

Shipping Weights

Table 3. Transmitter Weights without Options

Transmitter	lb. (kg)
2051C	4.9 (2,2)
2051L	Table 4 below
2051T	3.1 (1,4)

Table 4. 2051L Weights without Options

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

Table 5. Transmitter Options Weights

Code	Option	Add lb (kg)
J, K, L, M	Stainless Steel Housing	3.9 (1,8)
M5	LCD display for Aluminum Housing	0.5 (0,2)
B4	SST Mounting Bracket for Coplanar Flange	1.0 (0,5)
B1 B2 B3	Mounting Bracket for Traditional Flange	2.3 (1,0)
B7 B8 B9	Mounting Bracket for Traditional Flange	2.3 (1,0)
BA, BC	SST Bracket for Traditional Flange	2.3 (1,0)
H2	Traditional Flange	2.6 (1,2)
H3	Traditional Flange	3.0 (1,4)
H4	Traditional Flange	3.0 (1,4)
H7	Traditional Flange	2.7 (1,2)
FC	Level Flange—3 in., 150	12.7 (5,8)
FD	Level Flange—3 in., 300	15.9 (7,2)
FA	Level Flange—2 in., 150	8.0 (3,6)
FB	Level Flange—2 in., 300	8.4 (3,3)
FP	DIN Level Flange, SST, DN 50, PN 40	7.8 (3,5)
FQ	DIN Level Flange, SST, DN 80, PN 40	12.7 (5,8)

Product Certifications

Approved Manufacturing Locations

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

European Directive Information

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

ATEX Directive (94/9/EC)

All 2051 transmitters comply with the ATEX Directive.

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

2051CG2, 3, 4, 5; 2051CD2, 3, 4, 5 (also with P9 option) — QS Certificate of Assessment - EC No. PED-H-100 Module H Conformity Assessment

All other 2051 Pressure Transmitters

— Sound Engineering Practice

Transmitter Attachments: Diaphragm Seal - Process Flange - Manifold

— Sound Engineering Practice

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

All 2051 Pressure Transmitters meet all of the requirements of IECEN61326:2006 and NAMUR NE-21.

Ordinary Location Certification for Factory Mutual

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

HART PROTOCOL

Hazardous Locations Certifications

North American Certifications

FM Approvals

E5 Explosion-Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition-Proof for Class II, Division 1, Groups E, F, and G. Dust-Ignition-Proof for Class III, Division 1.
T5 (Ta = 85 °C), Factory Sealed, Enclosure Type 4X

I5 Intrinsically Safe for use in Class I, Division 1, Groups A, B, C, and D; Class II, Division 1, Groups E, F, and G; Class III, Division 1 when connected per Rosemount drawing 02051-1009; Non-incendive for Class I, Division 2, Groups A, B, C, and D.
Temperature Code:T4 (Ta = 40 °C), T3 (Ta = 85 °C), Enclosure Type 4X
For input parameters see control drawing 02051-1009.

Canadian Standards Association (CSA)

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

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

I6 Intrinsically safe approval. Intrinsically safe for Class I, Division 1, Groups A, B, C, and D when connected in accordance with Rosemount drawing 02051-1008. Temperature Code T3C.
Dust-Ignition-Proof for Class II and Class III, Division 1, Groups E, F, and G. Suitable for Class I, Division 2 Groups A, B, C, and D hazardous locations. Enclosure type 4X, factory sealed
For input parameters see control drawing 02051-1008.

European Certifications

I1 ATEX Intrinsic Safety
Certification No. Baseefa08ATEX0129X ⟨Ex⟩ II 1 G
Ex ia IIC T4 (–60 ≤ T_a ≤ +70 °C)
IP66 IP68
CE 1180

TABLE 6. Input Parameters

U_i = 30V
I_i = 200 mA
P_i = 1.0W
C_i = 0.012 µF
L_i = 10 µH

TABLE 7. RTD Assembly (2051CFx Option T or R)

U_i = 5 Vdc
I_i = 500 mA
P_i = 0.63W

Special Conditions for Safe Use (X):
When the optional transient protection terminal block is installed, the apparatus is not capable of withstanding the 500V insulation test required by Clause 6.3.12 of EN60079-11. This must be taken into account when installing the apparatus.

N1 ATEX Type n
Certification No. Baseefa08ATEX0130X ⟨Ex⟩ II 3 G
Ex nAnL IIC T4 (–40 ≤ T_a ≤ +70 °C)
U_i = 42.4 Vdc max
IP66
CE

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

E1 ATEX Flame-Proof
Certification No. KEMA 08ATEX0090X ⟨Ex⟩ II 1/2 G
Ex d IIC T6 (–50 ≤ T_a ≤ 65 °C)
Ex d IIC T5 (–50 ≤ T_a ≤ 80 °C)
IP66
CE 1180
Vmax = 42.4 V dc

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

ND ATEX Dust
Certification No. Baseefa08ATEX0182X ⟨Ex⟩ II 1 D
Dust Rating: II 1 D Ex tD A20 T115 °C (-20 °C ≤ T_a ≤ 85 °C)
IP66 IP68
Vmax = 42.4 V dc
A = 22 mA
CE 1180

Special Conditions for Safe Use (X):
If the equipment is fitted with an optional 90V transient suppressor, it is incapable of isolation from earth test and this must be taken into account during installation.

IECEx Certifications

I7 IECEx Intrinsic Safety
Certification No. IECExBAS08.0045X II 1 G
Ex ia IIC T4 (–60 ≤ T_a ≤ +70 °C)
CE 1180

TABLE 8. Input Parameters

U_i = 30V
I_i = 200 mA
P_i = 1.0W
C_i = 0.012 µF

TABLE 9. RTD Assembly (2051CFx Option T or R)

U_i = 5 Vdc
I_i = 500 mA
P_i = 0.63W

Special Conditions for Safe Use (X):
When the optional transient protection terminal block is installed, the apparatus is not capable of withstanding the 500V insulation test required by Clause 6.3.12 of IEC60079-11. This must be taken into account when installing the apparatus.

E7 IECEx Explosion-Proof (Flame-Proof)
Certification No. IECEx KEM 08.0024X II 1/2 G
Ex d IIC T6 (–50 ≤ T_a ≤ 65 °C)
Ex d IIC T5 (–50 ≤ T_a ≤ 80 °C)
CE 1180
Vmax = 42.4 V dc

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

N7 IECEx Type n
Certification No. IECExBAS08.0046X II 3 G
Ex nAnL IIC T4 (–40 ≤ T_a ≤ +70 °C)
U_i = 42.4 Vdc max
CE

Special Conditions for Safe Use (X):

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

TIIS Certifications

E4 TIIS Flame-Proof
Ex d IIC T6

I4 TIIS Intrinsic Safety
Ex ia IIC T4

Inmetro Certifications

E2 Flame-Proof
BR-Ex d IIC T6/T5

I2 Intrinsic Safety
BR-Ex ia IIC T4

GOST - Russia Certifications

IM Intrinsic Safety
Certificate Pending

EM Flame-Proof
Certificate Pending

China (NEPSI) Certifications

E3 Flame-Proof
Ex d II B+H_2T3~T5

I3 Intrinsic Safety
Ex ia IIC T4

CCoE Certifications

IW Intrinsic Safety
Ex ia IIC T4

EW Flame-Proof
Ex d IIC T5 or T6

Combinations of Certifications

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

K1 **E1, I1, N1,** and **ND** combination

K4 **E4** and **I4** combination

K5 **E5** and **I5** combination

K6 **I6** and **E6** combination

K7 **E7, I7,** and **N7** combination

KA **E1, I1, E6,** and **I6** combination

KB **E5, I5, E6,** and **I6** combination

KC **E1, I1, E5,** and **I5** combination

KD **E1, I1, E5, I5, E6,** and **I6** combination

FIELDBUS PROTOCOL

Hazardous Locations Certifications

North American Certifications

FM Approvals

E5 Explosion-Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition-Proof for Class II, Division 1, Groups E, F, and G. Dust-Ignition-Proof for Class III, Division 1.

T5 (Ta = 85 °C), Factory Sealed, Enclosure Type 4X

I5/IE Intrinsically Safe for use in Class I, Division 1, Groups A, B, C, and D; Class II, Division 1, Groups E, F, and G; Class III, Division 1 when connected per Rosemount drawing 02051-1009; Non-incendive for Class I, Division 2, Groups A, B, C, and D.

Temperature Code:T4 (Ta = 40 °C), T3 (Ta = 85 °C), Enclosure Type 4X
For input parameters see control drawing 02051-1009.

Canadian Standards Association (CSA)

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

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

I6/IF Intrinsically safe approval. 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.
Dust-Ignition-Proof for Class II and Class III, Division 1, Groups E, F, and G. Suitable for Class I, Division 2 Groups A, B, C, and D hazardous locations. Enclosure type 4X, factory sealed
For input parameters see control drawing 02051-1008.

European Certifications

I1 ATEX Intrinsic Safety
Certification No. Baseefa08ATEX0129X Ⓔx II 1 G
Ex ia IIC T4 (T_{amb} = –60 to +60 °C)
IP66
CE 1180

TABLE 10. Input Parameters

U_i = 30V
I_i = 300 mA
P_i = 1.3 W
C_i = 0 µF
L_i = 0 uH

TABLE 11. RTD Assembly (2051CFx Option T or R)

U_i = 5 Vdc
I_i = 500 mA
P_i = 0.63W

Special Conditions for Safe Use (X):
The device is not capable of withstanding the 500V insulation test required by Clause 6.3.12 of EN60079-11. This must be taken into account when installing the apparatus.

IA ATEX FISCO Intrinsic Safety
Certification No. Baseefa08ATEX0129X Ⓔx II 1 G
Ex ia IIC T4 (T_{amb} = –60 to +60 °C)
IP66
CE 1180

TABLE 12. Input Parameters

U_i = 17.5 V
I_i = 380 mA
P_i = 5.32 W
C_i = ≤ 5 µF
L_i = ≤ 10 µH

Special Conditions for Safe Use (X):
The device is not capable of withstanding the 500V insulation test required by Clause 6.3.12 of EN60079-11. This must be taken into account when installing the apparatus.

N1 ATEX Type n
Certification No. Baseefa08ATEX0130X Ⓔx II 3 G
Ex nAnL IIC T4 (T_{amb} = –40 to +70 °C)
U_i = 32 Vdc max
IP66

Special Conditions for Safe Use (X):
The device is not capable of withstanding the 500V insulation test required by Clause 6.8.1 of EN60079-15. This must be taken into account when installing the apparatus.

E1 ATEX Flame-Proof
Certification No. KEMA 08ATEX0090X Ⓔx II 1/2 G
Ex d IIC T6 (T_{amb} = –50 to 65 °C)
Ex d IIC T5 (T_{amb} = –50 to 80 °C)
IP66
CE 1180
Vmax = 32 V dc

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

ND ATEX Dust
Certification No. Baseefa08ATEX0182X ⟨Ex⟩ II 1 D
Dust Rating: II 1 D Ex tD A20 T115 °C (-20 °C ≤ T_a ≤ 85 °C)
IP66 IP68
Vmax = 42.4 V dc
A = 22 mA
CE 1180

Special Conditions for Safe Use (X):
If the equipment is fitted with an optional 90V transient suppressor, it is incapable of isolation from earth test and this must be taken into account during installation.

IECEx Certifications

I7 IECEx Intrinsic Safety
Certification No. IECExBAS08.0045X II 1 G
Ex ia IIC T4 (T_{amb} = –60 to +60 °C)
IP66
CE 1180

TABLE 13. Input Parameters

U_i = 30V
I_i = 300 mA
P_i = 1.3 W
C_i = 0 µF

TABLE 14. RTD Assembly (2051CFx Option T or R)

U_i = 5 Vdc
I_i = 500 mA
P_i = 0.63W

Special Conditions for Safe Use (X):
The device is not capable of withstanding the 500V insulation test required by Clause 6.3.12 of IEC60079-11. This must be taken into account when installing the apparatus.

IG ATEX FISCO Intrinsic Safety
Certification No. IECExBAS08.0045X ⟨Ex⟩ II 1 G
Ex ia IIC T4 (T_{amb} = –60 to +60 °C)
IP66
CE 1180

TABLE 15. Input Parameters

U_i = 17.5 V
I_i = 380 mA
P_i = 5.32 W
C_i = ≤ 5 µF
L_i = ≤ 10 µH

Special Conditions for Safe Use (X):
The device is not capable of withstanding the 500V insulation test required by Clause 6.3.12 of EN60079-11. This must be taken into account when installing the apparatus.

E7 IECEx Explosion-Proof (Flame-Proof)
Certification No. IECEx KEM 08.0024X II 1/2 GD
Ex d IIC T6 (T_{amb} = –50 to 65 °C)
Ex d IIC T5 (T_{amb} = –50 to 80 °C)
IP66
CE 1180
Vmax = 32 V dc

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

N7 IECEx Type n
Certification No. IECExBAS08.0046X II 3 G
Ex nAnL IIC T4 (T_{amb} = –40 to +70 °C)
U_i = 32 Vdc max

Special Conditions for Safe Use (X):

The device is not capable of withstanding the 500V insulation test required by Clause 6.8.1 of IEC60079-15. This must be taken into account when installing the device.

TIIS Certifications

E4 TIIS Flame-Proof
Ex d IIC T6

I4 TIIS Intrinsic Safety
Ex ia IIC T4

ID TIIS FISCO Intrinsic Safety
Certificate Pending

Inmetro Certifications

E2 Flame-Proof
BR-Ex d IIC T6/T5

I2 Intrinsic Safety
BR-Ex ia IIC T4

IB FISCO Intrinsic Safety
Certificate Pending

GOST - Russia Certifications

IM Intrinsic Safety
Certificate Pending

EM Flame-Proof
Certificate Pending

China (NEPSI) Certifications

E3 Flame-Proof
Ex d II B+H_2T3~T5

I3 Intrinsic Safety
Ex ia IIC T4

CCoE Certifications

IW Intrinsic Safety
Ex ia IIC T4

EW Flame-Proof
Ex d IIC T5 or T6

Combinations of Certifications

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

K1 **E1, I1, N1,** and **ND** combination

K4 **E4** and **I4** combination

K5 **E5** and **I5** combination

K6 **I6** and **E6** combination

K7 **E7, I7,** and **N7** combination

KA **E1, I1, E6,** and **I6** combination

KB **E5, I5, E6,** and **I6** combination

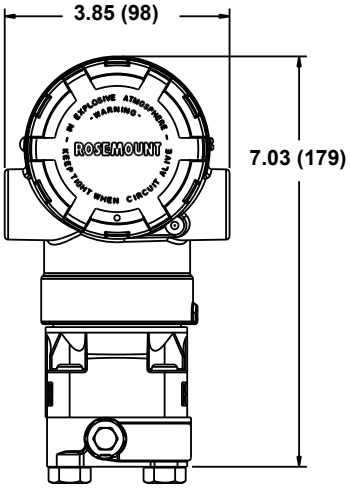
KC **E1, I1, E5,** and **I5** combination

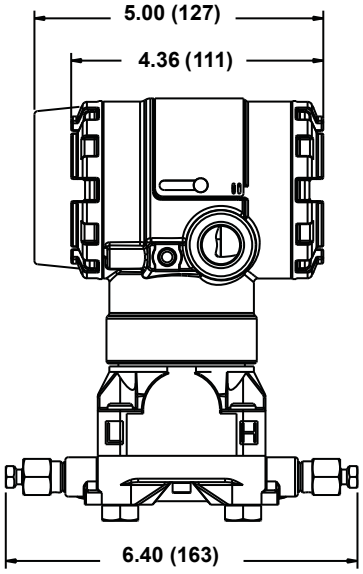
KD **E1, I1, E5, I5, E6,** and **I6** combination

Dimensional Drawings

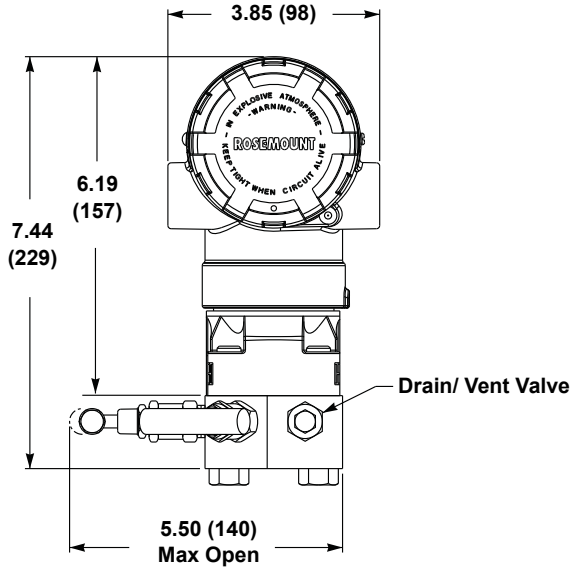
Dimensions are in inches (millimeters).

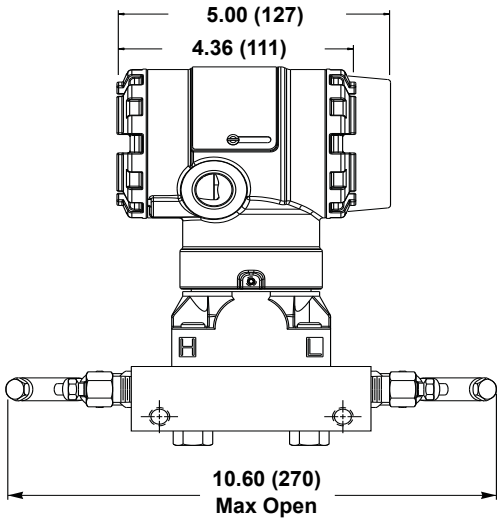
2051C Coplanar Flange Dimensional Drawing





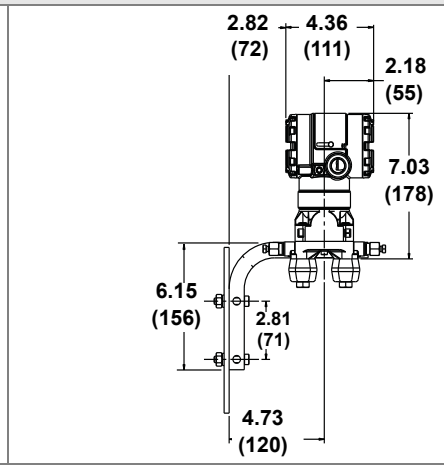
2051C Coplanar with Rosemount 305 Coplanar Integral Manifold

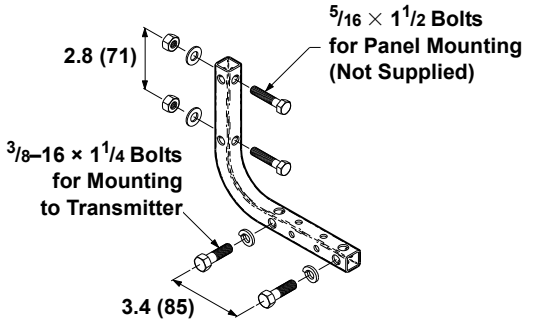




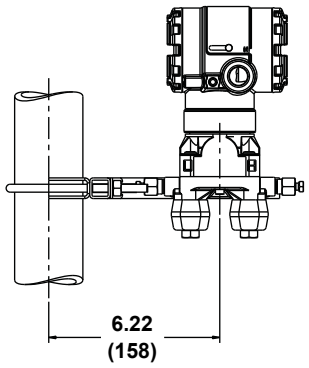
Coplanar Flange Mounting Configurations with Optional Bracket (B4) for 2-in. Pipe or Panel Mounting

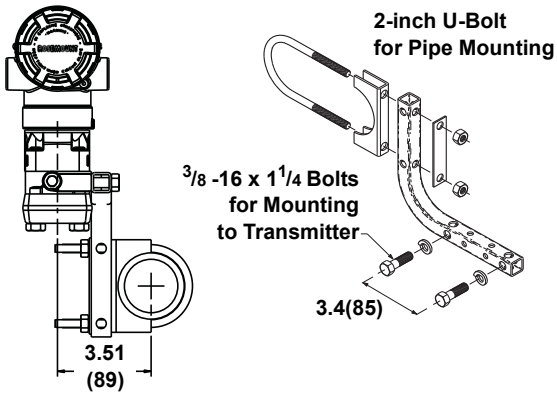
PANEL MOUNTING



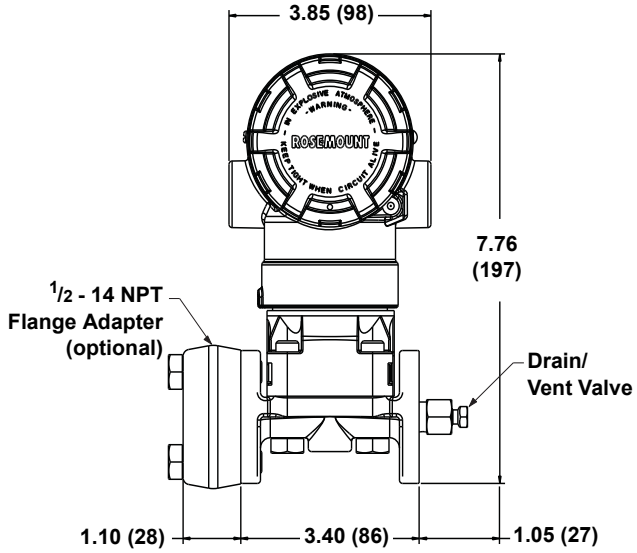


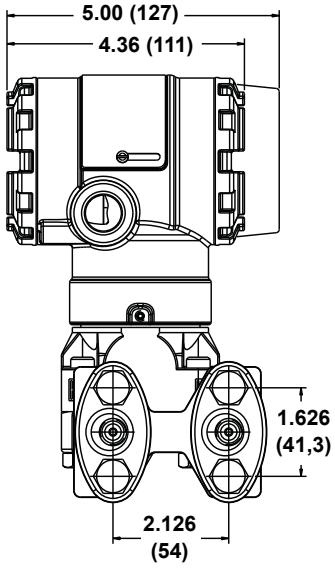
PIPE MOUNTING



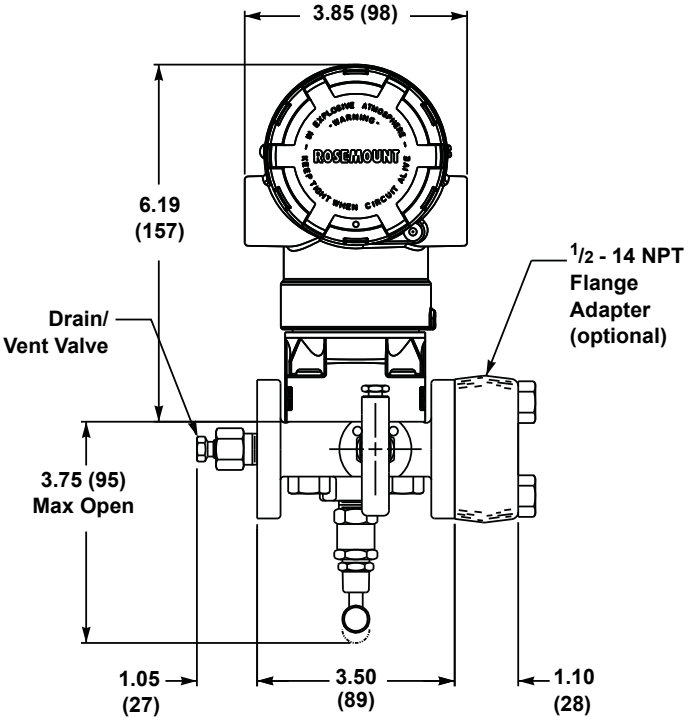


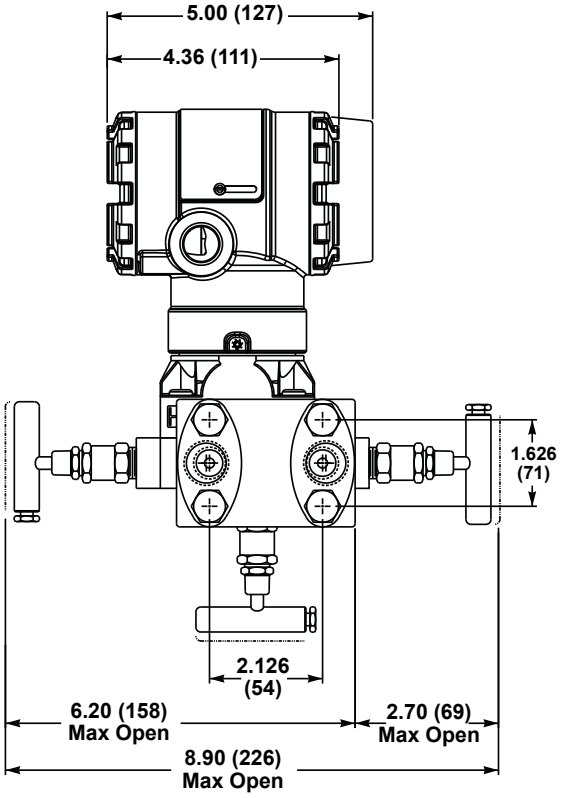
2051C Coplanar with Traditional Flange





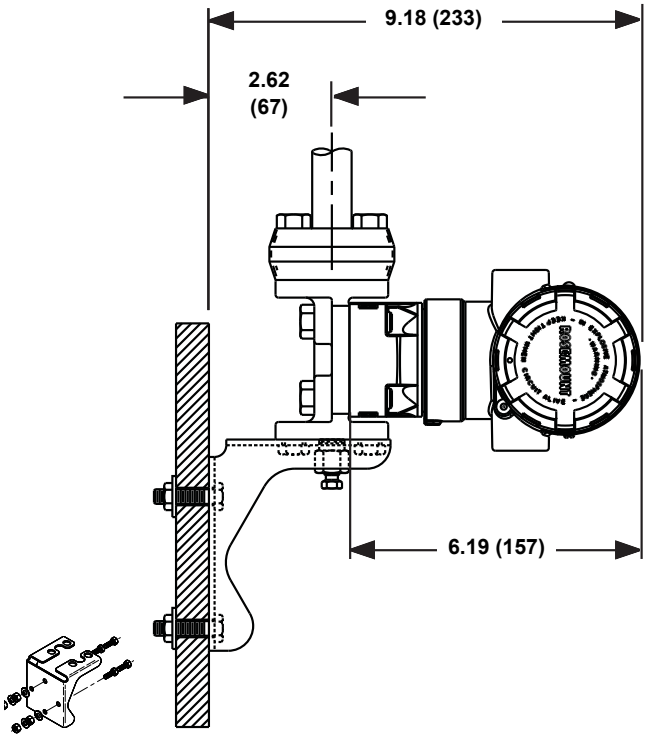
2051C Coplanar with Rosemount 305 Traditional Integral Manifold



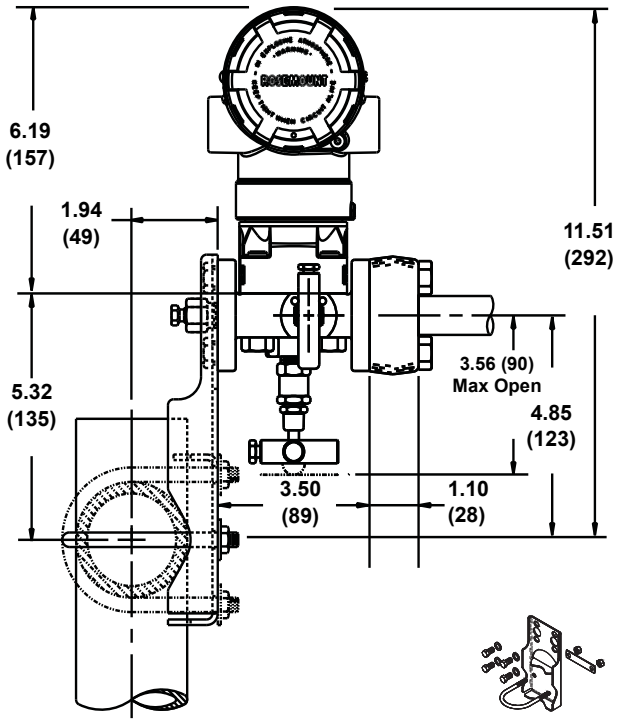


Traditional Flange Mounting Configurations with Optional Brackets for 2-in. Pipe or Panel Mounting

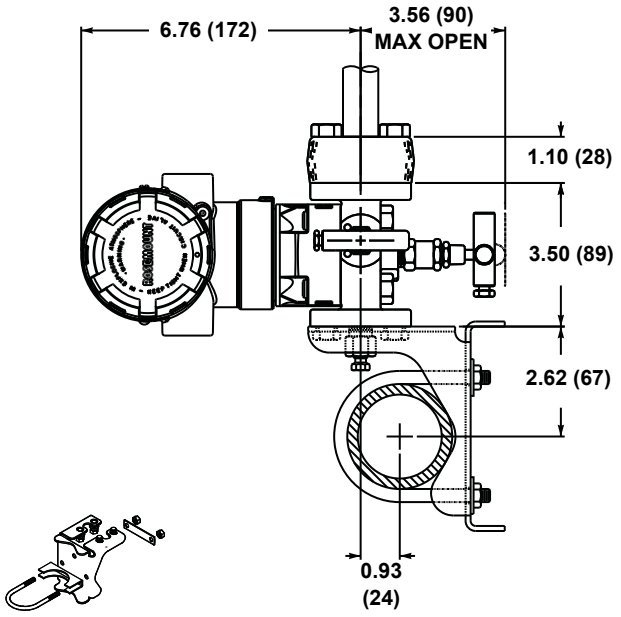
Panel Mount (Bracket Option B2/B8)



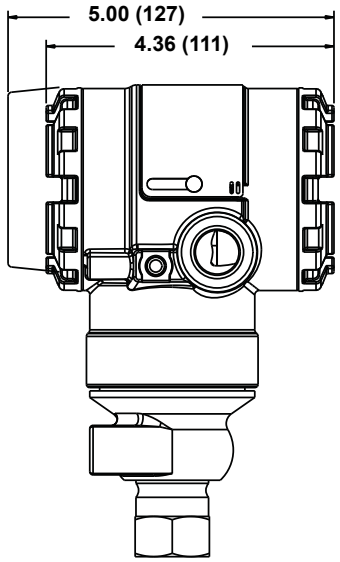
Pipe Mount (Bracket Option B3/B9/BC)

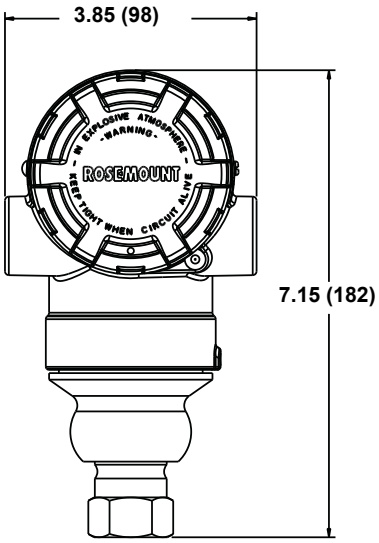


Pipe Mount (Bracket Option B1 / B7 / BA)

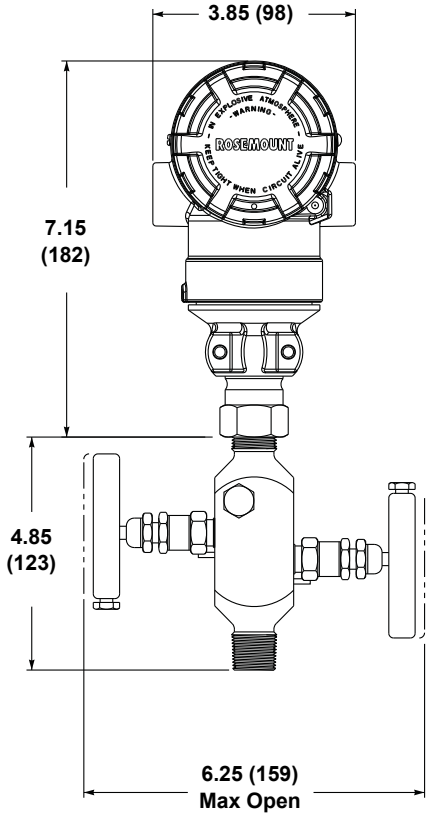


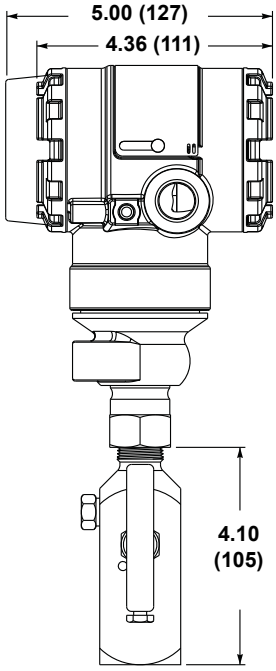
2051T Dimensional Drawings





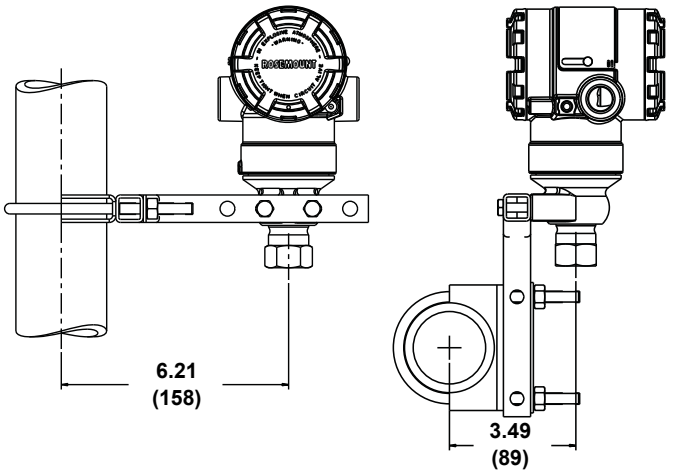
2051T with Rosemount 306 Integral Manifold



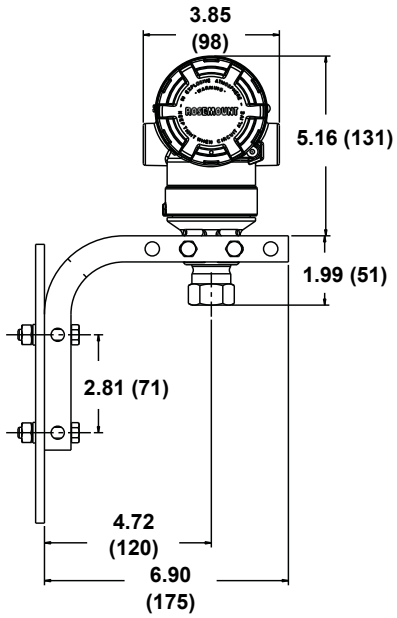


2051T Typical Mounting Configurations with Optional Mounting Bracket

Pipe Mounting

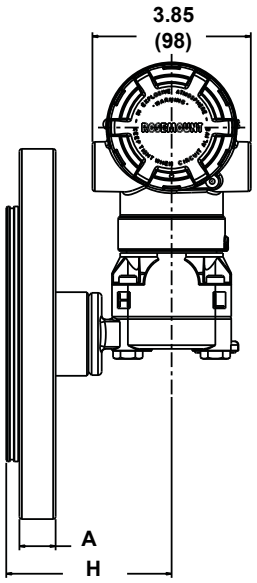


Panel Mounting

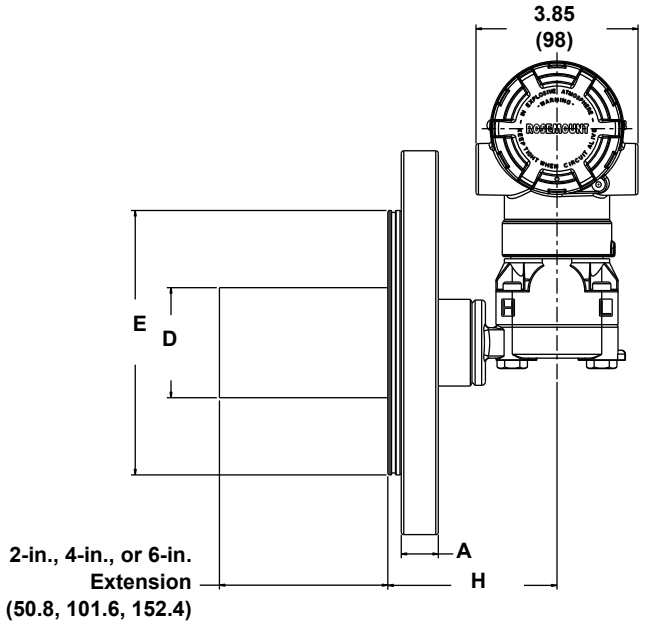


2051L Liquid Level

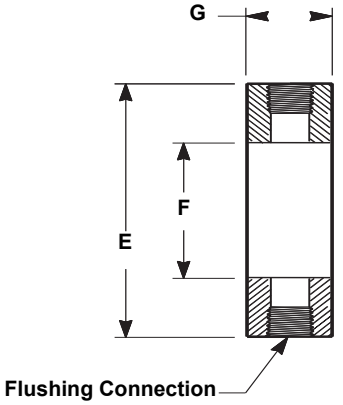
2-in. Flange Configuration (Flush Mount Only)



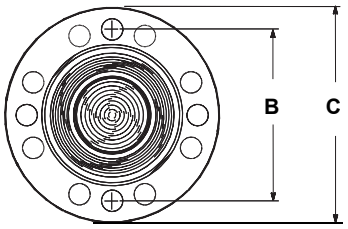
3- and 4-in. Flange Configuration



Optional Flushing Connection Ring (Lower Housing)



Diaphragm Assembly and Mounting Flange



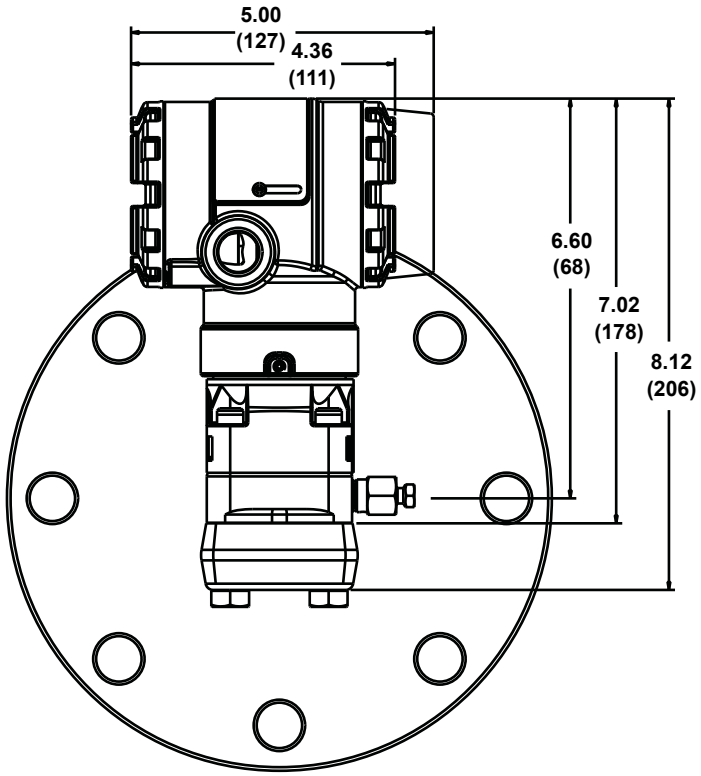


Table 16. 2051L Dimensional Specifications

Except where indicated, dimensions are in inches (millimeters).

Class	Pipe Size	Flange Thickness A	Bolt Circle Diameter B	Outside Diameter C	No. of Bolts	Bolt Hole Diameter	Extension Diameter(1) D	O.D. Gasket Surface E
ASME B16.5 (ANSI) 150	2 (51)	0.69 (18)	4.75 (121)	6.0 (152)	4	0.75 (19)	NA	3.6 (92)
	3 (76)	0.88 (22)	6.0 (152)	7.5 (191)	4	0.75 (19)	2.58 (66)	5.0 (127)
	4 (102)	0.88 (22)	7.5 (191)	9.0 (229)	8	0.75 (19)	3.5 (89)	6.2 (158)
ASME B16.5 (ANSI) 300	2 (51)	0.82 (21)	5.0 (127)	6.5 (165)	8	0.75 (19)	NA	3.6 (92)
	3 (76)	1.06 (27)	6.62 (168)	8.25 (210)	8	0.88 (22)	2.58 (66)	5.0 (127)
	4 (102)	1.19 (30)	7.88 (200)	10.0 (254)	8	0.88 (22)	3.5 (89)	6.2 (158)
DIN 2501 PN 10–40	DN 50	20 mm	125 mm	165 mm	4	18 mm	NA	4.0 (102)
DIN 2501 PN 25/40	DN 80	24 mm	160 mm	200 mm	8	18 mm	66 mm	5.4 (138)
	DN 100	24 mm	190 mm	235 mm	8	22 mm	89 mm	6.2 (158)

Class(1)	Pipe Size	Process Side F	Lower Housing G		H
			1/4 NPT	1/2 NPT	
ASME B16.5 (ANSI) 150	2 (51)	2.12 (54)	0.97 (25)	1.31 (33)	5.65 (143)
	3 (76)	3.6 (91)	0.97 (25)	1.31 (33)	5.65 (143)
	4 (102)	3.6 (91)	0.97 (25)	1.31 (33)	5.65 (143)
ASME B16.5 (ANSI) 300	2 (51)	2.12 (54)	0.97 (25)	1.31 (33)	5.65 (143)
	3 (76)	3.6 (91)	0.97 (25)	1.31 (33)	5.65 (143)
	4 (102)	3.6 (91)	0.97 (25)	1.31 (33)	5.65 (143)
DIN 2501 PN 10–40	DN 50	2.4 (61)	0.97 (25)	1.31 (33)	5.65 (143)
DIN 2501 PN 25/40	DN 80	3.6 (91)	0.97 (25)	1.31 (33)	5.65 (143)
	DN 100	3.6 (91)	0.97 (25)	1.31 (33)	5.65 (143)

(1) Tolerances are -0.020 and +0.040 (-0,51 and +1,02)

Ordering Information

Table 17. Rosemount 2051C Pressure 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			
2051C	Pressure Transmitter			
Measurement Type				
Standard				**Standard**
D	Differential			★
G	Gage			★
Pressure Upper Range Limit				
Standard				**Standard**
	2051CD	**2051CG**		
1	25 inH_2O (62,2 mbar)	25 inH_2O (62,2 mbar)		★
2	250 inH_2O (623 mbar)	250 inH_2O (623 mbar)		★
3	1000 inH_2O (2,5 bar)	1000 inH_2O (2,5 bar)		★
4	300 psi (20,7 bar)	300 psi (20,7 bar)		★
5	2000 psi (137,9 bar)	2000 psi (137,9 bar)		★
Transmitter Output				
Standard				**Standard**
A	4–20 mA with Digital Signal Based on HART Protocol			★
F	FOUNDATION fieldbus Protocol			★
Expanded				
M	Low-Power, 1–5 V dc with Digital Signal Based on *HART* Protocol			
Materials of Construction				
	Process Flange Type	**Flange Material**	**Drain/Vent**	
Standard				**Standard**
2	Coplanar	SST	SST	★
3(1)	Coplanar	Cast C-276	Alloy C-276	★
5	Coplanar	Plated CS	SST	★
7(1)	Coplanar	SST	Alloy C-276	★
8(1)	Coplanar	Plated CS	Alloy C-276	★
0	Alternate Process Connection			★
Isolating Diaphragm				
Standard				**Standard**
2(1)	316L SST			★
3(1)	Alloy C-276			★
Expanded				
5(2)	Tantalum			
O-ring				
Standard				**Standard**
A	Glass-filled PTFE			★
B	Graphite-filled PTFE			★
Sensor Fill Fluid				
Standard				**Standard**
1	Silicone			★
2	Inert fill (Halocarbon)			★

Table 17. Rosemount 2051C Pressure 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**	
Standard			**Standard**
A	Polyurethane-covered Aluminum	½–14 NPT	★
B	Polyurethane-covered Aluminum	M20 × 1.5 (CM20)	★
J	SST	½–14 NPT	★
K(3)	SST	M20 × 1.5 (CM20)	★
Expanded			
D	Polyurethane-covered Aluminum	G½	
M(3)	SST	G½	

Options (Include with selected model number)

PlantWeb Control Functionality		
Standard		**Standard**
A01	FOUNDATION fieldbus Advanced Control Function Block Suite	★
Alternate Flange(4)		
Standard		**Standard**
H2	Traditional Flange, 316 SST, SST Drain/Vent	★
H3(1)	Traditional Flange, Cast C-276, Alloy C-276 Drain/Vent	★
H7(1)	Traditional Flange, 316 SST, Alloy C-276 Drain/Vent	★
HJ	DIN Compliant Traditional Flange, SST, 7/16 in. Adapter/Manifold Bolting	★
FA	Level Flange, SST, 2 in., ANSI Class 150, Vertical Mount	★
FB	Level Flange, SST, 2 in., ANSI Class 300, Vertical Mount	★
FC	Level Flange, SST, 3 in., ANSI Class 150, Vertical Mount	★
FD	Level Flange, SST, 3 in., ANSI Class 300, Vertical Mount	★
FP	DIN Level Flange, SST, DN 50, PN 40, Vertical Mount	★
FQ	DIN Level Flange, SST, DN 80, PN 40, Vertical Mount	★
Expanded		
HK(5)	DIN Compliant Traditional Flange, SST, 10 mm Adapter/Manifold Bolting	
HL	DIN Compliant Traditional Flange, SST, 12mm Adapter/Manifold Bolting	
Manifold Assembly(4)(6)		
Standard		**Standard**
S5	Assemble to Rosemount 305 Integral Manifold	★
S6	Assemble to Rosemount 304 Manifold or Connection System	★
Integral Mount Primary Element(4)(6)		
Standard		**Standard**
S4(7)	Assemble to Rosemount Primary Element	★
S3	Assemble to Rosemount 405 Primary Element	★

Table 17. Rosemount 2051C Pressure 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 Assemblies[6]		
Standard		**Standard**
S1[8]	Assemble to one Rosemount diaphragm seal	★
S2[9]	Assemble to two Rosemount diaphragm seals	★
Mounting Brackets		
Standard		**Standard**
B1[10]	Traditional Flange Bracket for 2-in. Pipe Mounting, CS Bolts	★
B2[10]	Traditional Flange Bracket for Panel Mounting, CS Bolts	★
B3[10]	Traditional Flange Flat Bracket for 2-in. Pipe Mounting, CS Bolts	★
B4[11]	Coplanar Flange Bracket for 2-in. Pipe or Panel Mounting, all SST	★
B7[10]	B1 Bracket with Series 300 SST Bolts	★
B8[10]	B2 Bracket with Series 300 SST Bolts	★
B9[10]	B3 Bracket with Series 300 SST Bolts	★
BA[10]	SST B1 Bracket with Series 300 SST Bolts	★
BC[10]	SST B3 Bracket with Series 300 SST Bolts	★
Product Certifications		
Standard		**Standard**
E1[3]	ATEX Flameproof	★
E2[3]	INMETRO Flameproof	★
E3[3]	China Flameproof	★
E5	FM Explosion-proof, Dust Ignition-proof	★
E6	CSA Explosion-proof, Dust Ignition-proof, Division 2	★
E7[3]	IECEx Flameproof	★
I1[3]	ATEX Intrinsic Safety	★
I2[3]	INMETRO Intrinsically Safe	★
I3[3]	China Intrinsic Safety	★
I5	FM Intrinsically Safe, Division 2	★
I6	CSA Intrinsically Safe	★
I7[3]	IECEx Intrinsic Safety	★
IA[12]	ATEX FISCO Intrinsic Safety	★
IE[12]	FM FISCO Intrinsically Safe	★
IF[12]	CSA FISCO Intrinsically Safe	★
IG[12]	IECEx FISCO Intrinsically Safe	★
K1[3]	ATEX Flameproof, Intrinsic Safety, Type n, Dust	★
K5	FM Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
K6	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
K7[3]	IECEx Flameproof, Intrinsic Safety, Type n	★
KA[3]	ATEX and CSA Flameproof, Intrinsically Safe, Division 2	★
KB	FM and CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
KC[3]	FM and ATEX Explosion-proof, Intrinsically Safe, Division 2	★
KD[3]	FM, CSA, and ATEX Explosion-proof, Intrinsically Safe	★
N1[3]	ATEX Type n	★
N7[3]	IECEx Type n	★
ND[3]	ATEX Dust	★
Drinking Water Approval		
Standard		**Standard**
DW[13]	NSF Drinking Water Approval	★

Table 17. Rosemount 2051C Pressure Transmitter Ordering Information

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

Bolting Materials		
Standard		**Standard**
L4	Austenitic 316 SST Bolts	★
L5	ASTM A 193, Grade B7M Bolts	★
L8	ASTM A 193 Class 2, Grade B8M Bolts	★
Display and Interface Options		
Standard		**Standard**
M5	LCD display	★
Special Configuration (Hardware)		
Standard		**Standard**
D4(14)	Zero and Span Hardware Adjustments	★
Flange Adapters		
Standard		**Standard**
DF(15)	1/2-14 NPT Flange Adapters	★
Conduit Plug		
Standard		**Standard**
DO(16)	316 SST Conduit Plug	★
RC1/4 RC1/2 Process Connection		
Expanded		
D9(17)	RC 1/4 Flange with RC 1/2 Flange Adapter - SST	
Ground Screw		
Standard		**Standard**
V5(18)	External Ground Screw Assembly	★
Performance		
Standard		**Standard**
P8(19)	0.065% accuracy and 5 year stability	★
Terminal Blocks		
Standard		**Standard**
T1	Transient Protection Terminal Block	★
Special Configuration (Software)		
Standard		**Standard**
C1(20)	Custom Software Configuration (Requires completed Configuration Data Sheet)	★
Alarm Limit		
Standard		**Standard**
C4(20)(21)	Analog Output Levels Compliant with NAMUR Recommendation NE 43, Alarm High	★
CN(20)(21)	Analog Output Levels Compliant with NAMUR Recommendation NE 43 Alarm Low	★
Pressure Testing		
Expanded		
P1	Hydrostatic testing with certificate	
Cleaning Process Area		
Expanded		
P2(22)	Cleaning for Special Service	
P3(22)	Cleaning for < 1 PPM Chlorine/Flourine	
Maximum Static Line Pressure		
Standard		**Standard**
P9	4500 psig (310 bar) static pressure limit	★

Table 17. Rosemount 2051C Pressure 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.

Calibration Certification		
Standard		**Standard**
Q4	Calibration Certificate	★
Material Traceability Certification		
Standard		**Standard**
Q8	Material Traceability Certification per EN 10204 3.1.B	★
Quality Certification for Safety		
Standard		**Standard**
QS(20)	Prior-use certificate of FMEDA data	★
Surface Finish		
Standard		**Standard**
Q16 (23)	Surface finish certification for sanitary remote seals	★
Toolkit Total System Performance Reports		
Standard		**Standard**
QZ(23)	Remote Seal System Performance Calculation Report	★
Typical Model Number: 2051C D 2 A 2 2 A 1 A B4 M5		

(1) Materials of Construction comply with recommendations per 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.

(2) Available in Ranges 2-5 only.

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

(4) Requires 0 code in Materials of Construction for Alternate Process Connection.

(5) Not valid with optional code P9 for 4500psi Static Pressure.

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

(7) Process Flange limited to Coplanar (codes 2, 3, 5, 7, 8) or Traditional (H2, H3, H7).

(8) Not valid with optional code D9 for RC1/2 Adaptors.

(9) Not valid with optional codes DF and D9 for Adaptors.

(10) Requires option in the Alternate Process Connection: Flange section.

(11) Requires Coplanar flange.

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

(13) Not available with Alloy C-276 isolator (3 code), tantalum isolator (5 code), all cast C-276 flanges, all plated CS flanges, all DIN flanges, all Level flanges, assemble-to manifolds (S5 and S6 codes), assemble-to seals (S1 and S2 codes), assemble-to primary elements (S3 and S4 codes), surface finish certification (Q16 code), and remote seal system report (QZ code).

(14) Not available with FOUNDATION fieldbus output code F.

(15) Not valid with Alternate Process Connection options S3, S4, S5, S6.

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

(17) Not available with Alternate Process Connection: DIN Flanges and Level Flanges.

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

(19) Available with 4-20 mA HART output code A, FOUNDATION fieldbus output code F, Ranges 2-5, SST diaphragms and silicone fill fluid. If used with the S1 or S2 code, only the improved accuracy of 0.065% applies.

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

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

(22) Not required with Alternate Process Connections S5 and S6. Include P2 option in manifold model.

(23) Requires one of the Diaphragm Seal Assemblies codes (S1 or S2).

Table 18. 2051T In-Line Pressure 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		
2051T	In-Line Pressure Transmitter		
Pressure Type			
Standard			**Standard**
G	Gage		★
A	Absolute		★
Pressure Upper Range Limit			
Standard			**Standard**
	2051TG	**2051TA**	
1	30 psi (2,1 bar)	30 psi (2,1 bar)	★
2	150 psi (10,3 bar)	150 psi (10,3 bar)	★
3	800 psi (55,2 bar)	800 psi (55,2 bar)	★
4	4000 psi (275,8 bar)	4000 psi (275,8 bar)	★
5	10000 psi (689,5 bar)	10000 psi (689,5 bar)	★
Transmitter Output			
Standard			**Standard**
A	4–20 mA with Digital Signal Based on HART Protocol		★
F	FOUNDATION fieldbus Protocol		★
Expanded			
M	Low-Power, 1–5 V dc with Digital Signal Based on HART Protocol		
Process Connection Style			
Standard			**Standard**
2B	1/2–14 NPT female		★
2C	G1/2 A DIN 16288 male		★
2D	M20 x 1.5 Male (CM20 Male)		★
Expanded			
2F	Coned and Threaded, Compatible with Autoclave Type F-250-C		
Isolating Diaphragm		**Process Connection Wetted Parts Material**	
Standard			**Standard**
2(1)	316L SST	316L SST	★
3(1)	Alloy C-276	Alloy C-276	★
Sensor Fill Fluid			
Standard			**Standard**
1	Silicone		★
2	Inert fill (Fluorinert FC-43)		★
Housing Material		**Conduit Entry Size**	
Standard			**Standard**
A	Polyurethane-covered Aluminum	½–14 NPT	★
B	Polyurethane-covered Aluminum	M20 × 1.5 (CM20)	★
J	SST	½–14 NPT	★
K	SST	M20 × 1.5 (CM20)	★

Table 18. 2051T In-Line Pressure 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**	
Expanded			
D	Polyurethane-covered Aluminum	G½	
M	SST	G½	

Options (Include with selected model number)

PlantWeb Control Functionality		
Standard		**Standard**
A01	Advanced Control Function Block Suite	★
Manifold Assemblies		
Standard		**Standard**
S5[2]	Assemble to Rosemount 306 Integral Manifold	★
Seal Assemblies		
Standard		**Standard**
S1[2]	Assemble to one Rosemount seal	★
Mounting Bracket		
Standard		**Standard**
B4	Bracket for 2-in. Pipe or Panel Mounting, All SST	★
Product Certifications		
Standard		**Standard**
E1[3]	ATEX Flameproof	★
E2[3]	INMETRO Flameproof	★
E3[3]	China Flameproof	★
E5	FM Explosion-proof, Dust Ignition-proof	★
E6	CSA Explosion-proof, Dust Ignition-proof, Division 2	★
E7[3]	IECEx Flameproof	★
I1[3]	ATEX Intrinsic Safety	★
I2[3]	INMETRO Intrinsically Safe	★
I3[3]	China Intrinsic Safety	★
I5	FM Intrinsically Safe, Division 2	★
I6	CSA Intrinsically Safe	★
I7[3]	IECEx Intrinsic Safety	★
IA[4]	ATEX FISCO Intrinsic Safety	★
IE[4]	FM FISCO Intrinsically Safe	★
IF[4]	CSA FISCO Intrinsically Safe	★
IG[4]	IECEx FISCO Intrinsically Safe	★
K1[3]	ATEX Flameproof, Intrinsic Safety, Type n, Dust	★
K5	FM Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
K6	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
K7[3]	IECEx Flameproof, Intrinsic Safety, Type n	★
KA[3]	ATEX and CSA Flameproof, Intrinsically Safe, Division 2	★
KB	FM and CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
KC[3]	FM and ATEX Explosion-proof, Intrinsically Safe, Division 2	★
KD[3]	FM, CSA, and ATEX Explosion-proof, Intrinsically Safe	★
N1[3]	ATEX Type n	★
N7[3]	IECEx Type n	★
ND[3]	ATEX Dust	★

Table 18. 2051T In-Line Pressure 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.

Drinking Water Approval		
Standard		**Standard**
DW[5]	NSF Drinking Water Approval	★
Digital Display		
Standard		**Standard**
M5	LCD display	★
Special Configuration (Hardware)		
Standard		**Standard**
D4[6]	Zero and Span Hardware Adjustments	★
Conduit Plug		
Standard		**Standard**
DO[7]	316 SST Conduit Plug	★
Ground Screw		
Standard		**Standard**
V5[8]	External Ground Screw Assembly	★
Performance		
Standard		**Standard**
P8[9]	0.065% accuracy and 5 year stability	★
Terminal Blocks		
Standard		**Standard**
T1	Transient Protection Terminal Block	★
Special Configuration (Software)		
Standard		**Standard**
C1[10]	Custom Software Configuration (Requires completed Configuration Data Sheet)	★
Alarm Limits		
Standard		**Standard**
C4[10][11]	Analog Output Levels Compliant with NAMUR Recommendation NE 43, Alarm High	★
CN[10][11]	Analog Output Levels Compliant with NAMUR Recommendation NE 43 Alarm Low	★
Pressure Testing		
Expanded		
P1	Hydrostatic Testing with Certificate	
Cleaning Process Area		
Expanded		
P2[12]	Cleaning for Special Service	
P3[12]	Cleaning for <1 PPM Chlorine/Fluorine	
Calibration Certification		
Standard		**Standard**
Q4	Calibration Certificate	★
Material Traceability Certification		
Standard		**Standard**
Q8	Material Traceability Certification per EN 10204 3.1.B	★
Quality Certifcation for Safety		
Standard		**Standard**
QS[10]	Prior-use certificate of FMEDA data	★

Table 18. 2051T In-Line Pressure 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.

Surface Finish		
Standard		**Standard**
Q16[13]	Surface finish certification for sanitary remote seals	★
Toolkit Total System Performance Reports		
Standard		**Standard**
QZ[13]	Remote Seal System Performance Calculation Report	★
Typical Model Number:	**2051T G 3 A 2B 2 1 A B4 M5**	

(1) Materials of Construction comply with recommendations per 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.

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

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

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

(5) Not available with coned and threaded connection (2F code), assemble-to manifold (S5 code), assemble-to seal (S1 code), surface finish certification (Q16 code), remote seal system report (QZ code).

(6) Not available with FOUNDATION fieldbus output code F.

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

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

(9) Available with 4-20 mA HART output code A, FOUNDATION fieldbus output code F, Ranges 2-5, SST diaphragms and silicone fill fluid. If used with the S1 or S2 code, only the improved accuracy of 0.065% applies.

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

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

(12) Not valid with Alternate Process Connection S5.

(13) Requires S1 Diaphragm Seal Assembly code.

Table 19. 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				
Standard				**Standard**
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				
Standard				**Standard**
A	4–20 mA with Digital Signal Based on HART Protocol			★
F	FOUNDATION fieldbus Protocol			★
Expanded				
M	Low-Power, 1–5 Vdc with Digital Signal Based on HART Protocol			
Process Connection Size, Diaphragm Material (High Side)				
	Process Connection Size	**Diaphragm**		
Standard				**Standard**
G(1)	2 in./DN 50	316L SST		★
H(1)	2 in./DN 50	Alloy C-276		★
J	2 in./DN 50	Tantalum		★
A(1)	3 in./DN 80	316L SST		★
B(1)	4 in./DN 100	316L SST		★
C(1)	3 in./DN 80	Alloy C-276		★
D(1)	4 in./DN 100	Alloy C-276		★
E	3 in./DN 80	Tantalum		★
F	4 in./DN 100	Tantalum		★
Extension Length (High Side)				
Standard				**Standard**
0	None, Flush Mount			★
2	2 in./50 mm			★
4	4 in./100 mm			★
6	6 in./150 mm			★
Mounting Flange Size, Rating, Material (High Side)				
	Size	**Rating**	**Material**	
Standard				**Standard**
M	2-in.	ANSI/ASME B16.5 Class 150	CS	★
A	3-in.	ANSI/ASME B16.5 Class 150	CS	★
B	4-in.	ANSI/ASME B16.5 Class 150	CS	★
N	2-in.	ANSI/ASME B16.5 Class 300	CS	★
C	3-in.	ANSI/ASME B16.5 Class 300	CS	★
D	4-in.	ANSI/ASME B16.5 Class 300	CS	★
X(1)	2-in.	ANSI/ASME B16.5 Class 150	SST	★
F(1)	3-in.	ANSI/ASME B16.5 Class 150	SST	★
G(1)	4-in.	ANSI/ASME B16.5 Class 150	SST	★
Y(1)	2-in.	ANSI/ASME B16.5 Class 300	SST	★
H(1)	3-in.	ANSI/ASME B16.5 Class 300	SST	★
J(1)	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(1)	DN50	PN 10-40 per EN 1092-1	SST	★
T(1)	DN80	PN 40 per EN 1092-1	SST	★

Table 19. 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**	**Temperature Limits (Ambient Temperature of 70 °F (21 °C))**	
Standard				**Standard**
A	Syltherm XLT	0.85	-102 to 293 °F (-75 to 145 °C)	★
C	Silicone 704	1.07	32 to 401 °F (0 to 205 °C)	★
D	Silicone 200	0.93	-49 to 401 °F (-45 to 205 °C)	★
H	Inert (Halocarbon)	1.85	-49 to 320 °F (-45 to 160 °C)	★
G	Glycerin and Water	1.13	5 to 203 °F (-15 to 95 °C)	★
N	Neobee M-20	0.92	5 to 401 °F (-15 to 205 °C)	★
P	Propylene Glycol and Water	1.02	5 to 203 °F (-15 to 95 °C)	★

Sensor Module Configuration, Flange Adapter (Low Side)				
	Configuration	**Flange Adapter**		
Standard				**Standard**
1[(1)]	Gage	SST		★
2[(1)]	Differential	SST		★
3[(1)]	Tuned-System Assembly with Remote Seal	None		★

Sensor Module Diaphragm Material, Sensor Fill Fluid (Low Side)				
	Diaphragm Material	**Sensor Fill Fluid**		
Standard				**Standard**
1[(1)]	316L SST	Silicone		★
2[(1)]	Alloy C-276	Silicone		★
7[(1)]	Alloy C-276	Silicone		★
A[(1)]	316L SST	Inert (Halocarbon)		★
B[(1)]	Alloy C-276	Inert (Halocarbon)		★
G[(1)]	Alloy C-276	Inert (Halocarbon)		★

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

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

Options (Include with selected model number)

PlantWeb Control Functionality		
Standard		**Standard**
A01	FOUNDATION fieldbus Advanced Control Function Block Suite	★

Table 19. 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 Assemblies		
Standard		**Standard**
S1[2]	Assemble to One Rosemount 1199 Seal (Requires 1199M)	★
Product Certifications		
Standard		**Standard**
E1[3]	ATEX Flameproof	★
E2[3]	INMETRO Flameproof	★
E3[3]	China Flameproof	★
E5	FM Explosion-proof, Dust Ignition-proof	★
E6	CSA Explosion-proof, Dust Ignition-proof, Division 2	★
E7[3]	IECEx Flameproof	★
I1[3]	ATEX Intrinsic Safety	★
I2[3]	INMETRO Intrinsically Safe	★
I3[3]	China Intrinsic Safety	★
I5	FM Intrinsically Safe, Division 2	★
I6	CSA Intrinsically Safe	★
I7[3]	IECEx Intrinsic Safety	★
IA[4]	ATEX FISCO Intrinsic Safety	★
IE[4]	FM FISCO Intrinsically Safe	★
IF[4]	CSA FISCO Intrinsically Safe	★
IG[4]	IECEx FISCO Intrinsically Safe	★
K1[3]	ATEX Flameproof, Intrinsic Safety, Type n, Dust	★
K5	FM Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
K6	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
K7[3]	IECEx Flameproof, Intrinsic Safety, Type n	★
KA[3]	ATEX and CSA Flameproof, Intrinsically Safe, Division 2	★
KB	FM and CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
KC[3]	FM and ATEX Explosion-proof, Intrinsically Safe, Division 2	★
KD[3]	FM, CSA, and ATEX Explosion-proof, Intrinsically Safe	★
N1[3]	ATEX Type n	★
N7[3]	IECEx Type n	★
ND[3]	ATEX Dust	★
Digital Display		
Standard		**Standard**
M5	LCD display	★
Hardware Adjustments		
Standard		**Standard**
D4[5]	Zero and Span Hardware Adjustments	★
Flange Adapters		
Standard		**Standard**
DF[6]	1/2-14 NPT Flange Adapters	★
Conduit Plug		
Standard		**Standard**
DO[7]	316 SST Conduit Plug	★
Ground Screw		
Standard		**Standard**
V5[8]	External Ground Screw Assembly	★
Transient Protection		
Standard		**Standard**
T1[9]	Transient Terminal Block	★

Table 19. 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.

Software Configuration				
Standard				**Standard**
C1[10]	Custom Software Configuration (Requires completed Configuration Data Sheet)			★
Alarm Limit				
Standard				**Standard**
C4[10][11]	NAMUR alarm and saturation levels, high alarm			★
CN[10][12]	NAMUR alarm and saturation levels, low alarm			★
Calibration Certification				
Standard				**Standard**
Q4	Calibration Certificate			★
Material Traceability Certification				
Standard				**Standard**
Q8	Material Traceability Certification per EN 10204 3.1			★
Quality Certification for Safety				
Standard				**Standard**
QS[10]	Prior-use certificate of FMEDA data			★
Toolkit Total System Performance Reports				
Standard				**Standard**
QZ	Remote Seal System Performance Calculation Report			★
Lower Housing Flushing Connection Ring Material		**Number**	**Size (NPT)**	
Standard				**Standard**
F1	316 SST	1	1/4-18 NPT	★
F2	316 SST	2	1/4-18 NPT	★
F3[12]	Alloy C-276	1	1/4-18 NPT	★
F4[12]	Alloy C-276	2	1/4-18 NPT	★
F7	316 SST	1	1/2-14 NPT	★
F8	316 SST	2	1/2-14 NPT	★
F9	Alloy C-276	1	1/2-14 NPT	★
F0	Alloy C-276	2	1/2-14 NPT	★
Typical Model Number:	**2051L 2 A A0 X D 21 A A B4 M5 F1**			

(1) 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.

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

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

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

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

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

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

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

(9) 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.

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

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

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

OPTIONS

Standard Configuration

Unless otherwise specified, transmitter is shipped as follows:

Engineering Units 2051C:	inH_2O (Ranges 1-3), psi (Ranges 4-5)
Engineering Units 2051T:	psi (all ranges)
Engineering Units 2051L:	inH_2O
4 mA (1 V dc)(1):	0 (engineering units)
20 mA (5 V dc)(1):	Upper range limit
Output:	Linear
Flange type:	Specified model code option
Flange material:	Specified model code option
Drain/vent:	Specified model code option
Integral meter:	Installed or none
Alarm(1):	High
Software tag:	(Blank)

(1) Not applicable to fieldbus.

Tagging (3 options available)

- Standard SST hardware tag is permanently affixed on transmitter. Tag character height is 0.125 in. (3,18 mm), 140 characters maximum.
- Tag may be wired to the transmitter nameplate upon request, 85 characters maximum.
- Tag may be stored in transmitter memory (8 characters maximum). Software tag is left blank unless specified.

Commissioning tag (fieldbus only)

A temporary commissioning tag is attached to all transmitters. The tag indicates the device ID and allows an area for writing the location.

Optional Rosemount 304, 305 or 306 Integral Manifolds

Factory assembled to 2051C and 2051T transmitters. Refer to Product Data Sheet (document number 00813-0100-4839 for Rosemount 304 and 00813-0100-4733 for Rosemount 305 and 306) for additional information.

Other Seals

Refer to Product Data Sheet (document number 00813-0100-4016 or 00813-0201-4016) for additional information.

Output Information

Output range points must be the same unit of measure. Available units of measure include:

inH_2O	inH_2O@4 °C(1)	psi	Pa
inHg	ftH_2O	bar	kPa
mmH_2O	mmH_2O@4 °C(1)	mbar	torr
mmHg	g/cm2	kg/cm2	atm

(1) Not available on low power.

Hardware Adjustments

D4 Local zero and span adjustments

- Alarm and security adjustments ship standard

LCD display

M5 Digital Meter

- 2-Line, 5-Digit LCD for 4-20 mA HART and FOUNDATION fieldbus
- 1-Line, 4-Digit LCD for 1-5 Vdc HART Low Power
- Direct reading of digital data for higher accuracy
- Displays user-defined flow, level, volume, or pressure units
- Displays diagnostic messages for local troubleshooting
- 90-degree rotation capability for easy viewing

Transient Protection

T1 Integral Transient Protection Terminal Block

Meets IEEE C62.41, Category Location B

6 kV crest (0.5 μs - 100 kHz)
3 kV crest (8 × 20 microseconds)
6 kV crest (1.2 × 50 microseconds)

Bolts for Flanges and Adapters

- Standard material is plated carbon steel per ASTM A449, Type 1

L4 Austenitic 316 Stainless Steel Bolts
L5 ASTM A 193, Grade B7M Bolts
L8 ASTM A 193 Class 2, Grade B8M Bolts

Conduit Plug

- Single carbon steel plug ships standard, not installed in the transmitter

DO 316 SST Conduit Plug

- Single 316 SST conduit plug replaces carbon steel plug

Rosemount 2051C Coplanar Flange and 2051T Bracket Option

B4 Bracket for 2-in. Pipe or Panel Mounting

- For use with the standard Coplanar flange configuration
- Bracket for mounting of transmitter on 2-in. pipe or panel
- Stainless steel construction with stainless steel bolts

Rosemount 2051C Traditional Flange Bracket Options

B1 Bracket for 2-in. Pipe Mounting

- For use with the traditional flange option
- Bracket for mounting on 2-in. pipe
- Carbon steel construction with carbon steel bolts
- Coated with polyurethane paint

B2 Bracket for Panel Mounting

- For use with the traditional flange option
- Bracket for mounting transmitter on wall or panel
- Carbon steel construction with carbon steel bolts
- Coated with polyurethane paint

B3 Flat Bracket for 2-in. Pipe Mounting

- For use with the traditional flange option
- Bracket for vertical mounting of transmitter on 2-in. pipe
- Carbon steel construction with carbon steel bolts
- Coated with polyurethane paint

B7 B1 Bracket with SST Bolts

- Same bracket as the B1 option with Series 300 stainless steel bolts

B8 B2 Bracket with SST Bolts

- Same bracket as the B2 option with Series 300 stainless steel bolts

B9 B3 Bracket with SST Bolts

- Same bracket as the B3 option with Series 300 stainless steel bolts

BA Stainless Steel B1 Bracket with SST Bolts

- B1 bracket in stainless steel with Series 300 stainless steel bolts

BC Stainless Steel B3 Bracket with SST Bolts

- B3 bracket in stainless steel with Series 300 stainless steel bolts

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EMERSON™
Process Management

Product Data Sheet
00813-0100-4690, Rev KB
April 2010

Rosemount 2088 Absolute and Gage Pressure Transmitter

- *Performance of 0.075% with High Accuracy option*
- *Lightweight, compact design for cost effective installation*
- *Protocols available include 4-20 mA HART® and 1-5 Vdc HART Low Power*
- *Absolute and gage pressure ranges up to 4000 psi (276 bar)*
- *Rangeability of 20:1*

HART COMMUNICATION PROTOCOL CE

Contents

Rosemount 2088 Absolute and Gage Pressure Transmitter

Performance of 0.075% with high accuracy option

The Rosemount 2088 utilizes our reliable solid-state, polysilicon pressure sensor with a choice of either 316L or Alloy C-276 isolating diaphragms. This design has many benefits, including a reference accuracy of 0.075% and a stability of 0.10% for 12 months.

Lightweight, Compact Design

Its lightweight, compact design allows the 2088 to be directly connected to a process – providing a quick, easy and cost effective installation. A variety of process connections are available, including multiple threaded connections, our full line of manifolds and remote diaphragm seals that provide solutions for virtually any application.

4-20 mA HART and 1-5Vdc HART Low Power Protocols Available

The 2088 utilizes the advantages of HART communication, enabling quick and easy reranging, calibration and troubleshooting. It also features a fully configurable LCD that displays pressure and diagnostic information. The information displayed is directly from the microprocessor which accounts for its accuracy and reliability.

Absolute or gage pressure ranges up to 4000 psi (276 bar) and 20:1 rangedown

The 2088 is available in either gauge or absolute pressure in ranges to 4,000 psi (276 bar). Higher turndown means lower inventories by allowing you to measure pressures from 1.5 psi (103 mbar) to 4000 psi (276 bar) with only four transmitter ranges.

Rosemount Pressure Solutions

Rosemount 3051S Series of Instrumentation
Highest performing scalable pressure, flow and level measurement solutions drive better plant efficiency and more productivity. Innovative features include wireless, advanced diagnostics, and multivariable technologies.

Rosemount 305, 306 and 304 Manifolds
Factory-assembled, calibrated and seal-tested transmitter-to-manifold assemblies reduce installation costs.

Rosemount 1199 Diaphragm Seals
Provides reliable, remote measurements of process pressure and protects the transmitter from hot, corrosive, or viscous fluids.

Orifice Plate Primary Element Systems: Rosemount 1495 and 1595 Orifice Plates, 1496 Flange Unions and 1497 Meter Sections
A comprehensive offering of orifice plates, flange unions and meter sections that are easy to specify and order. The 1595 Conditioning Orifice provides superior performance in tight fit applications.

Rosemount 3051SFA Annubar® Flowmeters and Rosemount 485 Annubar Flowmeter Series
The state-of-the-art, fifth generation Rosemount 485 Annubar combined with the Rosemount MultiVariable transmitter technology creates an accurate, repeatable and dependable insertion-type flowmeter.

Rosemount 3051SFC Compact Orifice Flowmeters and Rosemount 405 Compact Orifice Flowmeter Series
Compact Orifice Flowmeters can be installed between existing flanges, up to a Class 600 (PN100) rating. A conditioning orifice plate version offers installation in tight fit applications requiring only two diameters of straight run upstream after a flow disturbance.

Rosemount 3051SFP Integral Orifice Flowmeters and Rosemount 1195 Integral Orifice Flowmeter Series
These integral orifice flowmeters eliminate the inaccuracies that become more pronounced in small orifice line installations. The completely assembled, ready to install flowmeters reduce cost and simplify installation.

Specifications

Performance Specifications

(Zero-based spans, reference conditions, silicone oil fill, and 316L SST isolating diaphragm.)

Reference Accuracy

- ±0.10% of calibrated span. Includes combined effects of linearity, hysteresis, and repeatability
- ±0.075% of calibrated span (high accuracy option)

Ambient Temperature Effect

Expressed as a total effect per 50 ℉ (28 ℃)
Total effect includes zero and span effects.
± (0.15% URL + 0.15% of span) from –40 °F to 185 °F
(-40 ℃ to 85 ℃)

Stability

±0.10% of URL for 12 months

Vibration Effect

Less than ±0.1% of URL when subjected to vibration of: peak to peak constant displacement of 4 mm (5–15 Hz) and constant acceleration of 2 g (15–150 Hz) and 1 g (150–2000 Hz).

Power Supply Effect

Less than 0.01% of calibrated span per volt

Mounting Position Effect

Zero shift of up to 1.2 inH_2O (0.30 kPa), which can be calibrated out. No span effect.

RFI Effect

Less than ±0.25% of upper range limit from 20–1000 MHz at 30 V/m with leads in conduit. Less than ±0.25% of upper range limit from 20-1000 MHz at 10 V/m with unshielded twisted pair (no conduit).

Transient Protection Limits

IEEE 587 Category B

6 kV Crest (1.2 × 50 μs)
3 kA Crest (8 × 20 μs)
6 kV Crest (0.5 μs by 100 kHz)

IEEE 472

SWC 2.5 kV Crest,1 MHz waveform

General Specifications

Tested to IEC 801-3

Functional Specifications

Service

Liquid, gas, and vapor applications

Ranges

Range	Minimum Span	Upper (URL)	Lower (LRL)	Lower[(1)] (LRL) (Gage)
1	1.5 psi (0,103 bar)	30 psi (2,1 bar)	0 psia (0 bar)	–14.7 psig (–1,01 bar)
2	8 psi (0,55 bar)	150 psi (10,3 bar)	0 psia (0 bar)	–14.7 psig (–1,01 bar)
3	40 psi (2,76 bar)	800 psi (55,2 bar)	0 psia (0 bar)	–14.7 psig (–1,01 bar)
4	200 psi (13,8 bar)	4000 psi (275,8 bar)	0 psia (0 bar)	–14.7 psig (–1,01 bar)

(1) Assumes atmospheric pressure of 14.7 psig.

Output

Code S: 4–20 mA dc
Code N: 1-5 volt dc, low power
(Outputs are directly proportional to the input pressure)

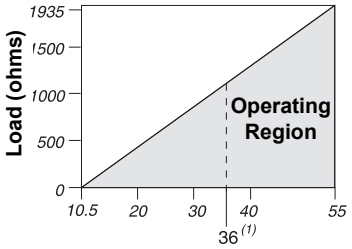
Rangedown

20 to 1

Load Limitations

Reverse polarity protection is standard. Maximum loop resistance is determined by the power supply voltage as described by the following equations:

Max. Loop Resistance = 43.5 (Power Supply Voltage – 10.5)



Power Supply Output Code S (dc Volts)

Communication requires a minimum loop resistance of 250 ohms.

(1) For hazardous location approvals, power supply must not exceed 36 V.

(2) For CENELEC Ex ia approval, the power supply must not exceed 30 V.

Power Supply

External power supply required. Transmitter operates on 10.5–36 V dc with no load (6–14V for Low Power). Reverse polarity protection is standard.

Current Draw

Output Code N: ≤ 3 mA without LCD display.

Overpressure Limits

Range 1: 120 psig max
All other ranges: two times the URL

Burst Pressure

11,000 psi for all ranges

Zero Elevation and Suppression

Zero can be suppressed between atmosphere for gage transmitters or 0 psia for absolute transmitters and upper range limit, provided the calibrated span is equal to or greater than the minimum span, and the upper range value does not exceed the upper range limit.

Time Response

Time Constant: 200 milliseconds
Dead time: < 0.1 s
Update rate: 20 times per second minimum

Temperature Limits

Ambient:
–40 to 185 °F (–40 to 85 °C)
–4 to 175 °F (–20 to 80 °C) with LCD display(1)

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

Storage:
–50 to 230 °F (–46 to 110 °C)
–40 to 185 °F (–40 to 85 °C) with LCD display

Process:
Silicone fill sensor: –40 to 250 °F (–40 to 121 °C)(1)
Inert fill sensor: –22 to 250 °F (–30 to 121 °C)(1)

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

(1) 250 °F (140 °C) limit in vacuum service; 130 °F (54 °C) for pressures below 0.5 psia.

Humidity Limits

0–100% relative humidity

Volumetric Displacement

Less than 0.00042 cm^3

Turn-on Time

2.0 seconds, no warm-up required

Transmitter Security

Activating the transmitter security function prevents changes to the transmitter configuration, including local zero and span adjustments. Security is activated by an internal switch.

Failure Mode

If self-diagnostics detect a sensor or microprocessor failure, the analog signal is driven either high or low to alert the user. High or low failure mode is user-selectable with a jumper on the transmitter. The values to which the transmitter drives its output in failure mode depend on whether it is factory-configured to *standard* or *NAMUR-compliant* operation. The values for each are as follows:

Standard Operation			
Output Code	**Linear Output**	**Fail High**	**Fail Low**
S	3.9 ≤ I ≤ 20.8	I ≥ 21.75 mA	I ≤ 3.75 mA
N	0.97 ≤ V ≤ 5.2	V ≥ 5.4 V	V ≤ 0.95V
N with Code C2	0.78 ≤ V ≤ 3.44	V ≥ 4.0 V	V ≤ 0.77 V

NAMUR-Compliant Operation	Linear Output	Fail High	Fail Low
Output Code S	3.8 ≤ I ≤ 20.5	I ≥ 22.5 mA	I ≤ 3.6 mA

Physical Specifications

Electrical Connection

1/2–14 NPT, M20 × 1.5 (CM20), PG 13.5, or
G 1/2 female (PF 1/2 female) conduit entry

Process Connection

1/2–14 NPT female, DIN 16288 G 1/2 male, RC 1/2 female (PT 1/2 female), M20 × 1.5 (CM20) male

Process Wetted Parts

Isolating Diaphragm

316L stainless steel or Alloy C-276

Process Connector

316L stainless steel CF-3M (Cast version of 316L SST, material per ASTM_A743) or Alloy C-276

Non-wetted Parts

Electronics Housing

Low-copper aluminum, NEMA 4X, IP65, IP67,CSA enclosure Type 4X

Paint

Polyurethane

Cover O-rings

Buna-N

Fill Fluid

Silicone or inert fill

Weight

Output Code S and N: Approximately 2.44 lb (1.11 kg)

Tagging

The transmitter is tagged, at no charge, in accordance with customer requirements. All tags are stainless steel. The standard tag is permanently attached to the transmitter. Tag character height is 1/8 in. (0.318 cm). A wired tag is available upon request.

Accessory Block and Bleed Valve (S5 Option)

The Rosemount 306 Integral Manifold is pre-assembled to transmitter and leak checked.

Product Certifications

Approved Manufacturing Locations

Rosemount Inc. — Chanhassen, Minnesota, USA

Emerson Process Management GmbH & Co. — Wessling, Germany

Emerson Process Management Asia Pacific Private Limited — Singapore

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

European Union Directive Information

The EC declaration of conformity for all applicable European directives for this product can be found at www.rosemount.com. A hard copy may be obtained by contacting our local sales office.

ATEX Directive (94/9/EC)

Emerson Process Management complies with the ATEX Directive.

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

2088/2090 Pressure Transmitters
— Sound Engineering Practice

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

All 2088/2090 Pressure Transmitter:
EN 61326-1:1997 with Amendments A1, A2, and A3

Hazardous Locations Certifications

North American Certifications

Ordinary Location Certification for Factory Mutual

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

Factory Mutual (FM) Approvals

E5 Explosion-Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition-Proof for Class II, Division 1, Groups E, F, G, Class III, Division 1, indoor and outdoor (Type 4X) hazardous locations; factory sealed. Temperature Class T5 Ta = 85 °C.

I5 Intrinsically safe for use in Class I, Division 1, Groups A, B, C, D; Class II, Division 1, Groups E, F, and G; and Class III, Division 1 when connected in accordance with Rosemount drawing 02088-1018. Non-incendive for Class I, Division 2, Groups A, B, C, and D.
For input parameters see control drawing 02088-1018.
Temperature Class T4 Ta = 85 °C; indoor and outdoor (NEMA 4X) hazardous locations.

Canadian Standards Association (CSA)

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

C6 Explosion-Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition-Proof for Class II, Division 1, Groups E, F, G, Class III, indoor and outdoor hazardous locations. CSA enclosure Type 4X; factory sealed. Suitable for Class I, Division 2, Groups A, B, C, and D.

Intrinsically Safe for Class I, Division 1, Groups A, B, C, and D. Temp. Code T3C. Intrinsically safe when connected with approved barriers in accordance with Rosemount drawing 02088-1024.
For input parameters see control drawing 02088-1024.

European Certifications

I1 ATEX Intrinsically Safe
Certificate No.: BAS00ATEX1166X ⟨Ex⟩ II 1 G
Ex ia IIC T5 (T_{amb} = –55 to 40 °C)
Ex ia IIC T4 (T_{amb} = –55 to 70°C)
CE 1180

TABLE 1. Input Parameters

Loop/Power
U_i = 30 V dc
I_i = 200 mA
P_i = 0.9 W
C_i = 0.012 µF

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

N1 ATEX Type n
Certification No.: BAS00ATEX3167X ⟨Ex⟩ II 3 G
Ex nA nL IIC T5 (T_a = -40 °C to 70 °C)
U_i = 50 V dc max
CE

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

ND ATEX Combustible Dust
Certificate No.: BAS01ATEX1427X ⟨Ex⟩ II 1 D
Ex tD A20 T105°C (T_{amb} = -20°C to 85°C)
IP66
CE 1180
Vmax = 36 V dc Max
I_i = 24 mA

Special Conditions For Safe Use (x):

1. The user must ensure that the maximum rated voltage and current (36 volts, 24 mA, D.C.) are not exceeded. All connections to other apparatus or associated apparatus shall have control over this voltage and current equivalent to a category “ib” circuit according to EN50020.
2. Cable entries must be used which maintain the ingress protection of the enclosure to at least IP66.
3. Unused cable entries must be filled with suitable blanking plugs which maintain the ingress protection of the enclosure to at least IP66.
4. Cable entries and blanking plugs must be suitable for the ambient range of the apparatus and capable of withstanding a 7J impact test.
5. The 2088/2090 sensor module must be securely screwed in place to maintain the ingress protection of the enclosure.

ED ATEX Flameproof
Certification No.: KEMA97ATEX2378 ⟨Ex⟩ II 1/2 G
Ex d IIC T6 (T_a = -40 °C to 40°C)
T4 (T_a = -40 °C to 80 °C)
CE 1180
Vmax = 36 (with Output Code S)
Vmax = 14 (with Output Code N)

Japanese Certifications

E4 TIIS Flameproof
Ex d IIC T6 (T_{amb} = 85 °C)

Certificate	Description
TC15879	2088 with SST wetted parts (with display)
TC15877	2088 with Alloy C-276 wetted parts (with display)
TC15876	2088 with Alloy C-276 wetted parts (no display)
TC15875	2088 with SST wetted parts (no display)
TC15874	2088 with Alloy C-276 wetted parts (with display)
TC15873	2088 with Alloy C-276 wetted parts (no display)
TC15872	2088 with SST wetted parts (with display)
TC15871	2088 with SST wetted parts (no display)

Australian Certifications

I7 SAA Intrinsic Safety
Certification No.: AUS Ex 1249X
Ex ia IIC T4 (T_{amb} = 70 °C)
Ex ia IIC T5 (T_{amb} = 40 °C)
IP66
When connected per Rosemount drawing 03031-1026

TABLE 2. Input Parameters

Loop/Power
U_{max} = 30 V
I_{max} = 200 mA
P_{max} = 0.9 W
C_i = 0.01 μF
L_i = 10 μH

Special Conditions For Safe Use (X):

Observe barrier/entity parameters during installation. A passive current limited power source must be used. The power source must be such that Po ≤ (Uo * Io)/4. For modules using transient protection in the terminal assembly (T1 transient protection models), the apparatus enclosure is to be electrically bonded to the protective earth. The conductor used for the connection shall be equivalent to a copper conductor of $4mm^2$ minimum cross-sectional area.

N7 SAA Type n (Non-Sparking)
Certificate No.: AUS Ex 1249X
Ex n IIC T4 (T_{amb} = 70 °C)
Ex n IIC T5 (T_{amb} = 40 °C)
IP66

Special Conditions For Safe Use (X):

Where the equipment is installed such that there is an unused conduit entry, it must be sealed with a suitable blanking plug to maintain the IP66 degree of protection. Any blanking plug used with the equipment shall be of a type which requires the use of a tool to effect its removal. Voltage source shall not exceed 60V ac or 75V dc.

E7 IECEx Flameproof (Explosion-Proof)
IECEx Certificate number: IECEx KEM 06.0021X
Ex d IIC T6(T_{amb} = -20°C to 40°C)
Ex d IIC T4(T_{amb} = -20°C to 80°C)
Vmax = 55Vdc
Ii = 23mA

NK IECEx Dust Ignition Proof
IECEx Certificate number: IECEx KEM 06.0021X
Ex tD A22 IP66 T90°C(T_{amb} = -20°C to 80°C)
Vmax = 55Vdc
Ii = 23mA

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. Cable entries must be used which maintain the ingress protection of the enclosure to at least IP 66.
3. Unused cable entries must be used which maintain the ingress protection of the enclosure to at least IP 66.
4. Cable entries and blanking plugs must be suitable for the ambient range of the apparatus and capable of withstanding a 7J impact.
5. The 2088/2090 sensor module must be securely screwed in place to maintain the ingress protection of the enclosure

Brazil Certifications

I2 INMETRO Intrinsic Safety
Certification No.: CEPEL-Ex-063/97-1X
BR-Ex ia IIC T5/T4

E2 INMETRO Flameproof
Certification No.: CEPEL-Ex-076/97-1
BR-Ex d IIC T6/T5

Combinations of Certifications

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

KB Combination of K5 and C6

KH Combination of K5, I1, and ED

K5 Combination of E5 and I5

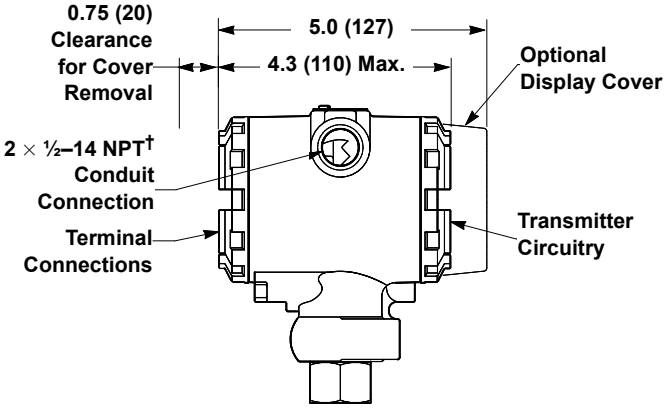
K6 Combination of C6, I1, and ED

K7 Combination of I7, N7, E7, and NK

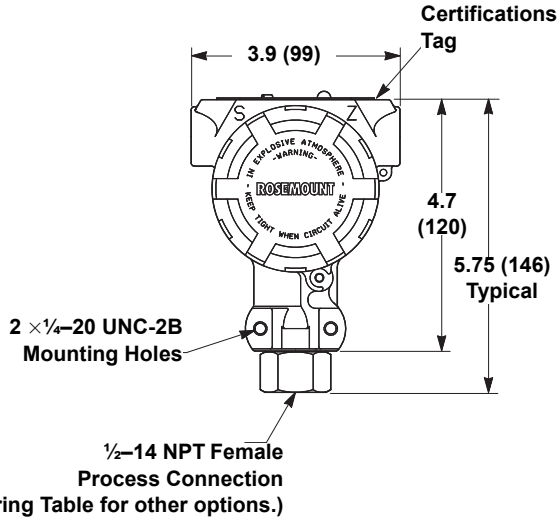
K1 Combination of I1, N1, ED, and ND

Dimensional Drawings

Rosemount 2088

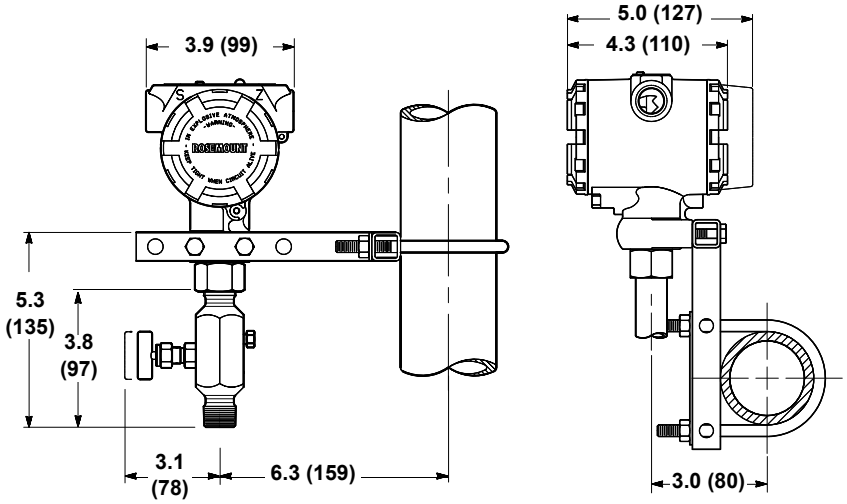


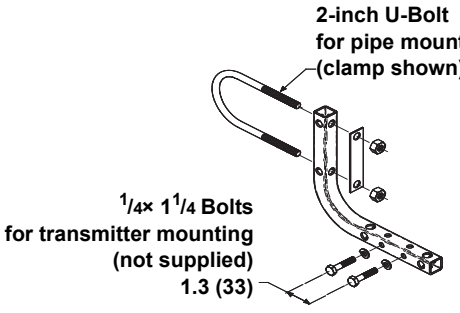
† *M20 × 1.5 Female (CM20), PG 13.5, and G 1/2 Female (PF 1/2 Female) also available as options.*



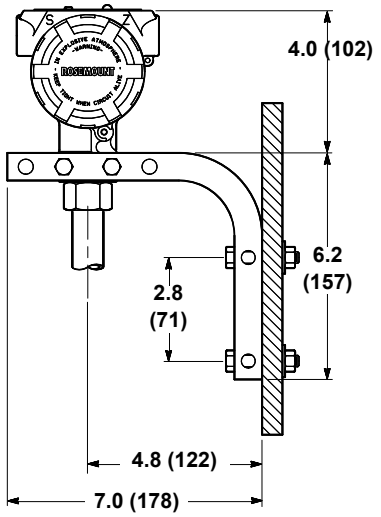
Mounting Configurations with Optional Mounting Brackets

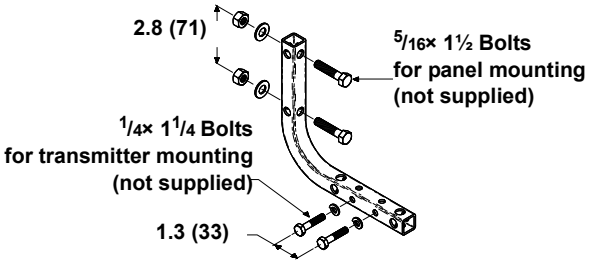
Pipe Mounting





Panel Mounting





Dimensions are in inches (millimeters).

Ordering Information

TABLE 3. Rosemount 2088 Pressure Transmitter Ordering Information

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

Model	Product description			
2088	Pressure Transmitter			
Code	**Measurement Type**			
Standard				**Standard**
A	Absolute			★
G	Gage			★
Code	**Pressure Ranges**			
Standard				**Standard**
	2088G		**2088A**	
1	-14.7 to 30 psi /(-1,01 to 2,1 bar)		0 to 30 psi (0 to 2,1 bar)	★
2	-14.7 to 150 psi (-1,01 to 10,3 bar)		0 to 150 psi (0 to 10,3 bar)	★
3	-14.7 to 800 psi (-1,01 to 55,2 bar)		0 to 800 psi (0 to 55,2 bar)	★
4	-14.7 to 4,000 psi(-1,01 to 275,8 bar)		0 to 4,000 psi (0 to 275,8 bar)	★
Code	**Transmitter Output**			
Standard				**Standard**
S	4–20 mA dc/Digital HART® Protocol			★
N	1-5 V dc Low Power/ Digital HART protocol			★
Code	**Materials of Construction**			
Standard				**Standard**
	Process connection	**Isolating diaphragm**	**Fill Fluid**	
22(1)	316L SST	316L SST	Silicone	★
33(1)	Alloy C-276	Alloy C-276	Silicone	★
Expanded				
2B(1)	316L SST	316L SST	Inert	
Code	**Process Connection**			
Standard				**Standard**
A	½–14 NPT Female			★
B(2)	DIN 16288 G ½ Male			★
D(2)(3)	M20 × 1.5 Male (CM20 Male)			★
Expanded				
C(2)(3)	RC ½ Female (PT ½ Female)			
Code	**Conduit Entry**			
Standard				**Standard**
1	½–14 NPT			★
2(2)	M20 × 1.5 Female (CM20)			★
Expanded				
4(2)	G ½ Female (PF ½ Female)			

Options (Include with selected model number)

Diaphragm seal assemblies		
Standard		**Standard**
S1(4)(5)	Assemble to one Rosemount 1199 diaphragm seal	★

TABLE 3. Rosemount 2088 Pressure Transmitter Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.
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Digital Display		
Standard		**Standard**
M5	LCD display	★
M7	LCD display, special configuration	★
Mounting brackets		
Standard		**Standard**
B4	SST mounting bracket with SST Bolts	★
Product Certifications		
Standard		**Standard**
C6	CSA Explosion-Proof, Intrinsically Safe, and Non-Incendive	★
E4[(2)(6)]	TIIS Flameproof	★
E5	FM Explosion-Proof, Dust Ignition-proof	★
E7	IECEx Flameproof	★
ED	ATEX Flameproof	★
I1[(2)]	ATEX Intrinsic Safety	★
I5	FM Intrinsically safe, Division 2	★
I7	SAA Intrinsic Safety	★
K5	FM Explosion-Proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
K6[(2)]	CSA Explosion-Proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
KB	FM and CSA Explosion-Proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
KH[(2)]	FM Approvals and ATEX Explosion-Proof and Intrinsically Safe	★
N1[(2)]	ATEX Type n	★
N7	SAA Type n	★
ND[(2)]	ATEX Dust	★
NK	IECEx Dust	★
K7	SAA Flameproof, Dust Ignition-proof, Intrinsic Safety, Type n	★
K1	ATEX Flameproof, Intrinsic Safety, Type n, Dust	★
I2	INMETRO Intrinsic Safety	★
E2	INMETRO Flameproof	★
Pressure Testing		
Expanded		
P1	Hydrostatic testing	
Terminal Blocks		
Standard		**Standard**
T1	Transient protection	★
Special Cleaning		
Expanded		
P2	Cleaning for special service	
Calibration Certificate		
Standard		**Standard**
Q4	Calibration certificate	★
Quality Calibration Certificate Traceability Certification		
Standard		**Standard**
Q8	Material Traceability Certification per EN 10204 3.1B	★
Digital Signal		
Standard		**Standard**
C4[(2)]	NAMUR alarm and saturation levels, high alarm	★
CN[(2)]	NAMUR alarm and saturation levels, low alarm	★
Configuration		
Standard		**Standard**
C9	Software configuration	★

TABLE 3. Rosemount 2088 Pressure Transmitter Ordering Information

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

Manifold Assemblies		
Standard		**Standard**
S5[4][5]	Assemble to Rosemount 306 integral manifold	★
Calibration Accuracy		
Standard		**Standard**
P8[7]	0.075% accuracy to 10:1 turndown	★
Water Approval		
Standard		**Standard**
DW[8]	NSF drinking water approval	★
Low Output for Low Power		
Expanded		
C2	0.8 - 3.2 V dc output with HART protocol, Output code N only.	
Surface Finish		
Standard		**Standard**
Q16	Surface finish certification for sanitary remote seals	★
Toolkit Total System Performance Reports		
Standard		**Standard**
QZ	Remote Seal System Performance Calculation Report	★
Typical Model Number: 2088 G 2 S 22 A 1 B4 M5		

(1) Materials of Construction comply with recommendations per 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.

(2) Not available with low-power Output code N.

(3) Not available with Alloy C-276, Materials of Construction code 33.

(4) Use 1/2 - 14 NPT Female Process Connection code A.

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

(6) Only available with Conduit Thread code 4.

(7) Available with Output code S, stainless steel isolators, and silicone fill.

(8) Requires Materials of Construction code 22 with Process Connection code A.

Rosemount 2088

Product Data Sheet
00813-0100-4690, Rev KB
April 2010

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00813-0100-4690 Rev KB, 4/10

EMERSON™
Process Management

Product Data Sheet
00813-0100-4022, Rev FB
April 2010

Rosemount 4600 Oil & Gas Panel Pressure Transmitter

TRANSMITTER FEATURES:

- *A compact, lightweight, all-welded stainless steel design*
- *40:1 rangeability for increased flexibility and reduced inventories*
- *3 year stability guarantee reduces maintenance costs*
- *Leading edge capacitance sensor with integral temperature measurement for improved total performance*
- *4-20 mA HART® Smart capabilities and 0.25% of calibrated span reference accuracy*

Contents

Legendary Rosemount Performance, Customized For Your Panel Applications

The Rosemount 4600 Oil & Gas Panel Transmitter is a compact, reliable transmitter designed to meet your panel-mount monitoring needs. The Rosemount 4600 continues the Rosemount tradition of delivering superior performance, industry leading reliability, and exceptional value.

A compact, lightweight, all-welded stainless steel design

You asked for it and we've delivered — the stability, performance and reliability of Rosemount are now available in a compact transmitter for your space and weight constrained panel applications. The entire transmitter weighs less than 1.5 pounds (0,6 kg) and the all-welded, hermetic enclosure maximizes reliability by minimizing environmental effects, such as salt spray and humidity, on the electronics and sensor.

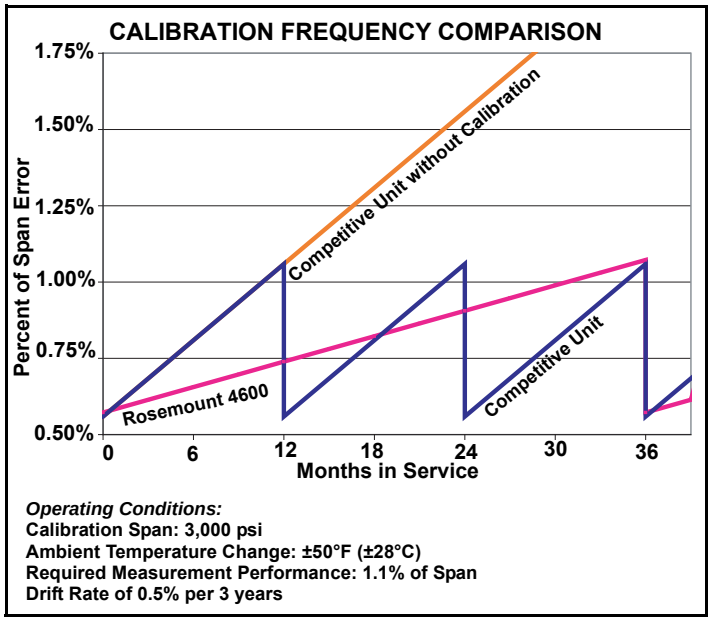
40:1 rangeability for increased flexibility and reduced inventories

Rosemount understands that Oil & Gas Well Pressures are sometimes unpredictable, and that's why we've incorporated 40:1 rangeability into the Rosemount 4600 Oil & Gas Panel Transmitter. Not only does 40:1 rangeability allow you incredible flexibility, it also lowers your transmitter inventories by allowing you to measure pressure ranges from 20 psi to 20,000 psi with only 4 transmitter ranges.

Leading edge capacitance sensor with integral temperature measurement for improved total performance

Integral temperature measurement means the Rosemount 4600 provides superior temperature compensation and therefore, a more precise pressure measurement over the entire operating temperature range.

3-year stability guarantee reduces maintenance costs



Most competitive devices can drift out of specification after just a few months and require recalibration, which consumes both your time and money. The Rosemount 4600 carries a 3-year "Set and Forget" stability guarantee to reduce the frequency of calibration and lower maintenance costs.

4-20 mA HART Smart capabilities and 0.25% of calibrated span reference accuracy

The HART protocol enables quick and easy reranging, calibration and troubleshooting for nearly effortless field adjustments. As always, reference accuracy is specified as a percent of *calibrated span*, not as a percent of full scale, so you're guaranteed 0.25% reference accuracy whether you're measuring 20,000 psi or 20 psi.

Specifications

PERFORMANCE SPECIFICATIONS

For zero-based spans, reference conditions, silicone oil fill, SST materials, 1/2 in.- 14 NPT process connections, digital trim values set to equal range points. Does not include any error due to the effects of sealed gauge.

Conformance to specification (±3 Sigma)

Technology leadership, advanced manufacturing techniques and statistical process control ensure specification conformance to at least ±3 sigma.

Reference Accuracy

Includes the effects of terminal based linearity, hysteresis, and repeatability.

Range 2: ±0.25% of calibrated span from 1:1 to 7.5:1 rangedown

Range 4: ±0.25% of calibrated span from 1:1 to 40:1 rangedown

Range 5: ±0.25% of calibrated span from 1:1 to 30:1 rangedown

Range 6: ±0.25% of calibrated span from 1:1 to 30:1 rangedown

Long Term Stability

0.5% of span for 3 years under normal operating conditions

Vibration Effect

Less than ±0.1% of URL when tested per the requirements of IEC 60770.84 pipeline (general and extreme vibration level) (10-60 Hz 0.21mm peak to peak displacement/60-2000 Hz 3g).

Electromagnetic Compatibility (EMC)

Meets all relevant requirements of EN 61326

Transient Protection (Option T1)

Meets IEEE C62.41, Category B

- 6 kV crest (0.5 μs - 100 kHz)
- 3 kA crest (8 × 20 microseconds)
- 6 kV crest (1.2 × 50 microseconds)

Meets IEEE C37.90.1, Surge Withstand Capability

- SWC 2.5 kV crest, 1.25 MHz wave form

General Specifications:

- Response Time: < 1 nanosecond
- Peak Surge Current: 5000 amps to housing
- Peak Transient Voltage: 100 V dc
- Loop Impedance: < 25 ohms
- Applicable Standards: IEC61000-4-4, IEC61000-4-5

NOTE:
Calibrations at 68 °F (20 °C) per ASME Z210.1 (ANSI)

Range and Sensor Limits

Rosemount 4600 Oil & Gas Panel Transmitter Range Limits								
Units	Range 2		Range 4 Span		Range 5		Range 6	
	min.	max.	min.	max.	min.	max.	min.	max.
psi	20	150	125	5,000	330	10,000	660	20,000
MPa	0.14	1.03	125	34.47	2.28	68.95	4.55	137.90
bar	1.38	10.34	125	344.74	22.75	689.48	45.51	1378,95
kg/cm^2	1.41	10.55	125	351.535	23.20	703.07	46.40	1406,14

FUNCTIONAL SPECIFICATIONS

Dynamic Performance

500 Milliseconds (response time + dead time)

Ambient Temperature Effect per 100°F (56°C)

±0.03% URL + 1.0% span from 1:1 to maximum rangedown

Service

Liquid, gas, and vapor applications

4–20 mA (output code A)

Zero and Span Adjustment

Zero and span values can be set anywhere within the range. Span must be greater than or equal to the minimum span.

Output

Digital process variable superimposed on 4–20 mA signal, available to any host that conforms to the HART protocol.

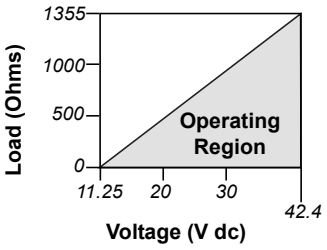
Power Supply

External power supply required. Standard transmitter (4–20 mA) operates on 11.25 to 42.4 V dc with no load.

Load Limitations

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

Max. Loop Resistance = 43.5 (Power Supply Voltage – 11.25)



Communication requires a minimum loop resistance of 250 ohms.

Overpressure Limits

Transmitters withstand the following pressure without damage:

Range 2: 1,500 psi (103,4 bar)
Range 4: 7,500 psi (517,1 bar)
Range 5: 15,000 psi (1034 bar)
Range 6: 24,000 psi (1655 bar)

Burst Pressure Limits

Range 2: 11,000 psi (758,4 bar)
Range 4: 11,000 psi (758,4 bar)
Range 5: 26,000 psi (1793 bar)
Range 6: 31,000 psi (2137 bar)

Temperature Limits

Ambient

–40 to 185 °F (–40 to 85 °C)

Storage

–50 to 230 °F (–46 to 110 °C)

Process Temperature Limits

–40 to 200 °F (–40 to 93°C)

Turn-On Time

Performance within specifications less than 2.5 seconds after power is applied to the transmitter

Damping

Analog output response to a step input change is user-selectable from 0.3 to 60 seconds for one time constant. This software damping is in addition to sensor module response time.

Failure Mode Alarm

HART 4-20mA (output code A)

If self-diagnostics detect a gross transmitter failure, the analog signal will be driven offscale to alert the user. Rosemount standard and custom alarm levels are available.

High or low alarm signal is software-selectable.

Alarm Configuration

Rosemount

High Alarm: ≥ 21.75 mA
Low Alarm: ≤ 3.75 mA

Custom Level (1)

High Alarm: 20.2 - 23.0 mA
Low Alarm: 3.6 - 3.8 mA

(1) Low alarm must be 0.1 mA less than low saturation and high alarm must be 0.1 mA greater than high saturation.

PHYSICAL SPECIFICATIONS

Electrical Connections

1/2–14 NPT Male, 72in. flying leads (polyvinyl chloride insulated #18 AWG copper wire)

Conduit Seal

Integral conduit seal meets the requirements of NEC© 2002 section 501.5 (A), 501.5 (B) and 505.16 (B)(1). No additional conduit seal required.

Process Connections

- 1/2-14 NPT female (Available on Ranges 2 and 4 only)
- 1/4–18 NPT female (Not available on Range 6)
- Autoclave type F-250-C (Pressure relieved 9/16-18 gland thread: 1/4 OD high pressure tube 60° cone: available Range 5 and 6 transmitters only.

Process Sealing

Reliable dual process seal design meets the requirements NEC© 2002 section 501.5 (F)(3), 505.16 (E)(3) and API 14F/14FZ 6.8.2.2. No additional process sealing is required.

Process-Wetted Parts

Process Isolating Diaphragms

316L SST (1)
Hastelloy C-276® (1)

Non-Wetted Parts

Electronics Housing

316L SST
NEMA 4X
IP 68, IP 66

Sensor Module Fill Fluid

Silicone

Shipping Weights for Rosemount 4600

Range 2 and 4: 1.34 lb. (0,61 kg.)
Range 5 and 6: 2.03 lb. (0,92 kg.)

(1) Materials of Construction comply with recommendations per NACE MR0175/ISO 15156 for sour oilfield production environments. Environmental limits apply to certain materials. Consult latest standard for details. Selected materials also conform to NACE MR0103 for sour refining environments.

Product Certifications

Approved Manufacturing Locations

Rosemount Inc. — Chanhassen, Minnesota, USA

Ordinary Locations Certifications

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

European Directive Information

The EC declaration of conformity for all applicable European directives for this product can be found on the Rosemount website at www.rosemount.com. A hard copy may be obtained by contacting our local sales office.

ATEX Directive (94/9/EC)

Emerson Process Management complies with the ATEX Directive.

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

Model 4600 Pressure Transmitters-
Sound Engineering Practice

Electro Magnetic Compatibility (EMC) (89/336/EEC)

All Models: EN 50081-1: 1992; EN 50082-2:1995;
EN 61326-1:1997 + A1, A2, and A3 – Industrial

Process Sealing Certification

FM Approved Dual Process Seal

Certified to the requirements of ANSI / ISA 12.27.01

No additional sealing required.

Hazardous Locations Certifications

North American Certifications

Factory Mutual (FM) Approvals

E5 Explosion-Proof for Class I, Division 1, Groups B, C, and D; dust-ignition proof for Class II and Class III, Division 1, Groups E, F, and G hazardous locations;
Temperature Code T5
(T_{amb} = -40°C to 85°C);
Explosion-Proof for Class 1, Zone 1 AEx d IIC
T5 (T_{amb} = -40°C to 85°C);
Enclosure Type 4X
Conduit seal not required

I5 Intrinsically Safe for use in Class I, Division 1, Groups A, B, C, and D;
Temperature Code T4 (T_{amb} = -50°C to 70°C);
Intrinsically Safe for use in Class I, Zone 0 AEx ia IIC
T4 (T_{amb} = -50°C to 70°C);
Non-incendive for Class I, Division 2, Groups A, B, C, and D;
When connected in accordance with
Rosemount drawing 04620-5007;
Enclosure Type 4X
For entity parameters see control drawing 04620-5007

Canadian Standards Association (CSA) Approvals

E6 Explosion-Proof for Class I, Division 1, Groups B, C, and D; dust-ignition proof for Class II and Class III, Division 1, Groups E, F, and G hazardous locations;
Temperature Code T5 (T_{amb} = -50°C to 40°C);
Explosion-Proof for Class 1, Zone 1 Ex d IIC
T5 (T_{amb} = -20°C to 40°C);
Suitable for Class I, Division 2, Groups A, B, C, and D, when installed per Rosemount drawing 04620-5005;
Enclosure Type 4X
Conduit seal not required

I6 Intrinsically Safe for use in Class I, Division 1, Groups A, B, C, and D;
Temperature Code T3C (T_{amb} = -50°C to 70°C);
Intrinsically Safe for use in Class I, Zone 0 Ex ia IIC
T4 (T_{amb} = -50°C to 70°C);
When connected in accordance with
Rosemount drawing 04620-5005;
Enclosure Type 4X
For entity parameters see control drawing 04620-5005

European Certifications

I1 **ATEX Intrinsic Safety**
Certificate No. Baseefa03ATEX0114X
ATEX Marking: ⟨Ex⟩ II 1 G
EEx ia IIC T4 (-40 ≤ Ta ≤ 70°C)
CE 1180
Input Parameters:
U_i = 30V
I_i = 200mA
P_i = 1.0W
C_i = 35nF
L_i = 390µH

SPECIAL CONDITIONS FOR SAFE USE (X):

The Apparatus with the Transient Protection (T1) option is not capable of withstanding the 500V insulation test required by Clause 6.4.12 of EN50020 2002. This must be taken into account when installing the apparatus.

E1 **ATEX Flame-Proof**
Certificate No. KEMA02ATEX2231X
ATEX Marking: ⟨Ex⟩ II 1/2 G
EEx d IIC T6 (-40 ≤ Ta ≤ 80°C)
CE 1180

SPECIAL CONDITIONS FOR SAFE USE (X):

This device contains a thin wall diaphragm. Installation, maintenance, and use shall take into account the environmental conditions to which the diaphragm will be subjected. The manufacturer's instructions for installation and maintenance shall be followed in detail to assure safety during its expected lifetime.

The Model 4600 Pressure transmitter is provided with a permanently connected unterminated cable. The free end of the cable shall be connected using a suitable junction box, e.g. in type of explosion protection flameproof enclosure "d" or increased safety "e".

N1 **ATEX Type n**
Certificate No. Baseefa03ATEX0115X
ATEX Marking: ⟨Ex⟩ II 3 G
EEx nA II T5 (-40 ≤ Ta ≤ 70°C)
U_i = 42.4V MAXIMUM

SPECIAL CONDITIONS FOR SAFE USE (X):

The Apparatus with the Transient Protection (T1) option is not capable of withstanding the 500V insulation test required by Clause 9.1 of EN50021 1999. This must be taken into account when installing the apparatus.

ND **ATEX Dust Ignition-Proof**
Certificate No. KEMA02ATEX2231X
ATEX Marking: ⟨Ex⟩ II 1 D
Dust Rating: T85°C (-40 ≤ Ta ≤ 80°C)
IP66, IP68
CE 1180
V = 42.4 Volts MAX
A = 24mA

SPECIAL CONDITIONS FOR SAFE USE (X):

This device contains a thin wall diaphragm. Installation, maintenance, and use shall take into account the environmental conditions to which the diaphragm will be subjected. The manufacturer's instructions for installation and maintenance shall be followed in detail to assure safety during its expected lifetime.

The Model 4600 Pressure transmitter is provided with a permanently connected unterminated cable. The free end of the cable shall be connected using a suitable junction box, e.g. in type of explosion protection flameproof enclosure "d" or increased safety "e".

Combinations of Certifications

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

K1 Combination of **E1**, **I1**, and **N1**
K5 Combination of **E5** and **I5**
K6 Combination of **E6** and **I6**
KA Combination of **E1**, **I1**, **E6,** and **I6**
KB Combination of **E5**, **I5**, **I6** and **E6**
KC Combination of **E5**, **E1**, **I5** and **I1**

Dimensional Drawings

FIGURE 1. Dimensional Drawings for the Rosemount 4600 Oil & Gas Panel Pressure Transmitter

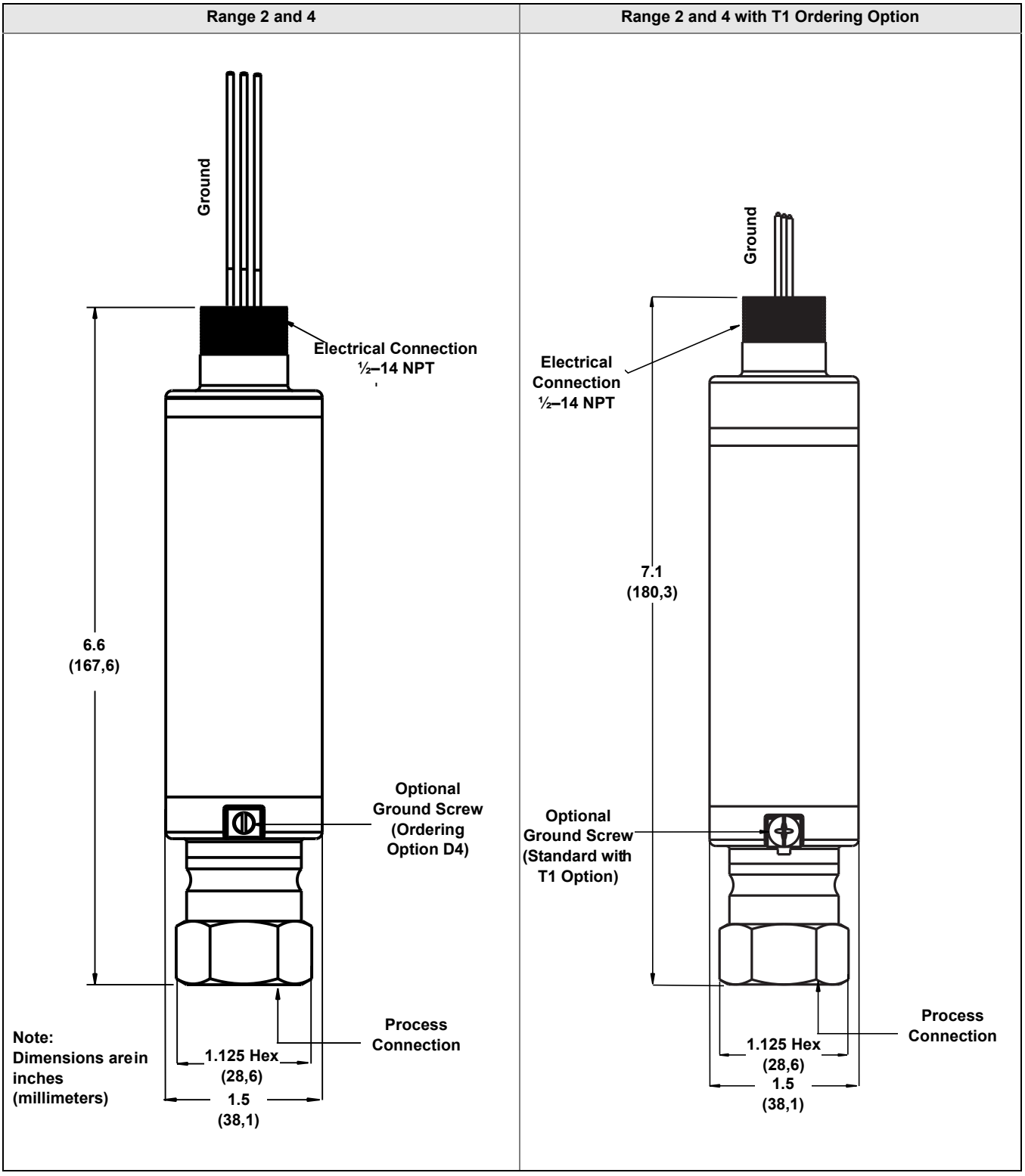
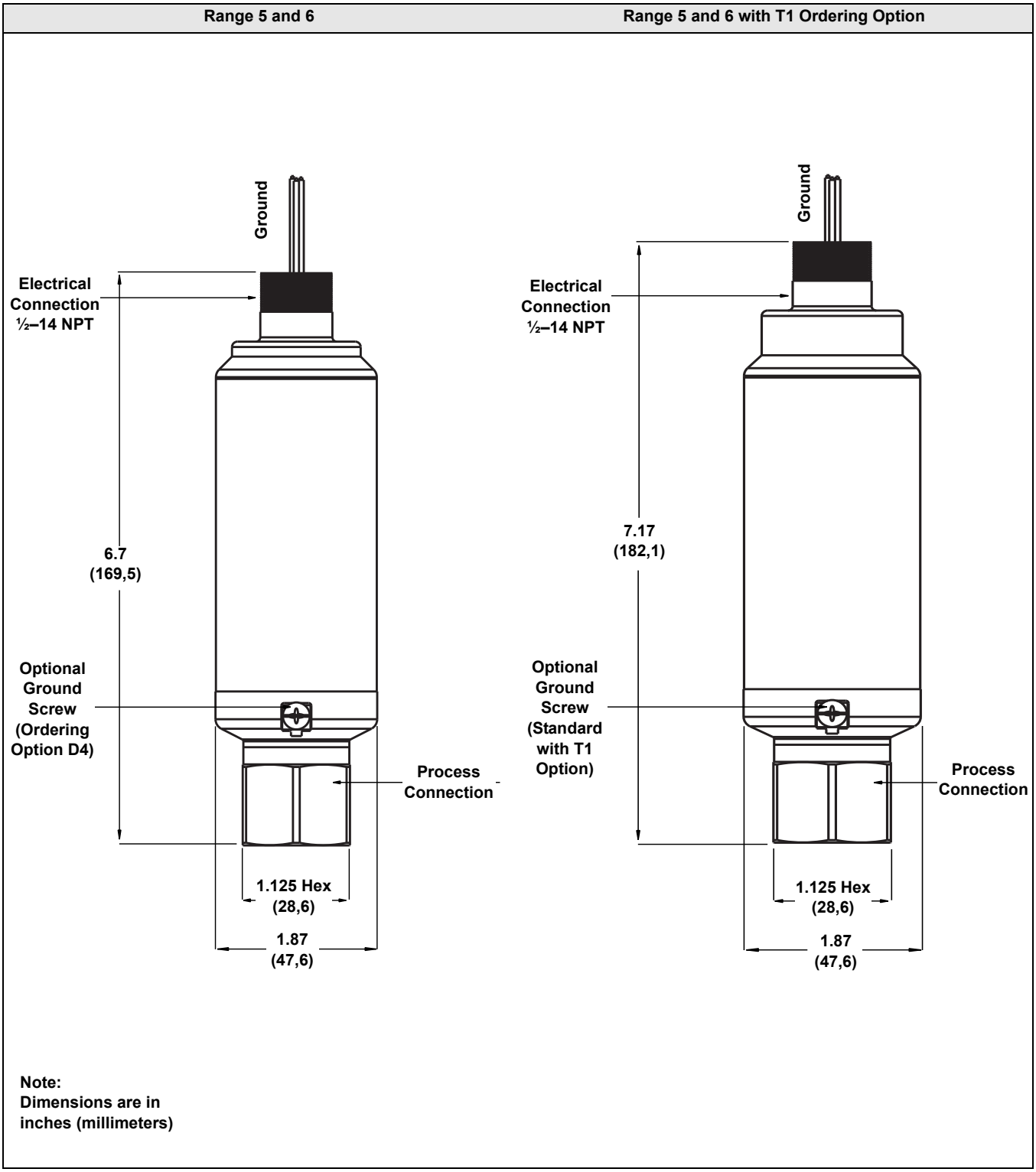


FIGURE 2. Dimensional Drawings for the Rosemount 4600 Oil & Gas Panel Pressure Transmitter



Ordering Information

Table 1. Rosemount 4600 Oil and Gas Pressure 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	
4600	Oil and Gas Panel Pressure Transmitter	
Measurement Type		
Standard		**Standard**
G	Sealed Gauge	★
A	Absolute	★
Pressure Range		
Standard		**Standard**
2	0-20 to 0-150 psi	★
4	0-125 to 0-5000 psi	★
5	0-330 to 0-10,000 psi	★
6	0-660 to 0-20,000 psi (available only with H11)	★
Isolating Diaphragm/ Process Connection Materials		
Standard		**Standard**
2	316L SST (1)	★
3	Alloy C-276 (1)	★
Process Connection Style		
Standard		**Standard**
E09	1/4-18 NPT Female (not available with Pressure Range 6)	★
E11	1/2-14 NPT Female (not available with Pressure Range 5 or 6)	★
H11	Coned and Threaded, compatible with autoclave type F-250-C	★
Output		
Standard		**Standard**
A	4-20 mA with Digital Signal Based on HART protocol	★
Electrical Connection		
Standard		**Standard**
5A	1/2-14 NPT Male with 72 in. Flying Lead	★

Options (Include with selected model number)

Software Configuration		
Standard		**Standard**
C1	Custom Software Configuration (CDS required with order)	★
Alarm Limits		
Standard		**Standard**
C6	Custom Alarm and Saturation Signal Levels, High Alarm	★
C7	Custom Alarm and Saturation Signal Levels, Low Alarm	★
Hardware Adjustments		
Standard		**Standard**
D1	Zero and Span Adjustments	★
External Ground Screw Assembly		
Standard		**Standard**
D4	External Ground Screw Assembly	★

Table 1. Rosemount 4600 Oil and Gas Pressure 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		
Standard		**Standard**
E1	ATEX Flameproof	★
I1	ATEX Intrinsic Safety	★
K1	ATEX Flameproof, Intrinsic Safety, Type n (combination of E1, I1, and N1)	★
N1	ATEX Type n	★
ND	ATEX Dust Ignition-Proof	★
E5	FM Approval Explosionproof	★
I5	FM Approval Intrinsic Safety, Non-incendive	★
K5	FM Approval Explosionproof, Intrinsic Safety, Non-incendive (combination of E5 and I5)	★
E6	CSA Explosionproof, Division 2	★
I6	CSA Intrinsic Safety	★
K6	CSA Explosionproof, Intrinsic Safety, Division 2 (combination of E6 and I6)	★
KA	ATEX/ CSA Flameproof and Intrinsic Safety (combination of E1, I1, E6, and I6)	★
KB	FM Approval and CSA Explosionproof and Intrinsic Safety (combination of E5, E6, I5, and I6)	★
KC	FM Approval and ATEX Explosionproof and Intrinsic Safety (combination of E5, E1, I5, and I1)	★
Calibration Certifications		
Standard		**Standard**
Q4	Calibration Data Certificate consistent with ISO 104742.1 or EN 10204 2.1	★
Material Traceability Certification		
Standard		**Standard**
Q8	Material Traceability Certification per EN 10204 3.1B	★
Transient Protection		
Standard		**Standard**
T1	Transient Protection	★
Quality Certification for Safety		
Standard		**Standard**
QS	Prior-use certificate of FMEDA data	★
Typical Model Number: 4600 G 4 2 E11 A 5A D1 E5		

(1) Materials of Construction comply with recommendations per NACE MR0175/ISO 15156 for sour oilfield production environments. Environmental limits apply to certain materials. Consult latest standard for details. Selected materials also conform to NACE MR0103 for sour refining environments.

Emerson Process Management

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EMERSON™
Process Management

Product Data Sheet
00813-0100-4698, Rev EA
April 2010

Rosemount 2090F Hygienic Pressure Transmitter

- *Conforms to 3-A® Sanitary Standards*
- *Features CIP/SIP service for process temperatures up to 284 ° F (140 ° C)*
- *Absolute or gage pressure ranges from 0-1.5 to 0-300 psi*
- *Mounts with either 1½- or 2-in. Tri-Clamp® connection*
- *Utilizes single-filled sensor system for reliability and outstanding accuracy*

Contents

Accurate, stable, and reliable pressure measurements for the Pharmaceutical and Food and Beverage Industry

Conforms to 3-A Sanitary Standards

The 2090F is a microprocessor-based Smart pressure transmitter that conforms to 3-A Sanitary Standards. The sanitary design also provides a product contact surface that is easy to clean and able to withstand thermal shocks.

Features CIP/SIP service with an upper temperature limit of 284 °F (140 °C)

The 2090F provides accurate, stable, and reliable pressure measurement, which makes it an ideal choice for pharmaceutical and food and beverage applications, including CIP/SIP service for process temperatures up to 284 °F (140 °C).

Absolute or Gauge pressure ranges from 0-1.5 to 0-300 psi and 20:1 turndown

Higher turndown allows for lower inventories by allowing you to measure pressures from 1.5 psi to 300 psi with only three transmitter ranges.

Mounts with either 1 $^{1}/_{2}$-in or 2-in. Tri-Clamp Connection

The 2090F is available with both 1 $^{1}/_{2}$-in. and 2-in. Tri-Clamp process connections, designed for sanitary applications to easily connect to standard sanitary fittings without requiring special mounting hardware.

Utilizes single-filled sensor system for reliability and outstanding accuracy

The 2090F sensor has a single-filled system with Neobee M-20 fill fluid which is approved as an indirect food additive according to the FDA. Its benefits include reliability, low oil fill for less temperature effect, and outstanding accuracy due to full sensor compensation.

Rosemount Pressure Solutions

Rosemount 3051S Series of Instrumentation
Scalable pressure, flow and level measurement solutions improve installation and maintenance practices.

Rosemount 3095 MultiVariable™ Mass Flow Transmitter
Accurately measures differential pressure, static pressure and process temperature to dynamically calculate fully compensated mass flow.

Rosemount 304, 305, and 306 Integral Manifolds
Factory-assembled, calibrated and seal-tested manifolds reduce on-site installation costs.

Rosemount 1199 Diaphragm Seals
Provides reliable, remote measurements of process pressure and protects the transmitter from hot, corrosive, or viscous fluids.

Annubar Flowmeter Series: Rosemount 3051SFA, 3095MFA, and 485
The state-of-the-art, fifth generation Rosemount 485 Annubar combined with the 3051S or 3095MV MultiVariable transmitter creates an accurate, repeatable and dependable insertion-type flowmeter.

Compact Orifice Flowmeter Series: Rosemount 3051SFC, 3095MFC, and 405
Compact Orifice Flowmeters can be installed between existing flanges, up to a Class 600 (PN100) rating. In tight fit applications, a conditioning orifice plate version is available, requiring only two diameters of straight run upstream.

Integral Orifice Flowmeter Series: Rosemount 3051SFP, 3095MFP, and 1195
These integral orifice flowmeters eliminate the inaccuracies that become more pronounced in small orifice line installations. The completely assembled, ready to install flowmeters reduce cost and simplify installation.

Orifice Plate Primary Element Systems: Rosemount 1495 and 1595 Orifice Plates, 1496 Flange Unions and 1497 Meter Sections
A comprehensive offering of orifice plates, flange unions and meter sections that is easy to specify and order. The 1595 Conditioning Orifice provides superior performance in tight fit applications.

Specifications

Functional Specifications

Service

Liquid, gas, vapor, and high-viscosity applications

Ranges

Range	Minimum Span	URL/Max. Span Sensor Limit
1	1.5 psi (103 mbar)	30 psi (2,06 bar)
2	7.5 psi (517 mbar)	150 psi (10,34 bar)
3	40 psi (2,76 bar)	300 psi (20,68 bar)

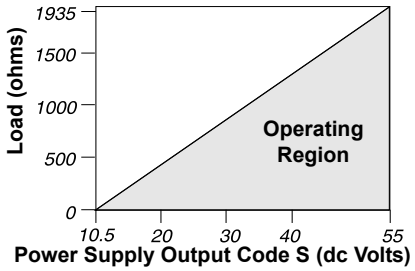
Output

4–20 mA dc/Digital HART Protocol

Load Limitations

Maximum loop resistance is determined by the power supply voltage, as described by the following equation:

Max. Loop Resistance = 43.5 (Power Supply Voltage – 10.5)



(1) For hazardous location approvals, power supply must not exceed 36 V.

Power Supply

External power supply required. Transmitter operates on 10.5–36 V dc with no load. Reverse polarity protection is standard.

Zero Elevation and Suppression

Zero can be suppressed between atmosphere (2090FG), or 0 psia (2090FA) and upper range limit, if the calibrated span is equal to or greater than the minimum span, and the upper range value does not exceed the upper range limit. No vacuum calibrations are allowed on the 2090F.

Overpressure Limits

Range 1:120 psig max
All other ranges: Twice the upper range limit

Temperature Limits

Process

–4 to 284 °F (–20 to 140 °C)

Ambient

–4 to 185 °F (–20 to 85 °C)

Storage

–22 to 185 °F (–30 to 85 °C)

Process temperatures above 185 °F (85 °C) require lowering the ambient limits by a 1.5:1 ratio:

Max. Ambient temperature in °F =

$$\frac{185 - (\text{Process Temp} - 185)}{1.5}$$

Max. Ambient temperature in °C =

$$\frac{85 - (\text{Process Temp} - 85)}{1.5}$$

Humidity Limits

0–100% relative humidity

Volumetric Displacement

Less than 0.00042 cm^3

Turn-on Time

2.0 seconds, no warm-up required

Failure Alarm

If self-diagnostics detect a sensor or microprocessor failure, the analog signal is driven either high or low to alert the user. High or low failure mode is user-selectable by a jumper on the transmitter. The values to which the transmitter drives its output in failure mode depend on whether it is factory-configured to *standard* or *NAMUR-compliant* operation. The values for each are as follows:

Standard Operation

Linear Output: $3.9 \leq I \leq 20.8$
Fail High: $I \geq 21.75$ mA
Low: $I \leq 3.75$ mA

NAMUR-Compliant Operation

Linear Output: $3.8 \leq I \leq 20.5$
Fail High: $I \geq 22.5$ mA
Low: $I \leq 3.6$ mA

Transmitter Security

Activating the transmitter security function prevents changes to the transmitter configuration, including local zero and span adjustments. Security is activated by an internal jumper.

Performance Specifications

(Zero-based spans, reference conditions, and 316 SST isolating diaphragm.)

Reference Accuracy

±0.20% of calibrated span. Includes combined effects of linearity, hysteresis, and repeatability.

Ambient Temperature Effect per 100 °F (56 °C)

±(0.3% URL + 0.3% of span) from –40 to 185 °F (-40 to 85 °C)

Stability

±0.10% of upper range limit for 12 months

Time Response

Less than 200 ms time constant (63.2% response to a step change in pressure)

Vibration Effect

Less than ±0.1% of upper range limit when subjected to vibration of peak to peak constant displacement of 4 mm (5–15 Hz) and constant acceleration of 2 g (15–150 Hz) and 1 g (150–2000 Hz).

Power Supply Effect

Less than 0.01% of calibrated span per volt

Mounting Position Effect

Zero shift of up to 1.2 inH_2O (0,3 kPa), which can be calibrated out. No span effect

RFI Effect

Less than ±0.25% of upper range limit from 20–1000 MHz at 30 V/m with leads in conduit. Less than ±0.25% of upper range limit from 20-1000 MHz at 10 V/m with unshielded twisted pair (no conduit).

Physical Specifications

Electrical Connection

$^1/_2$–14 NPT, PG 13.5, or M20 × 1.5 (CM20) conduit entry.

Process Wetted Parts

Isolating Diaphragm
316L stainless steel

Process Connector
316L stainless steel

Non-wetted Parts

Electronics Housing
Low-copper aluminum, NEMA 4X, IP65, IP67, CSA enclosure Type 4X

Paint
Polyurethane

Cover O-rings
Buna-N

Product Certifications

Approved Manufacturing Locations

Rosemount Inc. — Chanhassen, Minnesota, USA

Emerson Process Management GmbH & Co. — Wessling, Germany

Emerson Process Management Asia Pacific Private Limited — Singapore

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

European Union Directive Information

The EC declaration of conformity for all applicable European directives for this product can be found on the Rosemount website at www.rosemount.com. A hard copy may be obtained by contacting our local sales office.

ATEX Directive (94/9/EC)
Emerson Process Management complies with the ATEX Directive.

European Pressure Equipment Directive (PED) (97/23/EC)
2088/2090 Pressure Transmitters
— Sound Engineering Practice

Electro Magnetic Compatibility (EMC) (2004/108/EC)
All 2088/2090 Smart Pressure Transmitter:
EN 61326-1:1997 with Amendments A1, A2, and A3

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

Hazardous Locations Certifications

North American Certifications

Factory Mutual (FM) Approvals

E5 Explosion-Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition-Proof for Class II, Division 1, Groups E, F, G, Class III, Division 1, indoor and outdoor (NEMA 4X) hazardous locations; factory sealed.

I5 Intrinsically safe for use in Class I, Division 1, Groups A, B, C, D; Class II, Division 1, Groups E, F, and G; and Class III, Division 1 when connected in accordance with Rosemount drawing 02088-1018. Non-incendive for Class I, Division 2, Groups A, B, C, and D.
For input parameters see control drawing 02088-1018.

Canadian Standards Association (CSA)

C6 Explosion-Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition-Proof for Class II, Division 1, Groups E, F, G, Class III, indoor and outdoor hazardous locations. CSA enclosure Type 4X; factory sealed. Suitable for Class I, Division 2, Groups A, B, C, and D.

Intrinsically Safe for Class I, Division 1, Groups A, B, C, and D. Temp. Code T3C. Intrinsically safe when connected with approved barriers in accordance with Rosemount drawing 02088-1024.
For input parameters see control drawing 02088-1024.

European Certifications

I1 ATEX Intrinsic Safety
Certificate No.: BAS00ATEX1166X ⟨Ex⟩ II 1 G
EEx ia IIC T5 (T_{amb} = –55 to 40 °C)
EEx ia IIC T4 (T_{amb} = –55 to 70°C)
CE 1180

TABLE 1. Input Parameters

Loop/Power	Input Type
U_i = 30 V dc	Smart
I_i = 200 mA	Smart
P_i = 0.9 W	Smart
C_i = 0.012 µF	Smart

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

N1 ATEX Type n
Certification No.: BAS00ATEX3167X ⟨Ex⟩ II 3 G
EEx nL IIC T5 (T_a = -40 °C to 70 °C)
U_i = 50 V dc max
CE

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

ND ATEX Combustible Dust
Certificate No.: BAS01ATEX1427X ⟨Ex⟩ II 1 D
T105°C (T_{amb} = -20°C to 85°C)
IP66
CE 1180
Vmax = 36 V dc Max
I_i - 24 mA

Special Conditions for Safe Use (x):
1. The user must ensure that the maximum rated voltage and current (36 volts, 24 mA, D.C.) are not exceeded. All connections to other apparatus or associated apparatus shall have control over this voltage and current equivalent to a category “ib” circuit according to EN50020.
2. Cable entries must be used which maintain the ingress protection of the enclosure to at least IP66.
3. Unused cable entries must be filled with suitable blanking plugs which maintain the ingress protection of the enclosure to at least IP66.
4. Cable entries and blanking plugs must be suitable for the ambient range of the apparatus and capable of withstanding a 7J impact test.
5. The 2088/2090 sensor module must be securely screwed in place to maintain the ingress protection of the enclosure.

ED ATEX Flameproof
Certification No.: KEMA97ATEX2378 ⟨Ex⟩ II 1/2 G
EEx d IIC T6 (T_a = -20 °C to 40°C)
T4 (T_a = -20 °C to 80 °C)
CE 1180
Vmax = 36 (with Smart output option)
Vmax = 14 (with low power output option)

Japanese Certifications

E4 TIIS Flame-Proof
Ex d IIC T6 (T_{amb} = 85 °C)

Certificate	Description
C15870	2090F with SST wetted parts (with meter)
C15878	2090F with SST wetted parts (no meter)

Combinations of Certifications

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

KB Combination of E5, I5, and C6

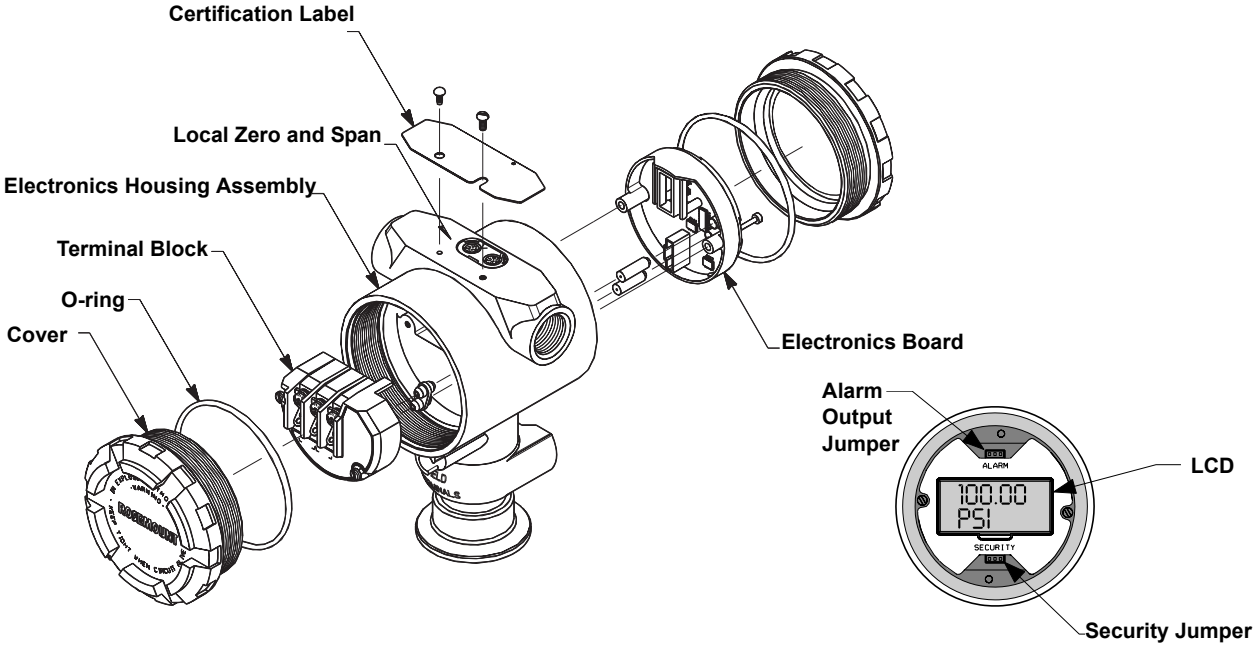
KH Combination of E5, I5 and I1

K5 Combination of E5 and I5

K6 Combination of C6, I1, and ED

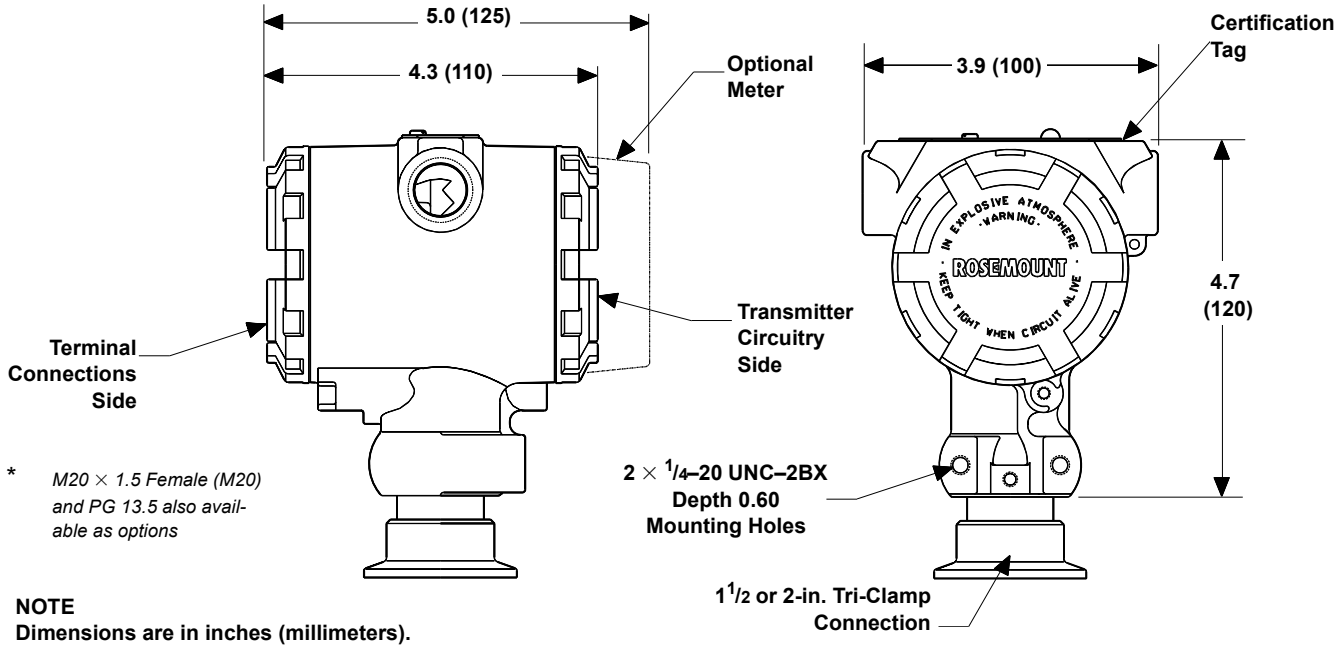
Dimensional Drawings

Rosemount 2090F Transmitter Exploded View



OPTIONAL SMART LCD DISPLAY

Rosemount 2090F



* *M20 × 1.5 Female (M20) and PG 13.5 also available as options*

NOTE
Dimensions are in inches (millimeters).

Ordering Information

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

Model	**Product Description**			
2090F	Sanitary Pressure Transmitter			
Transmitter Type				
Standard				**Standard**
A	Absolute			★
G	Gage			★
Pressure Ranges				
	Range	**Minimum Span**	**URL/Max. Span Sensor Limit**	
Standard				**Standard**
1	0–30 psi (0–2 bar)	1.5 psi (103 mbar)	30 psi (2,06 bar)	★
2	0–150 psi (0–10.3 bar)	7.5 psi (517 mbar)	150 psi (10,34 bar)	★
3	0–300 psi (0–20.7 bar)	40 psi (2,76 bar)	300 psi (20,68 bar)	★
Output				
Standard				**Standard**
S	4–20 mA dc/Digital HART Protocol			★
Material of Construction				
	Process Connection	**Isolating Diaphragm**	**Oil Fill**	
Standard				**Standard**
2D	316L SST	316L SST	*Neobee*	★
Code	**Process Connection**			
Standard				**Standard**
E	1 1/2–in. *Tri-Clamp* Connection			★
F	2–in. *Tri-Clamp* Connection			★
Conduit Entry				
Standard				**Standard**
1	1/2–14 NPT			★
2	M20 × 1.5 (CM 20)			★
OPTIONS				
Digital Display				
Standard				**Standard**
M5	LCD display, scaled 0-100%			★
M7	LCD display, special configuration			★
Mounting Brackets				
Standard				**Standard**
B4	SST mounting bracket with SST Bolts			★
Product Certifications				
Standard				**Standard**
E5	FM Explosion-Proof, Dust Ignition-proof			★
ED	ATEX Flameproof			★
I5	FM Intrinsically safe, Division2			★
K5	FM Explosion-Proof, Dust Ignition-proof, Intrinsically Safe, Division 2			★
I1	ATEX Intrinsic Safety			★
N1	ATEX Type n			★
C6	CSA Explosion-Proof, Intrinsically Safe, and Non-incendive			★
KB	FM and CSA Explosion-Proof, Dust Ignition-proof, Intrinsically Safe, Division 2			★
KH	FM Approvals and ATEX Explosion-Proof and Intrinsically Safe			★
ND	ATEX Dust			★
NK	IECEx Dust			★
K7	I7, N7, E7 & NK Combination			★

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

K1	I1, N1, ED & ND Combination	★
K6	CSA Explosion-Proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
Terminal Blocks		
Standard		**Standard**
T1	Transient Protection	★
Special Certificate		
Standard		**Standard**
Q4	Calibration Certificate	★
Alarm Limit		
Standard		**Standard**
C4	NAMUR alarm and saturation levels, high alarm	★
CN	NAMUR alarm and saturation levels, low alarm	★
Special Procedures		
Expanded		
P2	Cleaning for Special Service	
Calibration Accuracy		
Standard		**Standard**
P8	0.1% Accuracy to 10:1 Turndown	★
P Specials		
Standard		**Standard**
PXXXX	Special that need to be created	★
Typical Model Number: 2090FG 2 S 2D E 1		

Calibration

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

Tagging

The transmitter will be tagged, at no charge, in accordance with customer requirements. All tags are stainless steel. The standard tag is wired to the transmitter. Tag character height is 1/8 inch (0.318 cm). A permanently attached tag is available upon request.

Rosemount 2090F

Product Data Sheet
00813-0100-4698, Rev EA
April 2010

Emerson Process Management

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00813-0100-4698 Rev EA, 4/10

EMERSON™
Process Management

Product Data Sheet
00813-0100-4699, Rev GA
April 2010

Rosemount 2090P Pulp and Paper Pressure Transmitter

- *1-inch flush mount compatible with a PMC® process connection, or 1½-inch threaded mounting connection*
- *Absolute or gage pressure ranges from 0–1.5 to 0–300 psi*
- *20:1 turndown*
- *Communicates via the HART® protocol*
- *0.20% reference accuracy, including linearity, hysteresis, and repeatability*

HART COMMUNICATION PROTOCOL CE

Content

Accurate, stable, and reliable pressure measurements for the Pulp and Paper Industry

1-in. flush mount compatible with PMC process connection, or 1 1/2-in. threaded mounting connection

The 2090P has process connections that position the isolation diaphragm flush with vessel or pipe walls, eliminating clogging problems associated with highly viscous processes that tend to crystallize, polymerize, or precipitate, such as those in the pulp and paper industry.

Absolute or gauge pressure ranges from 0-1.5 to 0-300 psi and 20:1 turndown

Higher turndown allows for lower inventories by allowing you to measure pressures from 1.5 psi to 300 psi with only three transmitter ranges.

Communicates via the HART® protocol

The 2090P utilizes the advantages of HART communication, enabling quick and easy reranging, calibration and troubleshooting.

0.20% Reference Accuracy, including linearity, hysteresis, and repeatability

The single-filled sensor system of the 2090P leads to outstanding accuracy due to full sensor compensation.

Rosemount Pressure Solutions

Rosemount 3051S Series of Instrumentation
Scalable pressure, flow and level measurement solutions improve installation and maintenance practices.

Rosemount 3095 MultiVariable™ Mass Flow Transmitter
Accurately measures differential pressure, static pressure and process temperature to dynamically calculate fully compensated mass flow.

Rosemount 304, 305, and 306 Integral Manifolds
Factory-assembled, calibrated and seal-tested manifolds reduce on-site installation costs.

Rosemount 1199 Diaphragm Seals
Provides reliable, remote measurements of process pressure and protects the transmitter from hot, corrosive, or viscous fluids.

Annubar Flowmeter Series: Rosemount 3051SFA, 3095MFA, and 485
The state-of-the-art, fifth generation Rosemount 485 Annubar combined with the 3051S or 3095MV MultiVariable transmitter creates an accurate, repeatable and dependable insertion-type flowmeter.

Compact Orifice Flowmeter Series: Rosemount 3051SFC, 3095MFC, and 405
Compact Orifice Flowmeters can be installed between existing flanges, up to a Class 600 (PN100) rating. In tight fit applications, a conditioning orifice plate version is available, requiring only two diameters of straight run upstream.

Integral Orifice Flowmeter Series: Rosemount 3051SFP, 3095MFP, and 1195
These integral orifice flowmeters eliminate the inaccuracies that become more pronounced in small orifice line installations. The completely assembled, ready to install flowmeters reduce cost and simplify installation.

Orifice Plate Primary Element Systems: Rosemount 1495 and 1595 Orifice Plates, 1496 Flange Unions and 1497 Meter Sections
A comprehensive offering of orifice plates, flange unions and meter sections that is easy to specify and order. The 1595 Conditioning Orifice provides superior performance in tight fit applications.

Specifications

Functional Specifications

Service

Liquid, gas, vapor, and high-viscosity applications

Ranges

Ranges	Min. Span	URL/Max. Span. Sensor Limit
1	1.5 psi (103 mbar)	30 psi (2,06 bar)
2	7.5 psi (517 mbar)	150 psi (10,34 bar)
3	40 psi (2,76 bar)	300 psi (20,68 bar)

Output

4–20 mA dc/Digital HART Protocol

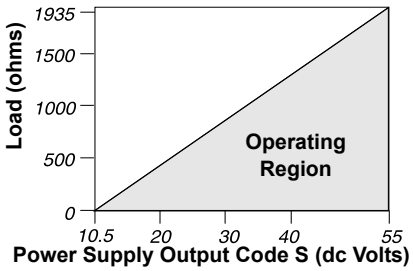
Rangedown

20:1

Load Limitations

Reverse polarity protection is standard. Maximum loop resistance is determined by the power supply voltage as described by the following equation:

Max. Loop Resistance = 43.5 (Power Supply Voltage – 10.5)



(1) For hazardous location approvals, power supply must not exceed 36 V.

Zero Elevation and Suppression

Zero can be suppressed between atmosphere (2090PG), or 0 psia (2090PA) and upper range limit, provided the calibrated span is equal to or greater than the minimum span, and the upper range value does not exceed the upper range limit. No vacuum calibrations are allowed on the 2090P.

Overpressure Limits

Range 1: 120 psig

Range 2: 300 psig

Range 3: 1,600 psig

Temperature Limits

Process: Codes A & C: –40 to 250 °F (–40 to 121 °C)

Codes D & G: –4 to 250 °F (–20 °C to 121 °C)

Ambient: All Codes: –4 to 185 °F (–20 to 85 °C)

Storage: All Codes: –50 to 185 °F (–46 to 85 °C)

Process temperatures above 185 °F (85 °C) require derating the ambient limits by a 1.5:1 ratio.

$$\textbf{Maximum Ambient Temperature in °F} = 185 - \frac{(\text{Process Temp} - 185)}{1.5}$$

$$\textbf{Maximum Ambient Temperature in °C} = 85 - \frac{(\text{Process Temp} - 85)}{1.5}$$

Humidity Limits

0–100% relative humidity

Volumetric Displacement

Less than 0.00042 cm^3

Turn-on Time

2.0 seconds, no warm-up required

Failure Alarm

If self-diagnostics detect a sensor or microprocessor failure, the analog signal is driven either high or low to alert the user. High or low failure mode is user-selectable with a jumper on the transmitter. The values to which the transmitter drives its output in failure mode depend on whether it is factory-configured to *standard* or *NAMUR-compliant* operation. The values for each are as follows:

Standard Operation

Linear Output: $3.9 \leq I \leq 20.8$
Fail High: $I \geq 21.75$ mA
Low: $I \leq 3.75$ mA

NAMUR-Compliant Operation

Linear Output: $3.8 \leq I \leq 20.5$
Fail High: $I \geq 22.5$ mA
Low: $I \leq 3.6$ mA

Transmitter Security

Activating the transmitter security function prevents changes to the transmitter configuration, including local zero and span adjustments. Security is activated by an internal jumper.

Performance Specifications

(Zero-based spans, reference conditions, and 316 SST isolating diaphragm.)

Reference Accuracy

±0.20% of calibrated span. Includes combined effects of linearity, hysteresis, and repeatability.

Ambient Temperature Effect per 100 °F (56 °C)

±(0.3% URL + 0.3% of span) from –40 to 185 °F (–40 to 85 °C)

Stability

±0.10% of upper range limit for 12 months

Time Response

Less than 200 ms time constant (63.2% response to a step change in pressure).

Vibration Effect

Less than ±0.1% of upper range limit when subjected to vibration of peak to peak constant displacement of 4 mm (5–15 Hz) and constant acceleration of 2 g (15–150 Hz) and 1 g (150–2000 Hz).

Power Supply Effect

Less than 0.01% of calibrated span per volt

Mounting Position Effect

Zero shift of up to 1.2 inH_2O (0.003 bar), which can be calibrated out. No span effect.

RFI Effect

Less than ±0.25% of upper range limit from 20–1000 MHz at 30 V/m with leads in conduit. Less than ±0.25% of upper range limit from 20-1000 MHz at 10 V/m with unshielded twisted pair (no conduit).

Physical Specifications

Electrical Connection

$^1/_2$–14 NPT, M20 × 1.5 (CM20), or PG 13.5 conduit entry

Process Wetted Parts

Isolating Diaphragm

316L stainless steel

Process Connector

316L stainless steel

Process Connection Size

$1^1/_2$ –11.5 NPT or 1-in. Flush Mount

Process Connector Gasket ($1^1/_2$-in.)

TFE

Process Connection O-rings (1-in.)

Standard: Viton®. Optional: Buna-N or Ethylene propylene

Non-wetted Parts

Electronics Housing

Low-copper aluminum, NEMA 4X, IP65, IP67, CSA enclosure Type 4X

Paint

Polyurethane

Cover O-rings

Buna-N

Fill Fluid

Silicone oil

Weight

Approximately 2.96 lb (1.34 kg)

Product Certifications

Approved Manufacturing Locations

Rosemount Inc. — Chanhassen, Minnesota, USA

Emerson Process Management GmbH & Co. — Wessling, Germany

Emerson Process Management Asia Pacific Private Limited — Singapore

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

European Union Directive Information

The EC declaration of conformity for all applicable European directives for this product can be found on the Rosemount website at www.rosemount.com. A hard copy may be obtained by contacting our local sales office.

ATEX Directive (94/9/EC)

Emerson Process Management complies with the ATEX Directive.

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

2088/2090 Pressure Transmitters
— Sound Engineering Practice

Electro Magnetic Compatibility (EMC) (89/336/EEC)

All 2088/2090 Smart Pressure Transmitter:
EN 61326-1:1997 with Amendments A1, A2, and A3

Ordinary Location Certification for Factory Mutual

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

Hazardous Locations Certifications

North American Certifications

Factory Mutual (FM) Approvals

E5 Explosion-Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition-Proof for Class II, Division 1, Groups E, F, G, Class III, Division 1, indoor and outdoor (NEMA 4X) hazardous locations; factory sealed.

I5 Intrinsically safe for use in Class I, Division 1, Groups A, B, C, D; Class II, Division 1, Groups E, F, and G; and Class III, Division 1 when connected in accordance with Rosemount drawing 02088-1018. Non-incendive for Class I, Division 2, Groups A, B, C, and D.
For input parameters see control drawing 02088-1018.

Canadian Standards Association (CSA)

C6 Explosion-Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition-Proof for Class II, Division 1, Groups E, F, G, Class III, indoor and outdoor hazardous locations. CSA enclosure Type 4X; factory sealed. Suitable for Class I, Division 2, Groups A, B, C, and D.

Intrinsically Safe for Class I, Division 1, Groups A, B, C, and D. Temp. Code T3C. Intrinsically safe when connected with approved barriers in accordance with Rosemount drawing 02088-1024.
For input parameters see control drawing 02088-1024.

European Certifications

I1 ATEX Intrinsically Safe
Certificate No.: BAS00ATEX1166X ⟨Ex⟩ II 1 G
EEx ia IIC T5 (T_{amb} = –55 to 40 °C)
EEx ia IIC T4 (T_{amb} = –55 to 70°C)
CE 1180

TABLE 1. Input Parameters

Loop/Power	Input Type
U_i = 30 V dc	Smart
I_i = 200 mA	Smart
P_i = 0.9 W	Smart
C_i = 0.012 μF	Smart

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

N1 ATEX Type n
Certification No.: BAS00ATEX3167X ⟨Ex⟩ II 3 G
EEx nL IIC T5 (T_a = -40 °C to 70 °C)
U_i = 50 V dc max
CE

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

ND ATEX Combustible Dust
Certificate No.: BAS01ATEX1427X ⟨Ex⟩ II 1 D
T105°C (T_{amb} = -20°C to 85°C)
IP66
CE 1180
Vmax = 36 V dc Max
I_i = 24 mA

Special Conditions for Safe Use (x):
1. The user must ensure that the maximum rated voltage and current (36 volts, 24 mA, D.C.) are not exceeded. All connections to other apparatus or associated apparatus shall have control over this voltage and current equivalent to a category “ib” circuit according to EN50020.
2. Cable entries must be used which maintain the ingress protection of the enclosure to at least IP66.
3. Unused cable entries must be filled with suitable blanking plugs which maintain the ingress protection of the enclosure to at least IP66.
4. Cable entries and blanking plugs must be suitable for the ambient range of the apparatus and capable of withstanding a 7J impact test.
5. The 2088/2090 sensor module must be securely screwed in place to maintain the ingress protection of the enclosure.

ED ATEX Flame-Proof
Certification No.: KEMA97ATEX2378 ⟨Ex⟩ II 1/2 G
EEx d IIC T6 (T_a = -20 °C to 40°C)
EEx d IIC T4 (T_a = -20 °C to 80 °C)
CE 1180
Vmax = 36 (with Smart output option)
Vmax = 14 (with low power output option)

Combinations of Certifications

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

KB Combination of E5, I5, and C6

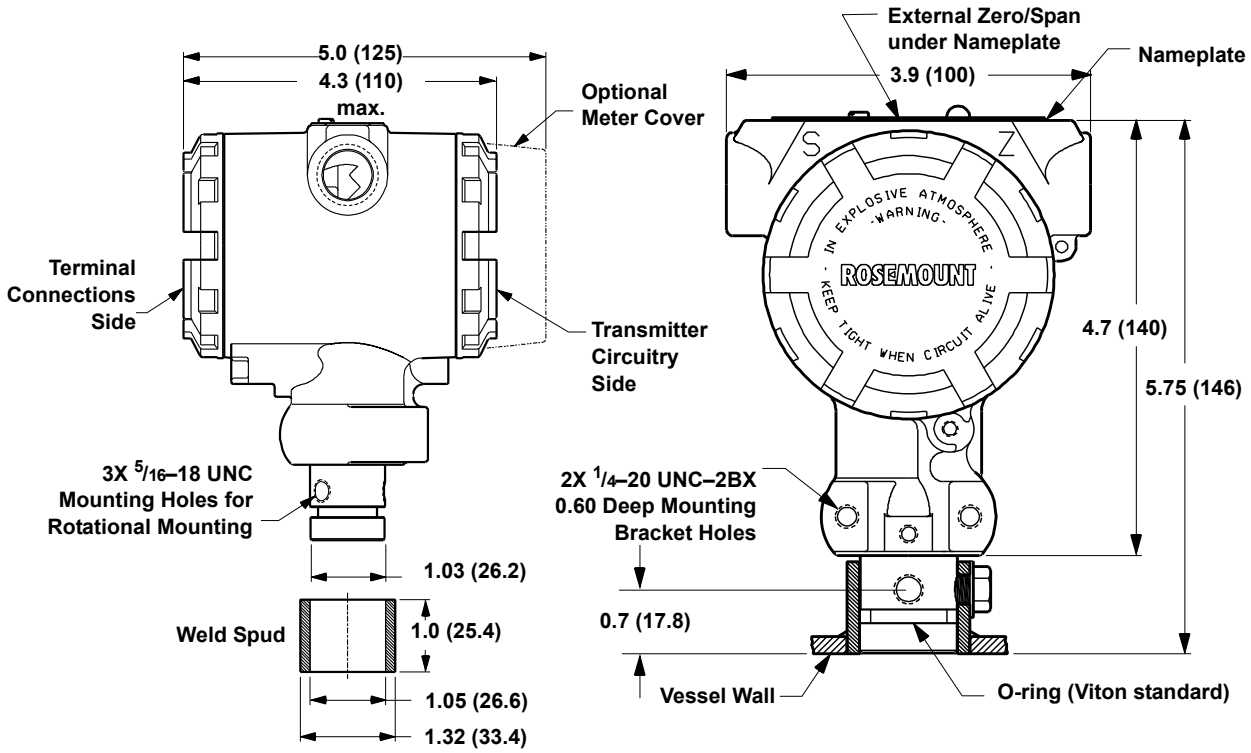
KH Combination of E5, I5, and I1

K5 Combination of E5 and I5

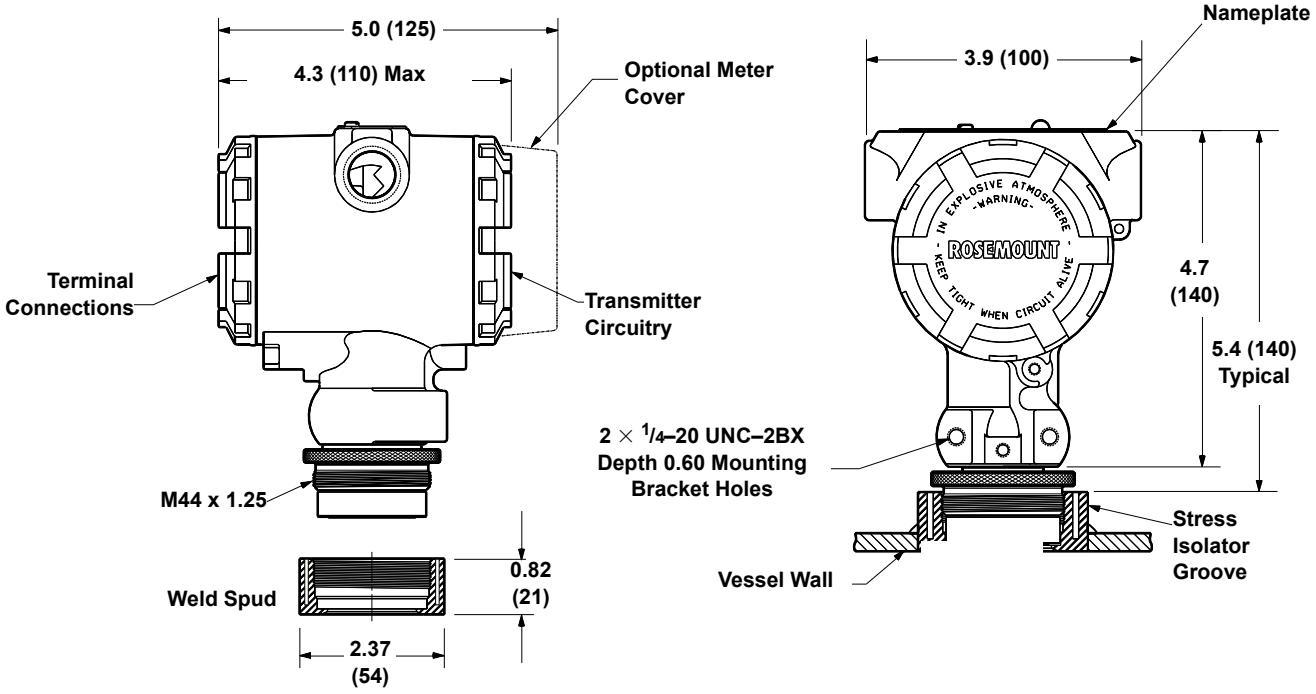
K6 Combination of C6, I1, and ED

Dimensional Drawings

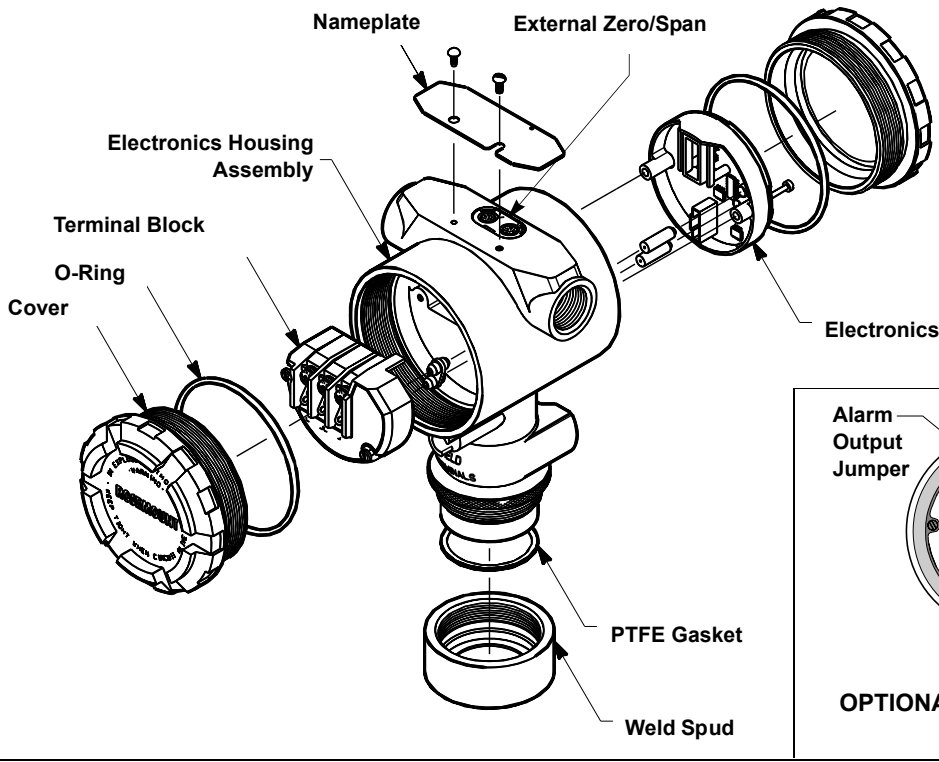
Rosemount 2090P One-inch Flush Mount

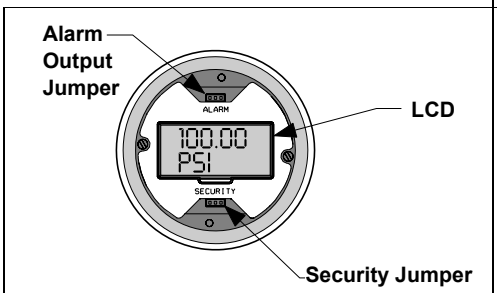


Rosemount 2090P 1 1/2 inch Flush Mount

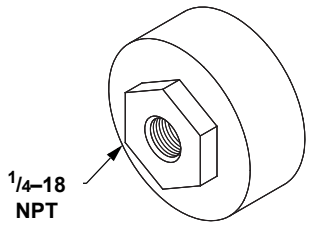
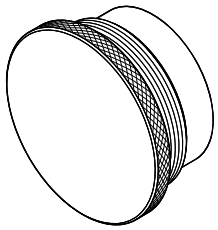
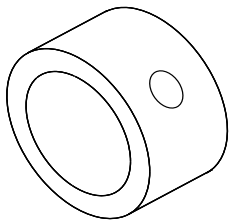


Rosemount 2090P 1 1/2 inch Flush Mount Exploded View and Optional LCD Display





OPTIONAL SMART LCD DISPLAY

Calibration Adapter(1)	316 SST Plug/Heat Sink for Process Connection Codes A and C	Weld Spud for Process Connection Codes D and G
		

Note: See "Accessories" on page 11 for part numbers.

(1)See ordering information

Ordering Information

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

Model	**Product Description**			
2090P	Flush Mount Pressure Transmitter			
Transmitter Type				
Standard				**Standard**
A	Absolute			★
G	Gage			★
Pressure Ranges				
	Range	**Minimum Span**	**URL/Max. Span Sensor Limit**	
Standard				**Standard**
1	0–30 psi (0–2 bar)	1.5 psi (103 mbar)	30 psi (2,06 bar)	★
2	0–150 psi (0–10.3 bar)	7.5 psi (517 mbar)	150 psi (10,34 bar)	★
3	0–300 psi (0–20.7 bar)	40 psi (2,76 bar)	300 psi (20,68 bar)	★
Output				
Standard				**Standard**
S	4–20 mA dc/Digital HART Protocol			★
Material of Construction				
	Process Connection	**Isolating Diaphragm**	**Oil Fill**	
Standard				**Standard**
22	316L SST	316L SST	*Silicone*	★
Process Connection				
Standard				**Standard**
A	1 1/2-in. Threaded, No Weld Spud, 1 1/2-in. PTFE Gasket			★
C	1 1/2-in. Threaded, 316L SST Weld Spud with Stress Isolation and PTFE Gasket			★
D	1-in. Flush Mount			★
G	1-in. Flush Mount with weld-on nipple			★
Conduit Entry				
Standard				**Standard**
1	1/2–14 NPT			★
2	M20 × 1.5 (CM 20)			★
OPTIONS				
Digital Display				
Standard				**Standard**
M5	LCD display, scaled 0-100%			★
M7	LCD display, special configuration			★
Mounting Brackets				
Standard				**Standard**
B4	SST mounting bracket with SST Bolts			★
Product Certifications				
Standard				**Standard**
E5	FM Explosion-Proof, Dust Ignition-proof			★
ED	ATEX Flameproof			★
I5	FM Intrinsically safe, Division2			★
K5	FM Explosion-Proof, Dust Ignition-proof, Intrinsically Safe, Division 2			★
I1	ATEX Intrinsic Safety			★
N1	ATEX Type n			★
C6	CSA Explosion-Proof, Intrinsically Safe, and Non-incendive			★
KB	FM and CSA Explosion-Proof, Dust Ignition-proof, Intrinsically Safe, Division 2			★
KH	FM Approvals and ATEX Explosion-Proof and Intrinsically Safe			★
ND	ATEX Dust			★
NK	IECEx Dust			★
K7	I7, N7, E7 & NK Combination			★

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

K1	I1, N1, ED & ND Combination	★
K6	CSA Explosion-Proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
Terminal Blocks		
Standard		**Standard**
T1	Transient Protection	★
Special Certificate		
Standard		**Standard**
Q4	Calibration Certificate	★
Alarm Limit		
Standard		**Standard**
C4	NAMUR alarm and saturation levels, high alarm	★
CN	NAMUR alarm and saturation levels, low alarm	★
Wetted O-ring Material		
Standard		**Standard**
W2	Buna-N	★
W3	Ethylene-Propylene	★
Special Procedures		
Expanded		
P2	Cleaning for Special Service	
Calibration Accuracy		
Standard		**Standard**
P8	0.1% Accuracy to 10:1 Turndown	★
P Specials		
Standard		**Standard**
PXXXX	Special that need to be created	★
Typical Model Number: 2090PG 2 S 22 A 1		

Standard Configuration

Unless otherwise specified, transmitter is shipped as follows:

- Engineering units: psi
- 4 mA: 0 psi
- 20 mA: Upper Range Limit
- Alarm Output High
- LCD Display: 0–100%

Custom Configuration

Calibration

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

Tagging

The transmitter will be tagged, at no charge, in accordance with customer requirements. All tags are stainless steel. The standard tag is wired to the transmitter. Tag character height is 1/8 in. (0.318 cm). A permanently attached tag is available upon request.

Accessories

Item Description	Part Number
Calibration Adapter (1) Use to connect a calibration device to a transmitter. (See the dimensional drawing of the Calibration Adapter)	02088-0197-0001
316 SST Plug/Heat Sink(1) Use during installation to prevent welding damage. (See the drawing of the 316 SST Plug/Heat Sink).	02088-0196-0001
1-in. Flush Mount Calibration Adapter(2) Use to connect a calibration device to the 1” Flush Mount. (See the drawing of the Calibration Adapter)	02088-0198-0002
1-in. Flush Mount Weld Spud (2) (See the drawing of the Weld Spud)	02088-0285-0001
1 1/2-in. Threaded Weld Spud Kit Includes PTFE O-ring.	02088-0295-0003

(1) Process Connection Codes A and C only.

(2) Process Connection Codes D and G only.

Emerson Process Management

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Enquiries@AP.EmersonProcess.com

EMERSON™
Process Management

Product Data Sheet
00813-0100-4716, Rev MA
April 2010

Rosemount 3095 *MultiVariable*™ Mass Flow Transmitter and Flowmeters

THE PROVEN LEADER IN MULTIVARIABLE MASS FLOW MEASUREMENT.

- *1.0% Mass Flow rate accuracyover 10:1 Flow Range*
- *Ten year stability under actual process conditions*
- *Unprecedented reliability backed by a limited 12-year warranty*
- *Four variables in one device*
- *"Real-Time" fully-compensated Mass Flow*
- *Coplanar™ platform enables DP Flowmeters*

Contents

The Leader in *MultiVariable* Mass Flow Measurement.

Rosemount delivers a tradition of excellence and technology leadership, featuring the state-of-the-art Rosemount 3095 *MultiVariable* Mass Flow transmitter. The Rosemount 3095 delivers four measurements from one *coplanar* device with unmatched operating performance, including dynamic fully compensated mass flow. Engineered to combine best products with best installation practices, the Rosemount 3095 enables a complete offering of DP Flowmeters.

1.0% of Mass Flow rate accuracy over 10:1 flow range

Enabled by superior sensor technology and engineered for optimal flow performance, the Rosemount 3095 delivers unprecedented ±0.05% of DP reading reference accuracy, resulting in mass flow accuracy of ±1.0% over 10:1 flow range. Superior performance means reduced variability and improved plant safety.

Ten year stability of ±0.25%

Through aggressive testing, the Rosemount 3095 has proven its ability to maintain unprecedented performance under the most demanding conditions. Superior transmitter stability decreases calibration frequency for reduced maintenance and operation costs.

Unprecedented reliability backed by a limited 12-year warranty

Further enhance installation practices with the most reliable platform supported by a 12-year warranty.

Four variables in one device

The advanced Rosemount 3095 measures three process variables simultaneously and dynamically calculates “real-time” fully compensated mass flow. One transmitter means reduced process penetrations, inventory and installation costs.

“Real-Time” fully-compensated mass flow

Fully compensated mass flow reduces sources of traditional DP flow uncertainty. Rosemount 3095 calculates Mass Flow by measuring process pressure and temperature to perform ‘real-time’ calculation of all flow equation parameters including density, viscosity, velocity, Reynolds number, beta ratio, discharge coefficient, velocity of approach, and the gas expansion factor. Superior flow calculations yield more accurate measurements to reduce variability and increase profitability.

Coplanar platform enables DP flowmeters

The flexible *coplanar* platform allows integration with the complete offering of Rosemount primary elements for any flow application. The solution arrives factory calibrated, pressure-tested, and ready to install right out of the box. Only Rosemount has a scalable *coplanar* transmitter design to reduce engineering and inventory costs.

Advanced *PlantWeb* functionality

From multiple process variable generation to advanced compensated Mass Flow functionality and highly integrated flowmeter solutions, the 3095 reduces operational and maintenance expenditures while improving throughput and utilities management.

Rosemount DP-Flow Solutions

Rosemount 3051S Series of Instrumentation
Scalable pressure, flow, and level measurement solutions improve installation and maintenance practices.

Rosemount Manifolds
The Rosemount 3095 can be pre-assembled to a manifold at the factory, resulting in an integrated assembly that is easier to order, install, operate, and maintain. Refer to document 00813-0100-4733 for more information.

Rosemount 1199 Diaphragm Seals
Provides reliable, remote measurements of process pressure and protects the transmitter from hot, corrosive, or viscous fluids.

Rosemount 1495, 1496, and 1595 Orifice Plate Primary Element Systems
A comprehensive offering of orifice plates, flange unions and meter sections that is easy to specify and order. The 1595 Conditioning Orifice provides superior performance in tight fit applications.

Rosemount 3051SFA, 3095MFA, 485, Annubar® Series
The state-of-the-art, fifth generation Rosemount 485 Annubar combined with the 3051S, 3051SMV or 3095 MultiVariable transmitter creates an accurate, repeatable and dependable insertion-type flowmeter.

Rosemount 3051SFC, 3095MFC, and 405 Compact Orifice Series
Compact Orifice Flowmeters can be installed between existing flanges, up to a Class 600 (PN100) rating. In tight fit applications, a conditioning orifice plate version is available, requiring only two diameters of straight run upstream and two diameters downstream.

Rosemount 3051SFP, 3095MFP, and 1195 Integral Orifice Plase Series
These Integral Orifice Flowmeters eliminate the inaccuracies that become more pronounced in small orifice line installations. The completely assembled, ready to install flowmeters reduce cost and simplify installation.

Rosemount 3095M MultiVariable Mass Flow Transmitter

3095M SPECIFICATIONS

3095M Functional Specifications

Service

Gas, liquid, or steam

Differential Sensor

Limits

- Range 1: –25 to 25 inH2O (–0,062 to 0,062 bar)
- Range 2: –250 to 250 inH2O (–0,622 to 0,622 bar)
- Range 3: –1000 to 1000 inH2O (–2,49 to 2,49 bar)

Absolute Sensor

Limits

- Range 3: 0.5 to 800 psia (3,447 to 5516 kPa)
- Range 4: 0.5 to 3,626 psia (3,447 to 25000 kPa)

Gage Sensor

Limits

- Range C: 0 to 800 psig (0 to 5516 kPa)
- Range D: 0 to 3,626 psig (0 to 25000 kPa)

Temperature Sensor

Process Temperature Range

- –300 to 1500 °F (–184 to 816 °C)

Fixed Temperature Range

- –459 to 3500 °F (–273 to 1927 °C)

Overpressure Limit

0.5 psia (3,447 kPa) to two times the static pressure sensor range up to a maximum of 3,626 psia (25000 kPa) for differential pressure ranges 2-3 and 2000 psia (13790 kPa) for differential pressure range 1.

Static Pressure Limit

Operates within specifications between static line pressures of 0.5 psia (3,45 kPa) and the URL of the absolute pressure sensor.

Temperature Limits

Process (at transmitter isolator flange for atmospheric pressures and above)

- Silicone fill: –40 to 250 °F (–40 to 121 °C)
- Inert fill: 0 to 185 °F (–18 to 85 °C) (Process temperature above 185 °F (85 °C) require derating the ambient limits by a 1.5:1 ratio.)

Ambient:

- -40 to 185 °F (-40 to 85 °C)
- With LCD Display(1): -40 to 175 °F (-40 to 80 °C)

Storage:

- -50 to 230 °F (-46 to 110 °C)
- With LCD Display: -40 to 185 °F (-40 to 85 °C)

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

Damping

Analog output response to step input change can be user-selectable from 0 to 29 seconds for one time constant.

4–20 mA (output option code A)

Zero and Span Adjustment

Zero and span values can be set anywhere within the range. Span must be greater than or equal to the minimum span.

Output

Two-wire 4–20 mA, user-selectable for DP, AP, GP, PT, mass flow, or totalized flow. Digital HART protocol superimposed on 4–20 mA signal, available to any host that conforms to the HART protocol.

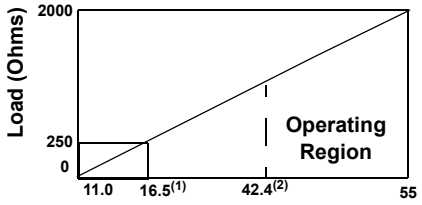
Power Supply

External power supply required. Transmitter operates on terminal voltage of 11–55 V dc.

Load Limitations

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

$$\text{Maximum Loop Resistance} = \frac{\text{Power Supply} - 11.0}{0.022}$$



(1) HART protocol communication requires a loop resistance value between 250-1100 ohms, inclusive.

(2) For CSA approval, power supply must not exceed 42.4 V dc.

FOUNDATION fieldbus (output option code V)

Power Supply

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

Current Draw

17.5 mA for all configurations (including LCD Display option)

Humidity Limits

0–100% relative humidity

Turn-on Time

Digital and analog measured variables will be within specifications 7–10 seconds after power is applied to transmitter.

Digital and analog flow output will be within specifications 10–14 seconds after power is applied to transmitter.

Failure Mode Alarm

Output Code A

If self-diagnostics detect a non-recoverable transmitter failure, the analog signal will be driven either below 3.75 mA or above 21.75 mA to alert the user. High or low alarm signal is user-selectable by internal jumper pins.

Output Code V

If self-diagnostics detect a gross transmitter failure, that information gets passed as a status along with the process variable(s).

Configuration

375 or 475 HART Hand-held Communicator

- Performs traditional transmitter maintenance functions

3095 Multivariable Engineering Assistant (EA) software package

- Contains built-in physical property database
- Enables mass flow configuration, maintenance, and diagnostic functions via HART modem (output option code A)
- Enables mass flow configuration via PCM-CIA Interface for FOUNDATION fieldbus (output option code V)

Primary Elements

Supports over 25 different primary elements including:

- *Annubar* Averaging Pitot Tube
- Rosemount 1195 Integral Orifice Plate
- Rosemount 405 Compact and Conditioning Orifice
- ISO/ASME Orifice Flange Taps
- Calibrated and Custom Primary Elements
- ISO/ASME Corner Taps
- AGA Flange Taps
- ISO/ASME Venturi
- ISO/ASME Venturi Nozzle
- Area Averaging Meter
- V-Cone

Physical Properties Database

- Maintained in Engineering Assistant Software Configurator
- Physical properties for over 110 fluids
- Natural gas per AGA
- Steam and water per ASME
- Other database fluids per American Institute of Chemical Engineers (AIChE)
- Optional custom entry

FOUNDATION fieldbus Function Blocks

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.

5 Analog Input Blocks

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

PID Block with Auto-tune

- Contains all logic to perform PID control in the field including cascade and feedforward. Auto-tune capability allows for superior tuning for optimized control performance.

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 Bock

- 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.

Output Splitter Block

- Splits the output of one PID or other control block so that the PID will control two valves or other actuators.

Control Selector Block

- Selects one of up to three inputs (highest, middle, or lowest) that are normally connected to the outputs of PID or other control function blocks.

Steam Flow Calculations

Steam densities calculated per ASME steam tables.

Saturated steam configurable using static pressure based density calculations.

Natural Gas Flow Calculations

Flow calculations per 1992 AGA (American Gas Association) Report No 3 or ISO-5167 (2003).

Compressibilty Calculations per AGA Report No 8 or ISO-12213.

3095M Performance Specifications

(Zero-based spans, reference conditions, silicone oil fill, 316 SST isolating diaphragms, 4–20 mA analog output.)

Specification Conformance

The Rosemount 3095 maintains a specification conformance of measured variables to at least 3σ.

Mass Flow

Fully compensated for pressure, temperature, density, viscosity gas expansion, discharge coefficient, and thermal correction variances over operating range.

$$Q_m = NC_d E Y_1 d^2 \sqrt{DP(\rho)}$$

Ultra for Flow: Mass Flow Reference Accuracy (option U3)(1)

- ±1.0% of Mass Flow Rate over a 10:1 flow range (100:1 DP range for liquids and gases)

Mass Flow Reference Accuracy

- ±1.0% of Mass Flow Rate over 8:1 flow range (64:1 DP range for liquids and gases)

Totalized Mass Flow

- ±1.0% of Total Mass Flow

(Uncalibrated differential producer (Orifice) installed per ASME MFC3M or ISO 5167-1. Uncertainties for discharge coefficient, producer bore, tube diameter, and gas expansion factor defined in ASME MFC3M or ISO 5167-1. Density uncertainty of 0.1%. Differential pressure calibrated at up to 1/10th full scale for optimum flow accuracy/rangeability.)

Differential Pressure

Range 1

- 0–0.5 to 0–25 inH2O (0–1,25 to 0–62,3 mbar) (50:1 rangeability is allowed)

Range 2

- 0–2.5 to 0–250 inH2O (0–6,22 to 0–622,7 mbar) (100:1 rangeability is allowed)

Range 3

- 0–10 to 0–1000 inH2O (0–0,249 to 0–2,49 bar) (100:1 rangeability is allowed)

Reference Accuracy (including Linearity, Hysteresis, Repeatability)(2)

Range 2-3 Ultra for Flow (Option U3)(1)

- ±0.05% of DP reading up to 3:1 DP turndown from URL
- For DP turndowns up to 100:1 from URL,

$$\text{Accuracy} = \pm\left[0.05 + 0.0145\left(\frac{URL}{DPReading}\right)\right] \text{\% of DP Reading}$$

Accuracy = Range 2-3

- ±0.075% of span for spans from 1:1 to 10:1 of URL
- For spans less than 10:1 of URL,

$$\text{Accuracy} = \pm\left[0.025 + 0.005\left(\frac{URL}{Span}\right)\right] \text{ \% of Span}$$

Range 1

- ±0.10% of span for spans from 1:1 to 15:1 of URL
- For spans less than 15:1 of URL,

$$\text{Accuracy} = \pm\left[0.025 + 0.005\left(\frac{URL}{Span}\right)\right] \text{ \% of Span}$$

Ambient Temperature Effect per 50 °F (28 °C)

Range 2-3 Ultra for Flow (Option U3)(1)

- ±0.130% of DP reading up to 3:1 DP turndown from URL
- ±[0.05 + 0.0345 (URL/DP Reading)]% of DP reading up to 100:1 DP turndown from URL

Range 2-3

- ±(0.025% of URL + 0.125% of span) for spans from 1:1 to 30:1
- ±(0.035% of URL – 0.175% of span) for spans from 30:1 to 100:1

Range 1

- ±(0.20% of URL + 0.25% of span) for spans from 1:1 to 30:1
- ±(0.24% of URL +0.15% of span) for spans from 30:1 to 50:1

Static Pressure Effects

Range 2-3

- Zero error = ±0.05% of URL per 1,000 psi (68,9 bar)
- Span error = ±0.20% of DP Reading per 1,000 psi (68,9 bar)

Range 1

- Zero error = ±0.05% of URL per 800 psi (55,1 bar)
- Span error = ±0.40% of DP Reading per 800 psi (55,1 bar)

Stability

Range 2-3 Ultra for Flow (Option U3)(1)

- ±0.25% of URL for 10 years for ±50 °F (28 °C) temperature changes, up to 1000 psi (68,9 bar) line pressure

Ranges 2-3

- ±0.125% URL for 5 years for ±50 °F (28 °C) ambient temperature changes, and up to 1000 psi (68,9 bar) line pressure.

Range 1

- ±0.2% of URL for 1 year

Absolute/Gage Pressure

Absolute (100:1 rangeability allowed)

Range 3

0.5–8 to 0.5–800 psia (3,447–55,16 to 3,447–5516 kPa)

Range 4

0.5–36.26 to 0.5–3,626 psia (3,447–250 to 3,447–25000 kPa)

Gage (100:1 rangeability allowed)

Range C

0–8 to 0–800 psig (0–55,16 to 0–5516 kPa)

Range D

- 0–36.26 to 0–3,626 psig (0–250 to 0–25000 kPa)

Reference Accuracy (including Linearity, Hysteresis, Repeatability)

±0.075% of span for spans from 1:1 to 10:1 of URL
For spans less than 10:1 of URL,

$$\text{Accuracy} = \pm\left[0.03 + 0.0075\left(\frac{URL}{Span}\right)\right] \text{ \% of Span}$$

(1) Ultra for Flow (option U3) applicable for HART protocol, DP ranges 2 and 3 with SST isolator material and silicone fill fluid options only.

(2) For FOUNDATION fieldbus transmitters, use calibrated range in place of span.

Ambient Temperature Effect per 50 °F (28 °C)

±(0.050% of URL + 0.125% of span) spans from 1:1 to 30:1

±(0.060% of URL – 0.175% of span) spans from 30:1 to 100:1

Stability

±0.125% URL for 5 years for ±50°F (28 °C) ambient temperature changes, and up to 1000 psi (6,9MPa) line pressure.

Process Temperature

Specification for process temperature is for the transmitter portion only. Sensor errors caused by the RTD are not included. The transmitter is compatible with any PT100 RTD conforming to IEC 751 Class B, which has a nominal resistance of 100 ohms at 0 °C and $\propto$ = 0.00385. Examples of compatible RTDs include the Rosemount Series 68 and 78 RTD Temperature Sensors.

RTD Range

–300 to 1500°F (–184 to 816 °C)

Accuracy (including Linearity, Hysteresis, Repeatability)

For 12 and 24 ft. Cables

- ±1.0 °F (0.56 °C) for process temperatures from –300 to 1200 °F (–184 to 649 °C)
- For process temperatures above 1200 °F (649 °C), add ±1.0 °F (0.56 °C) per 100 °F (38 °C)

For 75 ft. cables:

- ±2.0 °F (1.12 °C) for process temperatures from –300 to 1200 °F (–184 to 649 °C)
- For process temperatures above 1200 °F (649 °C), add ±1.0 °F (0.56 °C) per 100 °F (38 °C)

Stability

±1.0 °F (0.56 °C) for 12 months

Vibration Effect

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).

3095M Physical Specifications

Security

Transmitter security jumper mounted on electronics board, when enabled prevents changes to transmitter configuration.

User Engineering Assistant provides two levels of optional password security

Electrical Connections

½–14 NPT, M20 × 1.5 (CM20), PG-13.5. HART interface connections fixed to terminal block for output code A.

RTD Process Temperature Input

100-ohm platinum RTD per IEC-751 Class B

Process Connections

Transmitter: ¼–18 NPT on $2^1/_8$-in. centers $^1/_2$–14 NPT on 2-, $2^1/_8$-, or $2^1/_4$-in. centers with optional flange adapters
RTD: RTD dependent.

Process Wetted Parts

Isolating Diaphragms

- 316L SST or Hastelloy C-276®. CF-8M (last version of 316 SST, material per ASTM-A743)

Drain/Vent Valves

- 316 SST or Hastelloy C-276

Flanges

- Plated carbon steel, 316 SST, or Hastelloy C-276

Wetted O-rings

- Glass-Filled PTFE

Non-Wetted Parts

Electronics Housing

- Low copper aluminum. NEMA 4X, CSA, Enclosure Type 4X, IP 65, IP 66, IP 68

Bolts

- Plated carbon steel per ASTM A449, Grade 5 or austenitic 316 SST

Fill Fluid

- Silicone or halocarbon inert oil (Inert oil only available for gage sensor modules.)

Paint (Aluminum Housing only)

- Polyurethane

O-rings

- Buna-N

Weight

Component	Weight in lb (kg)
Rosemount 3095 Transmitter	6.0 (2.7)
SST Mounting Bracket	1.0 (0.4)
12 ft (3.66 m) RTD Shielded Cable	0.5 (0.2)
12 ft (3.66 m) RTD Armored Cable	1.1 (0.5)
24 ft (7.32 m) RTD Shielded Cable	1.0 (0.4
24 ft (7.32 m) RTD Armored Cable	2.2 (1.0)
75 ft (22.86 m) RTD Shielded Cable	1.9 (0.9)
75 ft (22.86 m) RTD Armored Cable	7.2 (3.2)
21 in (53 cm) RTD Armored Cable	0.5 (0.2)
12 ft (3.66 m) RTD CENELEC Cable	2.1 (0.9)
24 ft (7.32 m) RTD CENELEC Cable	3.0 (1.4)
75 ft (22.86 m) RTD CENELEC Cable	7.1 (3.2)
21 in (53 cm) RTD CENELEC Cable	1.2 (0.5)
4 ft (1.22 m) RTD Shielded Cable	0.17 (.07)

Rosemount 3095M Product Certifications

ROSEMOUNT 3095M WITH HART

Approved Manufacturing Locations

Rosemount Inc. — Chanhassen, Minnesota USA

Emerson Process Management GmbH & Co. — Wessling, Germany

Emerson Process Management Asia Pacific Private Limited — Singapore

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

European Directive Information

The EC declaration of conformity for all applicable European directives for this product can be found on the Rosemount website at www.rosemount.com. A hard copy may be obtained by contacting our local sales office.

ATEX Directive (94/9/EC)

Emerson Process Management complies with the ATEX Directive.

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

3095F_2/3,4/D and 3095M_2/3,4/D Flow Transmitters — QS Certificate of Assessment - EC No. PED-H-100 Module H Conformity Assessment

All other 3095_ Transmitters/Level Controller — Sound Engineering Practice

Transmitter Attachments: Process Flange - Manifold — Sound Engineering Practice

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

3095 Flow Transmitters

— EN 61326-1:1997 – A1, A2, and A3

Ordinary Location Certification for Factory Mutual

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

Rosemount 3095M HART Hazardous Locations Certifications

North American Certifications

FM Approvals

A Explosion Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition Proof for Class II/Class III, Division 1, Groups E, F, and G. Enclosure Type 4X. Factory Sealed. Provides nonincendive RTD connections for Class I, Division 2, Groups A, B, C, and D.

J Intrinsically Safe for use in Class I, II and III, Division 1, Groups A, B, C, D, E, F, and G hazardous outdoor locations. Non-incendive for Class I, Division 2, Groups A, B, C, and D. Temperature Code T4. Factory Sealed.

For input parameters and installation see control drawing 03095-1010.

Canadian Standards Association (CSA)

C Explosion Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition Proof for Class II/Class III, Division 1, Groups E, F, and G. CSA enclosure Type 4X suitable for indoor and outdoor hazardous locations. Provides nonincendive RTD connection for Class I, Division 2, Groups A, B, C, and D.Factory Sealed. Install in accordance with Rosemount Drawing 03095-1024. Approved for Class I, Division 2, Groups A, B, C, and D.

K Intrinsically Safe for Class I, Division 1, Groups A, B, C, and D. when installed in accordance with Rosemount drawing 03095-1021. Temperature Code T3C.

For input parameters and installation see control drawing 03095-1021.

European Certifications

F ATEX Intrinsic Safety
Certificate Number: BAS98ATEX1359X ⟨Ex⟩ II 1 G
EEx ia IIC T5 (T_{amb} = –45 °C to 40 °C)
EEx ia IIC T4 (T_{amb} = –45 °C to 70 °C)
CE 1180

TABLE 1. Connection Parameters
(Power/Signal Terminals)

U_i = 30V
I_i = 200 mA
P_i = 1.0 W
C_i = 0.012 µF
L_i = 0

TABLE 2. Temperature Sensor Connection Parameters

U_o = 30V
I_o = 19 mA
P_o = 140 mW
C_i = 0.002 µF
L_i = 0

TABLE 3. Connection Parameters for Temperature Sensor Terminals

C_o = 0.066 µF	Gas Group IIC
C_o = 0.560 µF	Gas Group IIB
C_o = 1.82 µF	Gas Group IIA
L_o = 96 mH	Gas Group IIC
L_o = 365 mH	Gas Group IIB
L_o = 696 mH	Gas Group IIA
L_o/R_o = 247 µH/ohm	Gas Group IIC
L_o/R_o = 633 µH/ohm	Gas Group IIB
L_o/R_o= 633 µH/ohm	Gas Group IIA

Special Conditions for Safe Use

The 3095, when fitted with the transient terminal block (order code B), are not capable of withstanding the 500 volts insulation test required by EN 60079-11: 2007, Clause 6.3.12. This condition must be accounted for during installation.

G ATEX Type n

Certificate Number: BAS98ATEX3360X ⟨Ex⟩ II 3 G

EEx nL IIC T5 (T_{amb} = –45 °C to 40 °C)
EEx nL IIC T4 (T_{amb} = –45 °C to 70 °C)

U_i = 55V

CE

The apparatus is designed for connection to a remote temperature sensor such as a resistance temperature detection (RTD)

Special Conditions for Safe Use

The 3095, when fitted with the transient terminal block (order code B), are not capable of withstanding the 500 volts insulation test required by EN50 021, Clause 9.1 (1995). This condition must be accounted for during installation.

H ATEX Flameproof

Certificate Number: KEMA02ATEX2320X ⟨Ex⟩ II 1/2 G
EEx d IIC T5 (-50°C ≤ T_{amb} ≤ 80°C)
T6 (-50°C ≤ T_{amb} ≤ 65°C)

CE 1180

Special Conditions for Safe Use (x):

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.

P ATEX Dust

Certificate Number: KEMA02ATEX2321 ⟨Ex⟩ II 1 D T 90°C
V = 55 Vdc MAX
I = 23 mA MAX
IP66
CE 1180

IECEx Certifications (HART)

4 IECEx Intrinsic Safety
Certificate Number: IECEx BAS06.0070X
Ex ia IIC T4 (-45°C ≤ T_a ≤ 70°C)
Ex ia IIC T5 (-45°C ≤ T_a ≤ 40°C)

TABLE 4. Input Parameters

HART I.S.		
U_i = 30Vdc		
I_i = 200 mAdc		
P_i = 1.0 W		
C_i = 12 nF		
L_i = 0		

TABLE 5. RTD Terminals Entity Parameters

U_o = 30Vdc
I_o = 19 mAdc
P_o = 140 mW

The capacitance and either the Inductance or the Inductance to Resistance Ratio (L/R) of the load connected to the 4-pin connector must not exceed the following values:

Group	Capacitance (µF)	Inductance (mH)	or L/R Ratio µH/Ohm
IIC	0.066	96	247
IIB	0.56	365	633
IIA	1.82	696	633

NOTE
1. The external circuit contains no combined lumped inductance and capacitance greater than 1% of the above values.
Or 2. The inductance and capacitance are distributed as in a cable.
Or 3. The external circuit contains only lumped inductance or only lumped capacitance in combination with a cable.
In all other situations e.g. combined lumped inductance and capacitance, up to 50% of each of L and C values is allowed.

Conditions of Certification (X):

When fitted with the transient option, the apparatus is not capable of withstanding the 500V electrical strength test as defined in Clause 6.4.12 of IEC 60079-11: 1999. This must be taken into account during installation.

5 IECEx Type n
Certificate Number: IECEx BAS06.0071X
Ex nA nL IIC T4 (-45°C ≤ T_a ≤ 70°C)
Ex nA nL IIC T5 (-45°C ≤ T_a ≤ 40°C)
U_i = 55V dc max

Conditions of Certification (X):
When fitted with the transient option, the apparatus is not capable of withstanding the 500V electrical strength test as defined in Clause 6.8.1 of IEC 60079-15: 2005. This must be taken into account during installation.

7 IECEx Flameproof
Certificate Number: IECEx KEM 06.0018
Zone 0/1 Ex d IIC T6 (-20°C ≤ T_a ≤ 65°C)
Zone 0/1 Ex d IIC T5 (-20°C ≤ T_a ≤ 80°C)
V_{max} = 55 Vdc
I_{max} = 23 mAdc

8 IECEx Dust
Certificate Number: IECEx KEM 06.0018
Ex tD A22 T90°C
IP66

INMETRO Certifications

E INMETRO Flameproof
BR-Ex d IIC T6/T5

China (NEPSI) Certifications

2 China Intrinsic Safety
Ex ia IIC T4

Special conditions for safe use (x)

1. The ambient temperature range is (-20 ~ +60) °C.
2. The relation between temperature class and maximum temperature of process medium is as following.

Maximum Temperature of Process Medium (°C)	Temperature Class
121	T4
95	T5
80	T6

3. The earth connection facility in the enclosure should be connected reliably.
4. During installation, use and maintenance of transmitter, observe the warning, “Don’t open the cover when the circuit is alive.”
5. During installation, there should be no mixture harm to flameproof housing.
6. Cable entry, certified by NEPSI with type of protection Ex d IIC in accordance with GB3836.2-2000, should be applied when installation in hazardous location. Five full threads should be in engagement when the cable entry is assembled onto the transmitter.
7. 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.
8. Maintenance should be done in non-hazardous location.
9. End users is not permitted to change any components insides.
10. 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 contruction and acceptance of electric device for explosion atmospheres and fire hazard electrical equipment installation engineering”

3 China Flameproof
Ex d II B+H_2T4~T6

Special conditions for safe use (x)

1. 3095 Series transmitter with temperature sensor have **not** been certified.
2. The temperature of process medium should be less than 121 °C.
3. The ambient temperature range is (-40~+60) °C.
4. Safety parameters
4.1 Input parameters
4.1.1 Transmitter with output code “V”
U_i = 30V I_i = 300 mA P_i = 1.3W $C_i \approx 0$ $L_i \approx 0$
4.1.2 Other transmitters
U_i=40V I_i=165 mA P_i=1.0W C_i=0.012 μ F L_i=20 μ H
4.2 RTD terminals
U_o=30V I_o=12 mA P_o=100 mW C_o=66nF L_o=100 mH
5. The cable entry of transmitter should be protected to ensure the degree of protection of the enclosure IP 20 (GB4208-1993) at least.
6. The terminals for connection to power supply of transmitter should be connected to associated apparatus certified by NEPSI in acocrdance with GB3836.1-2000 and GB3836.4-2000 to establish intrinsic safety system, it has to fulfill the following requirements:
$U_o \le U_i$ $I_o \le I_i$ $P_o \le P_i$ $C_o \ge C_c + C_i$ $L_o \ge L_c + L_i$
Note: C_c, L_c the distributed capacitance and inductance of the cables
U_o, I_o, P_o maximum output parameters of associated apparatus
C_o, L_o, maximum external parameters of associated apparatus
7. The terminals for connection to sensor of transmitter should be connected to intrinsic safety sensor certified by NEPSI in accordance with GB3836.1-2000 and GB3836.4-2000 to establish intrinsic safety system, it has to fulfill the following requirements:
$U_i \ge U_o$ $I_i \ge I_o$ $P_i \ge P_o$ $C_i \le C_o - C_c$ $L_i \le L_c + L_o$
Note: C_c, L_c the distributed capacitance and inductance of the cables
U_i, I_i, P_i maximum intput parameters of intrinsic safety sensor
C_i, L_i, maximum internal parameters of intrinsic safety sensor
8. The cables between the transmitter, associated apparatus and sensor are 2-core shielded cables (the cables must have insulated shield). The cable core section area should be more than 0.5 mm^2. The shielded has to be grounded in non-hazardous area and isolated from the housing. The wiring has to not be affected by electromagnetic disturbance.
9. Associated apparatus should installed in a safe location, and during installation, operation and maintenance, the regulations of the instruction manual have to be strictly observed.
10. End users is not permitted to change any components insides.

11. When installation, use and maintenance transmitter, 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 contruction and acceptance of electric device for explosion atmospheres and fire hazard electrical equipment installation engineering”

R TIIS Flameproof
Consult factory for availability

Combinations of Certifications

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

B A and J combination
D C and K combination
L F, G, H, and P combination
9 4, 5, 7, and 8 combination

ROSEMOUNT 3095M WITH *FIELDBUS*

Approved Manufacturing Locations

Rosemount Inc. — Chanhassen, Minnesota USA

European Directive Information

The EC declaration of conformity for all applicable European directives for this product can be found on the Rosemount website at www.rosemount.com. A hard copy may be obtained by contacting our local sales office.

ATEX Directive (94/9/EC)

Emerson Process Management complies with the ATEX Directive.

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

3095F_2/3,4/D and 3095M_2/3,4/D Flow Transmitters

— QS Certificate of Assessment - EC No. PED-H-100 Module H Conformity Assessment

All other 3095_ Transmitters/Level Controller

— Sound Engineering Practice

Transmitter Attachments: Process Flange - Manifold

— Sound Engineering Practice

Primary Elements, Flowmeter

— See appropriate Primary Element QIG

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

3095 Flow Transmitters

— EN 50081-1: 1992; EN 50082-2:1995; EN 61326-1:1997 – A1, A2, and A3

Ordinary Location Certification for Factory Mutual

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

Rosemount 3095M Fieldbus Hazardous Locations Certifications

North American Certifications

FM Approvals

A Explosion Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition Proof for Class II/Class III, Division 1, Groups E, F, and G. Enclosure type NEMA 4X. Factory Sealed. Provides nonincendive RTD connections for Class I, Division 2, Groups A, B, C, and D.

J Intrinsically Safe for use in Class I, II and III, Division 1, Groups A, B, C, D, E, F, and G hazardous outdoor locations. Non-incendive for Class I, Division 2, Groups A, B, C, and D. Temperature Code T4. Factory Sealed.

For input parameters and installation see control drawing 03095-1020.

V FISCO for use in Class I, II and III, Division 1, Groups A, B, C, D, E, F, and G hazardous outdoor locations. Temperature Code T4. Factory Sealed.

For input parameters and installation see control drawing 03095-1020.

Canadian Standards Association (CSA)

C Explosion Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition Proof for Class II/Class III, Division 1, Groups E, F, and G. Factory Sealed. CSA enclosure Type 4X for indoor and outdoor hazardous locations. Suitable for Class I, Division 2, Groups A, B, C, and D. Install in accordance with Rosemount Drawing 03095-1024.

K Intrinsically Safe for Class I, Division 1, Groups A, B, C, and D. When installed in accordance with Rosemount Drawing 03095-1021. Temperature Code T3C.

W FISCO Field Device. Intrinsically Safe for Class I, Division 1, Groups A, B, C, and D. When installed in accordance with Rosemount Drawing 03095-1021. Temperature Code T3C.

European Certifications

F/T ATEX Intrinsic Safety Certificate Number: Baseefa 05ATEX0022X

Ⓔx II 1 G

EEx ia IIC T5 (T_{amb} = -45°C to 40°C)

EEx ia IIC T4 (T_{amb} = -45°C to 70°C)

CE 1180

TABLE 6. Connection Parameters (Power/Signal Terminals)

Fieldbus (F Option)		FISCO (T Option)
U_i = 30V		U_i = 17.5V
I_i = 300 mA		I_i = 380 mA
P_i = 1.3 W		P_i = 5.32 W
C_i = 3.3 nF		$C_i \leq$ 5 nF
L_i = 0		L_i = 10 µH

TABLE 7. Temperature Sensor Connection Parameters

U_o = 30V
I_o = 19 mA
P_o = 140 mW

TABLE 8. Connection Parameters for Temperature Sensor Terminals

C_o = 0.066 µF	Gas Group IIC
C_o = 0.560 µF	Gas Group IIB
C_o = 1.82 µF	Gas Group IIA
L_o = 96 mH	Gas Group IIC
L_o = 365 mH	Gas Group IIB
L_o = 696 mH	Gas Group IIA
L_o/R_o = 247 µH/ohm	Gas Group IIC
L_o/R_o = 633 µH/ohm	Gas Group IIB
L_o/R_o= 633 µH/ohm	Gas Group IIA

Special Conditions for Safe Use

Versions of the apparatus fitted with the transient protected terminals are not capable of withstanding the 500 volts insulation test required by Clause 6.4.12 of EN 50020:2002. This must be taken into account when installing the apparatus.

G ATEX Type N

Certificate Number: Baseefa05ATEX0023X
Ⓔx II 3 G

EEx nA nL IIC T5 (T_{amb} = –45 °C to 40 °C)
EEx nA nL IIC T4 (T_{amb} = –45 °C to 70 °C)

U_i = 55V
RTD Terminals - The apparatus is designed for connection to a remote temperature sensor such as a resistance temperature detection (RTD).

Special Conditions for Safe Use

Versions of the apparatus fitted with the transient protected terminals are not capable of withstanding the 500 volts insulation test required by Clause 8.1 of EN 60079-15:2003. This must be taken into account when installing the apparatus.

H ATEX Flameproof

Certificate Number: KEMA02ATEX2320X
Ⓔx II 1/2 G
EEx d IIC T5 (-50°C ≤ T_{amb} ≤ 80°C)
T6 (-50°C ≤ T_{amb} ≤ 65°C)
Vmax = 55 Vdc MAX
Imax = 23 mA MAX
IP66
CE 1180

Special Conditions for Safe Use (x):

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.

P ATEX Dust
Certificate Number: KEMA02ATEX2321
Ⓔx II 1 D T90°C (-50°C ≤ T_{amb} ≤ 80°C)
Vmax = 55 Vdc
Imax = 23 mA
IP66
CE 1180

IECEx Certifications (Fieldbus)

4/Y IECEx Intrinsic Safety
Certificate Number: IECEx BAS05.0023X
Ex ia IIC T4 (-45°C ≤ T_a ≤ 70°C)
Ex ia IIC T5 (-45°C ≤ T_a ≤ 40°C)

TABLE 9. Input Parameters

Fieldbus I.S.		FISCO
U_i = 30Vdc		U_i = 17.5Vdc
I_i = 300 mAdc		I_i = 380 mAdc
P_i = 1.3 W		P_i = 5.32 W
C_i = 3.3 nF		$C_i \leq$ 5 nF
L_i = 0		$L_i \leq$ 10 mH

TABLE 10. RTD Terminals Entity Parameters

U_o = 30Vdc
I_o = 19 mAdc
P_o = 140 mW

The capacitance and either the Inductance or the Inductance to Resistance Ratio (L/R) of the load connected to the 4-pin connector must not exceed the following values:

Group	Capacitance (µF)	Inductance (mH)	or L/R Ratio µH/Ohm
IIC	0.066	96	247
IIB	0.56	365	633
IIA	1.82	696	633

Conditions of Certification (X):

When fitted with the transient option, the apparatus is not capable of withstanding the 500V electrical strength test as defined in Clause 6.4.12 of IEC 60079-11: 1999. This must be taken into account during installation.

5 IECEx Type n
Certificate Number: IECEx BAS05.0024X
Ex nC IIC T4 (-45°C ≤ T_a ≤ 70°C)
Ex nC IIC T5 (-45°C ≤ T_a ≤ 40°C)
U_i = 55V dc max

Conditions of Certification (X):

When fitted with the transient option, the apparatus is not capable of withstanding the 500V electrical strength test as defined in Clause 8 of IEC 60079-15: 1987. This must be taken into account during installation.

7 IECEx Flameproof
Certificate Number: IECEx KEM 06.0018
Zone 0/1 Ex d IIC T6 (-20°C ≤ T_a ≤ 65°C)
Zone 0/1 Ex d IIC T5 (-20°C ≤ T_a ≤ 80°C)
V_{max} = 55 Vdc
I_{max} = 23 mAdc

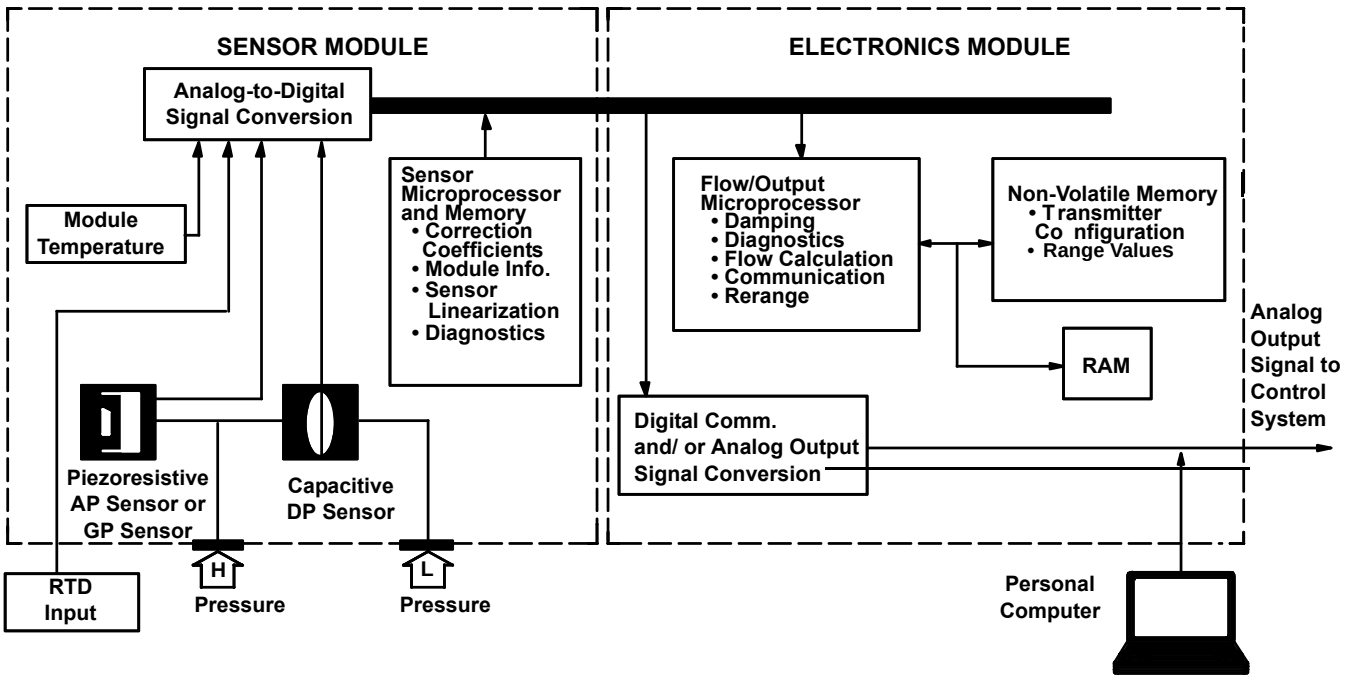
8 IECEx Dust
Certificate Number: IECEx KEM 06.0018
Ex tD A22 T90°C
IP66

Combinations of Certifications

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

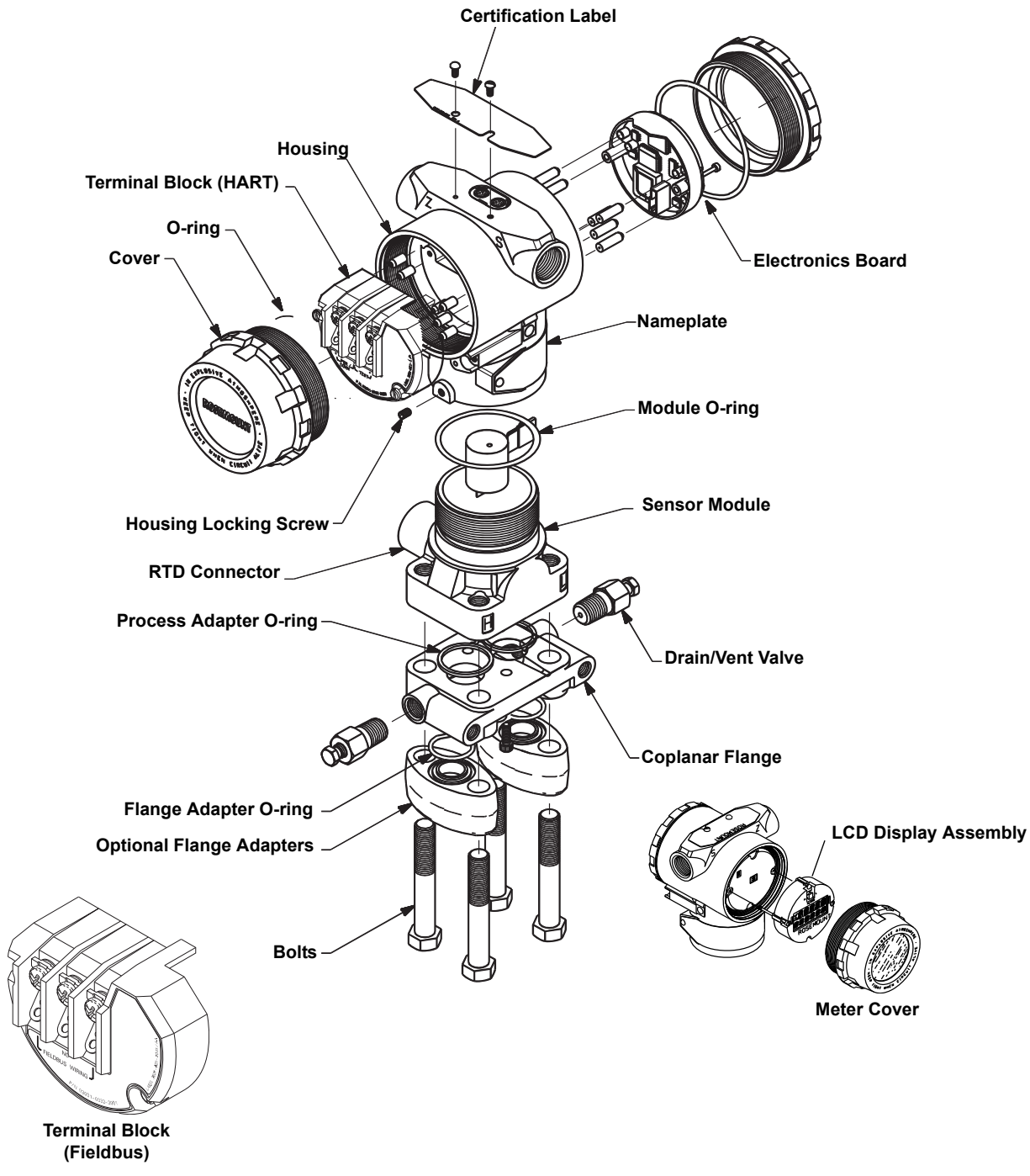
B A and J combination
D C and K combination
L F, G, H, and P combination
6 T, G, H, and P combination
9 4, 5, 7, and 8 combination

FIGURE 1. 3095 MultiVariable Sensor Module/ Electronics Module

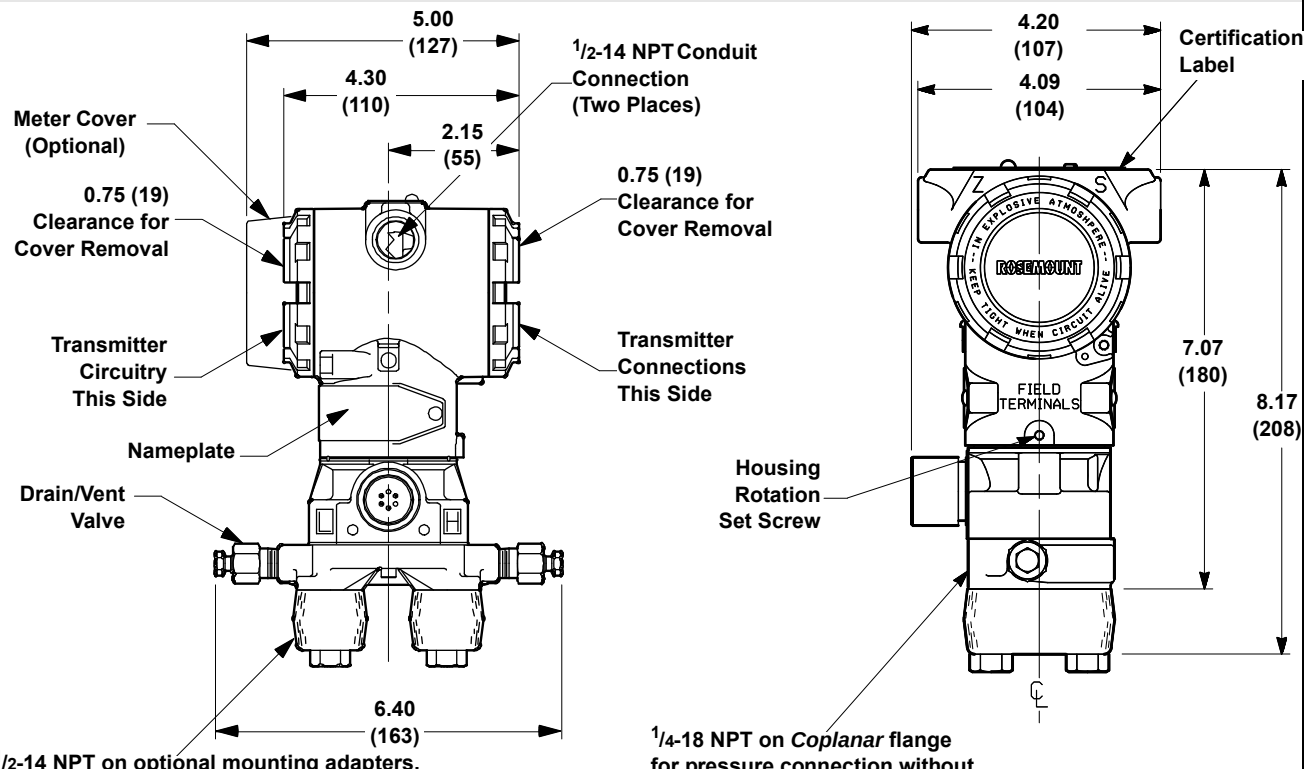


Rosemount 3095M Dimensional Drawings

Exploded View of the Rosemount 3095M

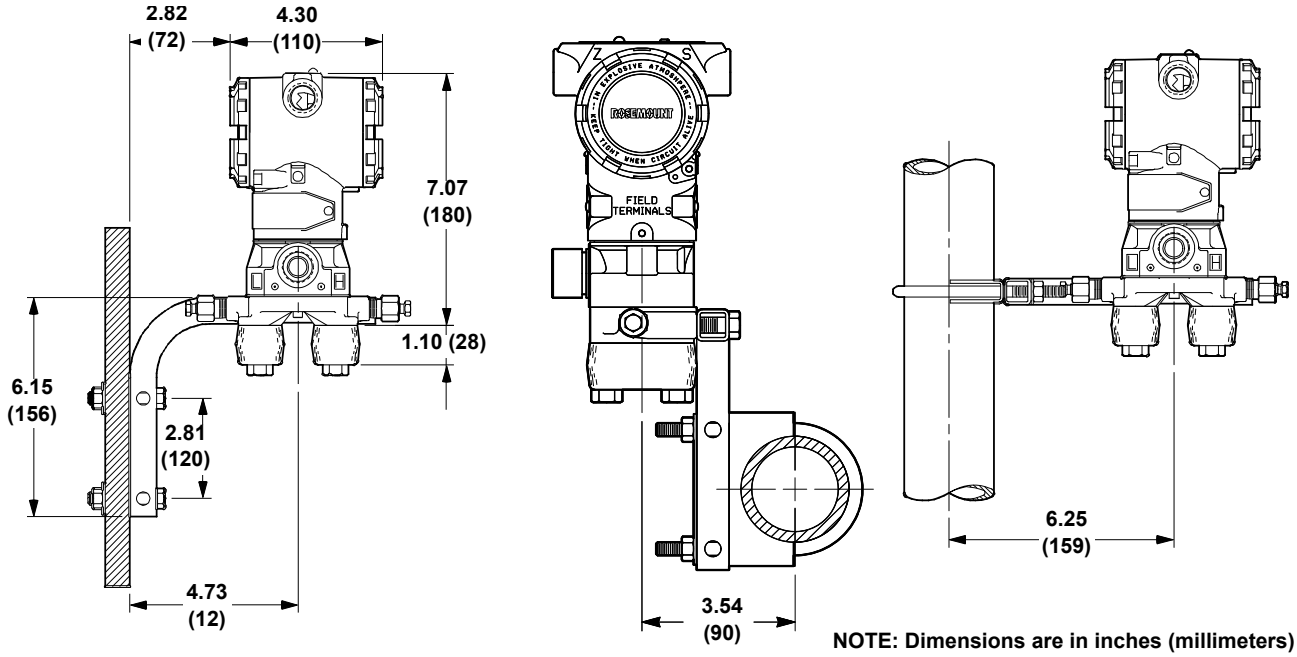


Rosemount 3095M



NOTE: Dimensions are in inches (millimeters).

Mounting Configurations



NOTE: Dimensions are in inches (millimeters)

Ordering Information

Model	Product Description		
3095M	MultiVariable Mass Flow Transmitter		
Output			
A	4–20 mA with digital signal based on HART protocol		
V	FOUNDATION™ fieldbus protocol		
Differential Pressure Ranges			
1(1)	0–0.5 to 0–25 inH_2O (0–1,25 to 0–62,2 mbar)		
2	0–2.5 to 0–250 inH_2O (0–6,22 to 0–623 mbar)		
3	0–10 to 0–1000 inH_2O (0–0,0249 to 0–2,49 bar)		
Static Pressure Ranges			
3	0.5-8 to 0.5–800 psia (0,03-0,552 to 0,03-55,2 bar)		
4	0.5-36.26 to 0.5–3626 psia (0,03-2,5 to 0,03–250bar)		
C	0-8 to 0-800 psig (0–552 to 0–55,2 bar)		
D	0-36.26 to 0-3626 psig (0-2,5 to 0-250 bar)		
	Isolator Material	**Fill Fluid**	
A(2)	316L SST	Silicone	
B(2)	Hastelloy C-276	Silicone	
J(2)(3)	316L SST	Inert	
K(2)(3)	Alloy C-276	Inert	
	Flange Style	**Material**	
A(2)	Coplanar	CS	
B(2)	Coplanar	SST	
C(2)	Coplanar	Alloy C-276	
J	DIN compliant traditional flange, SST 10 mm adapter/manifold bolting	SST, 7/16 — 20 Bolting	
0	None (required for option code S3 or S5)		
Drain/Vent Material			
A	SST		
C(2)	Alloy C-276		
0	None (required for option code S3 or S5)		
O-ring			
1	Glass-filled PTFE		
Process Temperature Input (RTD ordered separately)			
0	Fixed process temperature (no cable)		
1	RTD Input with 12 ft. (3,66 m) of Shielded cable (intended for use in conduit)		
2	RTD Input with 24 ft. (7,32 m) of Shielded cable (intended for use in conduit)		
7	RTD Input with 75 ft. (22,86 m) of Armored, Shielded cable (intended for use in conduit)		
3	RTD Input with 12 ft. (3,66 m) of Armored, Shielded cable		
4	RTD Input with 24 ft. (7,32 m) of Armored, Shielded cable		
8	RTD Input with 75 ft. (22,86 m) of Armored, Shielded cable		
A	RTD Input with 12 ft. (3,66 m) of ATEX/IECEx Flameproof cable		
B	RTD Input with 24 ft. (7,32 m) of ATEX/IECEx Flameproof cable		
C	RTD Input with 75 ft. (22,86 m) of ATEX/IECEx Flameproof cable		
	Transmitter Housing Material	**Conduit Entry Size**	
A	Polyurethane-covered aluminum	½–14 NPT	
B	Polyurethane-covered aluminum	M20 × 1.5 (CM20)	
C	Polyurethane-covered aluminum	PG 13.5	
J	SST	½–14 NPT	
K	SST	M20 × 1.5 (CM20)	
L	SST	PG 13.5	
Terminal Block			
A	Standard		
B	With integral transient protection		

Display		
0	None	
1	LCD Display	
Bracket		
0	None	
1	Coplanar SST flange bracket for 2-in. pipe or panel mount, SST bolts	
2	Traditional Flange Bracket for 2-in. Pipe Mounting, CS Bolts	
3	Traditional Flange Bracket for panel Mounting, CS Bolts	
4	Traditional Flange Flat Bracket for 2-in. Pipe Mounting, CS Bolts	
5	Traditional Flange Bracket for 2-in. Pipe Mounting, 300-Series, SST Bolts	
6	Traditional Flange Bracket for Panel Mounting, 300-Series, SST Bolts	
7	Traditional Flange Flat Bracket for 2-in. Pipe Mounting, 300-Series, SST Bolts	
8	SST Traditional Flange Bracket for 2-in. Pipe Mounting, 300-Series, SST Bolts	
9	SST Traditional Flange Flat Bracket for 2-in. Pipe Mounting, 300-Series, SST Bolts	
Bolts		
0	CS bolts	
1	Austenitic 316 SST bolts	
N	None (Required for Option Code S3 or S5)	
Product Certifications		
0	None	
A	FM Explosion-proof, Dust Ignition-proof	
B	FM Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of A and J)	
J	FM Intrinsically Safe, Division 2	
V	FM FISCO Intrinsically Safe; for FOUNDATION fieldbus protocol only	
K	CSA Intrinsically Safe, Division 2	
C	CSA Explosion-proof, Dust Ignition-proof, Division 2	
D	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of C and K)	
W	CSA FISCO Intrinsically Safe; for FOUNDATION fieldbus protocol only	
F	ATEX Intrinsic Safety	
G	ATEX Type n	
H	ATEX Flameproof	
L	ATEX Flameproof, Intrinsic Safety, Type n, Dust (combination of F, G, H, and P)	
P	ATEX Dust	
T	ATEX FISCO Intrinsic Safety; for FOUNDATION fieldbus protocol only	
6	ATEX FISCO, Flameproof, Intrinsic Safety, Type n, Dust	
Y	IECEx FISCO Intrinsic Safety	
4	IECEx Intrinsic Safety	
5	IECEx Type n	
7	IECEx Flameproof	
8	IECEx Dust	
9	IECEx Flameproof, Dust, Intrinsic Safety, Type n (combination of 4, 5, 7, and 8)	
2	China Intrinsic Safety	
3	China Flameproof	
R	TIIS Flameproof	
Engineered Measurement Solution (EMS)		
B[4]	Fully Compensated Mass Flow and Measured Variables (DP, P, and T) with HART or FOUNDATION fieldbus.	
V[5]	Process Variable Measurement (DP, P, and T) only (No Mass Flow Variable) with FOUNDATION fieldbus.	

OPTIONS		
Custom Configuration		
C2	Custom Flow Configuration (Requires completed Configuration Data Sheet)	
Process Adapter		
DF[6]	1/2-14 NPT Process Adapter, Material Type Determined by Selected Flange Material: Plated CS, SST, Cast C-276	
Integral Manifold		
S5[7]	Assemble to Rosemount 305 Integral Manifold	
S6[7]	Assemble to Rosemount 304 Manifold or Connection System (Requires traditional Flange Style Options J, K, or L)	
Cleaning		
P2	Cleaning for Special Services	
Material Traceability Certification		
Q8[8]	Material Inspection Certificate per EN 10204 3.1B	
Calibration Certificate		
Q4	Inspection Certificate for Calibration Data	
Pressure Testing		
P1	Hydrostatic Testing with certificate	
Primary Element		
S3	Assemble to Rosemount 405 Compact Orifice	
S4[7][9]	Assemble to Rosemount 485 or Rosemount 1195	
Surface Finish Toolkit		
Q16	Surface Finish Certification	
Performance Class		
U3[10]	Ultra for Flow: ±0.05% DP reading accuracy, up to 100:1 rangedown, 10 year stability, limited 12 year warranty	
PlantWeb Control Functionality		
A01[11]	FOUNDATION fieldbus Advanced Control Function Block Suite	
Cleaning		
P2	Cleaning for Special Services	
Typical Model Number	**3095M A 2 3 A A A 1 3 A B 0 1 1 0 B**	

(1) Available only with 3 or C sensor modules and "A" 316L SST/silicone, Isolator/Fill Fluid option.

(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.

(3) Only available with C or D Gage Sensor Modules.

(4) Requires Rosemount 3095 Engineering Software Assistant to configure mass flow.

(5) Not available with HART output.

(6) Not available with assembly to Rosemount 1195 Integral Orifice Option Code S4.

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

(8) This option is available for the sensor module housing, Coplanar and Coplanar flange adapters.

(9) With a primary element installed, the maximum operating pressure will be the lesser of either the transmitter or the primary element.

(10) Ultra for Flow applicable for HART protocol, DP ranges 2 and 3 with SST isolator material and silicone fill fluid options only.

(11) Function Blocks include: Arithmetic, Integrator, Analog Output, Signal Characterizer, Control Selector, and Output Selector.

OPTIONS

Standard Configuration

Unless otherwise specified, transmitter is shipped as follows:

Engineering units:	
Differential	inH_2O (Range 2)
Absolute/gage	psi (all ranges)
Output:	Specified model code option
Flange type:	Specified model code option
Flange material:	Specified model code option
O-ring material:	Specified model code option
Drain/vent:	Specified model code option
Flow Configuration Parameters:	Factory default
Software tag:	(Blank)

In addition, transmitter is shipped as follows:

- The three process variables are digitally trimmed to the specified upper and lower range values.
- For Mass Flow and Measured Variables (EMS Code B), process variable output order is set to Flow, DP, AP/GP, PT.
- Flow is configured to measure air via ASME Orifice: Flange Tap, with a primary element minimum diameter of 0.5 in. (SST material), meter tube diameter of 2 in. (carbon steel material), flow range configured from 0–8,262 SCFH, 10–100 psia operating pressure range, and 50–100 °F operating temperature range.

Custom Configuration (Option Code C2)

If Option Code C2 is ordered, the custom flow configuration parameters are specified in addition to the standard configuration parameters.

Fixed Process Temperature (Option Code 0)

If Process Temperature Input (option code 0) is ordered, the fixed process temperature is set to 68 °F unless specified during order entry (HART protocol only).

Tagging

Three customer tagging options are available:

- Standard SST tag is wired to the transmitter. Tag character height is 0.125 in. (3.18 mm), 85 characters maximum.
- Tag may be permanently stamped on transmitter nameplate upon request. Tag character height is 0.0625 in. (1.59 mm), 65 characters maximum.
- Tag may be stored in transmitter memory.
- Software tag (8 characters maximum HART protocol; 32 characters maximum FOUNDATION fieldbus protocol) is left blank unless specified.

Optional Rosemount 305 Integral Manifolds

Rosemount 3095 Transmitter and 305AC (305BC) Integral Manifold are fully assembled, calibrated, and seal tested by the factory. Refer to PDS 00813-0100-4733 for additional information.

Temperature Sensors and Assemblies

Rosemount offers many types of temperature sensors and assemblies.

ACCESSORIES

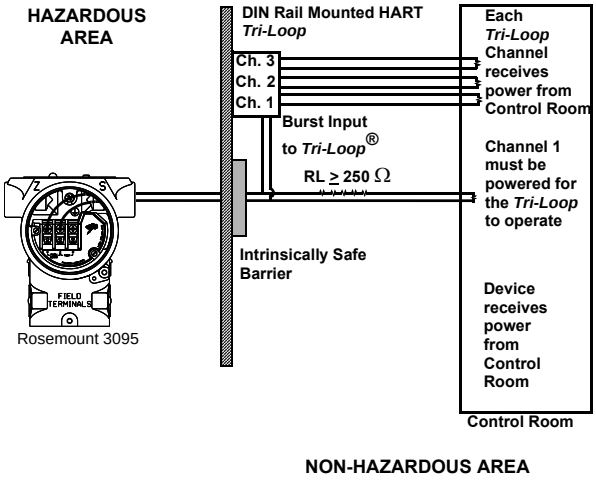
Rosemount 333 HART *Tri-Loop*™ HART-to-Analog Signal Converter

The Rosemount 333 HART *Tri-Loop* can be installed with the 3095 without disrupting existing device wiring. The 333 HART *Tri-Loop* provides up to three additional analog outputs for process monitoring or control without additional pipe penetrations.

The HART *Tri-Loop* accepts the 3095 digital signal and converts it to three independent isolated 4–20 mA analog signals. Any of the 3095 process variables (DP, AP, GP, PT, or flow) can be provided via the 333 HART *Tri-Loop*.

Rosemount 333 HART *Tri-Loop*

Model	**Product Description**
333	*HART Tri-Loop* (standard configuration)
Code	**Alarm Option**
U	High Alarm
D	Low Alarm
Code	**Options**
C2	Custom Configuration. Requires a completed Configuration Data Sheet (00806-0100-4754)
Typical Model Number: 333 U	



Accessories

Item Description	Part Number
Serial Port HART Modem and Cables Only	03095-5105-0001
USB Port HART Modem and Cables Only(1)	03095-5105-0002
FOUNDATION fieldbus PCM-CIA Interface Card and Cables Only	03095-5108-0001

(1) Supported by Snap-On EA with AMS Device Manager version 6.2 or higher.

Rosemount 3095 Engineering Assistant (EA) Software Packages

The Rosemount 3095 Engineering Assistant software supports mass flow configuration for both HART and FOUNDATION fieldbus protocols. The package is available with or without protocol-specific modem and connecting cables. All configurations are packaged separately.

For best performance of the EA Software, the following computer hardware and software is recommended:

- Pentium, 800MHz personal computer or above
- 512 MB RAM
- 350 MB of available hard disk space
- Mouse or other pointing device
- Color computer display
- *Microsoft* ® *Windows*™ NT, 2000 or XP

3095 Engineering Assistant Software Package

Code	Product Description
EA	Engineering Assistant Software Package
Code	**Software Version**
2(1)	EA Rev. 5 (Compatible with 3095, 3051S FOUNDATION fieldbus, and 333)
Code	**Language**
E	English
Code	**Modem and Connecting Cables**
0	None
H	Serial Port HART Modem and Cables
B	USB Port HART Modem and Cables
C	FOUNDATION fieldbus PCM-CIA Interface Card and Cables
Code	**License**
N1	Single PC License
N2	Site License
Typical Model Number: EA 2 E O N1	

(1) Revisions of EA - HART 5.3, 5.4, and 5.5 supports Windows NT, 2000, and XP operating systems. EA-FOUNDATION Fieldbus supports Windows 2000 and XP.

Rosemount 3095MFA Annubar Flowmeter

Rosemount 3095MFA Specifications

3095MFA Performance Specifications

System Reference Accuracy

±0.95% (8:1 turndown) of mass flow rate accuracy

Repeatability

±0.1%

Line Sizes

- Sensor Size 1: 2-in. to 8-in. (50 to 200 mm)
- Sensor Size 2: 6-in. to 96-in. (150 to 2400 mm)
- Sensor Size 3: 12-in. to 96-in. (300 to 2400 mm)

NOTE
Some mounting types are not available in larger line sizes.

TABLE 11. Reynolds Number and Probe Width

Sensor Size	Minimum Rod Reynolds Number (R_d)	Probe Width ($_d$) (inches)
1	6500	0.590-in. (14.99 mm)
2	12500	1.060-in. (26.92 mm)
3	25000	1.935-in. (49.15 mm)

$$R_d = \frac{d \times v \times p}{\mu}$$

Where
d = Probe width (feet)
v = Velocity of fluid (ft/sec)
p = Density of fluid (lbm/ft^3)
μ = Viscosity of the fluid (lbm/ft-sec)

Output

Two-wire 4–20 mA, user-selectable for DP, AP, GP, PT, mass flow, or totalized flow. Digital HART protocol superimposed on 4–20 mA signal, available to any host that conforms to the HART protocol

Performance Statement Assumptions

- Measured pipe I.D.
- Electronics are trimmed for optimum flow accuracy.
- Performance dependent on application parameters.

Sizing

Contact a Emerson Process Management sales representative for assistance. A “Configuration Data Sheet” is required prior to order for application verification

Optional Performance Class Specification

Ultra for Flow (Code U3): up to 0.95% mass flow rate accuracy, 10:1 turndown, 10-year stability, limited 12-year warranty

Annubar Sensor Surface Finish

The front surface of the Annubar primary is textured for high Reynolds number applications (typically gas and steam). The surface texture creates a more turbulent boundary layer on the front surface of the sensor. The increased turbulence produces a more predictable and repeatable separation of flow at the edge of the sensor. The appropriate surface finish will be determined for each application by the Emerson Process Management sizing program, Instrument Toolkit software.

3095MFA Functional Specifications

Service

- Liquid
- Gas
- Steam

Power Supply

4–20 mA option

- External power supply required. Standard transmitter (4–20 mA) operates on 11 to 55 v dc with no load

Process Temperature Limits

Direct Mount Transmitter

- 500 °F (260 °C)
- 750 °F (398 °C) when used with a direct mount, high temperature 5-valve manifold (Transmitter Connection Platform code 6)
- 400 °F (205 °C) when top mounted in steam service

Remote Mount Transmitter

- 1250 °F (677 °C) – Alloy C-276 Sensor Material (For superheated steam applications above 1000 °F (538 °C), it is recommended that the Rosemount 585 with Alloy 800H sensor material is used.)
- 850 °F (454 °C) – Stainless Steel Sensor Material

Transmitter Temperature Limits

Ambient

- –40 to 185 °F (–40 to 85 °C)
- With Integral Display: –4 to 175 °F (–20 to 80 °C)

Storage

- –50 to 230 °F (–46 to 110 °C)
- With Integral Display: –40 to 185 °F (–40 to 85 °C)

Pressure Limits

Direct Mount Transmitter

- Up to 600# ANSI (1440 psig at 100 °F (99 bar at 38 °C))
- Integral temperature measurement is not available with Flanged mounting type greater than class 600

Remote Mount Transmitter(1)

- Up to 2500# ANSI (6000 psig at 100 °F (416 bar at 38 °C))

(1) Maximum allowable pressure will be limited by the transmitter pressure limit of 3626 psi.

Overpressure Limits

0 to 2 times the absolute pressure range with a maximum of 3626 psia (250 bar).

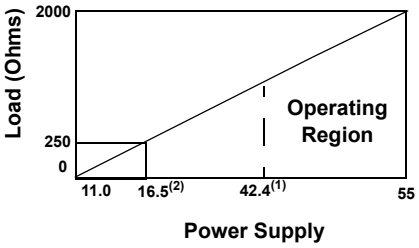
Static Pressure Limits

- Operates within specification between static pressures of 0.5 psia (0.03 bar-A) and the URL of the static pressure sensor.

Load Limitations

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

$$\text{Maximum Loop Resistance} = \frac{\text{Power Supply} - 11.0}{0.022}$$



(1) For CSA approval, power supply must not exceed 42.4 V dc.

(2) HART protocol communication requires a loop resistance value between 250-1100 ohms, inclusive.

FOUNDATION fieldbus (output option code V)

Power Supply

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

Current Draw

17.5 mA for all configurations (including LCD display option).

Humidity Limits

- 0–100% relative humidity

Turn-On Time

Digital and analog measured variables will be within specification 7 – 10 seconds after power is applied to the transmitter.

Digital and analog flow output will be within specifications 10 – 14 seconds after power is applied to the transmitter.

Damping

Analog output response to a step input change is user-selectable from 0 to 29 seconds for one time constant. This software damping is in addition to sensor module response time

Failure Mode Alarm

Output Code A

If self-diagnostics detect a non-recoverable transmitter failure, the analog signal will be driven either below 3.75 mA or above 21.75 mA to alert the user. High or low alarm signal is user-selectable by internal jumper pins.

Output Code V

If self-diagnostics detect a gross transmitter failure, that information gets passed as a status along with the process variable(s).

Configuration

HART Hand-held Communicator

- Performs traditional transmitter maintenance functions

3095 Multivariable Engineering Assistant (EA) software package

- Contains built-in physical property database
- Enables mass flow configuration, maintenance, and diagnostic functions via HART modem (output option code A)
- Enables mass flow configuration via PCMCIA Interface for FOUNDATION fieldbus (output option code V)

Physical Properties Database

- Maintained in Engineering Assistant Software Configurator
- Physical properties for over 110 fluids
- Natural gas per AGA
- Steam and water per ASME
- Other database fluids per American Institute of Chemical Engineers (AIChE)
- Optional custom entry

FOUNDATION fieldbus Function Blocks

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.

5 Analog Input Blocks

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

PID Block with Auto-tune

- Contains all logic to perform PID control in the field including cascade and feedforward. Auto-tune capability allows for superior tuning for optimized control performance.

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 Bock

- 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.

Output Splitter Block

- Splits the output of one PID or other control block so that the PID will control two valves or other actuators.

Control Selector Block

- Selects one of up to three inputs (highest, middle, or lowest) that are normally connected to the outputs of PID or other control function blocks.

3095MFA Physical Specifications

Temperature Measurement

Integral RTD

- 100 Ohm platinum RTD
- 4-wire RTD (α = 0.00385)

Remote RTD

- 100 Ohm platinum RTD, spring loaded with $^1/_2$-in. NPT nipple and union (078 series with Rosemount 644 housing)

Thermowell

- $^1/_2$-in. x $^1/_2$-in NPT, 316 Stainless Steel with $^1/_2$-in. Weld coupling material to match process pipe.

Housing Connections

$^1/_2$–14 NPT, G$^1/_2$, and M20 × 1.5 (CM20) conduit. HART interface connections fixed to terminal block for output code A

Annubar Sensor Material

- 316 Stainless Steel
- Alloy C-276

Annubar Type

See “Dimensional Drawings” on page 29

Pak-Lok Model (option P)

- Provided with a compression sealing mechanism rated up to 600# ANSI (1440 psig at 100 °F (99 bar at 38 °C))
- Graphite Packing (–100 to 850 °F (–73 to 454 °C)).
- Not available for steam above 600 °F (315 °C)

Flanged with Opposite Side Support Model (option F)

- Provided with opposite side support, which is the same material as the pipe and requires a second pipe penetration
- Sensor flange is the same material as the Annubar sensor and the mounting flange is the same material as the pipe material
- Flanged mounting hardware: nuts, studs and gaskets (DIN units supplied without nuts, studs and gaskets)
- SST: (–300 to 850 °F (–184 to 454 °C))
- Alloy C-276: (–300 to 1250 °F (–184 to 677 °C)).
- Top mounting is recommended for steam temperatures above 600 °F (315 °C)

Flange–Lok Model (option L)

- Flange–Lok assembly is supplied in 316 SST material.
- Flange-Lok mounting hardware: nuts, studs and gaskets (DIN units supplied without nuts, studs and gaskets)
- –100 to 850 °F (–73 to 454 °C).
- Not available for steam above 600 °F (315 °C)

Flo-Tap Models (options G and M)

- Opposite side support is not available
- Threaded connection is not available with Sensor Size 3
- Gear Drive is not available with Sensor Size 1
- Packing gland required
- Packing Gland Material Temperature Limits
  - PTFE: –40 to 400 °F (–40 to 204 °C)
  - Graphite: –100 to 850 °F (–73 to 454 °C)
- Isolation valve included
  - The isolation valve will carry the same pressure rating as the sensor flange and mounting flange specified in the mounting type
  - Ball valves have a 300# limitation
  - For threaded flo-tap models, the isolation valve NPT size is 1$^1/_4$-in. (Sensor Size one) and 2-in. (Sensor Size 2).
  - Top mounting is recommended for steam temperatures above 600 °F (315 °C)

Process-Wetted Parts

Integral Manifolds

- 316 SST
- Alloy C-276

Remote Manifolds

- 316 SST
- Alloy C-276

Transmitter Vent Valves and Process Flanges

- 316 SST
- Alloy C-276
- Glass-filled PTFE O-rings

Process Isolation Diaphragms

- 316 SST
- Alloy C-276

Integral Manifold O-Rings

- PTFE/Graphite

Non-Wetted Parts

Sensor Module Fill Fluid

- Silicone oil
- Inert Fill optional

Cover O-rings

- Buna-N

Remote Mounting Brackets

- SST

Sensor Mounting (including nuts, bolts, and gasket)

- Match Process Pipe Material

Transmitter Housing

- Low copper aluminum, NEMA 4x, IP65
- SST (optional)

Paint

- Polyurethane

Bolts

- Carbon Steel

Annubar Type Specification Chart

Option Code	Description	Pak-Lok(1)	Flange-Lok	Flange	Manual and Gear Drive Flo-Tap
T1(1)	Pak-Lok Body	X			
	Threaded connection				X
A1	150# RF ANSI		X	X	X
A3	300# RF ANSI		X	X	X
A6	600# RF ANSI		X	X	X
A9(2)	900# RF ANSI			X	
AF(2)	1500# RF ANSI			X	
AT(2)	2500# RF ANSI			X	
D1	DN PN 16		X	X	X
D3	DN PN 40		X	X	X
D6	DN PN 100		X	X	X
R1	150# RTJ Flange		X	X	X
R3	300# RTJ Flange		X	X	X
R6	600# RTJ Flange		X	X	X
R9(2)	900# RTJ Flange			X	
RF(2)	1500# RTJ Flange			X	
RT(2)	2500# RTJ Flange			X	

(1) Available up to 600# ANSI (1440 psig at 100 °F (99 bar at 38 °C)) rating.

(2) Remote mount only. Maximum allowable pressure will be limited by the transmitter pressure limit of 3626 psi.

Instrument Connections Temperature Ranges

TABLE 12. Minimum / Maximum Temperature Range

Code	Description	Temperature
G1	Needle Valves, Carbon Steel	–20 to 500 °F (–29 to 260 °C)
G2	Needle Valves, Stainless Steel	–40 to 600 °F (–40 to 316 °C)
G3	Needle Valves, Alloy C-276	–40 to 600 °F (–40 to 316 °C)
G5	OS&Y Gate Valve, Carbon Steel	–20 to 775 °F (–29 to 413 °C)
G6	OS&Y Gate Valve, Stainless Steel	–40 to 850 °F (–40 to 454 °C)
G7	OS&Y Gate Valve, Alloy C-276	–40 to 1250 °F (–40 to 677 °C)

Flowmeter Installed in Flanged Pipe Spool Section (option codes H3, H4, and H5)

- All pipe spool sections are flanged pipe sections
- The flanged pipe spool section is constructed from the same material as the pipe
- Consult the factory for remote temperature measurement and ANSI ratings above 600# and DIN flanges
- Available in carbon steel (A105) and stainless steel

TABLE 13. Flanged Pipe Spool Section Schedule

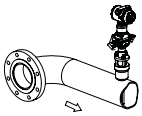
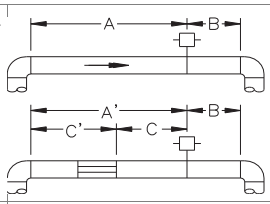
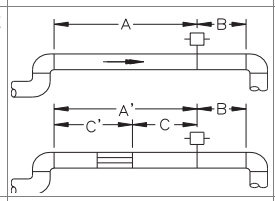
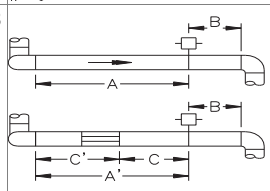
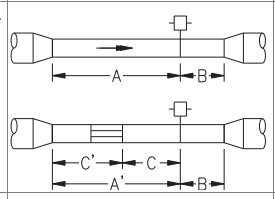
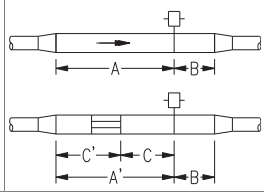
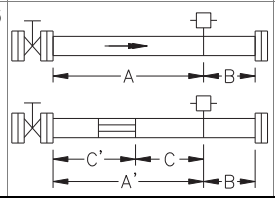
ANSI	Schedule
150# ANSI	40
300# ANSI	40
600# ANSI	80

TABLE 14. Flange Pipe Spool Section Length

Nominal Pipe Size	Length
2-in. (50 mm)	10.52-in. (267.2 mm)
3-in. (80 mm)	11.37-in. (288.8 mm)
4-in. (100 mm)	12.74-in. (323.6 mm)
6-in. (150 mm)	14.33-in. (364.0 mm)
8-in. (200 mm)	16.58-in. (421.1 mm)

3095MFA Installation Considerations

Straight Run Requirements(1)

	In Plane  Out of Plane 	Upstream Dimensions (Pipe Diameters)					Downstream
		Without Vanes(2)		With Vanes(3)			
		In Plane A	Out of Plane A	A'	C	C'	B
1		8 —	10 —	— 8	— 4	— 4	4 4
2		11 —	16 —	— 8	— 4	— 4	4 4
3		23 —	28 —	— 8	— 4	— 4	4 4
4		12 —	12 —	— 8	— 4	— 4	4 4
5		18 —	18 —	— 8	— 4	— 4	4 4
6		30 —	30 —	— 8	— 4	— 4	4 4

(1) Consult the factory for instructions regarding use in square or rectangular ducts.

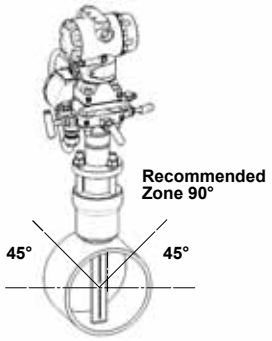
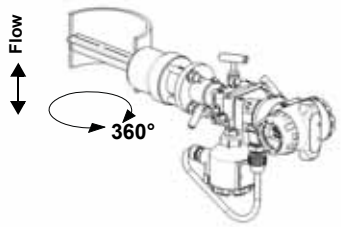
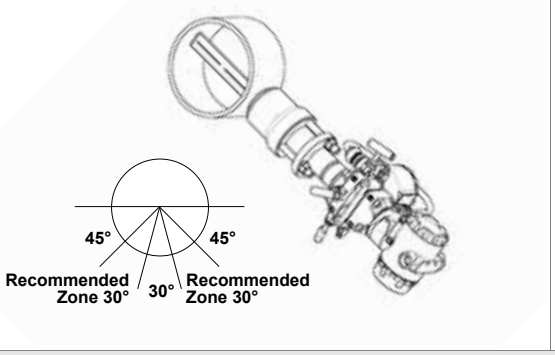
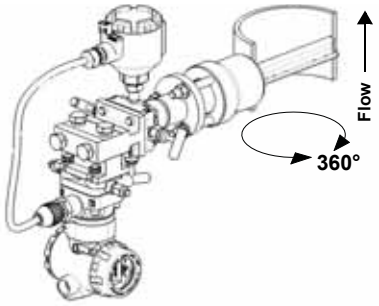
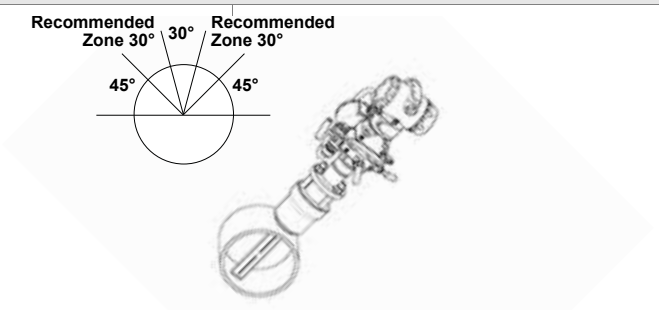
(2) "In Plane A" means the bar is in the same plane as the elbow. "Out of Plane A" means the bar is perpendicular to the plane of the upstream elbow.

(3) Use straightening vane toreduce the required straight run length.

Drill Hole Size According to Sensor Size

Sensor Size	Diameter
1	3/4-in. (19 mm)
2	1 5/16-in. (34 mm)
3	2 1/2-in. (64 mm)

Flowmeter Orientation (Recommended)(1)

Gas (Horizontal)	Gas (Vertical)
	
Liquid and Steam (Horizontal)	**Steam (Vertical)**
	
Top Mounting for Steam (Horizontal)(2)	
	

(1) The flowmeter orientation recommendations may vary for the Manual and Gear-Drive Flo-Tap Annubar Types.

(2) Direct mount up to 400 °F (205 °C).

Rosemount 3095MFA Product Certifications

Rosemount 3095MFA with HART

European Directive Information

The EC declaration of conformity for all applicable European directives for this product can be found on the Rosemount website at www.rosemount.com. A hard copy may be obtained by contacting our local sales office.

ATEX Directive (94/9/EC)

Emerson Process Management complies with the ATEX Directive.

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

3095M_2/3,4/D Flow Transmitters — QS Certificate of Assessment - EC No. PED-H-20
Module H Conformity Assessment

All other 3095_ Transmitters/Level Controller — Sound Engineering Practice

Transmitter Attachments: Process Flange - Manifold — Sound Engineering Practice

Electro Magnetic Compatibility (EMC) (89/336/EEC)

3095MV Flow Transmitters

— EN50081-1:1992; EN50082-2:1995; EN61326-1:2006; EN61326-2-3:2006

Ordinary Location Certification for Factory Mutual

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

Hazardous Locations Certifications

North American Certifications

FM Approvals

E5 Explosion Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition Proof for Class II/Class III, Division 1, Groups E, F, and G. Enclosure type NEMA 4X. Factory Sealed. Provides nonincendive RTD connections for Class I, Division 2, Groups A, B, C, and D.

I5 Intrinsically Safe for use in Class I, II and III, Division 1, Groups A, B, C, D, E, F, and G hazardous outdoor locations and Zone 0 A Exia IIC T4.
Non-incendive for Class I, Division 2, Groups A, B, C, and D. Temperature Code T4. Factory Sealed.
For input parameters and installation see control drawing 03095-1020.

Canadian Standards Association (CSA)

E6 Explosion Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition Proof for Class II/Class III, Division 1, Groups E, F, and G. CSA enclosure Type 4X suitable for indoor and outdoor hazardous locations. Provides nonincendive RTD connection for Class I, Division 2, Groups A, B, C, and D.Factory Sealed. Install in accordance with Rosemount Drawing 03095-1024. Approved for Class I, Division 2, Groups A, B, C, and D.

I6 Intrinsically Safe for Class I, Division 1, Groups A, B, C, and D. when installed in accordance with Rosemount drawing 03095-1021. Temperature Code T3C.

For input parameters and installation see control drawing 03095-1021.

European Certifications

I1 ATEX Intrinsic Safety
Certificate Number: BAS98ATEX1359X ⟨Ex⟩ II 1 G
Ex ia IIC T5 (T_{amb} = –45 °C to 40 °C)
Ex ia IIC T4 (T_{amb} = –45 °C to 70 °C)
CE 1180

TABLE 15. Connection Parameters (Power/Signal Terminals)

U_i = 30V
I_i = 200 mA
P_i = 1.0 W
C_i = 0.012 µF
L_i = 0

TABLE 16. Temperature Sensor Connection Parameters

U_o = 30V
I_o = 19 mA
P_o = 140 mW
C_i = 0.002 µF
L_i = 0

TABLE 17. Temp Sensor Terminals Connection Parameters

C_o = 0.066 µF	Gas Group IIC
C_o = 0.560 µF	Gas Group IIB
C_o = 1.82 µF	Gas Group IIA
L_o = 96 mH	Gas Group IIC
L_o = 365 mH	Gas Group IIB
L_o = 696 mH	Gas Group IIA
L_o/R_o = 247 µH/ohm	Gas Group IIC
L_o/R_o = 633 µH/ohm	Gas Group IIB
L_o/R_o= 633 µH/ohm	Gas Group IIA

Special Conditions for Safe Use

The 3095, when fitted with the transient terminal block (order code B), are not capable of withstanding the 500 volts insulation test required by EN60079-11, Clause 6.3.12. This condition must be accounted for during installation.

N1 ATEX Type N

Certificate Number: BAS98ATEX3360X ⟨Ex⟩ II 3 G

Ex nL IIC T5 (T_{amb} = –45 °C to 40 °C)
Ex nL IIC T4 (T_{amb} = –45 °C to 70 °C)

U_i = 55V

CE

The apparatus is designed for connection to a remote temperature sensor such as a resistance temperature detection (RTD)

Special Conditions for Safe Use

The 3095, when fitted with the transient terminal block (order code B), are not capable of withstanding the 500 volts insulation test required by EN60079-15, Clause 6.8.1. This condition must be accounted for during installation.

E1 ATEX Flameproof
Certificate Number: KEMA02ATEX2320X ⟨Ex⟩ II 1/2 G
EEx d IIC T5 (-50°C ≤ T_{amb} ≤ 80°C)
T6 (-50°C ≤ T_{amb} ≤ 65°C)
CE 1180

Special Conditions for Safe Use (x):

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.

ND ATEX Dust
Certificate Number: KEMA02ATEX2321 ⟨Ex⟩ II 1 D
V = 55 Vdc MAX
I = 23 mA MAX
IP66
CE 1180

Combinations of Certifications

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

K5 E5 and I5 combination

K6 E6 and I6 combination

K1 I1, N1, E1, and ND combination

Rosemount 3095MFA with *Fieldbus*

European Directive Information

The EC declaration of conformity for all applicable European directives for this product can be found on the Rosemount website at www.rosemount.com. A hard copy may be obtained by contacting our local sales office.

ATEX Directive (94/9/EC)

Emerson Process Management complies with the ATEX Directive.

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

3095F_2/3,4/D and 3095M_2/3,4/D Flow Transmitters

— QS Certificate of Assessment - EC No. PED-H-20 Module H Conformity Assessment

All other 3095_ Transmitters/Level Controller

— Sound Engineering Practice

Transmitter Attachments: Process Flange - Manifold

— Sound Engineering Practice

Primary Elements, Flowmeter

— See appropriate Primary Element QIG

Electro Magnetic Compatibility (EMC) (89/336/EEC)

3095 Flow Transmitters

— EN50081-1:1992; EN50082-2:1995; EN61326-1:2006; EN61326-2-3:2006

Ordinary Location Certification for Factory Mutual

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

Rosemount 3095MFA Fieldbus Hazardous Locations Certifications

North American Certifications

FM Approvals

E5 Explosion Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition Proof for Class II/Class III, Division 1, Groups E, F, and G. Enclosure type NEMA 4X. Factory Sealed. Provides nonincendive RTD connections for Class I, Division 2, Groups A, B, C, and D.

I5 Intrinsically Safe for use in Class I, II and III, Division 1, Groups A, B, C, D, E, F, and G hazardous outdoor locations. Non-incendive for Class I, Division 2, Groups A, B, C, and D. Temperature Code T4. Factory Sealed.

For input parameters and installation see control drawing 03095-1020.

IE FISCO for use in Class I, II and III, Division 1, Groups A, B, C, D, E, F, and G hazardous outdoor locations. Temperature Code T4. Factory Sealed.

For input parameters and installation see control drawing 03095-1020.

Combinations of Certifications

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

K5 E5 and I5 combination

Canadian Standards Association (CSA)

IF CSA FISCO Intrinsically Safe; for FOUNDATION fieldbus protocol only

European Certifications

IA ATEX FISCO Intrinsically Safe; for FOUNDATION fieldbus protocol only

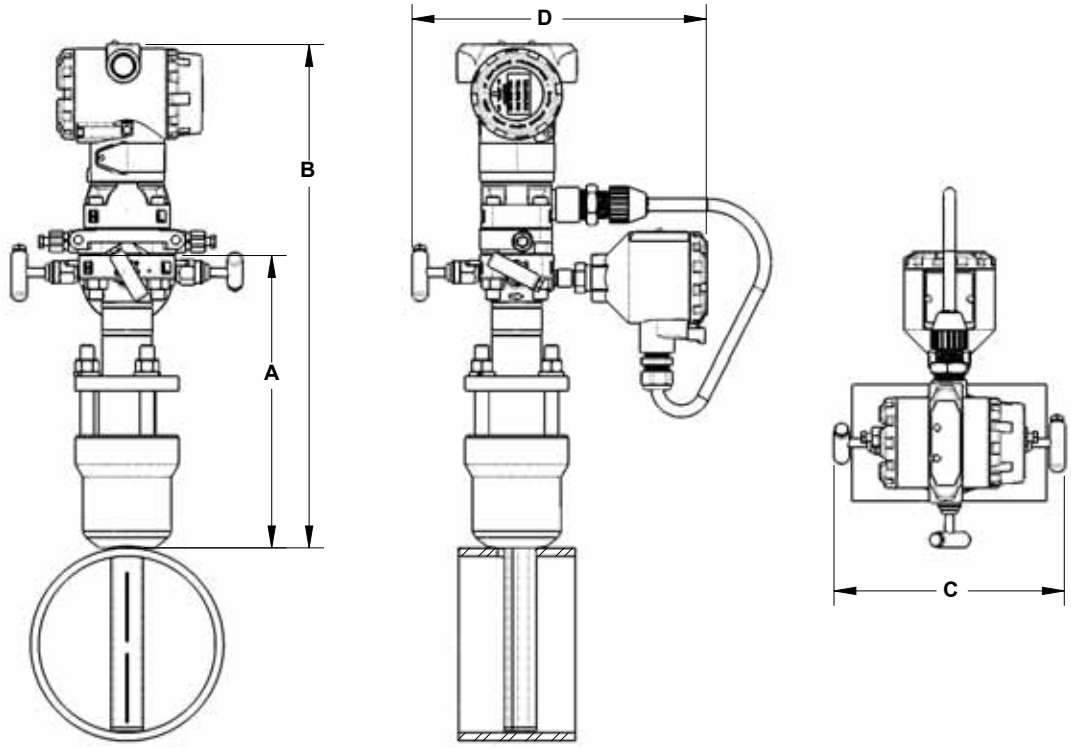
Australian Certifications

IG IECEx FISCO Intrinsic Safety

DIMENSIONAL DRAWINGS

Rosemount 3095MFA Pak-Lok Annubar Flowmeter(1)

Front View	Side View	Top View



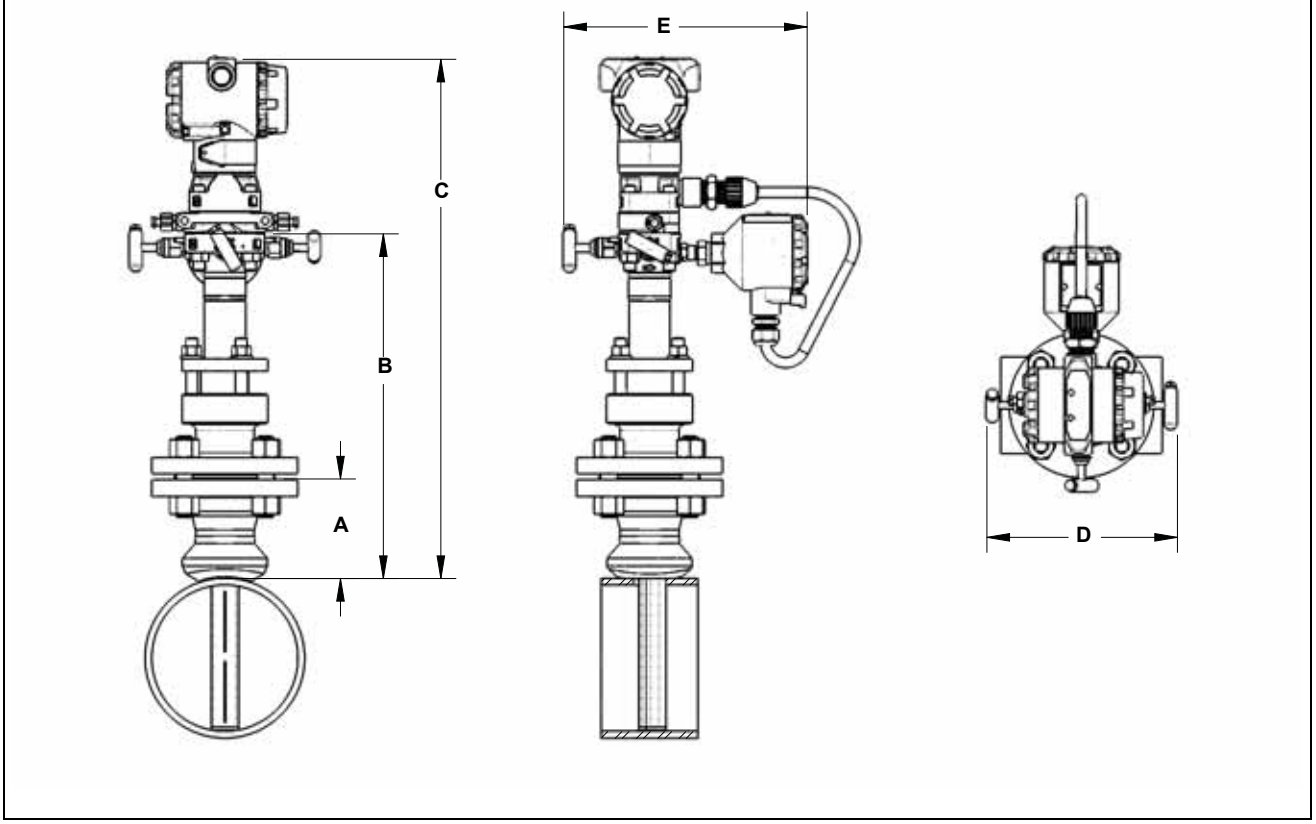
(1) The Pak-Lok Annubar model is available up to 600# ANSI (1440 psig at 100 °F (99 bar at 38 °C)).

TABLE 18. Pak-Lok Annubar Flowmeter Dimensional Data

Sensor Size	A (Max)	B (Max)	C (Max)	D (Max)
1	7.50 (190.5)	14.60 (370.8)	9.00 (228.6)	11.25 (285.8)
2	9.25 (235.0)	16.35 (415.3)	9.00 (228.6)	11.25 (285.8)
3	12.00 (304.8)	19.10 (485.1)	9.00 (228.6)	11.25 (285.8)
Dimensions are in inches (millimeters)				

Rosemount 3095MFA Flange-Lok Annubar Flowmeter(1)

Front View	Side View	Top View



(1) The Flange-Lok Annubar model can be direct mounted up to 600# ANSI (1440 psig at 100 °F (99 bar at 38 °C)).

TABLE 19. Flange-Lok Annubar Flowmeter Dimensional Data

Sensor Size	Flange Size and Rating	A ± 0.125 (3.2)	B ± 0.25 (6.4)	C (Max)	D (Max)	E (Max)
1	1 1/2 – 150#	3.88 (98.6)	12.25 (311.2)	19.35 (491.5)	9.00 (228.6)	11.25 (285.8)
1	1 1/2 – 300#	4.13 (104.9)	12.25 (311.2)	19.35 (491.5)	9.00 (228.6)	11.25 (285.8)
1	1 1/2 – 600#	4.44 (112.8)	12.25 (311.2)	19.35 (491.5)	9.00 (228.6)	11.25 (285.8)
1	DN40/PN16	3.09 (78.5)	12.25 (311.2)	19.35 (491.5)	9.00 (228.6)	11.25 (285.8)
1	DN40/PN40	3.21 (81.5)	12.25 (311.2)	19.35 (491.5)	9.00 (228.6)	11.25 (285.8)
1	DN40/ PN100	3.88 (98.6)	12.25 (311.2)	19.35 (491.5)	9.00 (228.6)	11.25 (285.8)
2	2 – 150#	4.13 (104.9)	14.25 (362.0)	21.35 (542.3)	9.00 (228.6)	11.25 (285.8)
2	2 – 300#	4.38 (111.3)	14.25 (362.0)	21.35 (542.3)	9.00 (228.6)	11.25 (285.8)
2	2 – 600#	4.76 (120.9)	14.25 (362.0)	21.35 (542.3)	9.00 (228.6)	11.25 (285.8)
2	DN50/PN16	3.40 (86.4)	14.25 (362.0)	21.35 (542.3)	9.00 (228.6)	11.25 (285.8)
2	DN50/PN40	3.51 (89.2)	14.25 (362.0)	21.35 (542.3)	9.00 (228.6)	11.25 (285.8)
2	DN50/PN100	4.30 (109.2)	14.25 (362.0)	21.35 (542.3)	9.00 (228.6)	11.25 (285.8)
3	3 – 150#	4.63 (117.6)	17.50 (444.5)	24.60 (624.8)	9.00 (228.6)	11.25 (285.8)
3	3 – 300#	5.00 (127.0)	17.50 (444.5)	24.60 (624.8)	9.00 (228.6)	11.25 (285.8)
3	3 – 600#	5.38 (136.7)	17.50 (444.5)	24.60 (624.8)	9.00 (228.6)	11.25 (285.8)
3	DN80/PN16	3.84 (97.5)	17.50 (444.5)	24.60 (624.8)	9.00 (228.6)	11.25 (285.8)

TABLE 19. Flange-Lok Annubar Flowmeter Dimensional Data

Sensor Size	Flange Size and Rating	A ± 0.125 (3.2)	B ± 0.25 (6.4)	C (Max)	D (Max)	E (Max)
3	DN80/PN40	4.16 (105.7)	17.50 (444.5)	24.60 (624.8)	9.00 (228.6)	11.25 (285.8)
3	DN80/PN100	4.95 (125.7)	17.50 (444.5)	24.60 (624.8)	9.00 (228.6)	11.25 (285.8)
Dimensions are in inches (millimeters)						

Rosemount 3095MFA Flanged Annubar Flowmeter

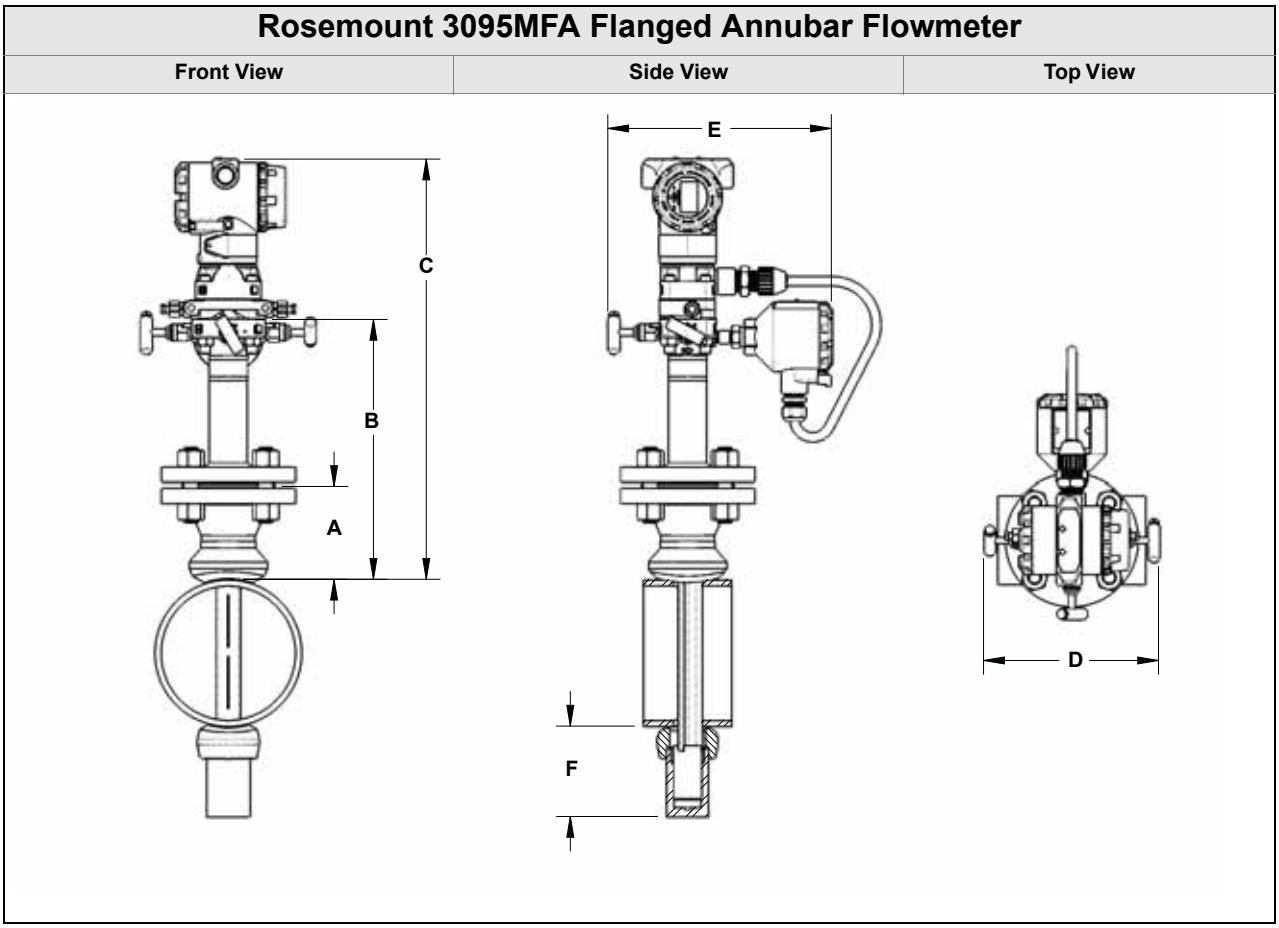


TABLE 20. Flanged Annubar Flowmeter Dimensional Data

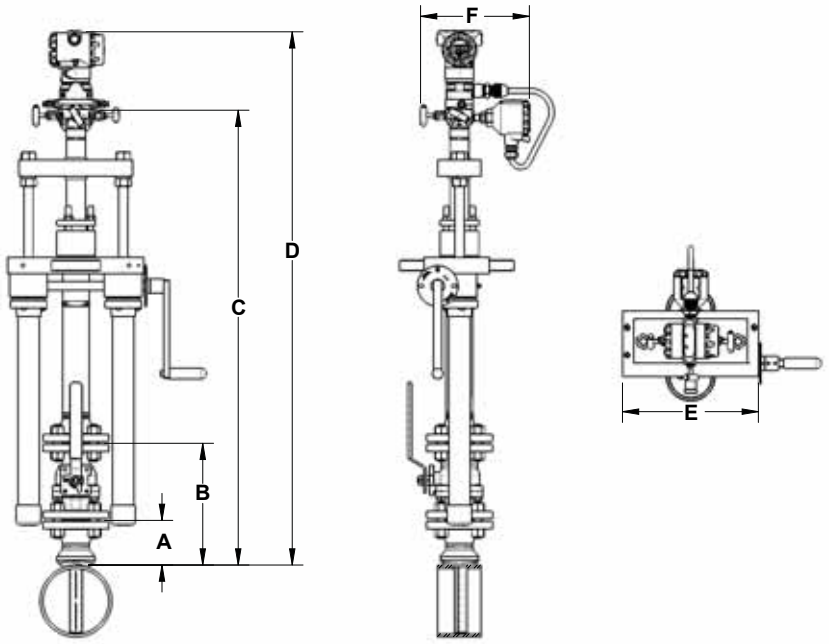
Sensor Size	Flange Size and Rating	A ± 0.125 (3.2)	B ± 0.25 (6.4)	C ± 0.25 (6.4)	D (Max)	E (Max)	F (Max)
1	1 1/2 – 150#	3.88 (98.6)	11.00 (279.4)	18.10 (459.7)	9.00 (228.6)	11.25 (285.8)	3.50 (88.9)
1	1 1/2 – 300#	4.13 (104.9)	11.00 (279.4)	18.10 (459.7)	9.00 (228.6)	11.25 (285.8)	3.50 (88.9)
1	1 1/2 – 600#	4.44 (112.8)	11.00 (279.4)	18.10 (459.7)	9.00(228.6)	11.25 (285.8)	3.50 (88.9)
1	DN40/PN16	3.09 (78.5)	11.00 (279.4)	18.10 (459.7)	9.00 (228.6)	11.25 (285.8)	3.50 (88.9)
1	DN40/PN40	3.21 (81.5)	11.00 (279.4)	18.10 (459.7)	9.00 (228.6)	11.25 (285.8)	3.50 (88.9)
1	DN40/ PN100	3.88 (98.6)	11.00 (279.4)	18.10 (459.7)	9.00 (228.6)	11.25 (285.8)	3.50 (88.9)
1	1 1/2 – 900#	4.94 (125.5)	9.32 (236.6)	—	—	—	3.50 (88.9)
1	1 1/2 – 1500#	4.94 (125.5)	9.32 (236.6)	—	—	—	3.50 (88.9)
1	1 1/2 – 2500#	6.76 (171.7)	11.64 (295.5)	—	—	—	4.00 (101.6)
2	2 – 150#	4.13 (104.9)	12.00 (304.8)	19.10 (485.1)	9.00 (228.6)	11.25 (285.8)	5.00 (127.0)
2	2 – 300#	4.38 (111.3)	12.00 (304.8)	19.10 (485.1)	9.00 (228.6)	11.25 (285.8)	5.00 (127.0)
2	2 – 600#	4.76 (120.9)	12.00 (304.8)	19.10 (485.1)	9.00 (228.6)	11.25 (285.8)	5.00 (127.0)
2	DN50/PN16	3.40 (86.4)	12.00 (304.8)	19.10 (485.1)	9.00 (228.6)	11.25 (285.8)	5.00 (127.0)

TABLE 20. Flanged Annubar Flowmeter Dimensional Data

Sensor Size	Flange Size and Rating	A ± 0.125 (3.2)	B ± 0.25 (6.4)	C ± 0.25 (6.4)	D (Max)	E (Max)	F (Max)
2	DN50/PN40	3.51 (89.2)	12.00 (304.8)	19.10 (485.1)	9.00 (228.6)	11.25 (285.8)	5.00 (127.0)
2	DN50/ PN100	4.30 (109.2)	12.00 (304.8)	19.10 (485.1)	9.00 (228.6)	11.25 (285.8)	5.00 (127.0)
2	2 – 900#	5.88 (149.4)	10.51 (266.8)	—	—	—	5.00 (127.0)
2	2 – 1500#	5.88 (149.4)	10.51 (266.8)	—	—	—	5.00 (127.0)
2	3 – 2500#	9.87 (250.7)	15.62 (396.7)	—	—	—	4.50 (114.3)
3	3 – 150#	4.63 (117.6)	13.50 (342.9)	20.60 (523.2)	9.00 (228.6)	11.25 (285.8)	4.00 (101.6)
3	3 – 300#	5.00 (127.0)	13.50 (342.9)	20.60 (523.2)	9.00 (228.6)	11.25 (285.8)	4.00 (101.6)
3	3 – 600#	5.38 (136.7)	13.50 (342.9)	20.60 (523.2)	9.00 (228.6)	11.25 (285.8)	4.00 (101.6)
3	DN80/PN16	3.84 (97.5)	13.50 (342.9)	20.60 (523.2)	9.00 (228.6)	11.25 (285.8)	4.00 (101.6)
3	DN80/PN40	4.16 (105.7)	13.50 (342.9)	20.60 (523.2)	9.00 (228.6)	11.25 (285.8)	4.00 (101.6)
3	DN80/ PN100	4.95 (125.7)	13.50 (342.9)	20.60 (523.2)	9.00 (228.6)	11.25 (285.8)	4.00 (101.6)
3	4 – 900#	8.19 (208.0)	13.44 (341.3)	—	—	—	7.00 (177.8)
3	4 – 1500#	8.56 (217.4)	13.81 (350.8)	—	—	—	7.00 (177.8)
3	4 – 2500#	11.19 (284.2)	17.32 (439.8)	—	—	—	7.00 (177.8)
	Dimensions are in inches (millimeters)						

Rosemount 3095MFA Flanged Flo-Tap Annubar Flowmeter(1)

Front View	Side View	Top View



(1) The Flanged Flo-Tap Annubar Flowmeter is available with both the manual and gear drive options.

TABLE 21. Flanged Flo-Tap Annubar Flowmeter Dimensional Data

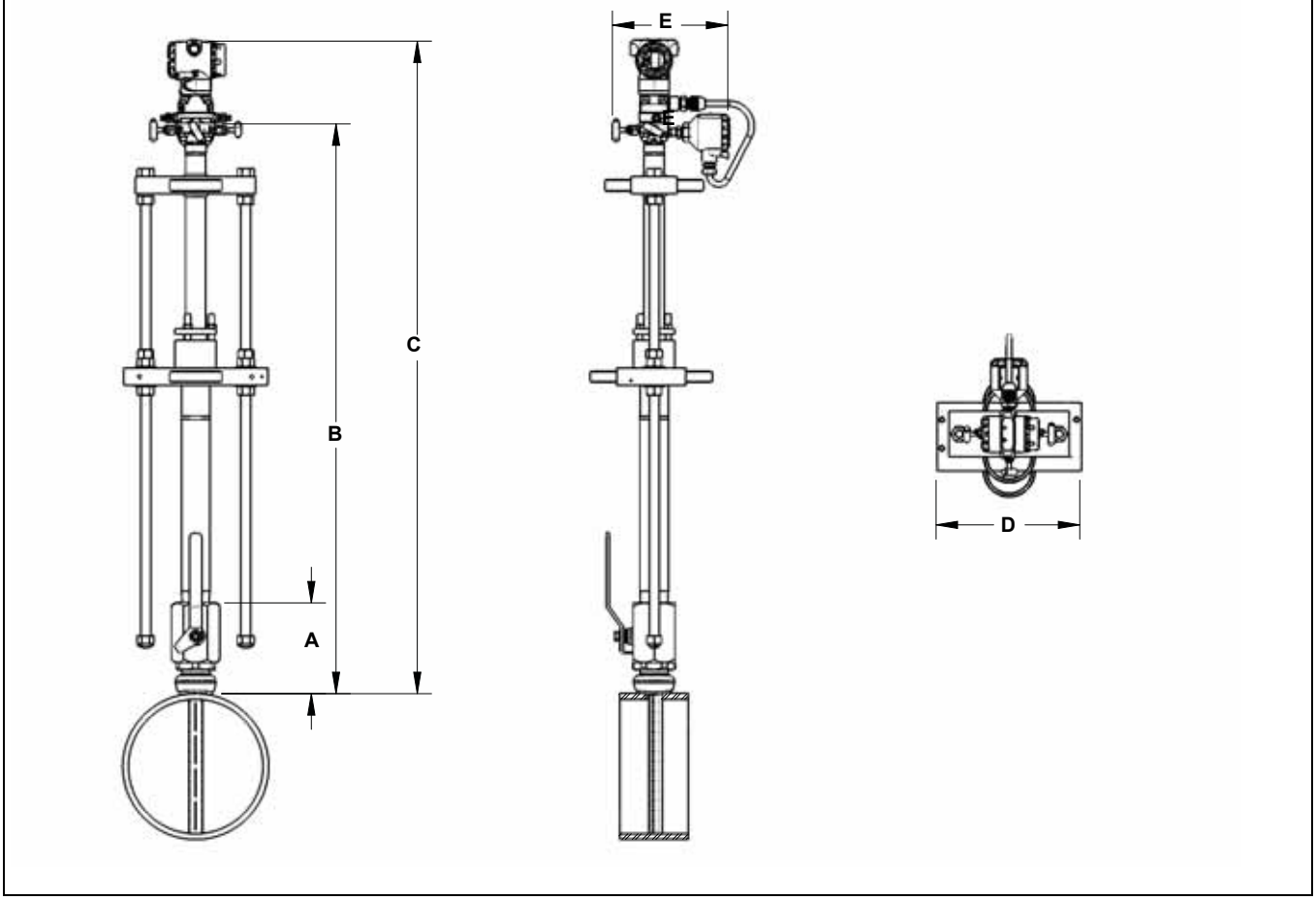
Sensor Size	Flange Size and Rating	A ± 0.125 (3.2)	B ± 0.25 (6.4)	C^I (Max) (Gear Drive)	C^I (Max) (Manual)	D (Max)	E (Max)	F (Max)
1	1 1/2 – 150#	3.88 (98.5)	10.50 (266.7)	—	17.9 (454.7)	C + 7.10 (180.3)	10.50 (266.7)	11.25 (285.8)
1	1 1/2 – 300#	4.13 (104.9)	11.75 (298.5)	—	17.9 (454.7)	C + 7.10 (180.3)	10.50 (266.7)	11.25 (285.8)
1	1 1/2 – 600#	4.44 (112.8)	14.06 (357.2)	—	17.9 (454.7)	C + 7.10 (180.3)	10.50 (266.7)	11.25 (285.8)
1	DN40/PN16	3.09 (78.5)	See Note.	—	17.9 (454.7)	C + 7.10 (180.3)	10.50 (266.7)	11.25 (285.8)
1	DN40/PN40	3.21 (81.5)	See Note.	—	17.9 (454.7)	C + 7.10 (180.3)	10.50 (266.7)	11.25 (285.8)
1	DN40/PN100	3.88 (98.6)	See Note.	—	17.9 (454.7)	C + 7.10 (180.3)	10.50 (266.7)	11.25 (285.8)
2	2 – 150#	4.13 (104.9)	11.25 (285.8)	24.6 (624.8)	21.4 (543.6)	C + 7.10 (180.3)	12.56 (319.0)	11.25 (285.8)
2	2 – 300#	4.38 (111.3)	13.00 (330.2)	24.6 (624.8)	21.4 (543.6)	C + 7.10 (180.3)	12.56 (319.0)	11.25 (285.8)
2	2 – 600#	4.76 (120.9)	16.38 (416.0)	24.6 (624.8)	21.4 (543.6)	C + 7.10 (180.3)	12.56 (319.0)	11.25 (285.8)
2	DN50/PN16	3.40 (86.4)	See Note.	24.6 (624.8)	21.4 (543.6)	C + 7.10 (180.3)	12.56 (319.0)	11.25 (285.8)
2	DN50/PN40	3.51 (89.2)	See Note.	24.6 (624.8)	21.4 (543.6)	C + 7.10 (180.3)	12.56 (319.0)	11.25 (285.8)
2	DN50/PN100	4.30 (109.2)	See Note.	24.6 (624.8)	21.4 (543.6)	C + 7.10 (180.3)	12.56 (319.0)	11.25 (285.8)
3	3 – 150#	4.63 (117.6)	12.75 (323.9)	26.5 (673.1)	23.3 (591.8)	C + 7.10 (180.3)	14.13 (358.9)	11.25 (285.8)
3	3 – 300#	5.00 (127.0)	16.25 (412.8)	26.5 (673.1)	23.3 (591.8)	C + 7.10 (180.3)	14.13 (358.9)	11.25 (285.8)
3	3 – 600#	5.38 (136.7)	19.50 (495.4)	26.5 (673.1)	23.3 (591.8)	C + 7.10 (180.3)	14.13 (358.9)	11.25 (285.8)
3	DN80/PN16	3.84 (97.5)	See Note.	26.5 (673.1)	23.3 (591.8)	C + 7.10 (180.3)	14.13 (358.9)	11.25 (285.8)
3	DN80/PN40	4.16 (105.7)	See Note.	26.5 (673.1)	23.3 (591.8)	C + 7.10 (180.3)	14.13 (358.9)	11.25 (285.8)
3	DN80/PN100	4.95 (125.7)	See Note.	26.5 (673.1))	23.3 (591.8)	C + 7.10 (180.3)	14.13 (358.9)	11.25 (285.8)
	Dimensions are in inches (millimeters)							

Note: Customer Supplied.

Inserted, C Dimension = Pipe I.D. + Wall Thickness + B + C^I

Retracted, C Dimension = 2 x (Pipe I.D. + Wall Thickness + B) + C^I

Rosemount 3095MFA Threaded Flo-Tap Annubar Flowmeter(1)



(1) The Threaded Flo-Tap Annubar Flowmeter is available with both the manual and gear drive options.

TABLE 22. Threaded Flo-Tap Annubar Flowmeter Dimensional Data

Sensor Size	A ± 0.50 (12.7)	B^I (Max) (Gear Drive)	B^I (Max) (Manual)	C (Max)	D (Max)	E (Max)
1	6.76 (171.8)	—	17.40 (442.0)	B + 7.10 (180.3)	10.50 (266.7.0)	11.25 (285.8)
2	8.17 (207.5)	23.70 (602.0)	20.80 (528.3)	B + 7.10 (180.3)	12.56 (319.0)	11.25 (285.8)
Sensor Size 3 is not available in a Threaded Flo-Tap.						
Dimensions are in inches (millimeters)						

Inserted, B Dimension = Pipe I.D. + Wall Thickness + A + B^I
Retracted, B Dimension = 2 x (Pipe I.D. + Wall Thickness + A) + B^I

ORDERING INFORMATION

Rosemount 3095MFA Annubar Flowmeter Ordering Information

Model	DP Flow Flowmeter Type	
3095MFA	Annubar Flowmeter	
Fluid Type		
L	Liquid	
G	Gas	
S	Steam	
Line Size		
020	2-in. (50 mm)	
025	2 1/2-in. (63,5 mm)	
030	3-in. (80 mm)	
035	3 1/2-in. (89 mm)	
040	4-in. (100 mm)	
050	5-in. (125 mm)	
060	6-in. (150 mm)	
070	7-in. (175 mm)	
080	8-in. (200 mm)	
100	10-in. (250 mm)	
120	12-in. (300 mm)	
140	14-in. (350 mm)	
160	16-in. (400 mm)	
180	18-in. (450 mm)	
200	20-in. (500 mm)	
240	24-in. (600 mm)	
300	30-in. (750 mm)	
360	36-in. (900 mm)	
420	42-in. (1066 mm)	
480	48-in. (1210 mm)	
600	60-in. (1520 mm)	
720	72-in. (1820 mm)	
780	78-in. (1950 mm)	
840	84-in. (2100 mm)	
900	90-in. (2250 mm)	
960	96-in. (2400 mm)	
Pipe I.D. Range		
A	Range A from the Pipe I.D. table	
B	Range B from the Pipe I.D. table	
C	Range C from the Pipe I.D. table	
D	Range D from the Pipe I.D. table	
E	Range E from the Pipe I.D. table	
Z	Non-standard Pipe I.D. Range or Above 12-in. Line Size	
Pipe Material / Assembly Material		
C	Carbon steel (A105)	
S	316 Stainless Steel	
G	Chrome-Moly Grade F-11	
N	Chrome-Moly Grade F-22	
J	Chrome-Moly Grade F-91	
0[(1)]	No Mounting (Customer Supplied)	
Piping Orientation		
H	Horizontal Piping	
D	Vertical Piping with Downwards Flow	
U	Vertical Piping with Upwards Flow	

Rosemount 3095MFA Annubar Flowmeter Ordering Information

Annubar Type				
P	Pak-Lok			
F	Flanged with opposite side support			
L	Flange-Lok			
G	Gear-Drive Flo-Tap			
M	Manual Flo-Tap			
Sensor Material				
S	316 Stainless Steel			
H	Alloy C-276			
Sensor Size				
1	Sensor size 1 - Line sizes 2-in. (50 mm) to 8-in. (200 mm)			
2	Sensor size 2 - Line sizes 6-in. (150 mm) to 96-in. (2400 mm)			
3	Sensor size 3 - Line sizes 12-in. (300 mm)			
Mounting Type				
T1	Compression/Threaded Connection			
A1	150# RF ANSI			
A3	300# RF ANSI			
A6	600# RF ANSI			
A9	900# RF ANSI			
AF	1500# RF ANSI			
AT	2500 # RF ANSI			
D1	DN PN16 Flange			
D3	DN PN40 Flange			
D6	DN PN100 Flange			
R1	150# RTJ Flange			
R3	300# RTJ Flange			
R6	600# RTJ Flange			
R9	900# RTJ Flange			
RF	1500# RTJ Flange			
RT	2500# RTJ Flange			
Opposite Side Support or Packing Gland				
0	No opposite side support or packing gland (Required for Pak-Lok and Flange-Lok models)			
	Opposite Side Support – Required for Flanged Models			
C	NPT Threaded Opposite Support Assembly – Extended Tip			
D	Welded Opposite Support Assembly – Extended Tip			
	Packing Gland – Required for Flo-Tap Models			
	Packing Gland Material	*Rod Material*	*Packing Material*	
J	Stainless Steel Packing Gland / Cage Nipple	Carbon Steel	PTFE	
K	Stainless Steel Packing Gland / Cage Nipple	Stainless Steel	PTFE	
L	Stainless Steel Packing Gland / Cage Nipple	Carbon Steel	Graphite	
N	Stainless Steel Packing Gland / Cage Nipple	Stainless Steel	Graphite	
R	Alloy C-276 Packing Gland / Cage Nipple	Stainless Steel	Graphite	
Isolation Valve for Flo-Tap Models				
1	Gate Valve, Carbon Steel			
2	Gate Valve, Stainless Steel			
5	Ball Valve, Carbon Steel			
6	Ball Valve, Stainless Steel			
0[(1)]	Not Applicable or Customer Supplied			
Temperature Measurement				
T	Integral RTD – not available with Flanged model greater than class 600			
R	Remote Thermowell and RTD			
0	No Temperature Sensor			

Rosemount 3095MFA Annubar Flowmeter Ordering Information

Transmitter Connection Platform			
3	Direct-mount, Integral 3-valve manifold– not available with Flanged model greater than class 600		
5	Direct -mount, 5-valve manifold– not available with Flanged model greater than class 600		
6	Direct-mount, high temperature 5-valve manifold– not available with Flanged model greater than class 600		
7	Remote-mount NPT Connections ($^1/_2$-in. FNPT)		
8	Remote-mount SW Connections ($^1/_2$-in.)		
Differential Pressure Ranges			
1	0 to 25 in H_2O (0 to 62,3 mbar) – not available with Sensor Material code H		
2	0 to 250 in H_2O (0 to 623 mbar)		
3	0 to 1000 in H_2O (0 to 2,5 bar)		
Static Pressure Ranges			
B	0–8 to 0–800 psia (0–55,16 to 0–5515,8 kPa)		
C	0–8 to 0–800 psig (0–55,16 to 0–5515,8 kPa)		
D	0–36.2 to 0–3626 psia (0–250 to 0–25000 kPa)		
E	0–36.2 to 0–3626 psig (0–250 to 0–25000 kPa)		
Output Protocol			
A	4–20 mA with digital signal based on HART protocol		
V	FOUNDATION fieldbus		
Code	**Transmitter Housing Style**	**Conduit Entry Size**	
1A	Polyurethane-covered aluminum	$^1/_2$-14 NPT	
1B	Polyurethane-covered aluminum	M20 x 1.5	
1C	Polyurethane-covered aluminum	G $^1/_2$	
1J	SST	$^1/_2$-14 NPT	
1K	SST	M20 x 1.5	
1L	SST	G $^1/_2$	
OPTIONS			
Performance Class			
U3[2]	Ultra for Flow: up to 0.95% mass flow rate accuracy, up to 10:1 turndown, 10-year stability, limited 12-year warranty		
PlantWeb Control Functionality			
A01[3]	Advanced Control Function Block Suite		
Pressure Testing			
P1[4]	Hydrostatic Testing		
PX[4]	Extended Hydrostatic Testing		
Special Cleaning			
P2	Cleaning for Special Processes		
PA	Cleaning per ASTM G93 level D (section 11.4)		
Material Testing			
V1	Dye Penetrant Exam		
Material Examination			
V2	Radiographic Examination		
Flow Calibration			
W1	Flow Calibration (Average K)		
WZ	Special Calibration		
Special Inspection			
QC1	Visual & Dimensional Inspection with Certificate		
QC7	Inspection & Performance Certificate		
Surface Finish			
RL	Surface finish for Low Pipe Reynolds Number in Gas and Steam		
RH	Surface finish for High Pipe Reynolds Number in Liquid		
Material Traceability Certification			
Q8[5]	Material Certificate per EN 10204:2004 3.1		
Code Conformance			
J2[6]	ANSI/ASME B31.1		
J3[6]	ANSI/ASME B31.3		

Rosemount 3095MFA Annubar Flowmeter Ordering Information

Material Conformance		
J5[7]	NACE MR-0175 / ISO 15156	
Country Certification		
J1	Canadian Registration	
Installed in Flanged Pipe Spool Section[8]		
H3	150# Flanged Connection with Rosemount Standard Length and Schedule	
H4	300# Flanged Connection with Rosemount Standard Length and Schedule	
H5	600# Flanged Connection with Rosemount Standard Length and Schedule	
Instrument Connections for Remote Mount Option		
G1	Needle Valves, Carbon Steel	
G2	Needle Valves, Stainless Steel	
G3	Needle Valves, Alloy C-276	
G5	OS&Y Gate Valve, Carbon Steel	
G6	OS&Y Gate Valve, Stainless Steel	
G7	OS&Y Gate Valve, Alloy C-276	
Special Shipment		
Y1	Mounting Hardware Shipped Separately	
Special Dimensions		
VM	Variable Mounting	
VT	Variable Tip	
VS	Variable length Spool Section	
V9	Special Dimension	
Transmitter Calibration Certification		
Q4	Calibration Data Certificate for Transmitter	
Product Certifications		
E5	FM Approvals Explosion-proof	
I5	FM Approvals Intrinsic Safety, Non-Incendive	
K5	FM Approvals Explosion-proof, Intrinsic Safety, Non-Incendive (combination of E5 and I5)	
E6	CSA Explosion-proof	
I6	CSA Intrinsically Safe, Division 2	
K6	CSA Explosion-proof, Intrinsically Safe, Division 2	
I1	ATEX Intrinsic Safety	
E1	ATEX Flameproof	
N1	ATEX Type n	
K1	ATEX Flameproof, Intrinsic Safety, Type n	
ND	ATEX Dust	
E4	TIIS Flameproof Certification	
I7	IECEx Intrinsic Safety	
Alternate Transmitter Material of Construction		
L1[9]	Inert Sensor Fill Fluid	
Display		
M5	Digital Display	
Terminal Blocks		
T1	Transient Protection	
Manifold for Remote Mount Option		
F1	3-Valve Manifold, Carbon Steel	
F2	3-Valve Manifold, Stainless Steel	
F3	3-Valve Manifold, Alloy C-276	
F5	5-Valve Manifold, Carbon Steel	
F6	5-Valve Manifold, Stainless Steel	
F7	5-Valve Manifold, Alloy C-276	
Typical Model Number: 3095MFA L 060 D C H P S 2 T1 0 0 0 3 2 C A 1A		

(1) Provide the "A" dimension for Flanged, Flange-Lok, and Threaded Flo-Tap models. Provide the "B" dimension for Flange Flo-Tap models.

(2) Ultra for Flow applicable for HART protocol, DP ranges 2 and 3 with SST isolator material and silicone fill fluid options only.

(3) Function Blocks include: Arithmetic, Integrator, Analog Output, Signal Characterizer, Control Selector, and Output Selector.

(4) Applies to assembled flowmeter only, mounting not tested.

(5) Isolation and Instrument valves not included in Traceability Certification.

(6) Not available with Transmitter Connection Platform 6.

(7) Materials of Construction comply with metallurgical requirements 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.

(8) Available for line sizes from 2 to 8-in. (50 to 200 mm).

(9) Not available with DP range 1.

Rosemount 3095MFC Compact Orifice Flowmeter

Rosemount 3095MFC Specifications

3095MFC Performance Specifications

System Reference Accuracy

Percent (%) of mass flow rate

TABLE 23. 3095MFCC - Conditioning Orifice Plate Technology

Beta	3095MFCC (8:1 flow turndown)	3095MFCC with Ultra for Flow (14:1 flow turndown)
2-in. to 8-in. line size		
0.4 0.65	±2.50% ±2.65%	±0.90% ±1.25%
10-in. to 12-in. line size		
0.4 0.65	±2.75% ±2.90%	±1.15% ±1.50%

TABLE 24. 3095MFCP - Compact Orifice Plate Technology

Beta	3095MFCP (8:1 flow turndown)	3095MFCP with Ultra for Flow (14:1 flow turndown)
1/2-in. line size		
0.4 0.65	±3.35%	±2.35%
1-in. to 1 1/2-in. line size		
0.4 0.65	±3.00%	±1.90%
2-in. to 8-in. line size		
0.4 0.65	±2.75%	±1.45%
10-in. to 12-in. line size		
0.4 0.65	±3.00%	±1.70%

Repeatability

±0.1%

Line Sizes

- 1/2-in. (15 mm) – not available for the 3095MFCC
- 1-in. (25 mm) – not available for the 3095MFCC
- 1 1/2-in. (40 mm) – not available for the 3095MFCC
- 2-in. (50 mm)
- 3-in. (80 mm)
- 4-in. (100 mm)
- 6-in. (150 mm)
- 8-in. (200 mm)
- 10-in. (250 mm)
- 12-in. (300 mm)

Output

Two-wire 4–20 mA, user-selectable for DP, AP, GP, PT, mass flow, or totalized flow. Digital HART protocol superimposed on 4–20 mA signal, available to any host that conforms to the HART protocol.

Performance Statement Assumptions

- Measured pipe I.D
- Electronics are trimmed for optimum flow accuracy

Sizing

Contact an Emerson Process Management representative for assistance. A Configuration Data Sheet is required prior to order for application verification.

3095MFC Functional Specifications

Service

- Liquid
- Gas
- Steam

Power Supply

4–20 mA option

- External power supply required. Standard transmitter (4–20 mA) operates on 11 to 55 v dc with no load

Process Temperature Limits

Direct Mount Transmitter

- 450 °F (232 °C)
- 400 °F (204 °C) when top mounted in steam service

Remote Mount Transmitter

- 850 °F (454 °C) – Stainless Steel

Transmitter Temperature Limits

Ambient

- -40 to 185 °F (-40 to 85 °C)
- with integral display: -4 to 175 °F (-20 to 80 °C)

Storage

- -50 to 230 °F (-46 to 110 °C)
- with integral display: -40 to 185 °F (-40 to 85 °C)

Differential Pressure Limits

Maximum differential pressure (DP) up to 800 inH_2O.

Pressure Limits(1)

Direct Mount Transmitter

- Pressure retention per ANSI B16.5 600# or DIN PN 100

Overpressure Limits

0 to 2 times the absolute pressure range with a maximum of 3626 psia (250 bar).

Static Pressure Limits

Operates within specification between static pressures of 0.5 psia (0.03 bar-A) and the URL of the static pressure sensor.

(1) Static pressure selection may effect pressure limitations.

Vibration Limits

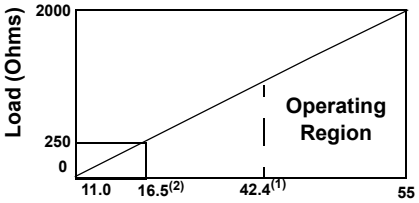
Qualified per IEC61298-3 (1998) for field with high vibration level or pipeline with high vibration level (10-60Hz 0.21mm displacement peak amplitude / 60 - 2000Hz 3g).

The weight and length of the transmitter assembly shall not exceed 5.8 lbs and 7.75-in.

Load Limitations

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

$$\text{Maximum Loop Resistance} = \frac{\text{Power Supply} - 11.0}{0.022}$$



(1) For CSA approval, power supply must not exceed 42.4 Vdc.

(2) HART protocol communication requires a loop resistance value between 250-1100 ohms, inclusive.

FOUNDATION fieldbus (output option code V)

Power Supply

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

Current Draw

17.5 mA for all configurations (including LCD display option)

Humidity Limits

- 0–100% relative humidity

Turn-On Time

Digital and analog measured variables will be within specification 7 – 10 seconds after power is applied to the transmitter.

Digital and analog flow output will be within specifications 10 – 14 seconds after power is applied to the transmitter.

Damping

Analog output response to a step input change is user-selectable from 0 to 29 seconds for one time constant. This software damping is in addition to sensor module response time

Failure Mode Alarm

Output Code A

If self-diagnostics detect a non-recoverable transmitter failure, the analog signal will be driven either below 3.75 mA or above 21.75 mA to alert the user. High or low alarm signal is user-selectable by internal jumper pins.

Output Code V

If self-diagnostics detect a gross transmitter failure, that information gets passed as a status along with the process variable(s).

Configuration

Field Communicator (Model 375 or 475)

- Performs traditional transmitter maintenance functions

3095 MultiVariable Engineering Assistant (EA) software package

- Contains built-in physical property database
- Enables mass flow configuration, maintenance, and diagnostic functions via HART modem (output option code A)

  Enables mass flow configuration via PCMCIA Interface for FOUNDATION fieldbus (output option code V)

Physical Properties Database

- Maintained in Engineering Assistant Software Configurator
- Physical properties for over 110 fluids
- Natural gas per AGA
- Steam and water per ASME
- Other database fluids per American Institute of Chemical Engineers (AIChE)
- Optional custom entry

FOUNDATION fieldbus Function Blocks

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.

5 Analog Input Blocks

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

PID Block with Auto-tune

- Contains all logic to perform PID control in the field including cascade and feedforward. Auto-tune capability allows for superior tuning for optimized control performance.

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 Bock

- 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.

Output Splitter Block

- Splits the output of one PID or other control block so that the PID will control two valves or other actuators.

Control Selector Block

- Selects one of up to three inputs (highest, middle, or lowest) that are normally connected to the outputs of PID or other control function blocks.

3095MFC Physical Specifications

Temperature Measurement

Integral RTD

- 100 Ohm platinum RTD temperature sensor assembly (316 SST Mineral Insulated Cable) with 1/4-in. NPT connection to wafer side and 1/2-in. NPT connection to transmitter RTD sensor is separated from process fluid by 1/16-in. and is pressure retaining rated for ANSI 600#. Complies with IEC-751 Class B accuracy. Meets Intrinsic Safety certification, see “Rosemount 3095MFC Specifications” on page 40.

Remote RTD

- 100 Ohm platinum with 1/2-in. NPT nipple and union (078 series with Rosemount 644 housing)
  Model 0078D21N00A025T32Ex
  Connection Head: 00644-4410-0011
- Standard RTD cable is shielded armored cable, length is 12-ft. (3.66 m)
- Remote RTD material is SST

Thermowell

- 1/2-in. x 1/2-in. NPT, 316 SST

Electronic Connections for Remote Mount

- 1/2–14 NPT, G1/2, and M20 × 1.5 (CM20) conduit. HART interface connections fixed to terminal block for output code A

Process-Wetted Parts

Integral Manifolds

- 316 SST
- Alloy C-276

Remote Manifolds

- 316 SST
- Alloy C-276

Transmitter Vent Valves and Process Flanges

- 316 SST
- Alloy C-276
- Glass-filled PTFE O-rings

Process Isolating Diaphragms

- 316L SST
- Alloy C-276

Integral Manifold O-Rings

- PTFE/Graphite

Non-Wetted Parts

Sensor Module Fill Fluid

- Silicone oil
- Inert Fill optional

Cover O-rings

- Buna-N

Remote Mounting Brackets

- SST

Electronic Housing

- Low copper aluminum, NEMA 4x, IP65
- SST (optional)

Paint

- Polyurethane

Bolts

- CS

Material of Construction

Body/Plate

- 316 SST
- 50 micro-inch Ra surface finish

Manifold Head/Valves

- 316 SST

Flange Studs and Nuts

- Customer supplied
- Available as a spare part

Transmitter Connection Studs and Nuts

- Studs– A193 Grade B8M.
- Nuts– A194 Grade 8M.

Gasket and O-rings

- Gaskets are customer supplied.
- Durlon 8500 fiber gaskets are recommended. Consult an Emerson Process Management representative for use with other gaskets.
- Available as a spare part

NOTE
Gaskets and O-rings should be replaced when the 405 is disassembled.

Transmitter Connections

Remote Mount

- Available with 1/4-in. (standard) or 1/2-in. (option code E) connections

Orifice Type

- Square edged, Wafer style

Orifice Pressure Taps

- Corner

Process Connections

Mounts between the following flange configurations

ASME B16.5 (ANSI)	DIN	JIS
Class 150	PN16 (option code G)	10k (option code B)
Class 300	PN40 (option code H)	20k (option code R)
Class 600	PN100 (option code H)	40k (option code S)

ANSI alignment ring is included as standard when ordering

Typical Orifice Hole Sizes (For 3095MFCC)

Beta is calculated by: (β) = d_C / Pipe ID, where the calculated bore is equal to 2 x typical orifice hole size (d_C = 2d). The table below shows the diameter of each of the four typical orifice holes.

TABLE 25. β = 0.4(1)(2)

Line Size	3095MFCC	3095MFCP
1/2-in. (15 mm)	Not Available	0.249 (6.325)
1-in. (25 mm)	Not Available	0.420 (10.668)
1 1/2-in. (40 mm)	Not Available	0.644 (16.358)
2-in. (50 mm)	0.413 (10.490)	0.827 (21.006)
3-in. (80 mm)	0.614 (15.596)	1.227 (31.166)
4-in. (100 mm)	0.805 (20.447)	1.610 (40.894)
6-in. (150 mm)	1.213 (30.810)	2.426 (61.620)
8-in. (200 mm)	1.596 (40.538)	3.192 (81.077)
10-in. (250 mm)	2.004 (50.902)	4.008 (101.80)
12-in. (300 mm)	2.400 (60.960)	4.800 (121.92)

(1) Measurement is in inches (millimeters)

(2) Tolerance = ±0.002-in.

TABLE 26. β = 0.65(1)(2)

Line Size	3095MFCC	3095MFCP
1/2-in. (15 mm)	Not Available	0.404 (10.262)
1-in. (25 mm)	Not Available	0.682 (17.323)
1 1/2-in. (40 mm)	Not Available	1.047 (26.594)
2-in. (50 mm)	0.620 (15.748)(3)	1.344 (34.138)
3-in. (80 mm)	0.997 (25.324)	1.994 (50.648)
4-in. (100 mm)	1.308 (33.223)	2.617 (66.472)
6-in. (150 mm)	1.971 (50.063)	3.942 (100.127)
8-in. (200 mm)	2.594 (65.888)	5.188 (131.775)
10-in. (250 mm)	3.257 (82.728)	6.513 (165.43)
12-in. (300 mm)	3.900 (99.060)	7.800 (198.120)

(1) Measurement is in inches (millimeters)

(2) Tolerance = ±0.002-in.

(3) Beta (β) = 0.60-in. (15.24 mm) for 2-in. line size only.

3095MFC Weight

Line Size	Direct Mount (D3)(1)(2)	Remote Mount (R3)(1)
1/2-in. (15 mm)	9.50 (4.69)	6.3 (3.11)
1-in. (25 mm)	10.25 (5.06)	7.05 (3.48)
1 1/2-in. (40 mm)	10.75 (5.31)	7.55 (3.73)
2-in. (50 mm)	11.00 (5.43)	7.80 (3.85)
3-in. (80 mm)	13.00 (6.42)	9.80 (4.84)
4-in. (100 mm)	15.50 (7.65)	12.30 (6.07)
6-in. (150 mm)	20.45 (9.28)	17.25 (7.83)
8-in. (200 mm)	24.95 (11.32)	21.75 (9.87)
10-in. (250 mm)	30.70 (13.92)	27.50 (13.58)
12-in. (300 mm)	36.70 (16.64)	33.50 (16.54)

(1) Measurement in lb (kg).

(2) Includes 3095 MultiVariable transmitter.

3095MFC Installation Considerations

Straight Run Requirements

TABLE 27. 3095MFCC Straight Pipe Requirements(1)

	Beta	0.40	0.65
Upstream (inlet) side of primary	Reducer (1 line size)	2	2
	Single 90° bend or tee	2	2
	Two or more 90 ° bends in the same plane	2	2
	Two or more 90° bends in different plane	2	2
	Up to 10° of swirl	2	2
	Butterfly valve (75% to 100% open)	2	N/A
Downstream (outlet) side of primary		2	2

TABLE 28. 3095MFCP Straight Pipe Requirements(1)(2)(3)

	Beta	0.40	0.65
(2)(3) Upstream (inlet) side of primary	Reducer	5	12
	Single 90° bend or tee	16	44
	Two or more 90 ° bends in the same plane	10	44
	Two or more 90° bends in different plane	50	60
	Expander	12	28
	Ball / Gate valve fully open	12	18
Downstream (outlet) side of primary		6	7

(1) Consult an Emerson Process Management representative if disturbance is not listed.

(2) Recommended lengths represented in pipe diameters per ISO 5167.

(3) Refer to ISO 5167 for recommended lengths when using flow straighteners.

Pipe Orientation

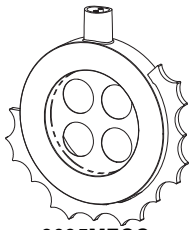
Pipe orientation for both 3095MFCC Compact Conditioning Mass Orifice and standard 3095MFCP Compact Mass Orifice.

Orientation/ Flow Direction	Process(1)		
	Gas	Liquid	Steam
Horizontal	D/R	D/R	D/R
Vertical Up	R	D/R	R
Vertical Down	D/R	NR	NR

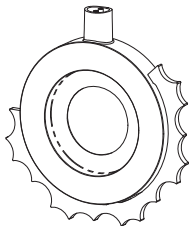
(1) D = Direct mount acceptable (recommended)
R = Remote mount acceptable
NR = Not recommended

Pipe Centering

Improper centering of any orifice type device can cause an error of up to ±5% in small line sizes. A centering mechanism (centering ring) independent of flange rating comes standard with the 405 Compact Orifice Series.



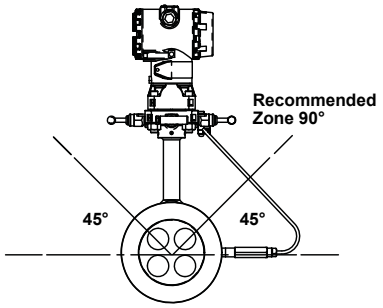
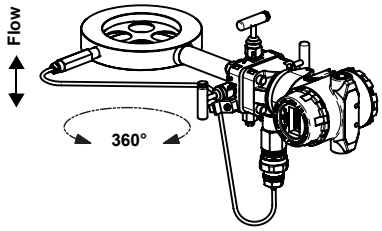
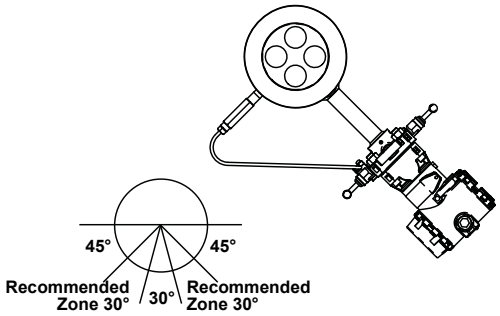
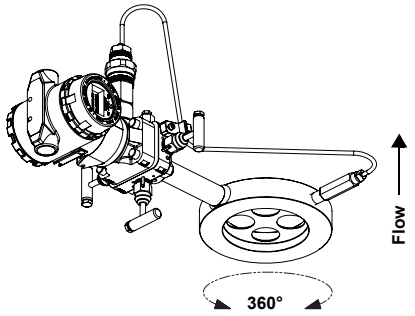
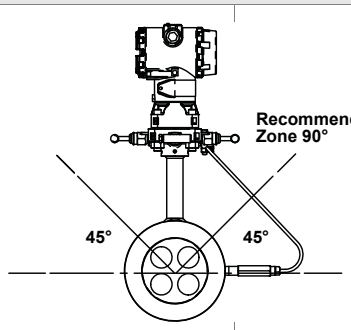
3095MFCC
Conditioning Orifice



3095MFCP
Compact Orifice

Flowmeter Orientation

Flowmeter orientation for both 3095MFC Conditioning Compact Orifice and standard Compact Orifice.

Gas (Horizontal)	Gas (Vertical)
	
Liquid and Steam (Horizontal)	**Steam (Vertical)**
	
Top Mounting for Steam (Horizontal)	
	

Rosemount 3095MFC Product Certifications

Rosemount 3095MFC with HART

European Directive Information

The EC declaration of conformity for all applicable European directives for this product can be found on the Rosemount website at www.rosemount.com. A hard copy may be obtained by contacting our local sales office.

ATEX Directive (94/9/EC)

Emerson Process Management complies with the ATEX Directive.

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

3095M_2/3,4/D Flow Transmitters — QS Certificate of Assessment - EC No. PED-H-20
Module H Conformity Assessment

All other 3095_ Transmitters/Level Controller — Sound Engineering Practice

Transmitter Attachments: Process Flange - Manifold — Sound Engineering Practice

Electro Magnetic Compatibility (EMC) (89/336/EEC)

3095MV Flow Transmitters

— EN 50081-1: 1992; EN 50082-2:1995; EN61326-1:2006; EN61326-2-3:2006

Ordinary Location Certification for Factory Mutual

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

Hazardous Locations Certifications

North American Certifications

FM Approvals

E5 Explosion Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition Proof for Class II/Class III, Division 1, Groups E, F, and G. Enclosure type NEMA 4X. Factory Sealed. Provides nonincendive RTD connections for Class I, Division 2, Groups A, B, C, and D.

I5 Intrinsically Safe for use in Class I, II and III, Division 1, Groups A, B, C, D, E, F, and G hazardous outdoor locations and Zone 0 Exia IIC T4.
Non-incendive for Class I, Division 2, Groups A, B, C, and D. Temperature Code T4. Factory Sealed.
For input parameters and installation see control drawing 03095-1020.

Canadian Standards Association (CSA)

E6 Explosion Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition Proof for Class II/Class III, Division 1, Groups E, F, and G. CSA enclosure Type 4X suitable for indoor and outdoor hazardous locations. Provides nonincendive RTD connection for Class I, Division 2, Groups A, B, C, and D.Factory Sealed. Install in accordance with Rosemount Drawing 03095-1024. Approved for Class I, Division 2, Groups A, B, C, and D.

I6 Intrinsically Safe for Class I, Division 1, Groups A, B, C, and D. when installed in accordance with Rosemount drawing 03095-1021. Temperature Code T3C.

For input parameters and installation see control drawing 03095-1021.

European Certifications

I1 ATEX Intrinsic Safety
Certificate Number: BAS98ATEX1359X ⟨Ex⟩ II 1 G
Ex ia IIC T5 (T_{amb} = –45 °C to 40 °C)
Ex ia IIC T4 (T_{amb} = –45 °C to 70 °C)
CE 1180

TABLE 29. Connection Parameters (Power/Signal Terminals)

U_i = 30V
I_i = 200 mA
P_i = 1.0 W
C_i = 0.012 µF
L_i = 0

TABLE 30. Temperature Sensor Connection Parameters

U_o = 30V
I_o = 19 mA
P_o = 140 mW
C_i = 0.002 µF
L_i = 0

TABLE 31. Temp Sensor Terminals Connection Parameters

C_o = 0.066 µF	Gas Group IIC
C_o = 0.560 µF	Gas Group IIB
C_o = 1.82 µF	Gas Group IIA
L_o = 96 mH	Gas Group IIC
L_o = 365 mH	Gas Group IIB
L_o = 696 mH	Gas Group IIA
L_o/R_o = 247 µH/ohm	Gas Group IIC
L_o/R_o = 633 µH/ohm	Gas Group IIB
L_o/R_o= 633 µH/ohm	Gas Group IIA

Special Conditions for Safe Use

The 3095, when fitted with the transient terminal block (order code B), are not capable of withstanding the 500 volts insulation test required by EN60079-11, Clause 6.3.12 (1994). This condition must be accounted for during installation.

N1 ATEX Type N

Certificate Number: BAS98ATEX3360X ⟨Ex⟩ II 3 G

Ex nL IIC T5 (T_{amb} = –45 °C to 40 °C)
Ex nL IIC T4 (T_{amb} = –45 °C to 70 °C)

U_i = 55V

CE

The apparatus is designed for connection to a remote temperature sensor such as a resistance temperature detection (RTD)

Special Conditions for Safe Use

The 3095, when fitted with the transient terminal block (order code B), are not capable of withstanding the 500 volts insulation test required by EN60079-15, Clause 6.8.1. This condition must be accounted for during installation.

E1 ATEX Flameproof
Certificate Number: KEMA02ATEX2320X ⟨Ex⟩ II 1/2 G
EEx d IIC T5 (-50°C ≤ T_{amb} ≤ 80°C)
T6 (-50°C ≤ T_{amb} ≤ 65°C)
CE 1180

Special Conditions for Safe Use (x):

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.

ND ATEX Dust
Certificate Number: KEMA02ATEX2321 ⟨Ex⟩ II 1 D
V = 55 Vdc MAX
I = 23 mA MAX
IP66
CE 1180

Combinations of Certifications

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

K5 E5 and I5 combination

K6 E6 and I6 combination

K1 I1, N1, E1, and ND combination

Rosemount 3095MFC with Fieldbus

European Directive Information

The EC declaration of conformity for all applicable European directives for this product can be found on the Rosemount website at www.rosemount.com. A hard copy may be obtained by contacting our local sales office.

ATEX Directive (94/9/EC)

Emerson Process Management complies with the ATEX Directive.

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

3095F_2/3,4/D and 3095M_2/3,4/D Flow Transmitters

— QS Certificate of Assessment - EC No. PED-H-20 Module H Conformity Assessment

All other 3095_ Transmitters/Level Controller

— Sound Engineering Practice

Transmitter Attachments: Process Flange - Manifold

— Sound Engineering Practice

Primary Elements, Flowmeter

— See appropriate Primary Element QIG

Electro Magnetic Compatibility (EMC) (89/336/EEC)

3095 Flow Transmitters

— EN 50081-1: 1992; EN 50082-2:1995; EN61326-1:2006; EN61326-2-3:2006

Ordinary Location Certification for Factory Mutual

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

Rosemount 3095MFC Fieldbus Hazardous Locations Certifications

North American Certifications

FM Approvals

E5 Explosion Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition Proof for Class II/Class III, Division 1, Groups E, F, and G. Enclosure type NEMA 4X. Factory Sealed. Provides nonincendive RTD connections for Class I, Division 2, Groups A, B, C, and D.

I5 Intrinsically Safe for use in Class I, II and III, Division 1, Groups A, B, C, D, E, F, and G hazardous outdoor locations. Non-incendive for Class I, Division 2, Groups A, B, C, and D. Temperature Code T4. Factory Sealed.

For input parameters and installation see control drawing 03095-1020.

IE FISCO for use in Class I, II and III, Division 1, Groups A, B, C, D, E, F, and G hazardous outdoor locations. Temperature Code T4. Factory Sealed.

For input parameters and installation see control drawing 03095-1020.

Combinations of Certifications

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

K5 E5 and I5 combination

Canadian Standards Association (CSA)

IF CSA FISCO Intrinsically Safe; for FOUNDATION fieldbus protocol only

European Certifications

IA ATEX FISCO Intrinsically Safe; for FOUNDATION fieldbus protocol only

Australian Certifications

IG IECEx FISCO Intrinsic Safety

DIMENSIONAL DRAWINGS

Rosemount 3095MFC Compact Orifice Flowmeter

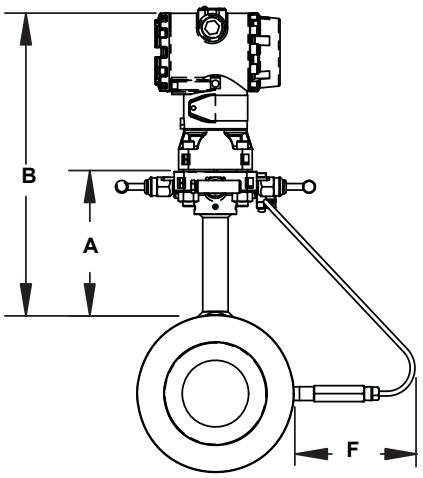
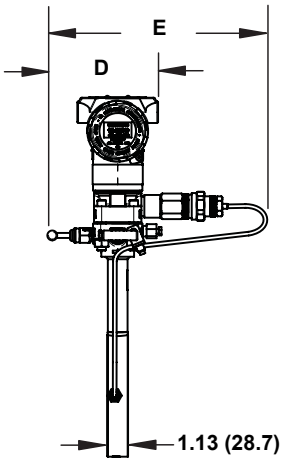
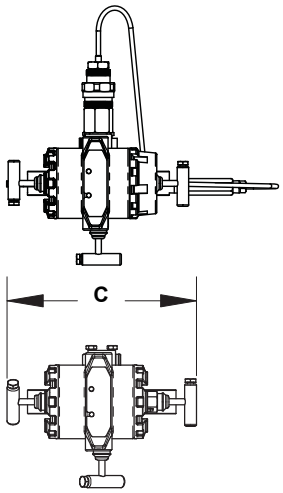
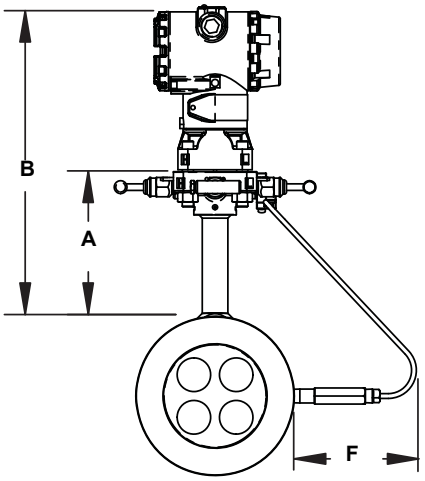
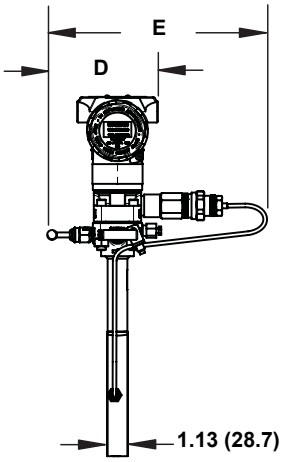
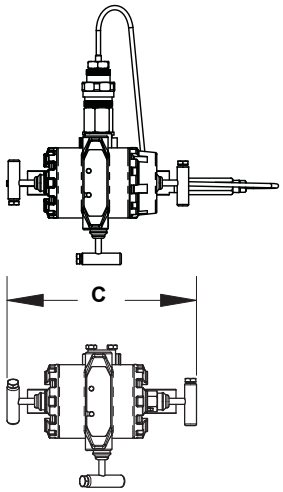
	Orifice Plate Front View	Orifice Plate Side View	Orifice Plate Top View
Compact Orifice Plate (Primary Element Type code P)			
Conditioning Orifice Plate (Primary Element Type code C)			

TABLE 32. Dimensional Drawings[(1)]

Plate Type[(1)]	A	B	Transmitter Height	C	D	E	F
Type P & C	5.50 (140)	Transmitter Height + A	6.25 (159)	7.75 (197) - closed 8.25 (210) - open	6.0 (152) - closed 6.25 (159) - open	Max of 11.9 (302)	Max of 7.2 (183)

(1) Measurement is in inches (millimeters).

ORDERING INFORMATION

Rosemount 3095MFC Compact Orifice Flowmeter Ordering Information

Model	Product Description		
3095MFC	Compact Orifice Flowmeter		
Primary Element Technology			
C	Conditioning Orifice Plate		
P	Orifice Plate		
Material Type			
S	316 Stainless Steel		
Line Size			
005(1)	1/2-in. (15 mm)		
010(1)	1-in. (25 mm)		
015(1)	1 1/2-in. (40 mm)		
020	2-in. (50 mm)		
030	3-in. (80 mm)		
040	4-in. (100 mm)		
060	6-in. (150 mm)		
080	8-in. (200 mm)		
100(2)	10-in. (250 mm)		
120(2)	12-in. (300 mm)		
Primary Element Style			
N	Square Edged		
Beta Ratio			
040	0.40 Beta Ratio (β)		
065(3)	0.65 Beta Ratio (β)		
Temperature Measurement			
T	Integral RTD		
R	Remote Thermowell and RTD		
0	No Temperature Sensor		
Transmitter Connection Platform			
3	Direct-mount, 3-valve Integral Manifold, SST		
7	Remote-mount, 1/4-in. NPT connections		
Differential Pressure Range			
1	0 to 25 in H_2O (0 to 62,3 mbar)		
2	0 to 250 in H_2O (0 to 623 mbar)		
3	0 to 1000 in H_2O (0 to 2,5 bar)		
Static Pressure Range			
B	0 – 8 to 0 – 800 psia (0 –55,16 to 0 – 5515,8 kPa)		
C	0 – 8 to 0 – 800 psig (0 –55,16 to 0 – 5515,8 kPa)		
D	0 – 36.2 to 0 – 3626 psia (0 –250 to 0 – 25000 kPa)		
E	0 – 36.2 to 0 – 3626 psig (0 –250 to 0 – 25000 kPa)		
Output Protocol			
A	4–20 mA with digital signal based on HART protocol		
V	FOUNDATION fieldbus protocol		
	Transmitter Housing Style	**Conduit Entry Size**	
1A	Polyurethane-covered, Aluminum	1/2-14 NPT	
1B	Polyurethane-covered, Aluminum	M20 x 1.5 (CM20)	
1C	Polyurethane-covered, Aluminum	G1/2	
1J	SST	1/2-14 NPT	
1K	SST	M20 x 1.5 (CM20)	
1L	SST	G1/2	

Rosemount 3095MFC Compact Orifice Flowmeter Ordering Information

OPTIONS		
Performance Class		
U3[4]	Ultra for Flow: up to ±0.70% mass flow rate accuracy, up to 10:1 turndown, 10-year stability, limited 12-year warranty	
Installation Accessories		
A	ANSI Alignment Ring (150#), (Only required for 10-in. (250 mm) and 12-in. (300 mm) line sizes)	
C	ANSI Alignment Ring (300#), (Only required for 10-in. (250 mm) and 12-in. (300 mm) line sizes)	
D	ANSI Alignment Ring (600#), (Only required for 10-in. (250 mm) and 12-in. (300 mm) line sizes)	
G	DIN Alignment Ring (PN 16)	
H	DIN Alignment Ring (PN 40)	
J	DIN Alignment Ring (PN 100)	
B	JIS Alignment Ring (10K)	
R	JIS Alignment Ring (20K)	
S	JIS Alignment Ring (40K)	
Remote Adapters		
E	Flange adapters 316 SST ($^1/_2$-in. NPT)	
High Temperature Applications		
T	Graphite Valve Packing (T_{max} = 850 °F)	
Flow Calibration		
WC[5]	Discharge Coefficient Verification (3 point)	
WD[5]	Discharge Coefficient Verification (10 point)	
Pressure Testing		
P1	Hydrostatic Testing	
Special Cleaning		
P2	Cleaning for Special Processes	
PA	Cleaning per ASTM G93 Level D (section 11.4)	
Special Inspection		
QC1	Visual & Dimensional Inspection with Certificate	
QC7	Inspection & Performance Certificate	
Transmitter Calibration Certification		
Q4	Calibration Data Certificate for Transmitter	
Material Traceability Certification		
Q8[6]	Material Traceability Certification per EN 10204:2004 3.1	
Code Conformance		
J2	ANSI / ASME B31.1	
J3	ANSI / ASME B31.3	
Materials Conformance		
J5[7][8]	NACE MR-0175 / ISO 15156	
Country Certification		
J1	Canadian Registration	
Product Certifications		
E5	FM Approvals Explosion-proof	
I5	FM Approvals Intrinsic Safety and Non-Incendive	
K5	FM Approvals Explosion-proof, Intrinsic Safety, and Non-Incendive (combination of E5 and I5)	
E6	CSA Explosion-proof	
I6	CSA Intrinsically Safe, Division 2	
K6	CSA Explosion-proof, Intrinsically Safe, Division 2	
I1	ATEX Intrinsic Safety	
E1	ATEX Flameproof	
N1	ATEX Type n	
K1	ATEX Flameproof, Intrinsic Safety, Type n	
ND	ATEX Dust	
E4	TIIS Flameproof Certification	
I7	IECEx Intrinsically Safe	
Alternate Transmitter Material of Construction		
L1[8]	Inert Sensor Fill Fluid	
Digital Display		
M5	Integral mount LCD Display	

Rosemount 3095MFC Compact Orifice Flowmeter Ordering Information

Terminal Blocks		
T1	Transient Protection	
Manifold for Remote Mount Option		
F2	3-Valve Manifold, Stainless Steel	
F6	5-Valve Manifold, Stainless Steel	
Typical Model Number: 3095MFC C S 040 N 040 0 3 B A 1A		

(1) Not available for Primary Element Type code C.

(2) Requires the selection of an alignment ring option code in the Installation Accessories section.

(3) For 2-in. (50.8 mm) line sizes the Beta Ratio is 0.6 for Primary Element Type code C.

(4) Ultra for Flow applicable for HART protocol, DP ranges 2 and 3 with SST isolator material and silicone fill fluid options only.

(5) Not available with Primary Element Type code P.

(6) Instrument valves not included in Traceability Certification.

(7) Materials of Construction comply with metallurgical requirements 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.

(8) Not available with DP range 1.

Rosemount 3095MFP Integral Orifice Flowmeter

Rosemount 3095MFP Specifications

3095MFP Performance Specifications

System Reference Accuracy

Percentage (%) of mass flow rate(1)

Beta (β)(2)	Classic (8:1 flow turndown)	Ultra for Flow 10:1 flow turndown
β < 0.1	±2.60%	±2.55%
0.1 < β < 0.2	±1.50%	±1.35%
0.2 < β < 0.6	±1.10%	±0.95%
0.6 < β < 0.8	±1.70%	±1.60%

(1) Without associated straight run piping, discharge coefficient uncertainty can add up to 1.5% - 5% additional error. Consult the factory for additional information.

(2) $\beta = \frac{\text{Orifice Plate Bore}}{\text{body I.D.}}$

Repeatability

±0.1%

Line Sizes

- 1/2-in. (15 mm)
- 1-in. (25 mm)
- 1 1/2-in. (40 mm)

Output

Two-wire 4–20 mA, user-selectable for DP, AP, GP, PT, mass flow, or totalized flow. Digital HART protocol superimposed on 4–20 mA signal, available to any host that conforms to the HART protocol.

Performance Statement Assumptions

- Measured pipe I.D
- Electronics are trimmed for optimum flow accuracy

Sizing

Contact a Emerson Process Management sales representative for assistance. A “Configuration Data Sheet” is required prior to order for application verification.

3095MFP Functional Specifications

Service

- Liquid
- Gas
- Steam

Power Supply

4–20 mA option

- External power supply required. Standard transmitter (4–20 mA) operates on 11 to 55 v dc with no load

Process Temperature Limits

Direct Mount Transmitter

- –40 to 450 °F (–40 to 232 °C)

Remote Mount Transmitter

- –148 to 850 °F (–100 to 454 °C)(1)

(1) High temperature option code G must be selected.

Transmitter Temperature Limits

Ambient

- –40 to 185 °F (–40 to 85 °C)
- With Integral Mount LCD Display: –4 to 175 °F (–20 to 80 °C)

Storage

- –50 to 230 °F (–46 to 110 °C)
- With Integral Mount LCD Display: –40 to 185 °F (–40 to 85 °C)

Maximum Working Pressure

Transmitter

- Zero to two times the absolute pressure range with a maximum of 3626 psia (250 bar).

Flowmeter

- Pressure retention per ANSI B16.5 600 lb. or DIN PN100

TABLE 33. 1195 Pressure Limits

Line Size	Process Connection Code	Maximum Working Pressure @ 100 °F(1)(2)
1/2-in. (12.7 mm)	S1 or P2	3000 psig (207 bar)
	T1 or P1	1500 psig (103 bar)
1-in. (25.4 mm)	S1 or P2	2000 psig (138 bar)
	T1 or P1	1500 psig (103 bar)
1 1/2-in. (38.1 mm)	S1 or P2	1500 psig (103 bar)
	T1 or P1	1500 psig (103 bar)
All	Flanged	Meets flange primary pressure rating per ANSI B16.5 (EN-1092-1 for DIN flanges)

(1) For pressure ratings at temperatures less than -20 °F (-29 °C) or above 100 °F (38 °C) consult an Emerson Process Management representative.

(2) Transmitter static pressure range may limit maximum working pressure. Refer to Static Pressure Ranges specification.

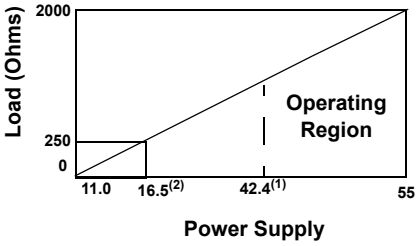
Static Pressure Limits

Operates within specification between static pressures of 0.5 psia (0.03 bar-A) and the URL of the static pressure sensor.

Load Limitations

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

$$\text{Maximum Loop Resistance} = \frac{\text{Power Supply} - 11.0}{0.022}$$



(1) For CSA approval, power supply must not exceed 42.4 V dc.

(2) HART protocol communication requires a loop resistance value between 250-1100 ohms, inclusive.

Humidity Limits

- 0–100% relative humidity

Turn-On Time

Digital and analog measured variables will be within specification 7 – 10 seconds after power is applied to the transmitter.

Digital and analog flow output will be within specifications 10 – 14 seconds after power is applied to the transmitter.

Damping

Analog output response to a step input change is user-selectable from 0 to 29 seconds for one time constant. This software damping is in addition to sensor module response time

Failure Mode Alarm

Output Code A

If self-diagnostics detect a non-recoverable transmitter failure, the analog signal will be driven either below 3.75 mA or above 21.75 mA to alert the user. High or low alarm signal is user-selectable by internal jumper pins.

Output Code V

If self-diagnostics detect a gross transmitter failure, that information gets passed as a status along with the process variable(s).

Configuration

HART Hand-held Communicator (Model 375 or 475)

- Performs traditional transmitter maintenance functions

3095 Multivariable Engineering Assistant (EA) software package

- Contains built-in physical property database
- Enables mass flow configuration, maintenance, and diagnostic functions via HART modem (output option code A)

  Enables mass flow configuration via PCMCIA Interface for FOUNDATION fieldbus (output option code V)

Physical Properties Database

- Maintained in Engineering Assistant Software Configurator
- Physical properties for over 110 fluids
- Natural gas per AGA
- Steam and water per ASME
- Other database fluids per American Institute of Chemical Engineers (AIChE)
- Optional custom entry

FOUNDATION fieldbus Function Blocks

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.

5 Analog Input Blocks

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

PID Block with Auto-tune

- Contains all logic to perform PID control in the field including cascade and feedforward. Auto-tune capability allows for superior tuning for optimized control performance.

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 Bock

- 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.

Output Splitter Block

- Splits the output of one PID or other control block so that the PID will control two valves or other actuators.

Control Selector Block

- Selects one of up to three inputs (highest, middle, or lowest) that are normally connected to the outputs of PID or other control function blocks.

3095MFP Physical Specifications

Temperature Measurement

Remote RTD

- 100 Ohm platinum with 1/2-in. NPT nipple and union (078 series with Rosemount 644 housing)
- Standard RTD cable is shielded armored cable, length is12 feet (3.66 m)
- Remote RTD material is SST

Thermowell

- 1/2-in. x 1/2-in. NPT, 316 SST

Electrical Considerations

1/2–14 NPT, G1/2, and CM20 conduit. HART interface connections permanently fixed to terminal block

Material of Construction

Orifice Plate

- 316/316L SST
- Alloy C-276
- Alloy 400

Body

- 316 SST (CF8M), material per ASTM A351
- Alloy C-276 (CW12MW), material per ASTM A494

Flange and Pipe Material (If Applicable)

- A312 Gr 316/316L, B622 UNS N10276
- Flange pressure limits are per ANSI B16.5
- Flange face finish per ANSI B16.5, 125 to 250 RMS

Body Bolts/Studs

- ASTM A193 Gr B8M studs
- SAE J429 Gr 8 bolts (meets or exceeds ASTM A193 B7 requirements) for body bolt/stud material option code G for high temperatures.

Transmitter Connection Studs

- ASTM A193 Gr B8M studs

Gaskets/O-rings

- Glass filled PTFE
- Optional high temperature Inconel® X-750
- Gaskets and o-rings must be replaced each time the 3095MFP is disassembled for installation or maintenance.

3095MFP Installation Considerations

Pipe Orientation

Orientation/ Flow Direction	Process(1)		
	Gas	Liquid	Steam
Horizontal	D/R	D/R	D/R
Vertical Up	R	R	R
Vertical Down	R	NR	NR

(1) D = Direct mount acceptable (recommended)
R = Remote mount acceptable
NR = Not recommended

Orifice Type

Square edged—orifice bore size

- 0.066-in and larger

Quadrant edged—orifice bore size (for 1/2-in. line size only)

- 0.034-in
- 0.020-in
- 0.014-in
- 0.010-in

NOTE
Integral Orifice bodies contain corner tapped pressure ports.

Pipe Lengths

- Upstream and downstream associated piping sections are available on the 1195. The table below lists the standard overall length (lay length) as a function of end connections and line size.

	Line Size		
Flanged Process Connection(1) (2) (3)	**1/2-in. (15 mm)**	**1-in. (25 mm)**	**1 1/2-in. (40 mm)**
RF, ANSI Class 150, slip-on	18.2 (463)	28.9 (734)	40.3 (1023)
RF, ANSI Class 300, slip-on	18.2 (463)	28.9 (734)	40.3 (1023)
RF, ANSI Class 600, slip-on	18.2 (463)	28.9 (734)	40.3 (1023)
RF, DIN PN16, slip-on	18.2 (463)	28.9 (734)	40.3 (1023)
RF, DIN PN40, slip-on	18.2 (463)	28.9 (734)	40.3 (1023)
RF, DIN PN100, slip-on	18.2 (463)	28.9 (734)	40.3 (1023)
RF, ANSI Class 150, weld-neck	21.8 (554)	33.2 (843)	44.9 (1140)
RF, ANSI Class 300, weld-neck	22.2 (564)	33.7 (856)	45.5 (1156)
RF, ANSI Class 600, weld-neck	22.8 (579)	34.3 (871	46.1 (1171)
RTJ, ANSI Class 150, slip-on	18.2 (463)	28.9 (734)	40.3 (1023)
RTJ, ANSI Class 300, slip-on	18.2 (463)	28.9 (734)	40.3 (1023)
RTJ, ANSI Class 600, slip-on	18.2 (463)	28.9 (734)	40.3 (1023)
NPT / Beveled Process Connection(1)(2)(3)	18 (457)	28.9 (734)	40.3 (1023)

(1) See the ordering information for model code description.

(2) Consult factory for other lengths.

(3) See page 54 for additional information on associated pipe lengths.

Weight

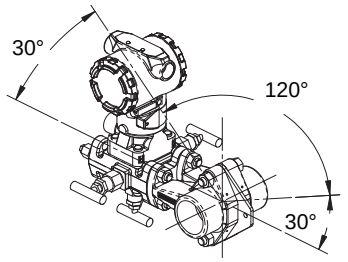
The following weights are approximate

Line Size	With Body		With Flanged Piping(1)	
	lb	kg	lb	kg
1/2-in. (15 mm)	16.1	7.3	20.1	9.1
1-in. (25 mm)	18.1	8.2	24.1	10.9
1 1/2-in. (40 mm)	20.1	9.1	37.1	16.8

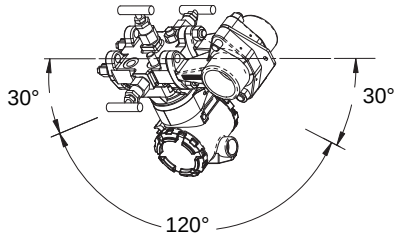
(1) As supplied with standard lengths, ANSI Class 150 flanges.

Flowmeter Orientation

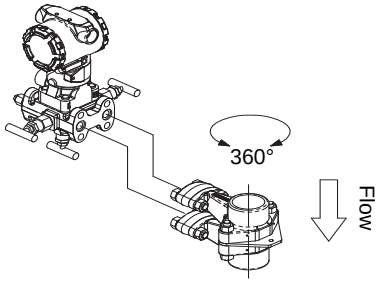
Gas (Horizontal)



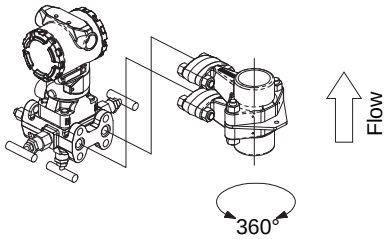
Liquid and Steam (Horizontal)



Gas (Vertical)



Liquid (Vertical)



Process-Wetted Parts

Manifolds

- 316 SST
- Alloy C-276

Manifold Option	Type	Type with J2, J3 Option
Direct Mount: D3-D6	Traditional	Traditional
Direct Mount: D7	Traditional	N/A
Remote Mount: R3-R6	Coplanar	Traditional

Transmitter Vent Valves and Process Flanges

- 316 SST
- Alloy C-276

Process Isolating Diaphragms

- 316L SST
- Alloy C-276

O-rings

- Glass-filled PTFE / Inconel X-750

Integral Manifold O-Rings

- PTFE / Graphite (D7)

Non-Wetted Parts

Electronics Housing

Low-copper aluminum alloy or SST: CF-3M (Cast 316L SST) or CF-8M (Cast 316 SST) NEMA 4X, IP 66,
IP 68 (66 ft (20 m) for 168 hours)
Note: IP 68 not available with Wireless Output

Coplanar Sensor Module Housing

SST: CF-3M (Cast 316L SST)

Sensor Module Fill Fluid

Silicone or inert halocarbon (Inert is not available with 3051S_CA). In-Line series uses Fluorinert® FC-43.

Remote Mounting Brackets

SST

Sensor mounting (including nuts, bolts, and gasket)

SST (CS optional for high temperature)

Bolts

CS

Paint

Polyurethane

Cover O-rings

Buna-N

Wireless Antenna

PBT/ polycarbonate (PC) integrated omnidirectional antenna

Power Module

Field replaceable, keyed connection eliminates the risk of incorrect installation, Intrinsically Safe Lithium-thionyl chloride Power Module with PBT enclosure

Rosemount 3095MFP Product Certifications

Rosemount 3095MFP with HART

European Directive Information

The EC declaration of conformity for all applicable European directives for this product can be found on the Rosemount website at www.rosemount.com. A hard copy may be obtained by contacting our local sales office.

ATEX Directive (94/9/EC)

Emerson Process Management complies with the ATEX Directive.

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

3095M_2/3,4/D Flow Transmitters — QS Certificate of

Assessment - EC No. PED-H-20
Module H Conformity Assessment

All other 3095_ Transmitters/Level Controller — Sound Engineering Practice

Transmitter Attachments: Process Flange - Manifold — Sound Engineering Practice

Electro Magnetic Compatibility (EMC) (89/336/EEC)

3095MV Flow Transmitters

— EN 50081-1: 1992; EN 50082-2:1995; EN61326-1:2006; EN61326-2-3:2006

Ordinary Location Certification for Factory Mutual

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

Hazardous Locations Certifications

North American Certifications

FM Approvals

E5 Explosion Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition Proof for Class II/Class III, Division 1, Groups E, F, and G. Enclosure type NEMA 4X. Factory Sealed. Provides nonincendive RTD connections for Class I, Division 2, Groups A, B, C, and D.

I5 Intrinsically Safe for use in Class I, II and III, Division 1, Groups A, B, C, D, E, F, and G hazardous outdoor locations. Non-incendive for Class I, Division 2, Groups A, B, C, and D. Temperature Code T4. Factory Sealed.

For input parameters and installation see control drawing 03095-1020.

Canadian Standards Association (CSA)

E6 Explosion Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition Proof for Class II/Class III, Division 1, Groups E, F, and G. CSA enclosure Type 4X suitable for indoor and outdoor hazardous locations. Provides nonincendive RTD connection for Class I, Division 2, Groups A, B, C, and D.Factory Sealed. Install in accordance with Rosemount Drawing 03095-1024. Approved for Class I, Division 2, Groups A, B, C, and D.

I6 Intrinsically Safe for Class I, Division 1, Groups A, B, C, and D. when installed in accordance with Rosemount drawing 03095-1021. Temperature Code T3C.

For input parameters and installation see control drawing 03095-1021.

European Certifications

I1 ATEX Intrinsic Safety
Certificate Number: BAS98ATEX1359X Ⓔx II 1 G

EEx ia IIC T5 (T_{amb} = –45 °C to 40 °C)
EEx ia IIC T4 (T_{amb} = –45 °C to 70 °C)
CE 1180

TABLE 34. Connection Parameters (Power/Signal Terminals)

U_i = 30V
I_i = 200 mA
P_i = 1.0 W
C_i = 0.012 µF
L_i = 0

TABLE 35. Temperature Sensor Connection Parameters

U_o = 30V
I_o = 19 mA
P_o = 140 mW
C_i = 0.002 µF
L_i = 0

TABLE 36. Temp Sensor Terminals Connection Parameters

C_o = 0.066 µF	Gas Group IIC
C_o = 0.560 µF	Gas Group IIB
C_o = 1.82 µF	Gas Group IIA
L_o = 96 mH	Gas Group IIC
L_o = 365 mH	Gas Group IIB
L_o = 696 mH	Gas Group IIA
L_o/R_o = 247 µH/ohm	Gas Group IIC
L_o/R_o = 633 µH/ohm	Gas Group IIB
L_o/R_o= 633 µH/ohm	Gas Group IIA

Special Conditions for Safe Use

The 3095, when fitted with the transient terminal block (order code B), are not capable of withstanding the 500 volts insulation test required by EN50 020, Clause 6.4.12 (1994). This condition must be accounted for during installation.

N1 ATEX Type N

Certificate Number: BAS98ATEX3360X Ⓔx II 3 G

EEx nL IIC T5 (T_{amb} = –45 °C to 40 °C)
EEx nL IIC T4 (T_{amb} = –45 °C to 70 °C)

U_i = 55V

CE

The apparatus is designed for connection to a remote temperature sensor such as a resistance temperature detection (RTD)

Special Conditions for Safe Use

The 3095, when fitted with the transient terminal block (order code B), are not capable of withstanding the 500 volts insulation test required by EN50 021, Clause 9.1 (1995). This condition must be accounted for during installation.

E1 ATEX Flameproof
Certificate Number: KEMA02ATEX2320X ⟨Ex⟩ II 1/2 G
EEx d IIC T5 (-50°C ≤ T_{amb} ≤ 80°C)
T6 (-50°C ≤ T_{amb} ≤ 65°C)
CE 1180

Special Conditions for Safe Use (x):

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 fro installation and maintenance shall be followed in detail to assure safety during its expected lifetime.

ND ATEX Dust
Certificate Number: KEMA02ATEX2321 ⟨Ex⟩ II 1 D
V = 55 Vdc MAX
I = 23 mA MAX
IP66
CE 1180

Combinations of Certifications

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

K5 E5 and I5 combination

K6 E6 and I6 combination

K1 I1, N1, E1, and ND combination

Rosemount 3095MFP with *Fieldbus*

European Directive Information

The EC declaration of conformity for all applicable European directives for this product can be found on the Rosemount website at www.rosemount.com. A hard copy may be obtained by contacting our local sales office.

ATEX Directive (94/9/EC)

Emerson Process Management complies with the ATEX Directive.

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

3095F_2/3,4/D and 3095M_2/3,4/D Flow Transmitters

— QS Certificate of Assessment - EC No. PED-H-20 Module H Conformity Assessment

All other 3095_ Transmitters/Level Controller

— Sound Engineering Practice

Transmitter Attachments: Process Flange - Manifold

— Sound Engineering Practice

Primary Elements, Flowmeter

— See appropriate Primary Element QIG

Electro Magnetic Compatibility (EMC) (89/336/EEC)

3095 Flow Transmitters

— EN 50081-1: 1992; EN 50082-2:1995; EN61326-1:2006; EN61326-2-3:2006

Ordinary Location Certification for Factory Mutual

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

Rosemount 3095MFP Fieldbus Hazardous Locations Certifications

North American Certifications

FM Approvals

E5 Explosion Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition Proof for Class II/Class III, Division 1, Groups E, F, and G. Enclosure type NEMA 4X. Factory Sealed. Provides nonincendive RTD connections for Class I, Division 2, Groups A, B, C, and D.

I5 Intrinsically Safe for use in Class I, II and III, Division 1, Groups A, B, C, D, E, F, and G hazardous outdoor locations. Non-incendive for Class I, Division 2, Groups A, B, C, and D. Temperature Code T4. Factory Sealed.

For input parameters and installation see control drawing 03095-1020.

IE FISCO for use in Class I, II and III, Division 1, Groups A, B, C, D, E, F, and G hazardous outdoor locations. Temperature Code T4. Factory Sealed.

For input parameters and installation see control drawing 03095-1020.

Combinations of Certifications

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

K5 E5 and I5 combination

Canadian Standards Association (CSA)

IF CSA FISCO Intrinsically Safe; for FOUNDATION fieldbus protocol only

European Certifications

IA ATEX FISCO Intrinsically Safe; for FOUNDATION fieldbus protocol only

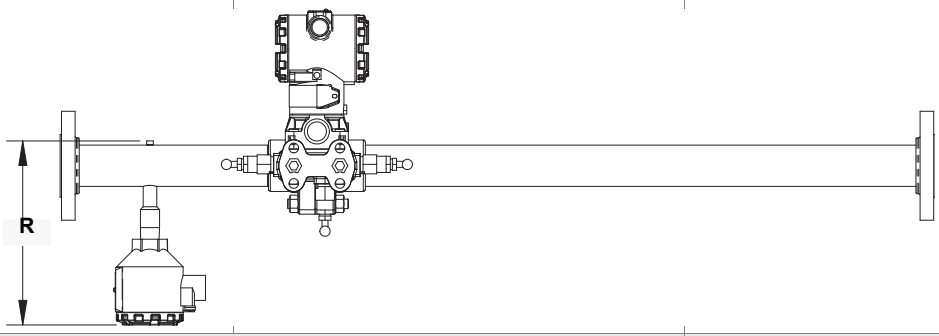
Australian Certifications

IG IECEx FISCO Intrinsic Safety

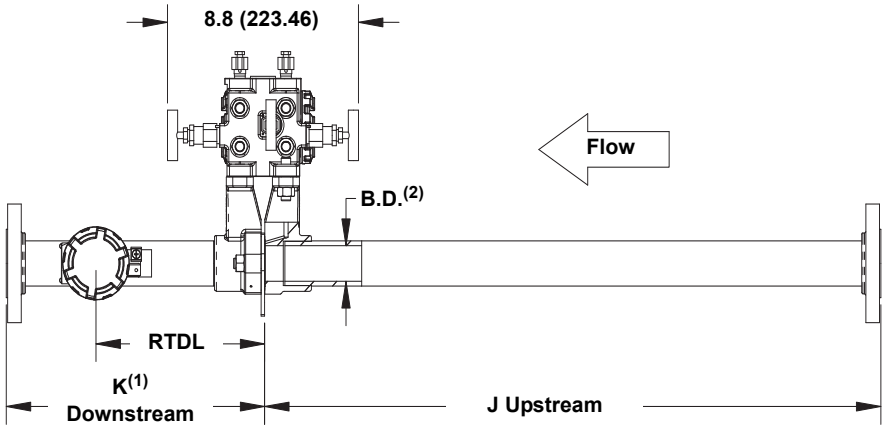
DIMENSIONAL DRAWINGS

Rosemount 3095MFP Integral Orifice Flowmeter

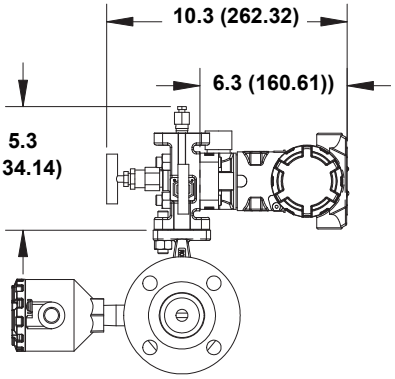
Top View



Bottom View



Side View



Dimensions are in inches (millimeters).

	Line Size					
Dimension	**1/2-in. (12.7 mm)**		**1-in. (25.4 mm)**		**1 1/2-in. (38.1 mm)**	
J (RF slip-on, RTJ slip-on, RF-DIN slip-on)	12.5-in.	318 mm	20.2-in.	513 mm	28.4-in.	721 mm
J (RF 150#, weld-neck)	14.3-in.	363 mm	22.3-in.	566 mm	30.7-in.	780 mm
J (RF 300#, weld-neck)	14.5-in.	368 mm	22.6-in.	574 mm	31.0-in.	787 mm
J (RF 600#, weld-neck)	14.8-in.	376 mm	22.9-in.	582 mm	31.3-in.	795 mm
K ((RF slip-on, RTJ slip-on, RF-DIN slip-on)(1)	5.7-in.	145 mm	8.7-in.	221 mm	11.9-in.	302 mm
K (RF 150#, weld-neck)	7.5-in.	191 mm	10.9-in.	277 mm	14.2-in.	361 mm
K (RF 300#, weld-neck)	7.7-in.	196 mm	11.1-in.	282 mm	14.5-in.	368 mm
K (RF 600#, weld-neck)	8.0-in.	203 mm	11.4-in.	290 mm	14.8-in.	376 mm
B.D.(2)	0.664-in.	16.86 mm	1.097-in.	27.86 mm	1.567-in.	39.80 mm
RTDL	3.11-in.	78.9 mm	5.25-in.	133.4 mm	7.50-in.	190.5 mm
R	7.4-in.	187.96 mm	7.8-in.	198.12 mm	8.4-in.	213.36 mm

(1) Downstream length shown here includes plate thickness of 0.162-in. (4.11 mm).

(2) B.D is diameter of the precision bored portion of the upstream and downstream piping.

Rosemount 3095MFP Integral Orifice Flowmeter Ordering Information

Model	Product Description	
3095MFP	Integral Orifice Flowmeter	
Body Material		
S	316 SST	
H	Alloy C-276	
Line Size/Schedule		
005	1/2-in. (15 mm)	
010	1-in. (25 mm)	
015	1 1/2-in. (40 mm)	
Process Connection		
T1	NPT Female Body (not available with thermowell and RTD, requires Temperature Sensor Code N)	
S1(1)	Socket Weld Body (not available with thermowell and RTD, requires Temperature Sensor Code N)	
P1	Pipe Ends: NPT threaded	
P2	Pipe Ends: Beveled	
A1	Pipe Ends: Flanged, RF, ANSI Class 150, slip-on	
A3	Pipe Ends: Flanged, RF, ANSI Class 300, slip-on	
A6	Pipe Ends: Flanged, RF, ANSI Class 600, slip-on	
D1	Pipe Ends: Flanged, RF, DIN PN16, slip-on	
D2	Pipe Ends: Flanged, RF, DIN PN40, slip-on	
D3	Pipe Ends: Flanged, RF, DIN PN100, slip-on	
W1	Pipe Ends: Flanged, RF, ANSI Class 150, weld-neck	
W3	Pipe Ends: Flanged, RF, ANSI Class 300, weld-neck	
W6	Pipe Ends: Flanged, RF, ANSI Class 600, weld-neck	
R1	Pipe Ends: Flanged, RTJ, ANSI Class 150, slip-on	
R3	Pipe Ends: Flanged, RTJ, ANSI Class 300, slip-on	
R6	Pipe Ends: Flanged, RTJ, ANSI Class 600, slip-on	
P9	Special Process Connection	
Orifice Plate Material		
S	316 SST	
H	Alloy C-276	
M	Alloy 400	
Bore Size Option		
0010	0.010-in. (0,25 mm) for 1/2-in. pipe	
0014	0.014-in. (0,36 mm) for 1/2-in. pipe	
0020	0.020-in. (0,51 mm) for 1/2-in. pipe	
0034	0.034-in. (0,86 mm) for 1/2-in. pipe	
0066	0.066-in. (1,68 mm) for 1/2-in. pipe	
0109	0.109-in. (2,77 mm) for 1/2-in. pipe	
0160(2)	0.160-in. (4,06 mm) for 1/2-in. pipe	
0196(2)	0.196-in. (4,98 mm) for 1/2-in. pipe	
0260(2)	0.260-in. (6,60 mm) for 1/2-in. pipe	
0340(2)	0.340-in. (8,64 mm) for 1/2-in. pipe	
0150	0.150-in. (3,81 mm) for 1-in. pipe	
0250(2)	0.250-in. (6,35 mm) for 1-in. pipe	
0345(2)	0.345-in. (8,76 mm) for 1-in. pipe	
0500(2)	0.500-in. (12,70 mm) for 1-in. pipe	
0630(2)	0.630-in. (16,00 mm) for 1-in. pipe	
0800	0.800-in. (20,32 mm) for 1-in. pipe	
0295	0.295-in. (7,49 mm) for 1 1/2-in. pipe	
0376(2)	0.376-in. (9,55 mm) for 1 1/2-in. pipe	
0512(2)	0.512-in. (13,00 mm) for 1 1/2-in. pipe	
0748(2)	0.748-in. (19,00 mm) for 1 1/2-in. pipe	
1022	1.022-in. (25,96 mm) for 1 1/2-in. pipe	
1184	1.184-in. (30,07 mm) for 1 1/2-in. pipe	

Rosemount 3095MFP Integral Orifice Flowmeter Ordering Information

Transmitter Connection Platform			
D3	Direct-mount, 3-valve manifold, SST		
D4	Direct-mount, 3-valve manifold, Alloy C-276		
D5	Direct-mount, 5-valve manifold, SST		
D6	Direct-mount, 5-valve manifold, Alloy C-276		
D7	Direct-mount, High Temperature, 5-valve manifold, SST		
R3	Remote-mount, 3-valve manifold, SST		
R4	Remote-mount, 3-valve manifold, Alloy C-276		
R5	Remote-mount, 5-valve manifold, SST		
R6	Remote-mount, 5-valve manifold, Alloy C-276		
Differential Pressure Range			
1	0 to 25 in H_2O (0 to 62,3 mbar)		
2	0 to 250 in H_2O (0 to 623 mbar)		
3	0 to 1000 in H_2O (0 to 2,5 bar)		
Static Pressure Range			
B	0 – 8 to 0 – 800 psia (0 –55,16 to 0 – 5515,8 kPa)		
C	0 – 8 to 0 – 800 psig (0 –55,16 to 0 – 5515,8 kPa)		
D	0 – 36.2 to 0 – 3626 psia (0 –250 to 0 – 25000 kPa)		
E	0 – 36.2 to 0 – 3626 psig (0 –250 to 0 – 25000 kPa)		
Output Protocol			
A	4–20 mA with digital signal based on HART protocol		
V	FOUNDATION fieldbus protocol		
	Transmitter Housing Style	**Conduit Entry Size**	
1A	Polyurethane-covered aluminum	1/2-14 NPT	
1B	Polyurethane-covered aluminum	M20 x 1.5 (CM20)	
1C	Polyurethane-covered aluminum	G 1/2	
1J	SST	1/2-14 NPT	
1K	SST	M20 x 1.5 (CM20)	
1L	SST	G 1/2	
OPTIONS			
Performance Class			
U3[3]	Ultra for Flow: up to ±0.95% mass flow rate accuracy, up to 10:1 turndown, 10-year stability, limited 12-year warranty		
Transmitter / Body Bolt Material			
G	High temperature (850 °F (454 °C))		
Temperature Sensor[4]			
N	No thermowell, Cable and RTD		
Optional Bore Calculation			
BC	Bore Calculation		
Optional Connection			
G1	DIN 19231 Transmitter Connection		
Pressure Testing			
P1[5]	Hydrostatic Testing with Certificate		
Special Cleaning			
P2	Cleaning for Special Processes		
PA	Cleaning per ASTM G93 Level D (section 11.4)		
Material Testing			
V1	Dye Penetrant Exam		
Material Examination			
V2	Radiographic Examination (available only with Process Connection codes W1, W3, and W6)		
Flow Calibration			
WD[6]	Flow Rate Calibration		
WZ[6]	Special Calibration		

Rosemount 3095MFP Integral Orifice Flowmeter Ordering Information

Special Inspection		
QC1	Visual & Dimensional Inspection with Certificate	
QC7	Inspection & Performance Certificate	
Material Traceability Certification		
Q8(7)	Material certification per EN 10204:2004 3.1	
Code Conformance		
J2(8)	ANSI / ASME B31.1	
J3(8)	ANSI / ASME B31.3	
Materials Conformance		
J5(9)	NACE MR-0175 / ISO 15156	
Country Certification		
J1	Canadian Registration	
J6	European Pressure Directive (PED)	
Transmitter Calibration Certificate		
Q4	Calibration Data Certificate for Transmitter	
Product Certifications		
E5	FM Explosion-proof	
I5	FM Intrinsic Safety and Non-Incendive	
K5	FM Explosion Proof, Intrinsic Safety, and Non-Incendive (combination of E5 and I5)	
E6	CSA Explosion Proof	
I6	CSA Intrinsically Safe, Division 2	
K6	CSA Explosion Proof, Intrinsically Safe, Division 2	
I1	ATEX Intrinsic Safety	
E1	ATEX Flameproof	
N1	ATEX Type n	
ND	ATEX Combustible Dust	
K1	ATEX Flameproof, Intrinsic Safety, Type n	
I7	IECEX Intrinsically Safe	
Alternative Transmitter Material of Construction		
L1	Inert Sensor Fill Fluid (not available with Static Pressure range codes B and D)	
Digital Display		
M5	Integral mount LCD display	
Terminal Blocks		
T1	Transient Protection	
Typical Model Number: 3095MFP S 010 A3 S 0150 D3 1 C A 1A		

(1) To improve pipe perpendicularity for gasket sealing, socket diameter is smaller than standard pipe O.D.

(2) Best flow coefficient uncertainty is between ($0.2 < \beta < 0.6$).

(3) Ultra for Flow applicable for HART protocol, DP ranges 2 and 3 with SST isolator material and silicone fill fluid options only.

(4) Rosemount 3095MFP is supplied with an integral temperature sensor as standard. Thermowell material is the same as the body material.

(5) Does not apply to Process Connection codes T1 and S1.

(6) Not available for bore sizes 0010, 0014, 0020, or 0034.

(7) Includes certificates for mechanical and chemical properties of bodies, orifice plates, pipes, flanges, and adapters as applicable.

(8) Not available with DIN Process Connection codes D1, D2, or D3.

(9) Materials of Construction comply with metallurgical requirements 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.

Rosemount 3095 MultiVariable

Product Data Sheet
00813-0100-4716, Rev MA
April 2010

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00813-0100-4716 Rev MA, 4/10

EMERSON™
Process Management

Product Data Sheet
00813-0100-4738, Rev HA
April 2010

Rosemount 3095 *MultiVariable*™ Transmitter with *MODBUS*® Protocol

THE PROVEN LEADER IN MULTIVARIABLE MEASUREMENT.

- *Industry leading performance with ±0.05% of DP reading accuracy*
- *Ten year stability under actual process conditions*
- *Unprecedented reliability backed by a limited 12-year warranty*
- *Four outputs from one device including Mass Flow and advanced data logging*
- *Easy integration with MODBUS protocol*
- *Coplanar™ platform enables DP Flowmeters*

CE

Contents

The Leader in *MultiVariable* Measurement

Rosemount pressure products deliver a tradition of excellence and technology leadership, featuring the state-of-the-art *MultiVariable* transmitter. The 3095FB and 3095FC use *MODBUS* communication protocol to deliver unmatched performance of process variable measurements, mass flow, and data logging.

Industry leading performance with ±0.05% of DP reading accuracy

Enabled by superior sensor technology and engineered for optimal flow performance, the 3095FB delivers unprecedented reference accuracy with up to 100:1 rangeability. Superior performance results in increased measurement accuracy.

Ten year stability of 0.25%

Through aggressive testing, the 3095FB has proven its ability to maintain unprecedented performance under the most demanding conditions. Superior transmitter stability decreases calibration frequency for reduced maintenance and operation costs.

Unprecedented reliability backed by a limited 12-year warranty

Further enhance installation practices with the most reliable platform supported by a 12-year warranty.

Four outputs from one device

The advanced MultiVariable device measures three process variables simultaneously with optional calculated mass flow and advanced data logging capabilities. One device installation means reduced process penetrations, reduced inventory, and reduced installations costs.

Easily integrated with *MODBUS* communications

Designed for easy integration with Supervisory Control and Data Acquisition units (SCADA), Distributed Control Systems (DCS), Flow Computers or Programmable Logic Controllers (PLC) and capable of multidropping up to 32 transmitters on one RS-485 bus. Easy integration reduces engineering and installation costs.

Coplanar platform enables DP flowmeters

The flexible *coplanar* platform allows integration with the complete offering of Rosemount primary elements for any flow application. The solution arrives factory calibrated, pressure-tested, and ready to install right out of the box. Only Rosemount has a scalable *coplanar* transmitter design to reduce engineering and inventory costs.

Advanced *PlantWeb* functionality

From multiple process variable generation to advanced compensated Mass Flow functionality and highly integrated flowmeter solutions, the 3095 reduces operational and maintenance expenditures while improving throughput and utilities management.

Rosemount DP-Flow Solutions

Rosemount 3051S Series of Instrumentation
Scalable pressure, flow, and level measurement solutions improve installation and maintenance practices.

Rosemount 3095 Mass Flow Transmitter
Accurately measures differential pressure, static pressure, and process temperature to dynamically calculate fully compensated mass flow.

Rosemount 305, 306 and 304 Manifolds
Factory-assembled, calibrated, and seal-tested transmitter-to-manifold assemblies reduce on-site installation costs.

Rosemount 1495, 1496, 1497, and 1595 Orifice Plate Primary Element Systems
A comprehensive offering of orifice plates, flange unions and meter sections that is easy to specify and order. The 1595 Conditioning Orifice provides superior performance in tight fit applications.

Rosemount 3051SFA, 3095MFA, 485, and 285 Annubar® Series

The state-of-the-art, fifth generation Rosemount 485 Annubar combined with the 3051S or 3095 MultiVariable transmitter creates an accurate, repeatable and dependable insertion-type flowmeter. The Rosemount 285 provides a commercial product offering for your general purpose applications.

Rosemount 3051SFC, 3095MFC, and 405 Compact Orifice Series

Compact Orifice Flowmeters can be installed between existing flanges, up to a Class 600 (PN100) rating. In tight fit applications, a conditioning orifice plate version is available, requiring only two diameters of straight run upstream and two diameters downstream.

Rosemount 3051SFP, 3095MFP, and 1195 ProPlate® Series

These Integral Orifice Flowmeters eliminate the inaccuracies that become more pronounced in small orifice line installations. The completely assembled, ready to install flowmeters reduce cost and simplify installation.

Specifications

Functional Specifications

Service

3095FB

- Gas, Liquid, or Steam
- DP, P, and T with MODBUS output

3095FC

- AGA 8 Natural Gas, AGA 3 Orifice Plates
- Consult factory for other fluid and primary element combinations
- DP, P, T, mass flow, and API compliant data log with MODBUS output

Differential Sensor

Limits

- Range 2: –250 to 250 inH_2O (-62,2 to 62,2 kPa)
- Range 3: –1000 to 1000 inH_2O (-249 to 249 kPa)

Absolute Sensor

Limits

- Range 3: 0.5 to 800 psia (3,447 to 5516 kPa)
- Range 4: 0.5 to 3,626 psia (3,447 to 25000 kPa)

Gage Sensor

Limits

- Range C: 0 to 800 psig (0 to 5516 kPa)
- Range D: 0 to 3,626 psig (0 to 25000 kPa)

Over Pressure Limit

0.5 psia (3,447 kPa) to two times the absolute pressure sensor range up to a maximum of 3,626 psia (25000 kPa).

Static Pressure Limit

Operates within specifications between static line pressures of 0.5 psia (3,447 kPa) and the URL of the absolute pressure sensor.

Power

3095FB

- Quiescent supply current 10 mA typical. Transmitting supply current not to exceed 100 mA.
- External power supply required
- Transmitter: operates on terminal voltage of 7.5 - 42 Vdc

3095FC

- Transmitter: operates on terminal voltage of 8 - 28 Vdc
- Input current: 5mA nominal, 9.5 mA at 100% duty cycle (battery charging not included)
- Internal battery: rechargeable, Nominal 6.2 Vdc (2.5 Amp/hr)
- Maximum power consumption: 19 watts
- Solar panel input: nominal 8 V to 200 mA
- Solar panel output: 2 watts, 9 V nominal
- External charging input: 12 Vdc max (8 - 10 Vdc nominal)

RS-485 Signal Wiring

2-wire half-duplex RS-485 *MODBUS* with 8 data bits, 1 stop bit, and no parity

Bus Terminations

Standard RS-485 bus terminations required per EIA-485.

Failure Mode Alarm

If self-diagnostics detect a gross transmitter failure, non-latched status bits are set in the transmitter alarm registers.

Humidity Limits

3095FB

- 0 – 100% relative humidity

3095FC

- 0 – 95%, non condensing

Communications

PC-Based User Interface Software

Baud Rate: 600 to 19.2 K User selectable

Host: 3095FB - RS485 (MODBUS)
3095FC - RS485 (MODBUS) or RS-232 Direct Connect

User Interface Software and Hardware Requirements:

3095FB

- IBM-compatible PC
- 10 MB of available hard drive space
- Microsoft® Windows® 98 or higher operating system
- CD-ROM drive
- 32 MB of RAM

3095FC

- IBM-compatible PC
- 1 MB of RAM
- Pentium-grade processor: 233 MHz or faster
- Microsoft Windows 98 or higher operating system
- CD-ROM drive

Temperature Limits

Process (at transmitter isolator flange for atmospheric pressures and above):

3095FB

- With standard Silicon Fill Sensor: –40 to 250 °F (–40 to 121 °C)
- Inert fill sensor: 0 to 185 °F (-18 to 85 °C).
- Process temperatures above 185 °F (85 °C) requires derating the ambient limits by a 1.5:1 ratio.

3095FC

- With standard Silicon Fill Sensor: –40 to 212 °F (–40 to 100 °C)
- Inert fill sensor: 0 to 185 °F (-18 to 85 °C).
- Process temperatures above 185 °F (85 °C) requires derating the ambient limits by a 1.5:1 ratio.

Ambient:

3095FB

- With Standard Silicon Fill Sensor: –40 to 185 °F (–40 to 85 °C)
- With LCD Display(1): -40 to 175 °F (-40 to 80 °C)

3095FC

- –40 to 167 °F (–40 to 75 °C)
- With LCD Displayr: -4 to 167 °F (-20 to 75 °C)

Storage:

3095FB

- –50 to 212 °F (–46 to 100 °C)
- With LCD Display: -40 to 185 °F (-40 to 85 °C)

3095FC

- –50 to 185 °F (–46 to 85 °C)
- With LCD Display: -40 to 185 °F (-40 to 85 °C)

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

Turn-on Time

Process variables will be within specifications less than 4 seconds after power is applied to transmitter.

Damping (3095FB only)

Response to step input change can be user-selectable from 0.1 to 30 seconds for one time constant. This is in addition to sensor response time of 0.2 seconds.

Filtering (3095FC only)

Response to step input change can be filtered by user entered percentage of add value to be used.

(Last Value X Entered %) + [New Value X (100 - Entered %)] = Filtered Value

Real Time Clock (3095FC only)

- Year / month / day / hour / minute / second
- Battery backed

Performance Specifications

(Zero-based spans, reference conditions, silicone oil fill, 316 SST isolating diaphragms, and digital trim values equal to the span end points.)

Specification Conformance

The Rosemount 3095 maintains a specification conformance of measured variables to at least 3σ.

Differential Pressure

Range 2

0–2.5 to 0–250 inH_2O (0–0,622 to 0–62,2 kPa)
(100:1 rangeability is allowed)

Range 3

0–10 to 0–1000 inH_2O(0–2,49 to 0–249 kPa)
(100:1 rangeability is allowed)

Accuracy (including Linearity, Hysteresis, Repeatability)

Range 2-3: 3095FB Ultra for Flow (Option U3)(1)

- ±0.05% of DP reading up to 3:1 DP turndown from URL
- For DP turndowns up to 100:1 from URL

$$\text{Accuracy} = \pm \left[0.05 + 0.0145\left(\frac{\text{URL}}{\text{DP Reading}}\right)\right] \text{ \% of DP Reading}$$

Range 2-3: 3095FB and 3095FC

- ±0.075% of span for spans from 1:1 to 10:1 URL
- For spans less than 10:1 rangedown

$$\text{Accuracy} = \pm\left[0.025 + 0.005\left(\frac{\text{URL}}{\text{Span}}\right)\right] \text{\% of span}$$

Ambient Temperature Effect per 50 °F (28 °C)

Range 2-3: 3095FB Ultra for Flow (Option U3)(1)

- ±0.130% of DP reading up to 3:1 DP turndown URL
- ±[0.05 + 0.0345 (URL/DP Reading)]% of DP Reading up to 100:1 DP turndown from URL

Range 2-3: 3095FB and 3095FC

- ±(0.025% URL + 0.125% span) spans from 1:1 to 30:1
- ±(0.035% URL + 0.175% span) spans from 30:1 to 100:1

Static Pressure Effects

- Zero error = ±0.05% of URL per 1000 psi (68,9 bar)
- Span error = ±0.20% of DP Reading per 1000 psi (68,9 bar)

Stability

Range 2-3: 3095FB Ultra for Flow (Option U3)(1)

- ±0.25% of URL for 10 years for ±50 °F (28 °C) temperature changes, and up to 1000 psi (68,9 bar) line pressure

Range 2-3: 3095FB and 3095FC

- ±0.125% of URL for five years for ±50 °F (28 °C) ambient temperature changes, and up to 1000 psi (68,9 bar) line pressure.

(1) Ultra for Flow (Option U3) applicable for 3095FB DP ranges 2 and 3 with SST isolator material and silicone fill fluid only.

Absolute/Gage Pressure

Absolute (100:1 rangeability allowed)

Range 3

0.5–8 to 0.5–800 psia (3,447–55,16 to 3,447–5516 kPa)

Range 4

0.5–36.26 to 0.5–3,626 psia (3,447–250 to 3,447–25000 kPa)

Gage (100:1 rangeability allowed)

Range C

0–8 to 0–800 psig (0–55,16 to 0–5516 kPa)

Range D

0–36.26 to 0–3,626 psig (0–250 to 0–25000 kPa)

Ambient Temperature Effect per 50 °F (28 °C)

- ±(0.05% URL + 0.125% of span) spans from 1:1 to 30:1
  ±(0.06% URL – 0.175% of span) spans from 30:1 to 100:1

Stability

±0.125% of URL for five years for ±50 °F (28 °C) ambient temperature changes.

Accuracy (including Linearity, Hysteresis, Repeatability)

- ±0.075% of span for spans from 1:1 to 10:1 of URL
- For spans less than 10:1 rangedown,

$$\text{Accuracy} = \pm\left[0.03 + 0.0075\left(\frac{\text{URL}}{\text{Span}}\right)\right]\% \text{ of span}$$

Process Temperature (RTD)

Specification for process temperature is for the transmitter portion only. Sensor errors caused by the RTD are not included. The transmitter is compatible with any PT100 RTD conforming to IEC 751 Class B, which has a nominal resistance of 100 ohms at 0 °C and $\propto$ = 0.00385. Examples of compatible RTDs include the Rosemount Series 68 and 78 RTD Temperature Sensors.

Sensing Range

3095FB

- –300 to 1500 °F (–184 to 816 °C)

3095FC

- –40 to 464 °F (–40 to 240 °C)

Accuracy (including Linearity, Hysteresis, Repeatability)

±1.0 °F (0.56 °C)

Ambient Temperature Effects per 50 °F (28 °C)

3095FB

- ±0.72 °F (0.40 °C) for process temperatures from –40 to 185 °F (–40 to 85°C)
- (±1.28 °F (0.72 °C) + 0.16% of reading) for process temperatures from 185 to 1200 °F (85 to 649 °C)

3095FC

- ±0.90 °F (0.50 °C) for process temperatures from –40 to 464°F (–40 to 240°C)

Stability

±1.0 °F (0.56 °C) for one year

Physical Specifications

Electrical Connections

- ½–14 NPT, M20 x 1.5 (CM20), PG-13.5
- $^3/_4$–14 NPT (3095FC only)

RTD Process Temperature Input:

100-ohm platinum RTD per IEC-751 Class B

Process Connections

- Transmitter: ¼–18 NPT on $2^1/_8$-in. centers
- RTD: RTD dependent (see ordering information)

Radiated/Conducted Transmissions

Meets requirements of IEC 61326

Process Wetted Parts

Isolating Diaphragms

- 316L SST or Hastelloy C-276®

Drain/Vent Valves

- 316 SST or Hastelloy C-276®

Flanges

- Plated carbon steel, 316 SST, or Hastelloy C-276

Wetted O-rings

- Glass-Filled PTFE

Non-Wetted Parts

Electronics Housing

- Low copper aluminum

Bolts

- Plated carbon steel per ASTM A449, Grade 5; or austenitic 316 SST

Fill Fluid

- Silicone oil
- Inert oil (available for gage pressure ranges only)

Paint

- Polyurethane

O-rings

- Buna-N

Battery (3095FC only)

- Lead-acid, rechargeable

Weight

Components	Weight in lb. (kg)	
	3095FB	3095FC
3095 Transmitter	6.0 (2.7)	11.5 (5.2)
LCD Meter	0.5 (0.2)	0.6 (0.3)
SST Mounting Bracket	1.0 (0.5)	1.0 (0.5)
12 ft. (3.66 m) RTD Shielded Cable	0.5 (0.2)	user provided
12 ft. (3.66 m) RTD Armored Cable	1.1 (0.5)	user provided
24 ft. (7.32 m) RTD Shielded Cable	1.0 (0.5)	user provided
24 ft. (7.32 m) RTD Armored Cable	2.2 (1.0)	user provided
Battery / Solar panel	–	2.0 (0.9)
Battery Backup	–	1.3 (0.6)

3095FC Memory Specifications

Programmable Memory

2 MB x 8 flash EPROM

Data Memory

512 kB SRAM

Boot Memory

128 kB flash EPROM

History Database

The history database archives measured and calculated values for on-demand viewing or saving to a file. Each point in the historical database can be configured to archive the current value, average value, totalized value, or accumulated value.

Up to 35 standard history points provided, with archiving of min/max (for today and yesterday), minute (for last 60 minutes), hourly and daily values (for last 35 days). The first 8 of these are non-configurable.

Up to 15 extended history points provided with archiving of up to 5040 entries at 1, 2, 3, 4, 5, 10, 12, 15, 20, 30, or 60 minute intervals.

Memory Logging

- 240 alarms before rollover
- 240 events before rollover

3095FC Flow Specifications

Flow Calculation:

- Computed in accordance with ANSI/API 2530-92 (AGA 3, 1992), API 14.2 (AGA 8, 1992), and API 21.1. Detail, Gross I, Gross II.

Product Certifications

Approved Manufacturing Locations

Rosemount Inc. — Chanhassen, Minnesota USA

European Directive Information

The EC declaration of conformity for all applicable European directives for this product can be found on the Rosemount website at www.rosemount.com. A hard copy may be obtained by contacting our local sales office.

ATEX Directive (94/9/EC)

Emerson Process Management complies with the ATEX Directive.

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

3095F_2/3,4/D Flow Transmitters — QS Certificate of Assessment - EC No. PED-H-100 Module H Conformity Assessment

All other 3095_ Transmitters/Level Controller — Sound Engineering Practice

Transmitter Attachments: Process Flange - Manifold — Sound Engineering Practice

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

3095F Flow Transmitters - EN 61326-1:1997 - A1, A2, and A3

Ordinary Location Certification for Factory Mutual

As standard, the Rosemount 3095FB transmitter has been examined and tested to determine that the design meets basic electrical, mechanical, and fire protection requirements by FM, a nationally recognized testing laboratory (NRTL) as accredited by the Federal Occupational Safety and Health Administration (OSHA).

Hazardous Locations Certifications

North American Certifications

FM Approvals

A 3095FB
Explosion Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition Proof for Class II/III, Division 1, Groups E, F, and G, hazardous locations. Factory Sealed. Provides non-incendive RTD connections for Class I, Division 2, Groups A, B, C, and D. Install per Rosemount drawing 03095-1025. Enclosure Type 4X.

Canadian Standards Association (CSA) - Canada only

C 3095FB
Explosion-Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition Proof for Class II/III, Division 1, Groups E, F, and G, hazardous locations. CSA enclosure Type 4X. Factory Sealed. Provides a non-incendive RTD Connection for Class I, Division 2, Groups A, B, C, and D. Suitable for use in Class I, Division 2, Groups A, B, C, and D. Install in accordance with Rosemount Drawing 03095-1024.

Canadian Standards Association (CSA) - U.S. and Canada

M 3095FC
Explosion-Proof for Class I, Division 1, Groups C and D including optional solar panel: mast option: Suitable for use in Class I, Division 2, Groups A, B, C, D, and T3. CSA Enclosure Type 4.

European Certifications

H **ATEX Flameproof**
3095FB
Certificate Number: KEMA02ATEX2320X ⟨Ex⟩ II 1/2 G
EEx d IIC T5 (-50°C ≤ T_{amb} ≤ 80°C)
T6 (-50°C ≤ T_{amb} ≤ 65°C)
V_{max} = 55V dc
CE 1180
Special Conditions for Safe Use (x):
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.

3095FC
Certificate Number: LCIE05ATEX6057X ⟨Ex⟩ II 2 G
EEx d IIB T5
V_{max} = 28V dc
IP66
CE 1180
Special Conditions for Safe Use (x):
Operating ambient temperature: -40°C to 75°C
The users have to make sure that the thermal fluid transfer doesn't overheat the equipment to a temperature corresponding to the spontaneous combustion temperature of surrounding gas.

P **ATEX Dust**
3095FB
Certificate Number: KEMA02ATEX2321 ⟨Ex⟩ II 1 D T90°C
Ambient Temp (-50°C ≤ T_{amb} ≤ 80°C)
V = 55 Vdc MAX
I = 23 mA MAX
IP66
CE 1180

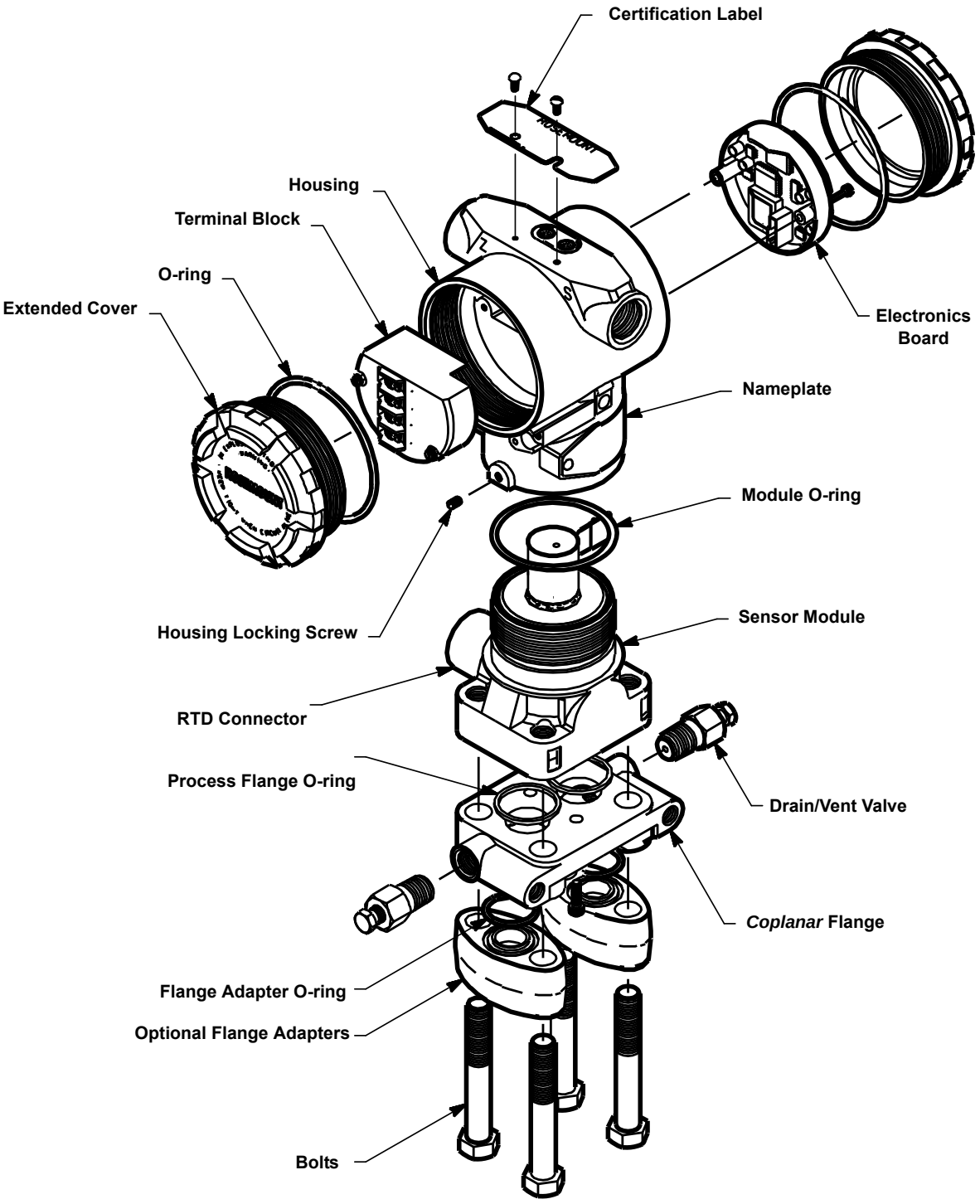
IECEx Certifications

7 **IECEx Flameproof**
3095FB
Certificate Number: IECEx KEM 06.0018
Zone 0/1 Ex d IIC T6 (-20°C ≤ T_a ≤ 65°C)
Zone 0/1 Ex d IIC T5 (-20°C ≤ T_a ≤ 80°C)
V_{max} = 55 Vdc
I_{max} = 23 mAdc

8 **IECEx Dust**
3095FB
Certificate Number: IECEx KEM 06.0018
Ex tD A22 T90°C
IP66

Dimensional Drawings

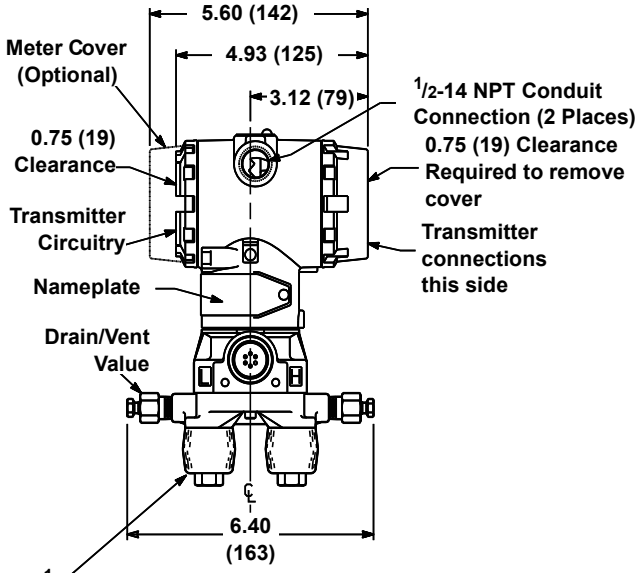
Exploded View of 3095FB Transmitter



Dimensions are in inches (millimeters)

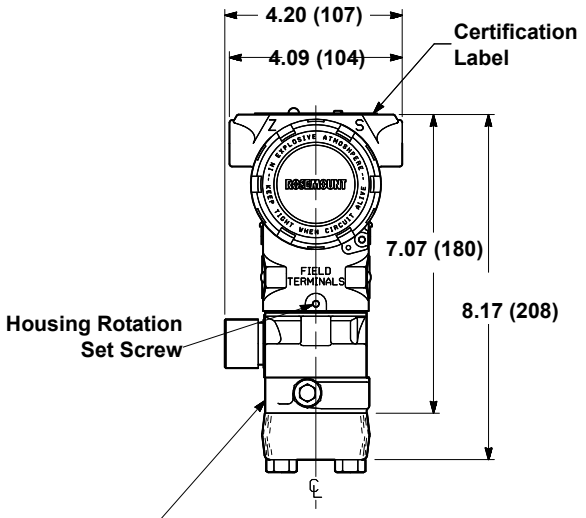
3095FB

Side View



1/2-14 NPT on Optional Mounting Adapters. Adapters Can be Rotated to Give Connection Centers of 2.00 (51), 2.125 (54), or 2.25 (57)

Front View

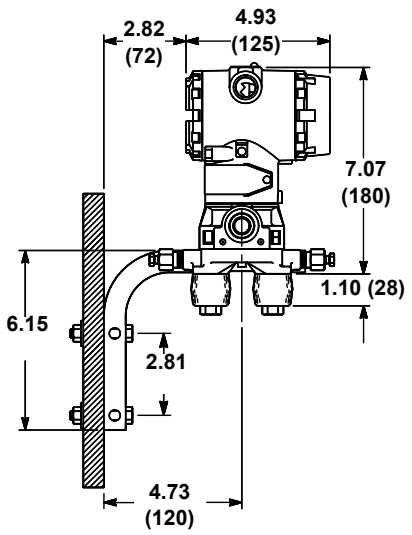


1/4-18 NPT on *Coplanar* Flange for Pressure Connection without the use of Mounting Adapters

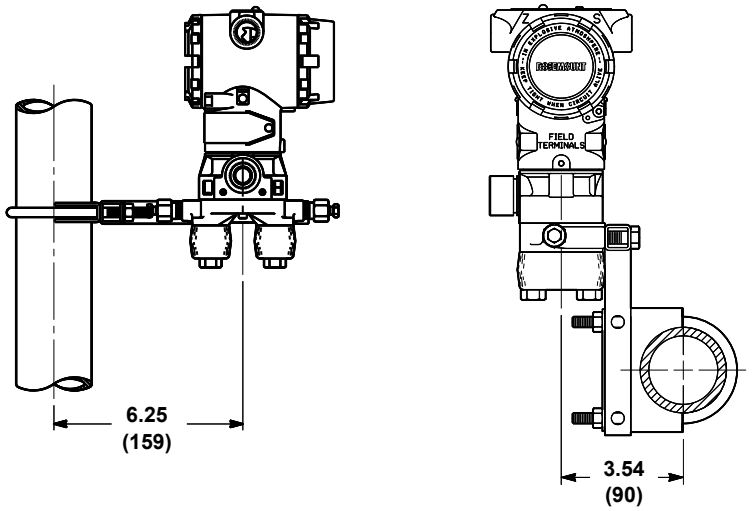
Dimensions are in inches (millimeters)

Mounting Configurations for 3095FB Transmitter

Panel Mount



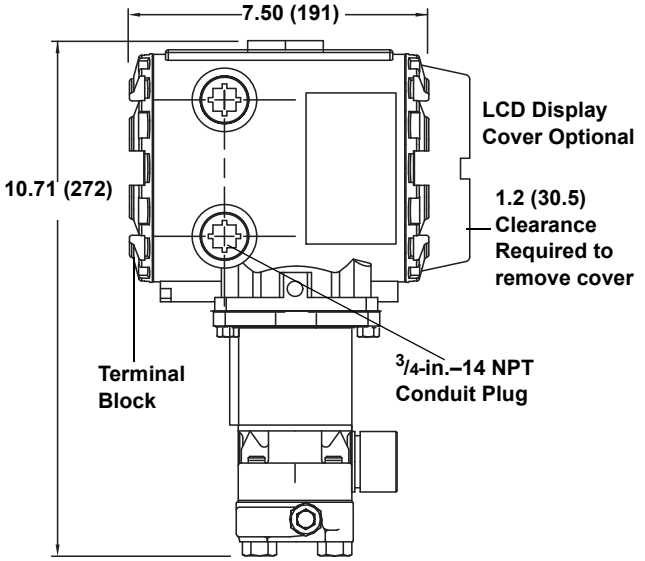
Pipe Mount



Dimensions are in inches (millimeters)

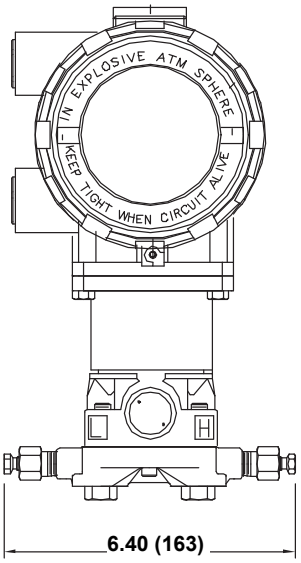
3095FC

Side View

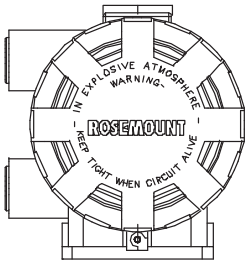


Front View

With LCD Display



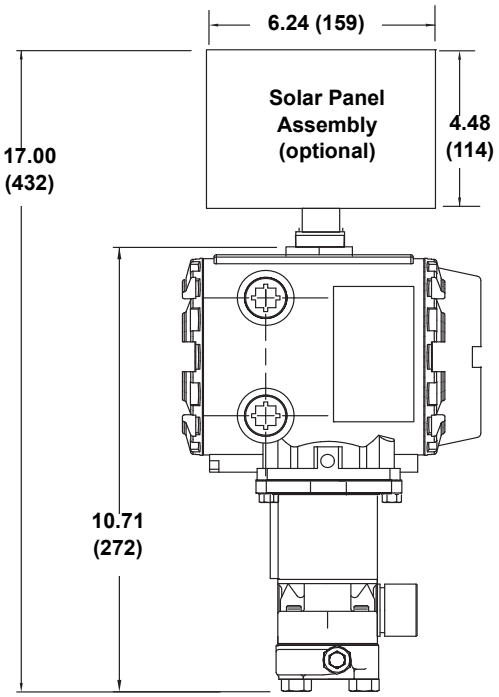
Without LCD Display



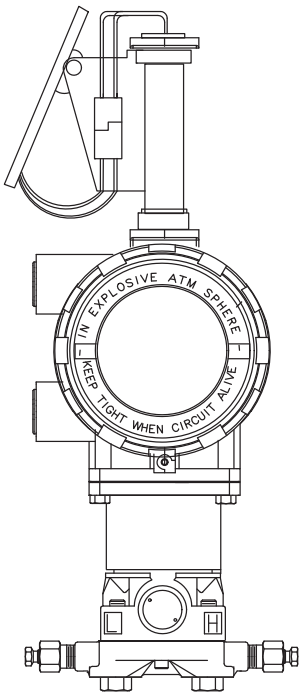
Dimensions are in inches (millimeters)

3095FC with Solar Panel Assembly

Side View



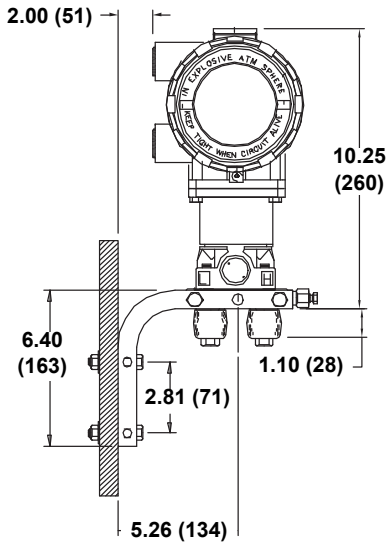
Front View



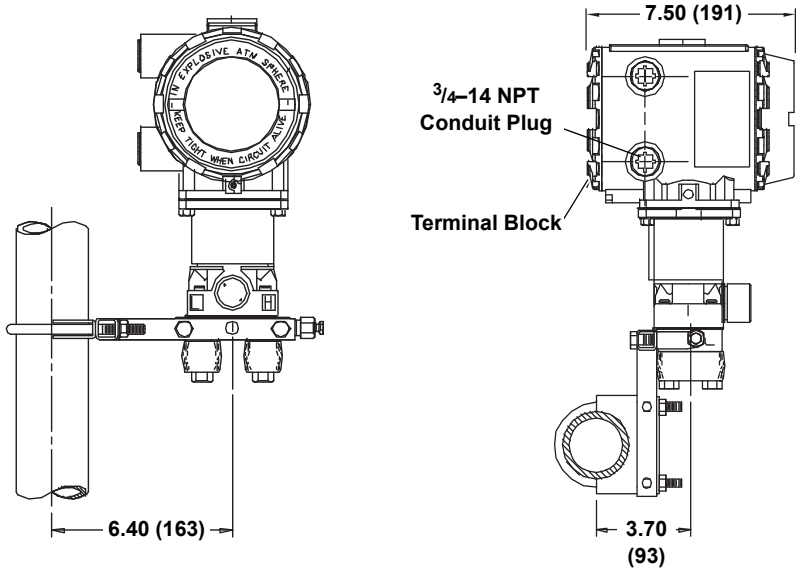
Dimensions are in inches (millimeters)

Mounting Configurations for 3095FC Transmitter

Panel Mount



Pipe Mount



Dimensions are in inches (millimeters)

Ordering Information

• Available — Not available

Code	Product Description		3095FB	3095FC
3095F	*MultiVariable* Transmitter		•	•
Code	**Output**			
B	Process Variable Measurement: *Modbus* RS-485		•	—
C	Process Variable Measurement: Mass Flow and Data Logging, *Modbus* RS-485		—	•
Code	**Differential Pressure Ranges**			
2	0–2.5 to 0–250 inH_2O (0–0,622 to 0–62,2 kPa)		•	•
3	0–10 to 0–1000 inH_2O (0–2,49 to 0–249 kPa)		•	•
Code	**Absolute/Gage Pressure Ranges**			
3	0.5–8 to 0.5–800 psia (3,447–55,16 to 3,447–5516 kPa)		•	•
4	0.5–36.26 to 0.5–3,626 psia (3,447-250 to 3,447–25000 kPa)		•	•
C	0–8 to 0–800 psig (0–55,16 to 0–5516 kPa)		•	•
D	0–36.26 to 0–3,626 psig (0-250 to 0–25000 kPa)		•	•
Code	**Isolator Material**	**Fill Fluid**		
A	316L SST	Silicone	•	•
B[1]	Hastelloy C-276	Silicone	•	•
F	Gold Plated SST	Silicone	•	•
D	Tantalum	Silicone	•	—
J[2]	316L SST	Inert	•	•
K[1][2]	Hastelloy C-276	Inert	•	•
L[2]	Tantalum	Inert	•	—
Code	**Flange Style**	**Material**		
A	*Coplanar*	CS	•	•
B	*Coplanar*	SST	•	•
C	*Coplanar*	Hastelloy C-276[1]	•	•
J	DIN Compliant Traditional Flange	SST, $^7/_{16}$ - 20 Bolting	•	•
0	None (Required for Option Codes S3 or S5)		•	•
Code	**Drain/Vent Material**			
A	SST		•	•
C[1]	Hastelloy C-276		•	•
0	None (Required for Option Codes S3 or S5)		•	•
Code	**O-ring**			
1	Glass-filled PTFE		•	•
Code	**Process Temperature Input (RTD ordered separately)**			
0	No RTD Cable (required for 3095FC)		•	•
1	RTD Input with 12 ft. (3,66 m) of Shielded Cable (intended for use with conduit)		•	—
2	RTD Input with 24 ft. (7,32 m) of Shielded Cable (intended for use with conduit)		•	—
3	RTD Input with 12 ft. (3,66 m) of Armored, Shielded Cable		•	—
4	RTD Input with 24 ft. (7,32 m) of Armored, Shielded Cable		•	—
7	RTD Input with 75 ft. (22,86 m) of Shielded Cable (intended for use with conduit)		•	—
8	RTD Input with 75 ft. (22,86 m) of Armored, Shielded Cable		•	—
A	RTD Input with 12 ft. (3,66 m) of ATEX/IECEx Flameproof Cable		•	—
B	RTD Input with 24 ft. (7,32 m) of ATEX/IECEx Flameproof Cable		•	—
C	RTD Input with 75 ft. (22,86 m) of ATEX/IECEx Flameproof Cable		•	—
Code	**Transmitter Housing Material**	**Conduit**		
A	Polyurethane-covered Aluminum	$^1/_2$–14 NPT	•	Adapter
E	Polyurethane-covered Aluminum	$^3/_4$–14 NPT	—	•
B	Polyurethane-covered Aluminum	M20 x 1.5 (CM20)	Adapter	Adapter
C	Polyurethane-covered Aluminum	PG 13.5	Adapter	Adapter
J	SST	$^1/_2$–14 NPT	•	—
K	SST	M20 x 1.5 (CM20)	Adapter	—
L	SST	PG 13.5	Adapter	—

• Available — Not available

Code		3095FB	3095FC
Code	**Terminal Block**		
A	Standard	•	—
B	With Integral Transient Protection	•	•
C	CE MARK/ Compliant with EMC - Transient Protection Included	•	—
Code	**Display**		
0	None	•	•
1	LCD Display	•	•
Code	**Bracket**		
0	None (required for option code S3 or S5)	•	•
1	*Coplanar* SST Flange Bracket for 2-in. Pipe or Panel Mount, SST Bolts	•	•
2	Traditional Flange Bracket for 2-in. Pipe Mounting, CS Bolts	•	•
3	Traditional Flange Bracket for Panel Mounting, CS Bolts	•	•
4	Traditional Flange Flat Bracket for 2-in. Pipe Mounting, CS Bolts	•	•
5	Traditional Flange Bracket for 2-in. Pipe Mounting, 300 Series, SST Bolts	•	•
6	Traditional Flange Bracket for Panel Mounting, 300 Series, SST Bolts	•	•
7	Traditional Flange Flat Bracket for 2-in. Pipe Mounting, 300 Series, SST Bolts	•	•
8	SST Traditional Flange Bracket for 2-in. Pipe Mounting, 300 Series, SST Bolts	•	•
9	SST Traditional Flange Flat Bracket for 2-in. Pipe Mounting, 300 Series, SST Bolts	•	•
Code	**Bolts**		
0	CS bolts	•	•
1	Austenitic 316 SST bolts	•	•
N	None (required for Options codes S3 or S5)	•	•
Code	**Product Certifications**		
0	None	•	•
A	FM Explosion-proof, Dust Ignition-proof	•	—
C	CSA Explosion-proof, Dust Ignition-proof, Division 2	•	—
H	ATEX Flameproof	•	•
M	CSA Explosion-proof (US and Canada)	—	•
P	ATEX Dust	•	—
7	IECEx Flameproof	•	—
8	IECEx Dust	•	—
Code	**Engineered Measurement Solution (EMS)**		
N	Process Variable Measurement: *MODBUS*	•	—
C	Mass Flow with Process Variable Measurement and Data Logging: *MODBUS* (required for 3095FC)	—	•
Code	**Options**		
Performance Class			
U3(3)	Ultra for Flow: ±0.05% DP reading accuracy, up to 100:1 rangedown, 10 year stability, limited 12 year warranty	•	—
S3(4)	Assemble to Rosemount 405 Compact Orifice	•	—
S4(4)(5)	Assemble to Rosemount *Annubar* Averaging Pitot Tubes or 1195 Integral Orifice Plates	•	—
S5(4)	Assemble to Rosemount 305 Integral Manifold	•	•
C1(6)	Custom Flow Configuration (requires completed Configuration Data Sheet)	•	•
A3	Mast with Solar Panel Assembly and 12 Vdc Batteries	—	•
P1	Hydrostatic testing with certificate	•	•
P2	Cleaning for Special Services	•	•
Q4	Calibration Certificate	•	•
Q8	Material Traceability Certification per EN 10204 3.1B	•	•
DF(7)	Flange Adapters — Adapter Type Determined by Selected Flange Material: Plated CS, SST, Hastelloy C-276	•	•
A1	Additional RS-232 Communication Board	—	•
A2	12 Vdc System with Batteries	—	•

Typical Model Number: 3095F B 2 3 A B A 1 1 A B 0 1 0 A N

(1) 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.

(2) Only available with C or D Gage Sensor Modules.
(3) Ultra for Flow (Option U3) applicable for 3095FB DP ranges 2 and 3 with SST isolator material and silicone fill fluid only.
(4) "Assemble-to" items are specified separately and require a completed model number.
(5) With a primary element installed, the maximum operating pressure will be the lesser of either the transmitter or the primary element.
(6) 3095FC only allows all English or all Metric units.
(7) Not available with S4 option.

OPTIONS

Standard Configuration

Unless otherwise specified, the transmitter is shipped as follows:
Engineering units:

Differential	inH_2O
Absolute/gage	psi
Output:	*MODBUS* RTU protocol signal
Flange type:	Specified model code option
Flange material:	Specified model code option
O-ring material:	Specified model code option
Drain/vent:	Specified model code option
Flow Configuration Parameters:	Factory default
Software tag:	(Blank)

Custom Configuration (Option Code C1)(1)

If Option Code C1 is ordered, the user-specified information and standard configuration parameters are factory configured. Unspecified parameters will remain at the factory default settings.

(1) 3095FC only allows all English or all Metric units.

Tagging

Three customer tagging options are available:

- Standard SST tag is wired to the transmitter. Tag character height is 0.125 in. (3.18 mm), 85 characters maximum.
- Tag may be permanently marked on transmitter nameplate upon request.
  Tag character height is 0.0625 in. (1.59 mm), 65 characters maximum.
- Tag may be stored in transmitter memory. Software tag is left blank unless specified.
- Software tag is left blank unless specified.

Optional 305 Integral Manifolds

The Rosemount MultiVariable transmitters with 305R Integral Manifold are fully assembled, calibrated, and seal tested by the factory. Refer to PDS 00813-0100-4733 for additional information.

ACCESSORIES

3095 User Interface Software Packages

The User Interface software package is available with or without the converter and connecting cables. All configurations are packaged separately.

Windows 98 or higher

3095FB

- Part Number 03095-5130-0003: Windows User Interface Software–Single PC License, Converter, and Cable.
- Part Number 03095-5125-0004: Windows User Interface Software–Single PC License.
- Part Number 03095-5125-0005: Windows User Interface Software– Site License.
- Part Number 03095-5106-0002: RS-485 Converter and Cable.

3095FC

- Part Number 03095-5136-0001: Windows User Interface Software–Single PC License, and Cable.
- Part Number 03095-5135-0001: Windows User Interface Software–Single PC License.
- Part Number 03095-5135-0002: Windows User Interface Software– Site License.
- Part Number 03095-5106-0003: 10 foot (3.05 m) 9-pin Serial Cable (For direct connect method)

Additional Information

Rosemount transmitters are available as fully assembled and factory calibrated flowmeters. Flowmeter Product Data Sheets are listed below:

- *Annubar* Flowmeter Series:00813-0100-4809
  Rosemount 3051SFA *ProBar*
  Rosemount 3095MFA Mass *ProBar*
  Rosemount 485 *Annubar* Primary Element
- *Proplate* Flowmeter Series: 00813-0100-4686
  Rosemount 3051SFP *Proplate*
  Rosemount 3095MFP Mass *Proplate*
  Rosemount 1195 Integral Orifice Primary Element
- Compact Orifice Flowmeter Series: 00813-0100-4810
  Rosemount 3051SFC Flowmeter
  Rosemount 3095MFC Mass Flowmeter
  Rosemount 405 Compact Orifice Primary
- Orifice Plate Primary Element Systems: 00813-0100-4792
  Rosemount 1495 Orifice Plate
  Rosemount 1496 Flange Union
  Rosemount 1497 Meter Section

Emerson Process Management

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Singapore 128461
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F (65) 6777 0947
Enquiries@AP.EmersonProcess.com

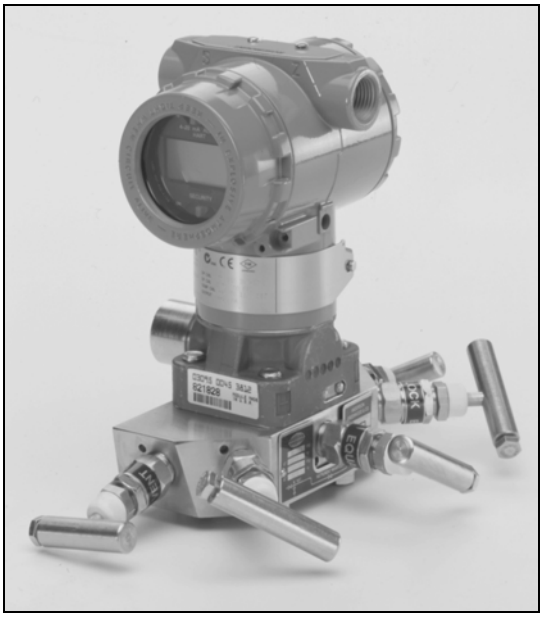
EMERSON™
Process Management

Product Data Sheet
00813-0100-4015, Rev FA
April 2010

Rosemount 3095FT *MultiVariable*™ Flow Data Logger

THE PROVEN LEADER IN MULTIVARIABLE MEASUREMENT:

- *Industry leading performance with ±0.05% of DP reading accuracy*
- *Ten year stability under actual process conditions*
- *Unprecedented reliability backed by a limited 12-year warranty*
- *Measures natural gas flow through an orifice plate per AGA, API, and GPA standards*
- *Advanced data and event logging, API compliant*
- *Coplanar™ platform enables orifice-based DP Flowmeters*



CE

Contents

Rosemount 3095FT — Leader in *MultiVariable* Measurement

Developed in coordination with the Gas Research Institute, the state-of-the-art 3095FT is the world's most compact electronic flow measurement (EFM) device. The 3095FT delivers four measurements from one *coplanar* device while performing user configured data logging.

Industry leading performance with ±0.05% of DP reading accuracy

Enabled by superior sensor technology and engineered for optimal flow performance, the 3095FT delivers unprecedented reference accuracy with 100:1 rangeability. Superior performance means reduced variability for improved billing accuracy.

Ten year stability under actual process conditions

Through aggressive simulation testing, the 3095FT has proven its ability to maintain unprecedented performance under the most demanding conditions. Superior transmitter stability decreases calibration frequency for reduced maintenance and operation costs.

Unprecedented reliability backed by a limited 12-year warranty

Further enhance installation practices with the most reliable platform supported by a 12-year warranty.

Four variables in one device

The advanced 3095FT measured three process variables simultaneously, while calculating flow through an orifice plate per American Gas Association (AGA), American Petroleum Institute (API) and Gas Processors Associations (GPA) standards. One installation means reduced process penetrations, inventory and installation costs.

Advanced data logging

With user-configurable data logging exceeding EFM requirements of API MPMS Chapter 21.1, the 3095FT logs the continuously averaged flow data. The nonvolatile memory logs 50 days of daily, variable and event logs. A cost effective solution for natural gas flow monitoring and custody transfer.

Coplanar platform enables DP flowmeters

The solution arrives factory calibrated, pressure-tested, and ready to install right out of the box. Only Rosemount has a scalable *coplanar* transmitter design to reduce engineering and inventory costs.

Advanced *PlantWeb* functionality

From multiple process variable generation to advanced compensated Mass Flow functionality and highly integrated flowmeter solutions, the 3095 reduces operational and maintenance expenditures while improving throughput and utilities management.

Rosemount DP-Flow Solutions

Rosemount 3051S Series of Instrumentation
Scalable pressure, flow, and level measurement solutions improve installation and maintenance practices.

Rosemount 3095 Mass Flow Transmitter
Accurately measures differential pressure, static pressure, and process temperature to dynamically calculate fully compensated mass flow.

Rosemount 305, 306 and 304 Manifolds
Factory-assembled, calibrated, and seal-tested transmitter-to-manifold assemblies reduce on-site installation costs.

Rosemount 1495, 1496, 1497, and 1595 Orifice Plate Primary Element Systems
A comprehensive offering of orifice plates, flange unions and meter sections that is easy to specify and order. The 1595 Conditioning Orifice provides superior performance in tight fit applications.

Rosemount 3051SFA, 3095MFA, 485, and 285 Annubar® Series
The state-of-the-art, fifth generation Rosemount 485 Annubar combined with the 3051S or 3095 MultiVariable transmitter creates an accurate, repeatable and dependable insertion-type flowmeter. The Rosemount 285 provides a commercial product offering for your general purpose applications.

Rosemount 3051SFC, 3095MFC, and 405 Compact Orifice Series
Compact Orifice Flowmeters can be installed between existing flanges, up to a Class 600 (PN100) rating. In tight fit applications, a conditioning orifice plate version is available, requiring only two diameters of straight run upstream and two diameters downstream.

Rosemount 3051SFP, 3095MFP, and 1195 ProPlate® Series
These Integral Orifice Flowmeters eliminate the inaccuracies that become more pronounced in small orifice line installations. The completely assembled, ready to install flowmeters reduce cost and simplify installation.

Specifications

FUNCTIONAL

Service

AGA 8 Natural Gas, AGA 3 Orifice Plates
Consult factory for other fluid and primary element combinations

Differential Sensor

Limits

- Range 2: –250 to 250 inH_2O (-62,2 to 62,2 kPa)
- Range 3: –1000 to 1000 inH_2O (-249 to 249 kPa)

Absolute Sensor

Limits

- Range 3: 0.5 to 800 psia (0,0034 to 5,516 MPa)
- Range 4: 0.5 to 3,626 psia (0,0034 to 25,00 MPa)

Gage Pressure

Limits

- Range C: 0 to 800 psig (0 to 5,516 MPa)
- Range D: 0 to 3,626 psig (0 to 25,00 MPa)

Over Pressure Limit

0.5 psia (0,0034 MPa) to two times the absolute pressure sensor range up to a maximum of 3,626 psia (25,00 MPa).

Static Pressure Limit

Operates within specifications between static line pressures of 0.5 psia (0,0034 MPa) and the URL of the absolute pressure sensor.

Flow Calculations

- 1992 AGA Report No. 3(1)
- API MPMS Chapter 14.3(1)
- GPA(1)
- Flange tap configurable per corresponding AGA calculations
- Pipe Tap configurable per corresponding AGA calculations

NOTE
Flow calculations will cease when DP readings are below low flow cut off.

Compressibility Calculations

- AGA Report No. 8
- API MPMS Chapter 14.2
- Gross or Detailed Characterization Method

Data Logging

- Exceeds API MPMS 21.1
- Daily & Variable Logs have user selected time duration between 1-99 minutes
- Event Logs record alarms, configuration changes, and significant occurrences affecting flow calculation
- 50 days of daily logs maintained for user-selected process variables and calculated values when seven required API variables are logged.
- Logged files saved as ASCII file or comma separated value file.

Daily Variable Log Parameters

Maximum: DP, PT, and SP
Minimum: DP, PT, and SP
Average: DP, PT, and SP
Total: Energy, Flow, and Flow Time
Average: Energy Rate, Flow Rate, Integral Value, C', Z
Specific Gravity
Heating Value

Audit Trail

Exceeds API MPMS Chapter 21.1 standards for electronic flow measurement systems.

User Interface Software and Hardware Requirements

- PC with CD-ROM Drive
- 4 MB RAM minimum
- *Microsoft® Windows®* 98, NT, 2000, or XP
- 2 MB of free hard disk space

Output

Two-wire, constant 9.5mA current, data logging

Power Supply

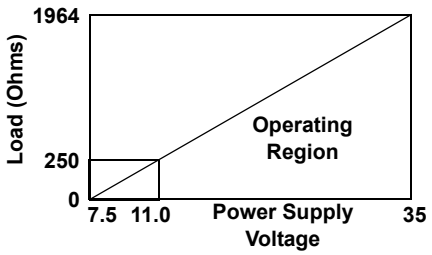
External power supply required. Data Logger operates on terminal voltage of 7.5–35 V dc with a constant average operating current of 9.5 mA.

(1) "Orifice Metering of Natural Gas and Other Related Hydrocarbon Fluids." Third Edition, August 1992. Part 3 Natural Gas Applications. American Gas Association Report No. 3; American Petroleum Institute API 14.3; Gas Processor Association GPA 8185-92.

Load Limitations

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

$$\text{Max. Loop Resistance} = \frac{\text{Power Supply Voltage} - 7.5}{0.014}$$



Communication requires a minimum loop resistance of 250 ohms.

Temperature Limits

Process (at transmitter isolator flange for atmospheric pressures and above)

- –40 to 185 °F (–40 to 85 °C)

Ambient:

- -40 to 185 °F (-40 to 85 °C)
- With LCD Display(1): -40 to 175 °F (-40 to 80 °C)

Storage:

- -50 to 212 °F (-46 to 100 °C)
- With LCD Display: -40 to 185 °F (-40 to 85 °C)

Humidity Limits

0–100% relative humidity

Failure Mode Alarm

If self-diagnostics detect a gross transmitter failure, the output registers an alarm with each message.

Turn-on Time

Process variables will be within specifications less than 60 seconds after power is applied to transmitter.

Damping

Response to step input change can be user-selectable from 0 to 15 seconds for one time constant. This is in addition to sensor response time of 0.2 seconds.

Real-Time Clock Accuracy

±2 minutes per month at reference conditions

Memory

Non-volatile memory per applicable A.G.A., A.P.I., and G.P.A. orifice meter and electronic flow measurement standards.

PERFORMANCE

Zero-based spans, reference conditions, silicone oil fill, 316 SST isolating diaphragms, and digital trim values equal to the span end points.

Specification Conformance

The Rosemount 3095 maintains a specification conformance of measured variables to at least 3σ.

Differential Pressure

Range 2:

0–2.5 to 0-250 inH2O (0–0,6227 to 0-62,27 kPa)

Range 3:

0-10 to 0-1000 inH2O (0–2,491 to 0-249,1 kPa)

Reference Accuracy (including Linearity, Hysteresis, Repeatability)

Range 2-3 Ultra for Flow (Option U3)(2)

- ±0.05% of DP reading up to 3:1 DP turndown from URL
- For DP turndowns up to 100:1 from URL,

  $$\text{Accuracy} = \pm\left[0.05 + 0.0145\left(\frac{URL}{DPReading}\right)\right] \text{ \% of DP Reading}$$

Range 2-3

- ±0.075% of span for spans from 1:1 to 10:1 of URL
- For spans less than 10:1 of URL,

  $$\text{Accuracy} = \pm\left[0.025 + 0.005\left(\frac{URL}{Span}\right)\right] \text{ \% of Span}$$

Ambient Temperature Effect per 50 °F (28 °C)

Range 2-3 Ultra for Flow (Option U3)(2)

- ±0.130% of DP reading up to 3:1 DP turndown from URL
- ±[0.05 + 0.0345 (URL/DP Reading)]% of DP reading up to 100:1 DP turndown from URL

Range 2-3

- ±(0.025% URL + 0.125% span) spans from 1:1 to 30:1
- ±(0.035% URL – 0.175% span) spans from 30:1 to 100:1

Static Pressure Effects

- Zero error = ±0.05% of URL per 1,000 psi (6895 kPa)
- Span error = ±0.20% of DP Reading per 1,000 psi (6895 kPa)

Stability

Range 2-3 Ultra for Flow (Option U3)(2)

- ±0.25% of URL for 10 years; for ±50 °F (28 °C) temperature changes, up to 1000 psi (6895 kPa) line pressure

Range 2-3

- ±0.125% of URL for five years for ±50 °F (28 °C) ambient temperature changes, and up to 1000 psi (6895 kPa) line pressure.

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

(2) Ultra for Flow (option U3) applicable for DP ranges 2 and 3 with SST isolator material and silicone fill fluid options only.

Absolute/ Gage Pressure

Absolute (100:1 rangeability allowed)

Range 3

0.5–8 to 0.5–800 psia (0,0034–0,055 to 0,0034–5,516 MPa)

Range 4

0.5–36.26 to 0.5–3,626 psia (0,0034–0,250 to 0,0034–25,00 MPa)

Gage (100:1 rangeability allowed)

Range C

0–8 to 0–800 psig (0–0,055 to 0–5,516 MPa)

Range D

0–36.26 to 0–3,626 psig (0–0,250 to 0–25,00 MPa)

Reference Accuracy (including linearity, hysteresis, repeatability)

- ±0.075% of span for spans from 1:1 to 6:1 of URL
- For spans less than 6:1 rangedown

$$\text{Accuracy} = \pm\left[0.03 + 0.0075\left(\frac{\text{URL}}{\text{Span}}\right)\right]\% \text{ of span}$$

Ambient Temperature Effect per 50 °F (28 °C)

- ±(0.05% URL + 0.125% of span) spans from 1:1 to 30:1
- ±(0.06% URL - 0.175% of span) spans from 30:1 to 100:1

Stability

- ±0.125% of URL for five years for ±50 °F (28 °C) ambient temperature changes, and up to 1000 psi (6,89 MPa) line pressure.

Process Temperature (RTD)

Specification for process temperature is for the transmitter portion only. Sensor errors caused by the RTD are not included. The transmitter is compatible with any PT100 RTD conforming to IEC 751 Class B, which has a nominal resistance of 100 ohms at 0 °C and $\propto$ = 0.00385.Examples of compatible RTDs include the Rosemount Series 68 and 78 RTD Temperature Sensors.

Range

–40 to 185 °F (–40 to 85 °C). May be limited by the flow calculation characterization method.

Accuracy (including Linearity, Hysteresis, Repeatability)

±1.0 °F (0.56 °C)

Ambient Temperature Effects

±0.72 °F (0.40 °C) per 50 °F (28 °C)

Stability

±1.0 °F (0.56 °C) for one year

PHYSICAL

Security

Transmitter security switch mounted on electronics board, when enabled prevents changes to transmitter security.

User Interface Software provides three levels of password security, they are as follows:

- System Administrator (one password)
- Maintenance (three passwords)
- Operation (six passwords)

Electrical Connections

½–14 NPT, M20 x 1.5 (CM20), PG-13.5

Process Connections

Transmitter

- ¼–18 NPT on $2^1/_8$-in. centers.

RTD

- RTD dependent (see “Ordering Information” on page 9)

RTD Process Temperature Input

100-ohm platinum RTD per IEC-751 Class B

Process Wetted Parts

Isolating Diaphragms

- 316L SST or Hastelloy C-276®

Drain/Vent Valves

- 316 SST or Hastelloy C-276

Flanges

- Plated carbon steel, 316 SST, or Hastelloy C-276

Wetted O-rings

- Glass-Filled PTFE

Non-Wetted Parts

Electronics Housing

- Low copper aluminum

Bolts

- Plated carbon steel per ASTM A449, Grade 5; or austenitic 316 SST

Fill Fluid

- Silicone oil

Paint

- Polyurethane

O-rings

- Buna-N

Weight

Component	Weight in lb (kg)
3095FT Transmitter	6.0 (2,7)
LCD Display	0.5 (0,2)
SST Mounting Bracket	1.0 (0,4)
12 ft (3.66 m) RTD Shielded Cable	0.5 (0,2)
12 ft (3.66 m) RTD Armored Cable	1.1 (0,5)
24 ft (7.32 m) RTD Shielded Cable	1.0 (0,4)
24 ft (7.32 m) RTD Armored Cable	2.2 (1,0)
75 ft (22.86 m) RTD Shielded Cable	3.1 (1,4)
75 ft (22.86 m) RTD Armored Cable	6.9 (3,1)

Product Certifications

Approved Manufacturing Locations

Rosemount Inc. — Chanhassen, Minnesota USA

Emerson Process Management GmbH & Co. — Wessling, Germany

Emerson Process Management Asia Pacific Private Limited — Singapore

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

European Directive Information

The EC declaration of conformity for all applicable European directives for this product can be found on the Rosemount website at www.rosemount.com. A hard copy may be obtained by contacting our local sales office.

ATEX Directive (94/9/EC)

Emerson Process Management complies with the ATEX Directive.

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

3095F_2/3,4/D Flow Transmitters — QS Certificate of Assessment - EC No. PED-H-100 Module H Conformity Assessment

All other 3095_ Transmitters/Level Controller \— Sound Engineering Practice

Transmitter Attachments: Process Flange - Manifold — Sound Engineering Practice

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

3095FT Flow Transmitters — EN 61326:1997/ A1, A2, and A3

Ordinary Location Certification for Factory Mutual

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

Hazardous Locations Certifications

North American Certifications

FM Approvals

A Explosion Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition Proof for Class II, Division 1, Groups E, F, and G. Suitable for Class III, Division 1, indoor and outdoor (Type 4X) hazardous locations. Factory Sealed. Provides non-incendive RTD connections for Class I, Division 2, Groups A, B, C, and D. Install per Rosemount drawing 03095-1025.

Canadian Standards Association (CSA)

C Explosion Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition Proof for Class II, Division 1, Groups E, F, and G. Suitable for Class III, Division 1, indoor and outdoor hazardous locations, CSA enclosure Type 4X. Factory Sealed. Provides non-incendive RTD connection for Class I, Division 2, Groups A, B, C, and D. Approved for Class I, Division 2, Groups A, B, C, and D. Install in accordance with Rosemount Drawing 03095-1024.

European Certifications

H ATEX Flameproof
Certificate Number: KEMA02ATEX2320X II 1/2 G
EEx d IIC T5 ($-50°C \le T_{amb} \le 80°C$)
T6 ($-50°C \le T_{amb} \le 65°C$)
CE 1180

Special Conditions for Safe Use (x):

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 fro installation and maintenance shall be followed in detail to assure safety during its expected lifetime.

P ATEX Dust
Certificate Number: KEMA02ATEX2321 II 1 D
V = 55 Vdc MAX
I = 23 mA MAX
IP66
CE 1180

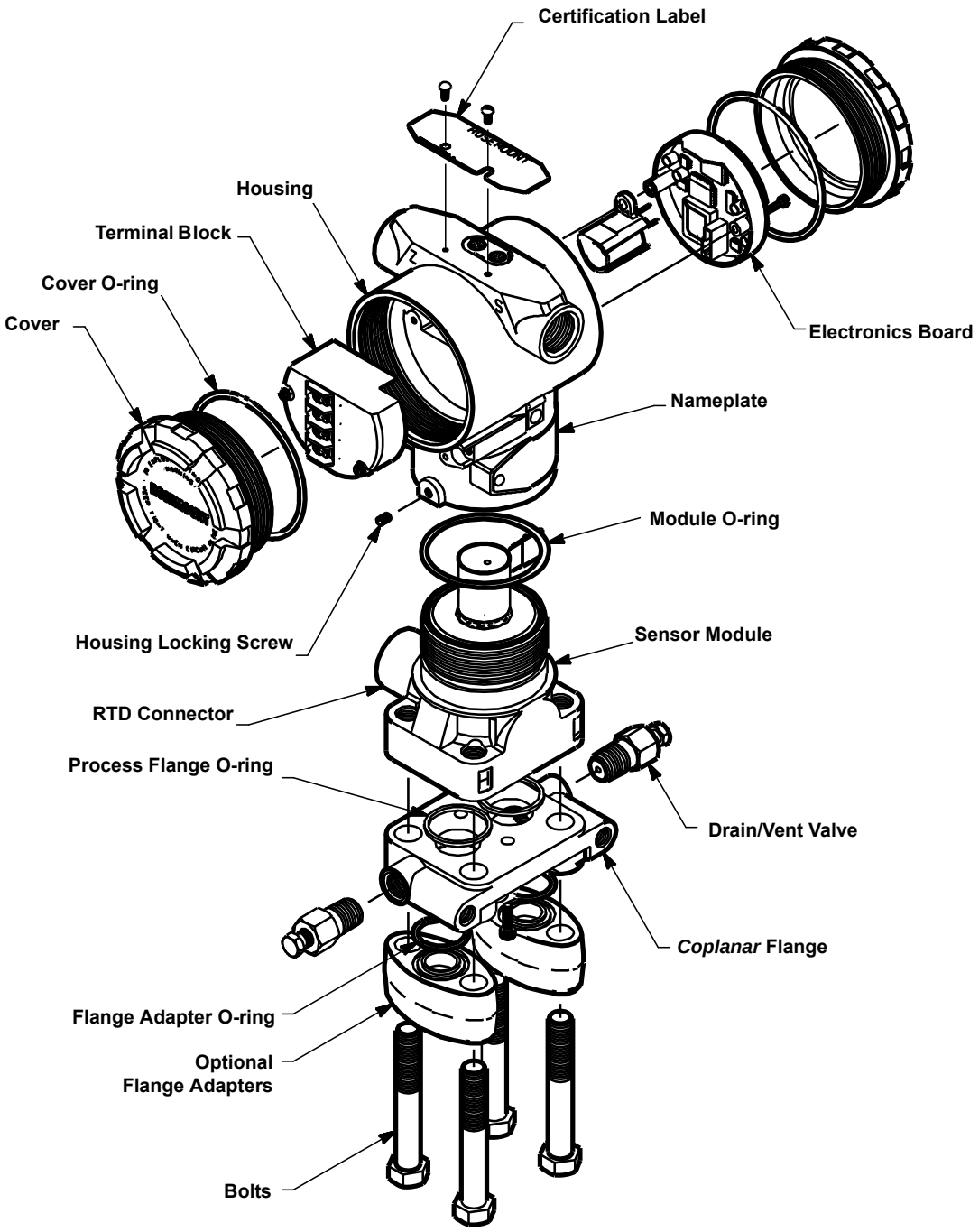
IECEx Certifications

7 IECEx Flameproof
Certificate Number: IECEx KEM 06.0018
Zone 0/1 Ex d IIC T6 ($-20°C \le T_a \le 65°C$)
Zone 0/1 Ex d IIC T5 ($-20°C \le T_a \le 80°C$)
V_{max} = 55 Vdc
I_{max} = 23 mAdc

8 IECEx Dust
Certificate Number: IECEx KEM 06.0018
Ex tD A22 T90°C
IP66

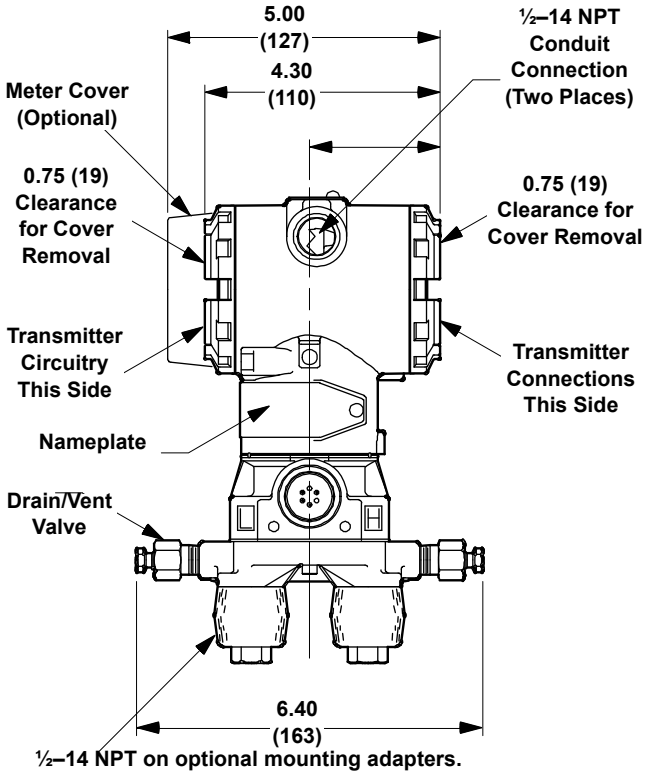
Dimensional Drawings

Exploded View of 3095FT

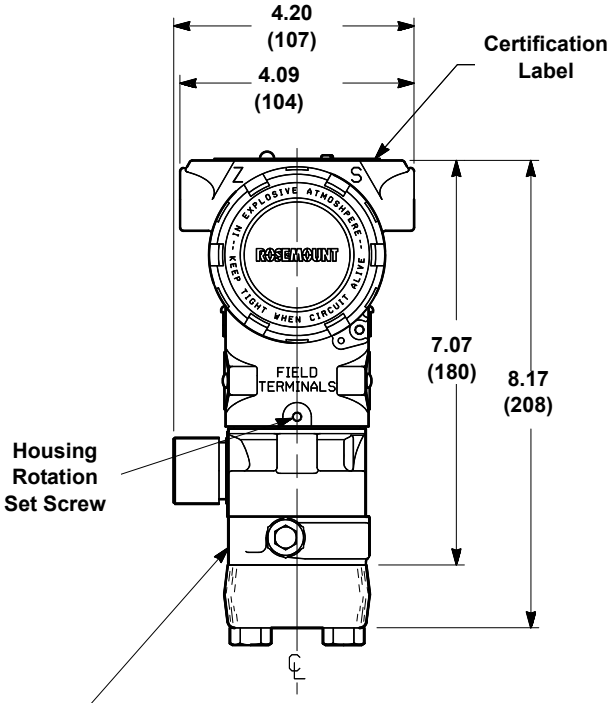


3095FT

Dimensions are in inches (millimeters).



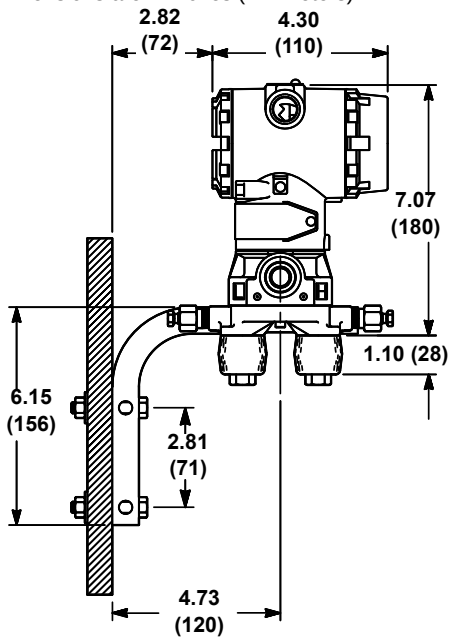
½–14 NPT on optional mounting adapters. Adapters can be rotated to give connection centers of 2.00 (51), 2.125 (54), or 2.25 (57).

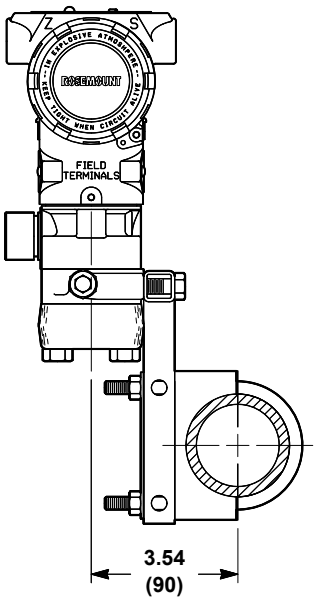


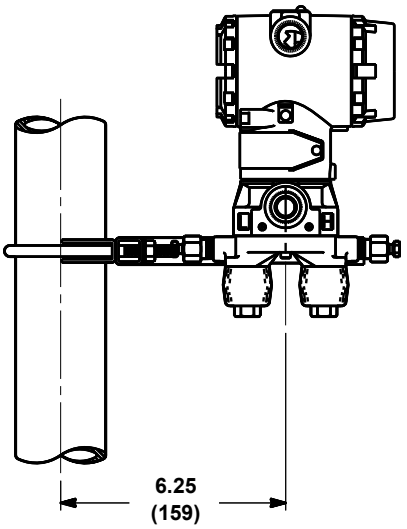
¼–18 NPT on *Coplanar* flange for pressure connection without the use of mounting adapters

Mounting Configurations for 3095FT

Dimensions are in inches (millimeters).







Ordering Information

Model	Product Description		
3095F	MultiVariable Flow Data Logger		
Code	**Output**		
H[1]	Data Log via PC based User Interface Software		
Code	**Differential Pressure Ranges**		
2	0–2.5 to 0–250 inH_2O (0–0,622 to 0–62,27 kPa)		
3	0–10 to 0–1000 inH_2O (0–2,49 to 0–249 kPa)		
Code	**Static Pressure Ranges**		
3	0.5-8 to 0.5–800 psia (0,0034–0,055 to 0,0034–5,516 MPa)		
4	0.5-36.26 to 0.5–3626 psia (0,0034-0,250 to 0,0034–25,00 MPa)		
C	0-8 to 0-800 psig (0–0,055 to 0–5,516 MPa)		
D	0-36.26 to 0-3626 psig (0-0,250 to 0–25,00 MPa)		
Code	**Isolator Material**	**Fill Fluid**	
A	316L SST	Silicone	
B[2]	Hastelloy C-276	Silicone	
F	Gold Plated SST	Silicone	
Code	**Flange Style**		**Material**
A	*Coplanar*		CS
B	*Coplanar*		SST
C	*Coplanar*		Hastelloy C-276
J	DIN compliant traditional flange, SST 10 mm adapter/manifold bolting		SST, $^7/_{16}$ — 20 Bolting
0	None (Required for Option Code S5)		
Code	**Drain/Vent Material**		
A	SST		
C	Hastelloy C-276		
0	None (Required for Option Code S5)		
Code	**O-ring**		
1	Glass-filled PTFE		
Code	**Process Temperature Input (RTD ordered separately)**		
0	No RTD Cable		
1	RTD input with 12 ft. (3,66 m) of Shielded Cable (intended for use with conduit)		
2	RTD input with 24 ft. (7,32 m) of Shielded Cable (intended for use with conduit)		
7	RTD input with 75 ft.(22,86 m) of Shielded Cable (intended for use with conduit)		
3	RTD input with 12 ft. (3,66 m) of Armored, Shielded Cable		
4	RTD input with 24 ft. (7,32 m) of Armored, Shielded Cable		
8	RTD Input with 75 ft. (22,86 m) of Armored, Shielded Cable		
A	RTD input with 12 ft. (3,66 m) ATEX/IECEx Flameproof Cable		
B	RTD input with 24 ft. (7,32 m) ATEX/IECEx Flameproof Cable		
C	RTD input with 75 ft. (22,86 m) ATEX/IECEx Flameproof Cable		
Code	**Transmitter Housing Material**	**Conduit Entry Size**	
A	Polyurethane-covered Aluminum	½–14 NPT	
B	Polyurethane-covered Aluminum	M20 × 1.5 (CM20)	Adapter
C	Polyurethane-covered Aluminum	PG 13.5	Adapter
J	316 SST	½–14 NPT	
K	316 SST	M20 × 1.5 (CM20)	Adapter
L	316 SST	PG 13.5	Adapter

Code	Terminal Block
A	Standard
B	With Integral Transient Protection
Code	**Display**
0	None
1	LCD Display
Code	**Bracket**
0	None
1	*Coplanar* SST flange bracket for 2-in. pipe or panel mount, SST bolts
2	Traditional Flange Bracket for 2-in. Pipe Mounting, CS Bolts
3	Traditional Flange Bracket for panel Mounting, CS Bolts
4	Traditional Flange Flat Bracket for 2-in. Pipe Mounting, CS Bolts
5	Traditional Flange Bracket for 2-in. Pipe Mounting, 300-Series, SST Bolts
6	Traditional Flange Bracket for panel Mounting, 300-Series, SST Bolts
7	Traditional Flange Flat Bracket for 2-in. Pipe Mounting, 300-Series, SST Bolts
8	SST Traditional Flange Bracket for 2-in. Pipe Mounting, 300-Series, SST Bolts
9	SST Traditional Flange Flat Bracket for 2-in. Pipe Mounting, 300-Series, SST Bolts
Code	**Bolts**
0	CS bolts
1	Austenitic 316 SST Bolts
N	None (Required for Option Code S5)
Code	**Product Certifications**
0	None
A	FM Explosion-proof, Dust Ignition-proof
C	CSA Explosion-proof, Dust Ignition-proof, Division 2
H	ATEX Flameproof
P	ATEX Dust
7	IECEx Flameproof
8	IECEx Dust
Code	**Engineered Measurement Solution (EMS)**
A	Averaging Method: Flow Dependent Time-weighted Formulaic Averaging Compressibility Factor: A.G.A. Report No. 8 /API MPMS Chapter 14.2
Code	**Options**
Performance Class	
U3[3]	Ultra for Flow: ±0.05% DP reading accuracy, up to 100:1 rangedown, 10 year stability, limited 12 year warranty
S5[4]	Assembly with Rosemount 305 Integral Manifold
S6[4]	Assemble to Rosemount 304 Manifold or Connection System (Required traditional Flange Style Option J, K, and L)
C1	Custom Configuration (requires completed Configuration Data Sheet)
DF	Flange Adapters — Adapter Type Determined by Selected Flange Material: Plated CS, SST, Hastelloy C-276
P1	Hydrostatic Testing with Certificate
P2	Cleaning for Special Services
Q4	Calibration Certificate
Q8	Material Traceability Certification per EN 10204 3.1B
Typical Model Number	**3095F H 2 3 A B A 1 1 A B 1 1 0 A A**

(1) Communication based on Digital HART Protocol.

(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.

(3) Ultra for Flow (Option U3) applicable for DP ranges 2 and 3 with SST isolator material and silicone fill fluid only.

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

OPTIONS

Standard Configuration

Unless otherwise specified, the transmitter is shipped as follows:

Engineering units:	
Differential	inH_2O at 60 °F (All ranges)
Absolute/gage	psi (all ranges)
Output:	9.5mA with Data Logging
Flange type:	Specified model code option
Flange material:	Specified model code option
O-ring material:	Specified model code option
Drain/vent:	Specified model code option
Flow Configuration Parameters:	Factory default
Software tag:	(Blank)

Custom Configuration (Option Code C1)

If Option Code C1 is ordered, the customer specifies the following information for the 3095FT in addition to the standard configuration parameters.

Configuration Data Sheet (see page 12): Gas composition parameters, contract hour, log parameters, LCD display parameters, meter run configuration parameters, low flow cut-off, passwords, static pressure tap location, static pressure measurement, damping, descriptor, message, and upper and lower trim points for each process variable.

Tagging

Three customer tagging options are available:

- Standard SST tag is wired to the transmitter. Tag character height is 0.125 in. (3,18 mm), 85 characters maximum.
- Tag may be stored in transmitter memory. Software tag (8 characters maximum) is left blank unless specified.
- Tag may be permanently stamped on transmitter nameplate upon request. Tag character height is 0.0625 in. (1,59 mm), 65 characters maximum.
- Software tag (8 characters maximum) is left blank unless specified.

ADDITIONAL INFORMATION

Rosemount transmitters are available as fully assembled and factory calibrated flowmeters. Flowmeter Product Data Sheets are listed below:

- Orifice Plate Primary Element Systems: 00813-0100-4792
  Rosemount 1495 Orifice Plate
  Rosemount 1496 Flange Union
  Rosemount 1497 Meter Section

ACCESSORIES

3095FT User Interface Software Packages

All configurations are packaged separately.

Windows 98, NT, 2000, and XP

- Single PC license: 03095-5100-0104
  Site license: 03095-5100-0105
- Single PC license, Serial Port HART Modem and cables: 3095-5100-0102
- Single PC license, USB HART Modem and Cables (Requires Windows XP or 2000 Operating System): 03095-5100-0103

Communication Accessories

Item Description	Part Number
Serial Port HART Modem and Cables Only	03095-5105-0001
USB Port HART Modem and Cables Only	03095-5105-0002

Emerson Process Management

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Chanhassen, MN 55317 USA
T (U.S.) 1 800 999 9307
T (International) (952) 906 8888
F (952) 949 7001

www.rosemount.com

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Emerson Process Management Asia Pacific Private Limited
1 Pandan Crescent
Singapore 128461
T (65) 6777 8211
F (65) 6777 0947
Enquiries@AP.EmersonProcess.com

EMERSON
Process Management

Product Data Sheet
00813-0100-4733, Rev NA
April 2010

Rosemount Manifolds

- *Factory assembled, leak-tested, and calibrated*
- *Full breadth of offering including integral, conventional, and inline designs*
- *Integral design enables “flangeless” valve integration*
- *2, 3, and 5 valve configurations*
- *Compact, lightweight design*
- *Easy in-process calibration*
- *Direct-mount capability*

Contents

Rosemount Manifolds

Factory assembled, leak-tested, and calibrated

Rosemount manifolds and transmitters can be pre-assembled at the factory, resulting in an integrated assembly that is easier to order, install, operate, and maintain.

Full breadth of offering

The Rosemount manifold product offering has a variety of process connections, platforms, and styles for use in any application.

Integral manifold design enables “flangeless” valve integration

Rosemount integral manifolds are assembled directly to the transmitter sensor body, eliminating the need for the transmitter flange. This results in a compact design that has 50% fewer leak points, requires less hardware, and is lighter and more streamlined compared to a traditional transmitter / flange / manifold interface.

Rosemount quality

Rosemount manifolds are designed and built to the same exceptional quality standards as Rosemount transmitters. From basic to demanding applications, Rosemount manifolds provide industry leading reliability at an exceptional value.

Rosemount Pressure Solutions

Rosemount 3051S Series of Instrumentation
Highest performing scalable pressure, flow and level measurement solutions drive better plant efficiency and more productivity. Innovative features include wireless, advanced diagnostics, and multivariable technologies.

Rosemount 3095 Mass Flow Transmitter
Accurately measures differential pressure, static pressure and process temperature to dynamically calculate fully compensated mass flow.

Rosemount 3051 Pressure Transmitter
Proven industry standard performance and reliability to increase plant profitability. Includes the most comprehensive offering to meet all application needs.

Rosemount 2051 Pressure Transmitter
Foundation for reliable measurement improves installation and maintenance practices. Common product family with a wide range of output protocols built on the flexible Coplanar™ platform.

Rosemount 304, 305 and 306 Manifolds
Factory-assembled, calibrated and seal-tested transmitter-to-manifold assemblies reduce installation costs.

Rosemount 1199 Diaphragm Seals
Provides reliable, remote measurements of process pressure and protects the transmitter from hot, corrosive, or viscous fluids.

Orifice Plate Primary Element Systems: Rosemount 1495 and 1595 Orifice Plates, 1496 Flange Unions and 1497 Meter Sections
A comprehensive offering of orifice plates, flange unions and meter sections that are easy to specify and order. The 1595 Conditioning Orifice provides superior performance in tight fit applications.

***Annubar*® Flowmeter Series: Rosemount 3051SFA *ProBar*®, 3095MFA Mass *ProBar*®, and 485**
The state-of-the-art, fifth generation Rosemount 485 *Annubar* combined with the 3051S or 3095 *MultiVariable* transmitter creates an accurate, repeatable and dependable insertion-type flowmeter.

Compact Orifice Flowmeter Series: Rosemount 3051SFC, 3095MFC, and 405
Compact Orifice Flowmeters can be installed between existing flanges, up to a Class 600 (PN100) rating. In tight fit applications, a conditioning orifice plate version is available, requiring only two diameters of straight run upstream and two downstream.

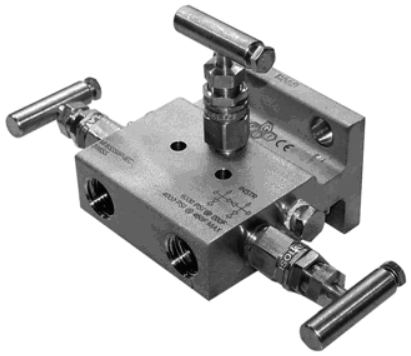
***ProPlate*® Flowmeter Series: Rosemount 3051SFP *ProPlate*, 3095MFP Mass *ProPlate*, and 1195**
These integral orifice flowmeters eliminate the inaccuracies that become more pronounced in small orifice line installations. The completely assembled, ready to install flowmeters reduce cost and simplify installation.

Rosemount Manifolds Selection Guide

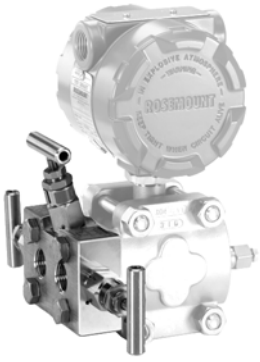
ROSEMOUNT 304 CONVENTIONAL MANIFOLD

See “Ordering Information” on page 22.

- Attaches to transmitter flange
- 2, 3, and 5-valve configurations
- Traditional (Flange x Flange, Flange x NPT) & Wafer styles
- Factory assembled, seal-tested and calibrated



Rosemount 304 Conventional Manifold-Traditional Style

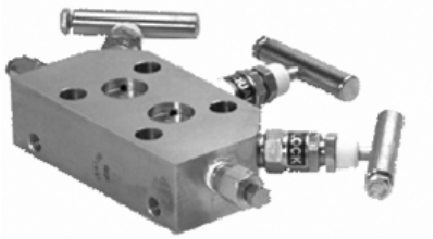


Rosemount 304 Conventional Manifold-Wafer Style

ROSEMOUNT 305 INTEGRAL MANIFOLD

See “Ordering Information” on page 22.

- Assembles directly to transmitter, eliminating need for flange
- 2, 3, and 5-valve configuration
- Available in Coplanar™ and traditional styles
- Compact, lightweight assembly
- Factory assembled, seal-tested and calibrated
- 50% fewer leak points than conventional transmitter / flange / manifold interface



Rosemount 305 Integral Manifold Coplanar Style

ROSEMOUNT 306 INLINE MANIFOLD

See “Ordering Information” on page 22.

- Assembled directly to inline pressure transmitters
- Block-and-Bleed and 2-valve configurations
- Male or Female threaded NPT process connection

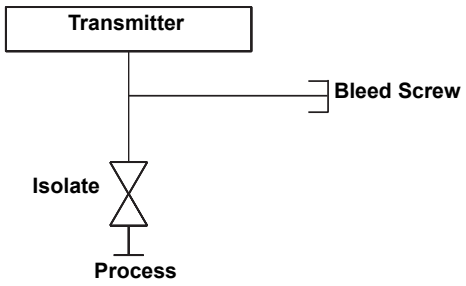
Rosemount 306 Inline Manifold

Valve Configuration

BLOCK-AND-BLEED

The block-and-bleed configuration is available on the Rosemount 306 Manifold for use with inline gage and absolute pressure transmitters. A single block valve provides instrument isolation, and a plug provides drain/vent capabilities.

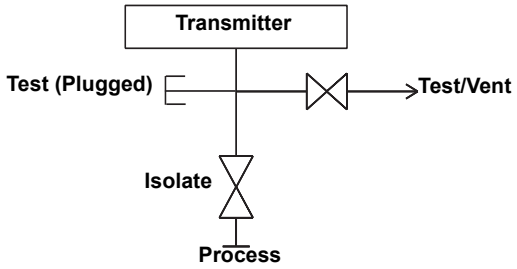
306 Manifold



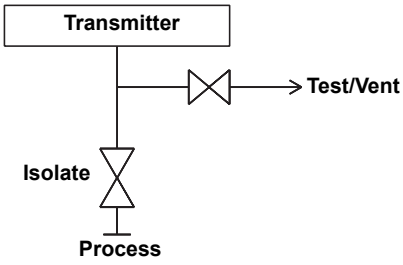
TWO-VALVE

The two-valve configuration is available on Rosemount 304, 305, and 306 Manifolds for use with absolute and gage pressure transmitters. A block valve provides instrument isolation, and a drain/vent valve allows venting, draining, or calibration.

304 Manifold



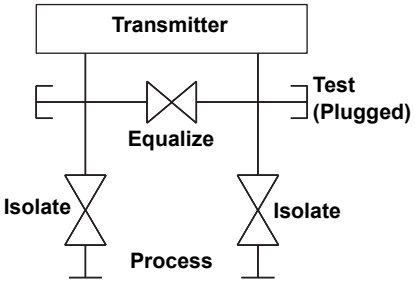
305 & 306 Manifolds



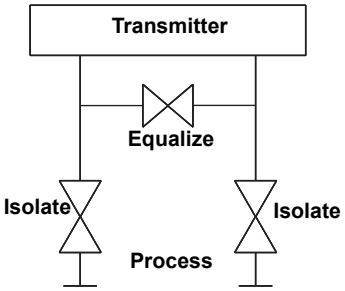
THREE-VALVE

The three-valve configuration is available on Rosemount 304 and 305 Manifolds for use with differential pressure and multivariable transmitters. Two block valves provide instrument isolation, and one equalize valve is positioned between the high and low transmitter process connections.

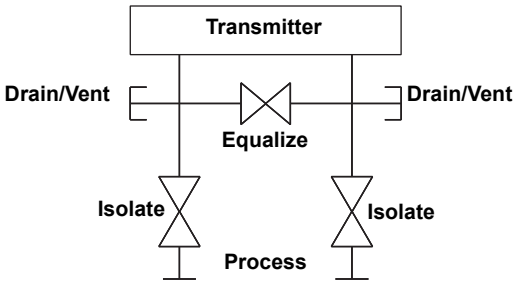
304 (Traditional) Manifold



304 (Wafer) Manifold



305 Manifold



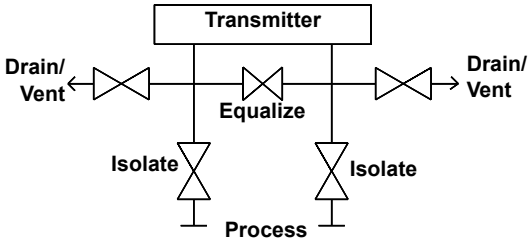
NOTE
Test/Vents receive plastic caps to protect threaded connections unless otherwise noted.

NOTE
Test (Plugged) connections receive ¼-in. NPT plugs unless otherwise noted.

FIVE-VALVE

The five-valve configuration is available on Rosemount 304 and 305 Manifolds for use with differential pressure and multivariable transmitters. Two block valves provide instrument isolation, and one equalize valve is positioned between the high and low transmitter process connections. In addition, two drain/vent valves allow for controlled venting, 100% capture of vented or drained process, and simplified in-process calibration capability.

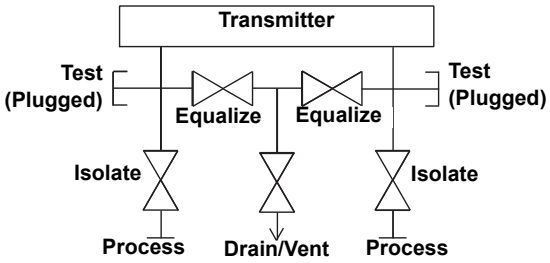
304 (Wafer) & 305 Manifolds



FIVE-VALVE NATURAL GAS

The five-valve natural gas configuration is available on the Rosemount 304 and 305 Manifolds for use with differential pressure and multivariable transmitters. Two block valves provide instrument isolation, and a single drain/vent valve allows for controlled venting, 100% capture of vented or drained process, and simplified in-process calibration capability. In addition, two equalize valves provide extra protection from leaking to ensure DP signal integrity.

304 (Traditional) & 305 Manifolds



NOTE
Test/Vents receive plastic caps to protect threaded connections unless otherwise noted.

NOTE
Test (Plugged) connections receive ¼-in. NPT plugs unless otherwise noted.

Specifications

Pressure and Temperature Ratings

FIGURE 1. 304 Conventional Manifolds - Pressure vs. Temperature

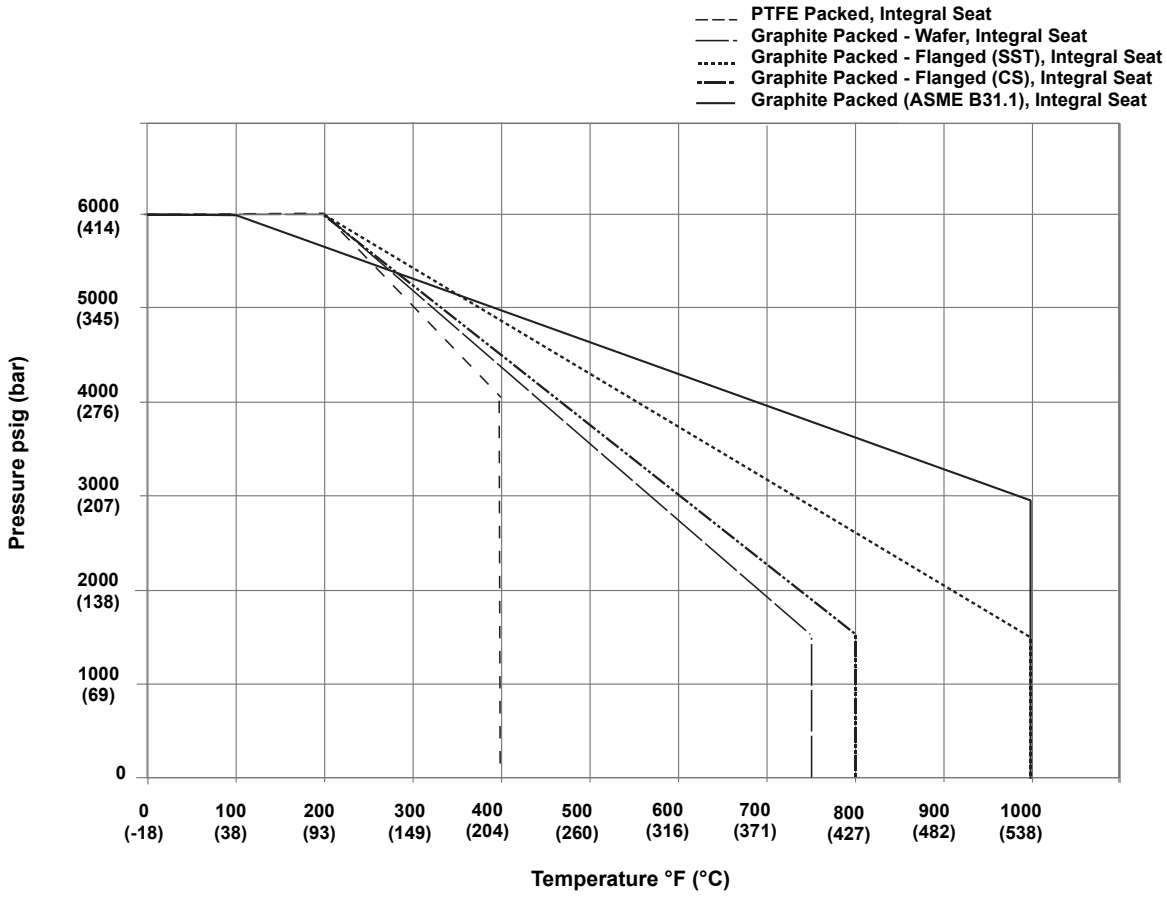


TABLE 1. 304 Conventional Manifolds - Pressure and Temperature Ratings

Packing	Seat	Pressure and Temperature Ratings
PTFE	Integral	6000 psi @ 200°F (414 bar @ 93°C) 4000 psi @ 400°F (276 bar @ 204°C)
Graphite - Wafer	Integral	6000 psi @ 200°F (414 bar @ 93°C) 1500 psi @ 750°F (103 bar @ 399°C)
Graphite - Flanged (SST)	Integral	6000 psi @ 200°F (414 bar @ 93°C) 1500 psi @ 1000°F (103 bar @ 538°C)
Graphite - Flanged (CS)	Integral	6000 psi @ 200°F (414 bar @ 93°C) 1500 psi @ 800°F (103 bar @ 427°C)
Graphite (ASME B31.1)	Integral	6000 psi @ 100°F (414 bar @ 38°C) 2915 psi @ 1000°F (201 bar @ 538°C)

FIGURE 2. 305 Integral Manifolds - Pressure vs. Temperature

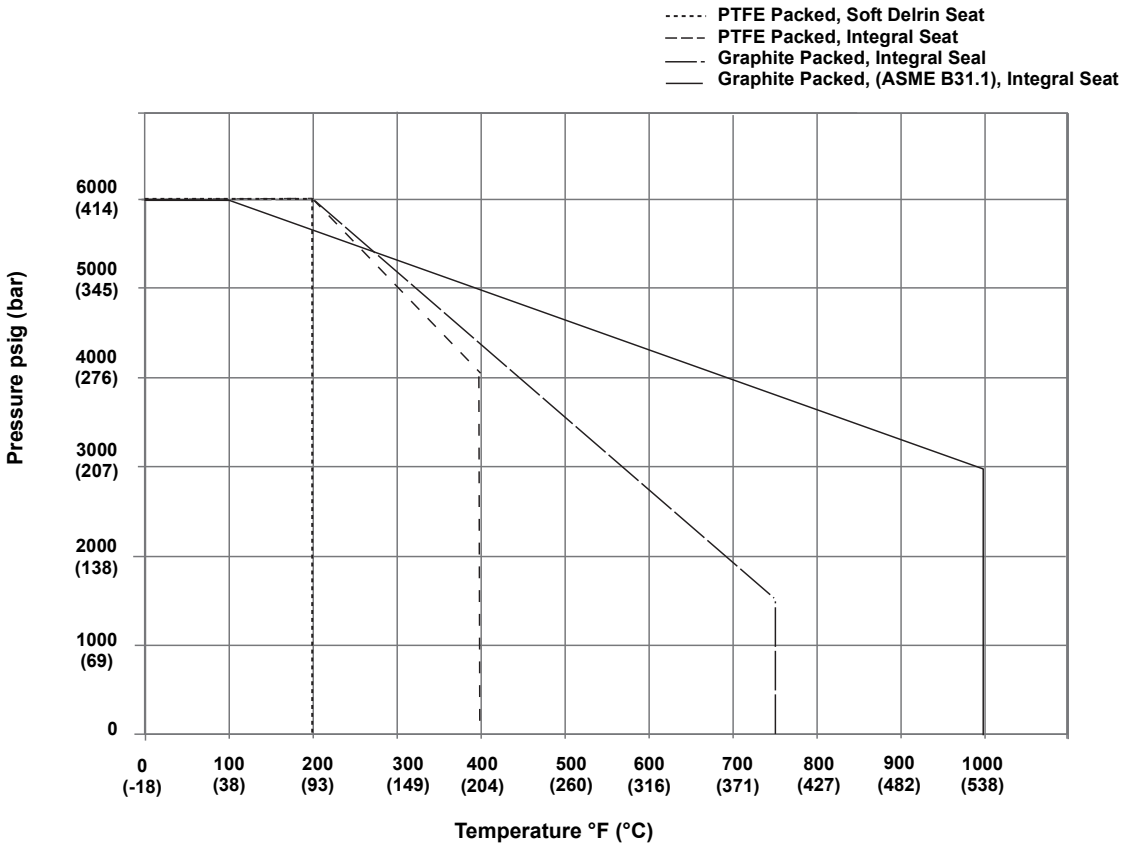


TABLE 2. 305 Integral Manifolds - Pressure and Temperature Ratings[(1)]

Packing[(1)]	Seat	Pressure and Temperature Ratings
PTFE	Integral	6092 psi @ 200°F (420 bar @ 93°C) 4000 psi @ 400°F (276 bar @ 204°C)
PTFE	Soft Delrin	6092 psi @ 200°F (420 bar @ 38°C)
Graphite	Integral	6092 psi @ 200°F (420 bar @ 93°C) 1500 psi @ 750°F (103 bar @ 399°C)
Graphite (ASME B31.1)	Integral	6092 psi @ 100°F (420 bar @ 38°C) 2915 psi @ 1000°F (201 bar @ 538°C)

(1) Except option HK:
PTFE, Integral seat: 2324 psi @ 200 °F (160 bar @ 93 °C), 1680 psi @ 400 °F (116 bar @ 204 °C)
Graphite, Integral seat: 2324 psi @ 200 °F (160 bar @ 93 °C), 1125 psi @ 750 °F (78 bar @ 399 °C)

FIGURE 3. 306 integral Manifolds - Pressure vs. Temperature

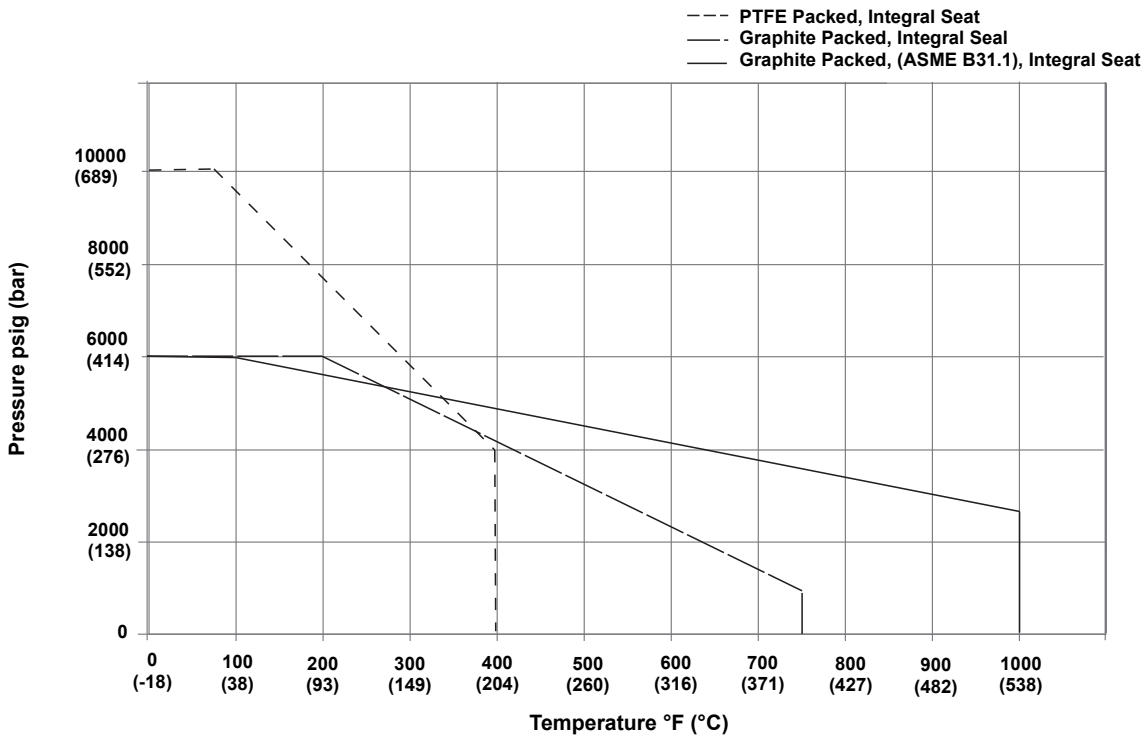


TABLE 3. 306 Integral manifolds - Pressure and Temperature Ratings

Packing	Seat	Pressure and Temperature Ratings
PTFE	Integral	10000 psi @ 85°F (689 bar @ 29°C) 4000 psi @ 400°F (276 bar @ 204°C)
Graphite	Integral	6000 psi @ 200°F (414 bar @ 93°C) 1500 psi @ 750°F (103 bar @ 399°C)
Graphite (ASME B31.1)	Integral	6000 psi @ 100°F (414 bar @ 38°C) 2915 psi @ 1000°F (201 bar @ 538°C)

Process Connections

TABLE 4. Process Connections

Model and Style	Connection
304 Flange by Pipe Flange by Flange Wafer	 1/2 - 14 Female NPT 2 1/8-in. (54 mm) center-to-center connection (Process Adapters required) 1/2 - 14 Female NPT Process Adapters 1/2 - 14 Female NPT Flange Adapter 1/2-in. Ferrule Flange Adapter 12-mm Ferrule Flange Adapter
305 Coplanar Traditional	 1/2 - 14 Female NPT 1/4 - 18 Female NPT (Process Adapters optional) Optional Process Adapters 1/2 - 14 Female NPT Flange Adapter 12 mm Ferrule Flange Adapter
306 Block-and-Bleed 2-Valve	 1/2 - 14 Male NPT 1/2 - 14 NPT (Male or Female)

Instrument Connections

TABLE 5. Manifold - Transmitter Interface

Model	Connection
304	Mounted to traditional transmitter flange, 2 1/8-in. (54 mm) center-to-center connection per IEC 61518, Type B shut-off device (without SPIGOT)
305	Mounted directly to Coplanar sensor module of transmitter, 1.3-in. (287 mm) center-to-center process isolators
306	1/2 - 14 Male NPT

Test / Vent Connections

1/4-18 Female NPT

Manifold Bolts

Standard material is plated carbon steel per ASTM A449, Type 1

Alternative bolt materials offered through Option Codes

- L4 Austenitic 316 Stainless Steel Bolts
- L5 ASTM-A-193, Grade B7M Bolts
- L8 ASTM-A-193, Class 2, Grade B8M Bolts

O-Rings

FIGURE 4. 304 Manifold O-Rings

Manifold-to-Flange O-Rings
Same material as specified by manifold "Packing Material" selection:

- **"1" = PTFE**
- **"2" = Graphite**

Flange Adapter O-Rings
Glass-filled PTFE

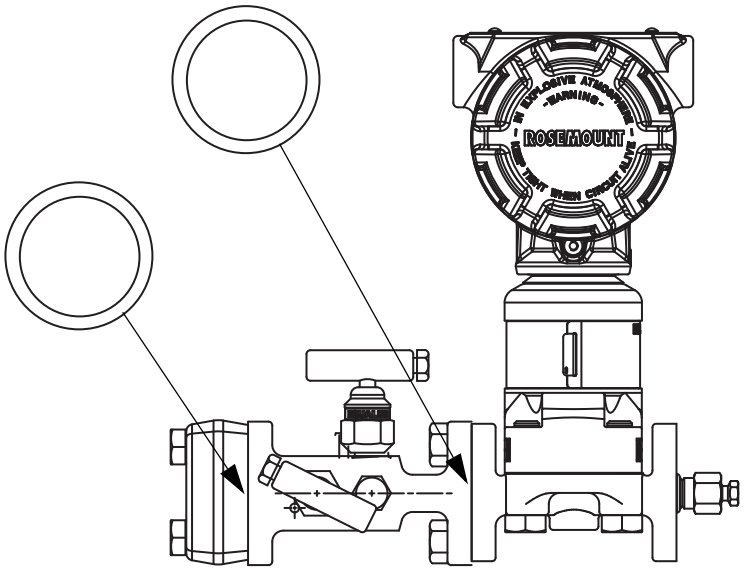


FIGURE 5. 305 Manifold O-Rings

Sensor Module-to-Manifold O-Rings
Specified in the transmitter model number

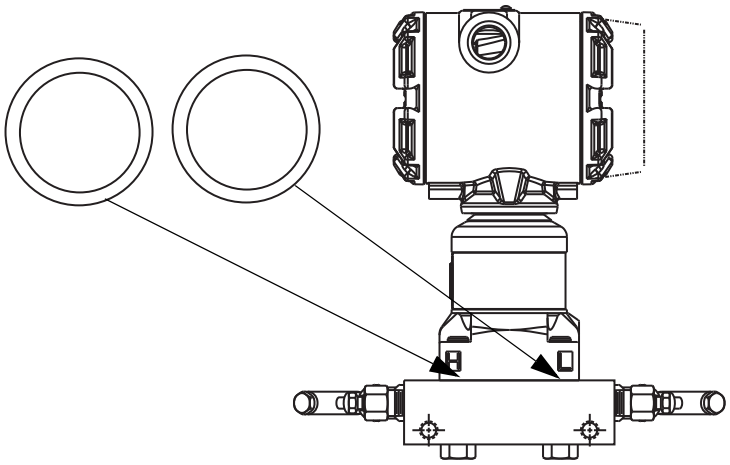


TABLE 6. 304 Conventional Manifolds - Process Wetted Materials of Construction

Component	SST	CS	SST with SG Option	
Body	316 SST	CS	316 SST	
Ball / Tip	316 SST /316Ti SST	316 SST	Alloy C-276	
Stem	316 SST	316 SST	Alloy C-276	
Packing	PTFE / Graphite	PTFE	PTFE / Graphite	
Bonnet	316 SST	316 SST	316 SST	
Pipe Plug	316 SST	CS	316 SST	

TABLE 7. 305 Integral Manifolds - Process Wetted Materials of Construction

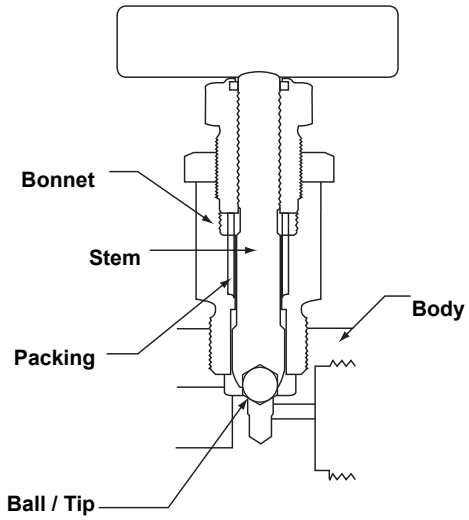
Component	SST	Alloy C-276	316 SST with SG option	
Body	316 SST	Alloy C-276	316 SST	
Ball / Tip	316 SST /316Ti SST	Alloy C-276	Alloy C-276	
Stem	316 SST	Alloy C-276	Alloy C-276	
Packing	PTFE / Graphite	PTFE / Graphite	PTFE / Graphite	
Bonnet	316 SST	Alloy C-276	316 SST	
Pipe Plug	316 SST	Alloy C-276	316 SST	
Drain / Vent Valve	316 SST	Alloy C-276	Alloy C-276	

TABLE 8. 306 Inline Manifolds - Process Wetted Materials of Construction

Component	SST	Alloy C-276	316 SST with SG option	
Body	316 SST	Alloy C-276	316 SST	
Ball / Tip	316 SST /316Ti SST	Alloy C-276	Alloy C-276	
Stem	316 SST	Alloy C-276	Alloy C-276	
Packing	PTFE / Graphite	PTFE / Graphite	PTFE / Graphite	
Bonnet	316 SST	Alloy C-276	316 SST	
Pipe Plug	316 SST	Alloy C-276	316 SST	
Bleed Screw	316 SST / 316Ti SST	Alloy C-276	Alloy C-276	

Materials of Contruction - Typical

FIGURE 6. Typical Rosemount Manifold Valve

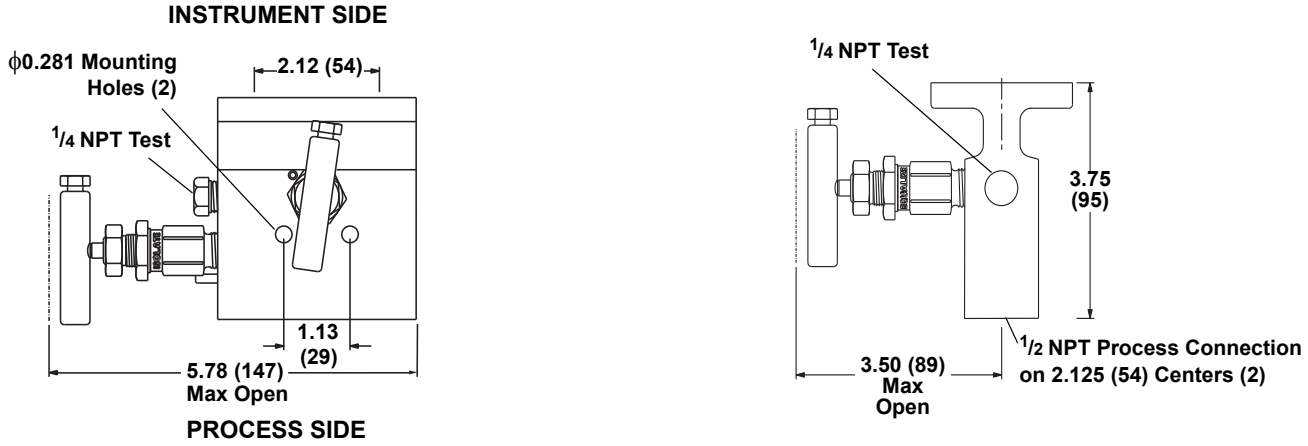


Estimated Weight

Model and Description	Weight
304	
2-valve traditional flange x NPT	5.0 lbs (2.3 kg)
2-valve traditional flange-x flange	5.5 lbs (2.5 kg)
3-valve traditional flange x NPT	5.2 lbs (2.4 kg)
3-valve traditional flange x flange	5.7 lbs (2.6 kg)
3-valve wafer flange x NPT	4.0 lbs (1.8 kg)
5-valve wafer flange x NPT	5.7 lbs (2.6 kg)
5-valve traditional flange x NPT	5.7 lbs (2.6 kg)
5-valve traditional flange x flange	5.7 lbs (2.6 kg)
305	
2-valve Coplanar	4.5 lbs (2.0 kg)
2-valve traditional	6.0 lbs (2.7 kg)
3-valve Coplanar	4.7 lbs (2.1 kg)
3-valve traditional	6.0 lbs (2.7 kg)
5-valve Coplanar	6.5 lbs (3.0 kg)
306	
Block-and-Bleed	1.1 lbs (0.5 kg)
2-valve	2.5 lbs (1.1 kg)

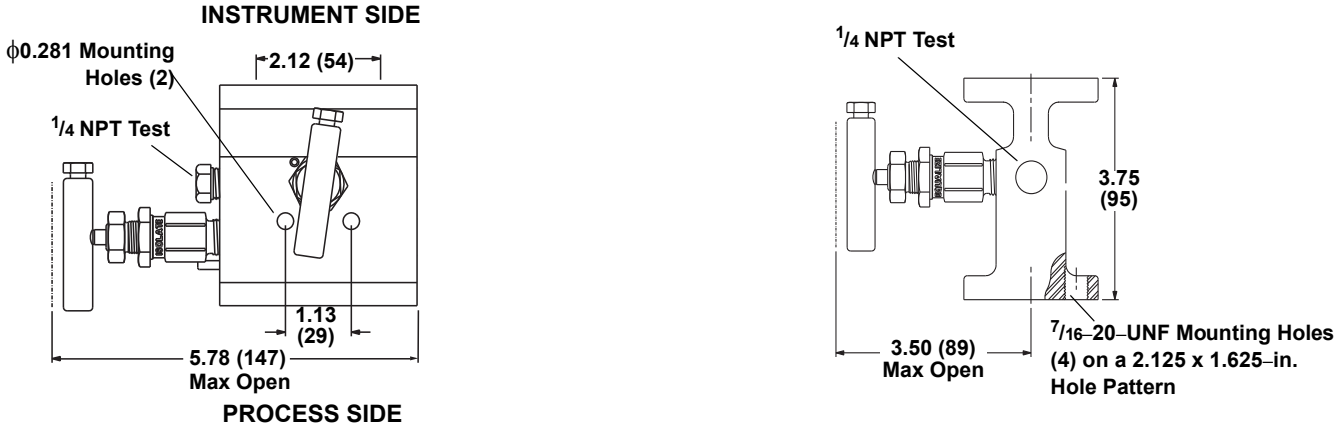
Dimensional Drawings

Rosemount 304 Two-Valve Flange X NPT Conventional Manifold



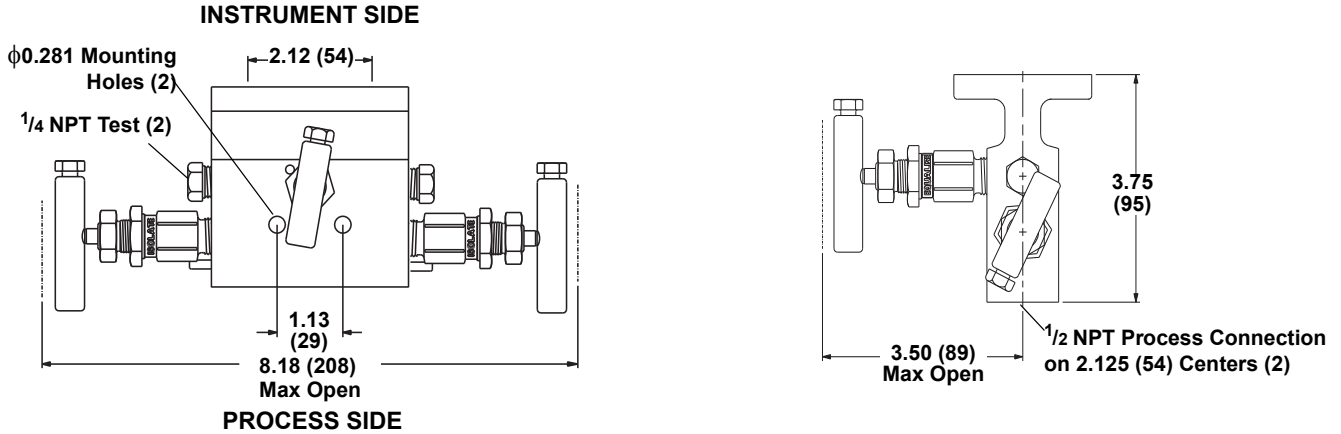
Dimensions are in inches (millimeters)

Rosemount 304 Two-Valve Flange X Flange Conventional Manifold



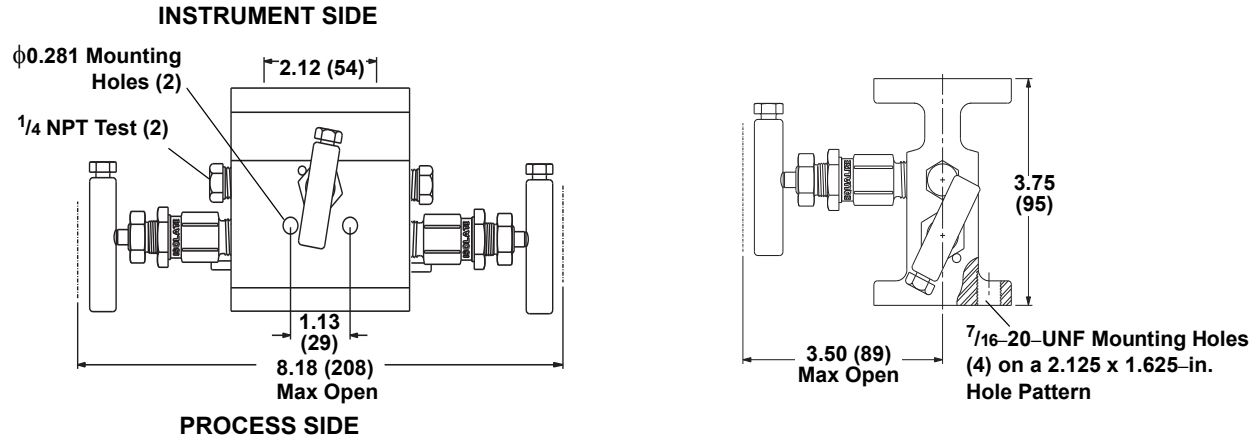
Dimensions are in inches (millimeters)

Rosemount 304 Three-Valve Flange X NPT Conventional Manifold



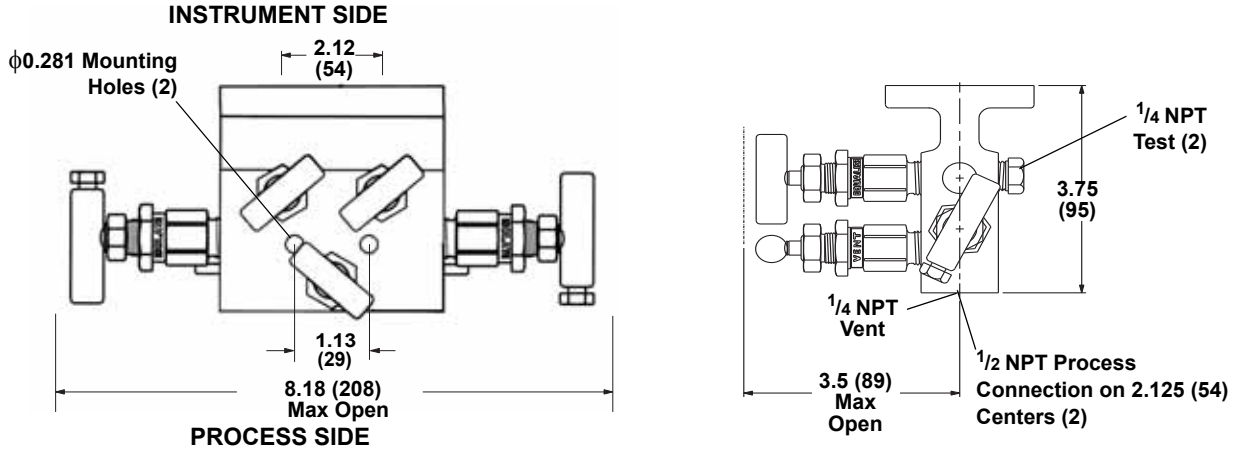
Dimensions are in inches (millimeters)

Rosemount 304 Three-Valve Flange X Flange Conventional Manifold



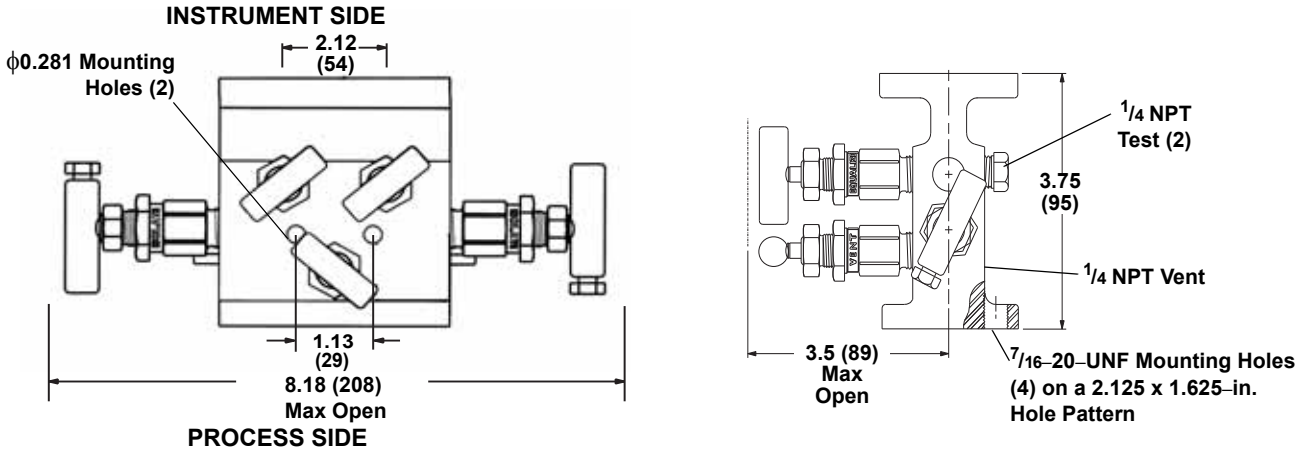
Dimensions are in inches (millimeters)

Rosemount 304 Natural Gas Five-Valve Flange X NPT Conventional Manifold



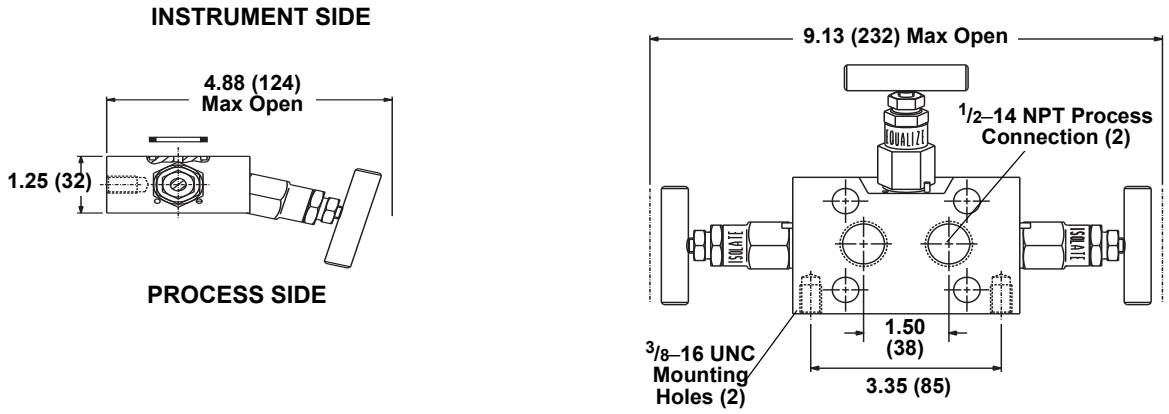
Dimensions are in inches (millimeters)

Rosemount 304 Natural Gas Five-Valve Flange X Flange Conventional Manifold



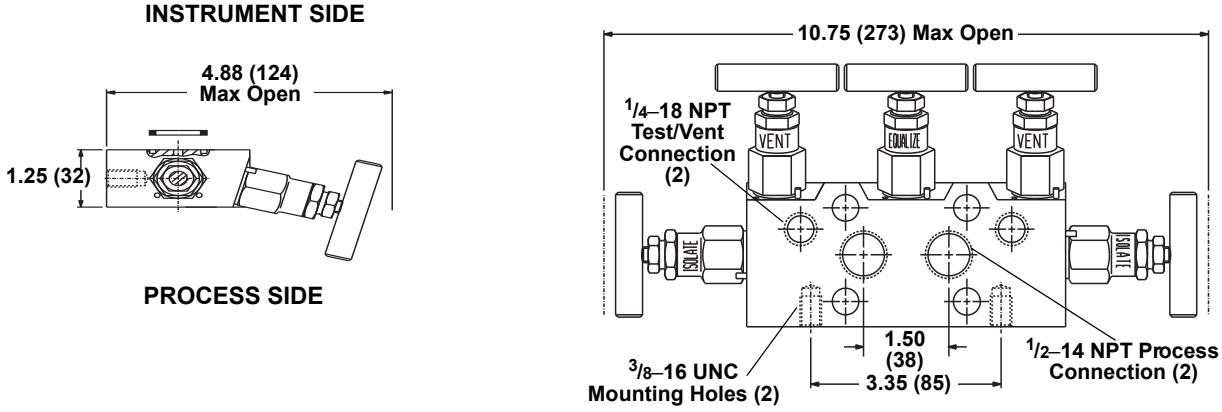
Dimensions are in inches (millimeters)

Rosemount 304 Three-Valve Wafer Manifold



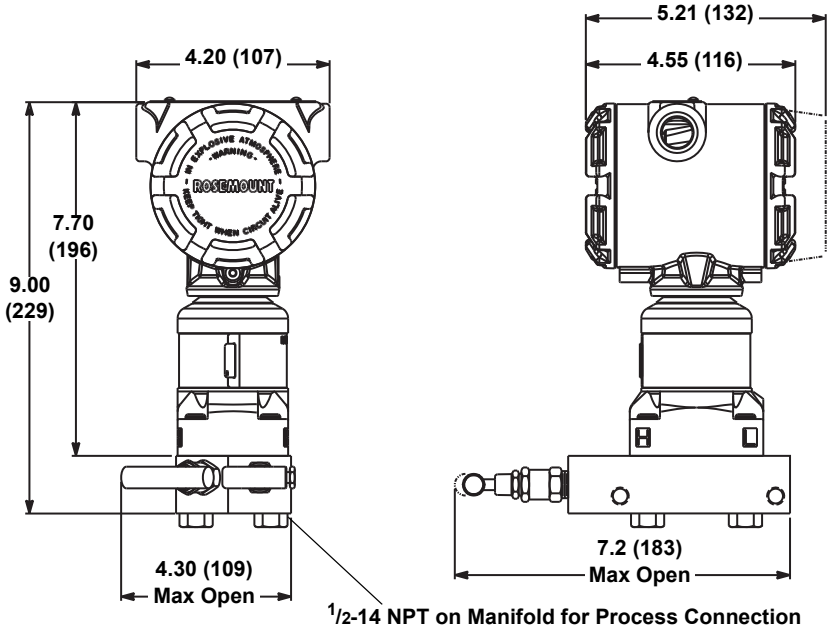
Dimensions are in inches (millimeters)

Rosemount 304 Five-Valve Wafer Manifold



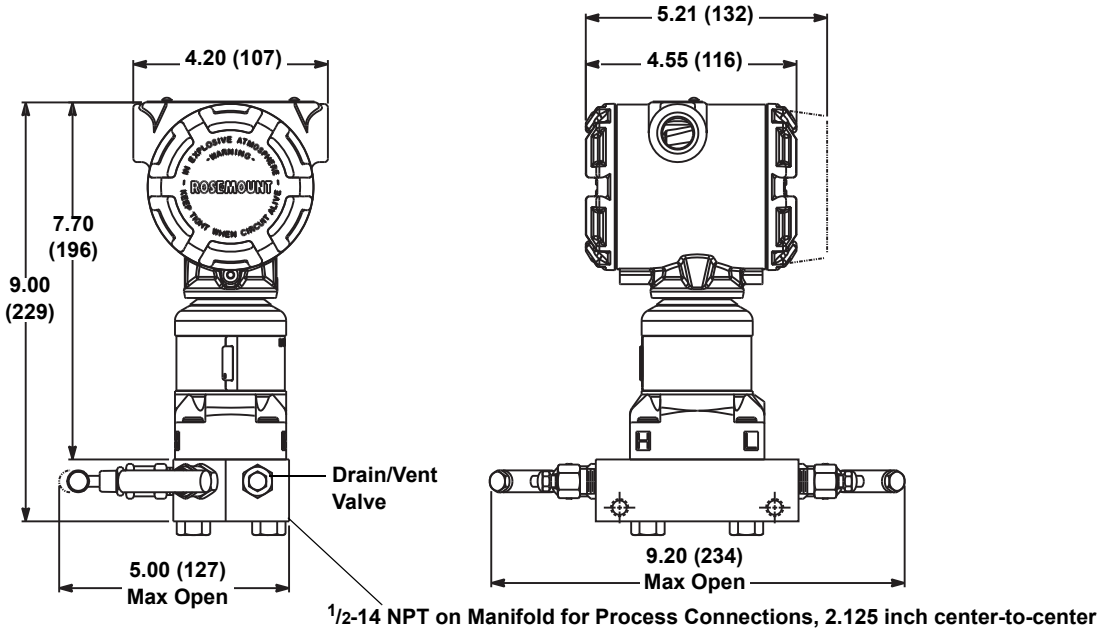
Dimensions are in inches (millimeters)

Rosemount 305R Two-Valve Coplanar Style Manifold



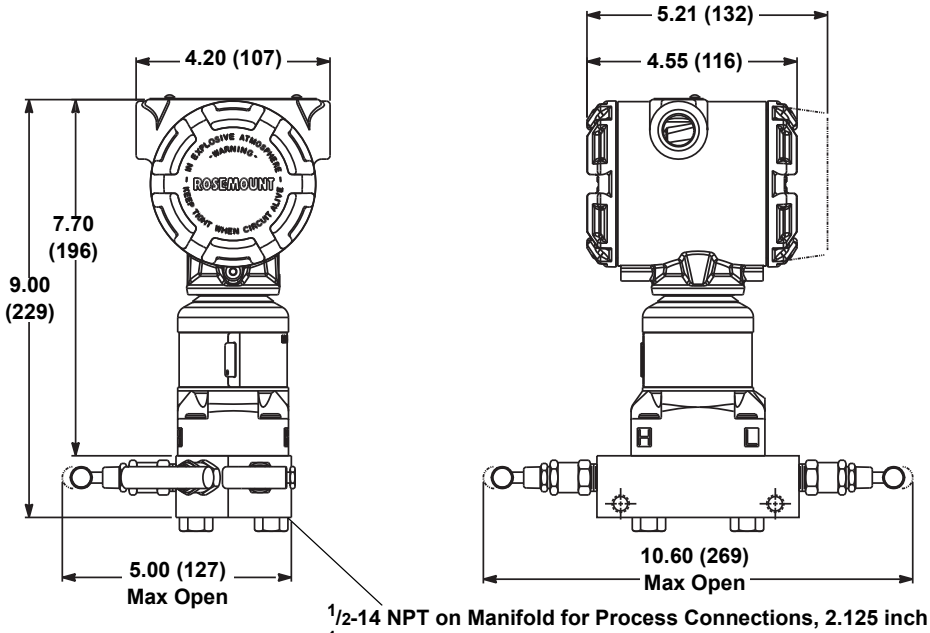
Dimensions are in inches (millimeters)

Rosemount 305R Three-Valve Coplanar Style Manifolds



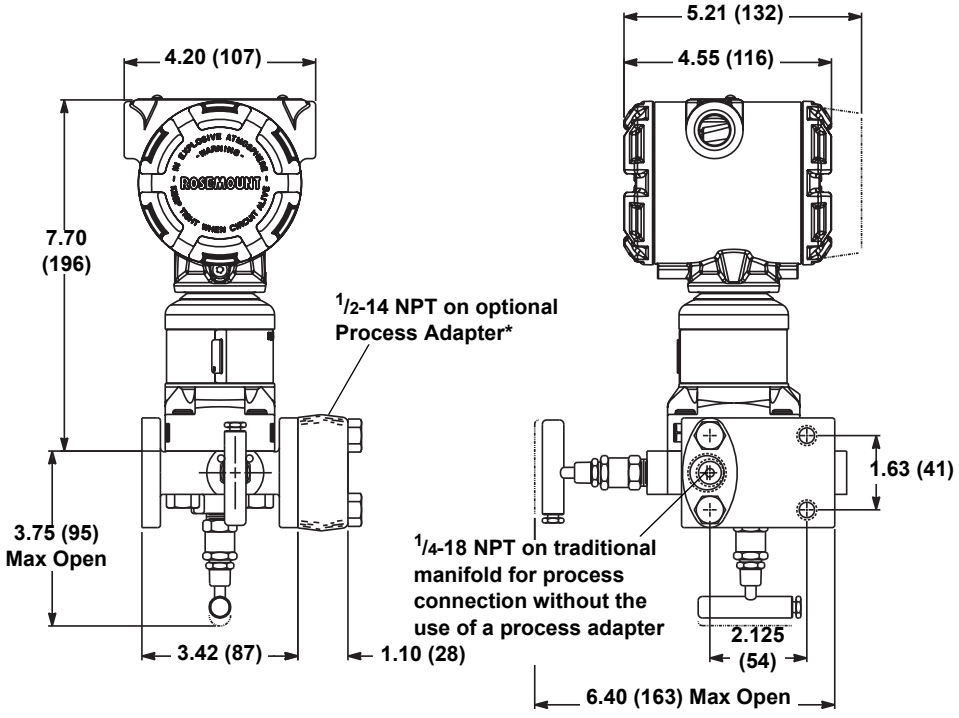
Dimensions are in inches (millimeters)

Rosemount 305R Five-Valve Coplanar Style Manifold



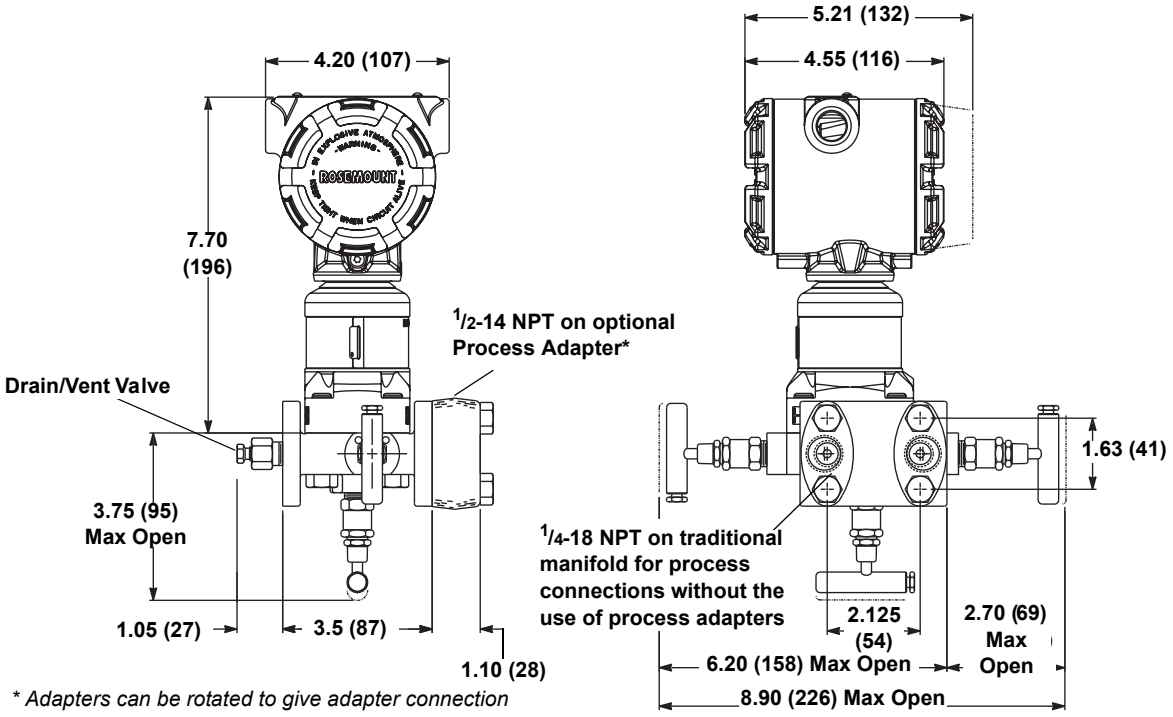
Dimensions are in inches (millimeters)

Rosemount 305RT Two-Valve Traditional Style Manifold



Dimensions are in inches (millimeters)

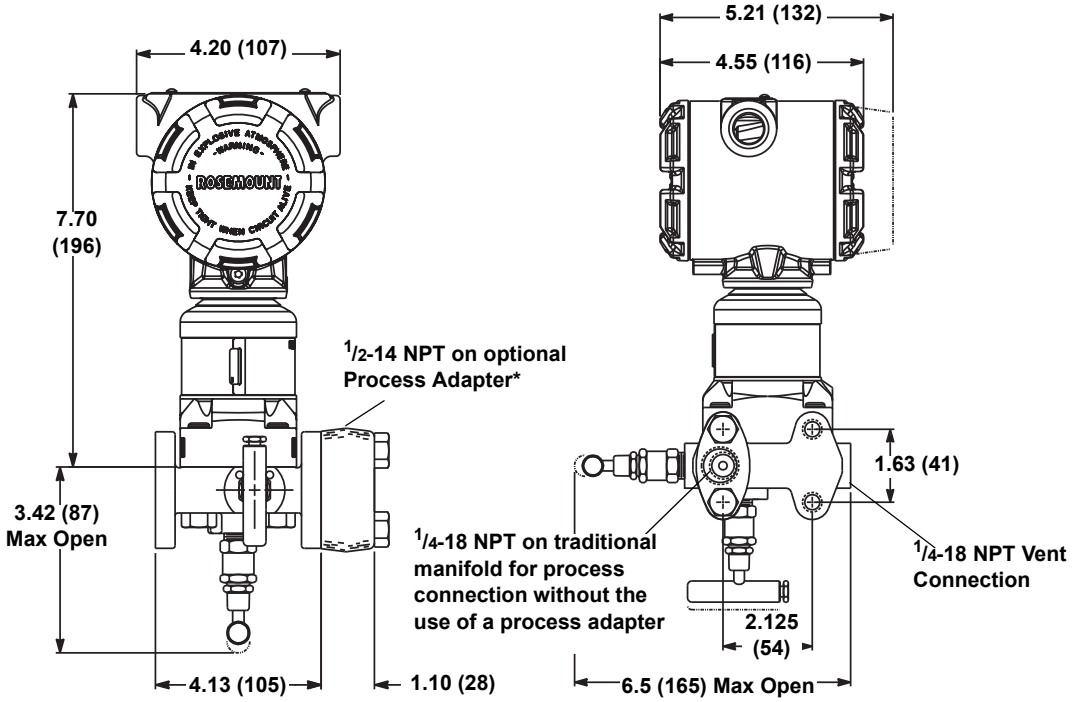
Rosemount 305RT Three-Valve Traditional Style Manifold



** Adapters can be rotated to give adapter connection centers of 2.0 (51), 2.125 (54), or 2.25 (57).*

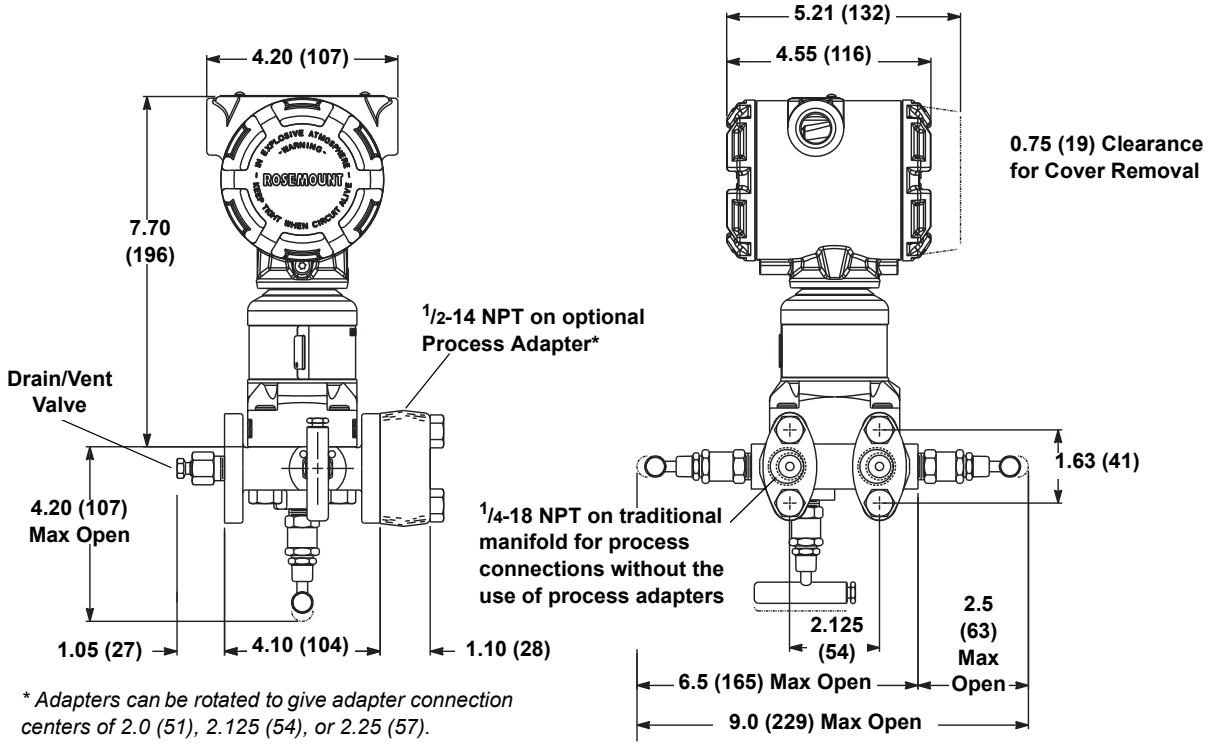
Dimensions are in inches (millimeters)

Rosemount 305RM Two-Valve Traditional Style Manifold



Dimensions are in inches (millimeters)

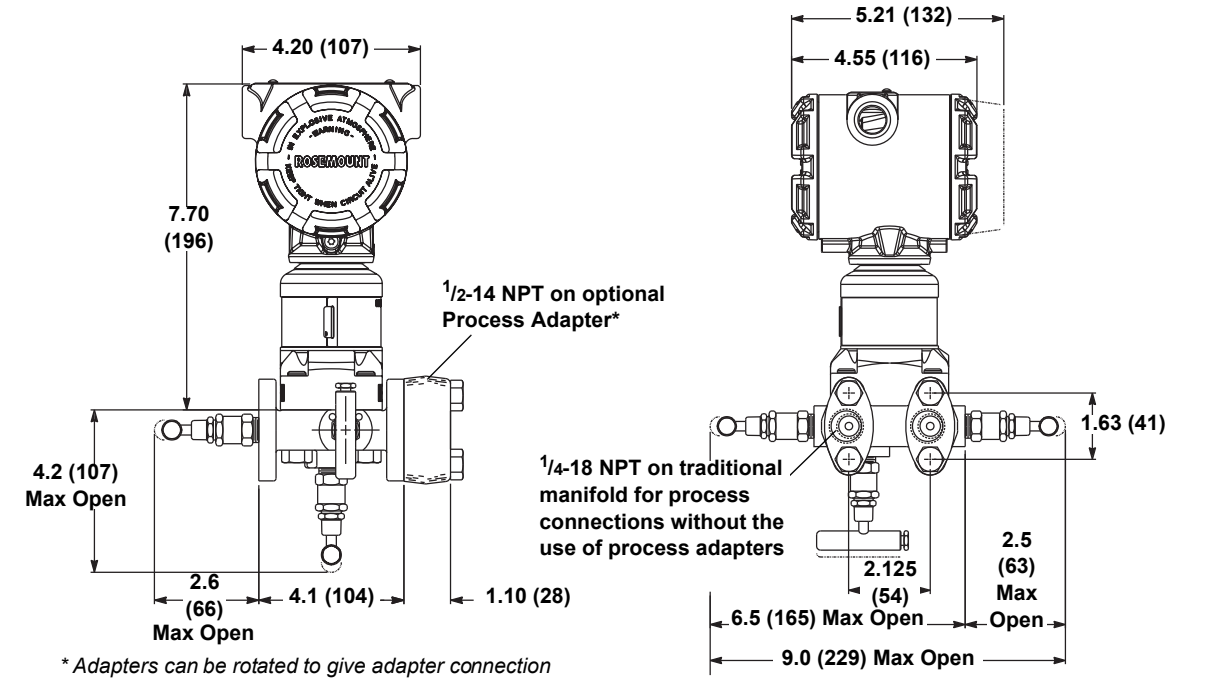
Rosemount 305RM Three-Valve Traditional Style Manifold



** Adapters can be rotated to give adapter connection centers of 2.0 (51), 2.125 (54), or 2.25 (57).*

Dimensions are in inches (millimeters)

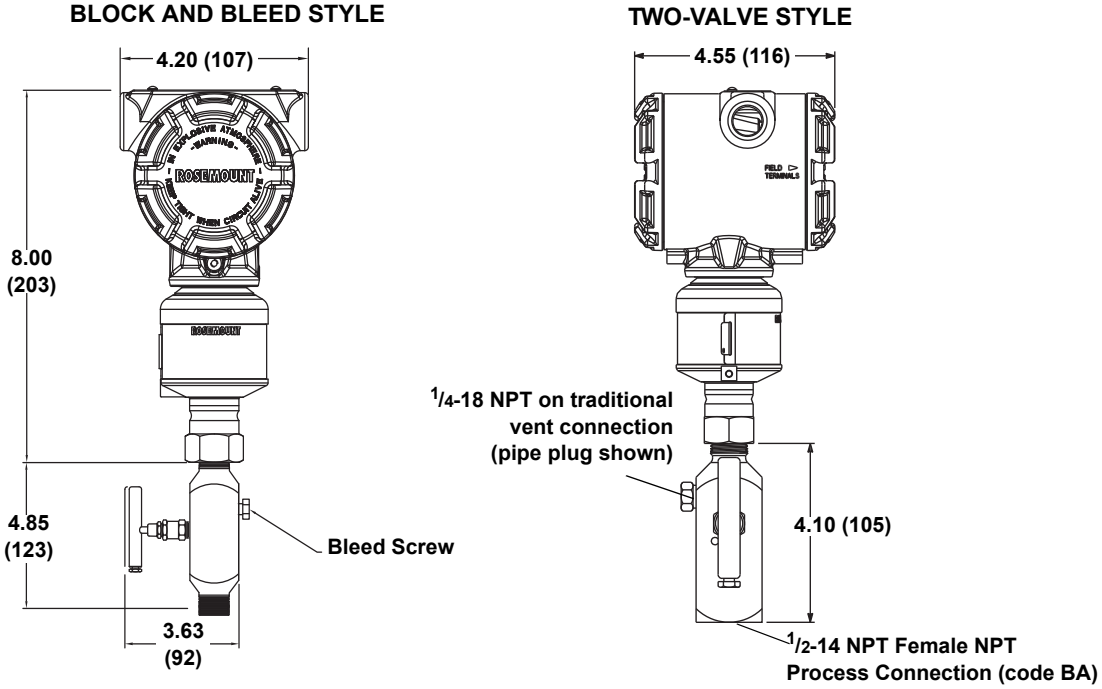
Rosemount 305RM Five-Valve Traditional Style Manifold



** Adapters can be rotated to give adapter connection centers of 2.0 (51), 2.125 (54), or 2.25 (57).*

Dimensions are in inches (millimeters)

Rosemount 306R Pressure Style Manifold (3051S_T Shown)

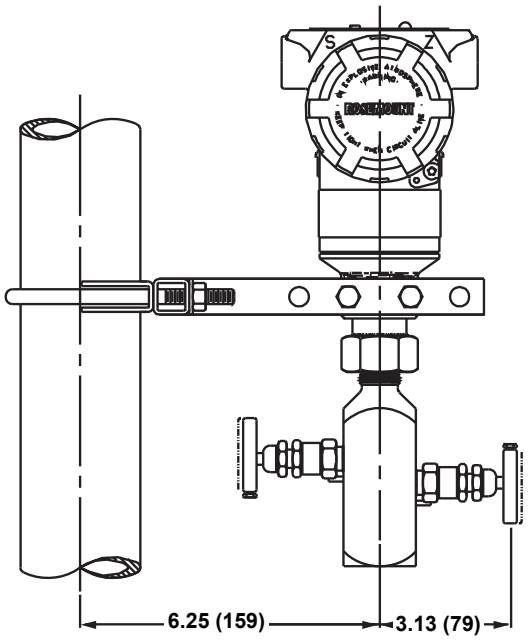


Manifold valve orientation may vary with respect to transmitter mounting holes.

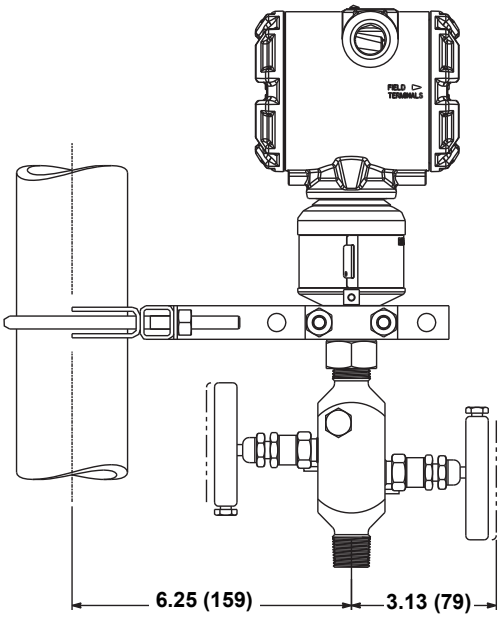
Dimensions are in inches (millimeters)

Installations for Rosemount 3051T and 3051S_T Transmitters for 2-in. Pipe Mounting

ROSEMOUNT 3051T



ROSEMOUNT 3051S_T

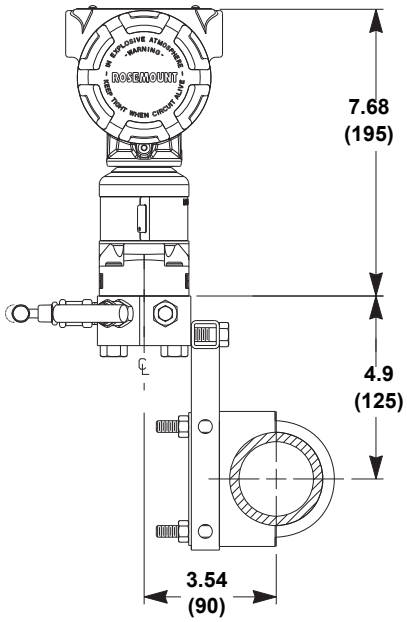


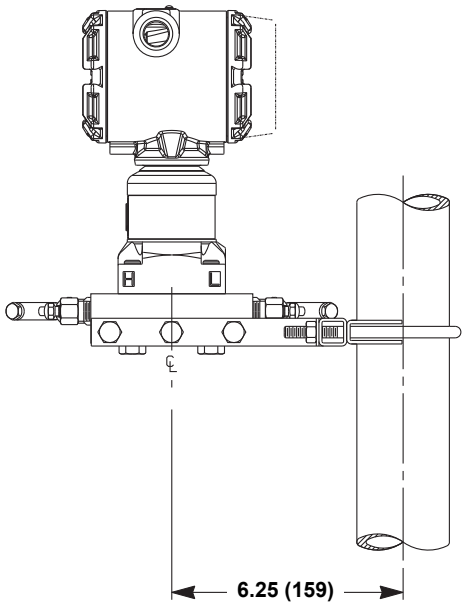
NOTE: Dimensions are in inches (millimeters).

Manifold valve orientation may vary with respect to transmitter mounting holes.

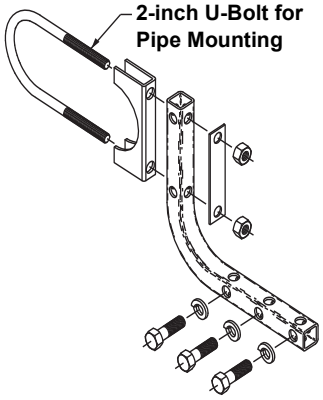
Dimensions are in inches (millimeters)

Coplanar Manifold with Optional Bracket for 2-in. Pipe Mounting



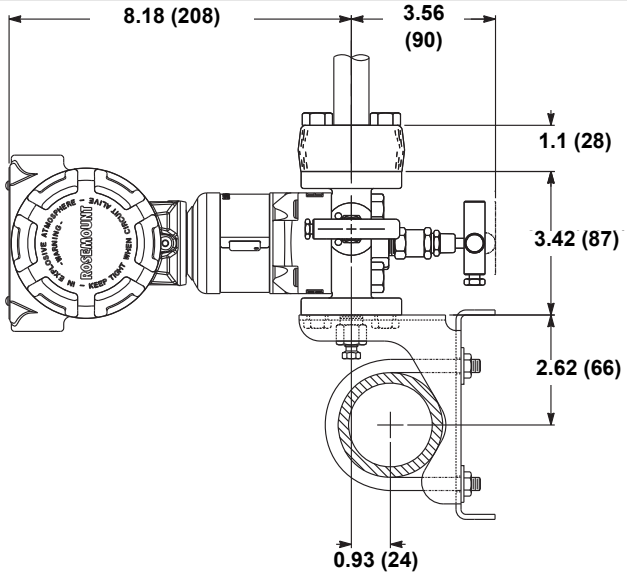


OPTION CODE B4

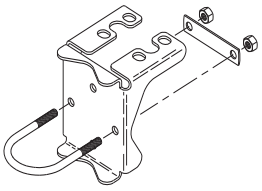


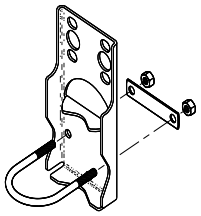
Dimensions are in inches (millimeters)

Traditional Manifold with Optional Brackets for 2-in. Pipe Mounting

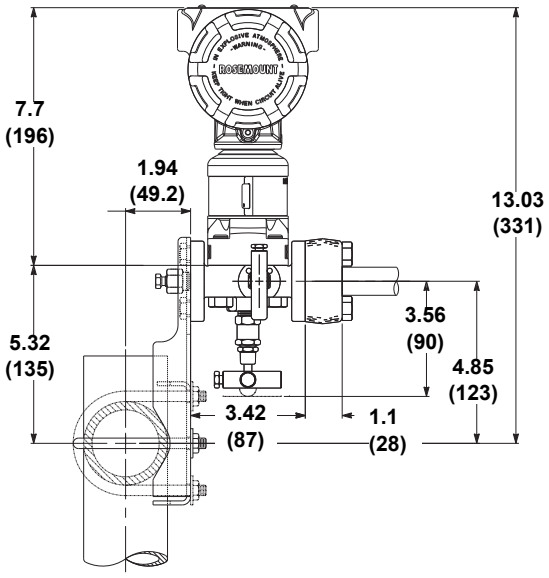


B1/B7/BA MOUNTING BRACKET





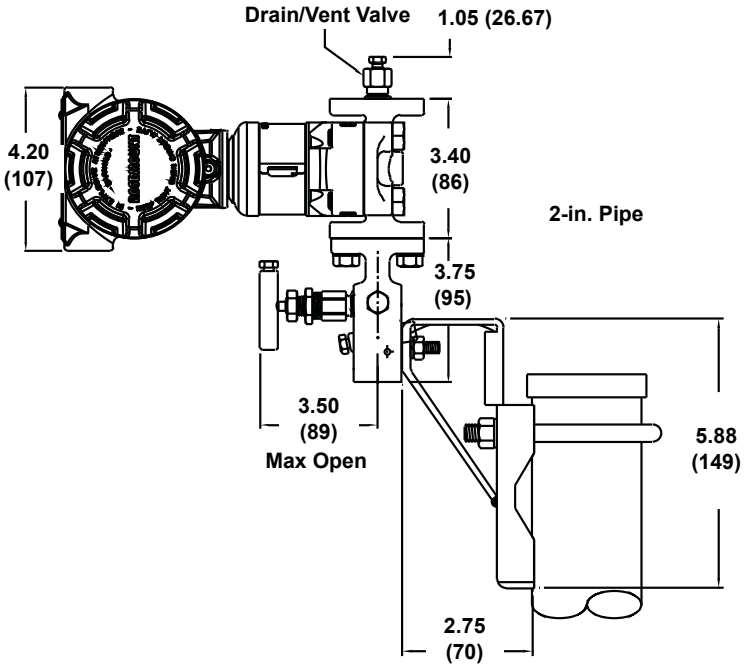
B3/B9/BC MOUNTING BRACKET



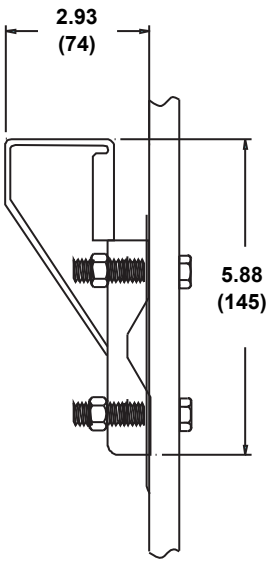
Dimensions are in inches (millimeters)

VS/VC Heavy Duty Manifold Mounting Bracket

2-IN. PIPE MOUNT



PANEL MOUNT



Dimensions are in inches (millimeters)

Ordering Information

Rosemount Manifolds can be ordered as a stand-alone product or as an integrated assembly that is attached to a transmitter.

Stand-Alone Manifold:

1. Reference the “Rosemount Manifolds Selection Guide” (see page 3) for assistance on choosing the type of manifold needed.
2. Specify a completed model number by referencing the applicable ordering table for the selected manifold type:

   a. Rosemount 304 Conventional Manifold, see page 23.

   b. Rosemount 305 Integral Manifold, see page 25.

   c. Rosemount 306 Inline Manifold, see page 27.

Transmitter / Manifold Assembly:

1. Specify a completed Rosemount transmitter model number by referencing the applicable product data sheet.
2. Specify a completed manifold model number by referencing the applicable ordering table for the selected manifold type:

   a. Rosemount 304 Conventional Manifold, see page 23.

   b. Rosemount 305 Integral Manifold, see page 25.

   c. Rosemount 306 Inline Manifold, see page 27.
3. Verify the transmitter model number contains the correct “Process Connection” code or “Manifold Option” code for the desired transmitter manifold assembly (see Table 9).

TABLE 9. Ordering Codes for a Transmitter / Manifold Assembly

Transmitter	Manifold	Process Connection Code	“Manifold” Option Code
3051S	304	A12	–
	305	A11	–
	306	A11	–
3051/2051/3095	304	–	S6
	305	–	S5
	306	–	S5
1151	304	S6	–
	305	–	–
	306	–	–
2088	304	–	–
	305	–	–
	306	–	S5

Rosemount 304 Conventional Manifolds

TABLE 10. Rosemount 304 Conventional Manifold 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				
0304	Conventional Manifold				
Manufacturer					
Standard					**Standard**
R	Rosemount Inc.				★
Manifold Style					
Standard					**Standard**
T	Traditional (Flange x Flange or Flange x NPT)				★
Expanded					
W(1)	Wafer				
Manifold Type					
Standard					**Standard**
2(2)	2-valve				★
3	3-valve				★
5(3)	5-valve				★
6(2)	5-valve Natural Gas Metering Pattern				★
Expanded					
7(2)(4)	2-valve (per ASME B31.1 [ANSI] Power and Piping Code)				
8(2)(4)	3-valve (per ASME B31.1 [ANSI] Power and Piping Code)				
	Body	**Bonnet**	**Stem**	**Tip**	
Standard					**Standard**
2	316 SST	316 SST	316 SST	316 SST	★
5	CS	316 SST	316 SST	316 SST	★
Process Connection Style					
Standard					**Standard**
B	1/2-14 NPT				★
F(2)	Flanged				★
Packing Material					
Standard					**Standard**
1	PTFE				★
Expanded					
2(1)	Graphite-based				
Transmitter Type					
Standard					**Standard**
1	For assembly to 2051/3051 Traditional Flange				★
2	For assembly to 2051/3051/3095 DIN Compliant Traditional Flange				★
3	For assembly to 2051/3051/3095 Coplanar Flange				★
OPTIONS					
Mounting Brackets					
Standard					**Standard**
VC(2)	Manifold Heavy Duty Mounting Bracket, CS for Traditional Style				★
VS(2)	Manifold Heavy Duty Mounting Bracket, SST for Traditional Style				★
B4	Manifold SST Mounting Bracket for 2-in. pipe mount with series 300 SST bolts for wafer style				★
Adapters					
Standard					**Standard**
DF(5)	1/2-14 NPT Female Flange Adapter				★
DT(5)	1/2-in. ferrule flange adapter				★
DQ(5)	12 mm ferrule flange adapter				★

TABLE 10. Rosemount 304 Conventional Manifold 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.

Bolts		
Standard		**Standard**
L4[6]	Austenitic 316 SST Bolts	★
L5	ASTM A 193, Grade B7M Bolts	★
L8	ASTM A 193, Class 2, Grade B8M Bolts	★
Material Recommendations for NACE		
Standard		**Standard**
SG[1][7]	Sour Gas (Meets NACE MR 0175 / ISO 15156, MR 0103)	★
Cleanings		
Expanded		
P2[8]	Cleaning for special service	
Heater Block Kits		
Standard		**Standard**
SB	Steam block kit, ¼-in. NPT connection	★
Typical Model Number:_ 0304_R_T_3_2_B_1_1_VS		

(1) Only allowed with Material of Construction code 2.

(2) Not available with Wafer Manifold Style code W.

(3) Not available with Traditional Manifold Style code T.

(4) Only available with 316 SST materials of construction code 2 and graphite based packing code 2.

(5) Only allowed with both Manifold Style code T and Process Connection code F. Not allowed with Graphite-based Packing Code 2.

(6) Not available with Manifold Type codes 7, 8.

(7) Materials of construction comply with recommendations per NACE MR 0175 / ISO 1516 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.

(8) Not available with Graphite-Based Packing Material code 2.

Rosemount 305 Integral Manifolds

TABLE 11. Rosemount 305 Integral Manifold 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			
0305	Integral Manifold			
Manufacturer				
Standard				**Standard**
R	Rosemount			★
Manifold Style				
Standard				**Standard**
C	Coplanar			★
T	Traditional			★
M	Traditional (Rosemount 3095-compatible; DIN-compliant flange)			★
Manifold Type				
Standard				**Standard**
2	2-valve			★
3	3-valve			★
5(1)	5-valve			★
6(2)	5-valve Natural Gas Metering Pattern			★
Expanded				
7(2)(3)	2-valve (per ASME B31.1 [ANSI] Power and Piping Code)			
8(2)(3)	3-valve (per ASME B31.1 [ANSI] Power and Piping Code)			
9(2)(3)	5-valve (per ASME B31.1 [ANSI] Power and Piping Code)			
	Body	**Bonnet**	**Stem and Tip / Ball**	
Standard				**Standard**
2	316 SST	316 SST	316 SST	★
Expanded				
3(4)(5)	Alloy C-276	Alloy C-276	Alloy C-276	
4	Alloy 400	Alloy 400	Alloy 400 / K-500	
Process Connection Style				
Standard				**Standard**
A	1/4–18 NPT female			★
B	1/2–14 NPT female			★
Packing Material				
Standard				**Standard**
1	PTFE			★
Expanded				
2(6)	Graphite-based			
Valve Seat				
Standard				**Standard**
1	Integral			★
5	Soft delrin (only available with natural gas metering pattern)			★
OPTIONS				
Mounting Brackets				
Standard				**Standard**
B1	Bracket for 2-in. pipe mounting, CS bolts			★
B3(7)	Flat bracket for 2-in. pipe mounting, CS bolts			★
B4	SST Mounting Bracket for 2-in. pipe mounting, CS bolts			★
B7	B1 bracket with series 300 SST bolts			★
B9(7)	B3 bracket with series 300 SST bolts			★
BA	SST B1 bracket with series 300 SST bolts			★
BC(7)	SST B3 bracket with series 300 SST bolts			★

TABLE 11. Rosemount 305 Integral Manifold 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.

Bolts		
Standard		**Standard**
L4[8]	Austenitic 316 SST bolts	★
L5	ASTM-A-193-B7M bolts	★
L8	ASTM-A-193, Class 2, Grade B8M bolts	★
Cleanings		
Standard		**Standard**
P2[9]	Cleaning for special services	★
Material Recommendations for NACE		
Standard		**Standard**
SG[5][10]	Sour Gas (Meets NACE MR 0175 / ISO 15156, MR 0103)	★
Adapters		
Standard		**Standard**
DF[11]	1/2-14 NPT female flange adapter	★
Expanded		
DQ[11]	12 mm ferrule flange adapter	
Process Flange Bolting Connection		
Standard		**Standard**
HK[12]	10mm (M10) process flange bolting connection	★
HL[12]	12mm (M12) process flange bolting connection	★
Typical Coplanar Integral Manifold Model Number: 305RC32B11B4		
Typical Transmitter Model Number: 3051CD2A02A1AS5		

(1) Not available with traditional manifold style T.

(2) Only available with Coplanar manifold style code C.

(3) Only available with 316 SST materials of construction code 2 and graphite based backing code 2.

(4) Not available with traditional manifold Style code M.

(5) Materials of Construction comply with recommendations per 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 MR0103 for sour refining environments.

(6) Includes graphite tape on drain/vent valves and plugs.

(7) Not compatible with the Rosemount 3095 transmitter.

(8) Not available with ASME B31.1 manifold type codes 7, 8, and 9.

(9) Not available with Graphite-Based Packing Material code 2.

(10) Only available with 316 SST Materials of Construction Code 2: 316 SST body and bonnets; Alloy C-276 stems, tip/balls, and drain/vents.

(11) Only allowed with Manifold Style code T. Not allowed with Graphite-Based Packing code 2.

(12) Only available with traditional manifold style code M.

Rosemount 306 Inline Manifolds

TABLE 12. Rosemount 306 Inline Pressure Manifold 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			
0306	Pressure Manifold			
Manufacturer				
Standard				**Standard**
R	Rosemount Inc.			★
Manifold Style				
Standard				**Standard**
T	Threaded			★
Manifold Type				
Standard				**Standard**
1	Block and bleed			★
2	2-valve			★
Expanded				
3(1)	2-valve (per ASME B31.1 Power Piping Code)			
	Body	**Bonnet**	**Stem and Tip / Ball**	
Standard				**Standard**
2	316 SST	316 SST	316 SST	★
Expanded				
3(2)(3)	Alloy C-276	Alloy C-276	Alloy C-276	
Process Connection				
Standard				**Standard**
AA	1/2–14 male NPT			★
BA(2)	1/2–14 female NPT			★
Packing Material				
Standard				**Standard**
1	PTFE			★
Expanded				
2(4)	Graphite-based			
Valve Seat				
Standard				**Standard**
1	Integral			★
OPTIONS				
Cleanings				
Expanded				
P2(5)	Cleaning for special services			
Material Recommendations for NACE				
Standard				**Standard**
SG(3)(6)	Sour Gas (Meets NACE MR 0175 / ISO 15156, MR 0103)			★
Typical Integral Manifold Model Number: 3 0 6 R T 2 2 B A 1 1				
Typical Transmitter Model Number: 3051TG3A2B21AS5B4				

(1) Only available with 316SST materials of construction and graphite-based packing.

(2) Not available with block-and-bleed manifold type

(3) Materials of Construction comply with recommendations per 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.

(4) Includes graphite tape on plugs.

(5) Not available with Graphite-Based Packing Material code 2.

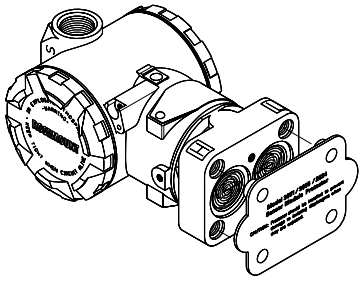
(6) Only available with 316 SST material of construction code 2. Manifolds with SG option are built with 316 SST body and bonnets; Alloy C-276 stems, tips/balls.

OPTIONS

Module Guard

A sensor module guard is available to protect the transmitter process isolating diaphragms. This guard should be used whenever the transmitter is removed from the integral manifold to avoid damage to the isolating diaphragms.

- Part number: 00305-1000-0001 (5/pack)



P2 Cleaning for Special Services

Per ASTM G93-96, this option minimizes process contaminants by cleaning wetted surfaces with a suitable detergent.

SG Sour Gas

Materials of Construction comply with recommendations per 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 MR0103 for sour refining environments.

Heat Block Kits

Rosemount 304 Manifolds are available with steam heat block kits for cold environments and services. The steam block attaches directly to the manifold to prevent the process from freezing.

ASME B31.1 Power Piping Code

Rosemount Manifolds are available in configurations that meet the requirements of the ASME B31.1 Power Piping Code. This code specifies design criteria for most air, gas, steam, water, and oil systems used in electric generating systems, central and district heating systems, industrial power plants and geothermal plants. ASME B31.1 includes requirements for manifolds, valves, and piping. Transmitters and other measuring devices do not fall within the scope of this code.

Marking

Manifolds are tagged with a part number, schematic drawing, temperature and pressure limits.

Other Publications

For additional information, go to www.rosemount.com.

SPARE PARTS LIST

TABLE 13. Rosemount 304 Conventional Manifold

Part Description	Part Number (Traditional Style)	Part Number (Wafer Style)
Mounting Brackets (qty. 1)		
Manifold Heavy Duty Mounting Bracket, CS	01166-8005-0002	NA
Manifold Heavy Duty Mounting Bracket, SST	01166-8005-0001	NA
Manifold SST Mounting Bracket for 2-in. Pipe Mount	NA	00305-0405-0001
O-Rings (set of 12)		
Manifold-to-Flange O-Ring, Glass-filled PTFE	03031-0019-0003	03031-0019-0003
Manifold-to-Flange O-Ring, Graphite-filled PTFE	03031-1302-0002	03031-1302-0002
Manifold-to-Flange Bolt Kits (set of 4)		
Consult factory for part numbers	Consult Factory	Consult Factory
Heater Block Kits (qty. 1)		
Steam Block Kit	00305-0406-0001	NA

TABLE 14. Rosemount 305 Integral Manifold

Part Description	Part Number (Traditional Style)	Part Number (Coplanar Style)
Mounting Brackets (qty. 1)		
Manifold SST Mounting Bracket for 2-in Pipe Mount	NA	00305-0405-0001
Bolt Kits (set of 4)		
CS Bolt Kit	03031-0312-0001	03031-0311-0001
SST Bolt Kit	03031-0312-0002	03031-0311-0002
ANSI/ASTM-A-193-B7M Bolt Kit	03031-0312-0003	03031-0311-0003
Drain/Vents (qty. 1)		
316 SST Drain/Vent for use with 3-valve 305 Manifold	01151-0028-0012	01151-0028-0012
Alloy C-276 Drain/Vent for use with 3-valve 305 Manifold	01151-0028-0013	01151-0028-0013
Coplanar Flange Kits (qty. 1)		
Differential Flange Kit, SST	NA	00305-1001-0001
Gauge Flange Kit, SST	NA	00305-1001-1001
O-Rings (set of 12)		
Manifold-to-Module O-Ring, Glass-filled PTFE	03031-0234-0001	03031-0234-0001
Manifold-to-Module O-Ring, Graphite-filled PTFE	03031-0234-0002	03031-0234-0002
Sensor Guard (set of 5)		
Coplanar Module Sensor Guard	00305-1000-0001	00305-1000-0001

Rosemount Manifolds

Product Data Sheet
00813-0100-4733, Rev NA
April 2010

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00813-0100-4733 Rev NA, 4/10

EMERSON™
Process Management

Product Data Sheet
00813-0100-4485, Rev AA
April 2010

Rosemount DP Flowmeters and Primary Elements

- *Multivariable capabilities allow for real time fully compensated mass and energy flow*
- *Fully-Integrated Wireless Flowmeters allow for easy installation*
- *Minimize permanent pressure loss and save energy with Annubar® Technology*
- *Reduce straight pipe requirements to two diameters upstream and downstream from any flow disturbance with Conditioning Orifice Plate Technology*
- *Improve accuracy and repeatability in small line sizes with Integral Orifice Plate Technology*

Contents

DP Flowmeter Selection Guide

Rosemount integrated DP Flowmeters arrive fully assembled, configured and leak tested for out-of-the-box installation.

Rosemount 3051SF Flowmeters enable best-in-class flow measurement utilizing advanced functionality

- Up to 0.80% mass flow rate accuracy
- Multivariable capabilities allow for real time fully compensated mass and energy flow
- Advanced diagnostics predict and prevent abnormal process conditions
- Installation ready wireless flow solution
- Ultra for Flow measures %-of-reading performance over 14:1 flow turndown
- 10-year stability, 12-year warranty

Rosemount 3051CF Flowmeters combine the proven 3051C pressure transmitter and the latest primary element technology

- Up to 1.65% volumetric flow accuracy at 8:1 turndown
- Available with HART®, FOUNDATION™ fieldbus, and Profibus Protocols
- 5-year stability

Rosemount 2051CF Flowmeters combine the 2051C pressure transmitter and the latest primary element technology

- Up to 2.00% volumetric flow accuracy at 5:1 turndown
- Available with HART, and FOUNDATION fieldbus Protocols
- 2-year stability

Rosemount Annubar Primary Element Technology

- Energy savings gained through minimal permanent pressure loss
- Innovative T-shape design that increases accuracy to ±0.75% of flow rate
- Variety of sensor materials for optimal compatibility with the process fluid
- Handles applications where conditions exceed the structural limitations of other primary elements
- Symmetrical sensor design allows bi-directional flow measurement

Rosemount Conditioning Orifice Plate Technology

- Reduce straight pipe requirements to two diameters upstream and downstream from any flow disturbance
- Discharge coefficient uncertainty of ±0.5%
- Integral thermowell enables fully compensated mass flow with a single pipe penetration
- Reduce installation costs compared to traditional orifice plates with the compact design
- Conditioning orifice plate is based on AGA, ASME and ISO industry standards
- Available in various plate styles providing installation flexibility

Rosemount Integral Orifice Plate Technology

- Improves accuracy and repeatability in 1/2-in., 1-in., and 1 1/2-in. line sizes
- Self-centering plate design eliminates installation errors that are magnified in small line sizes
- Precision honed pipe sections allow accuracy of up to ±0.75% of flow rate
- Installation flexibility with numerous process connections
- Integral thermowell enables fully compensated mass flow

Rosemount 3051SF Flowmeter Series

Rosemount 3051SF Flowmeters integrate industry leading transmitters with industry leading primary elements. Capabilities include:

- Flowmeters are factory configured to meet your application needs (Configuration Data Sheet required)
- MultiVariable capabilities allow scalable flow compensation (Measurement Types 1 -7)
- HART 4-20, WirelessHART™, and FOUNDATION fieldbus protocols
- Ultra for Flow for improved flow performance across wider flow ranges
- Integral temperature measurement (T option)
- Direct or remote mount configurations available

Additional Information

Specifications: page 25
Product Certifications: Measurement Types 1-7: page 34
Measurement Type D: page 36
Wireless: page 39
Dimensional Drawings: page 113
Installation and Flowmeter Orientation: page 151

Rosemount 3051SFA Annubar Flowmeter

- Annubar flowmeters reduce permanent pressure loss by creating less blockage in the pipe
- Ideal for large line size installations when cost, size and weight of the flowmeter are concerns

Table 1. Rosemount 3051SFA Annubar Flowmeter 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	Measurement Type		• = Available — = Unavailable
		D	1-7	
3051SFA	Annubar Flowmeter	•	•	
Measurement Type				
Standard				**Standard**
1	MultiVariable (Fully Compensated Mass & Energy Flow) – Differential & Static Pressures w/ Temperature	—	•	★
2	MultiVariable (Compensated Flow) – Differential & Static Pressures	—	•	★
3	MultiVariable (Compensated Flow) – Differential Pressure & Temperature	—	•	★
4	MultiVariable (Compensated Flow) – Differential Pressure	—	•	★
5	MultiVariable (Direct Measurement) – Differential & Static Pressures with Temperature	—	•	★
6	MultiVariable (Direct Measurement) – Differential & Static Pressures	—	•	★
7	MultiVariable (Direct Measurement) – Differential Pressure & Temperature	—	•	★
D	Differential Pressure	•	—	★
Fluid Type				
Standard				**Standard**
L	Liquid	•	•	★
G	Gas	•	•	★
S	Steam	•	•	★

Table 1. Rosemount 3051SFA Annubar Flowmeter Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.
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Line Size		**D**	**1-7**	
Standard				**Standard**
020	2-in. (50 mm)	•	•	★
025	2 1/2-in. (63.5 mm)	•	•	★
030	3-in. (80 mm)	•	•	★
035	3 1/2-in. (89 mm)	•	•	★
040	4-in. (100 mm)	•	•	★
050	5-in. (125 mm)	•	•	★
060	6-in. (150 mm)	•	•	★
070	7-in. (175 mm)	•	•	★
080	8-in. (200 mm)	•	•	★
100	10-in. (250 mm)	•	•	★
120	12-in. (300 mm)	•	•	★
Expanded				
140	14-in. (350 mm)	•	•	
160	16-in. (400 mm)	•	•	
180	18-in. (450 mm)	•	•	
200	20-in. (500 mm)	•	•	
240	24-in. (600 mm)	•	•	
300	30-in. (750 mm)	•	•	
360	36-in. (900 mm)	•	•	
420	42-in. (1066 mm)	•	•	
480	48-in. (1210 mm)	•	•	
600	60-in. (1520 mm)	•	•	
720	72-in. (1820 mm)	•	•	
780	78-in (1950 mm)	•	•	
840	84-in. (2100 mm)	•	•	
900	90-in. (2250 mm)	•	•	
960	96-in (2400 mm)	•	•	
Pipe I.D. Range				
Standard				**Standard**
C	Range C from the Pipe I.D. table	•	•	★
D	Range D from the Pipe I.D. table	•	•	★
Expanded				
A	Range A from the Pipe I.D. table	•	•	
B	Range B from the Pipe I.D. table	•	•	
E	Range E from the Pipe I.D. table	•	•	
Z	Non-standard Pipe I.D. Range or Line Sizes greater than 12-in. (300 mm)	•	•	
Pipe Material / Mounting Assembly Material				
Standard				**Standard**
C	Carbon steel (A105)	•	•	★
S	316 Stainless Steel	•	•	★
0(1)	No Mounting (Customer Supplied)	•	•	★
Expanded				
G	Chrome-Moly Grade F-11	•	•	
N	Chrome-Moly Grade F-22	•	•	
J	Chrome-Moly Grade F-91	•	•	
Piping Orientation				
Standard				**Standard**
H	Horizontal Piping	•	•	★
D	Vertical Piping with Downwards Flow	•	•	★
U	Vertical Piping with Upwards Flow	•	•	★

Table 1. Rosemount 3051SFA Annubar Flowmeter 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.

Annubar Type				**D**	**1-7**	
Standard						**Standard**
P	Pak-Lok			•	•	★
F	Flanged with opposite side support			•	•	★
Expanded						
L	Flange-Lok			•	•	
G	Gear-Drive Flo-Tap			•	•	
M	Manual Flo-Tap			•	•	
Sensor Material						
Standard						**Standard**
S	316 Stainless Steel			•	•	★
Expanded						
H	Alloy C-276			•	•	
Sensor Size						
Standard						**Standard**
1	Sensor size 1 — Line sizes 2-in. (50 mm) to 8-in. (200 mm)			•	•	★
2	Sensor size 2 — Line sizes 6-in. (150 mm) to 96-in. (2400 mm)			•	•	★
3	Sensor size 3 — Line sizes greater than 12-in. (300 mm)			•	•	★
Mounting Type						
Standard						**Standard**
T1	Compression or Threaded Connection			•	•	★
A1	150# RF ANSI			•	•	★
A3	300# RF ANSI			•	•	★
A6	600# RF ANSI			•	•	★
D1	DN PN16 Flange			•	•	★
D3	DN PN40 Flange			•	•	★
D6	DN PN100 Flange			•	•	★
Expanded						
A9[(2)]	900# RF ANSI			•	•	
AF[(2)]	1500# RF ANSI			•	•	
AT[(2)]	2500 # RF ANSI			•	•	
R1	150# RTJ Flange			•	•	
R3	300# RTJ Flange			•	•	
R6	600# RTJ Flange			•	•	
R9[(2)]	900# RTJ Flange			•	•	
RF[(2)]	1500# RTJ Flange			•	•	
RT[(2)]	2500# RTJ Flange			•	•	
Opposite Side Support or Packing Gland						
Standard						**Standard**
0	No opposite side support or packing gland (Required for Pak-Lok and Flange-Lok models)			•	•	★
	Opposite Side Support – Required for Flanged Models					
C	NPT Threaded Opposite Support Assembly – Extended Tip			•	•	★
D	Welded Opposite Support Assembly – Extended Tip			•	•	★
Expanded						
	Packing Gland – Required for Flo-Tap Models					
	Packing Gland Material	*Rod Material*	*Packing Material*			
J	Stainless Steel Packing Gland / Cage Nipple	Carbon Steel	PTFE	•	•	
K	Stainless Steel Packing Gland / Cage Nipple	Stainless Steel	PTFE	•	•	
L	Stainless Steel Packing Gland / Cage Nipple	Carbon Steel	Graphite	•	•	
N	Stainless Steel Packing Gland / Cage Nipple	Stainless Steel	Graphite	•	•	
R	Alloy C-276 Packing Gland / Cage Nipple	Stainless Steel	Graphite	•	•	

Table 1. Rosemount 3051SFA Annubar Flowmeter Ordering Information

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Isolation Valve for Flo-Tap Models				**D**	**1-7**	
Standard						**Standard**
0[1]	Not Applicable or Customer Supplied			•	•	★
Expanded						
1	Gate Valve, Carbon Steel			•	•	
2	Gate Valve, Stainless Steel			•	•	
5	Ball Valve, Carbon Steel			•	•	
6	Ball Valve, Stainless Steel			•	•	
Temperature Measurement						
Standard						**Standard**
T[3]	Integral RTD – not available with Flanged model greater than class 600#			•	•	★
0[4]	No Temperature Sensor			•	•	★
Expanded						
R[3]	Remote Thermowell and RTD			•	•	
Transmitter Connection Platform						
Standard						**Standard**
3	Direct-mount, Integral 3-valve Manifold– not available with Flanged model greater than class 600			•	•	★
5	Direct -mount, 5-valve Manifold – not available with Flanged model greater than class 600			•	•	★
7	Remote-mount NPT Connections ($^1/_2$-in. FNPT)			•	•	★
Expanded						
6	Direct-mount, High Temperature 5-valve Manifold – not available with Flanged model greater than class 600			•	•	
8	Remote-mount SW Connections ($^1/_2$-in.)			•	•	
Differential Pressure Range						
Standard						**Standard**
1	0 to 25 in H_2O (0 to 62,3 mbar)			•	•	★
2	0 to 250 in H_2O (0 to 623 mbar)			•	•	★
3	0 to 1000 in H_2O (0 to 2,5 bar)			•	•	★
Static Pressure Range						
Standard						**Standard**
A[5]	None			•	•	★
D	Absolute 0.5 to 800 psia (0,033 to 55,2 bar)			—	•	★
E[6]	Absolute 0.5 to 3626 psia (0,033 to 250 bar)			—	•	★
J	Gage -14.2 to 800 psig (-0,979 to 55,2 bar)			—	•	★
K[6]	Gage -14.2 to 3626 psig (-0,979 to 250 bar)			—	•	★
Transmitter Output						
Standard						**Standard**
A	4–20 mA with digital signal based on HART protocol			•	•	★
F	FOUNDATION fieldbus protocol (requires PlantWeb housing)			•	—	★
X[7]	Wireless (Requires wireless options and Wireless Plantweb housing)			•	—	★
Transmitter Housing Style		**Material**	**Conduit Entry Size**			
Standard						**Standard**
00	None (Customer-supplied electrical connection)			•	—	★
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 housing with output for remote display and interface	Aluminum	$^1/_2$-14 NPT	•	—	★

Table 1. Rosemount 3051SFA Annubar Flowmeter Ordering Information

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The Expanded offering is subject to additional delivery lead time.

2F	Junction Box housing with output for remote display and interface	Aluminum	M20 x 1.5	•	—	★
2J	Junction Box Housing	SST	1/2-14 NPT	•	—	★
2M	Junction Box housing with output for remote display and interface	SST	1/2-14 NPT	•	—	★
5A	Wireless PlantWeb housing	Aluminum	1/2-14 NPT	•	—	★
5J	Wireless PlantWeb housing	SST	1/2-14 NPT	•	—	★
7J(7)(8)	Quick Connect (A size Mini, 4-pin male termination)			•	—	★
Expanded						
1C	PlantWeb Housing	Aluminum	G1/2	•	•	
1L	PlantWeb Housing	SST	G1/2	•	•	
2C	Junction Box Housing	Aluminum	G1/2	•	—	
2G	Junction Box housing with output for remote display and interface	Aluminum	G1/2	•	—	
Transmitter Performance Class				**D**	**1-7**	
Standard						**Standard**
3051S MultiVariable SuperModule, Measurement Types 1, 2, 5, and 6						
3	Ultra for Flow: 0.8% flow rate accuracy, 14:1 flow turndown, 10-year stability. limited 12-year warranty			•	•	★
5	Classic MV: 0.85% flow rate accuracy, 8:1 flow turndown, 5-yr. stability			—	•	★
3051S Single Variable SuperModule, Measurement Types 3, 4, 7, and D						
1	Ultra: up to 0.9% flow rate accuracy, 8:1 flow turndown, 10-year stability, limited 12-year warranty			•	—	★
2	Classic: up to 1.1% flow rate accuracy, 8:1 flow turndown, 5-year stability			•	—	★
3(9)	Ultra for Flow: 0.8% flow rate accuracy, 14:1 flow turndown, 10-year stability. limited 12-year warranty			•	•	★

Wireless Options (Requires option code X and wireless PlantWeb housing)

Update Rate, Operating Frequency and Protocol				
Standard				**Standard**
WA	User Configurable Update Rate	•	—	★
Operating Frequency and Protocol				
Standard				
3	2.4 GHz DSSS, WirelessHART	•	—	★
Omnidirectional Wireless Antenna				
Standard				
WK(10)	Long Range, Integral Antenna	•	—	★
SmartPower™				
Standard				
1(11)	Power Module Adapter, Intrinsically Safe (Power Module separate)	•	—	★

Other Options (Include with selected model number)

Pressure Testing				
Expanded				
P1(12)	Hydrostatic Testing with Certificate	•	•	
PX(12)	Extended Hydrostatic Testing	•	•	
Special Cleaning				
Expanded				
P2	Cleaning for Special Services	•	•	
PA	Cleaning per ASTM G93 level D (section 11.4)	•	•	
Material Testing				
Expanded				
V1	Dye Penetrant Exam	•	•	

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★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.
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Material Examination		**D**	**1-7**	
Expanded				
V2	Radiographic Examination	•	•	
Flow Calibration				
Expanded				
W1	Flow Calibration (Average K)	•	•	
Special Inspection				
Standard				**Standard**
QC1	Visual and Dimensional Inspection with Certificate	•	•	★
QC7	Inspection and Performance Certificate	•	•	★
Surface Finish				
Standard				**Standard**
RL	Surface finish for Low Pipe Reynolds Number in Gas and Steam	•	•	★
RH	Surface finish for High Pipe Reynolds Number in Liquid	•	•	★
Material Traceability Certification				
Standard				**Standard**
Q8[13]	Material Traceability Certificate per EN 10204:2004 3.1	•	•	★
Code Conformance				
Expanded				
J2[14]	ANSI B31.1	•	•	
J3[14]	ANSI B31.3	•	•	
Material Conformance				
Expanded				
J5[15]	NACE MR-0175 / ISO 15156	•	•	
Country Certification				
Standard				**Standard**
J6	European Pressure Directive (PED)	•	•	★
Expanded				
J1	Canadian Registration	•	•	
Installed in Flanged Pipe Spool Section				
Expanded				
H3	150# Flanged Connection with Rosemount Standard Length and Schedule	•	•	
H4	300# Flanged Connection with Rosemount Standard Length and Schedule	•	•	
H5	600# Flanged Connection with Rosemount Standard Length and Schedule	•	•	
Instrument Connections for Remote Mount Option				
Standard				**Standard**
G2	Needle Valves, Stainless Steel	•	•	★
G6	OS&Y Gate Valve, Stainless Steel	•	•	★
Expanded				
G1	Needle Valves, Carbon Steel	•	•	
G3	Needle Valves, Alloy C-276	•	•	
G5	OS&Y Gate Valve, Carbon Steel	•	•	
G7	OS&Y Gate Valve, Alloy C-276	•	•	
Special Shipment				
Standard				**Standard**
Y1	Mounting Hardware Shipped Separately	•	•	★
Special Dimensions				
Expanded				
VM	Variable Mounting	•	•	
VT	Variable Tip	•	•	
VS	Variable length Spool Section	•	•	
Transmitter Calibration Certification				
Standard				**Standard**
Q4	Calibration Certificate for Transmitter	•	•	★

Table 1. Rosemount 3051SFA Annubar Flowmeter Ordering Information

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Quality Certification For Safety		**D**	**1-7**	
Standard				**Standard**
QS	Certificate of FMEDA data	•	—	★
QT[16][17][19]	Safety certified to IEC 61508 with certificate of FMEDA data	•	—	★
Product Certifications				
Standard				**Standard**
E1	ATEX Flameproof	•	•	★
I1	ATEX Intrinsic Safety	•	•	★
IA	ATEX FISCO Intrinsic Safety; for FOUNDATION fieldbus protocol only	•	—	★
N1	ATEX Type n	•	•	★
ND	ATEX Dust	•	•	★
K1	ATEX Flameproof, Intrinsic Safety, Type n, Dust (combination of E1, I1, N1, and ND)	•	•	★
E4	TIIS Flameproof	•	•	★
E5	FM Explosion-proof, Dust Ignition-proof	•	•	★
I5	FM Intrinsically Safe, Division 2	•	•	★
K5	FM Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E5 and I5)	•	•	★
E6[16]	CSA Explosion-proof, Dust Ignition-proof, Division 2	•	•	★
I6	CSA Intrinsically Safe	•	•	★
K6[16]	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E6 and I6)	•	•	★
E7	IECEx Flameproof, Dust Ignition-proof	•	•	★
I7	IECEx Intrinsic Safety	•	•	★
K7	IECEx Flameproof, Dust Ignition-proof, Intrinsic Safety, Type n (combination of E7, I7, and N7)	•	•	★
E3	China Flameproof	•	•	★
I3	China Intrinsic Safety	•	•	★
KA[16]	ATEX and CSA Explosion-proof, Intrinsically Safe, Division 2 (combination of E1, I1, E6, and I6)	•	•	★
KB[16]	FM and CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E5, E6, I5, and I6)	•	•	★
KC	FM and ATEX Explosion-proof, Intrinsically Safe, Division 2 (combination of E5, E1, I5, and I1)	•	•	★
KD[16]	FM, CSA, and ATEX Explosion-proof, Intrinsically Safe (combination of E5, I5, E6, I6, E1, and I1)	•	•	★
Alternate Transmitter Material of Construction				
Standard				**Standard**
L1	Inert Sensor Fill Fluid *Note: Silicone fill fluid is standard.*	•	•	★
L2	Graphite-Filled (PTFE) O-ring	•	•	★
LA	Inert Sensor Fill Fluid and Graphite-Filled (PTFE) O-ring	•	•	★
Digital Display[17]				
Standard				**Standard**
M5	PlantWeb LCD display (Requires PlantWeb housing)	•	•	★
M7[18][19]	Remote mount LCD display and interface, no cable; PlantWeb housing, SST bracket	•	•	★
M8[18][19][20]	Remote mount LCD display and interface, 50 ft. (15 m) cable; PlantWeb housing, SST bracket	•	•	★
M9[18][19][20]	Remote mount LCD display and interface, 100 ft. (31 m) cable; PlantWeb housing, SST bracket	•	•	★
Transient Protection				
Standard				**Standard**
T1[21]	Transient terminal block	•	•	★
Manifold for Remote Mount Option				
Standard				**Standard**
F2	3-Valve Manifold, Stainless Steel	•	•	★
F6	5-Valve Manifold, Stainless Steel	•	•	★

Table 1. Rosemount 3051SFA Annubar Flowmeter Ordering Information

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Expanded				
F1	3-Valve Manifold, Carbon Steel	•	•	
F3	3-Valve Manifold, Alloy C-276	•	•	
F5	5-Valve Manifold, Carbon Steel	•	•	
F7	5-Valve Manifold, Alloy C-276	•	•	
PlantWeb Control Functionality		**D**	**1-7**	
Standard				**Standard**
A01	FOUNDATION fieldbus Advanced Control Function Block Suite	•	—	★
PlantWeb Diagnostic Functionality				
Standard				**Standard**
D01	FOUNDATION fieldbus Diagnostics Suite	•	—	★
DA2(22)	Advanced HART Diagnostic Suite	•	—	★
PlantWeb Enhanced Measurement Functionality				
Standard				**Standard**
H01(23)	FOUNDATION fieldbus Fully Compensated Mass Flow Block	•	—	★
Cold Temperature				
Standard				**Standard**
BRR	-60 °F (-51 °C) Cold Temperature Start-up	•	•	★
Alarm Limit(18)(24)				
Standard				**Standard**
C4	NAMUR Alarm and Saturation Levels, High Alarm	•	•	★
C5	NAMUR Alarm and Saturation Levels, Low Alarm	•	•	★
C6	Custom Alarm and Saturation Levels, High Alarm	•	•	★
C7	Custom Alarm and Saturation Levels, Low Alarm	•	•	★
C8	Low Alarm (Standard Rosemount Alarm and Saturation Levels)	•	•	★
Hardware Adjustments and Ground Screw				
Standard				**Standard**
D1	Hardware Adjustments (zero, span, alarm, security)	•	—	★
D4	External Ground Screw Assembly	•	•	★
DA	Hardware Adjustments (zero, span, alarm, security) and External Ground Screw Assembly	•	—	★
Conduit Electrical Connector				
Standard				**Standard**
GE(25)	M12, 4-pin, Male Connector (*eurofast*®)	•	•	★
GM(25)	A size Mini, 4-pin, Male Connector (*minifast*®)	•	•	★
Typical Model Number: 3051SFA D L 060 D C H P S 2 T1 0 0 0 3 2A A 1A 3				

(1) Provide the "A" dimension for Flanged (page 115), Flange-Lok (page 114), and Threaded Flo-Tap (page 118) models. Provide the "B" dimension for Flange Flo-Tap models (page 117).

(2) Available in remote mount applications only.

(3) Temperature Measurement Option code T or R is required for Measurement Type codes 1, 3, 5, and 7.

(4) Required for Measurement Type codes 2, 4, 6, and D.

(5) Required for Measurement Type codes 3, 4, 7, and D.

(6) For Measurement Type 1, 2, 5, and 6 with DP range 1, absolute limits are 0.5 to 2000 psi (0,03 to 137,9 bar) and gage limits are -14.2 to 2000 psig (-0,98 to 137,9 bar).

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

(8) Available with output code A only.

(9) This option is only available with differential pressure ranges 2 and 3, and silicone fill fluid.

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

(11) Long-life Power Module must be shipped separately, order Part No. 00753-9220-0001.

(12) Applies to assembled flowmeter only, mounting not tested.

(13) Instrument Connections for Remote Mount Options and Isolation Valves for Flo-tap Models are not included in the Material Traceability Certification.

(14) Not available with Transmitter Connection Platform 6.

(15) Materials of Construction comply with metallurgical requirements 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.

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

(17) Not available with housing code 7J.

(18) Not available with output code X.

(19) Not available with output code F, option code DA2, or option code QT.

(20) Cable supplied is Belden 3084A, rated for ambient temperatures up to 167°F (75°C).

(21) Not available with Housing code 00, 5A, or 7J. External ground screw assembly (option code D4) is included with the T1 option. The T1 option is not needed with FISCO Product Certifications, transient protection is included with the FISCO Product Certification code IA.

(22) Includes Hardware Adjustments (option code D1) as standard.

(23) Requires Rosemount Engineering Assistant version 5.5.1 to configure.

(24) Not available with Output Protocol code F.

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

Rosemount 3051SFC Compact Orifice Flowmeter

- Compact Conditioning flowmeters reduce straight piping requirements to 2D upstream and 2D downstream from a flow disturbance
- Simple installation of Compact flowmeters between any existing raised-face flanges

Table 2. Rosemount 3051SFC Compact Orifice Flowmeter 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	Measurement Type		• = Available — = Unavailable
		D	1-7	
3051SFC	Compact Orifice Flowmeter	•	•	
Transmitter Feature Board Measurement Type				
Standard				**Standard**
1	MultiVariable (Fully Compensated Mass & Energy Flow) – Differential & Static Pressures w/ Temperature	—	•	★
2	MultiVariable (Compensated Flow) – Differential and Static Pressures	—	•	★
3	MultiVariable (Compensated Flow) – Differential Pressure and Temperature	—	•	★
4	MultiVariable (Compensated Flow) – Differential Pressure	—	•	★
5	MultiVariable (Direct Measurement) – Differential and Static Pressures with Temperature	—	•	★
6	MultiVariable (Direct Measurement) – Differential and Static Pressures	—	•	★
7	MultiVariable (Direct Measurement) – Differential Pressure and Temperature	—	•	★
D	Differential Pressure	•	—	★
Primary Element Technology				
Standard				**Standard**
C	Conditioning Orifice Plate	•	•	★
P	Orifice Plate	•	•	★
Material Type				
Standard				**Standard**
S	316 SST	•	•	★
Line Size				
Standard				**Standard**
005(1)	1/2-in. (15 mm)	•	•	★
010(1)	1-in. (25 mm)	•	•	★
015(1)	1 1/2-in. (40 mm)	•	•	★
020	2-in. (50 mm)	•	•	★
030	3-in. (80 mm)	•	•	★
040	4-in. (100 mm)	•	•	★
060	6-in. (150 mm)	•	•	★
080	8-in. (200 mm)	•	•	★
100	10-in. (250 mm)	•	•	★
120	12-in. (300 mm)	•	•	★
Primary Element Style				
Standard				**Standard**
N	Square Edged	•	•	★
Primary Element Type				
Standard				**Standard**
040	0.40 Beta Ratio (β)	•	•	★
065(2)	0.65 Beta Ratio (β)	•	•	★
Temperature Measurement				
Standard				**Standard**
T(4)	Integral RTD	—	•	★
0(3)	No Temperature Sensor	•	•	★
Expanded				
R(4)	Remote Thermowell and RTD	•	•	

Table 2. Rosemount 3051SFC Compact Orifice Flowmeter 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 Connection Platform				**D**	**1-7**	
Standard						**Standard**
3	Direct-mount, 3-valve Integral Manifold, SST			•	•	★
7	Remote-mount, 1/4-in. NPT Connections			•	•	★
Differential Pressure Range						
Standard						**Standard**
1	0 to 25 inH_2O (0 to 62,3 mbar)			•	•	★
2	0 to 250 inH_2O (0 to 623 mbar)			•	•	★
3	0 to 1000 inH_2O (0 to 2,5 bar)			•	•	★
Static Pressure Range						
Standard						**Standard**
A[5]	None			•	•	★
D	Absolute 0.5 to 800 psia (0,033 to 55,2 bar)			—	•	★
E[6]	Absolute 0.5 to 3626 psia (0,033 to 250 bar)			—	•	★
J	Gage -14.2 to 800 psig (-0,979 to 55,2 bar)			—	•	★
K[6]	Gage -14.2 to 3626 psig (-0,979 to 250 bar)			—	•	★
Transmitter Output						
Standard						**Standard**
A	4–20 mA with digital signal based on HART protocol			•	•	★
F	FOUNDATION fieldbus protocol (Requires PlantWeb housing)			•	—	★
X[7]	Wireless (Requires wireless options and wireless PlantWeb housing)			•	—	★
Transmitter Housing Style		**Material**	**Conduit Entry Size**			
Standard						**Standard**
1A	PlantWeb Housing	Aluminum	1/2-14 NPT	•	•	★
1B	PlantWeb Housing	Aluminum	M20 x 1.5	•	•	★
1J	PlantWeb Housing	SST	1/2-14 NPT	•	•	★
1K	PlantWeb Housing	SST	M20 x 1.5	•	•	★
2A	Junction Box Housing	Aluminum	1/2-14 NPT	•	—	★
2B	Junction Box Housing	Aluminum	M20 x 1.5	•	—	★
2E	Junction Box housing with output for remote display and interface	Aluminum	1/2-14 NPT	•	—	★
2F	Junction Box housing with output for remote display and interface	Aluminum	M20 x 1.5	•	—	★
2J	Junction Box Housing	SST	1/2-14 NPT	•	—	★
2M	Junction Box housing with output for remote display and interface	SST	1/2-14 NPT	•	—	★
5A	Wireless PlantWeb housing	Aluminum	1/2-14 NPT	•	—	★
5J	Wireless PlantWeb housing	SST	1/2-14 NPT	•	—	★
7J[7][8]	Quick Connect (A size Mini, 4-pin male termination)			•	—	★
Expanded						
1C	PlantWeb Housing	Aluminum	G1/2	•	•	
1L	PlantWeb Housing	SST	G1/2	•	•	
2C	Junction Box Housing	Aluminum	G1/2	•	—	
2G	Junction Box housing with output for remote display and interface	Aluminum	G1/2	•	—	
Transmitter Performance Class						
Standard						**Standard**
3051S MultiVariable SuperModule, Measurement Types 1, 2, 5, and 6				•	•	
3	Ultra for Flow: 0.55% flow rate accuracy, 14:1 flow turndown, 10-yr stability. limited 12-yr warranty			•	•	★
5	Classic MV: 0.6% flow rate accuracy, 8:1 flow turndown, 5-yr stability			—	•	★

Table 2. Rosemount 3051SFC Compact Orifice Flowmeter Ordering Information

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

Standard				**Standard**
3051S Single Variable SuperModule, Measurement Types 3, 4, 7, and D		•	•	
1	Ultra: 0.85% flow rate accuracy, 8:1 flow turndown, 10-yr stability, limited 12-yr warranty	•	—	★
2	Classic: 1.05% flow rate accuracy, 8:1 flow turndown, 5-yr stability	•	—	★
3(9)	Ultra for Flow: 0.55% flow rate accuracy, 14:1 flow turndown, 10-yr stability. limited 12-yr warranty	•	•	★

Wireless Options (Requires option code X and wireless PlantWeb housing)

Update Rate, Operating Frequency and Protocol				
Standard				**Standard**
WA	User Configurable Update Rate	•	—	★
Operating Frequency and Protocol				
Standard				
3	2.4 GHz DSSS, WirelessHART	•	—	★
Omnidirectional Wireless Antenna				
Standard				
WK(10)	Long Range, Integral Antenna	•	—	★
SmartPower™				
Standard				
1(11)	Power Module Adapter, Intrinsically Safe (Power Module separate)	•	—	★

Other Options (Include with selected model number)

Installation Accessories				
Standard				**Standard**
A	ANSI Alignment Ring (150#) (Only required for 10-in. (250 mm) and 12-in. (300mm) line sizes)	•	•	★
C	ANSI Alignment Ring (300#) (Only required for 10-in. (250 mm) and 12-in. (300mm) line sizes)	•	•	★
D	ANSI Alignment Ring (600#) (Only required for 10-in. (250 mm) and 12-in. (300mm) line sizes)	•	•	★
G	DIN Alignment Ring (PN 16)	•	•	★
H	DIN Alignment Ring (PN 40)	•	•	★
J	DIN Alignment Ring (PN 100)	•	•	★
Expanded				
B	JIS Alignment Ring (10K)	•	•	
R	JIS Alignment Ring (20K)	•	•	
S	JIS Alignment Ring (40K)	•	•	
Remote Adapters				
Standard				**Standard**
E	Flange adapters 316 SST (1/2-in. NPT)	•	•	★
High Temperature Applications				
Expanded				
T	Graphite Valve Packing (Tmax = 850 °F)	•	•	
Flow Calibration				
Expanded				
WC	Discharge Coefficient Verification (3 point)	•	•	
WD	Discharge Coefficient Verification (10 point)	•	•	
Pressure Testing				
Expanded				
P1	Hydrostatic Testing with Certificate	•	•	
Special Cleaning				
Expanded				
P2	Cleaning for special with Certificate	•	•	
PA	Cleaning per ASTM G93 Level D (section 11.4)	•	•	
Special Inspection				
Standard				**Standard**
QC1	Visual and Dimensional Inspection with Certificate	•	•	★
QC7	Inspection and Performance Certificate	•	•	★

Table 2. Rosemount 3051SFC Compact Orifice Flowmeter 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 Calibration Certification				
Standard				**Standard**
Q4	Calibration Certificate for Transmitter	•	•	★
QP	Calibration Certificate and Tamper Evident Seal	•	•	★
Quality Certification for Safety		**D**	**1-7**	
Standard				**Standard**
QS[(12)(13)]	Certificate of FMEDA data	•	—	★
QT[(12)(13)(16)]	Safety Certified to IEC 61508 with certificate of FMEDA data	•	—	★
Material Traceability Certifications				
Standard				**Standard**
Q8	Material Traceability Certification per EN 10204:2004 3.1	•	•	★
Code Conformance				
Expanded				
J2	ANSI / ASME B31.1	•	•	
J3	ANSI / ASME B31.3	•	•	
J4	ANSI / ASME B31.8	•	•	
Material Conformance				
Expanded				
J5[(14)]	NACE MR-0175-91 / ISO 15156	•	•	
Country Certification				
Expanded				
J1	Canadian Registration	•	•	
Product Certifications				
Standard				**Standard**
E1	ATEX Flameproof	•	•	★
I1	ATEX Intrinsic Safety	•	•	★
IA	ATEX FISCO Intrinsic Safety; for FOUNDATION fieldbus protocol only	•	—	★
N1	ATEX Type n	•	•	★
ND	ATEX Dust	•	•	★
K1	ATEX Flameproof, Intrinsic Safety, Type n, Dust (combination of E1, I1, N1, and ND)	•	•	★
E4	TIIS Flameproof	•	•	★
E5	FM Explosion-proof, Dust Ignition-proof	•	•	★
I5	FM Intrinsically Safe, Division 2	•	•	★
K5	FM Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E5 and I5)	•	•	★
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 (combination of E6 and I6)	•	•	★
E7	IECEx Flameproof, Dust Ignition-proof	•	•	★
I7	IECEx Intrinsic Safety	•	•	★
N7	IECEx Type n	•	•	★
K7	IECEx Flameproof, Dust Ignition-proof, Intrinsic Safety, Type n (combination of E7, I7, and N7)	•	•	★
E3	China Flameproof	•	•	★
I3	China Intrinsic Safety	•	•	★
KA[(15)]	ATEX and CSA Flameproof, Intrinsically Safe, Division 2 (combination of E1, I1, E6, and I6)	•	•	★
KB[(15)]	FM and CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E5, E6, I5, and I6)	•	•	★
KC	FM and ATEX Explosion-proof, Intrinsically Safe, Division 2 (combination of E5, E1, I5, and I1)	•	•	★
KD[(15)]	FM, CSA, and ATEX Explosion-proof, Intrinsically Safe (combination of E5, I5, E6, I6, E1, and I1)	•	•	★

Table 2. Rosemount 3051SFC Compact Orifice Flowmeter 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.

Alternative Transmitter Material of Construction		**D**	**1-7**	
Standard				**Standard**
L1	Inert Sensor Fill Fluid (not available with Differential Pressure range code 1A)	•	•	★
L2	Graphite-filled (PTFE) O-ring	•	•	★
LA	Inert sensor fill fluid and graphite-filled (PTFE) O-ring	•	•	★
Digital Display(16)				
Standard				**Standard**
M5	PlantWeb LCD display	•	•	★
M7(13)(17)	Remote mount LCD display and interface, PlantWeb housing, no cable, SST bracket	•	•	★
M8(13)(17)(18)	Remote mount LCD display and interface, PlantWeb housing, 50 foot cable, SST bracket	•	•	★
M9(13)(17)(18)	Remote mount LCD display and interface, PlantWeb housing, 100 foot cable, SST bracket	•	•	★
Transient Protection				
Standard				**Standard**
T1(19)	Transient terminal block	•	•	★
Manifold for Remote Mount Option				
Standard				**Standard**
F2	3-Valve Manifold, SST	•	•	★
F6	5-Valve Manifold, SST	•	•	★
PlantWeb Control Functionality				
Standard				**Standard**
A01	FOUNDATION fieldbus Advanced Control Function Block Suite	•	—	★
PlantWeb Diagnostic Functionality				
Standard				**Standard**
D01	FOUNDATION fieldbus Diagnostics Suite	•	—	★
DA2(20)	Advanced HART Diagnostic Suite	•	—	★
PlantWeb Enhanced Measurement Functionality				
Standard				**Standard**
H01(21)	FOUNDATION fieldbus Fully Compensated Mass Flow Block	•	—	★
Cold Temperature				
Standard				**Standard**
BRR	-60 °F (-51 °C) Cold Temperature Start-up	•	•	★
Alarm Limit(12)(13)				
Standard				**Standard**
C4	NAMUR alarm and saturation levels, high alarm	•	•	★
C5	NAMUR alarm and saturation levels, low alarm	•	•	★
C6	Custom alarm and saturation levels, high alarm	•	•	★
C7	Custom alarm and saturation levels, low alarm	•	•	★
C8	Low alarm (standard Rosemount alarm and saturation levels)	•	•	★
Hardware Adjustments and Ground Screw				
Standard				**Standard**
D1(17)	Hardware Adjustments (zero, span, alarm, security).	•	—	★
D4	External ground screw assembly	•	•	★
DA(17)	Hardware adjustments (zero, span, alarm, security) and external ground screw assembly	•	—	★
Conduit Electrical Connector				
Standard				**Standard**
ZE(22)	M12, 4-pin, Male Connector (eurofast)	•	•	★
ZM(22)	A size Mini, 4-pin, Male Connector (minifast)	•	•	★
Typical Model Number: 3051SFC 1 C S 060 N 065 T 3 2 J A 1A 3				

(1) Not available for Primary Element Technology code C.

(2) For 2-in. (50 mm) line sizes the Primary Element Type is 0.6 for Primary Element Technology Code C.

(3) Required for Measurement Type codes 2, 4, 6, and D.

(4) Only available with Transmitter Feature Board Measurement Type: 1, 3, 5, 7.

(5) Required for Measurement Type codes 3, 4, 7, and D.

(6) For Measurement Type 1, 2, 5, and 6 with DP range 1, absolute limits are 0.5 to 2000 psi (0,03 to 137,9 bar) and gage limits are -14.2 to 2000 psig (-0,98 to 137,9 bar).

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

(8) Available with output code A only.

(9) This option is only available with differential pressure ranges 2 and 3, and silicone fill fluid.

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

(11) Long-life Power Module must be shipped separately, order Part No. 00753-9220-0001.

(12) Not available with Output Protocol code F.

(13) Not available with output code X.

(14) Materials of Construction comply with metallurgical requirements within NACE MR0175/ISO 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.

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

(16) Not available with housing code 7J.

(17) Not available with output code F, option code DA2, or option code QT.

(18) Cable supplied is Belden 3084A, rated for ambient temperatures up to 167°F (75°C).

(19) Not available with Housing code 00, 5A, or 7J. External ground screw assembly (option code D4) is included with the T1 option. The T1 option is not needed with FISCO Product Certifications, transient protection is included with the FISCO Product Certification code IA.

(20) Includes Hardware Adjustments (option code D1) as standard.

(21) Requires Rosemount Engineering Assistant version 5.5.1 to configure.

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

Rosemount 3051SFP Integral Orifice Flowmeter

- Precision honed pipe section for increased accuracy in small line sizes
- Self-centering plate design prevents alignment errors that magnify measurement inaccuracies in small line sizes

Table 3. Rosemount 3051SFP Integral Orifice Flowmeter 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	Measurement Type		• = Available — = Unavailable
		D	1-7	
3051SFP	Integral Orifice Flowmeter	•	•	
Measurement Type				
Standard				**Standard**
1	MultiVariable (Fully Compensated Mass & Energy Flow) – Differential & Static Pressures w/ Temperature	—	•	★
2	MultiVariable (Compensated Flow) – Differential and Static Pressures	—	•	★
3	MultiVariable (Compensated Flow) – Differential Pressure and Temperature	—	•	★
4	MultiVariable (Compensated Flow) – Differential Pressure	—	•	★
5	MultiVariable (Direct Measurement) – Differential and Static Pressures with Temperature	—	•	★
6	MultiVariable (Direct Measurement) – Differential and Static Pressures	—	•	★
7	MultiVariable (Direct Measurement) – Differential Pressure and Temperature	—	•	★
D	Differential Pressure	•	—	★
Body Material				
Standard				**Standard**
S	316 SST	•	•	★
Line Size				
Standard				**Standard**
005	1/2-in. (15 mm)	•	•	★
010	1-in. (25 mm)	•	•	★
015	1 1/2-in. (40 mm)	•	•	★
Process Connection				
Standard				**Standard**
T1	NPT Female Body (Not Available with Remote Thermowell and RTD)	•	•	★
S1(1)	Socket Weld Body (Not Available with Remote Thermowell and RTD)	•	•	★
P1	Pipe Ends: NPT threaded	•	•	★
P2	Pipe Ends: Beveled	•	•	★
D1	Pipe Ends: Flanged, DIN PN16, slip-on	•	•	★
D2	Pipe Ends: Flanged, DIN PN40, slip-on	•	•	★
D3	Pipe Ends: Flanged, DIN PN100, slip-on	•	•	★
W1	Pipe Ends: Flanged, ANSI Class 150, weld-neck	•	•	★
W3	Pipe Ends: Flanged, ANSI Class 300, weld-neck	•	•	★
W6	Pipe Ends: Flanged, ANSI Class 600, weld-neck	•	•	★
Expanded				
A1	Pipe Ends: Flanged, RF, ANSI Class 150, slip-on	•	•	
A3	Pipe Ends: Flanged, RF, ANSI Class 300, slip-on	•	•	
A6	Pipe Ends: Flanged, RF, ANSI Class 600, slip-on	•	•	
R1	Pipe Ends: Flanged, RTJ, ANSI Class 150, slip-on	•	•	
R3	Pipe Ends: Flanged, RTJ, ANSI Class 300, slip-on	•	•	
R6	Pipe Ends: Flanged, RTJ, ANSI Class 600, slip-on	•	•	
P9	Special Process Connection	•	•	
Orifice Plate Material				
Standard				**Standard**
S	316 SST	•	•	★

Table 3. Rosemount 3051SFP Integral Orifice Flowmeter Ordering Information

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

Expanded				
H	Alloy C-276	•	•	
M	Alloy 400	•	•	
Bore Size Option		**D**	**1-7**	
Standard				**Standard**
0066	0.066-in. (1,68 mm) for 1/2-in. pipe	•	•	★
0109	0.109-in. (2,77 mm) for 1/2-in. pipe	•	•	★
0160	0.160-in. (4,06 mm) for 1/2-in. pipe	•	•	★
0196	0.196-in. (4,98 mm) for 1/2-in. pipe	•	•	★
0260	0.260-in. (6,60 mm) for 1/2-in. pipe	•	•	★
0340	0.340-in. (8,64 mm) for 1/2-in. pipe	•	•	★
0150	0.150-in. (3,81 mm) for 1-in. pipe	•	•	★
0250	0.250-in. (6,35 mm) for 1-in. pipe	•	•	★
0345	0.345-in. (8,76 mm) for 1-in. pipe	•	•	★
0500	0.500-in. (12,70 mm) for 1-in. pipe	•	•	★
0630	0.630-in. (16,00 mm) for 1-in. pipe	•	•	★
0800	0.800-in. (20,32 mm) for 1-in. pipe	•	•	★
0295	0.295-in. (7,49 mm) for 1 1/2-in. pipe	•	•	★
0376	0.376-in. (9,55 mm) for 1 1/2-in. pipe	•	•	★
0512	0.512-in. (13,00 mm) for 1 1/2-in. pipe	•	•	★
0748	0.748-in. (19,00 mm) for 1 1/2-in. pipe	•	•	★
1022	1.022-in. (25,96 mm) for 1 1/2-in. pipe	•	•	★
1184	1.184-in. (30,07 mm) for 1 1/2-in. pipe	•	•	★
Expanded				
0010	0.010-in. (0,25 mm) for 1/2-in. pipe	•	•	
0014	0.014-in. (0,36 mm) for 1/2-in. pipe	•	•	
0020	0.020-in. (0,51 mm) for 1/2-in. pipe	•	•	
0034	0.034-in. (0,86 mm) for 1/2-in. pipe	•	•	
Transmitter Connection Platform				
Standard				**Standard**
D3	Direct-mount, 3-valve Manifold, SST	•	•	★
D5	Direct-mount, 5-valve Manifold, SST	•	•	★
R3	Remote-mount, 3-valve Manifold, SST	•	•	★
R5	Remote-mount, 5-valve Manifold, SST	•	•	★
Expanded				
D4	Direct-mount, 3-valve Manifold, Alloy C-276	•	•	
D6	Direct-mount, 5-valve Manifold, Alloy C-276	•	•	
D7	Direct-mount, High Temperature, 5-valve Manifold, SST	•	•	
R4	Remote-mount, 3-valve Manifold, Alloy C-276	•	•	
R6	Remote-mount, 5-valve Manifold, Alloy C-276	•	•	
Differential Pressure Range				
Standard				**Standard**
1	0 to 25 in H_2O (0 to 62,3 mbar)	•	•	★
2	0 to 250 in H_2O (0 to 623 mbar)	•	•	★
3	0 to 1000 in H_2O (0 to 2,5 bar)	•	•	★
Static Pressure Range				
Standard				**Standard**
A[(2)]	None	•	•	★
D	Absolute 0.5 to 800 psia (0,033 to 55,2 bar)	—	•	★
E[(3)]	Absolute 0.5 to 3626 psia (0,033 to 250 bar)	—	•	★
J	Gage -14.2 to 800 psig (-0,979 to 55,2 bar)	—	•	★
K[(3)]	Gage -14.2 to 3626 psig (-0,979 to 250 bar)	—	•	★

Table 3. Rosemount 3051SFP Integral Orifice Flowmeter 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				**D**	**1-7**	
Standard						**Standard**
A	4–20 mA with digital signal based on HART protocol			•	•	★
F	FOUNDATION fieldbus (Requires PlantWeb housing)			•	—	★
X[4]	Wireless (Requires wireless options and wireless PlantWeb housing)			•	—	★
Transmitter Housing Style		**Material**	**Conduit Entry Size**			
Standard						**Standard**
00	None (Customer-supplied electrical connection)			•	—	★
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 Housing with output for remote display and interface	Aluminum	1/2-14 NPT	•	—	★
2F	Junction Box Housing with output for remote display and interface	Aluminum	M20 x 1.5	•	—	★
2J	Junction Box Housing	SST	1/2-14 NPT	•	—	★
2M	Junction Box Housing with output for remote display and interface	SST	1/2-14 NPT	•	—	★
5A	Wireless PlantWeb Housing	Aluminum	1/2–14 NPT	•	—	★
5J	Wireless PlantWeb Housing	SST	1/2–14 NPT	•	—	★
7J[4][5]	Quick Connect (A size Mini, 4-pin male termination)			•	—	★
Expanded						
1C	PlantWeb Housing	Aluminum	G1/2	•	•	
1L	PlantWeb Housing	SST	G1/2	•	•	
2C	Junction Box Housing	Aluminum	G1/2	•	—	
2G	Junction Box Housing with output for remote display and interface	Aluminum	G1/2	•	—	
Transmitter Performance Class						
Standard						**Standard**
3051S MultiVariable SuperModule, Measurement Types 1, 2, 5, and 6						
3[6]	Ultra for Flow: 0.80% flow rate accuracy, 14:1 flow turndown, 10-year stability, limited 12-year warranty			•	•	★
5	Classic 2: 0.85% flow rate accuracy, 8:1 flow turndown, 5-year stability			—	•	★
3051S Single Variable SuperModule, Measurement Types 3, 4, 7, and D						
1	Ultra: 1.05% flow rate accuracy, 8:1 flow turndown, 10-year stability, limited 12-year warranty			•	•	★
2	Classic: 1.20% flow rate accuracy, 8:1 flow turndown, 5-year stability			•	•	★
3[6]	Ultra for Flow: 0.80% flow rate accuracy, 14:1 flow turndown, 10-year stability. limited 12-year warranty			•	•	★

Wireless Options (Requires option code X and wireless PlantWeb housing)

Update Rate, Operating Frequency and Protocol				
Standard				**Standard**
WA	User Configurable Update Rate	•	—	★
Operating Frequency and Protocol				
Standard				
3	2.4 GHz DSSS, WirelessHART	•	—	★
Omnidirectional Wireless Antenna				
Standard				
WK[7]	Long Range, Integral Antenna	•	—	★
SmartPower™				
Standard				
1[8]	Power Module Adapter, Intrinsically Safe (Power Module separate)	•	—	★

Table 3. Rosemount 3051SFP Integral Orifice Flowmeter 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.

Other Options (Include with selected model number)

Transmitter / Body Bolt Material		**D**	**1-7**	
Expanded				
G	High temperature Option (850 °F (454 °C))	•	•	
Temperature Sensor				
Standard				**Standard**
T[9]	Thermowell and RTD	•	•	★
Optional Connection				
Standard				**Standard**
G1	DIN 19231 Transmitter Connection	•	•	★
Pressure Testing				
Expanded				
P1[10]	Hydrostatic Testing with Certificate	•	•	
Special Cleaning				
Expanded				
P2	Cleaning for Special Services	•	•	
PA	Cleaning per ASTM G93 Level D (Section 11.4)	•	•	
Material Testing				
Expanded				
V1	Dye Penetrant Exam	•	•	
Material Examination				
Expanded				
V2	Radiographic Examination (available only with Process Connection code W1, W3, and W6)	•	•	
Flow Calibration				
Expanded				
WD[11]	Discharge Coefficient Verification	•	•	
WZ[11]	Special Calibration	•	•	
Special Inspection				
Standard				**Standard**
QC1	Visual and Dimensional Inspection with Certificate	•	•	★
QC7	Inspection and Performance Certificate	•	•	★
Material Traceability Certification				
Standard				**Standard**
Q8	Material certification per EN 10204:2004 3.1	•	•	★
Code Conformance				
Expanded				
J2[12]	ANSI / ASME B31.1	•	•	
J3[12]	ANSI / ASME B31.3	•	•	
J4[12]	ANSI / ASME B31.8	•	•	
Materials Conformance				
Expanded				
J5[13]	NACE MR-0175 / ISO 15156	•	•	
Country Certification				
Standard				**Standard**
J6	European Pressure Directive (PED)	•	•	★
Expanded				
J1	Canadian Registration	•	•	
Transmitter Calibration Certification				
Standard				**Standard**
Q4	Calibration Certificate for Transmitter	•	•	★
Quality Certification for Safety				
Standard				**Standard**
QS[14][15]	Certificate of FMEDA data	•	—	★
QT[14][15][17]	Safety-certified to IEC 61508 with Certificate of FMEDA data	•	—	★

Table 3. Rosemount 3051SFP Integral Orifice Flowmeter 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		**D**	**1-7**	
Standard				**Standard**
E1	ATEX Flameproof	•	•	★
I1	ATEX Intrinsic Safety	•	•	★
IA	ATEX FISCO Intrinsic Safety; for FOUNDATION fieldbus protocol only	•	—	★
N1	ATEX Type n	•	•	★
ND	ATEX Dust	•	•	★
K1	ATEX Flameproof, Intrinsic Safety, Type n, Dust (combination of E1, I1, N1, and ND)	•	•	★
E4	TIIS Flameproof	•	•	★
E5	FM Explosion-proof, Dust Ignition-proof	•	•	★
I5	FM Intrinsically Safe, Division 2	•	•	★
K5	FM Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E5 and I5)	•	•	★
E6[16]	CSA Explosion-proof, Dust Ignition-proof, Division 2	•	•	★
I6	CSA Intrinsically Safe	•	•	★
K6[16]	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E6 and I6)	•	•	★
E7	IECEx Flameproof	•	•	★
I7	IECEx Intrinsic Safety	•	•	★
K7	IECEx Flameproof, Intrinsic Safety, Type n (combination of E7, I7, and N7)	•	•	★
E3	China Flameproof	•	•	★
I3	China Intrinsic Safety	•	•	★
KA[16]	ATEX and CSA Flameproof, Intrinsically Safe, Division 2 (combination of E1, I1, E6, and I6)	•	•	★
KB[16]	FM and CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E5, E6, I5, and I6)	•	•	★
KC	FM and ATEX Explosion-proof, Intrinsically Safe, Division 2 (combination of E5, E1, I5, and I1)	•	•	★
KD[16]	FM, CSA, and ATEX Explosion-proof, Intrinsically Safe (combination of E5, I5, E6, I6, E1, and I1)	•	•	★
Alternative Transmitter Material of Construction				
Standard				**Standard**
L1	Inert Sensor Fill Fluid	•	•	★
L2	Graphite-filled (PTFE) O-ring	•	•	★
LA	Inert sensor fill fluid and graphite-filled (PTFE) O-ring	•	•	★
Digital Display[17]				
Standard				**Standard**
M5	PlantWeb LCD display (Requires PlantWeb housing)	•	•	★
M7	Remote mount LCD display and interface, PlantWeb housing, no cable, SST bracket	•	—	★
M8[14][18][19]	Remote mount LCD display and interface, PlantWeb housing, 50 foot cable, SST bracket	•	—	★
M9[14][18][19]	Remote mount LCD display and interface, PlantWeb housing, 100 foot cable, SST bracket	•	—	★
Transient Protection				
Standard				**Standard**
T1[20]	Transient terminal block	•	•	★
PlantWeb Control Functionality				
Standard				**Standard**
A01	FOUNDATION fieldbus Advanced Control Function Block Suite	•	—	★
PlantWeb Diagnostic Functionality				
Standard				**Standard**
D01	FOUNDATION fieldbus Diagnostics Suite	•	—	★
DA2[21]	Advanced HART Diagnostics Suite	•	—	★
PlantWeb Enhanced Measurement Functionality				
Standard				**Standard**
H01[22]	FOUNDATION fieldbus Fully Compensated Mass Flow Block	•	—	★

Table 3. Rosemount 3051SFP Integral Orifice Flowmeter Ordering Information

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

Cold Temperature				
Standard				**Standard**
BRR	-60 °F (-51 °C) Cold Temperature Start-up	•	•	★
Alarm Limit[14][15]		**D**	**1-7**	
Standard				**Standard**
C4	NAMUR Alarm and Saturation Levels, High Alarm	•	•	★
C5	NAMUR Alarm and Saturation Levels, Low Alarm	•	•	★
C6	Custom Alarm & Saturation Levels, High Alarm	•	•	★
C7	Custom Alarm & Saturation Levels, Low Alarm	•	•	★
C8	Low Alarm (Standard Rosemount Alarm & Saturation Levels)	•	•	★
Hardware Adjustments and Ground Screw				
Standard				**Standard**
D1[17]	Hardware Adjustments (zero, span, alarm, security)	•	—	★
D4	External ground screw assembly	•	•	★
DA[17]	Hardware adjustments (zero, span, alarm, security) and external ground screw assembly	•	—	★
Conduit Electrical Connector				
Expanded				
GE [23]	M12, 4-pin, Male Connector (*eurofast*®)	•	•	
GM[23]	A size Mini, 4-pin, Male Connector (*minifast*®)	•	•	
Typical Model Number: 3051SFP 1 S 010 W3 S 0150 D3 1 J A 1A 3				

(1) To improve pipe perpendicularity for gasket sealing, socket diameter is smaller than standard pipe O.D.

(2) Required for Measurement Type codes 3, 4, 7, and D.

(3) For Measurement Type 1, 2, 5, and 6 with DP range 1, absolute limits are 0.5 to 2000 psi (0,03 to 137,9 bar) and gage limits are -14.2 to 2000 psig (-0,98 to 137,9 bar).

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

(5) Only available with output code A.

(6) This option is only available with differential pressure ranges 2 and 3, and silicone fill fluid.

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

(8) Long-life Power Module must be shipped separately, order Part No. 00753-9220-0001.

(9) Thermowell material is the same as the body material.

(10) Does not apply to Process Connection codes T1 and S1.

(11) Not available for bore sizes 0010, 0014, 0020, or 0034.

(12) Not available with DIN Process Connection codes D1, D2, or D3.

(13) Materials of Construction comply with metallurgical requirements within NACE MR0175/ISO 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.

(14) Not available with output code X.

(15) Not available with Output Protocol code F.

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

(17) Not available with housing code 7J.

(18) Not available with output code F, option code DA2, or option code QT.

(19) Cable supplied is Belden 3084A, rated for ambient temperatures up to 167°F (75°C).

(20) Not available with Housing code 00, 5A or 7J. The T1 option is not needed with FISCO Product Certifications, transient protection is included with the FISCO Product Certification code IA.

(21) Includes Hardware Adjustments (option code D1) as standard.

(22) Requires Rosemount Engineering Assistant version 5.5.1 to configure.

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

3051SF Series Specifications

3051SF PERFORMANCE SPECIFICATIONS

Performance assumptions include: measured pipe I.D, transmitter is trimmed for optimum flow accuracy, and performance is dependent on application parameters.

Table 4. MultiVariable Flow Performance - Flow Reference Accuracy (Measurement Type 1)(1)

3051SFA Annubar Flowmeter			
		Classic MV (8:1 flow turndown)	**Ultra for Flow (14:1 flow turndown)**
Ranges 2-3		1.15% of Flow Rate	±0.80% of Flow Rate
3051SFC Compact Orifice Flowmeter - Conditioning Option C			
		Classic MV (8:1 flow turndown)	**Ultra for Flow (14:1 flow turndown)**
Ranges 2-3	β =0.4	±1.10% of Flow Rate	±0.75% of Flow Rate
	β =0.65	±1.45% of Flow Rate	±1.15% of Flow Rate
3051SFC Compact Orifice Flowmeter - Orifice Type Option P (2-in. to 12-in. line sizes)			
		Classic MV (8:1 flow turndown)	**Ultra for Flow (14:1 flow turndown)**
Ranges 2-3	β =0.4	±1.30% of Flow Rate	±1.25% of Flow Rate
	β =0.65	±1.30% of Flow Rate	±1.25% of Flow Rate
3051SFP Integral Orifice Flowmeter			
		Classic MV (8:1 flow turndown)	**Ultra for Flow (14:1 flow turndown)**
	β <0.1	±2.55% of Flow Rate	±2.50% of Flow Rate
Ranges 2-3	0.1< β <0.2	±1.60% of Flow Rate	±1.35% of Flow Rate
	0.2< β <0.6	±1.25% of Flow Rate	±0.90% of Flow Rate
	0.6< β <0.8	±1.80% of Flow Rate	±1.60% of Flow Rate

(1) Measurement Types 2 - 4 assume that the unmeasured variables are constant. Additional uncertainty will depend on the variation in the unmeasured variables.

Table 5. Flow Performance - Flow Reference Accuracy (Measurement Type D)(1)(2)

3051SFA Annubar Flowmeter				
		Classic (8:1 flow turndown)	**Ultra (8:1 flow turndown)**	**Ultra for Flow (14:1 flow turndown)**
Ranges 2-3		±1.4% of Flow Rate	±0.95% of Flow Rate	±0.80% of Flow Rate
3051SFC Compact Orifice Flowmeter – Conditioning Option C				
		Classic (8:1 flow turndown)	**Ultra (8:1 flow turndown)**	**Ultra for Flow (14:1 flow turndown)**
Ranges 2-3	β =0.4	±1.4% of Flow Rate	±0.9% of Flow Rate	±0.75% of Flow Rate
	β =0.65	±1.65% of Flow Rate	±1.25% of Flow Rate	±1.15% of Flow Rate
3051SFC Compact Orifice Flowmeter – Orifice Type Option P (2-in. to 12-in. line sizes)				
		Classic (8:1 flow turndown)	**Ultra (8:1 flow turndown)**	**Ultra for Flow (14:1 flow turndown)**
Ranges 2-3	β =0.4	±1.80% of Flow Rate	±1.45% of Flow Rate	±1.35% of Flow Rate
	β =0.65	±1.80% of Flow Rate	±1.45% of Flow Rate	±1.35% of Flow Rate
3051SFP Integral Orifice Flowmeter				
		Classic (8:1 flow turndown)	**Ultra (8:1 flow turndown)**	**Ultra for Flow (14:1 flow turndown)**
	β <0.1	±2.70% of Flow Rate	±2.65% of Flow Rate	±2.60% of Flow Rate
Ranges 2-3	0.1< β <0.2	±1.80% of Flow Rate	±1.45% of Flow Rate	±1.40% of Flow Rate
	0.2< β <0.6	±1.50% of Flow Rate	±1.05% of Flow Rate	±0.95% of Flow Rate
	0.6< β <0.8	±2.00% of Flow Rate	±1.70% of Flow Rate	±1.60% of Flow Rate

(1) For Measurement Types 5 - 7, refer to the Reference Accuracy specification for the 3051SMV with Measurement Type P.

(2) These flow measurement accuracies assume a constant density, viscosity, and expansibility factor.

3051SF Dynamic Performance

Total Time Response at 75 °F (24 °C), includes dead time(1)

3051SF_D	3051SF_1, 2, 5, or 6	3051SF_3, 4, or 7
DP Ranges 2-5: 100 ms Range 1: 255 ms Range 0: 700 ms	DP Range 1: 310 ms DP Range 2: 170 ms DP Range 3: 155 ms AP & GP: 240 ms	DP Ranges 2-5: 145 ms DP Range 1: 300 ms DP Range 0: 745 ms

(1) For FOUNDATION fieldbus (output code F), add 52 ms to stated values (not including segment macro-cycle). For option code DA2, add 45 ms (nominal) to stated values.

Dead Time(1)

3051SF_D	3051SF_1-7
45 ms (nominal)	DP: 100 ms AP & GP: 140 ms RTD Interface: 1 s

(1) For option code DA2, dead time is 90 milliseconds (nominal).

Update Rate(1)

3051SF_D	3051SF_1-7	
22 updates per sec.	DP: 22 updates per sec. AP & GP: 11 updates per sec. RTD Interface: 1 update per sec.	Calculated Variables: Mass / Volumetric Flow Rate: 22 updates per sec. Energy Flow Rate: 22 updates per sec. Totalized Flow: 1 update per sec.

(1) Does not apply to Wireless (output code X). See"Wireless Self-Organizing Networks" on page 30 for wireless update rate.

Mounting Position Effects

Models		Ultra, Ultra for Flow, Classic and Classic MV
3051SF_3, 4, 7, or D		Zero shifts up to ±1.25 inH_2O (3,11 mbar), which can be zeroed Span: no effect
3051SF_1, 2, 5, or 6	DP Sensor:	Zero shifts up to ±1.25 inH_2O (3,11 mbar), which can be zeroed Span: no effect
	GP/AP Sensor:	Zero shifts to ±2.5 inH_2O (6,22 mbar), which can be zeroed Span: no effect

Vibration Effect

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).

Power Supply Effect

Less than ±0.005% of calibrated span per volt change in voltage at the transmitter terminals

Electromagnetic Compatibility (EMC)

Meets all relevant requirements of EN 61326 and NAMUR NE-21.(1)(2)

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

(2) 3051SMV and 3051SF_1, 2, 3, 4, 5, 6, 7 requires shielded cable for both temperature and loop wiring.

Transient Protection (Option T1)

Meets IEEE C62.41.2-2002, Location Category B

6 kV crest (0.5 μs - 100 kHz)

3 kA crest (8 × 20 microseconds)

6 kV crest (1.2 × 50 microseconds)

Meets IEEE C37.90.1-2002 Surge Withstand Capability

SWC 2.5 kV crest, 1.0 MHz wave form

3051SF FUNCTIONAL SPECIFICATIONS

Range and Sensor Limits

Flowmeter with Coplanar Sensor Module

Range	DP Sensor (3051SF_3, 4, or 7)	
	Lower (LRL)	Upper (URL)
1	0 inH_2O (0 mbar)	25 inH_2O (62,3 mbar)
2	0 inH_2O (0 bar)	250 inH_2O (0,62 bar)
3	0 inH_2O (0 bar)	1000 inH_2O (2,49 bar)

Flowmeter with MultiVariable Sensor Module

Range	DP Sensor (3051SF1, 2, 5, or 6)	
	Lower (LRL)	Upper (URL)
1	0 inH_2O (0 mbar)	25.0 inH_2O (62,3 mbar)
2	0 inH_2O (0 bar)	250.0 inH_2O (0,62 bar)
3	0 inH_2O (0 bar)	1000.0 inH_2O (2,49 bar)
Range	**Static Pressure Sensor (GP/AP)**	
	Lower (LRL)	**Upper (URL)[1]**
3	GP[2]: -14.2 psig (0,98 bar) AP: 0.5 psia (34,5 mbar)	GP: 800 psig (55,16 bar) AP: 800 psia (55,16 bar)
4	GP[2]: -14.2 psig (0,98 bar) AP: 0.5 psia (34,5 mbar)	GP: 3626 psig (250 bar) AP: 3626 psia (250 bar)

(1) For SP Range 4 with DP Range 1, the URL is 2000 psi (137,9 bar).

(2) Inert Fill: Minimum pressure = 1.5 psia (0,10 bar) or -13.2 psig (-0,91 bar).

Process Temperature RTD Interface (3051SF_1, 3, 5 or 7)[1]

Lower (LRL)	Upper (URL)
-328 °F (-200 °C)	1562 °F (850 °C)

(1) Transmitter is compatible with any Pt 100 RTD sensor. Examples of compatible RTDs include Rosemount Series 68 and 78 RTD Temperature Sensors.

Minimum Span Limits

Transmitter with Coplanar Sensor Module (Single Variable)

Range	DP Sensor (3051SF_D, 3, 4 or 7)	
	Ultra & Ultra for Flow	Classic
1	0.5 inH_2O (1,24 mbar)	0.5 inH_2O (1,24 mbar)
2	1.3 inH_2O (3,11 mbar)	2.5 inH_2O (6,23 mbar)
3	5.0 inH_2O (12,4 mbar)	10.0 inH_2O (24,9 mbar)

Transmitter with MultiVariable Sensor Module

Range	DP Sensor (3051SF_1, 2, 5, or 6)	
	Ultra for Flow	Classic MV
1	0.5 inH_2O (1,24 mbar)	0.5 inH_2O (1,24 mbar)
2	1.3 inH_2O (3,11 mbar)	2.5 inH_2O (6,23 mbar)
3	5.0 inH_2O (12,4 mbar)	10.0 inH_2O (24,9 mbar)
Range	**Static Pressure Sensor (GP/AP)**	
	Ultra for Flow	**Classic MV**
3	4.0 psi (276 mbar)	8.0 psi (522 mbar)
4	18.13 psi (1,25 bar)	36.26 psi (2,50 bar)

Process Temperature RTD Interface (3051SF_1, 3, 5 or 7)

Minimum Span = 50 °F (28 °C)

Service

3051SF_5, 6, 7, or D (Direct Process Variable Output):

Liquid, gas, and steam applications

3051SF_1, 2, 3, or 4 (Mass and Energy Flow Output):

Some fluid types are only supported by certain measurement types

Fluid Compatibility with Pressure and Temperature Compensation • Available — Not available

Ordering Code		Fluid Types			
	Measurement Type	Liquids	Saturated Steam	Superheated Steam	Gas and Natural Gas
1	DP / P/ T (Full Compensation)	•	•	•	•
2	DP / P	•	•	•	•
3	DP / T	•	•	—	—
4	DP only	•	•	—	—

4–20 mA/HART

Zero and Span Adjustment

Zero and span values can be set anywhere within the range. Span must be greater than or equal to the minimum span.

Output

Two-wire 4–20 mA is 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.

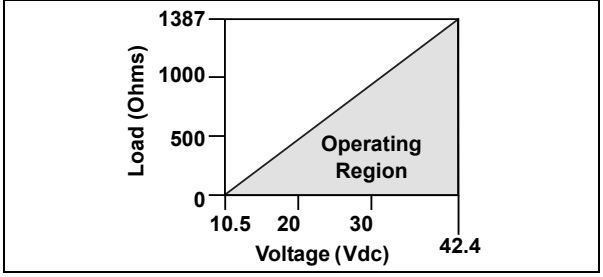
- 3051SF_D: 10.5 to 42.4 Vdc with no load
- 3051SF_D with Advanced HART Diagnostics Suite: 12 to 42.4 Vdc with no load
- 3051SF_1-7: 12 to 42.4 Vdc with no load

Load Limitations

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

3051SF_D

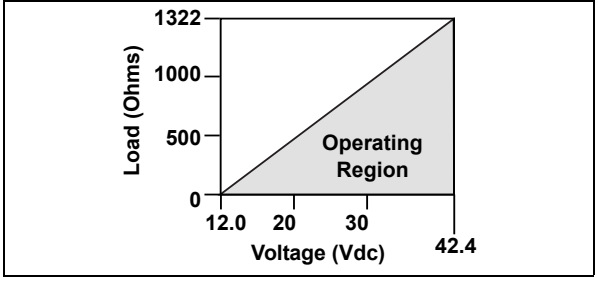
Maximum Loop Resistance = 43.5 * (Power Supply Voltage – 10.5)



The HART communicator requires a minimum loop resistance of 250Ω for communication.

3051SF_1-7 and 3051SF_D with HART Diagnostics (option code DA2)

Maximum Loop Resistance = 43.5 * (Power Supply Voltage – 12.0)



The HART communicator requires a minimum loop resistance of 250Ω for communication.

Advanced HART Diagnostics Suite (Option Code DA2)

The 3051SF provides Abnormal Situation Prevention indication for a breakthrough in diagnostic capability. The 3051SF ASP Diagnostics Suite for HART includes Statistical Process Monitoring (SPM), variable logging with time stamp and advanced process alerts. The enhanced EDDL graphic display provides an intuitive and user-friendly interface to better visualize these diagnostics.

The integral SPM technology calculates the mean and standard deviation of the process variable 22 times per second and makes them available to the user. The 3051SF uses 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). Variable logging with time stamp and advanced process alerts capture valuable process and sensor data to enable quick troubleshooting of application and installation issues.

FOUNDATION fieldbus

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)

FOUNDATION fieldbus Parameters

Schedule Entries	14 (max.)
Links	30 (max.)
Virtual Communications Relationships (VCR)	20 (max.)

Standard Function Blocks

Resource Block

- Contains hardware, electronics, and diagnostic information.

Transducer Block

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

LCD Block

- Configures the local display.

2 Analog Input Blocks

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

PID Block with Auto-tune

- Contains all logic to perform PID control in the field including cascade and feedforward. Auto-tune capability allows for superior tuning for optimized control performance.

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.

Software Upgrade in the Field

Software for the 3051SF with FOUNDATION fieldbus is easy to upgrade in the field using the FOUNDATION fieldbus Common Device Software Download procedure.

PlantWeb Alerts

Enable the full power of the PlantWeb digital architecture by diagnosing instrumentation issues, communicating advisory, maintenance, and failure details, and recommending a solution.

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 Bock

- 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.

Output Splitter Block

- Splits the output of one PID or other control block so that the PID will control two valves or other actuators.

Control Selector Block

- Selects one of up to three inputs (highest, middle, or lowest) that are normally connected to the outputs of PID or other control function blocks.

Block	Execution Time
Resource	-
Transducer	-
LCD Block	-
Analog Input 1, 2	20 milliseconds
PID with Auto-tune	35 milliseconds
Input Selector	20 milliseconds
Arithmetic	20 milliseconds
Signal Characterizer	20 milliseconds
Integrator	20 milliseconds
Output Splitter	20 milliseconds
Control Selector	20 milliseconds

Fully Compensated Mass Flow Block (Option Code H01)

Calculates fully compensated mass flow based on differential pressure with external process pressure and temperature measurements over the fieldbus segment. Configuration for the mass flow calculation is easily accomplished using the Rosemount Engineering Assistant.

ASP Diagnostics Suite for FOUNDATION fieldbus (Option Code D01)

The 3051SF ASP Diagnostics Suite for FOUNDATION fieldbus provides Abnormal Situation Prevention indication and enhanced EDDL graphic displays for easy visual analysis.

The integral Statistical Process Monitoring (SPM) technology calculates the mean and standard deviation of the process variable 22 times per second and makes them available to the user. The 3051SF uses 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).

Wireless Self-Organizing Networks

Output

WirelessHART, 2.4 GHz DSSS.

Local Display

The optional five-digit LCD can display user-selectable information such as primary variable in engineering units, percent of range, sensor module temperature, and electronics temperature. Display updates at up to once per minute.

Update Rate

WirelessHART, user selectable 8 sec. to 60 min.

Power Module

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

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

Overpressure Limits

Transmitters withstand the following limits without damage:

Coplanar Sensor Module (Single Variable)

Range	DP[1]
	3051SF_3, 4, 7, or D
1	2000 psi (137,9 bar)
2	3626 psi (250,0 bar)
3	3626 psi (250,0 bar)

(1) The overpressure limit of a DP Sensor with the P9 option is 4500 psig (310,3 bar). The overpressure limit of a DP Sensor with the P0 option is 6092 psig (420 bar).

Coplanar MultiVariable Sensor Module (3051SF_1, 2, 5, or 6)

Static Pressure	Differential Pressure		
	Range 1	Range 2	Range 3
Range 3 GP/AP	1600 psi (110,3 bar)	1600 psi (110,3 bar)	1600 psi (110,3 bar)
Range 4 GP/AP	2000 psi (137,9 bar)	3626 psi (250 bar)	3626 psi (250 bar)

Static Pressure Limits

Coplanar Sensor Module

Operates within specifications between static line pressures of:

Range	DP Sensor[1]
	3051SF_3, 4, 7, or D
1	0.5 psia to 2000 psig (0,03 to 137,9 bar)
2	0.5 psia to 3626 psig (0,03 to 150 bar)
3	0.5 psia to 3626 psig (0,03 to 150 bar)

(1) The static pressure limit of a DP Sensor with the P9 option is 4500 psig (310,3 bar). The static pressure limit of a DP Sensor with the P0 option is 6092 psig (420 bar).

Coplanar MultiVariable Sensor Module (3051SF_1, 2, 5, or 6)

Operates within specifications between static line pressures of 0.5 psia (0,03 bar) and the values in the table below:

Static Pressure	Differential Pressure		
	Range 1	Range 2	Range 3
Range 3 GP/AP	800 psi (57,91 bar)	800 psi (57,91 bar)	800 psi (57,91 bar)
Range 4 GP/AP	2000 psi (137,9 bar)	3626 psi (250 bar)	3626 psi (250 bar)

Burst Pressure Limits

Coplanar Sensor Module

10000 psig (689,5 bar)

Temperature Limits

Ambient

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

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

Storage

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

Process Temperature Limits

For 3051SFA Temperature Limits, see page 91.
For 3051SFC Temperature Limits, see page 103.
For 3051SFP Temperature Limits, see page 111.

At atmospheric pressures and above:

Humidity Limits

0–100% relative humidity

Turn-On Time(1)

When power is applied to the transmitter during startup, performance will be within specifications per the time period described below:

Transmitter	Turn-On Time (Typical)
3051S, 3051SF_D	2 seconds
Diagnostics	5 seconds
3051SMV, 3051SF_1-7	5 seconds

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

Volumetric Displacement

Less than 0.005 in^3 (0,08 cm^3)

Damping(1)

Analog output response time to a step change is user-selectable from 0 to 60 seconds for one time constant. For 3051SF_1-7, each variable can be individually adjusted. Software damping is in addition to sensor module response time.

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

Failure Mode Alarm

HART 4-20 mA (output option code A)

If self-diagnostics detect a gross transmitter failure, the analog signal will be driven offscale to alert the user. Rosemount standard (default), NAMUR, and custom alarm levels are available (see Alarm Configuration below).

High or low alarm signal is software-selectable or hardware-selectable via the optional switch (option D1).

Alarm Configuration

	High Alarm	Low Alarm
Default	≥ 21.75 mA	≤ 3.75 mA
NAMUR compliant(1)	≥ 22.5 mA	≤ 3.6 mA
Custom levels(2)	20.2 - 23.0 mA	3.4 - 3.8 mA

(1) Analog output levels are compliant with NAMUR recommendation NE 43, see option codes C4 or C5.

(2) Low alarm must be 0.1 mA less than low saturation and high alarm must be 0.1 mA greater than high saturation.

Safety-Certified Transmitter Failure Values(1)

Safety accuracy: 2.0%(2)

Safety response time: 1.5 seconds

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

(2) A 2% variation of the transmitter mA output is allowed before a safety trip. Trip values in the DCS or safety logic solver should be derated by 2%.

PHYSICAL SPECIFICATIONS

Electrical Connections

1/2–14 NPT, G1/2, and M20 × 1.5 conduit. HART interface connections fixed to terminal block for Output code A and X.

Process Connections

Coplanar Sensor Module	
Standard	1/4-18 NPT on 2 1/8-in. centers

Process-Wetted Parts

For 3051SFA wetted parts, see “Annubar Sensor Material” on page 92.
For 3051SFC wetted parts, see “Material of Construction” on page 104.
For 3051SFP wetted parts, see “Material of Construction” on page 111.

Process Isolating Diaphragms

Coplanar Sensor Module
316L SST (UNS S31603), Alloy C-276 (UNS N10276), Alloy 400 (UNS N04400), Tantalum (UNS R05440), Gold-Plated Alloy 400, Gold-plated 316L SST

Drain/Vent Valves

316 SST, Alloy C-276, or Alloy 400/K-500 material
(Drain vent seat: Alloy 400, Drain vent stem: Alloy K-500)

Process Flanges and Adapters

Plated carbon steel
SST: CF-8M (Cast 316 SST) per ASTM A743
Cast C-276: CW-12MW per ASTM A494
Cast Alloy 400: M-30C per ASTM A494

Non-Wetted Parts

Electronics Housing

Low-copper aluminum alloy or CF-8M (Cast 316 SST)
NEMA 4X, IP 66, IP 68 (66 ft (20 m) for 168 hours)
Note: IP 68 not available with Wireless Output.

Paint for Aluminum Housing

Polyurethane

Coplanar Sensor Module Housing

SST: CF-3M (Cast 316L SST)

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

Sensor Module Fill Fluid

Silicone or inert halocarbon

Cover O-rings

Buna-N

Wireless Antenna

PBT/ polycarbonate (PC) integrated omnidirectional antenna

Power Module

Field replaceable, keyed connection eliminates the risk of incorrect installation, Intrinsically Safe Lithium-thionyl chloride Power Module with PBT enclosure

3051SF Measurement Type 1-7 Certifications

Approved Manufacturing Locations

Rosemount Inc. — Chanhassen, Minnesota USA

Emerson Process Management GmbH & Co. — Wessling, Germany

Emerson Process Management Asia Pacific Private Limited — Singapore

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

Ordinary Location Certification for FM

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

European Directive Information

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

ATEX Directive (94/9/EC)

Emerson Process Management complies with the ATEX Directive.

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

Models with Differential Pressure Ranges = 2 to 4 inclusive with All other Model 3051SF with Measurement Type 1-7 Pressure Transmitters
— Sound Engineering Practice

Transmitter Attachments: Process Flange - Manifold
— Sound Engineering Practice

Primary Elements, Flowmeter
— See appropriate Primary Element QIG

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

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

Hazardous Locations Certifications

North American Certifications

FM Approvals

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

I5 Intrinsically Safe for use in Class I, Division 1, Groups A, B, C, and D; Class II, Division 1, Groups E, F, and G; Class III, Division 1; Class I, Zone 0 AEx ia IIC when connected in accordance with Rosemount drawing 03151-1206;
Non-incendive for Class I, Division 2, Groups A, B, C, and D Enclosure Type 4X
For entity parameters see control drawing 03151-1206.

Canadian Standards Association (CSA)

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

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

I6 Intrinsically Safe for Class I, Division 1, Groups A, B, C, and D when connected in accordance with Rosemount drawings 03151-1207;
For entity parameters see control drawing 03151-1207.

European Certifications

I1 ATEX Intrinsic Safety
Certificate No.: 08ATEX0064X ⟨Ex⟩ II 1G
Ex ia IIC T4 (T_a = -60 °C to 70 °C) -HART
CE 1180

Input Parameters

Loop / Power	Groups
U_i = 30 V	HART
I_i = 300 mA	HART
P_i = 1.0 W	HART
C_i = 14.8 nF	HART
L_i = 0	HART

Special conditions for safe use (x)

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

N1 ATEX Type n
Certificate No.: Baseefa 08ATEX0065X ⟨Ex⟩ II 3 G
Ex nA nL IIC T4 (T_a = -40 °C TO 70 °C)
Ui = 45 Vdc max
IP66
CE

Special conditions for safe use (x)

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

ND ATEX Dust
Certificate No.: BAS01ATEX1303X ⟨Ex⟩ II 1 D
T105°C (-20 °C ≤ T_{amb} ≤ 85 °C)
V_{max} = 42.4 volts max
A = 24 mA
IP66
CE 1180

Special conditions for safe use (x)

1. The user must ensure that the maximum rated voltage and current (42.4 volts, 22 milliampere, DC) are not exceeded. All connections to other apparatus or associated apparatus shall have control over this voltage and current equivalent to a category “ib” circuit according to EN 60079-11.
2. Cable entries must be used which maintain the ingress protection of the enclosure to at least IP66.
3. Unused cable entries must be filled with suitable blanking plugs which maintain the ingress protection of the enclosure to at least IP66.
4. Cable entries and blanking plugs must be suitable for the ambient range of the apparatus and capable of withstanding a 7J impact test.
5. The 3051SF with Measure Type 1-7 must be securely screwed in place to maintain the ingress protection of the enclosure. (The 3051SF with Measure Type 1-7 SuperModule must be properly assembled to the 3051SF with Measure Type 1-7 housing to maintain ingress protection.)

E1 ATEX Flameproof
Certificate No.: KEMA 00ATEX2143X ⟨Ex⟩ II 1/2 G
Ex d IIC T6 (-50 °C ≤ T_{amb} ≤ 65 °C)
Ex d IIC T5 (-50 °C ≤ T_{amb} ≤ 80 °C)
V_{max} = 42.4V
CE 1180

Special conditions for safe use (x)

1. Appropriate ex d blanking plugs, 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. The 3051SF with Measure Type 1-7 does not comply with the requirements of IEC 60079-1 Clause 5.2, Table 2 for all joints. Contact Emerson Process Management for information on the dimensions of flameproof joints.

Japanese Certifications

E4 TIIS Flameproof
Consult factory for availability

I4 TIIS Intrinsically Safe
Consult factory for availability

China (NEPSI) Certifications

E3 China Flameproof
Ex d II B+H_2T3~T5

I3 China Intrinsic Safety
Ex ia IIC T3/T4

IECEx Certifications

I7 IECEx Intrinsic Safety
Certificate No.: IECExBAS08.0025X
Ex ia IIC T4 (T_a = -60 °C to 70 °C) -HART
IP66

Input Parameters

Loop / Power	Groups
U_i = 30 V	HART
I_i = 300 mA	HART
P_i = 1.0 W	HART
C_i = 14.8 nF	HART
L_i = 0	HART

Special conditions for safe use (x)

The 3051SF with Measure Type 1-7 HART 4-20mA is not capable of withstanding the 500V test as defined in clause 6.3.12 of IEC 60079-11. This must be taken into account during installation.

N7 IECEx Type n
Certificate No.: IECExBAS08.0026X
Ex nAnL IIC T4 (Ta = -40 °C to 70 °C)
Ui = 45 Vdc MAX
IP66

Special conditions for safe use (x)

The apparatus is not capable of withstanding the 500 V insulation test required by Clause 6.8.1 of IEC 60079-15.

E7 IECEx Flameproof
Certificate No.: IECExKEM08.0010X
Ex d IIC T6 (-50 °C ≤ T_{amb} ≤ 65 °C)
Ex d IIC T5 (-50 °C ≤ T_{amb} ≤ 80 °C)
V_{max} = 42.4V

Special conditions for safe use (x)

1. Appropriate ex d blanking plugs, 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. The 3051SF with Measure Type 1-7 does not comply with the requirements of IEC 60079-1 Clause 5.2, Table 2 for all joints. Contact Emerson Process Management for information on the dimensions of flameproof joints.

Combinations of Certifications

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

K1 Combination of E1, I1, N1, and ND
K2 Combination of E2 and I2
K4 Combination of E4 and I4
K5 Combination of E5 and I5
K6 Combination of E6 and I6
K7 Combination of E7, I7, and N7
KA Combination of E1, E6, I1, and I6
KB Combination of E5, E6, I5, and I6
KC Combination of E5, E1, I5 and I1
KD Combination of E5, E6, E1, I5, I6, and I1

3051SF Measurement Type D Certifications

Approved Manufacturing Locations

Rosemount Inc. — Chanhassen, Minnesota USA

Emerson Process Management GmbH & Co. — Wessling, Germany

Emerson Process Management Asia Pacific Private Limited — Singapore

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

Emerson Process Management LTDA — Sorocaba, Brazil

Emerson Process Management (India) Pvt. Ltd. — Daman, India

Ordinary Location Certification for FM

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

European Directive Information

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

ATEX Directive (94/9/EC)

Emerson Process Management complies with the ATEX Directive.

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

Models 3051S_CA4; 3051S_CD2, 3, 4, 5; *(also with P9 option)*
Pressure Transmitters — QS Certificate of Assessment - EC No. PED-H-100, Module H Conformity Assessment

All other Model 3051S Pressure Transmitters — Sound Engineering Practice

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

Primary Elements, Flowmeter — See appropriate Primary Element QIG

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

EN 61326-1:1997 + A1, A2, and A3 – Industrial

Radio and Telecommunications Terminal Equipment Directive (R&TTE)(1999/5/EC)

Emerson Process Management complies with the R&TTE Directive.

HART & FOUNDATION fieldbus Hazardous Locations Certifications

North American Certifications

FM Approvals

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

I5/IE Intrinsically Safe for use in Class I, Division 1, Groups A, B, C, and D; Class II, Division 1, Groups E, F, and G; Class III, Division 1; Class I, Zone 0 AEx ia IIC when connected in accordance with Rosemount drawing 03151-1006;
Non-Incendive for Class I, Division 2, Groups A, B, C, and D
Enclosure Type 4X
For entity parameters see control drawing 03151-1006.

Canadian Standards Association (CSA)

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

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

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

European Certifications

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

Input Parameters

Loop / Power	Groups
U_i = 30 V	HART / FOUNDATION fieldbus/ Remote Display / Quick Connect / HART Diagnostics
U_i = 17.5 V	FISCO
I_i = 300 mA	HART / FOUNDATION fieldbus/ Remote Display / Quick Connect / HART Diagnostics
I_i = 380 mA	FISCO
P_i = 1.0 W	HART / Remote Display / Quick Connect / HART Diagnostics
P_i = 1.3 W	FOUNDATION fieldbus
P_i = 5.32 W	FISCO
C_i = 30 nF	SuperModule Platform / Quick Connect
C_i = 11.4 nF	HART / HART Diagnostics
C_i = 0	FOUNDATION fieldbus / Remote Display / FISCO
L_i = 0	HART / FOUNDATION fieldbus/ FISCO / Quick Connect / HART Diagnostics
L_i = 60 µH	Remote Display

Special conditions for safe use (x)

1. The apparatus, excluding the Types 3051 S-T and 3051 S-C (In-line and Coplanar SuperModule Platforms respectively), is not capable of withstanding the 500V test as defined in Clause 6.4.12 of EN 50020. This must be considered during installation.
2. The terminal pins of the Types 3051 S-T and 3051 S-C must be protected to IP20 minimum.

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

Special conditions for safe use (x)

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

ND ATEX Dust
Certificate No.: BAS01ATEX1374X ⟨Ex⟩ II 1 D
T105°C (-20 °C ≤ T_{amb} ≤ 85 °C)
V_{max} = 42.4 volts max
A = 22 mA
IP66
CE 1180

Special conditions for safe use (x)

1. The user must ensure that the maximum rated voltage and current (42.4 volts, 22 milliampere, DC) are not exceeded. All connections to other apparatus or associated apparatus shall have control over this voltage and current equivalent to a category “ib” circuit according to EN 50020.
2. Cable entries must be used which maintain the ingress protection of the enclosure to at least IP66.
3. Unused cable entries must be filled with suitable blanking plugs which maintain the ingress protection of the enclosure to at least IP66.
4. Cable entries and blanking plugs must be suitable for the ambient range of the apparatus and capable of withstanding a 7J impact test.
5. The 3051S must be securely screwed in place to maintain the ingress protection of the enclosure. (The 3051S SuperModule must be properly assembled to the 3051S housing to maintain ingress protection.)

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

Special conditions for safe use (x)

1. Appropriate ex d blanking plugs, 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. The 3051S does not comply with the requirements of EN 60079-1 Clause 5.2, Table 2 for all joints. Contact Emerson Process Management for information on the dimensions of flameproof joints.

Japanese Certifications

E4 TIIS Flameproof
Ex d IIC T6

Certificate	Description
TC15682	Coplanar with Junction Box Housing
TC15683	Coplanar with PlantWeb Housing
TC15684	Coplanar with PlantWeb Housing and LCD Display
TC15685	In-Line SST with Junction Box Housing
TC15686	In-Line Alloy C-276 with Junction Box Housing
TC15687	In-Line SST with PlantWeb Housing
TC15688	In-Line Alloy C-276 with PlantWeb Housing
TC15689	In-Line SST with PlantWeb Housing and LCD Display
TC15690	In-Line Alloy C-276 with PlantWeb Housing and LCD Display
TC17102	Remote Display

China (NEPSI) Certifications

I3 China Intrinsic Safety
Certificate No. (manufactured in Chanhassen, MN): GYJ081078
Certificate No. (manufactured in Singapore): GYJ06367
Ex ia IIC T3~T5

Input Parameters

Loop / Power	Groups
U_i = 30 V	HART / FOUNDATION fieldbus/ Remote Display / Quick Connect / HART Diagnostics
U_i = 17.5 V	FISCO
I_i = 300 mA	HART / FOUNDATION fieldbus/ Remote Display / Quick Connect / HART Diagnostics
I_i = 380 mA	FISCO
P_i = 1.0 W	HART / Remote Display / Quick Connect / HART Diagnostics
P_i = 1.3 W	FOUNDATION fieldbus
P_i = 5.32 W	FISCO
C_i = 30 nF	SuperModule Platform / Quick Connect
C_i = 11.4 nF	HART / HART Diagnostics
C_i = 0	FOUNDATION fieldbus / Remote Display / FISCO
L_i = 0	HART / FOUNDATION fieldbus/ FISCO / Quick Connect / HART Diagnostics
L_i = 60 µH	Remote Display

E3 China Flameproof
Certificate No.: GYJ06366
Ex d IIB+H_2 T3~T5

IECEx Certifications

E7 IECEx Flameproof
Certificate No.: IECExKEM08.0010X
Ex d IIC T6 (-50 °C ≤ T_{amb} ≤ 65 °C)
Ex d IIC T5 (-50 °C ≤ T_{amb} ≤ 80 °C)
V_{max} = 42.4V

Special conditions for safe use (x)

1. Appropriate ex d blanking plugs, 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. The 3051S does not comply with the requirements of IEC 60079-1 Clause 5.2, Table 2 for all joints. Contact Emerson Process Management for information on the dimensions of flameproof joints.

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

Input Parameters

Loop / Power	Groups
U_i = 30 V	HART / FOUNDATION fieldbus/ Remote Display / Quick Connect / HART Diagnostics
U_i = 17.5 V	FISCO
I_i = 300 mA	HART / FOUNDATION fieldbus/ Remote Display / Quick Connect / HART Diagnostics
I_i = 380 mA	FISCO
P_i = 1.0 W	HART / Remote Display / Quick Connect / HART Diagnostics
P_i = 1.3 W	FOUNDATION fieldbus
P_i = 5.32 W	FISCO
C_i = 30 nF	SuperModule Platform / Quick Connect
C_i = 11.4 nF	HART / HART Diagnostics
C_i = 0	FOUNDATION fieldbus / Remote Display / FISCO / Quick Connect / HART Diagnostics
L_i = 0	HART / FOUNDATION fieldbus / FISCO / Quick Connect / HART Diagnostics
L_i = 60 µ H	Remote Display

Special conditions for safe use (x)

1. The Models 3051S HART 4-20mA, 3051S fieldbus, 3051S Profibus and 3051S FISCO are not capable of withstanding the 500V test as defined in clause 6.4.12 of IEC 60079-11. This must be taken into account during installation.
2. The terminal pins of the Types 3051S-T and 3051S-C must be protected to IP20 minimum.

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

Combinations of Certifications

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

K1 Combination of E1, I1, N1, and ND
K2 Combination of E2 and I2
K5 Combination of E5 and I5
K6 Combination of E6 and I6
K7 Combination of E7, I7, and N7
KA Combination of E1, I1, E6, and I6
KB Combination of E5, I5, I6 and E6
KC Combination of E5, E1, I5 and I1
KD Combination of E5, I5, E6, I6, E1, and I1

3051SF Wireless Certifications

Approved Manufacturing Locations

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

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 Approvals

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 and 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 20cm from all persons.

Ordinary Location Certification for FM

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

European Directive Information

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

ATEX Directive (94/9/EC)

Emerson Process Management complies with the ATEX Directive.

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

Models 3051S_CA4; 3051S_CD2, 3, 4, 5; *(also with P9 option)*
Pressure Transmitters — QS Certificate of Assessment - EC No. PED-H-100, Module H Conformity Assessment

All other Model 3051S Pressure Transmitters
— Sound Engineering Practice

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

Primary Elements, Flowmeter
— See appropriate Primary Element QIG

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

EN 61326-1:1997 A1, A2, A3(1)
EN 61326-1:2006
EN 61326-2-3:2006

(1) Only applies to "Operating Frequency and Protocol" option code 1.

Radio and Telecommunications Terminal Equipment Directive (R&TTE)(1999/5/EC)

Emerson Process Management complies with the R&TTE Directive.

Hazardous Locations Certifications

North American Certifications

Factory Mutual (FM) Approvals

I5 FM Intrinsically Safe, Non-Incendive, and Dust Ignition-proof.
Intrinsically Safe for Class I/II/III, Division 1, Groups A, B, C, D, E, F, and G.
Zone Marking: Class I, Zone 0, AEx ia IIC
Temperature Codes T4 (T_{amb} = -50 to 70° C)
Non-Incendive for Class I, Division 2, Groups A, B, C, and D.
Dust Ignition-proof for Class II/III, Division 1, Groups E, F, and G.
Ambient temperature limits: -50 to 85° C
For use with Rosemount SmartPower options 00753-9220-0001 only.
Enclosure Type 4X / IP66

CSA - Canadian Standards Association

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

I6 CSA Intrinsically Safe
Intrinsically Safe for Class I, Division 1, Groups A, B, C, and D.
Temp Code T3C
Enclosure Type 4X / IP66
For use with Rosemount SmartPower options 00753-9220-0001 only.

European Certifications

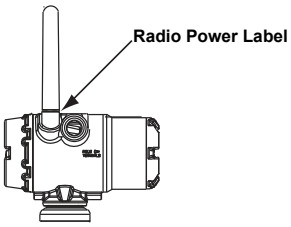
I1 ATEX Intrinsic Safety
Certificate No.: BAS01ATEX1303X ⟨Ex⟩ II 1G
Ex ia IIC T4 (T_a = -60 °C to 70 °C)
IP66
For use with Rosemount SmartPower options
00753-9220-0001 only.
CE 1180

CE ①

Country[1]	Restriction
Bulgaria	General authorization required for outdoor use and public service
France	Outdoor use limited to 10mW e.i.r.p.
Italy	If used outside of own premises, general authorization is required.
Norway	May be restricted in the geographical area within a radius of 20 km from the center of Ny-Alesund.
Romania	Use on a secondary basis. Individual license required.

(1) Only applies to "Operating Frequency and Protocol" option code 1.

Radio Power Label indicates output power configuration of the radio. Devices with this label are configured for output power less than 10 mW e.i.r.p. At time of purchase the customer must specify ultimate country of installation and operation.



IECEx Certifications

I7 IECEx Intrinsic Safety
Certificate No.: IECEx BAS 04.0017X
Ex ia IIC T4 (Ta = -60 °C to 70 °C)
For use with Rosemount SmartPower options
00753-9220-0001 only.
IP66

Rosemount 3051CF Flowmeter Series

Rosemount 3051CF Flowmeters combine the proven 3051C pressure transmitter and the latest primary element technology: Annubar Averaging Pitot Tube, Compact Conditioning Orifice Plate, and Integral Orifice Plate.

Additional Information
Specifications: page 56
Certifications: page 60
Dimensional Drawings: page 121
Installation and Flowmeter Orientation: page 151

Rosemount 3051CFA
Annubar Flowmeter

Table 6. Rosemount 3051CFA Annubar Flowmeter 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	
3051CFA	Annubar Flowmeter	
Measurement Type		
Standard		**Standard**
D	Differential Pressure	★
Fluid Type		
Standard		**Standard**
L	Liquid	★
G	Gas	★
S	Steam	★
Line Size		
Standard		**Standard**
020	2-in. (50 mm)	★
025	2 1/2-in. (63.5 mm)	★
030	3-in. (80 mm)	★
035	3 1/2-in. (89 mm)	★
040	4-in. (100 mm)	★
050	5-in. (125 mm)	★
060	6-in. (150 mm)	★
070	7-in. (175 mm)	★
080	8-in. (200 mm)	★
100	10-in. (250 mm)	★
120	12-in. (300 mm)	★
Expanded		
140	14-in. (350 mm)	
160	16-in. (400 mm)	
180	18-in. (450 mm)	
200	20-in. (500 mm)	
240	24-in. (600 mm)	
300	30-in. (750 mm)	
360	36-in. (900 mm)	
420	42-in. (1066 mm)	
480	48-in. (1210 mm)	
600	60-in. (1520 mm)	

Table 6. Rosemount 3051CFA Annubar Flowmeter 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.

720	72-in. (1820 mm)	
780	78-in (1950 mm)	
840	84-in. (2100 mm)	
900	90-in. (2250 mm)	
960	96-in (2400 mm)	
Pipe I.D. Range		
Standard		**Standard**
C	Range C from the Pipe I.D. table	★
D	Range D from the Pipe I.D. table	★
Expanded		
A	Range A from the Pipe I.D. table	
B	Range B from the Pipe I.D. table	
E	Range E from the Pipe I.D. table	
Z	Non-standard Pipe I.D. Range or Line Sizes greater than 12 inches	
Pipe Material / Mounting Assembly Material		
Standard		**Standard**
C	Carbon steel (A105)	★
S	316 Stainless Steel	★
0[(1)]	No Mounting (Customer Supplied)	★
Expanded		
G	Chrome-Moly Grade F-11	
N	Chrome-Moly Grade F-22	
J	Chrome-Moly Grade F-91	
Piping Orientation		
Standard		**Standard**
H	Horizontal Piping	★
D	Vertical Piping with Downwards Flow	★
U	Vertical Piping with Upwards Flow	★
Annubar Type		
Standard		**Standard**
P	Pak-Lok	★
F	Flanged with opposite side support	★
Expanded		
L	Flange-Lok	
G	Gear-Drive Flo-Tap	
M	Manual Flo-Tap	
Sensor Material		
Standard		**Standard**
S	316 Stainless Steel	★
Expanded		
H	Alloy C-276	
Sensor Size		
Standard		**Standard**
1	Sensor size 1 — Line sizes 2-in. (50 mm) to 8-in. (200 mm)	★
2	Sensor size 2 — Line sizes 6-in. (150 mm) to 96-in. (2400 mm)	★
3	Sensor size 3 — Line sizes greater than 12-in. (300 mm)	★
Mounting Type		
Standard		**Standard**
T1	Compression or Threaded Connection	★
A1	150# RF ANSI	★
A3	300# RF ANSI	★
A6	600# RF ANSI	★
D1	DN PN16 Flange	★

Table 6. Rosemount 3051CFA Annubar Flowmeter 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.

D3	DN PN40 Flange			★
D6	DN PN100 Flange			★
Expanded				
A9[(2)]	900# RF ANSI			
AF[(2)]	1500# RF ANSI			
AT[(2)]	2500 # RF ANSI			
R1	150# RTJ Flange			
R3	300# RTJ Flange			
R6	600# RTJ Flange			
R9[(2)]	900# RTJ Flange			
RF[(2)]	1500# RTJ Flange			
RT[(2)]	2500# RTJ Flange			
Opposite Side Support or Packing Gland				
Standard				**Standard**
0	No opposite side support or packing gland (Required for Pak-Lok and Flange-Lok models)			★
	Opposite Side Support – Required for Flanged Models			
C	NPT Threaded Opposite Support Assembly – Extended Tip			★
D	Welded Opposite Support Assembly – Extended Tip			★
Expanded				
	Packing Gland – Required for Flo-Tap Models			
	Packing Gland Material	*Rod Material*	*Packing Material*	
J	Stainless Steel Packing Gland / Cage Nipple	Carbon Steel	PTFE	
K	Stainless Steel Packing Gland / Cage Nipple	Stainless Steel	PTFE	
L	Stainless Steel Packing Gland / Cage Nipple	Carbon Steel	Graphite	
N	Stainless Steel Packing Gland / Cage Nipple	Stainless Steel	Graphite	
R	Alloy C-276 Packing Gland / Cage Nipple	Stainless Steel	Graphite	
Isolation Valve for Flo-Tap Models				
Standard				**Standard**
0[(1)]	Not Applicable or Customer Supplied			★
Expanded				
1	Gate Valve, Carbon Steel			
2	Gate Valve, Stainless Steel			
5	Ball Valve, Carbon Steel			
6	Ball Valve, Stainless Steel			
7	Ball Valve, Alloy C-276			
Temperature Measurement				
Standard				**Standard**
T	Integral RTD – not available with Flanged model greater than class 600#			★
0	No Temperature Sensor			★
Expanded				
R	Remote Thermowell and RTD			
Transmitter Connection Platform				
Standard				**Standard**
3	Direct-mount, Integral 3-valve Manifold– not available with Flanged model greater than class 600			★
5	Direct -mount, 5-valve Manifold – not available with Flanged model greater than class 600			★
7	Remote-mount NPT Connections ($^1/_2$-in. NPT)			★
Expanded				
6	Direct-mount, high temperature 5-valve Manifold – not available with Flanged model greater than class 600			
8	Remote-mount SW Connections ($^1/_2$-in.)			
Differential Pressure Range				
Standard				**Standard**
1	0 to 25 in H_2O (0 to 62,3 mbar)			★
2	0 to 250 in H_2O (0 to 623 mbar)			★
3	0 to 1000 in H_2O (0 to 2,5 bar)			★

Table 6. Rosemount 3051CFA Annubar Flowmeter 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			
Standard			**Standard**
A	4–20 mA with digital signal based on HART Protocol		★
F	FOUNDATION fieldbus Protocol		★
W	Profibus-PA Protocol		★
Expanded			
M[3]	Low-Power, 1-5 V dc with Digital Signal Based on HART Protocol		
Transmitter Housing Material[4]		**Conduit Entry Size**	
Standard			**Standard**
A	Aluminum	1/2-14 NPT	★
B	Aluminum	M20 x 1.5	★
J	SST	1/2-14 NPT	★
K	SST	M20 x 1.5	★
Expanded			
D	Aluminum	G1/2	
M	SST	G1/2	
Transmitter Performance Class			
Standard			**Standard**
1	1.6% flow rate accuracy, 8:1 flow turndown, 5-yr. stability		★

Options (Include with selected model number)

Pressure Testing		
Expanded		
P1[5]	Hydrostatic Testing with Certificate	
PX[5]	Extended Hydrostatic Testing	
Special Cleaning		
Expanded		
P2	Cleaning for Special Services	
PA	Cleaning per ASTM G93 Level D (Section 11.4)	
Material Testing		
Expanded		
V1	Dye Penetrant Exam	
Material Examination		
Expanded		
V2	Radiographic Examination	
Flow Calibration		
Expanded		
W1	Flow Calibration (Average K)	
Special Inspection		
Standard		**Standard**
QC1	Visual & Dimensional Inspection with Certificate	★
QC7	Inspection & Performance Certificate	★
Surface Finish		
Standard		**Standard**
RL	Surface finish for Low Pipe Reynolds # in Gas & Steam	★
RH	Surface finish for High Pipe Reynolds # in Liquid	★
Material Traceability Certification		
Standard		**Standard**
Q8[6]	Material Traceability Certification per EN 10474:2004 3.1	★
Code Conformance[7]		
Expanded		
J2	ANSI/ASME B31.1	
J3	ANSI/ASME B31.3	

Table 6. Rosemount 3051CFA Annubar Flowmeter 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 Conformance		
Expanded		
J5[8]	NACE MR-0175 / ISO 15156	
Country Certification		
Standard		**Standard**
J6	European Pressure Directive (PED)	★
Expanded		
J1	Canadian Registration	
Installed in Flanged Pipe Spool Section		
Expanded		
H3	150# Flanged Connection with Rosemount Standard Length and Schedule	
H4	300# Flanged Connection with Rosemount Standard Length and Schedule	
H5	600# Flanged Connection with Rosemount Standard Length and Schedule	
Instrument Connections for Remote Mount Options		
Standard		**Standard**
G2	Needle Valves, Stainless Steel	★
G6	OS&Y Gate Valve, Stainless Steel	★
Expanded		
G1	Needle Valves, Carbon Steel	
G3	Needle Valves, Alloy C-276	
G5	OS&Y Gate Valve, Carbon Steel	
G7	OS&Y Gate Valve, Alloy C-276	
Special Shipment		
Standard		**Standard**
Y1	Mounting Hardware Shipped Separately	★
Special Dimensions		
Expanded		
VM	Variable Mounting	
VT	Variable Tip	
VS	Variable length Spool Section	
PlantWeb Control Functionality		
Standard		**Standard**
A01	FOUNDATION fieldbus Advanced Control Function Block Suite	★
PlantWeb Diagnostic Functionality		
Standard		**Standard**
D01	FOUNDATION fieldbus Diagnostics Suite	★
Product Certifications		
Standard		**Standard**
C6	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
E5	FM Explosion-proof, Dust Ignition-proof	★
E7	IECEx Flameproof, Dust Ignition-proof	★
E8	ATEX Flameproof, Dust	★
I1	ATEX Intrinsic Safety	★
I5	FM Intrinsically Safe, Division 2	★
IA[9]	ATEX FISCO Intrinsic Safety; for FOUNDATION fieldbus protocol only	★
K5	FM Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E5 and I5)	★
K6	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E6 and I6)	★
K8	ATEX Flameproof, Intrinsic Safety, Type n, Dust (combination of E8, I1 and N1)	★
KB	FM and CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E5, E6, I5, and I6)	★
KD	FM, CSA, and ATEX Explosion-proof, Intrinsically Safe (combination of E5, I5, E6, I6, E1, and I1)	★
N1	ATEX Type n	★
Alternate Transmitter Material of Construction		
Standard		**Standard**
L1	Inert Sensor Fill Fluid *Note: Silicone fill fluid is standard.*	★

Table 6. Rosemount 3051CFA Annubar Flowmeter 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.

L2	Graphite-Filled (PTFE) O-ring	★
LA	Inert Sensor Fill Fluid and Graphite-Filled (PTFE) O-ring	★
Digital Display		
Standard		**Standard**
M5	LCD Display	★
Transmitter Calibration Certification		
Standard		**Standard**
Q4	Calibration Certificate for Transmitter	★
Quality Certification for Safety		
Standard		**Standard**
QS(11)	Certificate of FMEDA data	★
Transient Protection		
Standard		**Standard**
T1(10)	Transient terminal block	★
Manifold for Remote Mount Option		
Standard		**Standard**
F2	3-Valve Manifold, Stainless Steel	★
F6	5-Valve Manifold, Stainless Steel	★
Expanded		
F1	3-Valve Manifold, Carbon Steel	
F3	3-Valve Manifold, Alloy C-276	
F5	5-Valve Manifold, Carbon Steel	
F7	5-Valve Manifold, Alloy C-276	
Lower Power Output		
Standard		**Standard**
C2(11)	0.8-3.2 V dc Output with Digital Signal Based on Hart Protocol	★
Alarm Limit		
Standard		**Standard**
C4(11)(12)	NAMUR Alarm and Saturation Levels, High Alarm	★
CN(11)(12)	NAMUR Alarm and Saturation Levels, Low Alarm	★
Ground Screw		
Standard		**Standard**
V5(13)	External Ground Screw Assembly	★
Typical Model Number: 3051CFA D L 060 D C H P S 2 T1 0 0 0 3 2 A A 1		

(1) Provide the "A" dimension for Flanged (page 123), Flange-Lok (page 122), and Threaded Flo-Tap (page 126) models. Provide the "B" dimension for Flange Flo-Tap models (page 125).

(2) Available in remote mount applications only.

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

(4) Material specified is cast as follows: CF-8M is the cast version of 316 SST, CF-3M is the cast version of 316L SST. For housing, material is aluminum with polyurethane paint.

(5) Applies to assembled flowmeter only, mounting not tested.

(6) Instrument Connections for Remote Mount Options and Isolation Valves for Flo-tap Models are not included in the Material Traceability Certification.

(7) Not available with Transmitter Connection Platform 6.

(8) Materials of Construction comply with metallurgical requirements within NACE MR0175/ISO 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.

(9) Only valid with FOUNDATION fieldbus Output Code F.

(10) Not available with Housing code 00, 5A or 7J. The T1 option is not needed with FISCO Product Certifications, transient protection is included with the FISCO Product Certification code IA.

(11) Not available with FOUNDATION fieldbus (Output Code F) or Profibus (Output Code W).

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

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

Rosemount 3051CFC
Compact Flowmeter

Table 7. Rosemount 3051CFC Compact Flowmeter 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	
3051CFC	Compact Flowmeter	
Measurement Type		
Standard		**Standard**
D	Differential Pressure	★
Primary Element Technology		
Standard		**Standard**
C	Conditioning Orifice Plate	★
P	Orifice Type	★
Material Type		
Standard		**Standard**
S	316 SST	★
Line Size		
Standard		**Standard**
005(1)	1/2-in. (15 mm)	★
010(1)	1-in. (25 mm)	★
015(1)	1 1/2-in. (40 mm)	★
020	2-in. (50 mm)	★
030	3-in. (80 mm)	★
040	4-in. (100 mm)	★
060	6-in. (150 mm)	★
080	8-in. (200 mm)	★
100	10-in. (250 mm)	★
120	12-in. (300 mm)	★
Primary Element Style		
Standard		**Standard**
N	Square Edged	★
Primary Element Type		
Standard		**Standard**
040	0.40 Beta Ratio	★
065(2)	0.65 Beta Ratio	★
Temperature Measurement		
Standard		**Standard**
0	No Temperature Sensor	★
Expanded		
R	Remote Thermowell and RTD	
Transmitter Connection Platform		
Standard		**Standard**
3	Direct-mount, Integral 3-valve Manifold	★
7	Remote-mount, 1/4-in. NPT Connections	★
Differential Pressure Range		
Standard		**Standard**
1	0 to 25 in H_2O (0 to 62,3 mbar)	★
2	0 to 250 in H_2O (0 to 623 mbar)	★
3	0 to 1000 in H_2O (0 to 2,5 bar)	★

Table 7. Rosemount 3051CFC Compact Flowmeter 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			
Standard			**Standard**
A	4–20 mA with digital signal based on HART Protocol		★
F	FOUNDATION fieldbus Protocol		★
W	Profibus-PA Protocol		★
Expanded			
M(3)	Low-Power, 1-5 V dc with Digital Signal Based on HART Protocol		
Transmitter Housing Material(4)		**Conduit Entry Size**	
Standard			**Standard**
A	Polyurethane-covered Aluminum	1/2-14 NPT	★
B	Polyurethane-covered Aluminum	M20 x 1.5	★
J	SST	1/2-14 NPT	★
K	SST	M20 x 1.5	★
Expanded			
D	Polyurethane-covered Aluminum	G1/2	
M	SST	G1/2	
Transmitter Performance Class			
Standard			**Standard**
1	Up to ±1.75% flow rate accuracy, 8:1 flow turndown, 5-year stability		★

Options (Include with selected model number)

Installation Accessories		
Standard		**Standard**
AB	ANSI Alignment Ring (150#) (Only required for 10-in. (250 mm) and 12-in. (300mm) line sizes)	★
AC	ANSI Alignment Ring (300#) (Only required for 10-in. (250 mm) and 12-in. (300mm) line sizes)	★
AD	ANSI Alignment Ring (600#) (Only required for 10-in. (250 mm) and 12-in. (300mm) line sizes)	★
DG	DIN Alignment Ring (PN16)	★
DH	DIN Alignment Ring (PN40)	★
DJ	DIN Alignment Ring (PN100)	★
Expanded		
JB	JIS Alignment Ring (10K)	
JR	JIS Alignment Ring (20K)	
JS	JIS Alignment Ring (40K)	
Remote Adapters		
Standard		**Standard**
FE	Flange Adapters 316 SST (1/2-in NPT)	★
High Temperature Application		
Expanded		
HT	Graphite Valve Packing (Tmax = 850 °F)	
Flow Calibration		
Expanded		
WC(5)	Flow Calibration Certification (3 point)	
WD(5)	Discharge Coefficient Verification (full 10 point)	
Pressure Testing		
Expanded		
P1	Hydrostatic Testing with Certificate	
Special Cleaning		
Expanded		
P2	Cleaning for Special Services	
PA	Cleaning per ASTM G93 Level D (Section 11.4)	
Special Inspection		
Standard		**Standard**
QC1	Visual & Dimensional Inspection with Certificate	★
QC7	Inspection and Performance Certificate	★

Table 7. Rosemount 3051CFC Compact Flowmeter 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 Calibration Certification		
Standard		**Standard**
Q4	Calibration Certificate for Transmitter	★
Quality Certification for Safety		
Standard		**Standard**
QS[6]	Prior-use certificate of FMEDA data	★
Material Traceability Certification		
Standard		**Standard**
Q8	Material Traceability Certification per EN 10204:2004 3.1	★
Code Conformance		
Expanded		
J2	ANSI/ASME B31.1	
J3	ANSI/ASME B31.3	
J4	ANSI/ASME B31.8	
Materials Conformance		
Expanded		
J5[7]	NACE MR-0175 / ISO 15156	
Country Certification		
Expanded		
J1	Canadian Registration	
Product Certifications		
Standard		**Standard**
C6	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
E5	FM Explosion-proof, Dust Ignition-proof	★
E7	IECEx Flameproof, Dust Ignition-proof	★
E8	ATEX Flameproof, Dust	★
I1	ATEX Intrinsic Safety	★
I5	FM Intrinsically Safe, Division 2	★
IA[8]	ATEX FISCO Intrinsic Safety; for FOUNDATION fieldbus protocol only	★
K5	FM Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E5 and I5)	★
K6	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E6 and I6)	★
K8	ATEX Flameproof, Intrinsic Safety, Type n, Dust (combination of E8, I1 and N1)	★
KB	FM and CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E5, E6, I5, and I6) *Note: Only available on Housing Style codes 00, 1A, 1J, 2A, 2J, 2E, or 2M.*	★
KD	FM, CSA, and ATEX Explosion-proof, Intrinsically Safe (combination of E5, I5, E6, I6, E1, and I1) *Note: Only available on Housing Style codes 00, 1A, 1J, 2A, 2J, 2E, or 2M.*	★
N1	ATEX Type n	★
Alternate Transmitter Material of Construction		
Standard		**Standard**
L1	Inert Sensor Fill Fluid *Note: Silicone fill fluid is standard.*	★
L2	Graphite-Filled (PTFE) O-ring	★
LA	Inert Sensor Fill Fluid and Graphite-Filled (PTFE) O-ring	★
Digital Display		
Standard		**Standard**
M5	LCD display	★
Transient Protection		
Standard		**Standard**
T1[9]	Transient terminal block	★
Manifold for Remote Mount Option		
Standard		**Standard**
F2	3-Valve Manifold, Stainless Steel	★
F6	5-Valve Manifold, Stainless Steel	★

Table 7. Rosemount 3051CFC Compact Flowmeter 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.

PlantWeb Control Functionality		
Standard		**Standard**
A01	FOUNDATION fieldbus Advanced Control Function Block Suite	★
PlantWeb Diagnostic Functionality		
Standard		**Standard**
D01	FOUNDATION fieldbus Diagnostic Suite	★
Lower Power Output		
Standard		**Standard**
C2(10)	0.8-3.2 V dc Output with Digital Signal Based on Hart Protocol	★
Alarm Limit		
Standard		**Standard**
C4(10)(11)	NAMUR Alarm and Saturation Levels, High Alarm	★
CN(10)(11)	NAMUR Alarm and Saturation Levels, Low Alarm	★
Ground Screw		
Standard		**Standard**
V5(12)	External Ground Screw Assembly	★
Typical Model Number: 3051CFC D C S 060 N 065 0 3 2 A A 1 WC E5 M5		

(1) Not available for Primary Element Technology C.

(2) For 2-in. (50 mm) line sizes the Primary Element Type is 0.6 for Primary Element Technology Code C.

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

(4) Material specified is cast as follows: CF-8M is the cast version of 316 SST, CF-3M is the cast version of 316L SST. For housing, material is aluminum with polyurethane paint.

(5) Not available with Primary Element Technology P.

(6) Not available with FOUNDATION fieldbus (Output Code F) or Profibus (Output Code W).

(7) Materials of Construction comply with metallurgical requirements within NACE MR0175/ISO 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.

(8) Only valid with FOUNDATION fieldbus Output Code F.

(9) Not available with Housing code 00, 5A or 7J. The T1 option is not needed with FISCO Product Certifications, transient protection is included with the FISCO Product Certification code IA.

(10) Not available with FOUNDATION fieldbus (Output Code F) or Profibus (Output Code W).

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

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

Rosemount 3051CFP Integral Orifice Flowmeter

Table 8. Rosemount 3051CFP Integral Orifice Flowmeter 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	
3051CFP	Integral Orifice Flowmeter	
Measurement Type		
Standard		**Standard**
D	Differential Pressure	★
Body Material		
Standard		**Standard**
S	316 SST	★
Line Size		
Standard		**Standard**
005	1/2-in. (15 mm)	★
010	1-in. (25 mm)	★
015	1 1/2-in. (40 mm)	★
Process Connection		
Standard		**Standard**
T1	NPT Female Body (Not Available with Remote Thermowell and RTD)	★
S1(1)	Socket Weld Body (Not Available with Remote Thermowell and RTD)	★
P1	Pipe Ends: NPT Threaded	★
P2	Pipe ends: Beveled	★
D1	Pipe Ends: Flanged, DIN PN16, slip-on	★
D2	Pipe Ends: Flanged, DIN PN40, slip-on	★
D3	Pipe Ends: Flanged, DIN PN100, slip-on	★
W1	Pipe Ends: Flanged, RF, ANSI Class 150, weld-neck	★
W3	Pipe Ends: Flanged, RF, ANSI Class 300, weld-neck	★
W6	Pipe Ends: Flanged, RF, ANSI Class 600, weld-neck	★
Expanded		
A1	Pipe Ends: Flanged, RF, ANSI Class 150, slip-on	
A3	Pipe Ends: Flanged, RF, ANSI Class 300, slip-on	
A6	Pipe Ends: Flanged, RF, ANSI Class 600, slip-on	
R1	Pipe Ends: Flanged, RTJ, ANSI Class 150, slip-on	
R3	Pipe Ends: Flanged, RTJ, ANSI Class 300, slip-on	
R6	Pipe Ends: Flanged, RTJ, ANSI Class 600, slip-on	
Orifice Plate Material		
Standard		**Standard**
S	316 SST	★
Expanded		
H	Alloy C-276	
M	Alloy 400	
Bore Size Option		
Standard		**Standard**
0066	0.066-in. (1.68 mm) for 1/2-in. Pipe	★
0109	0.109-in. (2.77 mm) for 1/2-in. Pipe	★
0160	0.160-in. (4.06 mm) for 1/2-in. Pipe	★
0196	0.196-in. (4.98 mm) for 1/2-in. Pipe	★
0260	0.260-in. (6.60 mm) for 1/2-in. Pipe	★
0340	0.340-in. (8.64 mm) for 1/2-in. Pipe	★
0150	0.150-in. (3.81 mm) for 1-in. Pipe	★

Table 8. Rosemount 3051CFP Integral Orifice Flowmeter 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.

0250	0.250-in. (6.35 mm) for 1-in. Pipe		★
0345	0.345-in. (8.76 mm) for 1-in. Pipe		★
0500	0.500-in. (12.70 mm) for 1-in. Pipe		★
0630	0.630-in. (16.00 mm) for 1-in. Pipe		★
0800	0.800-in. (20.32 mm) for 1-in. Pipe		★
0295	0.295-in. (7.49 mm) for 1 1/2-in. Pipe		★
0376	0.376-in. (9.55 mm) for 1 1/2-in. Pipe		★
0512	0.512-in. (13.00 mm) for 1 1/2-in. Pipe		★
0748	0.748-in. (19.00 mm) for 1 1/2-in. Pipe		★
1022	1.022-in. (25.96 mm) for 1 1/2-in. Pipe		★
1184	1.184-in. (30.07 mm) for 1 1/2-in. Pipe		★
Expanded			
0010	0.010-in. (0.25 mm) for 1/2-in. Pipe		
0014	0.014-in. (0.36 mm) for 1/2-in. Pipe		
0020	0.020-in. (0.51 mm) for 1/2-in. Pipe		
0034	0.034-in. (0.86 mm) for 1/2-in. Pipe		
Transmitter Connection Platform			
Standard			**Standard**
D3	Direct-mount, 3-Valve Manifold, SST		★
D5	Direct-mount, 5-Valve Manifold, SST		★
R3	Remote-mount, 3-Valve Manifold, SST		★
R5	Remote-mount, 5-Valve Manifold, SST		★
Expanded			
D4	Direct-mount, 3-Valve Manifold, Alloy C-276		
D6	Direct-mount, 5-Valve Manifold, Alloy C-276		
D7	Direct-mount, High Temperature, 5-Valve Manifold, SST		
R4	Remote-mount, 3-Valve Manifold, Alloy C-276		
R6	Remote-mount, 5-Valve Manifold, Alloy C-276		
Differential Pressure Ranges			
Standard			**Standard**
1	0 to 25 in H_2O (0 to 62,3 mbar)		★
2	0 to 250 in H_2O (0 to 623 mbar)		★
3	0 to 1000 in H_2O (0 to 2,5 bar)		★
Transmitter Output			
Standard			**Standard**
A	4–20 mA with digital signal based on HART Protocol		★
F	FOUNDATION fieldbus Protocol		★
W	Profibus-PA Protocol		★
Expanded			
M(2)	Low-Power, 1-5 V dc with Digital Signal Based on HART Protocol		
Transmitter Housing Material(3)		**Conduit Entry Size**	
Standard			**Standard**
A	Polyurethane-covered Aluminum	1/2-14 NPT	★
B	Polyurethane-covered Aluminum	M20 x 1.5	★
J	SST	1/2-14 NPT	★
K	SST	M20 x 1.5	★
Expanded			
D	Polyurethane-covered Aluminum	G1/2	
M	SST	G1/2	
Transmitter Performance Class			
Standard			**Standard**
1	up to ±1.75% flow rate accuracy, 8:1 flow turndown, 5-year stability		★

Table 8. Rosemount 3051CFP Integral Orifice Flowmeter 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)

Transmitter Body / Bolt Material		
Expanded		
GT	High Temperature (850 °F / 454 °C)	
Temperature Sensor		
Expanded		
RT[4]	Thermowell and RTD	
Optional Connection		
Standard		**Standard**
G1	DIN 19213 Transmitter Connection	★
Pressure Testing		
Expanded		
P1[5]	Hydrostatic Testing with Certificate	
Special Cleaning		
Expanded		
P2	Cleaning for Special Services	
PA	Cleaning per ASTM G93 Level D (Section 11.4)	
Material Testing		
Expanded		
V1	Dye Penetrant Exam	
Material Examination		
Expanded		
V2	Radiographic Examination	
Flow Calibration		
Expanded		
WD[6]	Discharge Coefficient Verification	
Special Inspection		
Standard		**Standard**
QC1	Visual & Dimensional Inspection with Certificate	★
QC7	Inspection and Performance Certificate	★
Material Traceability Certification		
Standard		**Standard**
Q8	Material Traceability Certification per EN 10204:2004 3.1	★
Code Conformance		
Expanded		
J2[7]	ANSI/ASME B31.1	
J3[7]	ANSI/ASME B31.3	
J4[7]	ANSI/ASME B31.8	
Materials Conformance		
Expanded		
J5[8]	NACE MR-0175 / ISO 15156	
Country Certification		
Standard		**Standard**
J6	European Pressure Directive (PED)	★
Expanded		
J1	Canadian Registration	
Transmitter Calibration Certification		
Standard		**Standard**
Q4	Calibration Certificate for Transmitter	★
Quality Certification for Safety		
Standard		**Standard**
QS[9]	Prior-use certificate of FMEDA data	★

Table 8. Rosemount 3051CFP Integral Orifice Flowmeter 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		
Standard		**Standard**
C6	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
E5	FM Explosion-proof, Dust Ignition-proof	★
E7	IECEx Flameproof, Dust Ignition-proof	★
E8	ATEX Flameproof, Dust	★
I1	ATEX Intrinsic Safety	★
I5	FM Intrinsically Safe, Division 2	★
IA(10)	ATEX FISCO Intrinsic Safety; for FOUNDATION fieldbus protocol only	★
K5	FM Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E5 and I5)	★
K6	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E6 and I6)	★
K8	ATEX Flameproof, Intrinsic Safety, Type n, Dust (combination of E8, I1 and N1)	★
KB	FM and CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E5, E6, I5, and I6)	★
KD	FM, CSA, and ATEX Explosion-proof, Intrinsically Safe (combination of E5, I5, E6, I6, E1, and I1)	★
N1	ATEX Type n	★
Alternate Transmitter Material of Construction		
Standard		**Standard**
L1	Inert Sensor Fill Fluid *Note: Silicone fill fluid is standard.*	★
L2	Graphite-Filled (PTFE) O-ring	★
LA	Inert Sensor Fill Fluid and Graphite-Filled (PTFE) O-ring	★
Digital Display		
Standard		**Standard**
M5	LCD Display	★
Transient Protection		
Standard		**Standard**
T1(11)	Transient terminal block	★
PlantWeb Control Functionality		
Standard		**Standard**
A01	FOUNDATION fieldbus Advanced Control Function Block Suite	★
PlantWeb Diagnostic Functionality		
Standard		**Standard**
D01	FOUNDATION fieldbus Diagnostic Suite	★
Lower Power Output		
Standard		**Standard**
C2(12)	0.8-3.2 V dc Output with Digital Signal Based on Hart Protocol	★
Alarm Limit		
Standard		**Standard**
C4(12)(13)	NAMUR Alarm and Saturation Levels, High Alarm	★
CN(12)(13)	NAMUR Alarm and Saturation Levels, Low Alarm	★
Ground Screw		
Standard		**Standard**
V5(14)	External Ground Screw Assembly	★
Typical Model Number: 3051CFP D S 010 W1 S 0500 D3 2 A A 1 E5 M5		

(1) To improve pipe perpendicularity for gasket sealing, socket diameter is smaller than standard pipe O.D.

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

(3) Material specified is cast as follows: CF-8M is the cast version of 316 SST, CF-3M is the cast version of 316L SST. For housing, material is aluminum with polyurethane paint.

(4) Thermowell Material is the same as the body material.

(5) Does not apply to Process Connection codes T1 and S1.

(6) Not available for bore sizes 0010, 0014, 0020, or 0034.

(7) Not available with DIN Process Connection codes D1, D2, or D3.

(8) Materials of Construction comply with metallurgical requirements within NACE MR0175/ISO 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.

(9) Not available with FOUNDATION fieldbus (Output Code F) or Profibus (Output Code W).

(10) Only valid with FOUNDATION fieldbus Output Code F.

(11) Not available with Housing code 00, 5A or 7J. The T1 option is not needed with FISCO Product Certifications, transient protection is included with the FISCO Product Certification code IA.

(12) Not available with FOUNDATION fieldbus (Output Code F) or Profibus (Output Code W).

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

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

3051CF Specifications

3051CF PERFORMANCE SPECIFICATIONS

Performance assumptions include: measured pipe I.D, transmitter is trimmed for optimum flow accuracy, and performance is dependent on application parameters.

Table 9. Flow Performance - Flow Reference Accuracy

3051CFA Annubar Flowmeter		
Ranges 2-3		±1.60% of Flow Rate at 8:1 flow turndown
3051CFC Compact Orifice Flowmeter – Conditioning Option C		
Ranges 2-3	β =0.4	±1.75% of Flow Rate at 8:1 flow turndown
	β =0.65	±1.95% of Flow Rate at 8:1 flow turndown
3051CFC Compact Orifice Flowmeter – Orifice Type Option P(1)		
Ranges 2-3	β =0.4	±2.00% of Flow Rate at 8:1 flow turndown
	β =0.65	±2.00% of Flow Rate at 8:1 flow turndown
3051CFP Integral Orifice Flowmeter		
Ranges 2-3	β <0.1	±3.00% of Flow Rate at 8:1 flow turndown
	0.1< β <0.2	±1.95% of Flow Rate at 8:1 flow turndown
	0.2< β <0.6	±1.75% of Flow Rate at 8:1 flow turndown
	0.6< β <0.8	±2.15% of Flow Rate at 8:1 flow turndown

(1) For smaller line sizes, see Rosemount Compact Orifice

3051CF FUNCTIONAL SPECIFICATIONS

Range and Sensor Limits

Table 10. 3051CF Range and Sensor Limits

Range	3051CF Minimum Span	Range and Sensor Limits
1	0.5 inH_2O (1,2 mbar)	0 to 25 inH_2O (62,3 mbar)
2	2.5 inH_2O (6,2 mbar)	0 to 250 inH_2O (0,63 bar)
3	10 inH_2O (24,9 mbar)	0 to 1000 inH_2O (2,49 bar)

Zero and Span Adjustment Requirements (*HART* and Low Power)

Zero and span values can be set anywhere within the range limits stated in Table 10 and Table 11.

Span must be greater than or equal to the minimum span stated in Table 10 and Table 11.

Service

Liquid, gas, and vapor applications

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.

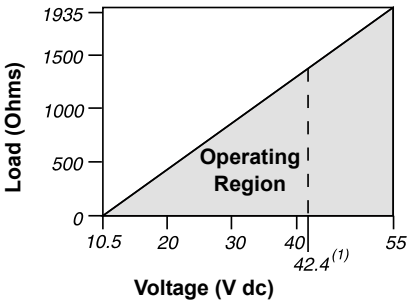
Power Supply

External power supply required. Standard transmitter (4–20 mA) operates on 10.5 to 55 V dc with no load.

Load Limitations

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

Max. Loop Resistance = 43.5 (Power Supply Voltage – 10.5)



Communication requires a minimum loop resistance of 250 ohms.

(1) For CSA approval, power supply must not exceed 42.4 V.

FOUNDATION fieldbus (output code F) and Profibus (output code W)

Power Supply

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

Current Draw

17.5 mA for all configurations (including LCD display option)

FOUNDATION fieldbus Function Block Execution Times

Block	Execution Time
Resource	-
Transducer	-
LCD Block	-
Analog Input 1, 2	30 milliseconds
PID	45 milliseconds
Input Selector	30 milliseconds
Arithmetic	35 milliseconds
Signal Characterizer	40 milliseconds
Integrator	35 milliseconds

FOUNDATION fieldbus Parameters

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

Standard Function Blocks

Resource Block

Contains hardware, electronics, and diagnostic information.

Transducer Block

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

LCD Block

Configures the local display.

2 Analog Input Blocks

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

PID Block

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

Backup Link Active Scheduler (LAS)

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

Advanced Control Function Block Suite (Option Code A01)

Input Selector Block

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

Arithmetic Block

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

Signal Characterizer Block

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

Integrator Block

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

FOUNDATION fieldbus Diagnostics Suite (Option Code D01)

The 3051C 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 3051C ASP algorithm uses these values and highly flexible configuration options for customization to many user-defined or application specific abnormal situations. The detection of plugged impulse lines is the first available predefined application.

Low Power (Output Code M)

Output

Three wire 1–5 V dc or 0.8–3.2 V dc (Option Code C2) user-selectable output. Also user selectable for linear or square root output configuration. Digital process variable superimposed on voltage signal, available to any host conforming to the *HART* protocol. Low-power transmitter operates on 6–12 V dc with no load.

Power Consumption

3.0 mA, 18–36 mW

Minimum Load Impedance

100 kΩ (V_{out} wiring)

Indication

Optional 5-digit LCD display

Overpressure Limits

Rosemount 3051CF

- Range 0: 750 psi (51,7 bar)
- Range 1: 2000 psig (137,9 bar)
- Ranges 2–5: 3626 psig (250 bar)
  4500 psig (310,3 bar) for option code P9

Static Pressure Limit

Operates within specifications between static line pressures of 0.5 psia and 3626 psig.
Range 1: 0.5 psia and 2000 psig (3, 4 bar and 137, 9 bar)

Burst Pressure Limits

Burst pressure on Coplanar process flange is 10000 psig (69 MPa).

Failure Mode Alarm

Output Code A

If self-diagnostics detect a gross transmitter failure, the analog signal will be driven either below 3.75 mA or to 21.75 mA to alert the user. NAMUR-compliant values are available, option code C4. High or low alarm signal is user-selectable by internal jumper.

Output Code M

If self-diagnostics detect a gross transmitter failure, the analog signal will be driven either below 0.94 V or above 5.4 V to alert the user (below 0.75 V or above 4.4 V for Option C2). High or low alarm signal is user-selectable by internal jumper.

Output Code F and W

If self-diagnostics detect a gross transmitter failure, that information gets passed as a status along with the process variable.

Process Temperature Limits

For 3051CFA Temperature Limits, see page 91.
For 3051CFC Temperature Limits, see page 103.
For 3051CFP Temperature Limits, see page 111.

Table 11. 3051CF Process Temperature Limits

3051CF	
Silicone Fill Sensor(1)	–40 to 250 °F (–40 to 121 °C)
Inert Fill Sensor(1)	0 to 185 °F (–18 to 85 °C)

(1) Process temperatures above 185 °F (85 °C) require derating the ambient limits by a 1.5:1 ratio (0.6:1 ratio for the 3051H).

Transmitter Temperature Limits:

Ambient

–40 to 185 °F (–40 to 85 °C)

With LCD display(1): –4 to 175 °F (–20 to 80 °C)

Storage

–50 to 230 °F (–46 to 110 °C)

With LCD display: –40 to 185 °F (–40 to 85 °C)

Process

At atmospheric pressures and above. See Table 11

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

Humidity Limits

0–100% relative humidity

Turn-On Time

Performance within specifications less than 2.0 seconds (10.0 s for Profibus protocol) after power is applied to the transmitter

Volumetric Displacement

Less than 0.005 in^3 (0,08 cm^3)

Damping

Analog output response to a step input change is user-selectable from 0 to 36 seconds for one time constant. This software damping is in addition to sensor module response time.

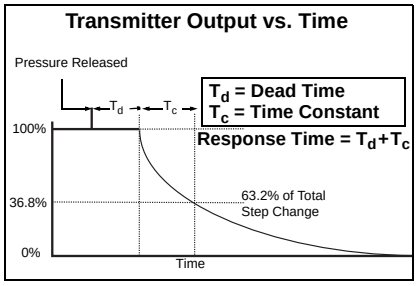
Long Term Stability

Models	Long Term Stability
3051CF	
Ranges 2-3	±0.125% of URL for 5 years ±50 °F (28 °C) temperature changes, and up to 1000 psi (6,9 MPa) line pressure.
3051CF Low/Draft Range	
Range 1	±0.2% of URL for 1 year

Dynamic Performance

	4 - 20 mA (HART protocol)(1)	Fieldbus protocol(3)	Typical HART Transmitter Response Time
Total Response Time (T_d + T_c)(2):			
3051CF, Ranges 2-5:	100 ms	152 ms	
Range 1:	255 ms	307 ms	
Dead Time (Td)	45 ms (nominal)	97 ms	
Update Rate	22 times per second	22 times per second	

(1) Dead time and update rate apply to all models and ranges; analog output only
(2) Nominal total response time at 75 °F (24 °C) reference conditions.
(3) Transmitter fieldbus output only, segment macro-cycle not included.



Vibration Effect

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).

3051CF PHYSICAL SPECIFICATIONS

Electrical Connections

1/2–14 NPT, PG 13.5, G1/2, and M20 × 1.5 conduit. HART interface connections fixed to terminal block.

Process-Wetted Parts

For 3051CFA wetted parts, see “Annubar Sensor Material” on page 92.
For 3051CFC wetted parts, see “Material of Construction” on page 104.
For 3051CFP wetted parts, see “Material of Construction” on page 111.

Process Isolating Diaphragms
316L SST, Alloy C-276, Alloy 400, Tantalum, Gold-plated Alloy 400, Gold-plate SST

Non-Wetted Parts

Electronics Housing

Low-copper aluminum or CF-3M (Cast version of 316L SST, material per ASTM-A743). NEMA 4X, IP 65, IP 66

Coplanar Sensor Module Housing

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

Bolts

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

Sensor Module Fill Fluid

Silicone oil (D.C. 200) or Fluorocarbon oil (Halocarbon or Fluorinert® FC-43 for 3051T)

Paint

Polyurethane

Cover O-rings

Buna-N

3051CF Product Certifications

Approved Manufacturing Locations

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

European Directive Information

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

ATEX Directive (94/9/EC)

All 3051 transmitters comply with the ATEX Directive.

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

3051CF with DP Range 2 and 3
— QS Certificate of Assessment - EC No. PED-H-100 Module H Conformity Assessment

All other 3051 Pressure Transmitters

— Sound Engineering Practice

Transmitter Attachments: Process Flange - Manifold

— Sound Engineering Practice

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

All 3051 Pressure Transmitters meet all of the requirements of EN61326: 1997 - A1, A2, and A3 and NAMUR NE-21

Ordinary Location Certification for Factory Mutual

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

HART Protocol

Hazardous Locations Certifications

North American Certifications

FM Approvals

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

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

Canadian Standards Association (CSA)

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

European Certifications

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

Table 12. Input Parameters

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

Special Conditions for Safe Use (X):
When the optional transient protection terminal block is installed, the apparatus is not capable of withstanding the 500V insulation test required by Clause 6.4.12 of EN50020:1994. This must be taken into account when installing the apparatus.

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

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

E8 ATEX Flame-Proof and Dust
Certification No.: KEMA 00ATEX2013X ⟨Ex⟩ II 1/2 GD
Ex d IIC T6 (–50 °C ≤ T_a ≤ 65 °C)
Dust rating Ex tD A20/A21 T90 °C, IP66
CE 1180
V_{max} = 55 V dc

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

E7 IECEx Flame-Proof and Dust
Certification No.:IECEx KEM 09.0034X
Ga/Gb Ex d IIC T6 (-50 °C ≤ T_a ≤ 65 °C)
Ex tD A20/A21 T90, IP66

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

Combinations of Certifications

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

K5 **E5** and **I5** combination
KB **K5** and **C6** combination
KD **K5**, **C6**, **I1**, and **E8** combination
K6 **C6**, **I1**, and **E8** combination
K8 **E8** and **I1** combination

3051CF FOUNDATION FIELDBUS PROTOCOL

Hazardous Locations Certifications

North American Certifications

FM Approvals

E5 Explosion-Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition-Proof for Class II, Division 1, Groups E, F, and G. Dust-Ignition-Proof for Class III, Division 1.

I5 Intrinsically Safe for use in Class I, Division 1, Groups A, B, C, and D; Class II, Division 1, Groups E, F, and G; Class III, Division 1 when connected per Rosemount drawing 03031-1019; Non-incendive for Class I, Division 2, Groups A, B, C, and D.

Temperature Code:T4 (Ta = 60 °C), T3 (Ta = 85 °C), Enclosure Type 4X
For input parameters see control drawing 03031-1019.

Canadian Standards Association (CSA)

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

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

European Certifications

I1 ATEX Intrinsic Safety and Dust
Certification No.: BAS 98ATEX1355X ⟨Ex⟩ II 1 GD
Ex ia IIC T4 (-60 °C ≤ T_a ≤ 60 °C)
Dust Rating: Ex tD A20 T70 °C (-20 °C ≤ T_a ≤ 40 °C) IP66
CE 1180

Table 13. Input Parameters

U_i = 30V
I_i = 300 mA
P_i = 1.3 W
C_i = 0 µF

Special Conditions for Safe Use (X):
The device is not capable of withstanding the 500V insulation test required by Clause 6.8.1 of EN60079-15:2005. This must be taken into account when installing the apparatus.

IA ATEX FISCO Intrinsic Safety
Certification No.: BAS 98ATEX1355X ⟨Ex⟩ II 1 G
EEx ia IIC T4 (-60 °C ≤ T_a ≤ 60 °C)
IP66
CE 1180

Table 14. Input Parameters

U_i = 17.5 V
I_i = 380 mA
P_i = 5.32 W
C_i = ≤ 5 µF
L_i = ≤ 10 µH

Special Conditions for Safe Use (X):
The device is not capable of withstanding the 500V insulation test required by Clause 6.8.1 of EN60079-15:2005. This must be taken into account when installing the apparatus.

N1 ATEX Type n and Dust
Certification No.: BAS 98ATEX3356X ⟨Ex⟩ II 3 GD
U_i = 40 Vdc max
Ex nA nL IIC T5 (-40 °C ≤ T_a ≤ 70 °C)
Dust rating: Ex tD A22 T80 °C (-20 °C ≤ T_a ≤ 40 °C) IP66

Special Conditions for Safe Use (X):
The device is not capable of withstanding the 500V insulation test required by Clause 6.8.1 of EN60079-15:2005. This must be taken into account when installing the apparatus.

E8 ATEX Flame-Proof and Dust
Certification No.: KEMA 00ATEX2013X ⟨Ex⟩ II 1/2 GD
Ex d IIC T6 (-50 °C ≤ T_a ≤ 65 °C)
Dust rating Ex tD A20/A21 T90 °C, IP66
CE 1180
V_{max} = 55 V dc

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

E7 IECEx Flame-Proof and Dust
Certification No.:IECEx KEM 09.0034X
Ga/Gb Ex d IIC T6 (-50 °C ≤ T_a ≤ 65 °C)
Ex tD A20/A21 T90, IP66

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

Combinations of Certifications

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

K5 **E5** and **I5** combination

KB **K5** and **C6** combination

KD **K5**, **C6**, **I1**, and **E8** combination

K6 **C6**, **I1**, and **E8** combination

K8 **E8** and **I1** combination

K7 **E7**, **I7**, and **N7** combination

Rosemount 2051CF Flowmeter Series

Rosemount 2051CF Flowmeters combine the 2051 Pressure transmitter and the latest primary element technology: Annubar Averaging Pitot Tube, Compact Conditioning Orifice Plate and Integral Orifice Plate.

Additional Information
Specifications: page 77
Product Certifications: page 81
Dimensional Drawings: page 129
Installation and Flowmeter Orientation: page 151

Rosemount 2051CFA Annubar Flowmeter

Table 15. Rosemount 2051CFA Annubar Flowmeter 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	
2051CFA	Annubar Flowmeter	
Measurement Type		
Standard		**Standard**
D	Differential Pressure	★
Fluid Type		
Standard		**Standard**
L	Liquid	★
G	Gas	★
S	Steam	★
Line Size		
Standard		**Standard**
020	2-in. (50 mm)	★
025	2 1/2-in. (63.5 mm)	★
030	3-in. (80 mm)	★
035	3 1/2-in. (89 mm)	★
040	4-in. (100 mm)	★
050	5-in. (125 mm)	★
060	6-in. (150 mm)	★
070	7-in. (175 mm)	★
080	8-in. (200 mm)	★
100	10-in. (250 mm)	★
120	12-in. (300 mm)	★
Pipe I.D. Range		
Standard		**Standard**
C	Range C from the Pipe I.D. table	★
D	Range D from the Pipe I.D. table	★

Table 15. Rosemount 2051CFA Annubar Flowmeter Ordering Information

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

Expanded		
A	Range A from the Pipe I.D. table	
B	Range B from the Pipe I.D. table	
E	Range E from the Pipe I.D. table	
Z	Non-standard Pipe I.D. Range or Line Sizes greater than 12 inches	
Pipe Material / Mounting Assembly Material		
Standard		**Standard**
C	Carbon steel (A105)	★
S	316 Stainless Steel	★
0(1)	No Mounting (Customer Supplied)	
Expanded		
G	Chrome-Moly Grade F-11	
N	Chrome-Moly Grade F-22	
J	Chrome-Moly Grade F-91	
Piping Orientation		
Standard		**Standard**
H	Horizontal Piping	★
D	Vertical Piping with Downwards Flow	★
U	Vertical Piping with Upwards Flow	★
Annubar Type		
Standard		**Standard**
P	Pak-Lok	★
F	Flanged with opposite side support	★
Sensor Material		
Standard		**Standard**
S	316 Stainless Steel	★
Sensor Size		
Standard		**Standard**
1	Sensor size 1 — Line sizes 2-in. (50 mm) to 8-in. (200 mm)	★
2	Sensor size 2 — Line sizes 6-in. (150 mm) to 96-in. (2400 mm)	★
3	Sensor size 3 — Line sizes greater than 12-in. (300 mm)	★
Mounting Type		
Standard		**Standard**
T1	Compression or Threaded Connection	★
A1	150# RF ANSI	★
A3	300# RF ANSI	★
A6	600# RF ANSI	★
D1	DN PN16 Flange	★
D3	DN PN40 Flange	★
D6	DN PN100 Flange	★
Expanded		
R1	150# RTJ Flange	
R3	300# RTJ Flange	
R6	600# RTJ Flange	
Opposite Side Support or Packing Gland		
Standard		**Standard**
0	No opposite side support or packing gland (Required for Pak-Lok and Flange-Lok models)	★
	Opposite Side Support – Required for Flanged Models	
C	NPT Threaded Opposite Support Assembly – Extended Tip	★
D	Welded Opposite Support Assembly – Extended Tip	★
Isolation Valve for Flo-Tap Models		
Standard		**Standard**
0(1)	Not Applicable or Customer Supplied	★

Table 15. Rosemount 2051CFA Annubar Flowmeter 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.

Temperature Measurement			
Standard			**Standard**
T	Integral RTD – not available with Flanged model greater than class 600#		★
0	No Temperature Sensor		★
Expanded			
R	Remote Thermowell and RTD		
Transmitter Connection Platform			
Standard			**Standard**
3	Direct-mount, Integral 3-valve Manifold– not available with Flanged model greater than class 600		★
5	Direct -mount, 5-valve Manifold – not available with Flanged model greater than class 600		★
7	Remote-mount NPT Connections ($^1/_2$-in. FNPT)		★
Expanded			
8	Remote-mount SW Connections ($^1/_2$-in.)		
Differential Pressure Range			
Standard			**Standard**
1	0 to 25 in H_2O (0 to 62,3 mbar)		★
2	0 to 250 in H_2O (0 to 623 mbar)		★
3	0 to 1000 in H_2O (0 to 2,5 bar)		★
Transmitter Output			
Standard			**Standard**
A	4–20 mA with digital signal based on HART Protocol		★
F	FOUNDATION fieldbus Protocol		★
Expanded			
M	Low-Power, 1-5 V dc with Digital Signal Based on HART Protocol		
Transmitter Housing Material(2)		**Conduit Entry Size**	
Standard			**Standard**
A	Polyurethane-covered Aluminum	$^1/_2$-14 NPT	★
B	Polyurethane-covered Aluminum	M20 x 1.5	★
J	SST	$^1/_2$-14 NPT	★
K(3)	SST	M20 x 1.5	★
Expanded			
D	Polyurethane-covered Aluminum	G$^1/_2$	
M(3)	SST	G$^1/_2$	
Transmitter Performance Class			
Standard			**Standard**
1	2.0% flow rate accuracy, 5:1 flow turndown, 2-year stability		★

Options (Include with selected model number)

Pressure Testing		
Expanded		
P1(4)	Hydrostatic Testing with Certificate	
PX(4)	Extended Hydrostatic Testing	
Special Cleaning		
Expanded		
P2	Cleaning for Special Services	
PA	Cleaning per ASTM G93 Level D (Section 11.4)	
Material Testing		
Expanded		
V1	Dye Penetrant Exam	
Material Examination		
Expanded		
V2	Radiographic Examination	

Table 15. Rosemount 2051CFA Annubar Flowmeter 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.

Special Inspection		
Standard		**Standard**
QC1	Visual & Dimensional Inspection with Certificate	★
QC7	Inspection & Performance Certificate	★
Surface Finish		
Standard		**Standard**
RL	Surface finish for Low Pipe Reynolds # in Gas & Steam	★
RH	Surface finish for High Pipe Reynolds # in Liquid	★
Material Traceability Certification		
Standard		**Standard**
Q8[5]	Material Traceability Certification per EN 10474:2004 3.1	★
Code Conformance		
Expanded		
J2	ANSI/ASME B31.1	
J3	ANSI/ASME B31.3	
Materials Conformance		
Expanded		
J5[6]	NACE MR-0175 / ISO 15156	
Country Certification		
Standard		**Standard**
J6	European Pressure Directive (PED)	★
Expanded		
J1	Canadian Registration	
Instrument Connections for Remote Mount Options		
Standard		**Standard**
G2	Needle Valves, Stainless Steel	★
G6	OS&Y Gate Valve, Stainless Steel	★
Expanded		
G1	Needle Valves, Carbon Steel	
G3	Needle Valves, Alloy C-276	
G5	OS&Y Gate Valve, Carbon Steel	
G7	OS&Y Gate Valve, Alloy C-276	
Special Shipment		
Standard		**Standard**
Y1	Mounting Hardware Shipped Separately	★
Product Certifications		
Standard		**Standard**
E1[3]	ATEX Flameproof	★
E5	FM Explosion-proof, Dust Ignition-proof	★
E6	CSA Explosion-proof, Dust Ignition-proof, Division 2	★
E7	IECEx Flameproof, Dust Ignition-proof	★
I1[3]	ATEX Intrinsic Safety	★
I5	FM Intrinsically Safe, Division 2	★
I6	CSA Intrinsically Safe	★
I7[3]	IECEx Intrinsic Safety	★
IA[7]	ATEX FISCO Intrinsic Safety; for FOUNDATION fieldbus protocol only	★
IE[7]	FM FISCO Intrinsically Safe	★
IF[7]	CSA FISCO Intrinsically Safe	★
IG[7]	IECEx FISCO Intrinsically Safe	★
K1[3]	ATEX Flameproof, Intrinsic Safety, Type n, Dust	★
K5	FM Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E5 and I5)	★
K6	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E6 and I6)	★
K7[3]	IECEx Flameproof, Dust Ignition-proof, Intrinsic Safety, Type n (combination of E7, I7, and N7)	★
KA[3]	ATEX and CSA Flameproof, Intrinsically Safe, Division 2	★
KB	FM and CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E5, E6, I5, and I6)	★
KC[3]	FM and ATEX Explosion-proof, Intrinsically Safe, Division 2	★

Table 15. Rosemount 2051CFA Annubar Flowmeter 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.

KD[3]	FM, CSA, and ATEX Explosion-proof, Intrinsically Safe (combination of E5, I5, E6, I6, E1, and I1)	★
N1[3]	ATEX Type n	★
N7[3]	IECEx Type n	★
ND[3]	ATEX Dust	★
Alternate Transmitter Material of Construction		
Standard		**Standard**
L1	Inert Sensor Fill Fluid	★
L2	Graphite-Filled (PTFE) O-ring	★
LA	Inert Sensor Fill Fluid and Graphite-Filled (PTFE) O-ring	★
Digital Display		
Standard		**Standard**
M5	PlantWeb LCD display (Requires PlantWeb housing)	★
Transmitter Calibration Certification		
Standard		**Standard**
Q4	Calibration Certificate for Transmitter	★
Quality Certification for Safety		
Standard		**Standard**
QS[8]	Certificate of FMEDA data	★
Transient Protection		
Standard		**Standard**
T1[9]	Transient terminal block	★
Manifold for Remote Mount Option		
Standard		**Standard**
F2	3-Valve Manifold, Stainless Steel	★
F6	5-Valve Manifold, Stainless Steel	★
Expanded		
F1	3-Valve Manifold, Carbon Steel	
F5	5-Valve Manifold, Carbon Steel	
Hardware Adjustments		
Standard		**Standard**
D4	Zero and Span Hardware Adjustments	★
Alarm Limit		
Standard		**Standard**
C4[8][10]	NAMUR Alarm and Saturation Levels, High Alarm	★
CN[8][10]	NAMUR Alarm and Saturation Levels, Low Alarm	★
Ground Screw		
Standard		**Standard**
V5[11]	External Ground Screw Assembly	★
Typical Model Number: 2051CFA D L 060 D C H P S 2 T1 0 0 0 3 2A A 1A 3		

(1) Provide the "A" dimension for Flanged (page 130) and Pak-Lok (page 129).

(2) Material specified is cast as follows: CF-8M is the cast version of 316 SST, CF-3M is the cast version of 316L SST. For housing, material is aluminum with polyurethane paint.

(3) Not available with Low Power Output Code M.

(4) Applies to assembled flowmeter only, mounting not tested.

(5) Instrument Connections for Remote Mount Options and Isolation Valves for Flo-tap Models are not included in the Material Traceability Certification.

(6) Materials of Construction comply with metallurgical requirements within NACE MR0175/ISO 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) Only valid with FOUNDATION fieldbus Output Code F.

(8) Not available with Output Protocol code F.

(9) Not available with Housing code 00, 5A or 7J. The T1 option is not needed with FISCO Product Certifications, transient protection is included with the FISCO Product Certification code IA.

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

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

Rosemount 2051CFC
Compact Flowmeter

Table 16. Rosemount 2051CFC Compact Flowmeter 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	
2051CFC	Compact Flowmeter	
Measurement Type		
Standard		**Standard**
D	Differential Pressure	★
Primary Element Technology		
Standard		**Standard**
C	Conditioning Orifice Plate	★
P	Orifice Type	★
Material Type		
Standard		**Standard**
S	316 SST	★
Line Size		
Standard		**Standard**
005(1)	1/2-in. (15 mm)	★
010(1)	1-in. (25 mm)	★
015(1)	1 1/2-in. (40 mm)	★
020	2-in. (50 mm)	★
030	3-in. (80 mm)	★
040	4-in. (100 mm)	★
060	6-in. (150 mm)	★
080	8-in. (200 mm)	★
100	10-in. (250 mm)	★
120	12-in. (300 mm)	★
Primary Element Style		
Standard		**Standard**
N	Square Edged	★
Primary Element Type		
Standard		**Standard**
040	0.40 Beta Ratio	★
065(2)	0.65 Beta Ratio	★
Temperature Measurement		
Standard		**Standard**
0	No Temperature Sensor	★
Expanded		
R	Remote Thermowell and RTD	
Transmitter Connection Platform		
Standard		**Standard**
3	Direct-mount, Integral 3-valve Manifold	★
7	Remote-mount, 1/4-in. NPT Connections	★
Differential Pressure Range		
Standard		**Standard**
1	0 to 25 in H_2O (0 to 62,3 mbar)	★
2	0 to 250 in H_2O (0 to 623 mbar)	★
3	0 to 1000 in H_2O (0 to 2,5 bar)	★

Table 16. Rosemount 2051CFC Compact Flowmeter 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			
Standard			**Standard**
A	4–20 mA with digital signal based on HART Protocol		★
F	FOUNDATION fieldbus Protocol		★
Expanded			
M	Low-Power, 1-5 V dc with Digital Signal Based on HART Protocol		
Transmitter Housing Material(3)		**Conduit Entry Size**	
Standard			**Standard**
A	Polyurethane-covered Aluminum	1/2-14 NPT	★
B	Polyurethane-covered Aluminum	M20 x 1.5	★
J	SST	1/2-14 NPT	★
K(4)	SST	M20 x 1.5	★
Expanded			
D	Polyurethane-covered Aluminum	G1/2	
M(4)	SST	G1/2	
Transmitter Performance Class			
Standard			**Standard**
1	up to ±2.25% flow rate accuracy, 5:1 flow turndown, 2-year stability		★

Options (Include with selected model number)

Installation Accessories		
Standard		**Standard**
AB	ANSI Alignment Ring (150#) (Only required for 10-in. (250 mm) and 12-in. (300mm) line sizes)	★
AC	ANSI Alignment Ring (300#) (Only required for 10-in. (250 mm) and 12-in. (300mm) line sizes)	★
AD	ANSI Alignment Ring (600#) (Only required for 10-in. (250 mm) and 12-in. (300mm) line sizes)	★
DG	DIN Alignment Ring (PN16)	★
DH	DIN Alignment Ring (PN40)	★
DJ	DIN Alignment Ring (PN100)	★
Expanded		
JB	JIS Alignment Ring (10K)	
JR	JIS Alignment Ring (20K)	
JS	JIS Alignment Ring (40K)	
Remote Adapters		
Standard		**Standard**
FE	Flange Adapters 316 SST (1/2-in NPT)	★
High Temperature Application		
Expanded		
HT	Graphite Valve Packing (Tmax = 850 °F)	
Flow Calibration		
Expanded		
WC	Flow Calibration Certification (3 point)	
WD	Discharge Coefficient Verification (full 10 point)	
Pressure Testing		
Expanded		
P1	Hydrostatic Testing with Certificate	
Special Cleaning		
Expanded		
P2	Cleaning for Special Services	
PA	Cleaning per ASTM G93 Level D (Section 11.4)	
Special Inspection		
Standard		**Standard**
QC1	Visual & Dimensional Inspection with Certificate	★
QC7	Inspection and Performance Certificate	★

Table 16. Rosemount 2051CFC Compact Flowmeter 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 Calibration Certification		
Standard		**Standard**
Q4	Calibration Certificate for Transmitter	★
Quality Certification for Safety		
Standard		**Standard**
QS[5]	Prior-use certificate of FMEDA data	★
Material Traceability Certification		
Standard		**Standard**
Q8	Material Traceability Certification per EN 10204:2004 3.1	★
Code Conformance		
Expanded		
J2	ANSI/ASME B31.1	
J3	ANSI/ASME B31.3	
J4	ANSI/ASME B31.8	
Materials Conformance		
Expanded		
J5[6]	NACE MR-0175 / ISO 15156	
Country Certification		
Expanded		
J1	Canadian Registration	
Product Certifications		
Standard		**Standard**
E1[4]	ATEX Flameproof	★
E5	FM Explosion-proof, Dust Ignition-proof	★
E6	CSA Explosion-proof, Dust Ignition-proof, Division 2	★
E7[4]	IECEx Flameproof, Dust Ignition-proof	★
I1[4]	ATEX Intrinsic Safety	★
I5	FM Intrinsically Safe, Division 2	★
I6	CSA Intrinsically Safe	★
I7[4]	IECEx Intrinsic Safety	★
IA[7]	ATEX FISCO Intrinsic Safety; for FOUNDATION fieldbus protocol only	★
IE[7]	FM FISCO Intrinsically Safe	★
IF[7]	CSA FISCO Intrinsically Safe	★
IG[7]	IECEx FISCO Intrinsically Safe	★
K1[4]	ATEX Flameproof, Intrinsic Safety, Type n, Dust	★
K5	FM Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E5 and I5)	★
K6	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E6 and I6)	★
K7[4]	IECEx Flameproof, Dust Ignition-proof, Intrinsic Safety, Type n (combination of E7, I7, and N7)	★
KA[4]	ATEX and CSA Flameproof, Intrinsically Safe, Division 2	★
KB	FM and CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E5, E6, I5, and I6)	★
KC[4]	FM and ATEX Explosion-proof, Intrinsically Safe, Division 2	★
KD[4]	FM, CSA, and ATEX Explosion-proof, Intrinsically Safe (combination of E5, I5, E6, I6, E1, and I1)	★
N1[4]	ATEX Type n	★
N7[4]	IECEx Type n	★
ND[4]	ATEX Dust	★
Alternate Transmitter Material of Construction		
Standard		**Standard**
L1	Inert Sensor Fill Fluid	★
L2	Graphite-Filled (PTFE) O-ring	★
LA	Inert Sensor Fill Fluid and Graphite-Filled (PTFE) O-ring	★
Digital Display		
Standard		**Standard**
M5	PlantWeb LCD display (Requires PlantWeb housing)	★

Table 16. Rosemount 2051CFC Compact Flowmeter 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.

Transient Protection		
Standard		**Standard**
T1[8]	Transient terminal block	★
Manifold for Remote Mount Option		
Standard		**Standard**
F2	3-Valve Manifold, Stainless Steel	★
F6	5-Valve Manifold, Stainless Steel	★
Alarm Limit		
Standard		**Standard**
C4[9][10]	NAMUR Alarm and Saturation Levels, High Alarm	★
CN[9][10]	NAMUR Alarm and Saturation Levels, Low Alarm	★
Hardware Adjustments		
Standard		**Standard**
D4	Zero and Span Hardware Adjustments	★
Ground Screw		
Standard		**Standard**
V5[11]	External Ground Screw Assembly	★
Typical Model Number: 2051CFC D C S 060 N 065 0 3 2 A A 1 WC E5 M5		

(1) Not available for Primary Element Technology C.

(2) For 2-in. (50 mm) line sizes the Primary Element Type is 0.6 for Primary Element Technology Code C.

(3) Material specified is cast as follows: CF-8M is the cast version of 316 SST, CF-3M is the cast version of 316L SST. For housing, material is aluminum with polyurethane paint.

(4) Not available with Low Power Output Code M.

(5) Not available with Output Protocol code F.

(6) Materials of Construction comply with metallurgical requirements within NACE MR0175/ISO 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) Only valid with FOUNDATION fieldbus Output Code F.

(8) Not available with Housing code 00, 5A or 7J. The T1 option is not needed with FISCO Product Certifications, transient protection is included with the FISCO Product Certification code IA.

(9) Not available with FOUNDATION fieldbus (Output Code F).

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

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

Rosemount 2051CFP Integral Orifice Flowmeter

Table 17. Rosemount 2051CFP Integral Orifice Flowmeter 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	
2051CFP	Integral Orifice Flowmeter	
Measurement Type		
Standard		**Standard**
D	Differential Pressure	★
Material Type		
Standard		**Standard**
S	316 SST	★
Line Size		
Standard		**Standard**
005	1/2-in. (15 mm)	★
010	1-in. (25 mm)	★
015	1 1/2-in. (40 mm)	★
Process Connection		
Standard		**Standard**
T1	NPT Female Body (Not Available with Remote Thermowell and RTD)	★
S1(1)	Socket Weld Body (Not Available with Remote Thermowell and RTD)	★
P1	Pipe Ends: NPT Threaded	★
P2	Pipe ends: Beveled	★
D1	Pipe Ends: Flanged, DIN PN16, slip-on	★
D2	Pipe Ends: Flanged, DIN PN40, slip-on	★
D3	Pipe Ends: Flanged, DIN PN100, slip-on	★
W1	Pipe Ends: Flanged, RF, ANSI Class 150, weld-neck	★
W3	Pipe Ends: Flanged, RF, ANSI Class 300, weld-neck	★
W6	Pipe Ends: Flanged, RF, ANSI Class 600, weld-neck	★
Expanded		
A1	Pipe Ends: Flanged, RF, ANSI Class 150, slip-on	
A3	Pipe Ends: Flanged, RF, ANSI Class 300, slip-on	
A6	Pipe Ends: Flanged, RF, ANSI Class 600, slip-on	
R1	Pipe Ends: Flanged, RTJ, ANSI Class 150, slip-on	
R3	Pipe Ends: Flanged, RTJ, ANSI Class 300, slip-on	
R6	Pipe Ends: Flanged, RTJ, ANSI Class 600, slip-on	
Orifice Plate Material		
Standard		**Standard**
S	316 SST	★
Bore Size Option		
Standard		**Standard**
0066	0.066-in. (1.68 mm) for 1/2-in. Pipe	★
0109	0.109-in. (2.77 mm) for 1/2-in. Pipe	★
0160	0.160-in. (4.06 mm) for 1/2-in. Pipe	★
0196	0.196-in. (4.98 mm) for 1/2-in. Pipe	★
0260	0.260-in. (6.60 mm) for 1/2-in. Pipe	★
0340	0.340-in. (8.64 mm) for 1/2-in. Pipe	★
0150	0.150-in. (3.81 mm) for 1-in. Pipe	★
0250	0.250-in. (6.35 mm) for 1-in. Pipe	★

Table 17. Rosemount 2051CFP Integral Orifice Flowmeter 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.

0345	0.345-in. (8.76 mm) for 1-in. Pipe		★
0500	0.500-in. (12.70 mm) for 1-in. Pipe		★
0630	0.630-in. (16.00 mm) for 1-in. Pipe		★
0800	0.800-in. (20.32 mm) for 1-in. Pipe		★
0295	0.295-in. (7.49 mm) for 1 1/2-in. Pipe		★
0376	0.376-in. (9.55 mm) for 1 1/2-in. Pipe		★
0512	0.512-in. (13.00 mm) for 1 1/2-in. Pipe		★
0748	0.748-in. (19.00 mm) for 1 1/2-in. Pipe		★
1022	1.022-in. (25.96 mm) for 1 1/2-in. Pipe		★
1184	1.184-in. (30.07 mm) for 1 1/2-in. Pipe		★
Expanded			
0010	0.010-in. (0.25 mm) for 1/2-in. Pipe		
0014	0.014-in. (0.36 mm) for 1/2-in. Pipe		
0020	0.020-in. (0.51 mm) for 1/2-in. Pipe		
0034	0.034-in. (0.86 mm) for 1/2-in. Pipe		
Transmitter Connection Platform			
Standard			**Standard**
D3	Direct-mount, 3-Valve Manifold, SST		★
D5	Direct-mount, 5-Valve Manifold, SST		★
R3	Remote-mount, 3-Valve Manifold, SST		★
R5	Remote-mount, 5-Valve Manifold, SST		★
Differential Pressure Ranges			
Standard			**Standard**
1	0 to 25 in H_2O (0 to 62,3 mbar)		★
2	0 to 250 in H_2O (0 to 623 mbar)		★
3	0 to 1000 in H_2O (0 to 2,5 bar)		★
Transmitter Output			
Standard			**Standard**
A	4–20 mA with digital signal based on HART protocol		★
F	FOUNDATION fieldbus protocol		★
Expanded			
M	Low-Power, 1-5 V dc with Digital Signal Based on HART Protocol		
Transmitter Housing Material(2)		**Conduit Entry Size**	
Standard			**Standard**
A	Polyurethane-covered Aluminum	1/2-14 NPT	★
B	Polyurethane-covered Aluminum	M20 x 1.5	★
J	SST	1/2-14 NPT	★
K(3)	SST	M20 x 1.5	★
Expanded			
D	Polyurethane-covered Aluminum	G1/2	
M(3)	SST	G1/2	
Transmitter Performance Class			
Standard			**Standard**
1	up to ±2.25% flow rate accuracy, 5:1 flow turndown, 2-year stability		★

Options (Include with selected model number)

Temperature Sensor		
Expanded		
RT(4)	Thermowell and RTD	
Optional Connection		
Standard		**Standard**
G1	DIN 19213 Transmitter Connection	★

Table 17. Rosemount 2051CFP Integral Orifice Flowmeter 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		
Expanded		
P1[5]	Hydrostatic Testing with Certificate	
Special Cleaning		
Expanded		
P2	Cleaning for Special Services	
PA	Cleaning per ASTM G93 Level D (Section 11.4)	
Material Testing		
Expanded		
V1	Dye Penetrant Exam	
Material Examination		
Expanded		
V2	Radiographic Examination	
Flow Calibration		
Expanded		
WD[6]	Discharge Coefficient Verification	
Special Inspection		
Standard		**Standard**
QC1	Visual & Dimensional Inspection with Certificate	★
QC7	Inspection and Performance Certificate	★
Material Traceability Certification		
Standard		**Standard**
Q8	Material Traceability Certification per EN 10204:2004 3.1	★
Code Conformance		
Expanded		
J2[7]	ANSI/ASME B31.1	
J3[7]	ANSI/ASME B31.3	
J4[7]	ANSI/ASME B31.8	
Materials Conformance		
Expanded		
J5[8]	NACE MR-0175 / ISO 15156	
Country Certification		
Standard		**Standard**
J6	European Pressure Directive (PED)	★
Expanded		
J1	Canadian Registration	
Transmitter Calibration Certification		
Standard		**Standard**
Q4	Calibration Certificate for Transmitter	★
Quality Certification for Safety		
Standard		**Standard**
QS[9]	Prior-use certificate of FMEDA data	★
Product Certifications		
Standard		**Standard**
E1[10]	ATEX Flameproof	★
E5	FM Explosion-proof, Dust Ignition-proof	★
E6	CSA Explosion-proof, Dust Ignition-proof, Division 2	★
E7[10]	IECEx Flameproof, Dust Ignition-proof	★
I1[10]	ATEX Intrinsic Safety	★
I5	FM Intrinsically Safe, Division 2	★
I6	CSA Intrinsically Safe	★
I7[10]	IECEx Intrinsic Safety	★
IA[11]	ATEX FISCO Intrinsic Safety; for FOUNDATION fieldbus protocol only	★
IE[11]	FM FISCO Intrinsically Safe	★
IF[11]	CSA FISCO Intrinsically Safe	★

Table 17. Rosemount 2051CFP Integral Orifice Flowmeter 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.

IG[11]	IECEx FISCO Intrinsically Safe	★
K1[10]	ATEX Flameproof, Intrinsic Safety, Type n, Dust	★
K5	FM Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E5 and I5)	★
K6	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E6 and I6)	★
K7[10]	IECEx Flameproof, Dust Ignition-proof, Intrinsic Safety, Type n (combination of E7, I7, and N7)	★
KA[10]	ATEX and CSA Flameproof, Intrinsically Safe, Division 2	★
KB	FM and CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E5, E6, I5, and I6)	★
KC[10]	FM and ATEX Explosion-proof, Intrinsically Safe, Division 2	★
KD[10]	FM, CSA, and ATEX Explosion-proof, Intrinsically Safe (combination of E5, I5, E6, I6, E1, and I1)	★
N1[10]	ATEX Type n	★
N7[10]	IECEx Type n	★
ND[10]	ATEX Dust	★
Alternate Transmitter Material of Construction		
Standard		**Standard**
L1	Inert Sensor Fill Fluid	★
L2	Graphite-Filled (PTFE) O-ring	★
LA	Inert Sensor Fill Fluid and Graphite-Filled (PTFE) O-ring	★
Digital Display		
Standard		**Standard**
M5	PlantWeb LCD display (Requires PlantWeb housing)	★
Transient Protection		
Standard		**Standard**
T1[12]	Transient terminal block	★
Alarm Limit		
Standard		**Standard**
C4[13][14]	NAMUR Alarm and Saturation Levels, High Alarm	★
CN[13][14]	NAMUR Alarm and Saturation Levels, Low Alarm	★
Hardware Adjustments		
Standard		**Standard**
D4	Zero and Span Hardware Adjustments	★
Ground Screw		
Standard		**Standard**
V5[15]	External Ground Screw Assembly	★
Typical Model Number: 2051CFP D S 010 W1 S 0500 D3 2 A A 1 E5 M5		

(1) To improve pipe perpendicularity for gasket sealing, socket diameter is smaller than standard pipe O.D.

(2) Material specified is cast as follows: CF-8M is the cast version of 316 SST, CF-3M is the cast version of 316L SST. For housing, material is aluminum with polyurethane paint.

(3) Not available with Low Power Output Code M.

(4) Thermowell Material is the same as the body material.

(5) Does not apply to Process Connection codes T1 and S1.

(6) Not available for bore sizes 0010, 0014, 0020, or 0034.

(7) Not available with DIN Process Connection codes D1, D2, or D3.

(8) Materials of Construction comply with metallurgical requirements within NACE MR0175/ISO 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.

(9) Not available with Output Protocol code F.

(10) Not available with Low Power Output Code M.

(11) Only valid with FOUNDATION fieldbus Output Code F.

(12) Not available with Housing code 00, 5A or 7J. The T1 option is not needed with FISCO Product Certifications, transient protection is included with the FISCO Product Certification code IA.

(13) Not available with FOUNDATION fieldbus (Output Code F).

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

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

2051CF Specifications

2051CF PERFORMANCE SPECIFICATIONS

Performance assumptions include: measured pipe I.D, transmitter is trimmed for optimum flow accuracy, and performance is dependent on application parameters.

Table 18. Flow Performance - Flow Reference Accuracy

2051CFA Annubar Flowmeter		
Ranges 2-3		±2.00% of Flow Rate at 5:1 flow turndown
2051CFC Compact Orifice Flowmeter – Conditioning Option C		
Ranges 2-3	β =0.4	±2.25% of Flow Rate at 5:1 flow turndown
	β =0.65	±2.45% of Flow Rate at 5:1 flow turndown
2051CFC Compact Orifice Flowmeter – Orifice Type Option P(1)		
Ranges 2-3	β =0.4	±2.50% of Flow Rate at 5:1 flow turndown
	β =0.65	±2.50% of Flow Rate at 5:1 flow turndown
2051CFP Integral Orifice Flowmeter		
Ranges 2-3	β <0.1	±3.10% of Flow Rate at 5:1 flow turndown
	0.1< β <0.2	±2.75% of Flow Rate at 5:1 flow turndown
	0.2< β <0.6	±2.25% of Flow Rate at 5:1 flow turndown
	0.6< β <0.8	±3.00% of Flow Rate at 5:1 flow turndown

(1) For smaller line sizes, see Rosemount Compact Orifice

2051CF FUNCTIONAL SPECIFICATIONS

Range and Sensor Limits

Range	2051CF Minimum Span	Range and Sensor Limits
1	0.5 inH_2O (1,2 mbar)	0 to 25 inH_2O (62,3 mbar)
2	2.5 inH_2O (6,2 mbar)	0 to 250 inH_2O (0,62 bar)
3	10 inH_2O (24,9 mbar)	0 to 1000 inH_2O (2,49 bar)

Service

Liquid, gas, and steam applications

Protocols

4–20 mA HART (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 operates on 10.5 to 42.4 V dc with no load.

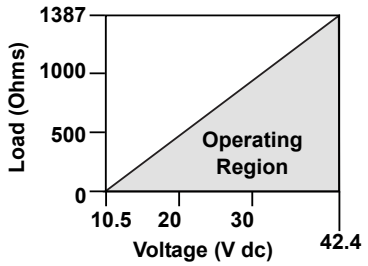
Turn-On Time

Performance within specifications less than 2.0 seconds after power is applied to the transmitter.

Load Limitations

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

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



The HART 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 V dc transmitter terminal voltage.

Current Draw

17.5 mA for all configurations (including LCD display option)

Turn-On Time

Performance within specifications less than 20.0 seconds after power is applied to the transmitter.

FOUNDATION fieldbus Function Block Execution Times

Block	Execution Time
Resource	-
Transducer	-
LCD Block	-
Analog Input 1, 2	30 milliseconds
PID	45 milliseconds

FOUNDATION fieldbus Parameters

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

Standard Function Blocks

Resource Block

- Contains hardware, electronics, and diagnostic information.

Transducer Block

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

LCD Block

- Configures the local display.

2 Analog Input Blocks

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

PID Block

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

Backup Link Active Scheduler (LAS)

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

1-5 Vdc HART Low Power (Output Code M)

Output

Three wire 1–5 Vdc output, user-selectable for linear or square root output. Digital process variable superimposed on voltage signal, available to any host conforming to the *HART* protocol.

Power Supply

External power supply required. Standard transmitter operates on 9 to 28 Vdc with no load.

Power Consumption

3.0 mA, 27–84 mW

Output Load

100 kΩ or greater

Turn-On Time

Performance within specifications less than 2.0 seconds after power is applied to the transmitter.

Overpressure Limits

Transmitters withstand the following limits without damage:

2051CF Flowmeters

- Ranges 2–5: 3626 psig (250 bar)
  4500 psig (310,3 bar) for option code P9
- Range 1: 2000 psig (137,9 bar)

Static Pressure Limit

- Operates within specifications between static line pressures of -14.2 psig (0.034 bar) and 3626 psig (250 bar)
- Range 1: 0.5 psia to 2000 psig (34 mbar and 137,9 bar)

Burst Pressure Limits

2051CF

- 10000 psig (689,5 bar)

Temperature Limits

For 2051CFA Temperature Limits, see page 91.
For 2051CFC Temperature Limits, see page 103.
For 2051CFP Temperature Limits, see page 111.

Transmitter Temperature Limits:

Ambient(1)

–40 to 185 °F (–40 to 85 °C)

With LCD display(2): –40 to 175 °F (–40 to 80 °C)

Storage(1)

–50 to 230 °F (–46 to 110 °C)

With LCD display: –40 to 185 °F (–40 to 85 °C)

(1) Limits for silicone fill fluid only.

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

Process Temperature Limits

At atmospheric pressures and above.

Table 19. 2051 Process Temperature Limits

2051C	
Silicone Fill Sensor(1)	–40 to 250 °F (–40 to 121 °C)
Inert Fill Sensor(1)	–40 to 185 °F (–40 to 85 °C)

(1) Process temperatures above 185 °F (85 °C) require derating the ambient limits by a 1.5:1 ratio.

Humidity Limits

0–100% relative humidity

Volumetric Displacement

Less than 0.005 in^3 (0,08 cm^3)

Damping

Analog output response to a step input change is user-selectable from 0 to 25.6 seconds for one time constant. This software damping is in addition to sensor module response time.

Failure Mode Alarm

If self-diagnostics detect a sensor or microprocessor failure, the analog signal is driven either high or low to alert the user. High or low failure mode is user-selectable with a jumper on the transmitter. The values to which the transmitter drives its output in failure mode depend on whether it is factory-configured to *standard* or *NAMUR-compliant* operation. The values for each are as follows:

Standard Operation			
Output Code	**Linear Output**	**Fail High**	**Fail Low**
A	3.9 ≤ I ≤ 20.8	I ≥ 21.75 mA	I ≤ 3.75 mA
M	0.97 ≤ V ≤ 5.2	V ≥ 5.4 V	V ≤ 0.95V

NAMUR-Compliant Operation			
Output Code	**Linear Output**	**Fail High**	**Fail Low**
A	3.8 ≤ I ≤ 20.5	I ≥ 22.5 mA	I ≤ 3.6 mA

Output Code F

If self-diagnostics detect a gross transmitter failure, that information gets passed as a status along with the process variable.

Long Term Stability

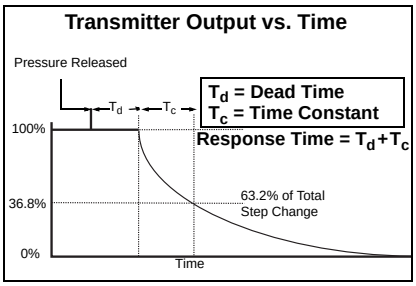
Models	**Standard**	**Performance Option, P8**
2051CF		
Range 1 (CF)	±0.2% of URL for 1 year, Reference Stability	
Ranges 2-5	±0.1% of URL for 2 years, Operating Stability	±0.125% of URL for 5 years, Operating Stability

Dynamic Performance

	4-20 mA HART[1] 1-5 Vdc HART Low Power	**FOUNDATION fieldbus[3]**
Total Response Time (T_d + T_c)[2]:		
2051CF, Range 3-5:	115 milliseconds	152 milliseconds
Range 1:	270 milliseconds	307 milliseconds
Range 2:	130 milliseconds	152 milliseconds
Dead Time (Td)	60 milliseconds (nominal)	97 milliseconds
Update Rate	22 times per second	22 times per second

(1) Dead time and update rate apply to all models and ranges; analog output only
(2) Nominal total response time at 75 °F (24 °C) reference conditions.
(3) Transmitter fieldbus output only, segment macro-cycle not included.

Typical HART Transmitter Response Time



Vibration Effect

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).

2051CF PHYSICAL SPECIFICATIONS

Electrical Connections

$^1/_2$–14 NPT, G$^1/_2$, and M20 × 1.5 conduit.

2051CF Process-Wetted Parts

For 2051CFA wetted parts, see “Annubar Sensor Material” on page 92.
For 2051CFC wetted parts, see “Material of Construction” on page 104.
For 2051CFP wetted parts, see “Material of Construction” on page 111.

Process Isolating Diaphragms

316L SST, Alloy C-276, or Tantalum

Non-Wetted Parts for 2051CF

Electronics Housing

Low-copper aluminum or CF-8M (Cast version of 316 SST).
Enclosure Type 4X, IP 65, IP 66, IP68

Coplanar Sensor Module Housing

CF-3M (Cast version of 316L SST)

Bolts

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 oil (D.C. 200) or Fluorocarbon oil (Halocarbon or Fluorinert® FC-43 for 2051T)

Paint

Polyurethane

Cover O-rings

Buna-N

2051CF Product Certifications

Approved Manufacturing Locations

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

European Directive Information

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

ATEX Directive (94/9/EC)
All 2051 transmitters comply with the ATEX Directive.

European Pressure Equipment Directive (PED) (97/23/EC)
2051CF with DP Range 2 and 3
— QS Certificate of Assessment - EC No. PED-H-100 Module H Conformity Assessment

All other 2051 Pressure Transmitters
— Sound Engineering Practice

Transmitter Attachments: Process Flange - Manifold
— Sound Engineering Practice

Electro Magnetic Compatibility (EMC) (2004/108/EC)
All 2051 Pressure Transmitters meet all of the requirements of IECEN61326:2006 and NAMUR NE-21.

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

HART PROTOCOL

Hazardous Locations Certifications

North American Certifications

FM Approvals

E5 Explosion-Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition-Proof for Class II, Division 1, Groups E, F, and G. Dust-Ignition-Proof for Class III, Division 1.
T5 (Ta = 85 °C), Factory Sealed, Enclosure Type 4X

I5 Intrinsically Safe for use in Class I, Division 1, Groups A, B, C, and D; Class II, Division 1, Groups E, F, and G; Class III, Division 1 when connected per Rosemount drawing 02051-1009; Non-incendive for Class I, Division 2, Groups A, B, C, and D.
Temperature Code:T4 (Ta = 40 °C), T3 (Ta = 85 °C), Enclosure Type 4X
For input parameters see control drawing 02051-1009.

Canadian Standards Association (CSA)

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

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

I6 Intrinsically safe approval. Intrinsically safe for Class I, Division 1, Groups A, B, C, and D when connected in accordance with Rosemount drawing 02051-1008. Temperature Code T3C.
Dust-Ignition-Proof for Class II and Class III, Division 1, Groups E, F, and G. Suitable for Class I, Division 2 Groups A, B, C, and D hazardous locations. Enclosure type 4X, factory sealed
For input parameters see control drawing 02051-1008.

European Certifications

I1 ATEX Intrinsic Safety
Certification No. Baseefa08ATEX0129X ⟨Ex⟩ II 1 G
Ex ia IIC T4 (–60 ≤ T_a ≤ +70 °C)
IP66 IP68
CE 1180

Table 20. Input Parameters

U_i = 30V
I_i = 200 mA
P_i = 1.0W
C_i = 0.012 µF
L_i = 10 µH

Table 21. RTD Assembly (2051CFx Option T or R)

U_i = 5 Vdc
I_i = 500 mA
P_i = 0.63W

Special Conditions for Safe Use (X):
When the optional transient protection terminal block is installed, the apparatus is not capable of withstanding the 500V insulation test required by Clause 6.3.12 of EN60079-11. This must be taken into account when installing the apparatus.

N1 ATEX Type n
Certification No. Baseefa08ATEX0130X ⟨Ex⟩ II 3 G
Ex nAnL IIC T4 (–40 ≤ T_a ≤ +70 °C)
U_i = 42.4 Vdc max
IP66
CE

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

E1 ATEX Flame-Proof
Certification No. KEMA 08ATEX0090X ⟨Ex⟩ II 1/2 G
Ex d IIC T6 (–50 ≤ T_a ≤ 65 °C)
Ex d IIC T5 (–50 ≤ T_a ≤ 80 °C)
IP66
CE 1180
Vmax = 42.4 V dc

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

ND ATEX Dust
Certification No. Baseefa08ATEX0182X ⟨Ex⟩ II 1 D
Dust Rating: II 1 D Ex tD A20 T115 °C (-20 °C ≤ T_a ≤ 85 °C)
IP66 IP68
Vmax = 42.4 V dc
A = 22 mA
CE 1180

Special Conditions for Safe Use (X):
If the equipment is fitted with an optional 90V transient suppressor, it is incapable of isolation from earth test and this must be taken into account during installation.

IECEx Certifications

I7 IECEx Intrinsic Safety
Certification No. IECExBAS08.0045X II 1 G
Ex ia IIC T4 (–60 ≤ T_a ≤ +70 °C)
CE 1180

Table 22. Input Parameters

U_i = 30V
I_i = 200 mA
P_i = 1.0W
C_i = 0.012 µF

Table 23. RTD Assembly (2051CFx Option T or R)

U_i = 5 Vdc
I_i = 500 mA
P_i = 0.63W

Special Conditions for Safe Use (X):
When the optional transient protection terminal block is installed, the apparatus is not capable of withstanding the 500V insulation test required by Clause 6.3.12 of IEC60079-11. This must be taken into account when installing the apparatus.

E7 IECEx Explosion-Proof (Flame-Proof)
Certification No. IECEx KEM 08.0024X II 1/2 G
Ex d IIC T6 (–50 ≤ T_a ≤ 65 °C)
Ex d IIC T5 (–50 ≤ T_a ≤ 80 °C)
CE 1180
Vmax = 42.4 V dc

Special Conditions for Safe Use (X):

This device contains a thin wall diaphragm. Installation, maintenance, and use shall take into account the environmental conditions to which the diaphragm will be subjected. The manufacturer's instructions for installation and maintenance shall be followed in detail to assure safety during its expected lifetime.

N7 IECEx Type n
Certification No. IECExBAS08.0046X II 3 G
Ex nAnL IIC T4 ($-40 \leq T_a \leq +70$ °C)
U_i = 42.4 Vdc max
CE

Special Conditions for Safe Use (X):

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

Combinations of Certifications

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

K1 **E1, I1, N1,** and **ND** combination

K5 **E5** and **I5** combination

K6 **I6** and **E6** combination

K7 **E7, I7,** and **N7** combination

KA **E1, I1, E6,** and **I6** combination

KB **E5, I5, E6,** and **I6** combination

KC **E1, I1, E5,** and **I5** combination

KD **E1, I1, E5, I5, E6,** and **I6** combination

2051CF FOUNDATION FIELDBUS PROTOCOL

Hazardous Locations Certifications

North American Certifications

FM Approvals

E5 Explosion-Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition-Proof for Class II, Division 1, Groups E, F, and G. Dust-Ignition-Proof for Class III, Division 1.

T5 (Ta = 85 °C), Factory Sealed, Enclosure Type 4X

I5/IE Intrinsically Safe for use in Class I, Division 1, Groups A, B, C, and D; Class II, Division 1, Groups E, F, and G; Class III, Division 1 when connected per Rosemount drawing 02051-1009; Non-incendive for Class I, Division 2, Groups A, B, C, and D.

Temperature Code:T4 (Ta = 40 °C), T3 (Ta = 85 °C), Enclosure Type 4X
For input parameters see control drawing 02051-1009.

Canadian Standards Association (CSA)

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

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

I6/IF Intrinsically safe approval. 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.
Dust-Ignition-Proof for Class II and Class III, Division 1, Groups E, F, and G. Suitable for Class I, Division 2 Groups A, B, C, and D hazardous locations. Enclosure type 4X, factory sealed
For input parameters see control drawing 02051-1008.

European Certifications

I1 ATEX Intrinsic Safety
Certification No. Baseefa08ATEX0129X ⟨Ex⟩ II 1 G
Ex ia IIC T4 (T_{amb} = –60 to +60 °C)
IP66
CE 1180

Table 24. Input Parameters

U_i = 30V
I_i = 300 mA
P_i = 1.3 W
C_i = 0 µF
L_i = 0 uH

Table 25. RTD Assembly (2051CFx Option T or R)

U_i = 5 Vdc
I_i = 500 mA
P_i = 0.63W

Special Conditions for Safe Use (X):
The device is not capable of withstanding the 500V insulation test required by Clause 6.3.12 of EN60079-11. This must be taken into account when installing the apparatus.

IA ATEX FISCO Intrinsic Safety
Certification No. Baseefa08ATEX0129X ⟨Ex⟩ II 1 G
Ex ia IIC T4 (T_{amb} = –60 to +60 °C)
IP66
CE 1180

Table 26. Input Parameters

U_i = 17.5 V
I_i = 380 mA
P_i = 5.32 W
C_i = ≤ 5 µF
L_i = ≤ 10 µH

Special Conditions for Safe Use (X):
The device is not capable of withstanding the 500V insulation test required by Clause 6.3.12 of EN60079-11. This must be taken into account when installing the apparatus.

N1 ATEX Type n
Certification No. Baseefa08ATEX0130X ⟨Ex⟩ II 3 G
Ex nAnL IIC T4 (T_{amb} = –40 to +70 °C)
U_i = 32 Vdc max
IP66

Special Conditions for Safe Use (X):
The device is not capable of withstanding the 500V insulation test required by Clause 6.8.1 of EN60079-15. This must be taken into account when installing the apparatus.

E1 ATEX Flame-Proof
Certification No. KEMA 08ATEX0090X ⟨Ex⟩ II 1/2 G
Ex d IIC T6 (T_{amb} = –50 to 65 °C)
Ex d IIC T5 (T_{amb} = –50 to 80 °C)
IP66
CE 1180
Vmax = 32 V dc

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

ND ATEX Dust
Certification No. Baseefa08ATEX0182X ⟨Ex⟩ II 1 D
Dust Rating: II 1 D Ex tD A20 T115 °C (-20 °C ≤ T_a ≤ 85 °C)
IP66 IP68
Vmax = 42.4 V dc
A = 22 mA
CE 1180

Special Conditions for Safe Use (X):
If the equipment is fitted with an optional 90V transient suppressor, it is incapable of isolation from earth test and this must be taken into account during installation.

IECEx Certifications

I7 IECEx Intrinsic Safety
Certification No. IECExBAS08.0045X II 1 G
Ex ia IIC T4 (T_{amb} = –60 to +60 °C)
IP66
CE 1180

Table 27. Input Parameters

U_i = 30V
I_i = 300 mA
P_i = 1.3 W
C_i = 0 µF

Table 28. RTD Assembly (2051CFx Option T or R)

U_i = 5 Vdc
I_i = 500 mA
P_i = 0.63W

Special Conditions for Safe Use (X):
The device is not capable of withstanding the 500V insulation test required by Clause 6.3.12 of IEC60079-11. This must be taken into account when installing the apparatus.

E7 IECEx Explosion-Proof (Flame-Proof)
Certification No. IECEx KEM 08.0024X II 1/2 GD
Ex d IIC T6 (T_{amb} = –50 to 65 °C)
Ex d IIC T5 (T_{amb} = –50 to 80 °C)
IP66
CE 1180
Vmax = 32 V dc

Special Conditions for Safe Use (X):

This device contains a thin wall diaphragm. Installation, maintenance, and use shall take into account the environmental conditions to which the diaphragm will be subjected. The manufacturer's instructions for installation and maintenance shall be followed in detail to assure safety during its expected lifetime.

N7 IECEx Type n
Certification No. IECExBAS08.0046X II 3 G
Ex nAnL IIC T4 (T_{amb} = –40 to +70 °C)
U_i = 32 Vdc max

Special Conditions for Safe Use (X):

The device is not capable of withstanding the 500V insulation test required by Clause 6.8.1 of IEC60079-15. This must be taken into account when installing the device.

Combinations of Certifications

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

K1 **E1, I1, N1,** and **ND** combination

K5 **E5** and **I5** combination

K6 **I6** and **E6** combination

K7 **E7, I7,** and **N7** combination

KA **E1, I1, E6,** and **I6** combination

KB **E5, I5, E6,** and **I6** combination

KC **E1, I1, E5,** and **I5** combination

KD **E1, I1, E5, I5, E6,** and **I6** combination

Rosemount 485 Annubar Primary Element

Rosemount 485 Annubar Primary Element utilizes a T-shaped sensor design that offers best in class accuracy and performance.

- Up to 0.75% Flow Rate Accuracy
- Lowest permanent pressure loss
- Available in 2 to 96-in. (50 - 2400 mm) line sizes

Additional Information
Specifications: page 91
Dimensional Drawings: page 134
Installation and Flowmeter Orientation: page 151

Table 29. Rosemount 485 Annubar Primary 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	DP Flow Primary Type	
485	Annubar Primary Element	
Fluid Type		
Standard		**Standard**
L	Liquid	★
G	Gas	★
S	Steam	★
Line Size		
Standard		**Standard**
020	2-in. (50 mm)	★
025	2 1/2-in. (63,5 mm)	★
030	3-in. (80 mm)	★
035	3 1/2-in. (89 mm)	★
040	4-in. (100 mm)	★
050	5-in. (125 mm)	★
060	6-in. (150 mm)	★
070	7-in. (175 mm)	★
080	8-in. (200 mm)	★
100	10-in. (250 mm)	★
120	12-in. (300 mm)	★
Expanded		
140	14-in. (350 mm)	
160	16-in. (400 mm)	
180	18-in. (450 mm)	
200	20-in. (500 mm)	
240	24-in. (600 mm)	
300	30-in. (750 mm)	
360	36-in. (900 mm)	
420	42-in. (1066 mm)	
480	48-in. (1210 mm)	
600	60-in. (1520 mm)	
720	72-in. (1820 mm)	
780	78-in. (1950 mm)	
840	84-in. (2100 mm)	
900	90-in. (2250 mm)	
960	96-in. (2400 mm)	

Table 29. Rosemount 485 Annubar Primary 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.

Pipe I.D. Range		
Standard		**Standard**
C	Range C from the Pipe I.D. table	★
D	Range D from the Pipe I.D. table	★
Expanded		
A	Range A from the Pipe I.D. table	
B	Range B from the Pipe I.D. table	
E	Range E from the Pipe I.D. table	
Z	Non-standard Pipe I.D. Range or Above 12-in. Line Size	
Pipe Material / Assembly Material		
Standard		**Standard**
C	Carbon steel (A105)	★
S	316 Stainless Steel	★
0[(1)]	No mounting (Customer Supplied)	★
Expanded		
G	Chrome-Moly Grade F-11	
N	Chrome-Moly Grade F-22	
J	Chrome-Moly Grade F-91	
Piping Orientation		
Standard		**Standard**
H	Horizontal Piping	★
D	Vertical Piping with Downwards Flow	★
U	Vertical Piping with Upwards Flow	★
Annubar Type		
Standard		**Standard**
P	Pak-Lok	★
F	Flanged with opposite side support	★
Expanded		
L	Flange-Lok	
G	Gear-Drive Flo-Tap	
M	Manual Flo-Tap	
Sensor Material		
Standard		**Standard**
S	316 Stainless Steel	★
Expanded		
H	Alloy C-276	
Sensor Size		
Standard		**Standard**
1	Sensor size 1 — Line sizes 2-in. (50 mm) to 8-in. (200 mm)	★
2	Sensor size 2 — Line sizes 6-in. (150 mm) to 96-in. (2400 mm)	★
3	Sensor size 3 — Line sizes greater than 12-in. (300 mm)	★
Mounting Type		
Standard		**Standard**
T1	Compression/Threaded Connection	★
A1	150# RF ANSI	★
A3	300# RF ANSI	★
A6	600# RF ANSI	★
D1	DN PN16 Flange	★
D3	DN PN40 Flange	★
D6	DN PN100 Flange	★

Table 29. Rosemount 485 Annubar Primary Ordering Information

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

Expanded				
A9[2]	900# RF ANSI			
AF[2]	1500# RF ANSI			
AT[2]	2500 # RF ANSI			
R1	150# RTJ Flange			
R3	300# RTJ Flange			
R6	600# RTJ Flange			
R9[2]	900# RTJ Flange			
RF[2]	1500# RTJ Flange			
RT[2]	2500# RTJ Flange			
Opposite Side Support or Packing Gland				
Standard				**Standard**
0	No opposite side support or Packing Gland (Required for Pak-Lok and Flange-Lok models)			★
	Opposite Side Support – Required for Flanged Models			
C	NPT Threaded Opposite Support Assembly – Extended Tip			★
D	Welded Opposite Support Assembly – Extended Tip			★
	Packing Gland – Required for Flo-Tap Models			
Expanded				
	Packing Gland Material	*Rod Material*	*Packing Material*	
J	Stainless Steel Packing Gland / Cage Nipple	Carbon Steel	PTFE	
K	Stainless Steel Packing Gland / Cage Nipple	Stainless Steel	PTFE	
L	Stainless Steel Packing Gland / Cage Nipple	Carbon Steel	Graphite	
N	Stainless Steel Packing Gland / Cage Nipple	Stainless Steel	Graphite	
R	Alloy C-276 Packing Gland / Cage Nipple	Stainless Steel	Graphite	
Isolation Valve for Flo-Tap Models				
Standard				**Standard**
0[1]	Not Applicable or Customer Supplied			★
Expanded				
1	Gate Valve, Carbon Steel			
2	Gate Valve, Stainless Steel			
5	Ball Valve, Carbon Steel			
6	Ball Valve, Stainless Steel			
Temperature Measurement				
Standard				**Standard**
T	Integral RTD – not available with Flanged model greater than class 600#			★
0	No Temperature Sensor			★
Expanded				
R	Remote Thermowell and RTD			
Transmitter Connection Platform				
Standard				**Standard**
3	Direct-mount, Integral 3-valve manifold– not available with Flanged model greater than class 600			★
5	Direct -mount, 5-valve Manifold– not available with Flanged model greater than class 600			★
7	Remote-mount NPT Connections			★
Expanded				
6	Direct-mount, High Temperature 5-valve Manifold– not available with Flanged model greater than class 600			
8	Remote-mount SW Connections			

Options (Include with selected model number)

Pressure Testing		
Expanded		
P1[3]	Hydrostatic Testing with Certificate	
PX[3]	Extended Hydrostatic Testing	

Table 29. Rosemount 485 Annubar Primary 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.

Special Cleaning		
Expanded		
P2	Cleaning for Special Services	
PA	Cleaning per ASTM G93 level D (section 11.4)	
Material Testing		
Expanded		
V1	Dye Penetrant Exam	
Material Examination		
Expanded		
V2	Radiographic Examination	
Flow Calibration		
Expanded		
W1	Flow Calibration (Average K)	
WZ	Special Calibration	
Special Inspection		
Standard		**Standard**
QC1	Visual and Dimensional Inspection with Certificate	★
QC7	Inspection and Performance Certificate	★
Surface Finish		
Standard		**Standard**
RL	Surface finish for Low Pipe Reynolds Number in Gas and Steam	★
RH	Surface finish for High Pipe Reynolds Number in Liquid	★
Material Traceability Certification		
Standard		**Standard**
Q8[4]	Material Certificate per EN 10204:2004 3.1	★
Code Conformance		
Expanded		
J2[5]	ANSI/ASME B31.1	
J3[5]	ANSI/ASME B31.3	
Materials Conformance		
Expanded		
J5[6]	NACE MR-0175 / ISO 15156	
Country Certification		
Standard		**Standard**
J6	European Pressure Directive (PED)	★
Expanded		
J1	Canadian Registration	
Installed in Flanged Pipe Spool Section		
Expanded		
H3	150# Flanged Connection with Rosemount Standard Length and Schedule	
H4	300# Flanged Connection with Rosemount Standard Length and Schedule	
H5	600# Flanged Connection with Rosemount Standard Length and Schedule	
Instrument Connections for Remote Mount Option		
Standard		**Standard**
G2	Needle Valves, Stainless Steel	★
G6	OS&Y Gate Valve, Stainless Steel	★
Expanded		
G1	Needle Valves, Carbon Steel	
G3	Needle Valves, Alloy C-276	
G5	OS&Y Gate Valve, Carbon Steel	
G7	OS&Y Gate Valve, Alloy C-276	
Special Shipment		
Standard		**Standard**
Y1	Mounting Hardware Shipped Separately	★

Table 29. Rosemount 485 Annubar Primary 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.

Attach To		
Expanded		
H1	Attach to Transmitter	
Special Dimensions		
Expanded		
VM	Variable Mounting	
VT	Variable Tip	
VS	Variable length Spool Section	
V9	Special Dimension	
Typical Model Number: 485 L 060 D C H P S 2 T1 0 0 0 3		

(1) Provide the "A" dimension for Flanged (page 136), Flange-Lok (page 135), and Threaded Flo-Tap models (page 139). Provide the "B" dimension for Flange Flo-Tap models (page 137).

(2) Available in remote mount applications only.

(3) Applies to flow element only, mounting hardware not tested.

(4) Instrument Connections for Remote Mount Options and Isolation Valves for Flo-tap Models are not included in the Material Traceability Certification.

(5) Not available with Transmitter Connection Platform 6.

(6) Materials of Construction comply with metallurgical requirements 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.

485 SPECIFICATIONS

485 Performance Specifications

Performance Statement Assumptions

Measured pipe I.D.

Discharge Coefficient Factor

±0.75% of flow rate

Repeatability

±0.1%

Line Sizes

- Sensor Size 1: 2-in. to 8-in. (50 to 200 mm)
- Sensor Size 2: 6-in. to 96-in. (150 to 2400 mm)
- Sensor Size 3: 12-in. to 96-in. (300 to 2400 mm)

NOTE
Some mounting types are not available in larger line sizes.

Table 30. Reynolds Number and Probe Width

Sensor Size	Minimum Rod Reynolds Number (R_d)	Probe Width ($_d$) (inches)
1	6500	0.590-in. (14.99 mm)
2	12500	1.060-in. (26.92 mm)
3	25000	1.935-in. (49.15 mm)

$$R_d = \frac{d \times v \times p}{\mu}$$

Where
d = Probe width (feet)
v = Velocity of fluid (ft/sec)
p = Density of fluid (lbm/ft^3)
μ = Viscosity of the fluid (lbm/ft-sec)

Sizing

Contact an Emerson Process Management representative for assistance. A Configuration Data Sheet is required prior to order for application verification.

Flow Turndown

10:1 or better

Annubar Sensor Surface Finish

The front surface of the Annubar primary is textured for high Reynolds number applications (typically gas and steam). The surface texture creates a more turbulent boundary layer on the front surface of the sensor. The increased turbulence produces a more predictable and repeatable separation of flow at the edge of the sensor. The appropriate surface finish will be determined for each application by the Emerson Process Management sizing program, Instrument Toolkit software.

485 Functional Specifications

Service

- Liquid
- Gas
- Steam

Process Temperature Limits

Direct Mount Transmitter

- 500 °F (260 °C)
- 750 °F (398 °C) when used with a direct mount, high temperature 5-valve manifold (Transmitter Connection Platform code 6). Maximum temperature limit for steam processes is 650 °F (343 °C).
- 400 °F (204 °C) when top mounted in steam service

Remote Mount Transmitter

- 1250 °F (677 °C) – Alloy C-276 Sensor Material (For superheated steam applications above 1000 °F (538 °C), it is recommended that the Rosemount 585 with Alloy 800H sensor material is used.)
- 850 °F (454 °C) – Stainless Steel Sensor Material

Pressure and Temperature Limits(1)

Direct Mount Transmitter

- Up to 600# ANSI (1440 psig at 100 °F (99 bar at 38 °C))
- Integral temperature measurement is not available with Flanged mounting type greater than class 600

Remote Mount Transmitter

- Up to 2500# ANSI (6000 psig at 100 °F (416 bar at 38 °C)).

(1) Static pressure selection may effect pressure limitations.

485 Physical Specifications

Temperature Measurement

Integral RTD

- 100 Ohm platinum RTD
- 4-wire RTD (α = 0.00385)

Remote RTD

- 100 Ohm platinum RTD, spring loaded with 1/2-in. NPT nipple and union (078 series with Rosemount 644 housing)

Thermowell

- 1/2-in. x 1/2-in NPT, 316 Stainless Steel with 1/2-in. weld couplet (same as specified pipe material).

Housing Connections

1/2–14 NPT, G1/2, and M20 × 1.5 conduit. HART interface connections fixed to terminal block for output code A

Annubar Sensor Material

- 316 Stainless Steel
- Alloy C-276

Mounting Material

- Carbon Steel (A105)
- 316 Stainless Steel
- Chrome-Moly Grade F-11
- Chrome-Moly Grade F-22
- Chrome-Moly Grade F-91

Annubar Type

See “Rosemount 485 Annubar Primary Element” on page 86

Pak-Lok Model (option P)

- Provided with a compression sealing mechanism rated up to 600# ANSI (1440 psig at 100 °F (99 bar at 38 °C))
- –150 to 850 °F (–101 to 454 °C)
- Not available for steam above 600°F (315°C)

Flanged with Opposite Side Support Model (option F)

- Provided with opposite side support, which is the same material as the pipe and requires a second pipe penetration
- Sensor flange is the same material as the Annubar sensor and the mounting flange is the same material as the pipe material
- Flanged mounting hardware: nuts, studs and gaskets (DIN units supplied without nuts, studs and gaskets)
- SST: (–300 to 850 °F (–184 to 454 °C))
- Alloy C-276: (–150 to 1250 °F (-101 to 677 °C))
- Top mounting is recommended for steam above 600 °F (315 °C)

Flange–Lok Model (option L)

- Flange–Lok assembly is supplied in 316 SST material.
- Flange-Lok mounting hardware: nuts, studs and gaskets (DIN units supplied without nuts, studs and gaskets)
- –150 to 850 °F (-101 to 454 °C)
- Not available for steam above 600°F (315°C)

Flo-Tap Models (options G and M)

- Opposite side support is not available
- Threaded connection is not available with Sensor Size 3
- Gear Drive is not available with Sensor Size 1
- Packing gland required
- Packing Gland Material Temperature Limits
  - PTFE: –40 to 400 °F (–40 to 204 °C)
  - Graphite: –150 to 850 °F (-101 to 454 °C)
- Isolation valve included
  - The isolation valve will carry the same pressure rating as the sensor flange and mounting flange specified in the mounting type
  - Isolation vales are not supplied with DIN flanges and must be customer supplied
- For threaded flo-tap models, the isolation valve NPT size is 1 1/4-in. (Sensor Size 1) and 2-in. (Sensor Size 2).
- Top mounting is recommended for steam above 600 °F (315 °C)

Annubar Type Specification Chart

Option Code	Description	Pak-Lok(1)	Flange-Lok	Flange	Manual and Gear Drive Flo-Tap
T1(1)	Pak-Lok Body	X			
	Threaded connection				X
A1	150# RF ANSI		X	X	X
A3	300# RF ANSI		X	X	X
A6	600# RF ANSI		X	X	X
A9(2)	900# RF ANSI			X	
AF(2)	1500# RF ANSI			X	
AT(2)	2500# RF ANSI			X	
D1	DN PN 16		X	X	X
D3	DN PN 40		X	X	X
D6	DN PN 100		X	X	X
R1	150# RTJ Flange		X	X	X
R3	300# RTJ Flange		X	X	X
R6	600# RTJ Flange		X	X	X
R9(2)	900# RTJ Flange			X	
RF(2)	1500# RTJ Flange			X	
RT(2)	2500# RTJ Flange			X	

(1) Available up to 600# ANSI (1440 psig at 100 °F (99 bar at 38 °C)) rating.

(2) Remote mount only.

Instrument Connections Temperature Ranges

Table 31. Minimum / Maximum Temperature Range

Code	Description	Temperature
G1	Needle Valves, Carbon Steel	–20 to 500 °F (–29 to 260 °C)
G2	Needle Valves, Stainless Steel	–40 to 600 °F (–40 to 316 °C)
G3	Needle Valves, Alloy C-276	–40 to 600 °F (–40 to 316 °C)
G5	OS&Y Gate Valve, Carbon Steel	–20 to 775 °F (–29 to 413 °C)
G6	OS&Y Gate Valve, Stainless Steel	–40 to 850 °F (–40 to 454 °C)
G7	OS&Y Gate Valve, Alloy C-276	–40 to 1250 °F (–40 to 677 °C)

Flowmeter Installed in Flanged Pipe Spool Section (option codes H3, H4, and H5)

- All pipe spool sections are flanged pipe sections
- The flanged pipe spool section is constructed from the same material as the pipe
- Consult the factory for remote temperature measurement and ANSI ratings above 600# and DIN flanges.
- Available in carbon steel (A105) and 316 stainless steel

Table 32. Flanged Pipe Spool Section Schedule

ANSI	Schedule
150# ANSI	40
300# ANSI	40
600# ANSI	80

Table 33. Flange Pipe Spool Section Length

Nominal Pipe Size	Length
2-in. (50 mm)	10.52-in. (267.2 mm)
3-in. (80 mm)	11.37-in. (288.8 mm)
4-in. (100 mm)	12.74-in. (323.6 mm)
6-in. (150 mm)	14.33-in. (364.0 mm)
8-in. (200 mm)	16.58-in. (421.1 mm)

Rosemount 585 Annubar Primary Element

Rosemount 585 Annubar Primary Element utilizes a solid sensor construction that offers capabilities for severe service applications.

- Main Steam Line mounting hardware available
- Symmetrical sensor design allows bi-directional flow measurement
- Available in 4 to 96-in. (50 - 2400 mm) line sizes

Additional Information
Specifications: page 99
Dimensional Drawings: page 140
Installation and Flowmeter Orientation: page 151

Table 34. Rosemount 585 Annubar 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	DP Flow Primary Type	
585	Severe Service Annubar Primary Element	
Application Type		
Standard		**Standard**
S[(1)(2)]	Severe Service Annubar	★
Expanded		
M[(3)]	Main Steam Line Annubar	
Fluid Type		
Standard		**Standard**
L	Liquid	★
G	Gas	★
S	Steam	★
Annubar Type		
Standard		**Standard**
F	Flanged with Opposite Side Support	★
Expanded		
L	Main Steam Annubar with Opposite Side Support	
G	Gear-Drive Flo-Tap	
Line Size		
Standard		**Standard**
040	4-in. (100 mm)	★
050	5-in. (125 mm)	★
060	6-in. (150 mm)	★
080	8-in. (200 mm)	★
100	10-in. (250 mm)	★
120	12-in. (300 mm)	★
Expanded		
140	14-in. (350 mm)	
160	16-in. (400 mm)	
180	18-in. (450 mm)	
200	20-in. (500 mm)	
240	24-in. (600 mm)	
300	30-in. (750 mm)	
360	36-in. (900 mm)	
420	42-in. (1066 mm)	
480	48-in. (1210 mm)	

Table 34. Rosemount 585 Annubar 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.

600	60-in. (1520 mm)	
720	72-in. (1820 mm)	
840	84-in. (2100 mm)	
960	96-in. (2400 mm)	
Mounting Assembly Material		
Standard		**Standard**
C	Carbon Steel (A105)	★
S	316/316L Stainless Steel	★
Expanded		
L	Carbon Steel (A350 LF2)	
G	Chrome-Moly Grade F-11	
N	Chrome-Moly Grade F-22	
J	Chrome-Moly Grade F-91	
0[4]	No Mounting (Customer Supplied)	
Piping Orientation		
Standard		**Standard**
H	Horizontal Piping	★
D	Vertical Piping with Downwards Flow	★
U	Vertical Piping with Upwards Flow	★
Sensor Material		
Standard		**Standard**
S	316/316L Stainless Steel	★
Expanded		
H[5]	Alloy C-276	
W[3][5]	Alloy 800H	
K[5]	PVDF (KYNAR)	
Sensor Size		
Standard		**Standard**
11	Sensor size 11	★
22[6]	Sensor size 22	★
Expanded		
44[2][3]	Sensor size 44	
Mounting Type		
Standard		**Standard**
A	ANSI B16.5 Raised Face Flanges	★
D[7]	DIN Raised Face Flanges	★
Expanded		
R[8]	ANSI B16.5 Ring Type Joint Flanges	
0[3]	Main Steam Packing Gland	
Mounting Pressure Class		
Standard		**Standard**
1	ANSI 150 / DIN PN16	★
3[6]	ANSI 300 / DIN PN40	★
6[6]	ANSI 600 / DIN PN100	★
Expanded		
N[5][6]	ANSI 900	
F[5][6]	ANSI 1500	
T[5][6]	ANSI 2500	
0[3][5][6]	Main Steam Packing Gland	
Opposite Side Support		
Standard		**Standard**
C[9]	NPT Threaded Opposite Support Assembly	★
D[3]	Welded Opposite Support Assembly	★

Table 34. Rosemount 585 Annubar Ordering Information

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

Expanded		
E	Flanged Opposite Support Assembly	
0[2]	No Opposite Side Support Required	
Packing Gland/ Packing		
Standard		**Standard**
0[1]	Not Applicable	★
Expanded		
L[2]	SS Packing Gland / Graphite Packing	
T[3]	Main Steam Packing Gland / Graphite Packing	
Insertion Mechanism		
Standard		**Standard**
0[1][3]	Not Applicable	★
Expanded		
C	Alloy Steel Insertion Rods / Nuts	
S	Stainless Steel Insertion Rods / Nuts	
Isolation Valve		
Standard		**Standard**
0[3][1]	Not Applicable or Customer Supplied	★
Expanded		
1	Gate Valve, Carbon Steel	
2	Gate Valve, Stainless Steel	
5	Ball Valve, Carbon Steel	
6	Ball Valve, Stainless Steel	
Temperature Measurement		
Standard		**Standard**
0	No Temperature Sensor Required	★
Expanded		
R[4][6][9]	Remote RTD ($^1/_2$-in. NPT Aluminum Housing) with Thermowell	
S[4][6][9]	Remote RTD ($^1/_2$-in. NPT Stainless Housing) with Thermowell	
Transmitter Connection Platform		
Standard		**Standard**
3[6][10][11]	Direct-Mount, 3-Valve Manifold	★
Expanded		
4[6][10][11]	Direct-Mount, Dual 3-Valve Manifolds	
6[6][10][12]	High Temperature Direct-Mount 5-Valve Manifold	
7	Remote-Mount $^1/_2$-in. Threaded Connections	
8[3]	Remote-Mount $^1/_2$-in. Welded Connections	
Mounting Flange Bolting materials		
Standard		**Standard**
A	193 Gr B7 Studs w/ A194 Gr 2H Nuts	★
0	No Flange Studs/Nuts Supplied	★
Mounting Flange Gasket Materials		
Standard		**Standard**
1	Spiral Wound, 304SS, Flexible-Graphite Filler	★
0	No Flange Gasket Supplied	★
Expanded		
2	Ring-Joint, ANSI B16.20, Hexagonal, 316L	
3	Spiral Wound, B16.20, 316SS, PTFE Filler	

Table 34. Rosemount 585 Annubar 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)

Optional Mounting for Rectangular Ducts		
Expanded		
RD	Annubar Mounting for rectangular ducts	
Pressure Testing		
Expanded		
P1[13]	Hydrostatic Testing with Certificate	
PX	Extended Hydrostatic Testing	
Special Cleaning		
Expanded		
PA[6][14]	Cleaning per ASTM G93 Level D (section 11.4)	
Material Testing		
Expanded		
V1	Dye Penetrant Weld Exam	
Material Examination		
Expanded		
V2	Radiographic Weld Examination	
Flow Calibration		
Expanded		
W1	Flow Calibration (Average K)	
Special Inspection		
Standard		**Standard**
QC1	Visual & Dimensional Inspection w/ Cert.	★
QC7	Inspection & Performance Certificate	★
Material Traceability Certification		
Standard		**Standard**
Q8[5][15]	Material Cert. per ISO 10474 3.1 and EN 10204 3.1	★
Positive Material Testing		
Expanded		
V4[15]	Positive Material Identification	
Code Conformance		
Expanded		
J2	ANSI/ASME B31.1	
J3	ANSI/ASME B31.3	
Materials Conformance		
Expanded		
J5[16]	NACE MR-0175 / ISO 15156	
Country Certification		
Standard		**Standard**
J6	European Pressure Directive (PED)	★
Expanded		
J1	Canadian Registration Certificate	
Instrument Valves for Remote Mount Option		
Standard		**Standard**
G2	1/2-in. Needle Valves, SS	★
G6	1/2-in. OS&Y Gate Valve, SS	★
Expanded		
G1	1/2-in. Needle Valves, CS	
G3	1/2-in. Needle Valves, Alloy C-276	
G5	1/2-in. OS&Y Gate Valve, CS	
Instrument Valve Options		
Standard		**Standard**
DV[17]	Double Instrument Valves (4 valves total)	★

Table 34. Rosemount 585 Annubar 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.

Special Shipment		
Standard		**Standard**
Y1	Mounting Hardware Shipped Separately	★
Assemble Mounting Hardware		
Expanded		
WP(18)	Assemble Weldolet to Packing body	
Special Dimensions		
Expanded		
VM	Variable Mounting	
585 Packing Gland Plug		
Expanded		
TP(18)	Packing Gland Plug for Steam Blow Down	
585 Installation Alignment Bar		
Expanded		
A1(18)	Installation Alignment Bar	
Typical Model Number: 585 M S L 120 J H W 44 0 0 0 T 0 0 8 0 0		

(1) Required for Annubar Type F.

(2) Required for Annubar Type G.

(3) Required for Annubar Type L.

(4) Not available with Annubar Type L.

(5) Not available with Annubar Type G.

(6) Not available with Sensor Material K.

(7) Mounting Flange Bolting and Gasket option code 0 must be selected.

(8) Mounting Flange Gasket Material option code 2 or 0 must be selected.

(9) Not available with ANSI 2500 Mounting Pressure Class.

(10) Not available with Mounting Pressure Class N, T, or F.

(11) Not available with Sensor Material W.

(12) Not available with Sensor Material H or W.

(13) Applies to flow element only, mounting not tested.

(14) If selected with Annubar Type F, Mounting Flange Gasket Material option code 3 must be selected.

(15) For pressure retaining parts only, isolation and instrument valves are not included.

(16) Materials of Construction comply with metallurgical requirements 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.

(17) Only available if Instrument Valves for Remote Mount Option are selected.

(18) Only available with Annubar Type L.

585 Specifications

585 PERFORMANCE SPECIFICATIONS

Performance Statement Assumptions
Measured pipe I.D.

Discharge Coefficient Factor
±1.50% of flow rate

Repeatability
±0.10%

Line Sizes
- Sensor Size 11: 4-in. to 24-in. (100 to 600 mm)
- Sensor Size 22: 6-in. to 36-in. (150 to 900 mm)
- Sensor Size 44: 10-in. to 96-in. (250 to 2400 mm)

Table 35. Reynolds Number and Probe Width

Sensor Size	Minimum Rod Reynolds Number (R_d)	Probe Width ($_d$) (inches)
11	6500	0.80-in. (20,32 mm)
22	10000	1.20-in. (30,48 mm)
44	25000	2.28-in. (57,91 mm)

Where

$$R_d = \frac{d \times v \times p}{\mu}$$

d = Probe width (feet)
v = Velocity of fluid (ft/sec)
p = Density of fluid (lbm/ft^3)
μ = Viscosity of the fluid (lbm/ft-sec)

Sizing
Contact an Emerson Process Management representative for assistance. A Configuration Data Sheet is required prior to order for application verification.

Flow Turndown
10:1 or better

585 FUNCTIONAL SPECIFICATIONS

Service
- Liquid
- Gas
- Steam

Process Temperature Limits
Table 36. Direct Mount Transmitter Connection Platform

Transmitter Connection Platform	Temperature Limit
3-valve manifold (Option code 3)	500 °F (260 °C)
5-valve manifold (Option code 6)	750 °F (398 °C)
Note: Specification is 600 °F (315 °C) in steam service	

Table 37. Remote Mount Transmitter Connection Platform

Sensor Material	Temperature Limit
316 Stainless Steel (Option code S)	850 °F (454 °C)
Alloy C-276 (Option code H)	1250 °F (677 °C)
Alloy 800H (Option code W)	1500 °F (816 °C)
PVDF (KYNAR) (Option code K)	250 °F (121 °C)

Pressure and Temperature Limits
Table 38. Main Steam Line Annubar

Mounting Material	Sensor Material	Max. Pressure @ Temp.	Max. Temp.
Chrome-Moly Grade F-11	Alloy 800H	2317 psig @ 1000 °F (160 bar @ 538 °C)	1100 °F (593 °C)
Chrome-Moly Grade F-22	Alloy 800H	2868 psig @ 1000 °F (198 bar @ 538 °C)	1100 °F (593 °C)
Chrome-Moly Grade F-91	Alloy 800H	3788 psig @ 1100 °F (261 bar @ 593 °C)	1200 °F (649 °C)

Table 39. Severe Service Annubar

Annubar Type	Sensor Material	Max. Flange Rating
Flanged (option code F)	316 SST	2500# ANSI
	Alloy C-276	2500# ANSI
	Alloy 800H	2500# ANSI
	PVDF (KYNAR)	150# ANSI
Flanged Flo-Tap (option code G)	316 SST	600# ANSI

585 PHYSICAL SPECIFICATIONS

Temperature Measurement

Remote RTD

- Series 78 with Rosemount 644 housing 100 Ohm platinum RTD
- Spring loaded with 1/2-in. NPT nipple and union

Thermowell

- 1/2-in. NPT x 3/4-in. socket weld
- 316 Stainless Steel and Alloy C-276 Material
- 2.5-in. insertion length provided

Annubar Sensor Material

- 316 Stainless Steel
- Alloy C-276
- Alloy 800H
- PVDF (KYNAR)

Mounting Material

- Carbon Steel (A105)
- 316 Stainless Steel
- Carbon Steel (A350 LF2)
- Chrome-Moly Grade F-11
- Chrome-Moly Grade F-22
- Chrome-Moly Grade F-91

Annubar Type

See “585 Dimensional Drawings” on page 140

Flanged with Opposite Side Support Model (option F)

- Provided with opposite side support, which is the same material as the pipe and requires a second pipe penetration
- Sensor flange is the same material as the Annubar sensor and the mounting flange is the same material as the pipe material
- Flanged mounting hardware: nuts, studs and gaskets (DIN units supplied without nuts, studs and gaskets)
- SST: –325 to 850 °F (–198 to 454 °C)
- Alloy C-276: –325 to 1250 °F (–198 to 677 °C)
- PVDF (KYNAR): -40 to 250 °F (-40 to 121 °C)
- Alloy 800H: -325 to 1500 °F (-198 to 816 °C)

Main Steam Annubar with Opposite Side Support (option L)

- Provided with opposite side support, which is the same material as the pipe and requires a second pipe penetration
- Alloy 800H: -325 to 1500 °F (-198 to 816 °C)
- Only available in sensor size 44

Flanged Flo-Tap Models (option G)

- Opposite side support is not available
- Packing Gland Material Temperature Limits
  - Graphite: –40 to 850 °F (–40 to 454 °C)
- Isolation valve option
  - The isolation valve will carry the same pressure rating as the sensor flange and mounting flange specified in the mounting type
- SST: –325 to 850 °F (–198 to 454 °C)
- Maximum allowable insertion pressure: 1440 psig (99 bar)
- Only available in sensor size 44

Annubar Type Specification Chart

Option Code	Mounting Type/ Pressure Class	Flanged	Main Steam	Gear-Drive Flo-Tap
A1	150# RF ANSI	X		X
A3	300# RF ANSI	X		X
A6	600# RF ANSI	X		X
AN(1)	900# RF ANSI	X		
AF(1)	1500# RF ANSI	X		
AT(1)	2500# RF ANSI	X		
D1	DIN PN 16	X		X
D3	DIN PN 40	X		X
D6	DIN PN 100	X		X
R1	150# RTJ Flange	X		X
R3	300# RTJ Flange	X		X
R6	600# RTJ Flange	X		X
RN(1)	900# RTJ Flange	X		
RF(1)	1500# RTJ Flange	X		
RT(1)	2500# RTJ Flange	X		
00(1)	Main Steam Packing Gland		X	

(1) Remote mount only.

Instrument Connection Temperature Ranges

Table 40. Minimum / Maximum Temperature Range

Code	Description	Temperature
G1	Needle Valves, Carbon Steel	–20 to 550 °F (–29 to 288 °C)
G2	Needle Valves, Stainless Steel	–20 to 1000 °F (–29 to 538 °C)
G3	Needle Valves, Alloy C-276	–20 to 1000 °F (–29 to 538 °C)
G5	OS&Y Gate Valve, Carbon Steel	–20 to 800 °F (–29 to 427 °C)
G6	OS&Y Gate Valve, Stainless Steel	–20 to 850 °F (–29 to 454 °C)

Rosemount 405 Compact Primary Element

Rosemount 405 Compact Primary Element utilizes an easy to install direct mount primary element assembly.

- Available with Conditioning Orifice Plate Technology
- 405P/C orifice primary elements are based on ASME/ISO corner tap design
- Available in 2 to 12-in. (50 - 300 mm) line sizes

Additional Information
Specifications: page 103
Dimensional Drawings: page 143
Installation and Flowmeter Orientation: page 151

Table 41. Rosemount 405 Compact Orifice Primary Element 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	
405	Compact Primary Element	
Primary Element Type		
Standard		**Standard**
C	Conditioning Orifice Plate	★
P	Orifice Plate	★
Material Type		
Standard		**Standard**
S	316 Stainless Steel (SST)	★
Line Size		
Standard		**Standard**
005(1)	1/2-in. (15 mm)	★
010(1)	1-in. (25 mm)	★
015(1)	1 1/2-in. (40 mm)	★
020	2-in. (50 mm)	★
030	3-in. (80 mm)	★
040	4-in. (100 mm)	★
060	6-in. (150 mm)	★
080	8-in. (200 mm)	★
100	10-in. (250 mm)	★
120	12-in. (300 mm)	★
Temperature Measurement		
Standard		**Standard**
N	No Temperature Measurement	★
Primary Element Type		
Standard		**Standard**
040	0.40 Beta Ratio (β)	★
065(2)	0.65 Beta Ratio (β)	★
Transmitter Connection		
Standard		**Standard**
D3	Coplanar, Direct mount, 3-valve Integral Manifold, SST	★
R3	Remote-mount, 1/4-in. NPT connections	★
Expanded		★
A3	Traditional, Direct mount, 3-valve Integral Manifold with adapter plate, SST	★

Table 41. Rosemount 405 Compact Orifice Primary Element 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)

Installation Accessories		
Standard		**Standard**
A	ANSI Alignment Ring (150#) (Only required for 10-in. (250 mm) and 12-in. (300mm) line sizes)	★
C	ANSI Alignment Ring (300#) (Only required for 10-in. (250 mm) and 12-in. (300mm) line sizes)	★
D	ANSI Alignment Ring (600#) (Only required for 10-in. (250 mm) and 12-in. (300mm) line sizes)	★
G	DIN Alignment Ring (PN 16)	★
H	DIN Alignment Ring (PN 40)	★
J	DIN Alignment Ring (PN 100)	★
Expanded		
B	JIS Alignment Ring (10K)	
R	JIS Alignment Ring (20K)	
S	JIS Alignment Ring (40K)	
Remote Adapters		
Standard		**Standard**
E	Flange adapters 316 SST ($^1/_2$-in. NPT)	★
High Temperature Application		
Expanded		
T	Graphite valve packing (Tmax = 850 °F)	
Flow Calibration		
Expanded		
WC	Discharge Coefficient Verification (3 point)	
WD	Discharge Coefficient Verification (10 point)	
Pressure Testing		
Expanded		
P1	Hydrostatic testing with Certificate	
Special Cleaning		
Expanded		
P2	Cleaning for Special Services	
PA	Cleaning per ASTM G93 Level D (section 11.4)	
Special Inspection		
Standard		**Standard**
QC1	Visual and Dimensional Inspection with certificate	★
QC7	Inspection and performance certificate	★
Material Traceability Certification		
Standard		**Standard**
Q8	Material Traceability Certification per En 10204:2004 3.1	★
Code Conformance		
Expanded		
J2	ANSI / ASME B31.1	
J3	ANSI / ASME B31.3	
J4	ANSI / ASME B31.8	
Materials Conformance		
Expanded		
J5(3)	NACE MR-0175 / ISO 15156	
Country Certification		
Expanded		
J1	Canadian Registration	
Typical Model Number: 405 C S 040 N 040 D3		

(1) Not available for Primary Element Type code C.

(2) For 2-in. (50 mm) line sizes the Beta Ratio is 0.6 for Primary Element Type code C.

(3) Materials of Construction comply with metallurgical requirements within NACE MR0175/ISO 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.

405 Specifications

405 PERFORMANCE SPECIFICATIONS

Table 42. 405C Conditioning Orifice Technology

Beta Ratio	Cd Uncertainty
$\beta = 0.40$	±0.50%
$\beta = 0.65$(1)	±1.00%

(1) For 0.65 beta and ReD< 10,000 add an additional 0.5% to the Discharge Coefficient Uncertainty.

Table 43. 405P Compact Orifice Technology

Beta	Discharge Coefficient Uncertainty
1/2-in. line size	
0.4 0.65	±2.25%
1-in. to 1 1/2-in. line size	
0.4 0.65	±1.75%
2-in. to 12-in. line size	
0.4 0.65	±1.25%

Line Sizes

- 1/2-in. (15 mm) – not available for the 405C
- 1-in. (25 mm) – not available for the 405C
- 1 1/2-in. (40 mm) – not available for the 405C
- 2-in. (50 mm)
- 3-in. (80 mm)
- 4-in. (100 mm)
- 6-in. (150 mm)
- 8-in. (200 mm)
- 10-in. (250 mm)
- 12-in. (300 mm)

Sizing

Contact an Emerson Process Management sales representative assistance. A “Configuration Data Sheet” is required prior to order for application verification.

405 FUNCTIONAL SPECIFICATIONS

Service

- Liquid
- Gas
- Vapor

Process Temperature Limits

Direct Mount Transmitter

- -40 to 450 °F (-40 to 232 °C)
- Up to 400 °F (204 °C) when top mounted in steam service

Remote Mount Transmitter

- -148 to 850 °F (-100 to 454 °C) – Stainless Steel

Differential Pressure Limits

Maximum differential pressure (DP) up to 800 inH_2O.

Maximum Working Pressure

- Pressure retention per ANSI B16.5 600# or DIN PN100

Vibration Limits

Qualified per IEC61298-3 (1998) for field with high vibration level or pipeline with high vibration level (10-60Hz 0.21mm displacement peak amplitude / 60 - 2000Hz 3g).

The weight and length of the transmitter assembly shall not exceed 5.8 lbs and 7.75-in.

Assembly to a transmitter

Select option code C11 for the Rosemount 3051S transmitter (or option code S3 for the Rosemount 3051C or 3095MV transmitters) to factory assemble the Rosemount 405 to a Rosemount pressure transmitter. If the 405 and transmitter are not factory assembled, they may be shipped separately. For a consolidated shipment, inform the Emerson Process Management representative when placing the order.

405 PHYSICAL SPECIFICATIONS

Temperature Measurement

Integral RTD(1)

- 100 Ohm platinum RTD temperature sensor assembly (316 SST Mineral Insulated Cable) with 1/4-in. NPT connection to wafer side and 1/2-in. NPT connection to transmitter RTD sensor is separated from process fluid by 1/16-in. and is pressure retaining rated for ANSI 600#. Complies with IEC-751 Class B accuracy. Meets Intrinsic Safety certification.

(1) Only available with 3051SFC or 3095MFC Compact Orifice Flowmeter models.

Remote RTD(1)

- 100 Ohm platinum with 1/2-in. NPT nipple and union (078 series with Rosemount 644 housing) Model 0078D21N00A025T32Ex Connection Head: 00644-4410-0011
- Standard RTD cable is shielded armored cable, length is 12 ft. (3.66 m)
- Remote RTD material is SST Thermowell
- 1/2-in. x 1/2-in. NPT, 316 SST

(1) Only available with 3051SFC or 3095MFC Compact Orifice Flowmeter models.

Material of Construction

Body/Plate

- 316/316L SST
- 50 micro-inch Ra surface finish

Manifold Head/Valves

- 316 SST

Flange Studs and Nuts

- Customer supplied
- Available as a spare part

Transmitter Connection Studs and Nuts

- Studs– A193 Grade B8M.
- Nuts– A194 Grade 8M.

Gasket and O-rings

- Gaskets are customer supplied.
- Durlon 8500 fiber gaskets are recommended. Consult an Emerson Process Management representative for use with other gaskets.
- Available as a spare part

NOTE
Gaskets and O-rings should be replaced when the 405 is disassembled.

Transmitter Connections

Direct Mount

- Available with 3051SMV, 3051S, 3051, 2051 and 3095 transmitters, ranges 1, 2, and 3.

Remote Mount

- Available with $^1/_4$-in. NPT (standard) or $^1/_2$-in. NPT (option code E) connections

Orifice Type

- Square edged

Orifice Pressure Taps

- Corner

Alignment Rings

Mounts between the following flange configurations:

ASME B16.5 (ANSI)	DIN	JIS
Class 150	PN16 (option code G)	10k (option code B)
Class 300	PN40 (option code H)	20k (option code R)
Class 600	PN100 (option code H)	40k (option code S)

ANSI 150 - 600# alignment ring is included as standard when ordering for up to 8-in. line size. For the 10-in. and 12-in. line size, the alignment ring must be ordered (Installation Accessories).

Typical Orifice Hole Sizes

For 405C, beta is calculated by: $\beta = d_C$ / Pipe ID, where the calculated bore is equal to 2 x typical orifice hole size ($d_C = 2d$). The tables below show the diameter of the typical orifice holes.

Table 44. $\beta = 0.4$[(1)(2)]

Line Size	405C	405P
$^1/_2$-in. (15 mm)	Not Available	0.249 (6.325)
1-in. (25 mm)	Not Available	0.420 (10.668)
$1^1/_2$-in. (40 mm)	Not Available	0.644 (16.358)
2-in. (50 mm)	0.413 (10.490)	0.827 (21.006)
3-in. (80 mm)	0.614 (15.596)	1.227 (31.166)
4-in. (100 mm)	0.805 (20.447)	1.610 (40.894)
6-in. (150 mm)	1.971 (50.063)	3.942 (100.127)
8-in. (200 mm)	2.594 (65.888)	5.188 (131.775)
10-in. (250 mm)	3.257 (82.728)	6.513 (165.43)
12-in. (300 mm)	3.900 (99.060)	7.800 (198.120)

(1) Measurement is in inches (millimeters)

(2) Tolerance = ±0.002-in.

Table 45. $\beta = 0.65$[(1)(2)]

Line Size	405C	405P
$^1/_2$-in. (15 mm)	Not Available	0.404 (10.262)
1-in. (25 mm)	Not Available	0.682 (17.323)
$1^1/_2$-in. (40 mm)	Not Available	1.047 (26.594)
2-in. (50 mm)	0.620 (15.748)[(3)]	1.344 (34.138)
3-in. (80 mm)	0.997 (25.324)	1.994 (50.648)
4-in. (100 mm)	1.308 (33.223)	2.617 (66.472)
6-in. (150 mm)	1.213 (30.810)	2.426 (61.620)
8-in. (200 mm)	1.596 (40.538)	3.192 (81.077)
10-in. (250 mm)	2.004 (50.902)	4.008 (101.80)
12-in. (300 mm)	2.400 (60.960)	4.800 (121.92)

(1) Measurement is in inches (millimeters)

(2) Tolerance = ±0.002-in.

(3) For 2-in. (50 mm) line size, the Beta (β) = 0.60.

Table 46. 405 Weight (measurement in lb. (kg))

Line Size	Direct Mount (D3)	Remote Mount (R3)
$^1/_2$-in. (15 mm)	3.50 (1.73)	7.5 (3.70)
1-in. (25 mm)	4.25 (2.10)	8.25 (4.07)
$1^1/_2$-in. (40 mm)	4.75 (2.34)	8.75 (4.32)
2-in. (50 mm)	5.00 (2.47)	9.00 (4.44)
3-in. (80 mm)	7.00 (3.45)	11.00 (5.43)
4-in. (100 mm)	9.50 (4.69)	13.50 (6.67)
6-in. (150 mm)	13.00 (6.41)	17.00 (8.40)
8-in. (200 mm)	18.25 (9.00)	22.25 (10.99)
10-in. (250 mm)	23.50 (11.59)	27.50 (13.58)
12-in. (300 mm)	29.50 (14.55)	33.50 (16.54)

Rosemount 1595 Conditioning Orifice Plate

Rosemount 1595 Conditioning Orifice combines a flow conditioner with an orifice plate into a highly accurate primary element.

- Requires only 2 diameters of straight pipe run upstream and downstream from a flow disturbance
- Suitable for most gas, liquid, and steam applications
- Available in 2 to 24-in. (50 - 600 mm) line sizes

Additional Information
Specifications: page 107
Dimensional Drawings: page 145
Installation and Flowmeter Orientation: page 151

TABLE 47. Rosemount 1595 Conditioning Orifice Plate Ordering Table

★ 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	
1595	Conditioning Orifice Plate	
Plate Type		
Standard		**Standard**
P	Paddle, Square Edged	★
U[(1)(2)]	Universal, Square Edged	★
Line Size		
Standard		**Standard**
020	2-in. (50 mm)	★
030	3-in. (76 mm)	★
040	4-in. (100 mm)	★
060	6-in. (150 mm)	★
080	8-in. (200 mm)	★
100	10-in. (250 mm)	★
120	12-in. (300 mm)	★
Expanded		
140	14-in. (350 mm)	
160	16-in. (400 mm)	
180	18-in. (450 mm)	
200	20-in. (500 mm)	
240	24-in. (600 mm)	
Flange Rating		
Standard		**Standard**
A1	ANSI Class 150 Raised Face (*Note: Not compatible with standard ASME B16.36 Orifice Flanges)*	★
A3	ANSI Class 300 Raised Face	★
A6	ANSI Class 600 Raised Face	★
A9	ANSI Class 900 Raised Face	★
AF	ANSI Class 1500 Raised Face	★
AT	ANSI Class 2500 Raised Face	★
D1[(1)]	DIN PN 10 (only available with Plate Type P)	★
D2[(1)]	DIN PN 16 (only available with Plate Type P)	★
D3[(1)]	DIN PN 25 (only available with Plate Type P)	★
D4[(1)]	DIN PN40 (only available with Plate Type P)	★
D5[(1)]	DIN PN 63 (only available with Plate Type P)	★
D6[(1)]	DIN PN 100 (only available with Plate Type P)	★
Expanded		
R3[(1)]	ANSI Class 300 Ring Joint (only available with Orifice Plate Type code U and requires Plate Holder code PH)	
R6[(1)]	ANSI Class 600 Ring Joint (only available with Orifice Plate Type code U and requires Plate Holder code PH)	

TABLE 47. Rosemount 1595 Conditioning Orifice Plate Ordering Table

★ 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.

R9[1]	ANSI Class 900 Ring Joint (only available with Orifice Plate Type code U and requires Plate Holder code PH)			
RF[1]	ANSI Class 1500 Ring Joint (only available with Orifice Plate Type code U and requires Plate Holder code PH)			
RT[1]	ANSI Class 2500 Ring Joint (only available with Orifice Plate Type code U and requires Plate Holder code PH)			
Material Type				
Standard				**Standard**
S	316/316L Stainless Steel			★
Expanded				
M	Alloy 400			
H	Alloy C-276			
Orifice Plate Thickness		**Plate Type P**	**Plate Type U**	
Standard				**Standard**
A	0.125-in.	Line Sizes 2 to 4-in. (50 to 100 mm)	Line size 2 to 6-in. (50 to 150 mm)	★
B	0.250-in.	Line Sizes 6 to 12-in. (150 to 300 mm)	Line size 8 to 12-in. (200 to 300 mm)	★
Expanded				
C	0.375-in.	Line Sizes 14 to 20-in. (350 to 500 mm)	N/A	
D	0.500-in.	Line Size 24-in. (600 mm)	N/A	
Beta Ratio				
Standard				**Standard**
020	0.20 Beta Ratio			★
040	0.40 Beta Ratio			★
065	0.65 Beta Ratio (0.60 beta ratio for Line Size option 020 only)			★

Options (Include with selected model number)

Flow Calibration		
Standard		**Standard**
WC	Flow Calibration Certification (3 points)	★
Expanded		
WD	Discharge Coefficient Verification (full 10 points)	
Plate Holder		
Expanded		
PH[1]	Plate Holder for Universal Type Orifice Plate for use with RTJ flange or section	
Special Cleaning		
Expanded		
P2	Cleaning for Special Services	
Special Inspection		
Standard		**Standard**
QC1	Visual and dimensional Inspection with certification	★
QC7	Inspection and performance certificate	★
Material Traceability Certification		
Standard		**Standard**
Q8	Material Certification per ISO 10474 3.1-B and EN 10204 3.1	★
Code Conformance		
Expanded		
J5[3]	NACE MR-0175 / ISO 15156	
Country Certification		
Expanded		
J1	Canadian Registration	
Typical Model Number: 1595 P 060 A3 S A 040		

(1) Currently available up to 12-in. (300 mm) line size.

(2) For use with a plate holder device in RTJ type flanges or orifice fittings.

(3) Materials of Construction comply with metallurgical requirements within NACE MR0175/ISO 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.

1595 Specifications

1595 PERFORMANCE SPECIFICATIONS

Flow Coefficient Uncertainty

Table 48. Discharge Coefficient Uncertainty

Beta Ratio(1)	Cd Uncertainty(2)
β = 0.20	±0.50%
β = 0.40	±0.50%
β = 0.65	±1.00% (applicable for Beta > 0.4)

(1) For 0.65 beta and ReD< 10,000 add an additional 0.5% to the Discharge Coefficient Uncertainty.

(2) When using the Calibration Factor (Fc) supplied.

Sizing

Perform a flow calculation using the Instrument Toolkit® software package. Alternatively, contact an Emerson Process Management representative.

Pressure Tap Orientation

Orient the 1595 Conditioning Orifice Plate so that the pressure taps are centered between any 2 (of 4) orifice bore holes. In addition, the pressure taps should be located at 90° to the plane of the last elbow.

The 1595 Conditioning Orifice Plate can be used with the following pressure taps:

- Corner pressure taps - all beta sizes
- Flange pressure taps - all beta sizes
- Radius pressure taps (D and D/2) - 0.4 beta size or smaller

Centering Requirements

The 1595 should be installed so that it is centered in the pipes as recommended by ISO-5167.

1595 FUNCTIONAL SPECIFICATIONS

Service and Flow Range

Liquid, gas or vapor turbulent flow, for pipe Reynold's Numbers greater than 5,000. For pipe Reynold's Numbers less than 10,000 add an additional +0.5% uncertainty to the discharge coefficient uncertainty.

Pipe Sizes

2 to 24-in. (50 to 600 mm). Contact Emerson Process Management for other pipe sizes.

Operating Limits

For line sizes 2-in. (50 mm) to 24-in. (600 mm)

Temperature Range: –320 to 1200 °F (–196 to 649 °C)

- – 320 to 800 °F (–196 to 427 °C) and differential pressure up to 800 inH_20
- 800 to 1200 °F (427 to 649 °C) and differential pressure up to 400 inH_20

Maximum Working Pressure

- Flange rating per ANSI B16.5 and DIN EN 1092-1.

1595 PHYSICAL SPECIFICATIONS

Material of Construction

Table 49. 1595 Materials of Construction

Code	Description	ASTM	UNS	DIN (W.-Nr.)
S	316/316L SST	A240 Gr 316/316L	S31600 / S31603	1.4401/1.4404 (1.4436/1.4435)
H	Alloy C-276	B575 Gr N10276	N10276	2.4819
M	Alloy 400	B127 Gr N04400	N04400	2.4360

Flange Mounting Hardware

- The 1595 can be used with the Rosemount 1496 Flange Union. See Product Data Sheet 00813-0100-4792 for more information regarding the Rosemount 1496.

Orifice Type

- Paddle, square-edge
- Universal, square-edge

Typical Orifice Hole Sizes

Beta is calculated by: β = d_C / Pipe ID, where the calculated bore is equal to 2 x typical orifice hole size (d_C = 2d). The table below shows the diameter of each of the four orifice holes.

Table 50. Typical Orifice Hole Sizes

Line Size	Pipe ID	Beta (β) = 0.20 d	Beta (β) = 0.40 d	Beta (β) = 0.65 d
2-in. (50 mm)	2.067-in. (52.502 mm)	0.207 (5.26)	0.413 (10.49)	0.620 (15.75)(1)
3-in. (76 mm)	3.068-in. (77.927 mm)	0.307 (7.80)	0.614 (15.60)	0.997 (25.32)
4-in. (100 mm)	4.026-in. (102.26 mm)	0.403 (10.25)	0.805 (20.45)	1.309 (32.22)
6-in. (150 mm)	6.065-in. (154.051 mm)	0.607 (15.42)	1.213 (30.81)	1.971 (50.06)
8-in. (200 mm)	7.981-in. (202.717 mm)	0.798 (20.27)	1.596 (40.54)	2.594 (65.89)
10-in. (250 mm)	10.02-in. (254.51 mm)	1.002 (25.45)	2.004 (50.90)	3.257 (82.73)
12-in. (300 mm)	12.00-in. (304.80 mm)	1.200 (30.48)	2.400 (60.96)	3.900 (99.06)
14-in. (350 mm)	13.124-in. (333.35 mm)	1.312 (33.32)	2.625 (66.68)	4.265 (108.33)
16-in. (400 mm)	15.000-in. (381.00 mm)	1.500 (38.10)	3.000 (76.20)	4.875 (123.83)
18-in. (450 mm)	16.876-in. (428.65 mm)	1.688 (42.88)	3.375 (85.73)	5.485 (139.32)
20-in. (500 mm)	18.812-in. (477.82 mm)	1.881 (47.78)	3.762 (95.55)	6.114 (155.30)
24-in. (600 mm)	22.624-in. (574.65 mm)	2.262 (57.45)	4.525 (114.94)	7.353 (186.77)

(1) For 2-in. (50.8 mm) line size, the beta (β) is 0.60.

Rosemount 1195 Integral Orifice Primary Element

1195 Integral Orifice Primary Element

Rosemount 1195 Integral Orifice Primary Element utilizes a self centering orifice plate design to eliminate installation error.

- Enables highly accurate flow measurement in small line sizes
- Available with a variety of process connections
- Available in 1/2 to 1 1/2-in. (15 - 40 mm) line sizes

Additional Information
Specifications: page 111
Dimensional Drawings: page 149
Installation and Flowmeter Orientation: page 151

Table 51. Rosemount 1195 Integral Orifice Primary Element 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	
1195	Integral Orifice Primary Flow Element	
Body Material		
Standard		**Standard**
S	316 SST	★
Line Size		
Standard		**Standard**
005	1/2-in. (15 mm)	★
010	1-in. (25 mm)	★
015	1 1/2-in. (40 mm)	★
Process Connection		
Standard		**Standard**
T1	NPT Female Body (not available with thermowell and RTD)	★
S1(1)	Socket Weld Body (not available with thermowell and RTD)	★
P1	Pipe Ends: NPT threaded	★
P2	Pipe Ends: Beveled	★
D1	Pipe Ends: Flanged, RF, DIN PN16, slip-on	★
D2	Pipe Ends: Flanged, RF, DIN PN40, slip-on	★
D3	Pipe Ends: Flanged, RF, DIN PN100, slip-on	★
W1	Pipe Ends: Flanged, RF, ANSI Class 150, weld-neck	★
W3	Pipe Ends: Flanged, RF, ANSI Class 300, weld-neck	★
W6	Pipe Ends: Flanged, RF, ANSI Class 600, weld-neck	★
Expanded		
A1	Pipe Ends: Flanged, RF, ANSI Class 150, slip-on	
A3	Pipe Ends: Flanged, RF, ANSI Class 300, slip-on	
A6	Pipe Ends: Flanged, RF, ANSI Class 600, slip-on	
R1	Pipe Ends: Flanged, RTJ, ANSI Class 150, slip-on	
R3	Pipe Ends: Flanged, RTJ, ANSI Class 300, slip-on	
R6	Pipe Ends: Flanged, RTJ, ANSI Class 600, slip-on	
P9	Special Process Connection	
Orifice Plate Material		
Standard		**Standard**
S	316 SST	★

Table 51. Rosemount 1195 Integral Orifice Primary Element Ordering Information

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

Expanded		
H	Alloy C-276	
M	Alloy 400	
Bore Size Option		
Standard		**Standard**
0066	0.066-in. (1,68 mm) for 1/2-in. pipe	★
0109	0.109-in. (2,77 mm) for 1/2-in. pipe	★
0160	0.160-in. (4,06 mm) for 1/2-in. pipe	★
0196	0.196-in. (4,98 mm) for 1/2-in. pipe	★
0260	0.260-in. (6,60 mm) for 1/2-in. pipe	★
0340	0.340-in. (8,64 mm) for 1/2-in. pipe	★
0150	0.150-in. (3,81 mm) for 1-in. pipe	★
0250	0.250-in. (6,35 mm) for 1-in. pipe	★
0345	0.345-in. (8,76 mm) for 1-in. pipe	★
0500	0.500-in. (12,70 mm) for 1-in. pipe	★
0630	0.630-in. (16,00 mm) for 1-in. pipe	★
0800	0.800-in. (20,32 mm) for 1-in. pipe	★
0295	0.295-in. (7,49 mm) for 1 1/2-in. pipe	★
0376	0.376-in. (9,55 mm) for 1 1/2-in. pipe	★
0512	0.512-in. (13,00 mm) for 1 1/2-in. pipe	★
0748	0.748-in. (19,00 mm) for 1 1/2-in. pipe	★
1022	1.022-in. (25,96 mm) for 1 1/2-in. pipe	★
1184	1.184-in. (30,07 mm) for 1 1/2-in. pipe	★
Expanded		
0010	0.010-in. (0,25 mm) for 1/2-in. pipe	
0014	0.014-in. (0,36 mm) for 1/2-in. pipe	
0020	0.020-in. (0,51 mm) for 1/2-in. pipe	
0034	0.034-in. (0,86 mm) for 1/2-in. pipe	
Transmitter / Body Bolt Material		
Standard		**Standard**
C	316 SST (1 1/2-in. transmitter studs)	★
Expanded		
G[2]	High temperature (850 °F (454 °C))	

Options (Include with selected model number)

Temperature Sensor		
Expanded		
S[3]	Thermowell and RTD (SST Temperature Housing)	
T[3]	Thermowell and RTD (Aluminum Temperature Housing)	
Assemble to Transmitter		
Expanded		
S4[4]	Factory assembly – Attach to transmitter and manifold	
Optional Bore Calculation		
Standard		**Standard**
BC	Bore Calculation	★
Optional Connection		
Standard		**Standard**
G1	DIN 19231 Transmitter Connection	★
Adapters for Remote Mounting		
Standard		**Standard**
G2	1/2–14 NPT Remote Adapters – SST	★
Expanded		
G3	1/2–14 NPT Remote Adapters – Alloy C-276	

Table 51. Rosemount 1195 Integral Orifice Primary Element 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		
Expanded		
P1[5]	Hydrostatic Testing with Certificate	
Special Cleaning		
Expanded		
P2	Cleaning for Special Services	
PA	Cleaning per ASTM G93 Level D (section 11.4)	
Material Testing		
Expanded		
V1	Dye Penetrant Exam	
Material Examination		
Expanded		
V2	Radiographic Examination (available only with Process Connection code W1, W3, and W6)	
Flow Calibration		
Expanded		
WD[6]	Discharge Coefficient Verification	
WZ[6]	Special Calibration	
Special Inspection		
Standard		**Standard**
QC1	Visual and dimensional inspection with certificate	★
QC7	Inspection and performance certificate	★
Material Traceability Certification		
Standard		**Standard**
Q8	Material certification per EN 10204:2004 3.1	★
Code Conformance		
Expanded		
J2[7]	ANSI / ASME B31.1	
J3[7]	ANSI / ASME B31.3	
J4[7]	ANSI / ASME B31.8	
Materials Conformance		
Expanded		
J5[8]	NACE MR-0175 / ISO 15156	
Country Certification		
Standard		**Standard**
J6	European Pressure Directive (PED)	★
Expanded		
J1	Canadian Registration	
Hardware Adjustments and Ground Screw		
Expanded		
A1	External Ground Screw for Temperature Connection Head	
A2	Cover Clamp and External Ground Screw for Temperature Connection Head	
Typical Model Number: 1195 S 010 A3 S 0150 C		

(1) To improve pipe perpendicularity for gasket sealing, socket diameter is smaller than standard pipe O.D.

(2) Not available with Assemble to Transmitter code S4.

(3) Thermowell material is the same as the body material.

(4) Not available with Process Connection code S1.

(5) Does not apply to Process Connection codes T1 and S1.

(6) Not available for bore sizes 0010, 0014, 0020, or 0034.

(7) Not available with DIN Process Connection codes D1, D2, or D3.

(8) Materials of Construction comply with metallurgical requirements 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.

1195 Specifications

1195 PERFORMANCE SPECIFICATIONS

Discharge Coefficient Uncertainty(1)

Beta (β)(2)	Discharge Coefficient Uncertainty
β < 0.1	±2.50%
0.1 < β < 0.2	±1.25%
0.2 < β < 0.6	±0.75%
0.6 < β < 0.8	±1.50%

(1) Without associated straight run piping, discharge coefficient uncertainty can add up to 1.5% - 5% additional error. Consult the factory for additional information.

(2) $\beta = \frac{\text{Orifice Plate Bore}}{\text{body I.D.}}$

Line Sizes

- 1/2-in. (15 mm)
- 1-in. (25 mm)
- 1 1/2-in. (40 mm)

Sizing

Contact a Emerson Process Management sales representative for assistance. A “Configuration Data Sheet” is required prior to order for application verification.

1195 FUNCTIONAL SPECIFICATIONS

Service

- Liquid
- Gas
- Steam

Process Temperature Limits

Standard (direct/remote mount):

- –40 to 450 °F (–40 to 232 °C)

Extended (remote mount only with option code T):

- –148 to 850 °F (–100 to 454 °C)

Maximum Working Pressure

- Pressure retention per ANSI B16.5 600# or DIN PN100

Table 52. 1195 Pressure Limits

Line Size	Process Connection Code	Maximum Working Pressure @ 100 °F(1)(2)
1/2-in. (15 mm)	S1 or P2	3000 psig (207 bar)
	T1 or P1	1500 psig (103 bar)
1-in. (25 mm)	S1 or P2	2000 psig (138 bar)
	T1 or P1	1500 psig (103 bar)
1 1/2-in. (40 mm)	S1 or P2	1500 psig (103 bar)
	T1 or P1	1500 psig (103 bar)
All	Flanged	Meets flange primary pressure rating per ANSI B16.5 (EN-1092-1 for DIN flanges)

(1) For pressure ratings at temperatures less than -20 °F (-29 °C) or above 100 °F (38 °C) consult an Emerson Process Management representative.

(2) Transmitter static pressure range may limit maximum working pressure. Refer to Static Pressure Ranges specification.

1195 PHYSICAL SPECIFICATIONS

Material of Construction

Orifice Plate

- 316/316L SST
- Alloy C-276
- Alloy 400

Body

- 316 SST (CF8M), material per ASTM A351

Pipe Material (If Applicable)

- A312 Gr 316/316L, B622 UNS N10276, Alloy C-276

Flange

- A182 Gr 316/316L, SB-564 UNS N10276, Alloy C-276
- Flange pressure limits are per ANSI B16.5
- Flange face finish per ANSI B16.5, 125 to 250 RMS

Body Bolts/Studs

- ASTM A193 Gr B8M studs
- ASTM A193 Gr B8M Class 2 body studs provided for high temperature option code G

Transmitter Connection Studs

- ASTM A193 Gr B8M studs

Gaskets/O-rings

- Glass filled PTFE
- Inconel® X-750 provided for high temperature option code G
- Gaskets and O-rings must be replaced each time the 3051SFP is disassembled for installation or maintenance.

Orifice Type

Square edge–orifice bore sizes

- 0.066-in. and larger

Quadrant edge–orifice bore sizes (for 1/2-in. line size only)

- 0.034-in.
- 0.020-in.
- 0.014-in.
- 0.010-in.

NOTE
Integral orifice bodies contain corner tapped pressure ports.

Pipe Lengths

Upstream and downstream associated piping sections are available on the 1195. The table below lists the standard overall length (lay length) as a function of end connections and line size.

Transmitter Connections

2 1/8-in. (54 mm) center-to-center. Other transmitter spacing can be accommodated using the optional remote adapters and customer-supplied impulse piping. DIN 19213 connections are available.

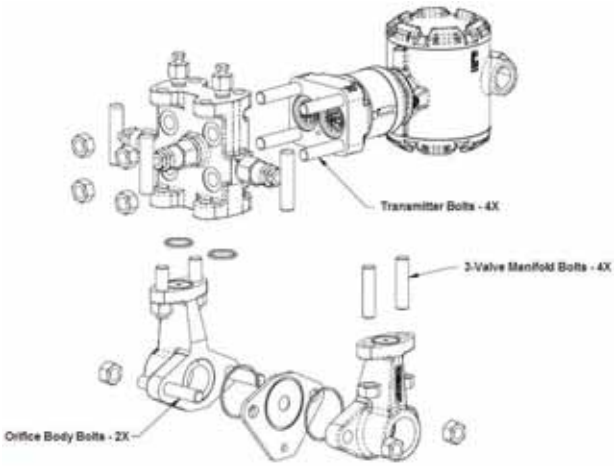
	Line Size		
Overall Length Dimension	**1/2-in. (15 mm)**	**1-in. (25 mm)**	**1 1/2-in. (40 mm)**
Beveled/Threaded pipe ends	18.27 (464.1)	28.98 (736.1)	40.35 (1024.9)
RF slip-on, RTJ slip-on, RF-DIN slip on	18.43 (468.2)	29.14 (740.2)	40.51 (1029.0)
RF 150#, weld neck	21.94 (557.2)	33.25 (844.5)	45.12 (1146.0)
RF 300#, weld neck	22.32 (566.9)	33.77 (857.7)	45.60 (1158.2)
RF 600#, weld neck	22.81 (579.4)	34.26 (870.3)	46.23 (1174.3)
Dimensions are in inches (millimeters).			

Torque Values of Standard Bolts

Stud & Nut Torque Specifications(1)	
Manifold/Adapter to 1195 Body	**Torque**
All Line sizes and gasket types	34-38 lb-ft (44 N-m)
1195 Body to Body(2)	
1/2-in. Line size (all gasket types)	60 lb-ft (82 N-m)
1-in. Line size (all gasket types)	60 lb-ft (82 N-m)
1 1/2-in. Line size (PTFE gasket)	60 lb-ft (82 N-m)
1 1/2-in. Line size (X-750 metal gasket)	75 lb-ft (102 N-m)

(1) Studs and nuts should be tightened to specification in two to three steps alternating between sides.

(2) Never reuse gaskets. Always replace gaskets after disassembly to ensure proper seal.



Weight

The following weights are approximate

Line Size	**1195 Only**		**With Flanged Piping(1)**	
	lb	**kg**	**lb**	**kg**
1/2-in. (15 mm)	4.0	1.8	8	3.6
1-in. (25 mm)	6.0	2.7	12	5.4
1 1/2-in. (40 mm)	8.0	3.6	25	11.3

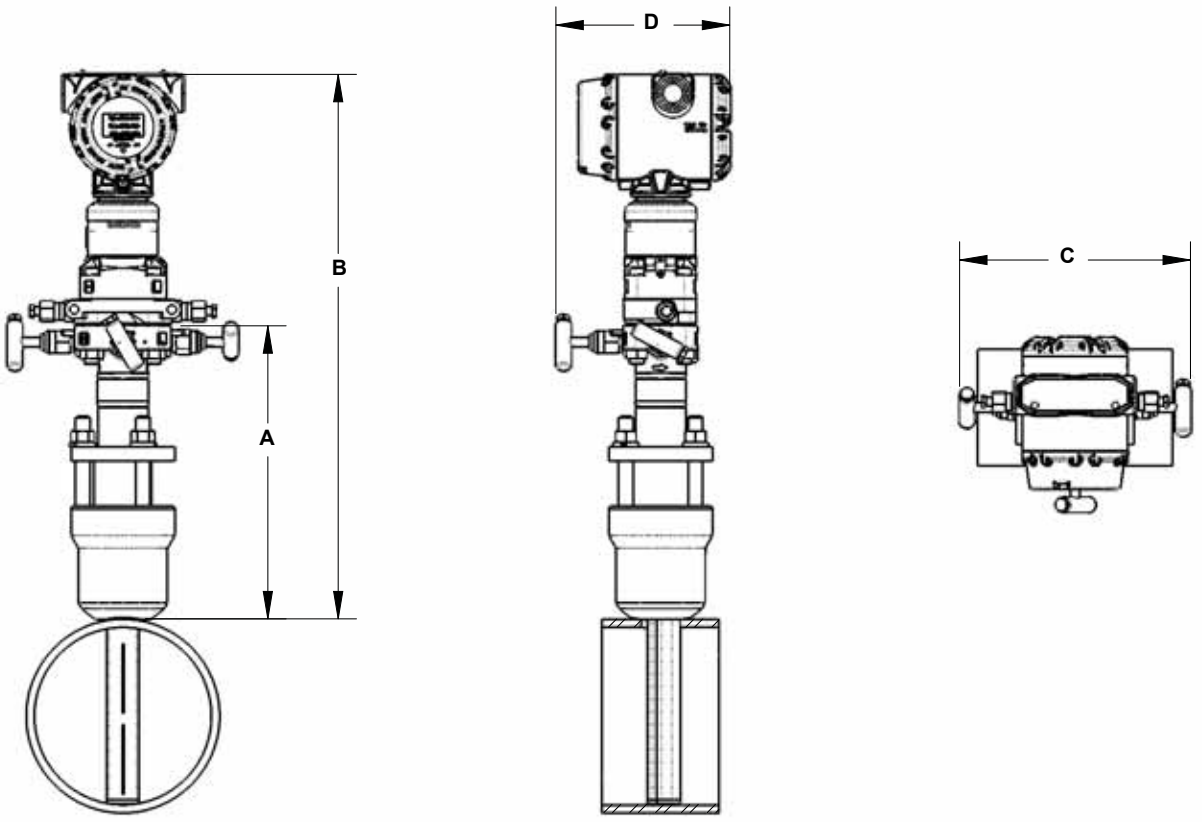
(1) As supplied with standard lengths, ANSI Class 150 flanges.

Dimensional Drawings

3051SF DIMENSIONAL DRAWINGS

Rosemount 3051SFA Pak-Lok Annubar Flowmeter(1)

Front View	Side View	Top View



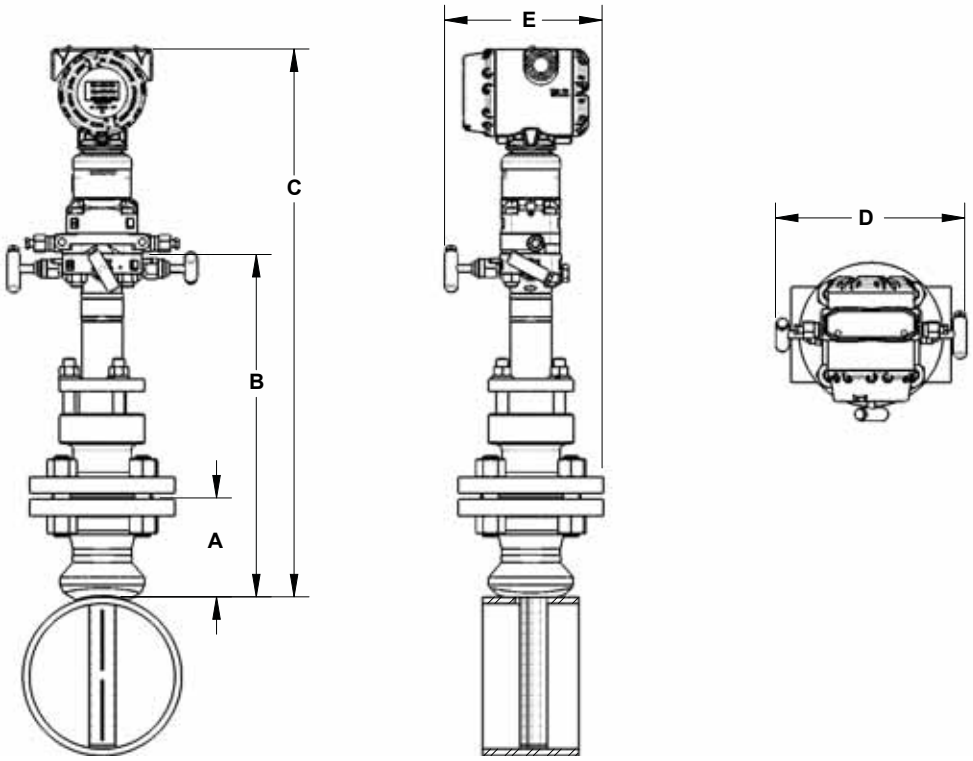
(1) The Pak-Lok Annubar model is rated equivalent to 600# ANSI (1440 psig at 100 °F (99 bar at 38 °C)).

Table 53. Pak-Lok Annubar Flowmeter Dimensional Data

Sensor Size	A (Max)	B (Max)	C (Max)	D (Max)
1	8.50 (215.9)	16.03 (407.2)	9.00 (228.6)	6.90 (175.3)
2	11.00 (279.4)	17.78 (451.6)	9.00 (228.6)	6.90 (175.3)
3	12.00 (304.8)	20.53 (521.5)	9.00 (228.6)	6.90 (175.3)
Dimensions are in inches (millimeters)				

Rosemount 3051SFA Flange-Lok Annubar Flowmeter(1)

Front View | **Side View** | **Top View**



(1) The Flange-Lok Annubar model is available up to 600# ANSI (1440 psig at 100 °F (99 bar at 38 °C)).

Table 54. Flange-Lok Annubar Flowmeter Dimensional Data

Sensor Size	Flange Size and Rating	A ± 0.125 (3.2)	B ± 0.25 (6.4)	C (Max)	D (Max)	E (Max)
1	1 1/2 – 150#	3.88 (98.6)	12.25 (311.2)	20.78 (527.8)	9.00 (228.6)	6.30 (160.0)
1	1 1/2 – 300#	4.13 (104.9)	12.25 (311.2)	20.78 (527.8)	9.00 (228.6)	6.86 (174.2)
1	1 1/2 – 600#	4.44 (112.8)	12.25 (311.2)	20.78 (527.8)	9.00 (228.6)	6.86 (174.2)
1	DN40/PN16	3.09 (78.5)	12.25 (311.2)	20.78 (527.8)	9.00 (228.6)	6.86 (174.2)
1	DN40/PN40	3.21 (81.5)	12.25 (311.2)	20.78 (527.8)	9.00 (228.6)	6.86 (174.2)
1	DN40/ PN100	3.88 (98.6)	12.25 (311.2)	20.78 (527.8)	9.00 (228.6)	6.86 (174.2)
2	2 – 150#	4.13 (104.9)	14.25 (362.0)	22.78 (578.6)	9.00 (228.6)	6.80 (172.7)
2	2 – 300#	4.38 (111.3)	14.25 (362.0)	22.78 (578.6)	9.00 (228.6)	7.05 (179.1)
2	2 – 600#	4.75 (120.7)	14.25 (362.0)	22.78 (578.6)	9.00 (228.6)	7.05 (179.1)
2	DN50/PN16	3.40 (86.4)	14.25 (362.0)	22.78 (578.6)	9.00 (228.6)	7.05 (179.1)
2	DN50/PN40	3.52 (89.4)	14.25 (362.0)	22.78 (578.6)	9.00 (228.6)	7.05 (179.1)
2	DN50/ PN100	4.30 (109.2)	14.25 (362.0)	22.78 (578.6)	9.00 (228.6)	7.05 (179.1)
3	3 – 150#	4.63 (117.6)	17.50 (444.5)	26.03 (661.2)	9.00 (228.6)	7.55 (191.8)
3	3 – 300#	5.00 (127.0)	17.50 (444.5)	26.03 (661.2)	9.00 (228.6)	7.93 (201.3)
3	3 – 600#	5.38 (136.7)	17.50 (444.5)	26.03 (661.2)	9.00 (228.6)	7.93 (201.3)
3	DN80/PN16	3.85 (97.8)	17.50 (444.5)	26.03 (661.2)	9.00 (228.6)	7.93 (201.3)
3	DN80/PN40	4.16 (105.7)	17.50 (444.5)	26.03 (661.2)	9.00 (228.6)	7.93 (201.3)
3	DN80/ PN100	4.95 (125.7)	17.50 (444.5)	26.03 (661.2)	9.00 (228.6)	7.93 (201.3)

Dimensions are in inches (millimeters)

Rosemount 3051SFA Flanged with Opposite Side Support Annubar Flowmeter

Front View | **Side View** | **Top View**

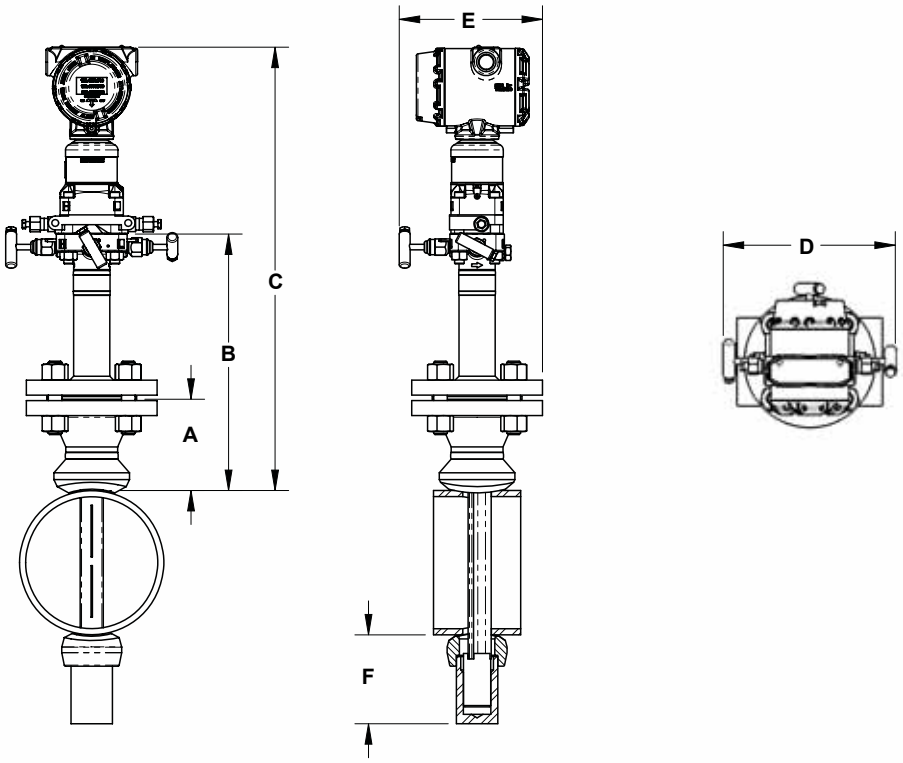


Table 55. Flanged Annubar Flowmeter Dimensional Data

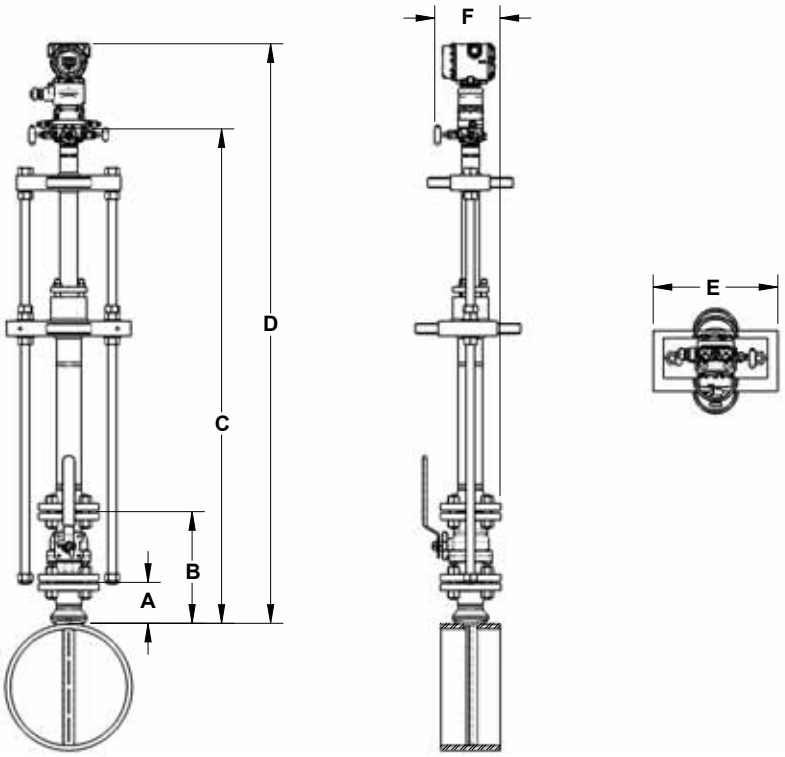
Sensor Size	Flange Size and Rating	A ± 0.125 (3.2)	B ± 0.25 (6.4)	C ± 0.25 (6.4)	D (Max)	E (Max)	F (Max)
1	1 1/2 – 150#	3.88 (98.6)	11.00 (279.4)	19.53 (496.1)	9.00 (228.6)	6.30 (160.0)	3.50 (88.9)
1	1 1/2 – 300#	4.13 (104.9)	11.00 (279.4)	19.53 (496.1)	9.00 (228.6)	6.86 (174.2)	3.50 (88.9)
1	1 1/2 – 600#	4.44 (112.8)	11.00 (279.4)	19.53 (496.1)	9.00(228.6)	6.86 (174.2)	3.50 (88.9)
1	DN40/PN16	3.09 (78.5)	11.00 (279.4)	19.53 (496.1)	9.00 (228.6)	6.86 (174.2)	3.50 (88.9)
1	DN40/PN40	3.21 (81.5)	11.00 (279.4)	19.53 (496.1)	9.00 (228.6)	6.86 (174.2)	3.50 (88.9)
1	DN40/ PN100	3.88 (98.6)	11.00 (279.4)	19.53 (496.1)	9.00(228.6)	6.86 (174.2)	3.50 (88.9)
1	1 1/2 – 900#	4.94 (125.5)	9.31 (236.5)	—	—	—	3.50 (88.9)
1	1 1/2 – 1500#	4.94 (125.5)	9.31 (236.5)	—	—	—	3.50 (88.9)
1	1 1/2 – 2500#	6.76 (171.7)	11.63 (295.4)	—	—	—	4.00 (101.6)
2	2 – 150#	4.13 (104.9)	12.00 (304.8)	20.53 (521.5)	9.00 (228.6)	6.80 (172.7)	5.00 (127.0)
2	2 – 300#	4.38 (111.3)	12.00 (304.8)	20.53 (521.5)	9.00 (228.6)	7.05 (179.1)	5.00 (127.0)
2	2 – 600#	4.75 (120.7)	12.00 (304.8)	20.53 (521.5)	9.00 (228.6)	7.05 (179.1)	5.00 (127.0)
2	DN50/PN16	3.40 (86.4)	12.00 (304.8)	20.53 (521.5)	9.00 (228.6)	7.05 (179.1)	5.00 (127.0)
2	DN50/PN40	3.52 (89.4)	12.00 (304.8)	20.53 (521.5)	9.00 (228.6)	7.05 (179.1)	5.00 (127.0)
2	DN50/ PN100	4.30 (109.2)	12.00 (304.8)	20.53 (521.5)	9.00 (228.6)	7.05 (179.1)	5.00 (127.0)
2	2 – 900#	5.88 (149.4)	10.50 (266.7)	—	—	—	5.00 (127.0)
2	2 – 1500#	5.88 (149.4)	10.50 (266.7)	—	—	—	5.00 (127.0)
2	3 – 2500#	9.88 (251.0)	15.63 (397.0)	—	—	—	4.50 (114.3)

Table 55. Flanged Annubar Flowmeter Dimensional Data

Sensor Size	Flange Size and Rating	A ± 0.125 (3.2)	B ± 0.25 (6.4)	C ± 0.25 (6.4)	D (Max)	E (Max)	F (Max)
3	3 – 150#	4.63 (117.6)	13.50 (342.9)	22.03 (559.6)	9.00 (228.6)	7.55 (191.8)	4.00 (101.6)
3	3 – 300#	5.00 (127.0)	13.50 (342.9)	22.03 (559.6)	9.00 (228.6)	7.93 (201.3)	4.00 (101.6)
3	3 – 600#	5.38 (136.7)	13.50 (342.9)	22.03 (559.6)	9.00 (228.6)	7.93 (201.3)	4.00 (101.6)
3	DN80/PN16	3.85 (97.8)	13.50 (342.9)	22.03 (559.6)	9.00 (228.6)	7.93 (201.3)	4.00 (101.6)
3	DN80/PN40	4.16 (105.7)	13.50 (342.9)	22.03 (559.6)	9.00 (228.6)	7.93 (201.3)	4.00 (101.6)
3	DN80/ PN100	4.95 (125.7)	13.50 (342.9)	22.03 (559.6)	9.00 (228.6)	7.93 (201.3)	4.00 (101.6)
3	4 – 900#	8.19 (208.0)	13.06 (331.7)	—	—	—	7.00 (177.8)
3	4 – 1500#	8.56 (217.4)	13.81 (350.8)	—	—	—	7.00 (177.8)
3	4 – 2500#	11.19 (284.2)	17.31 (439.7)	—	—	—	7.00 (177.8)
	Dimensions are in inches (millimeters)						

Rosemount 3051SFA Flanged Flo-Tap Annubar Flowmeter(1)

Front View | **Side View** | **Top View**



(1) The Flanged Flo-Tap Annubar Flowmeter is available with either the manual or gear drive options.

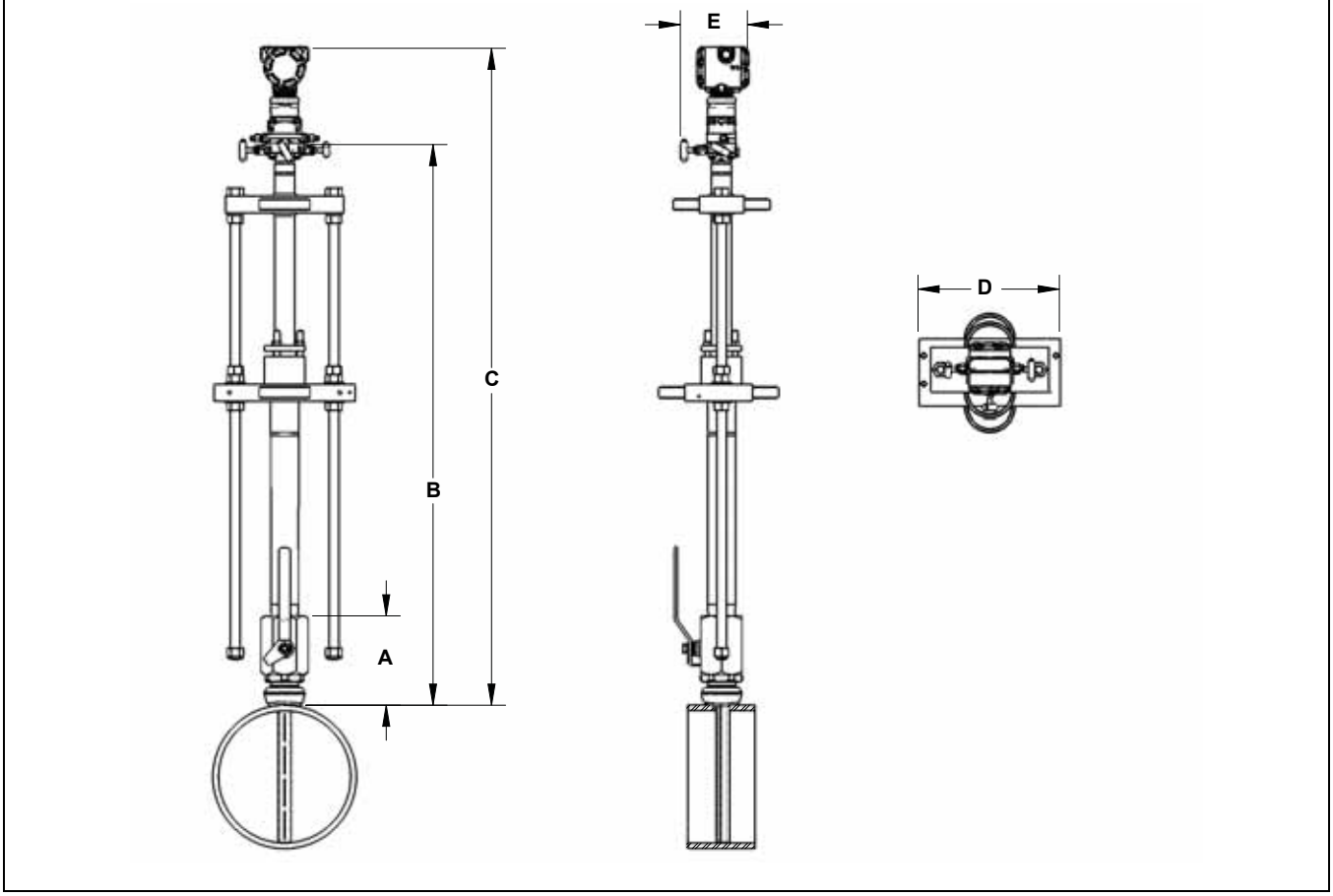
Table 56. Flanged Flo-Tap Annubar Flowmeter Dimensional Data

Sensor Size	Flange Size and Rating	A ± 0.125 (3.2)	B ± 0.25 (6.4)	C^I (Max) (Gear Drive)	C^I (Max) (Manual)	D (Max)	E (Max)	F (Max)
1	1 1/2 – 150#	3.88 (98.6)	10.50 (266.7)	—	17.77 (451.4)	C + 8.53 (216.7)	10.50 (266.7)	6.30 (160.0)
1	1 1/2 – 300#	4.13 (104.9)	11.75 (298.5)	—	17.77 (451.4)	C + 8.53 (216.7)	10.50 (266.7)	6.86 (174.2)
1	1 1/2 – 600#	4.44 (112.8)	14.06 (357.2)	—	17.77 (451.4)	C + 8.53 (216.7)	10.50 (266.7)	6.86 (174.2)
1	DN40/PN16(1)	3.09 (78.5)	See Note 1.	—	17.77 (451.4)	C + 8.53 (216.7)	10.50 (266.7)	6.86 (174.2)
1	DN40/PN40(1)	3.21 (81.5)	See Note 1.	—	17.77 (451.4)	C + 8.53 (216.7)	10.50 (266.7)	6.86 (174.2)
1	DN40/PN100(1)	3.88 (98.6)	See Note 1.	—	17.77 (451.4)	C + 8.53 (216.7)	10.50 (266.7)	6.86 (174.2)
2	2 – 150#	4.13 (104.9)	11.25 (285.8)	24.44 (620.8)	21.20 (538.5)	C + 8.53 (216.7)	12.56 (319.0)	6.80 (172.7)
2	2 – 300#	4.38 (111.3)	13.00 (330.2)	24.44 (620.8)	21.20 (538.5)	C + 8.53 (216.7)	12.56 (319.0)	7.05 (179.1)
2	2 – 600#	4.75 (120.7)	16.38 (416.0)	24.44 (620.8)	21.20 (538.5)	C + 8.53 (216.7)	12.56 (319.0)	7.05 (179.1)
2	DN50/PN16(1)	3.40 (86.4)	See Note 1.	24.44 (620.8)	21.20 (538.5)	C + 8.53 (216.7)	12.56 (319.0)	7.05 (179.1)
2	DN50/PN40(1)	3.52 (89.4)	See Note 1.	24.44 (620.8)	21.20 (538.5)	C + 8.53 (216.7)	12.56 (319.0)	7.05 (179.1)
2	DN50/PN100(1)	4.30 (109.2)	See Note 1.	24.44 (620.8)	21.20 (538.5)	C + 8.53 (216.7)	12.56 (319.0)	7.05 (179.1)
3	3 – 150#	4.63 (117.6)	12.75 (323.9)	26.37 (669.8)	23.14 (587.8)	C + 8.53 (216.7)	14.13 (358.9)	7.55 (191.8)
3	3 – 300#	5.00 (127.0)	16.25 (412.8)	26.37 (669.8)	23.14 (587.8)	C + 8.53 (216.7)	14.13 (358.9)	7.93 (201.3)
3	3 – 600#	5.38 (136.7)	19.50 (495.3)	26.37 (669.8)	23.14 (587.8)	C + 8.53 (216.7)	14.13 (358.9)	7.93 (201.3)
3	DN80/PN16(1)	3.85 (97.8)	See Note 1.	26.37 (669.8)	23.14 (587.8)	C + 8.53 (216.7)	14.13 (358.9)	7.93 (201.3)
3	DN80/PN40(1)	4.16 (105.7)	See Note 1.	26.37 (669.8)	23.14 (587.8)	C + 8.53 (216.7)	14.13 (358.9)	7.93 (201.3)
3	DN80/PN100(1)	4.95 (125.7)	See Note 1.	26.37 (669.8)	23.14 (587.8)	C + 8.53 (216.7)	14.13 (358.9)	7.93 (201.3)
	Dimensions are in inches (millimeters)							

(1) DIN Valves are not offered

Inserted, C Dimension = Pipe I.D. + Wall Thickness + B + C^I
Retracted, C Dimension = 2 x (Pipe I.D. + Wall Thickness + B) + C^I

Rosemount 3051SFA Threaded Flo-Tap Annubar Flowmeter(1)



(1) The Threaded Flo-Tap Annubar Flowmeter is available with both the manual and gear drive options.

Table 57. Threaded Flo-Tap Annubar Flowmeter Dimensional Data

Sensor Size	A ± 0.50 (12.7)	B^I (Max) (Gear Drive)	B^I (Max) (Manual)	C (Max)	D (Max)	E (Max)
1	7.51 (190.9)	—	16.96 (430.8)	B + 8.53 (216.7)	10.50 (266.7)	6.90 (175.3)
2	8.17 (207.5)	23.62 (599.9)	20.39 (517.9)	B + 8.53 (216.7)	12.56 (319.0)	6.90 (175.3)
Sensor Size 3 is not available in a Threaded Flo-Tap.						
Dimensions are in inches (millimeters)						

Inserted, B Dimension = Pipe I.D. + Wall Thickness + A + B^I
Retracted, B Dimension = 2 x (Pipe I.D. + Wall Thickness + A) + B^I

Rosemount 3051SFC Compact Orifice Flowmeter

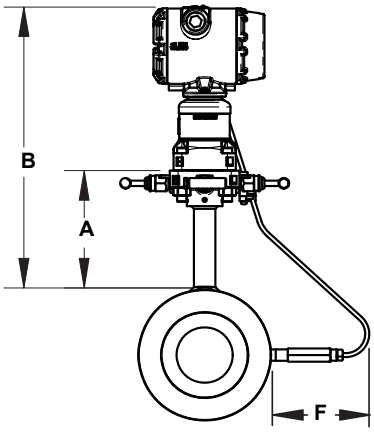
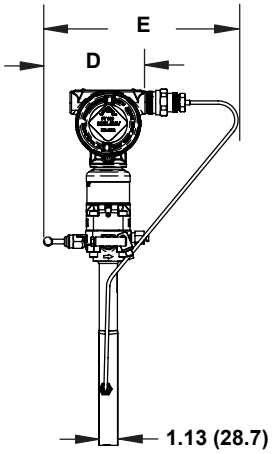
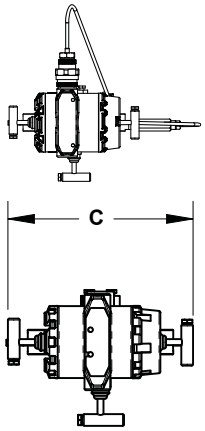
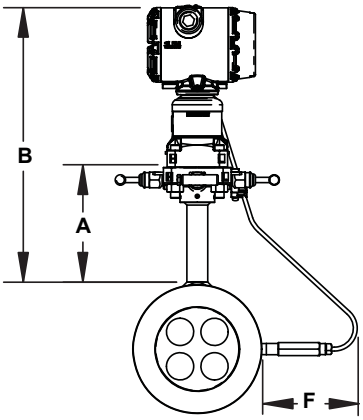
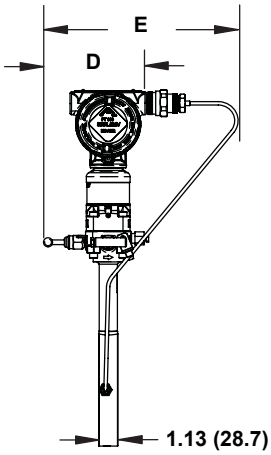
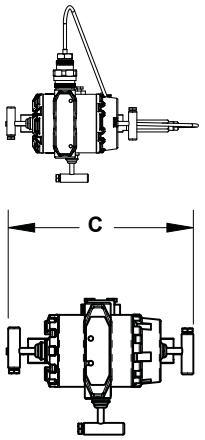
	Orifice Plate Front View	Orifice Plate Side View	Orifice Plate Top View
Compact Orifice Plate (Primary Element Type code P)			
Conditioning Orifice Plate (Primary Element Type code C)			

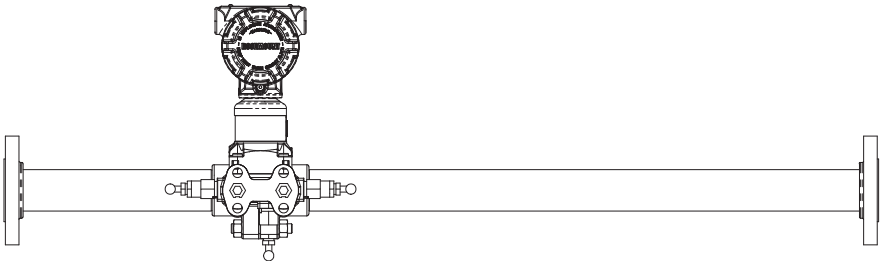
Table 58. Dimensional Drawings[(1)]

Primary[(1)] Element Type	A	B	Transmitter Height	C	D	E	F
Type P and C	5.62 (143)	Transmitter Height + A	7.70 (196)	7.75 (197) - closed 8.25 (210) - open	6.00 (152) - closed 6.25 (159) - open	10.2 (257.8) - closed 10.4 (264.2) - open	Max of 6.7 (71)

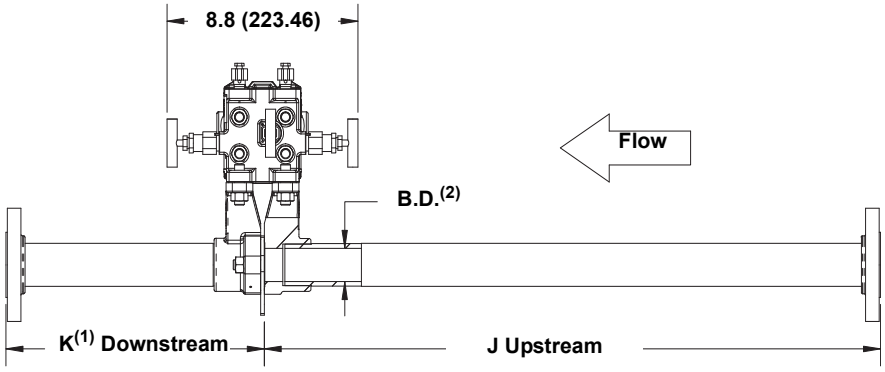
(1) Measurement in inches (millimeters).

Rosemount 3051SFP Integral Orifice Flowmeter

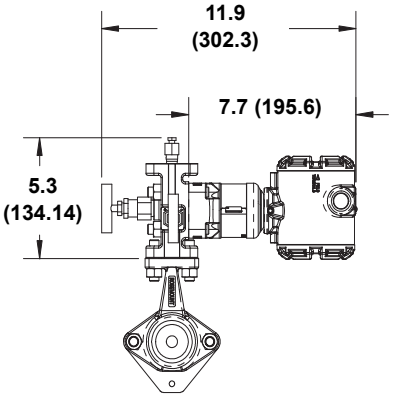
Front View



Bottom View



Side View



Dimensions are in inches (millimeters).

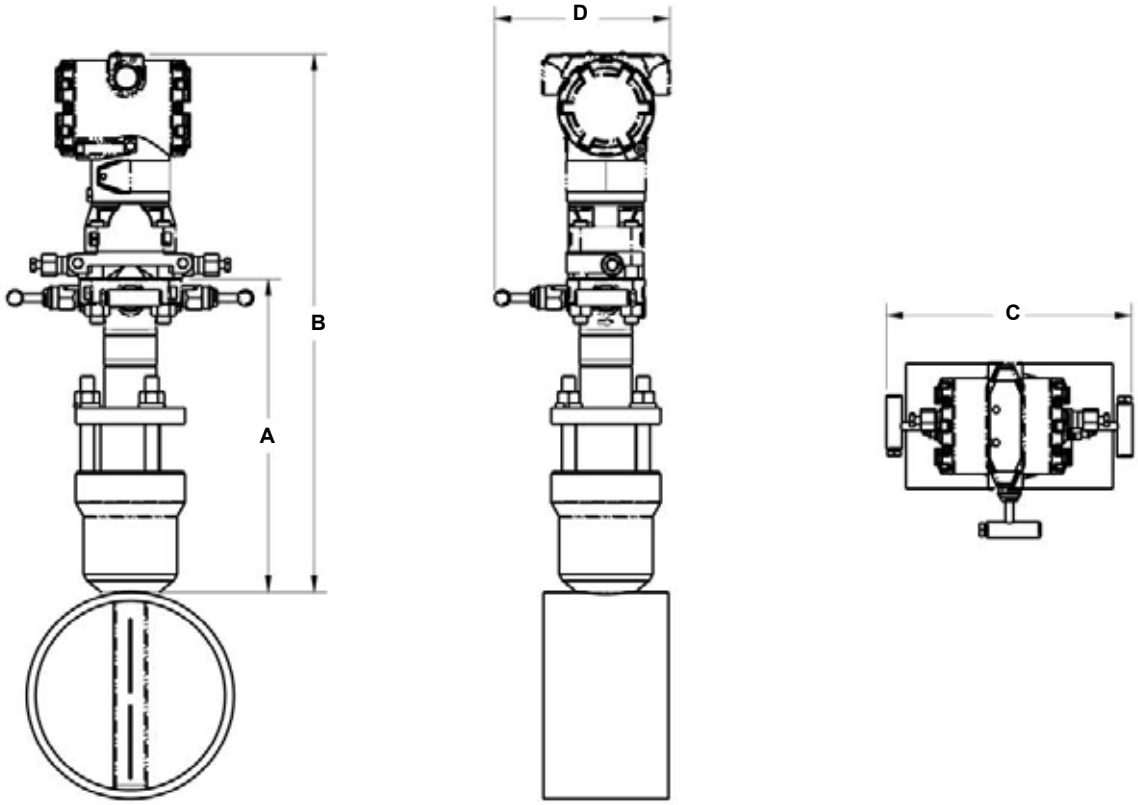
	Line Size		
Dimension	**1/2-in. (15 mm)**	**1-in. (25 mm)**	**1 1/2-in. (40 mm)**
J (Beveled/Threaded pipe ends)	12.54 (318.4)	20.24 (514.0)	28.44 (722.4)
J (RF slip-on, RTJ slip-on, RF-DIN slip on)	12.62 (320.4)	20.32 (516.0)	28.52 (724.4)
J (RF 150#, weld neck)	14.37 (364.9)	22.37 (568.1)	30.82 (782.9)
J (RF 300#, weld neck)	14.56 (369.8)	22.63 (574.7)	31.06 (789.0)
J (RF 600#, weld neck)	14.81 (376.0)	22.88 (581.0)	31.38 (797.1)
K (Beveled/Threaded pipe ends)	5.74 (145.7)	8.75 (222.2)	11.91 (302.6)
K (RF slip-on, RTJ slip-on, RF-DIN slip on)(1)	5.82 (147.8)	8.83 (224.2)	11.99 (304.6)
K (RF 150#, weld neck)	7.57 (192.3)	10.88 (276.3)	14.29 (363.1)
K (RF 300#, weld neck)	7.76 (197.1)	11.14 (282.9)	14.53 (369.2)
K (RF 600#, weld neck)	8.01 (203.4)	11.39 (289.2)	14.85 (377.2)
B.D. (Bore Diameter)	0.664 (16.87)	1.097 (27.86)	1.567 (39.80)
Dimensions are in inches (millimeters).			

(1) Downstream length shown here includes plate thickness of 0.162-in. (4.11 mm).

3051CF DIMENSIONAL DRAWINGS

Rosemount 3051CFA Pak-Lok Annubar Flowmeter(1)

Front View	Side View	Top View



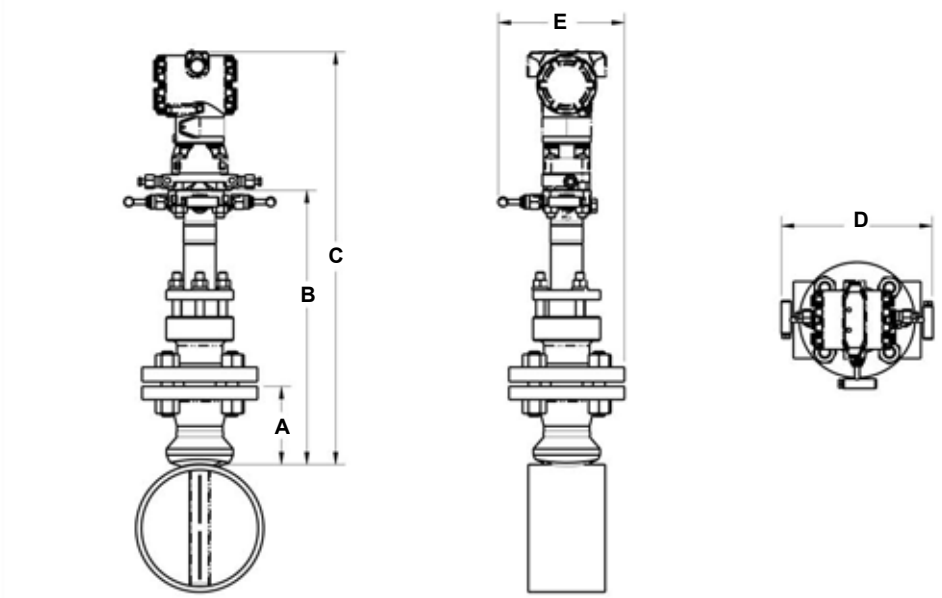
(1) The Pak-Lok Annubar model is available up to 600# ANSI (1440 psig at 100 °F (99 bar at 38 °C)).

Table 59. Pak-Lok Annubar Flowmeter Dimensional Data

Sensor Size	A (Max)	B (Max)	C (Max)	D (Max)
1	8.50 (215.9)	14.60 (370.8)	9.00 (228.6)	6.00 (152.4)
2	11.0 (279.4)	16.35 (415.3)	9.00 (228.6)	6.00 (152.4)
3	12.00 (304.8)	19.10 (485.1)	9.00 (228.6)	6.00 (152.4)
Dimensions are in inches (millimeters)				

Rosemount 3051CFA Flange-Lok Annubar Flowmeter(1)

Front View	Side View	Top View



(1) The Flange-Lok Annubar model can be direct mounted up to 600# ANSI (1440 psig at 100 °F (99 bar at 38 °C)).

Table 60. Flange-Lok Annubar Flowmeter Dimensional Data

Sensor Size	Flange Size and Rating	A ± 0.125 (3.2)	B ± 0.25 (6.4)	C (Max)	D (Max)	E (Max)
1	1 1/2 – 150#	3.88 (98.6)	12.25 (311.2)	19.35 (491.5)	9.00 (228.6)	6.30 (160.0)
1	1 1/2 – 300#	4.13 (104.9)	12.25 (311.2)	19.35 (491.5)	9.00 (228.6)	6.86 (174.2)
1	1 1/2 – 600#	4.44 (112.8)	12.25 (311.2)	19.35 (491.5)	9.00 (228.6)	6.86 (174.2)
1	DN40/PN16	3.09 (78.5)	12.25 (311.2)	19.35 (491.5)	9.00 (228.6)	6.86 (174.2)
1	DN40/PN40	3.21 (81.5)	12.25 (311.2)	19.35 (491.5)	9.00 (228.6)	6.86 (174.2)
1	DN40/ PN100	3.88 (98.6)	12.25 (311.2)	19.35 (491.5)	9.00 (228.6)	6.86 (174.2)
2	2 – 150#	4.13 (104.9)	14.25 (362.0)	21.35 (542.3)	9.00 (228.6)	6.80 (172.7)
2	2 – 300#	4.38 (111.3)	14.25 (362.0)	21.35 (542.3)	9.00 (228.6)	7.05 (179.1)
2	2 – 600#	4.75 (120.7)	14.25 (362.0)	21.35 (542.3)	9.00 (228.6)	7.05 (179.1)
2	DN50/PN16	3.40 (86.4)	14.25 (362.0)	21.35 (542.3)	9.00 (228.6)	7.05 (179.1)
2	DN50/PN40	3.52 (89.4)	14.25 (362.0)	21.35 (542.3)	9.00 (228.6)	7.05 (179.1)
2	DN50/ PN100	4.30 (109.2)	14.25 (362.0)	21.35 (542.3)	9.00 (228.6)	7.05 (179.1)
3	3 – 150#	4.63 (117.6)	17.50 (444.5)	24.60 (624.8)	9.00 (228.6)	7.55 (191.8)
3	3 – 300#	5.00 (127.0)	17.50 (444.5)	24.60 (624.8)	9.00 (228.6)	7.93 (201.3)
3	3 – 600#	5.38 (136.7)	17.50 (444.5)	24.60 (624.8)	9.00 (228.6)	7.93 (201.3)
3	DN80/PN16	3.85 (97.8)	17.50 (444.5)	24.60 (624.8)	9.00 (228.6)	7.93 (201.3)
3	DN80/PN40	4.16 (105.7)	17.50 (444.5)	24.60 (624.8)	9.00 (228.6)	7.93 (201.3)
3	DN80/ PN100	4.95 (125.7)	17.50 (444.5)	24.60 (624.8)	9.00 (228.6)	7.93 (201.3)

Dimensions are in inches (millimeters)

Rosemount 3051CFA Flanged Annubar Flowmeter

Front View	Side View	Top View

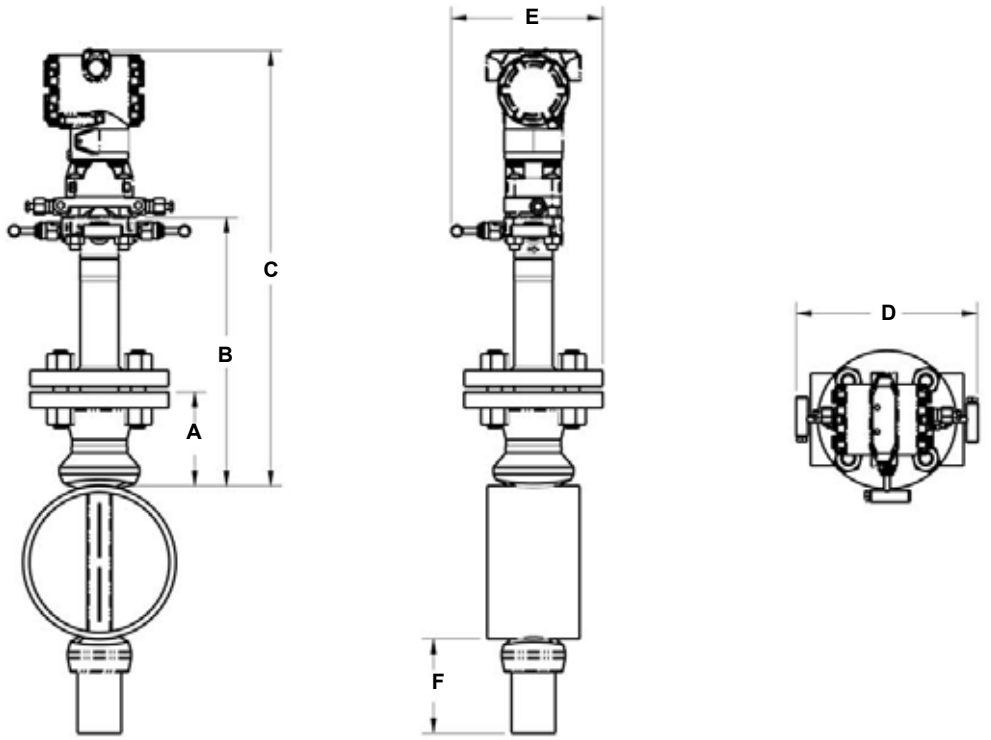


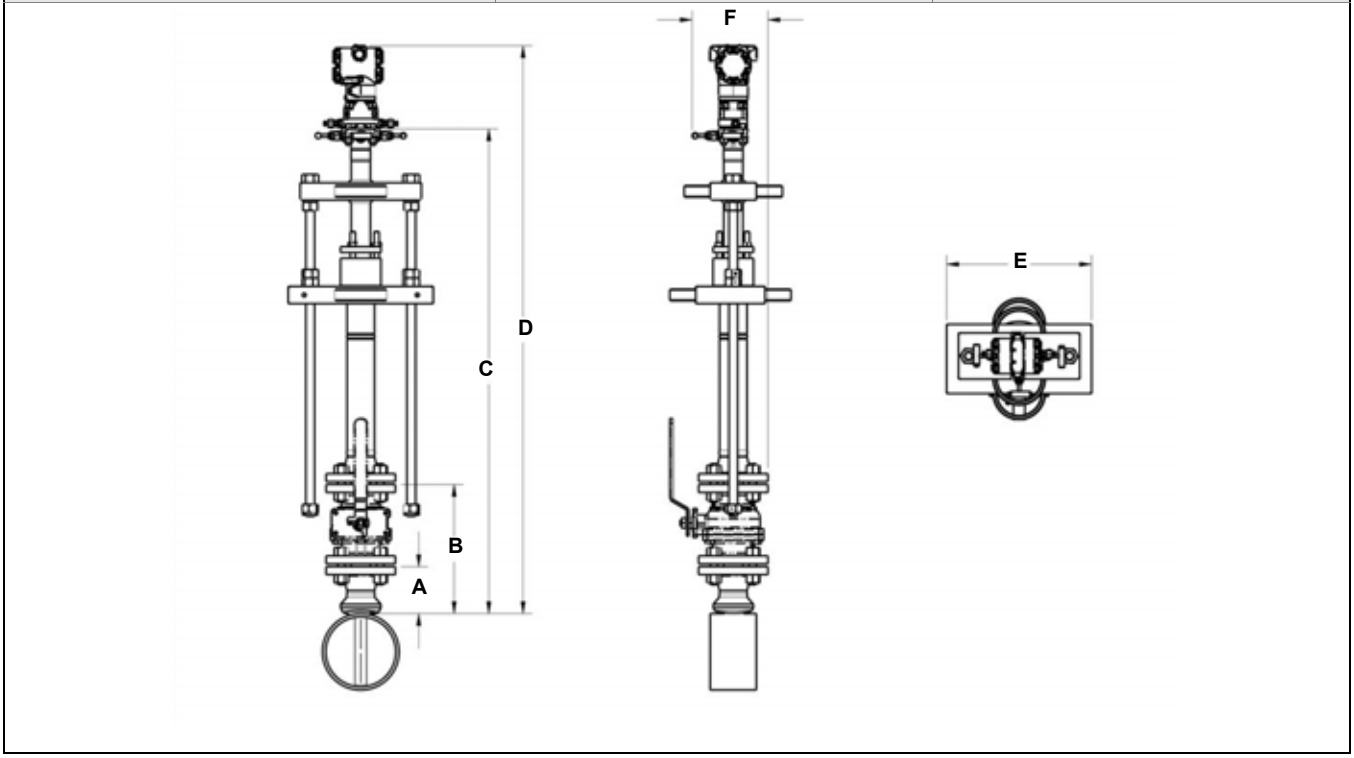
Table 61. Flanged Annubar Flowmeter Dimensional Data

Sensor Size	Flange Size and Rating	A ± 0.125 (3.2)	B ± 0.25 (6.4)	C ± 0.25 (6.4)	D (Max)	E (Max)	F (Max)
1	1 1/2 – 150#	3.88 (98.6)	11.00 (279.4)	18.10 (459.7)	9.00 (228.6)	6.30 (160.0)	3.50 (88.9)
1	1 1/2 – 300#	4.13 (104.9)	11.00 (279.4)	18.10 (459.7)	9.00 (228.6)	6.86 (174.2)	3.50 (88.9)
1	1 1/2 – 600#	4.44 (112.8)	11.00 (279.4)	18.10 (459.7)	9.00(228.6)	6.86 (174.2)	3.50 (88.9)
1	DN40/PN16	3.09 (78.5)	11.00 (279.4)	18.10 (459.7)	9.00 (228.6)	6.86 (174.2)	3.50 (88.9)
1	DN40/PN40	3.21 (81.5)	11.00 (279.4)	18.10 (459.7)	9.00 (228.6)	6.86 (174.2)	3.50 (88.9)
1	DN40/ PN100	3.88 (98.6)	11.00 (279.4)	18.10 (459.7)	9.00(228.6)	6.86 (174.2)	3.50 (88.9)
1	1 1/2 – 900#	4.94 (125.5)	9.31 (236.5)	—	—	—	3.50 (88.9)
1	1 1/2 – 1500#	4.94 (125.5)	9.31 (236.5)	—	—	—	3.50 (88.9)
1	1 1/2 – 2500#	6.76 (171.7)	11.63 (295.4)	—	—	—	4.00 (101.6)
2	2 – 150#	4.13 (104.9)	12.00 (304.8)	19.10 (458.1)	9.00 (228.6)	6.80 (172.7)	5.00 (127.0)
2	2 – 300#	4.38 (111.3)	12.00 (304.8)	19.10 (458.1)	9.00 (228.6)	7.05 (179.1)	5.00 (127.0)
2	2 – 600#	4.75 (120.7)	12.00 (304.8)	19.10 (458.1)	9.00 (228.6)	7.05 (179.1)	5.00 (127.0)
2	DN50/PN16	3.40 (86.4)	12.00 (304.8)	19.10 (458.1)	9.00 (228.6)	7.05 (179.1)	5.00 (127.0)
2	DN50/PN40	3.52 (89.4)	12.00 (304.8)	19.10 (458.1)	9.00 (228.6)	7.05 (179.1)	5.00 (127.0)
2	DN50/ PN100	4.30 (109.3)	12.00 (304.8)	19.10 (458.1)	9.00 (228.6)	7.05 (179.1)	5.00 (127.0)
2	2 – 900#	5.88 (149.4)	10.50 (266.7)	—	—	—	5.00 (127.0)
2	2 – 1500#	5.88 (149.4)	10.50 (266.7)	—	—	—	5.00 (127.0)
2	3 – 2500#	9.88 (251.0)	15.63 (397.0)	—	—	—	4.50 (114.3)

Table 61. Flanged Annubar Flowmeter Dimensional Data

Sensor Size	Flange Size and Rating	A ± 0.125 (3.2)	B ± 0.25 (6.4)	C ± 0.25 (6.4)	D (Max)	E (Max)	F (Max)
3	3 – 150#	4.63 (117.6)	13.50 (342.9)	20.60 (523.2)	9.00 (228.6)	7.55 (191.8)	4.00 (101.6)
3	3 – 300#	5.00 (127.0)	13.50 (342.9)	20.60 (523.2)	9.00 (228.6)	7.93 (201.3)	4.00 (101.6)
3	3 – 600#	5.38 (136.7)	13.50 (342.9)	20.60 (523.2)	9.00 (228.6)	7.93 (201.3)	4.00 (101.6)
3	DN80/PN16	3.85 (97.8)	13.50 (342.9)	20.60 (523.2)	9.00 (228.6)	7.93 (201.3)	4.00 (101.6)
3	DN80/PN40	4.16 (105.7)	13.50 (342.9)	20.60 (523.2)	9.00 (228.6)	7.93 (201.3)	4.00 (101.6)
3	DN80/ PN100	4.95 (125.7)	13.50 (342.9)	20.60 (523.2)	9.00 (228.6)	7.93 (201.3)	4.00 (101.6)
3	4 – 900#	8.19 (208.0)	13.06 (331.8)	—	—	—	7.00 (177.8)
3	4 – 1500#	8.56 (217.4)	13.81 (350.8)	—	—	—	7.00 (177.8)
3	4 – 2500#	11.19 (284.2)	17.31 (439.7)	—	—	—	7.00 (177.8)
Dimensions are in inches (millimeters)							

Rosemount 3051CFA Flanged Flo-Tap Annubar Flowmeter(1)



(1) The Flanged Flo-Tap Annubar Flowmeter is available with both the manual and gear drive options.

Table 62. Flanged Flo-Tap Annubar Flowmeter Dimensional Data

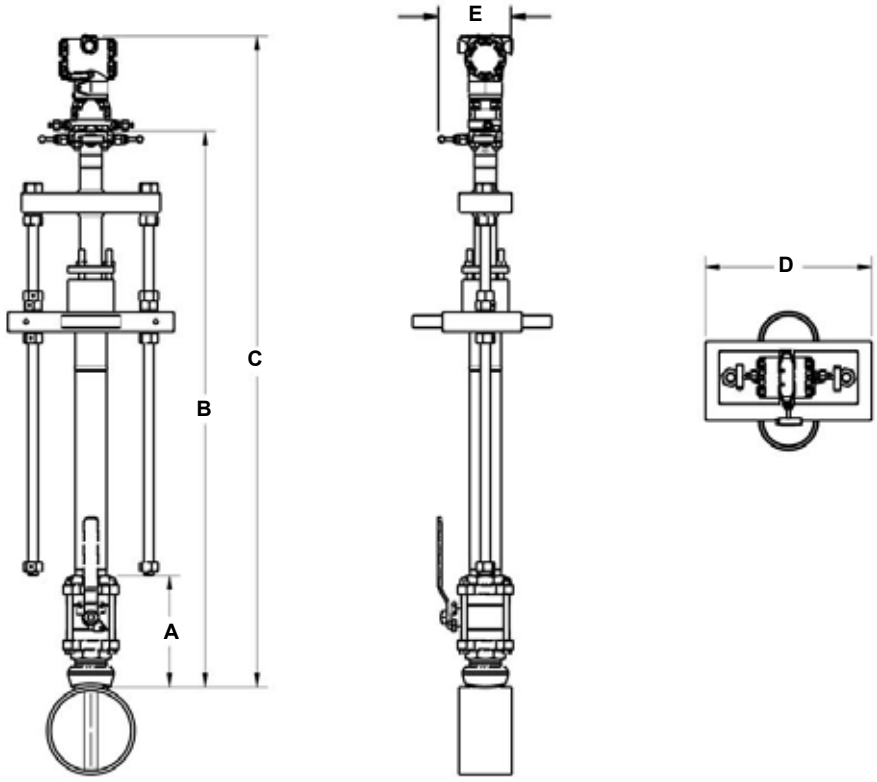
Sensor Size	Flange Size and Rating	A ± 0.125 (3.2)	B ± 0.25 (6.4)	C^I (Max) (Gear Drive)	C^I (Max) (Manual)	D (Max)	E (Max)	F (Max)
1	1 1/2 – 150#	3.88 (98.6)	10.50 (266.7)	—	17.77 (451.4)	C +7.10 (180.3)	10.50 (266.7)	6.30 (160.0)
1	1 1/2 – 300#	4.13 (104.9)	11.75 (298.5)	—	17.77 (451.4)	C +7.10 (180.3)	10.50 (266.7)	6.86 (174.2)
1	1 1/2 – 600#	4.44 (112.8)	14.06 (357.2)	—	17.77 (451.4)	C +7.10 (180.3)	10.50 (266.7)	6.86 (174.2)
1	DN40/PN16(1)	3.09 (78.5)	See Note 1.	—	17.77 (451.4)	C +7.10 (180.3)	10.50 (266.7)	6.86 (174.2)
1	DN40/PN40	3.21 (81.5)	See Note 1.	—	17.77 (451.4)	C +7.10 (180.3)	10.50 (266.7)	6.86 (174.2)
1	DN40/PN100	3.88 (98.6)	See Note 1.	—	17.77 (451.4)	C +7.10 (180.3)	10.50 (266.7)	6.86 (174.2)
2	2 – 150#	4.13 (104.9)	11.25 (285.8)	24.44 (620.8)	21.20 (538.5)	C +7.10 (180.3)	12.56 (319.0)	6.80 (172.7)
2	2 – 300#	4.38 (111.3)	13.00 (330.2)	24.44 (620.8)	21.20 (538.5)	C +7.10 (180.3)	12.56 (319.0)	7.05 (179.1)
2	2 – 600#	4.75 (120.7)	16.38 (416.0)	24.44 (620.8)	21.20 (538.5)	C +7.10 (180.3)	12.56 (319.0)	7.05 (179.1)
2	DN50/PN16	3.40 (86.4)	See Note 1.	24.44 (620.8)	21.20 (538.5)	C +7.10 (180.3)	12.56 (319.0)	7.05 (179.1)
2	DN50/PN40	3.52 (89.4)	See Note 1.	24.44 (620.8)	21.20 (538.5)	C +7.10 (180.3)	12.56 (319.0)	7.05 (179.1)
2	DN50/PN100	4.30 (109.2)	See Note 1.	24.44 (620.8)	21.20 (538.5)	C +7.10 (180.3)	12.56 (319.0)	7.05 (179.1)
3	3 – 150#	4.63 (117.6)	12.75 (323.9)	26.37 (669.8)	23.14 (587.8)	C +7.10 (180.3)	14.13 (358.9)	7.55 (191.8)
3	3 – 300#	5.00 (127.0)	16.25 (412.8)	26.37 (669.8)	23.14 (587.8)	C +7.10 (180.3)	14.13 (358.9)	7.93 (201.3)
3	3 – 600#	5.38 (136.7)	19.50 (495.3)	26.37 (669.8)	23.14 (587.8)	C +7.10 (180.3)	14.13 (358.9)	7.93 (201.3)
3	DN80/PN16	3.85 (97.8)	See Note 1.	26.37 (669.8)	23.14 (587.8)	C +7.10 (180.3)	14.13 (358.9)	7.93 (201.3)
3	DN80/PN40	4.16 (105.7)	See Note 1.	26.37 (669.8)	23.14 (587.8)	C +7.10 (180.3)	14.13 (358.9)	7.93 (201.3)
3	DN80/PN100	4.95 (125.7)	See Note 1.	26.37 (669.8)	23.14 (587.8)	C +7.10 (180.3)	14.13 (358.9)	7.93 (201.3)
	Dimensions are in inches (millimeters)							

(1) DIN Valves are not offered.

Note: Customer Supplied.
Inserted, C Dimension = Pipe I.D. + Wall Thickness + B + C^I
Retracted, C Dimension = 2 x (Pipe I.D. + Wall Thickness + B) + C^I

Rosemount 3051CFA Threaded Flo-Tap Annubar Flowmeter(1)

Front View	Side View	Top View



(1) The Threaded Flo-Tap Annubar Flowmeter is available with both the manual and gear drive options.

Table 63. Threaded Flo-Tap Annubar Flowmeter Dimensional Data

Sensor Size	A ± 0.50 (12.7)	B^I (Max) (Gear Drive)	B^I (Max) (Manual)	C (Max)	D (Max)	E (Max)
1	7.51 (190.9)	—	16.96 (430.8)	B + 7.10 (180.3)	10.50 (266.7)	6.00 (152.4)
2	8.17 (207.5)	23.62 (599.9)	20.39 (517.9)	B + 7.10 (180.3)	12.56 (319.0)	6.00 (152.4)
Sensor Size 3 is not available in a Threaded Flo-Tap.						
Dimensions are in inches (millimeters)						

Inserted, B Dimension = Pipe I.D. + Wall Thickness + A + B^I
Retracted, B Dimension = 2 x (Pipe I.D. + Wall Thickness + A) + B^I

Rosemount 3051CFC Compact Orifice Flowmeter

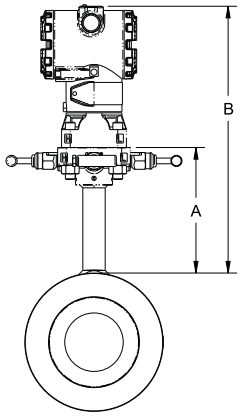
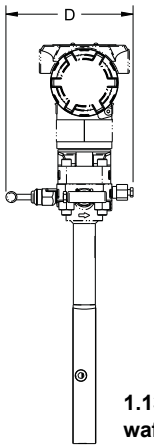
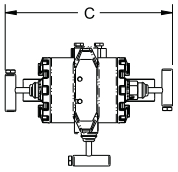
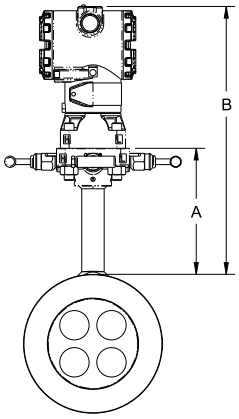
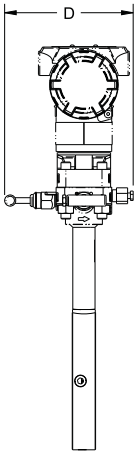
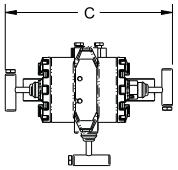
	Orifice Plate Side View	Orifice Plate Front View	Orifice Plate Top View
Compact Orifice Plate (Primary Element Type code P)		 **1.13-in. (28.7 mm) wafer thickness**	
Conditioning Orifice Plate (Primary Element Type code C)			

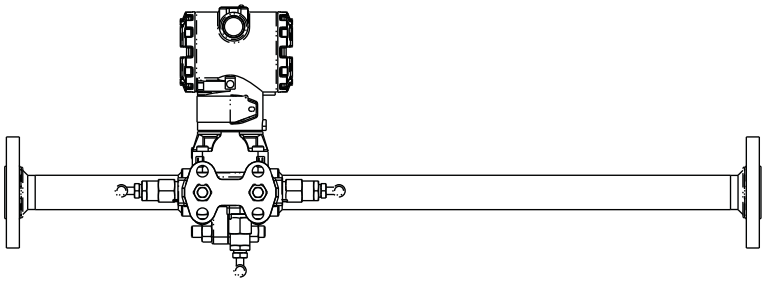
Table 64. Dimensional Drawings[(1)]

Primary[(1)] Element Type	A	B	Transmitter Height	C	D
Type P and C	5.62 (143)	Transmitter Height + A	6.27 (159)	7.75 (197) - closed 8.25 (210) - open	6.00 (152) - closed 6.25 (159) - open

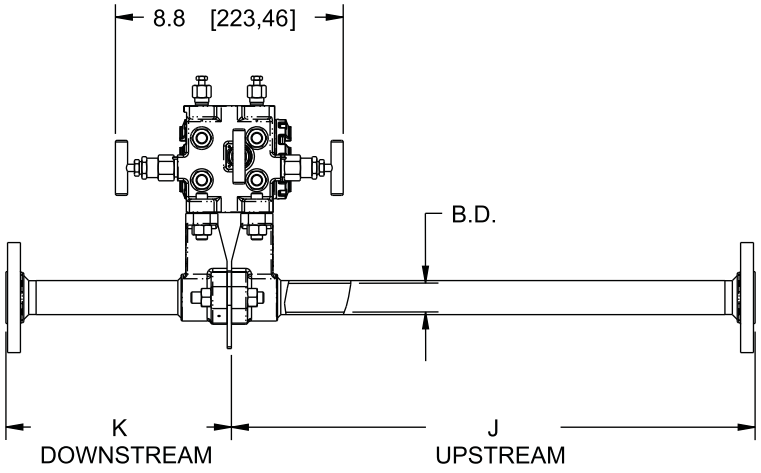
(1) Measurement in inches (millimeters).

Rosemount 3051CFP Integral Orifice Flowmeter

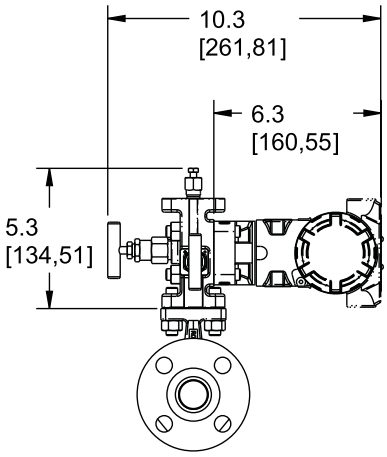
Side View



Bottom View



Front View



Dimensions are in inches (millimeters).

	Line Size		
Dimension	**1/2-in. (15 mm)**	**1-in. (25 mm)**	**1 1/2-in. (40 mm)**
J (Beveled/Threaded pipe ends)	12.54 (318.4)	20.24 (514.0)	28.44 (722.4)
J (RF slip-on, RTJ slip-on, RF-DIN slip on)	12.62 (320.4)	20.32 (516.0)	28.52 (724.4)
J (RF 150#, weld neck)	14.37 (364.9)	22.37 (568.1)	30.82 (782.9)
J (RF 300#, weld neck)	14.56 (369.8)	22.63 (574.7)	31.06 (789.0)
J (RF 600#, weld neck)	14.81 (376.0)	22.88 (581.0)	31.38 (797.1)
K (Beveled/Threaded pipe ends)	5.74 (145.7)	8.75 (222.2)	11.91 (302.6)
K (RF slip-on, RTJ slip-on, RF-DIN slip on)(1)	5.82 (147.8)	8.83 (224.2)	11.99 (304.6)
K (RF 150#, weld neck)	7.57 (192.3)	10.88 (276.3)	14.29 (363.1)
K (RF 300#, weld neck)	7.76 (197.1)	11.14 (282.9)	14.53 (369.2)
K (RF 600#, weld neck)	8.01 (203.4)	11.39 (289.2)	14.85 (377.2)
B.D. (Bore Diameter)	0.664 (16.87)	1.097 (27.86)	1.567 (39.80)

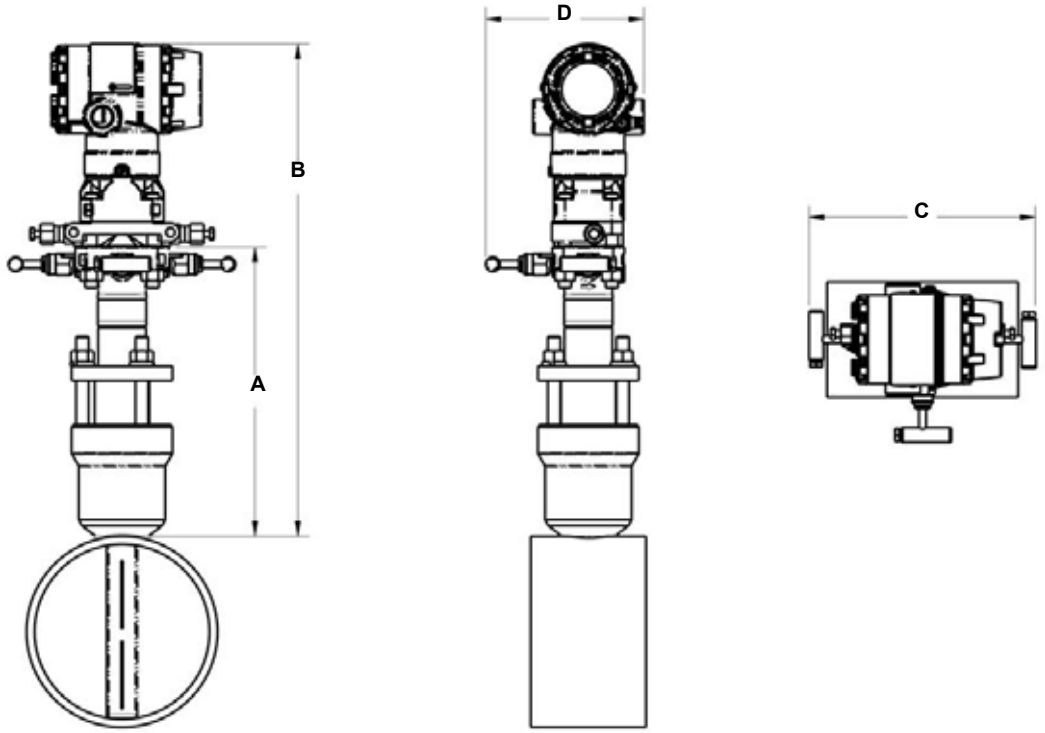
Dimensions are in inches (millimeters).

(1) Downstream length shown here includes plate thickness of 0.162-in. (4.11 mm).

2051CF DIMENSIONAL DRAWINGS

Rosemount 2051CFA Pak-Lok Annubar Flowmeter(1)

Front View	Side View	Top View



(1) The Pak-Lok Annubar model is available up to 600# ANSI (1440 psig at 100 °F (99 bar at 38 °C)).

Table 65. 2051CFA Pak-Lok Annubar Flowmeter Dimensional Data

Sensor Size	A (Max)	B (Max)	C (Max)	D (Max)
1	8.50 (215.9)	14.55 (369.6)	9.00 (228.6)	6.00 (152.4)
2	11.00 (279.4)	16.30 (414.0)	9.00 (228.6)	6.00 (152.4)
3	12.00 (304.8)	19.05 (483.9)	9.00 (228.6)	6.00 (152.4)
Dimensions are in inches (millimeters)				

Rosemount 2051CFA Flanged with Opposite Side Support Annubar Flowmeter

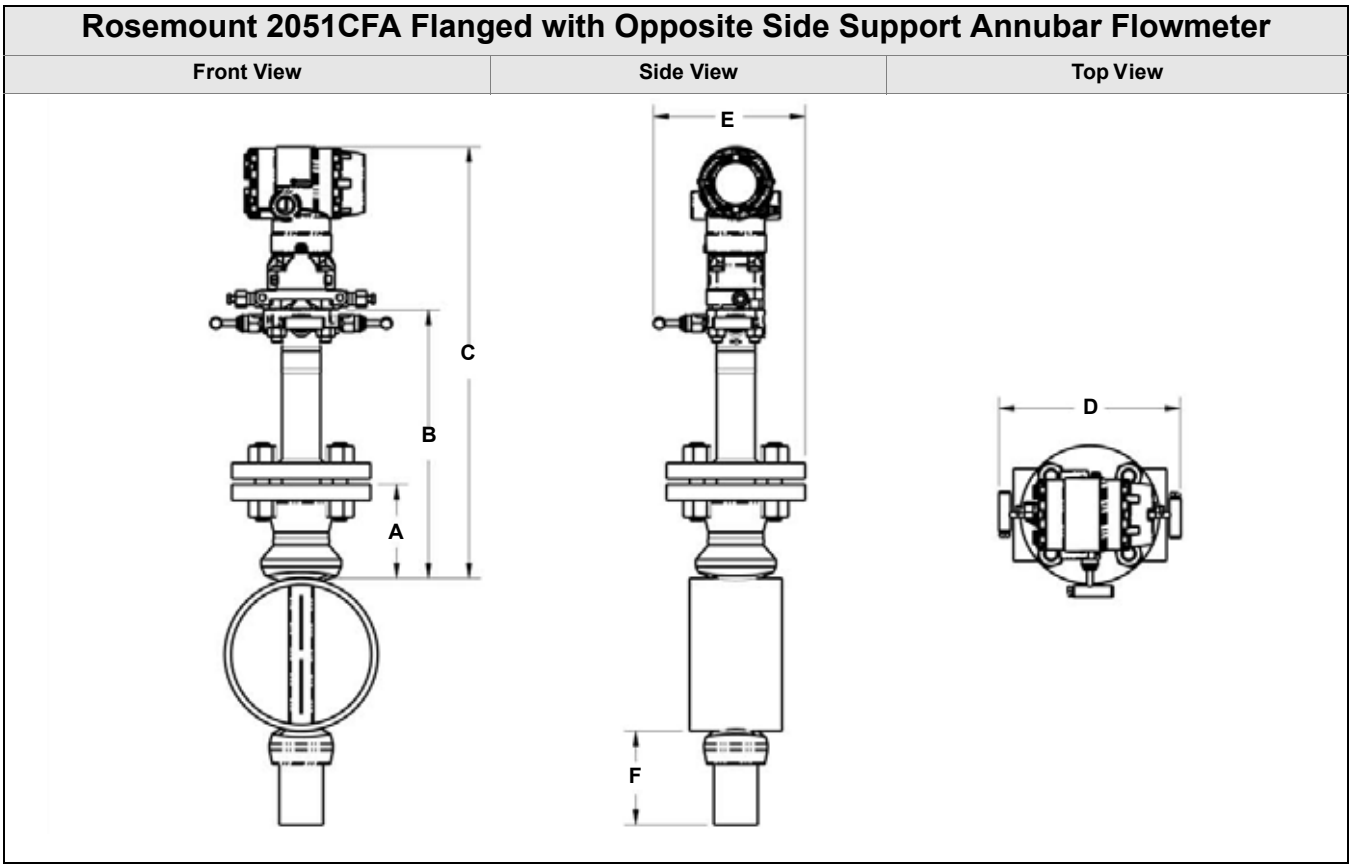


Table 66. Flanged Annubar Flowmeter Dimensional Data

Sensor Size	Flange Size and Rating	A ± 0.125 (3.2)	B ± 0.25 (6.4)	C ± 0.25 (6.4)	D (Max)	E (Max)	F (Max)
1	1 1/2 – 150#	3.88 (98.6)	11.00 (279.4)	18.03 (458.0)	9.00 (228.6)	6.30 (160.0)	3.50 (88.9)
1	1 1/2 – 300#	4.13 (104.9)	11.00 (279.4)	18.03 (458.0)	9.00 (228.6)	6.86 (174.2)	3.50 (88.9)
1	1 1/2 – 600#	4.44 (112.8)	11.00 (279.4)	18.03 (458.0)	9.00 (228.6)	6.86 (174.2)	3.50 (88.9)
1	DN40/PN16	3.09 (78.5)	11.00 (279.4)	18.03 (458.0)	9.00 (228.6)	6.30 (160.0)	3.50 (88.9)
1	DN40/PN40	3.21 (81.5)	11.00 (279.4)	18.03 (458.0)	9.00 (228.6)	6.86 (174.2)	3.50 (88.9)
1	DN40/ PN100	3.88 (98.6)	11.00 (279.4)	18.03 (458.0)	9.00 (228.6)	6.86 (174.2)	3.50 (88.9)
1	1 1/2 – 900#	4.94 (125.5)	9.31 (236.5)	-	-	-	3.50 (88.9)
1	1 1/2 – 1500#	4.94 (125.5)	9.31 (236.5)	-	-	-	3.50 (88.9)
1	1 1/2 – 2500#	6.76 (171.7)	11.63 (295.4)	-	-	-	4.00 (101.6)
2	2 – 150#	4.13 (104.9)	12.00 (304.8)	19.03 (483.4)	9.00 (228.6)	6.30 (160.0)	5.00 (127.0)
2	2 – 300#	4.38 (111.3)	12.00 (304.8)	19.03 (483.4)	9.00 (228.6)	6.86 (174.2)	5.00 (127.0)
2	2 – 600#	4.75 (120.7)	12.00 (304.8)	19.03 (483.4)	9.00 (228.6)	6.86 (174.2)	5.00 (127.0)
2	DN50/PN16	3.40 (86.4)	12.00 (304.8)	19.03 (483.4)	9.00 (228.6)	6.30 (160.0)	5.00 (127.0)
2	DN50/PN40	3.52 (89.4)	12.00 (304.8)	19.03 (483.4)	9.00 (228.6)	6.86 (174.2)	5.00 (127.0)
2	DN50/ PN100	4.30 (109.2)	12.00 (304.8)	19.03 (483.4)	9.00 (228.6)	6.86 (174.2)	5.00 (127.0)
2	2 – 900#	5.88 (149.4)	10.50 (266.7)	-	-	-	5.00 (127.0)
2	2 – 1500#	5.88 (149.4)	10.50 (266.7)	-	-	-	5.00 (127.0)
2	2 – 2500#	9.88 (251.0)	15.63 (397.0)	-	-	-	4.50 (114.3)

Table 66. Flanged Annubar Flowmeter Dimensional Data

Sensor Size	Flange Size and Rating	A ± 0.125 (3.2)	B ± 0.25 (6.4)	C ± 0.25 (6.4)	D (Max)	E (Max)	F (Max)
3	3 – 150#	4.63 (117.6)	13.50 (342.9)	20.53 (521.5)	9.00 (228.6)	6.30 (160.0)	4.00 (101.6)
3	3 – 300#	5.00 (127.0)	13.50 (342.9)	20.53 (521.5)	9.00 (228.6)	6.86 (174.2)	4.00 (101.6)
3	3 – 600#	5.38 (136.7)	13.50 (342.9)	20.53 (521.5)	9.00 (228.6)	6.86 (174.2)	4.00 (101.6)
3	DN80/PN16	3.85 (97.8)	13.50 (342.9)	20.53 (521.5)	9.00 (228.6)	6.30 (160.0)	4.00 (101.6)
3	DN80/PN40	4.16 (105.7)	13.50 (342.9)	20.53 (521.5)	9.00 (228.6)	6.86 (174.2)	4.00 (101.6)
3	DN80/ PN100	4.95 (125.7)	13.50 (342.9)	20.53 (521.5)	9.00 (228.6)	6.86 (174.2)	4.00 (101.6)
3	3 – 900#	8.19 (208.0)	13.06 (331.7)	-	-	-	7.00 (177.8)
3	3 – 1500#	8.56 (217.4)	13.81 (350.8)	-	-	-	7.00 (177.8)
3	3 – 2500#	11.19 (284.2)	17.31 (439.7)	-	-	-	7.00 (177.8)

Dimensions are in inches (millimeters)

Rosemount 2051CFC Compact Orifice Flowmeter

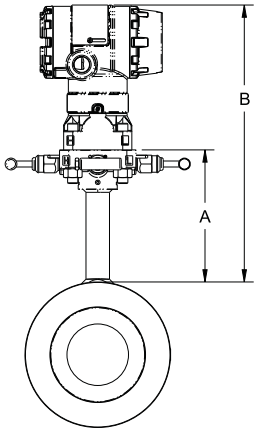
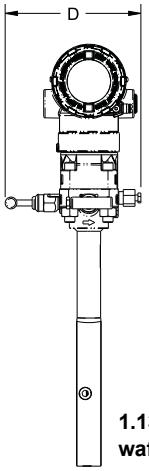
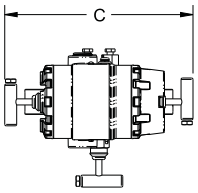
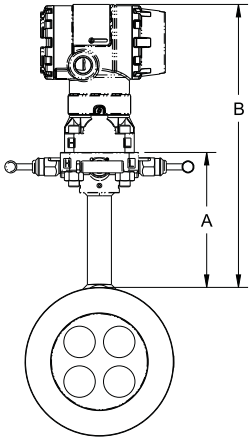
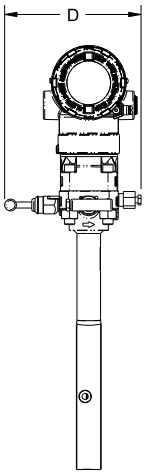
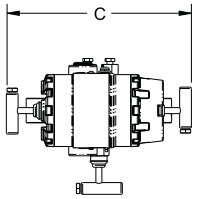
	Orifice Plate Side View	Orifice Plate Front View	Orifice Plate Top View
Compact Orifice Plate (Primary Element Type code P)		 **1.13-in. (28.7 mm) wafer thickness**	
Conditioning Orifice Plate (Primary Element Type code C)			

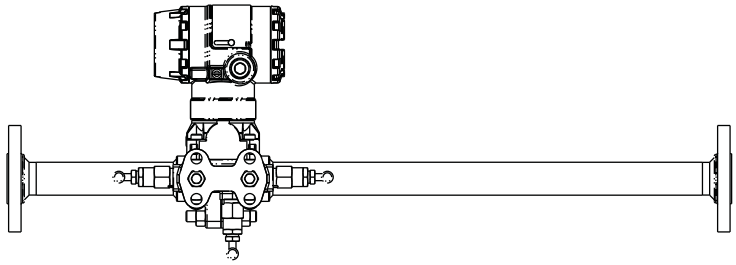
Table 67. 2051CFC Dimensional Drawings[(1)]

Primary[(1)] Element Type	A	B	Transmitter Height	C	D
Type P and C	5.62 (143)	Transmitter Height + A	6.2 (157)	7.75 (197) - closed 8.25 (210) - open	6.00 (152) - closed 6.25 (159) - open

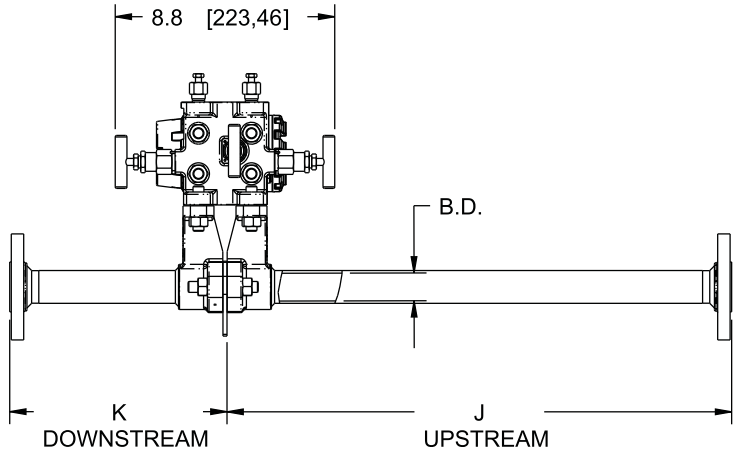
(1) Measurement in inches (millimeters).

Rosemount 2051CFP Integral Orifice Flowmeter

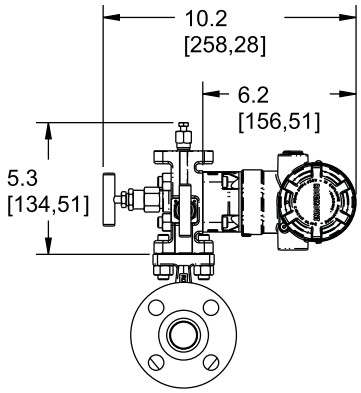
Side View



Bottom View



Front View



Dimensions are in inches (millimeters).

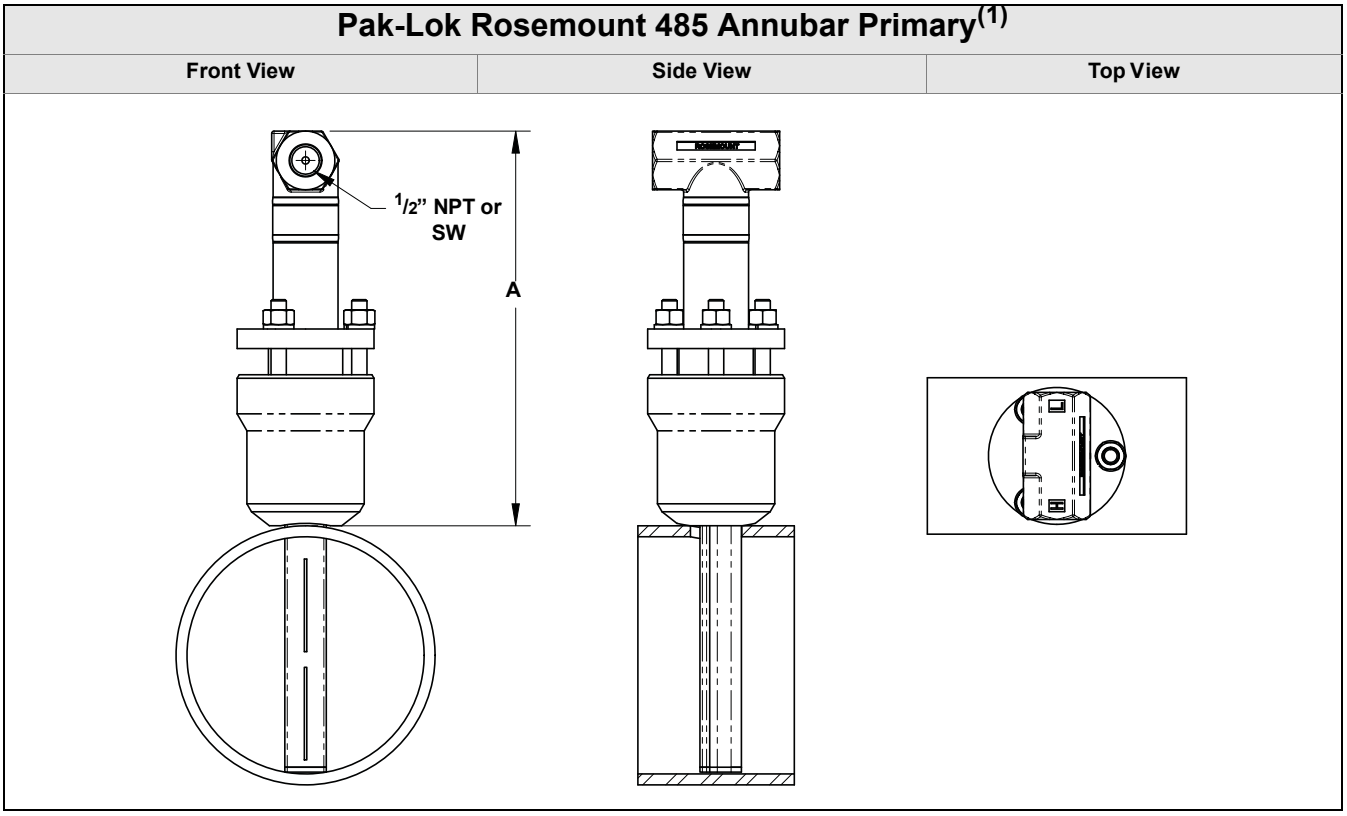
	Line Size		
Dimension	**1/2-in. (15 mm)**	**1-in. (25 mm)**	**1 1/2-in. (40 mm)**
J (Beveled/Threaded pipe ends)	12.54 (318.4)	20.24 (514.0)	28.44 (722.4)
J (RF slip-on, RTJ slip-on, RF-DIN slip on)	12.62 (320.4)	20.32 (516.0)	28.52 (724.4)
J (RF 150#, weld neck)	14.37 (364.9)	22.37 (568.1)	30.82 (782.9)
J (RF 300#, weld neck)	14.56 (369.8)	22.63 (574.7)	31.06 (789.0)
J (RF 600#, weld neck)	14.81 (376.0)	22.88 (581.0)	31.38 (797.1)
K (Beveled/Threaded pipe ends)	5.74 (145.7)	8.75 (222.2)	11.91 (302.6)
K (RF slip-on, RTJ slip-on, RF-DIN slip on)(1)	5.82 (147.8)	8.83 (224.2)	11.99 (304.6)
K (RF 150#, weld neck)	7.57 (192.3)	10.88 (276.3)	14.29 (363.1)
K (RF 300#, weld neck)	7.76 (197.1)	11.14 (282.9)	14.53 (369.2)
K (RF 600#, weld neck)	8.01 (203.4)	11.39 (289.2)	14.85 (377.2)
B.D. (Bore Diameter)	0.664 (16.87)	1.097 (27.86)	1.567 (39.80)

Dimensions are in inches (millimeters).

(1) Downstream length shown here includes plate thickness of 0.162-in. (4.11 mm).

485 DIMENSIONAL DRAWINGS

Pak-Lok Rosemount 485 Annubar Primary(1)



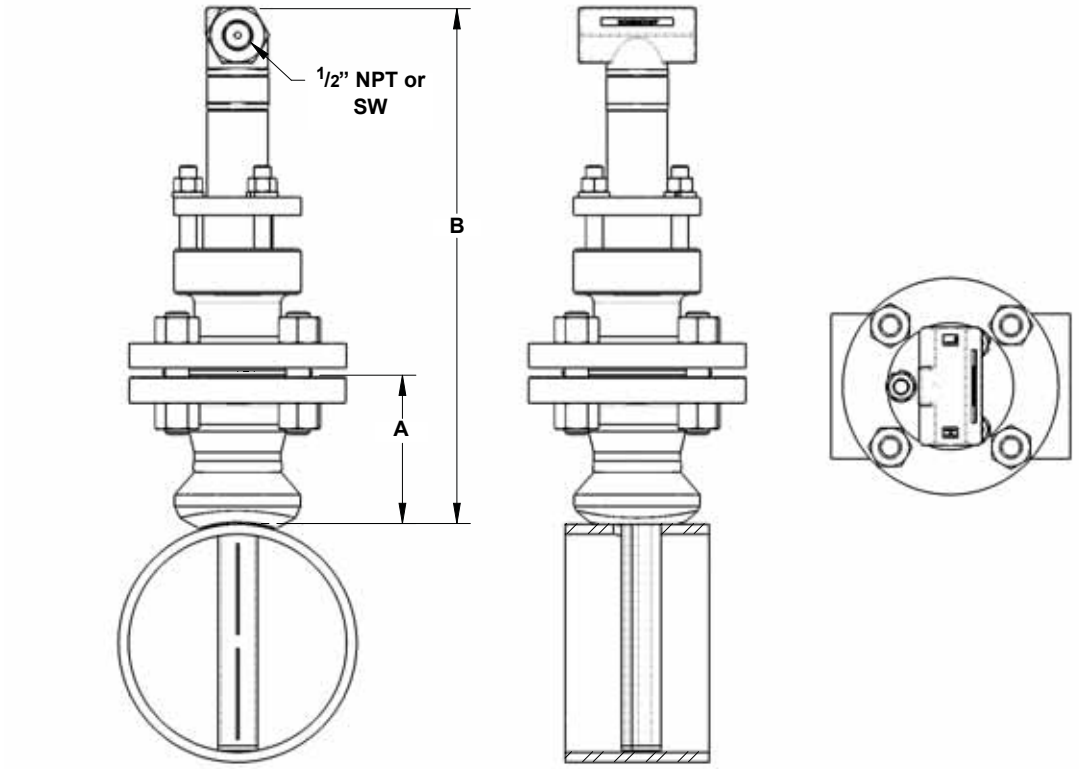
(1) The Pak-Lok Annubar model is available up to 600# ANSI (1440 psig at 100 °F (99 bar at 38 °C)).

Table 68. Pak-Lok Rosemount 485 Annubar Primary Dimensional Data

Sensor Size	A (Max)
1	8.50 (215.9)
2	11.00 (279.4)
3	12.00 (304.8)
Dimensions are in inches (millimeters)	

Flange-Lok Rosemount 485 Annubar Primary(1)

Front View	Side View	Top View



(1) The Flange-Lok Annubar model can be direct mounted up to 600# ANSI (1440 psig at 100 °F (99 bar at 38 °C)).

Table 69. Flange-Lok 485 Annubar Primary Dimensional Data

Sensor Size	Flange Size and Rating	A ± 0.125 (3.2)	B ± 0.25 (6.4)
1	1 1/2 – 150#	3.88 (98.6)	12.25 (311.2)
1	1 1/2 – 300#	4.13 (104.9)	12.25 (311.2)
1	1 1/2 – 600#	4.44 (112.8)	12.25 (311.2)
1	DN40/PN16	3.09 (78.5)	12.25 (311.2)
1	DN40/PN40	3.21 (81.5)	12.25 (311.2)
1	DN40/PN100	3.88 (98.6)	12.25 (311.2)
2	2 – 150#	4.13 (104.9)	14.25 (362.0)
2	2 – 300#	4.38 (111.3)	14.25 (362.0)
2	2 – 600#	4.75 (120.7)	14.25 (362.0)
2	DN50/PN16	3.40 (86.4)	14.25 (362.0)
2	DN50/PN40	3.52 (89.4)	14.25 (362.0)
2	DN50/ PN100	4.30 (109.2)	14.25 (362.0)
3	3 – 150#	4.63 (117.6)	17.50 (444.5)
3	3 – 300#	5.00 (127.0)	17.50 (444.5)
3	3 – 600#	5.38 (136.7)	17.50 (444.5)
3	DN80/PN16	3.85 (97.8)	17.50 (444.5)
3	DN80/PN40	4.16 (105.7)	17.50 (444.5)
3	DN80/ PN100	4.95 (125.7)	17.50 (444.5)
Dimensions are in inches (millimeters)			

Flanged 485 Annubar Primary

Front View | Side View | Top View

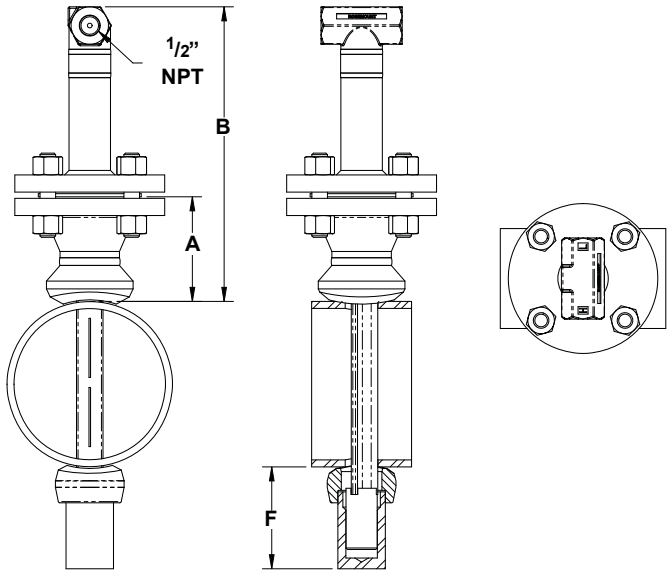


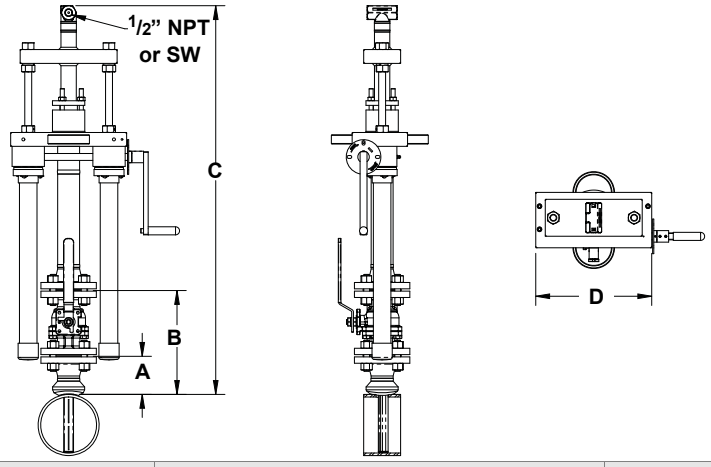
Table 70. Flanged Annubar Flowmeter Dimensional Data

Sensor Size	Flange Size and Rating	A ± 0.125 (3.2)	B ± 0.25 (6.4)	F (Max)
1	1 1/2 – 150#	3.88 (98.6)	11.00 (279.4)	3.50 (88.9)
1	1 1/2 – 300#	4.13 (104.9)	11.00 (279.4)	3.50 (88.9)
1	1 1/2 – 600#	4.44 (112.8)	11.00 (279.4)	3.50 (88.9)
1	DN40/PN16	3.09 (78.5)	11.00 (279.4)	3.50 (88.9)
1	DN40/PN40	3.21 (81.5)	11.00 (279.4)	3.50 (88.9)
1	DN40/ PN100	3.88 (98.6)	11.00 (279.4)	3.50 (88.9)
1	1 1/2 – 900#	4.94 (125.5)	9.31 (236.5)	3.50 (88.9)
1	1 1/2 – 1500#	4.94 (125.5)	9.31 (236.5)	3.50 (88.9)
1	1 1/2 – 2500#	6.76 (171.7)	11.63 (295.4)	4.00 (101.6)
2	2 – 150#	4.13 (104.9)	12.00 (304.8)	5.00 (127.0)
2	2 – 300#	4.38 (111.3)	12.00 (304.8)	5.00 (127.0)
2	2 – 600#	4.75 (120.7)	12.00 (304.8)	5.00 (127.0)
2	DN50/PN16	3.40 (86.4)	12.00 (304.8)	5.00 (127.0)
2	DN50/PN40	3.52 (89.4)	12.00 (304.8)	5.00 (127.0)
2	DN50/ PN100	4.30 (109.2)	12.00 (304.8)	5.00 (127.0)
2	2 – 900#	5.88 (149.4)	10.50 (266.7)	5.00 (127.0)
2	2 – 1500#	5.88 (149.4)	10.50 (266.7)	5.00 (127.0)
2	3 – 2500#	9.88 (251.0)	15.63 (397.0)	4.50 (114.3)
3	3 – 150#	4.63 (117.6)	13.50 (342.9)	4.00 (101.6)
3	3 – 300#	5.00 (127.0)	13.50 (342.9)	4.00 (101.6)
3	3 – 600#	5.38 (136.7)	13.50 (342.9)	4.00 (101.6)
3	DN80/PN16	3.85 (97.8)	13.50 (342.9)	4.00 (101.6)
3	DN80/PN40	4.16 (105.7)	13.50 (342.9)	4.00 (101.6)
3	DN80/ PN100	4.95 (125.7)	13.50 (342.9)	4.00 (101.6)
3	4 – 900#	8.19 (208.0)	13.06 (331.7)	7.00 (177.8)
3	4 – 1500#	8.56 (217.4)	13.81 (350.8)	7.00 (177.8)
3	4 – 2500#	11.19 (284.2)	17.31 (439.7)	7.00 (177.8)

Dimensions are in inches (millimeters)

Flanged Flo-Tap 485 Annubar Primary

Gear Drive



Manual

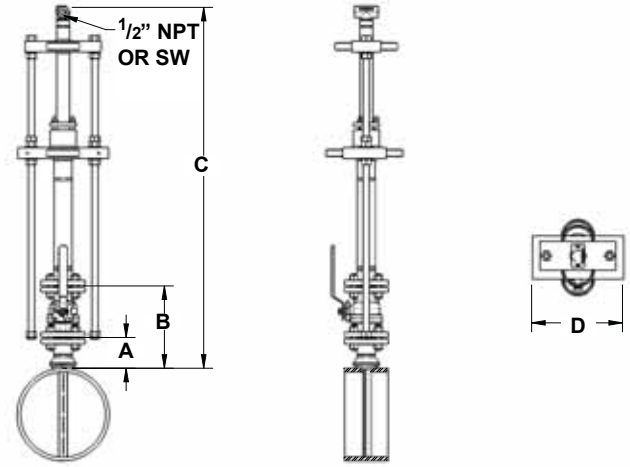


Table 71. Flanged Flo-Tap 485 Annubar Primary Dimensional Data

Sensor Size	Flange Size and Rating	A ± 0.125 (3.2)	B ± 0.25 (6.4)	C^I (Max) (Gear Drive)	C^I (Max) (Manual)	D (Max)
1	1 1/2 – 150#	3.88 (98.6)	10.50 (266.7)	**—**	**17.77 (451.4)**	10.50 (266.7)
1	1 1/2 – 300#	4.13 (104.9)	11.75 (298.5)	—	**17.77 (451.4)**	10.50 (266.7)
1	1 1/2 – 600#	4.44 (112.8)	14.06 (357.2)	—	**17.77 (451.4)**	10.50 (266.7)
1	DN40/PN16	3.09 (78.5)	See Note (1)	—	**17.77 (451.4)**	10.50 (266.7)
1	DN40/PN40	3.21 (81.5)	See Note (1)	—	**17.77 (451.4)**	10.50 (266.7)
1	DN40/PN100	3.88 (98.6)	See Note (1)	—	**17.77 (451.4)**	10.50 (266.7)
2	2 – 150#	4.13 (104.9)	11.25 (285.8)	24.44 (620.8)	21.20 (538.5)	12.56 (319.0)
2	2 – 300#	4.38 (111.3)	13.00 (330.2)	24.44 (620.8)	21.20 (538.5)	12.56 (319.0)
2	2 – 600#	4.75 (120.7)	16.38 (416.0)	24.44 (620.8)	21.20 (538.5)	12.56 (319.0)
2	DN50/PN16	3.40 (86.4)	See Note (1)	24.44 (620.8)	21.20 (538.5)	12.56 (319.0)
2	DN50/PN40	3.52 (89.4)	See Note (1)	24.44 (620.8)	21.20 (538.5)	12.56 (319.0)
2	DN50/PN100	4.30 (109.2)	See Note (1)	24.44 (620.8)	21.20 (538.5)	12.56 (319.0)

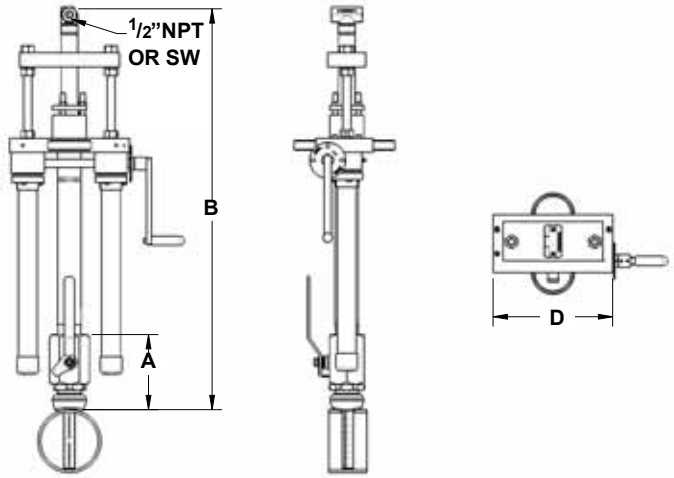
Table 71. Flanged Flo-Tap 485 Annubar Primary Dimensional Data

Sensor Size	Flange Size and Rating	A ± 0.125 (3.2)	B ± 0.25 (6.4)	C^I (Max) (Gear Drive)	C^I (Max) (Manual)	D (Max)
3	3 – 150#	4.63 (117.6)	12.75 (323.9)	26.37 (669.8)	23.14 (587.8)	14.13 (358.9)
3	3 – 300#	5.00 (127.0)	16.25 (412.8)	26.37 (669.8)	23.14 (587.8)	14.13 (358.9)
3	3 – 600#	5.38 (136.7)	19.50 (495.4)	26.37 (669.8)	23.14 (587.8)	14.13 (358.9)
3	DN80/PN16	3.85 (97.8)	See Note (1)	26.37 (669.8)	23.14 (587.8)	14.13 (358.9)
3	DN80/PN40	4.16 (105.7)	See Note (1)	26.37 (669.8)	23.14 (587.8)	14.13 (358.9)
3	DN80/PN100	4.95 (125.7)	See Note (1)	26.37 (669.8)	23.14 (587.8)	14.13 (358.9)
	Use the appropriate formula to determine C value: *Inserted formula:* Pipe I.D. + Wall Thickness + Value B + C^1 (use the Manual Drive or Gear drive values for C^1) *Retracted formula:* [2 x (Pipe I.D. + Wall Thickness + Value B)] + C^1 (use the Manual Drive or Gear drive values for C^1)					
Dimensions are in inches (millimeters)						

(1) DIN Valves are not offered.

Threaded Flo-Tap 485 Annubar Primary

Gear Drive



Manual

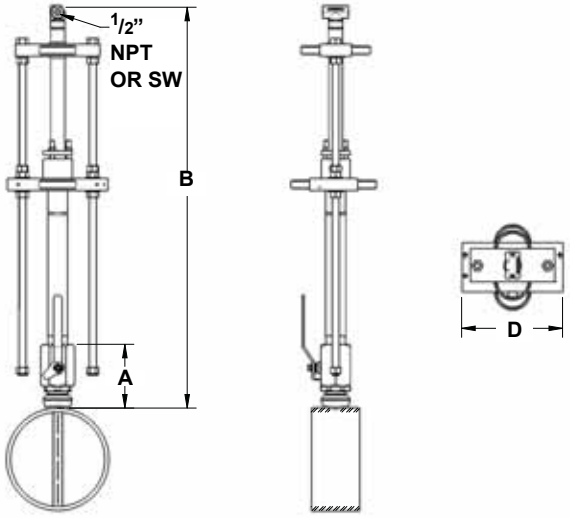


Table 72. Threaded Flo-Tap 485 Annubar Primary Dimensional Data

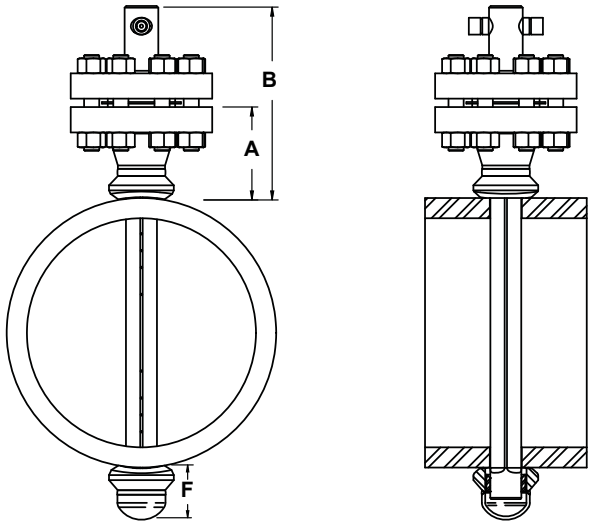
Sensor Size	A ± 0.50 (12.7)	B^I (Max) (Gear Drive)	B^I (Max) (Manual)	D (Max)
1	7.51 (190.9)	—	16.96 (430.8)	10.50 (266.7)
2	8.17 (207.5)	23.62 (599.9)	20.39 (517.9)	12.56 (319.0)
Sensor Size 3 is not available in a Threaded Flo-Tap.				

Inserted, B Dimension = Pipe I.D. + Wall Thickness + A + B^I
Retracted, B Dimension = 2 x (Pipe I.D. + Wall Thickness + A) + B^I

585 DIMENSIONAL DRAWINGS

Flanged w/ Opposite Side Support 585 Annubar Primary

Front View | **Side View**



Note: Dimensions are shown with a remote-mount connection. Using direct-mount will add 0.15-in. for sensor size 11 and 22 or 3.15-in. for sensor size 44 to Dimension B.

Table 73. Flanged w/ Opposite Side Support Dimensional Data

Sensor Size	Flange Size and Rating	A ± 0.125 (3.2)	B ± 0.25 (6.4)	F (Max)
11	1 1/2-in.– 150#	3.88 (98.6)	9.70 (246.4)	3.10 (78.7)
11	1 1/2-in. – 300#	4.13 (104.9)	10.07 (255.8)	3.10 (78.7)
11	1 1/2-in. – 600#	4.44 (112.8)	10.70 (271.8)	3.10 (78.7)
11	DIN40/PN16	3.21 (81.5)	9.05 (229.9)	3.10 (78.7)
11	DIN40/PN40	3.21 (81.5)	9.05 (229.9)	3.10 (78.7)
11	DIN40/ PN100	3.88 (98.6)	10.03 (254.8)	3.10 (78.7)
11	1 1/2-in. – 900#	4.94 (125.5)	11.57 (293.9)	3.60 (91.4)
11	1 1/2-in. – 1500#	4.94 (125.5)	11.57 (293.9)	3.60 (91.4)
11	1 1/2-in. – 2500#	6.75 (171.5)	13.88 (352.6)	3.60 (91.4)
22	2-in. – 150#	4.13 (104.9)	10.01 (254.3)	4.50 (114.3)
22	2-in. – 300#	4.38 (111.3)	10.38 (263.7)	4.50 (114.3)
22	2-in. – 600#	4.75 (120.7)	11.13 (282.7)	4.50 (114.3)
22	DIN50/PN16	3.40 (86.4)	9.24 (234.7)	4.50 (114.3)
22	DIN50/PN40	3.52 (89.4)	9.44 (239.8)	4.50 (114.3)
22	DIN50/ PN100	4.30 (109.2)	10.53 (267.5)	4.50 (114.3)
22	2-in. – 900#	5.88 (149.4)	12.76 (324.1)	4.50 (114.3)
22	2-in. – 1500#	5.88 (149.4)	12.76 (324.1)	4.50 (114.3)
22	3-in. – 2500#	9.88 (250.1)	17.88 (454.2)	4.50 (114.3)
44	3-in. – 150#	4.63 (117.6)	10.69 (271.5)	3.90 (99.1)
44	3-in. – 300#	5.00 (127.0)	11.26 (286.6)	3.90 (99.1)
44	3-in. – 600#	5.38 (136.7)	12.00 (304.8)	3.90 (99.1)
44	DIN80/PN16	3.85 (97.8)	9.77 (248.2)	3.90 (99.1)
44	DIN80/PN40	4.16 (105.7)	10.23 (259.8)	3.90 (99.1)
44	DIN80/ PN100	4.95 (125.7)	11.34 (288.8)	3.90 (99.1)
44	4-in. – 900#	8.19 (208.8)	15.32 (389.1)	6.40 (162.6)
44	4-in. – 1500#	8.56 (217.4)	16.07 (408.2)	6.40 (162.6)
44	4-in. – 2500#	11.19 (284.2)	19.57 (497.1)	6.40 (162.6)

Dimensions are in inches (millimeters)

Main Steam Annubar w/ Opposite Side Support 585 Annubar Primary

Front View | **Top View**

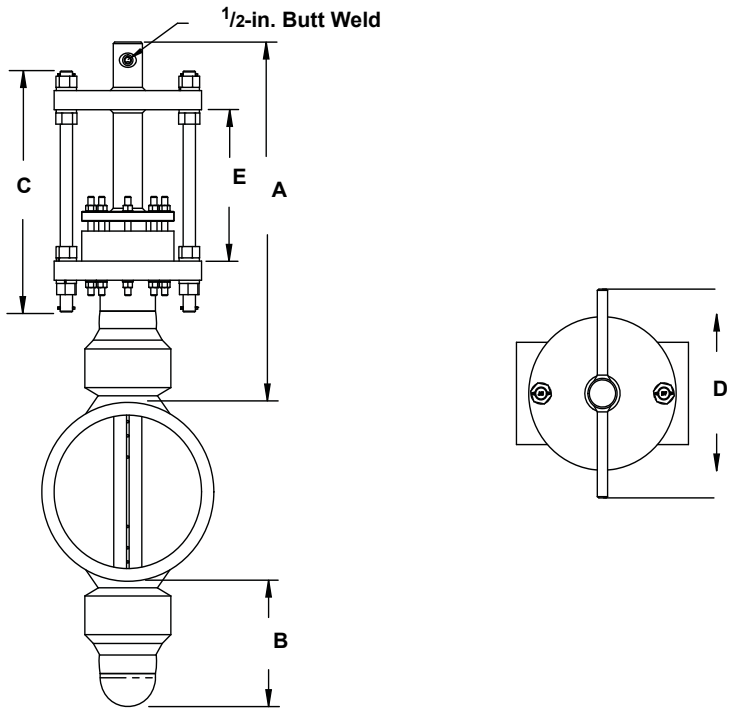


Table 74. Main Steam Annubar w/ Opposite Side Support Dimensional Data

Sensor Size	A (Max)	B	C	D	E
44	29.67 (753.6)	10.0 (254)	19.0 (483)	16.33 (414.0)	11.0 (279)
Dimensions are in inches (millimeters)					

NOTE
Locking rods are always located 90° from the instrument connections. For horizontal installations, the instrument connections will be parallel to the pipe. For vertical installations, the instrument connections will be perpendicular to the pipe.

Flanged Flo-Tap 585 Annubar Primary

Front View | **Top View**

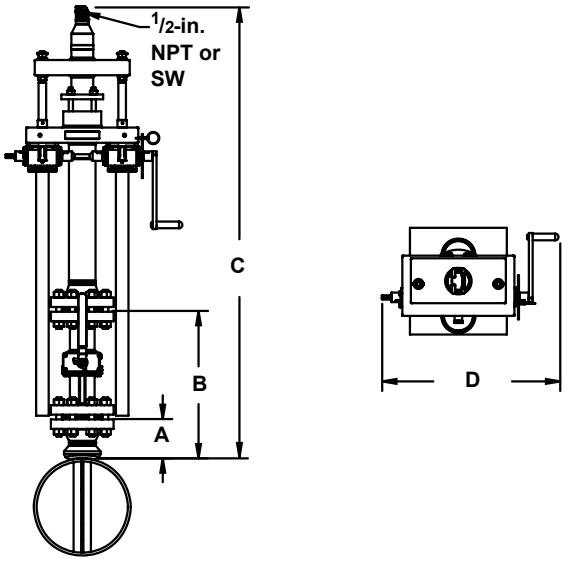
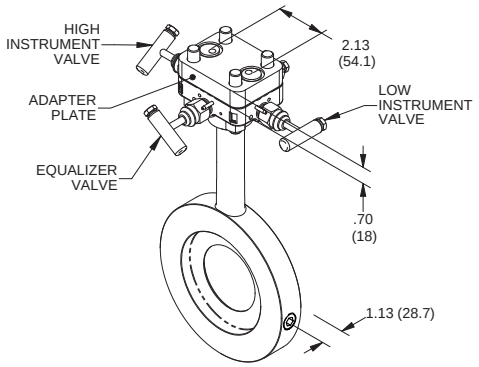
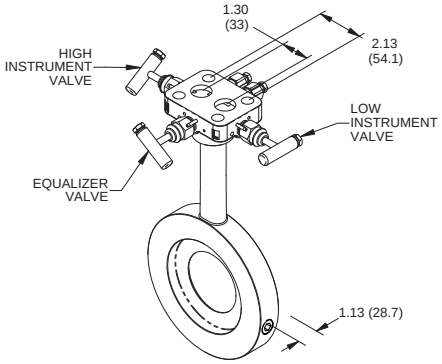
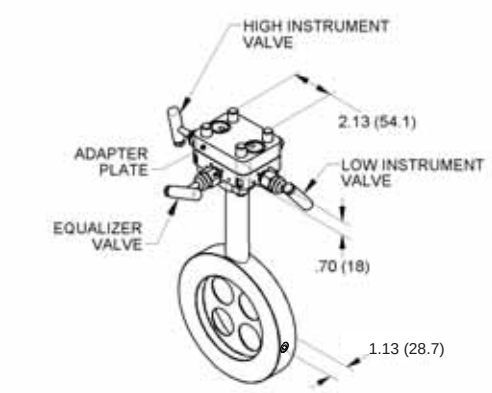
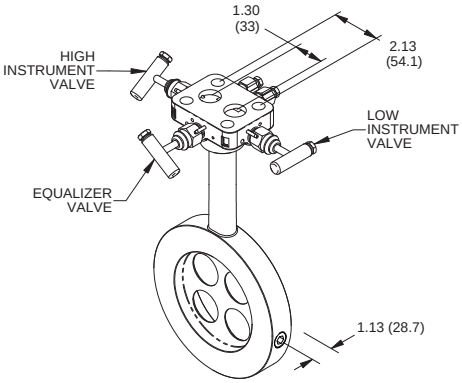


Table 75. Flanged Flo-Tap 585 Annubar Primary Dimensional Data

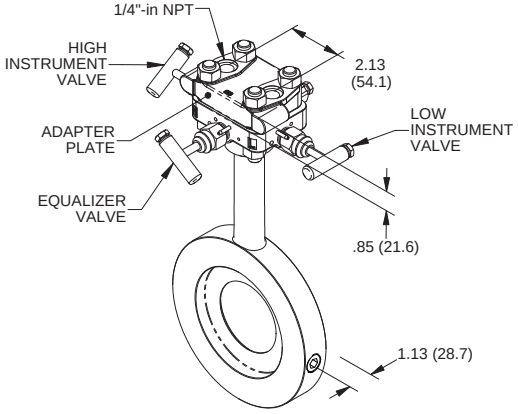
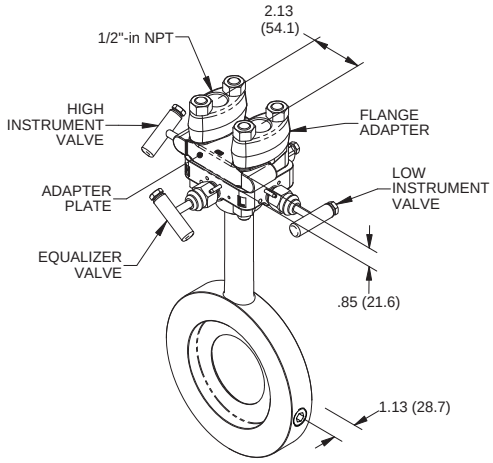
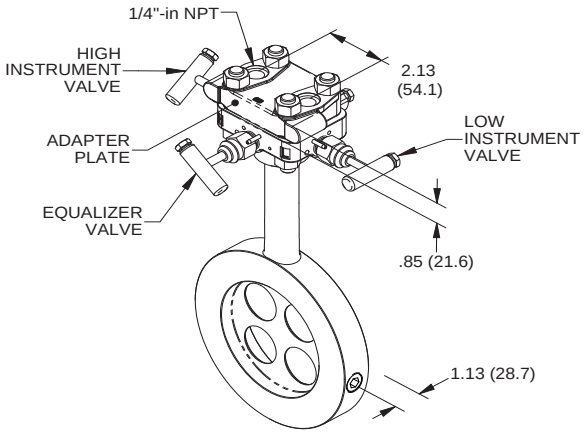
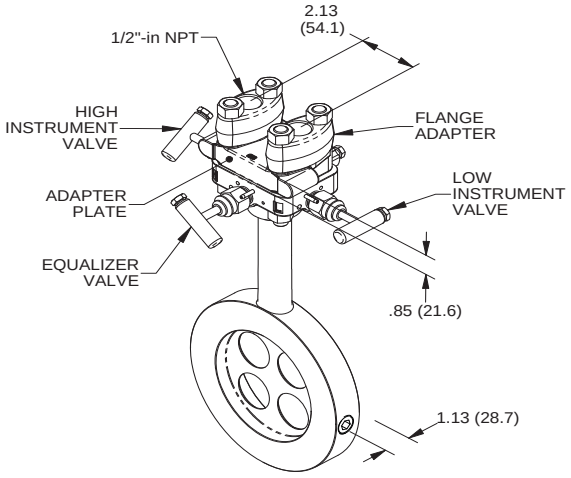
Sensor Size	Flange Size and Rating	A ± 0.125 (3.2)	B ± 0.25 (6.4)	C[1] (Max) (Gear Drive)	D (Max)
44	3 – 150#	4.63 (117,6)	12.75 (323,9)	25.58 (649.7)	23.3 (591,8)
44	3 – 300#	5.00 (127,0)	16.25 (412,8)	25.58 (649.7)	23.3 (591,8)
44	3 – 600#	5.38 (136,7)	19.50 (495,4)	25.58 (649.7)	23.3 (591,8)
	Use the appropriate formula to determine C value: *Inserted formula:* Pipe I.D. + Wall Thickness + Value B + C[1] (use the Gear drive values for C[1]) *Retracted formula:* [2 x (Pipe I.D. + Wall Thickness + Value B)] + C[1] (use the Gear drive values for C[1])				
Dimensions are in inches (millimeters)					

405 DIMENSIONAL DRAWINGS

	Rosemount 405 Compact Orifice Plate (Direct Mount)	
	Front View (transmitter connection A3)	**Front View (transmitter connection D3)**
Compact Orifice Plate (Primary Element Type code P)		
Conditioning Orifice Plate (Primary Element Type code C)		

NOTE
Transmitter connection code A3 is to be used with a traditional style transmitter. This is a stainless steel adapter plate for allowing the direct mount of traditional style transmitters.

Rosemount 405 Compact Orifice Plate (Remote Mount Transmitter)

	Adapter Plate (R3)	Flange Adapter (R3 with option E)
Compact Orifice Plate (Primary Element Type code P)		
Conditioning Orifice Plate (Primary Element Type code C)		

1595 DIMENSIONAL DRAWINGS

Rosemount 1595 Conditioning Orifice Plate

(ANSI Flange, Paddle, Square edged)

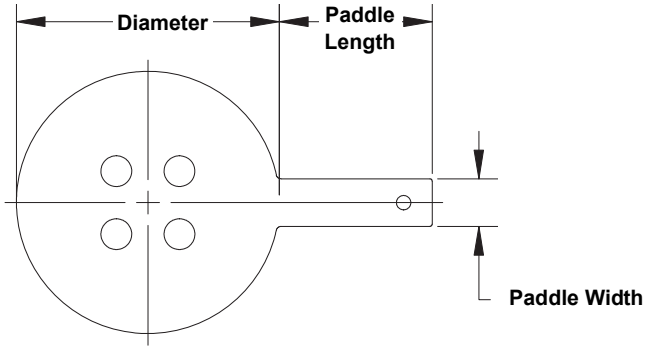


Table 76. Paddle Type Orifice Plate Dimensions in inches (millimeters)

		Diameter for Paddle Type						
Line Size	**150#**	**300#**	**600#**	**900#**	**1500#**	**2500#**	**Paddle Length**	**Paddle Width**
2 -in. (50 mm)	4.125 (104.78)	4.375. (111.13)	4.375 (111.13)	5.625 (142.875)	5.625 (142.875)	5.750 (146.050)	4.0 (101.6)	1.0 (25.4)
3-in. (76 mm)	5.375 (136.53)	5.875 (149.23)	5.875 (149.23)	6.625 (168.275)	6.875 (174.625)	7.750 (196.85)	4.0 (101.6)	1.0 (25.4)
4-in. (100 mm)	6.875 (174.63)	7.125 (180.98)	7.625 (193.68)	8.125 (206.35)	8.250 (209.550)	9.250 (234.95)	4.0 (101.6)	1.0 (25.4)
6-in. (150 mm)	8.750 (222.25)	9.875 (250.83)	10.500 (266.7)	11.375 (288.925)	11.125 (282.575)	12.500 (317.50)	4.0 (101.6)	1.0 (25.4)
8-in. (200 mm)	11.000 (279.4)	12.125 (307.98)	12.625 (320.675)	14.125 (358.775)	13.875 (352.425)	15.250 (387.350)	6.0 (152.4)	1.5 (38.1)
10-in. (250 mm)	13.375 (339.73)	14.250 (361.95)	15.750 (400.05)	17.125 (434.975)	17.125 (434.975)	18.750 (476.25)	6.0 (152.4)	1.5 (38.1)
12-in. (300 mm)	16.125 (409.58)	16.625 (422.26)	18.000 (457.2)	19.625 (498.475)	20.500 (520.7)	21.625 (549.275)	6.0 (152.4)	1.5 (38.1)
14-in. (350 mm)	17.750 (450.85)	19.125 (485.78)	19.375 (492.125)				6.0 (152.4)	1.5 (38.1)
16-in (400 mm)	20.250 (514.35)	21.250 (539.75)	22.250 (565.15)				6.0 (152.4)	1.5 (38.1)
18-in. (450 mm)	21.500 (546.1)	23.375 (593.725)	24.000 (609.6)				6.0 (152.4)	1.5 (38.1)
20-in. (500 mm)	23.750 (603.25)	25.625 (650.875)	26.750 (679.45)				6.0 (152.4)	1.5 (38.1)
24-in. (600 mm)	28.125 (714.375)	30.375 (771.525)	31.000 (787.4)				6.0 (152.4)	1.5 (38.1)

NOTE: Consult factory for availability of line sizes and flange ratings not shown in the above table.

1595U Orifice Universal Type
(Universal, Square edged)

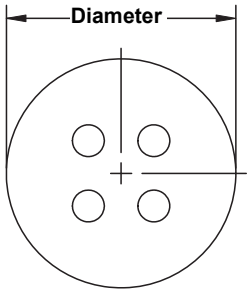


Table 77. A.P.I Ring No.'s and Rating

Line Size	Diameter for Universal Type	A.P.I Ring No.	Rating (lbs.)
2-in. (50 mm)	2.437-in. (61.8998 mm)	R-23	300-600
		R-24	900-1500
		R-26	2500
3-in. (76 mm)	3.437-in. (87.2998 mm)	R-31	300-600 & 900
		R-32	2500
		R-35	1500
4-in. (100 mm)	4.406-in. (111.912 mm)	R-37	300-600 & 900
		R-38	2500
		R-39	1500
6-in. (150 mm)	6.437-in. (163.5 mm)	R-45	300-600 & 900
		R-46	1500
		R-47	2500
8-in. (200 mm)	8.437-in. (214.3 mm)	R-49	300-600 & 900
		R-50	1500
		R-51	2500
10-in. (250 mm)	10.687-in. (271.45 mm)	R-53	300-600 & 900
		R-54	1500
		R-55	2500
12-in. (300 mm)	12.593-in. (319.862 mm)	R-57	300-600 & 900
		R-58	1500
		R-59	2500

NOTE
Refer to Table 76 for line size and pressure rating availability.

Rosemount 1595 Conditioning Orifice Plate
(DIN Flange, Paddle, Square edged)

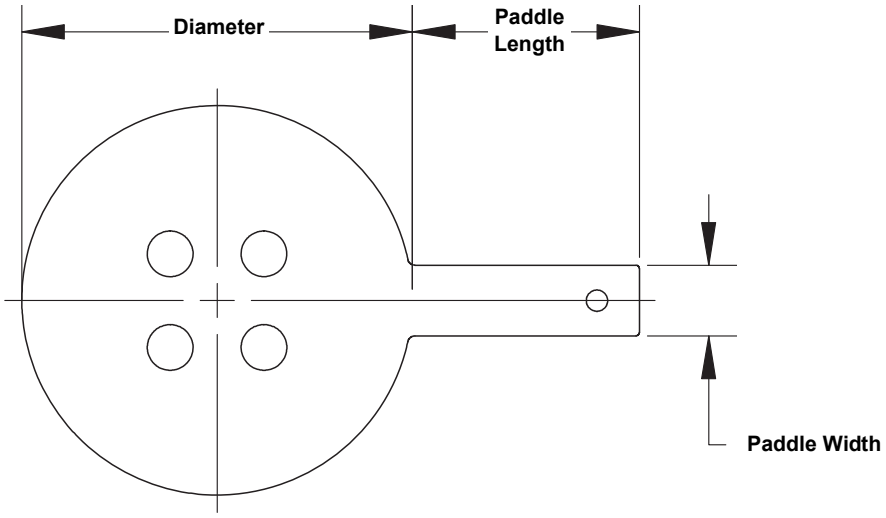


Table 78. 1595 Conditioning Orifice Plate Dimensions in millimeters (inches)

	Diameter (max) – by flange rating							
Line Size	**PN 10**	**PN 16**	**PN 25**	**PN 40**	**PN 63/64**	**PN 100**	**Paddle Length**	**Paddle Width**
DN 50 (2-in.)	107 (4.21)	107 (4.21)	107 (4.21)	107 (4.21)	113 (4.45)	119 (4.69)	101.6 (4.0)	25.4 (1.0)
DN 80 (3-in.)	142 (5.60)	142 (5.60)	142 (5.60)	142 (5.60)	148 (5.82)	154 (6.06)	101.6 (4.0)	25.4 (1.0)
DN 100 (4-in.)	162 (6.38)	162 (6.38)	168 (6.61)	168 (6.61)	174 (6.85)	180 (7.09)	101.6 (4.0)	25.4 (1.0)
DN 150 (6-in.)	218 (8.58)	218 (8.58)	224 (8.82)	224 (8.82)	247 (9.72)	257 (10.12)	101.6 (4.0)	25.4 (1.0)
DN 200 (8-in.)	273 (10.74)	273 (10.74)	284 (11.18)	290 (11.42)	309 (12.17)	324 (12.76)	152.4 (6.0)	38.1 (1.5)
DN 250 (10-in.)	328 (12.91)	329 (12.95)	340 (13.39)	352 (13.86)	364 (14.33)	391 (15.39)	152.4 (6.0)	38.1 (1.5)
DN 300 (12-in.)	378 (14.88)	384 (15.12)	400 (15.75)	417 (16.42)	424 (16.69)	458 (18.03)	152.4 (6.0)	38.1 (1.5)

NOTE: Consult factory for availability of line sizes and flange ratings not shown in the above table.

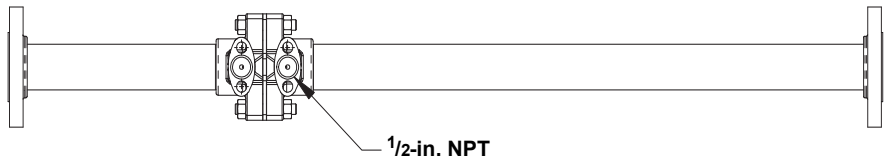
Table 79. Available Beta Ratio (β)
The table below shows the available Beta Ratio (β) for line size vs. pipe schedule

Line Size	Pipe Schedule	Beta (β) Available	Line Size	Pipe Schedule	Beta (β) Available
2	≤ 80	0.20, 0.40, 0.60	14	≤ 80	0.20, 0.40, 0.65
2	160	0.20	14	100	0.20, 0.40
3	≤ 80	0.20, 0.40, 0.65	14	120	0.20, 0.40
3	160	0.20, 0.40	14	140	0.20, 0.40
3	XXS	0.20	14	160	0.20, 0.40
4	≤ 80	0.20, 0.40, 0.65	14	XXS	0.20, 0.40
4	120	0.20, 0.40	16	≤ 80	0.20, 0.40, 0.65
4	160	0.20, 0.40	16	100	0.20, 0.40
4	XXS	0.20	16	120	0.20, 0.40
6	≤ 80	0.20, 0.40, 0.65	16	140	0.20, 0.40
6	120	0.20, 0.40	16	160	0.20, 0.40
6	160	0.20, 0.40	16	XXS	0.20, 0.40
6	XXS	0.20	18	≤ 80	0.20, 0.40, 0.65
8	≤ 80	0.20, 0.40, 0.65	18	100	0.20, 0.40, 0.65
8	100	0.20, 0.40, 0.65	18	120	0.20, 0.40
8	120	0.20, 0.40	18	140	0.20, 0.40
8	140	0.20, 0.40	18	160	0.20, 0.40
8	160	0.20, 0.40	18	XXS	0.20, 0.40
8	XXS	0.20, 0.40	20	≤ 80	0.20, 0.40, 0.65
10	≤ 80	0.20, 0.40, 0.65	20	100	0.20, 0.40, 0.65
10	100	0.20, 0.40, 0.65	20	120	0.20, 0.40
10	120	0.20, 0.40	20	140	0.20, 0.40
10	140	0.20, 0.40	20	160	0.20, 0.40
10	160	0.20, 0.40	20	XXS	0.20, 0.40
10	XXS	0.20, 0.40	24	≤ 80	0.20, 0.40, 0.65
12	≤ 80	0.20, 0.40, 0.65	24	100	0.20, 0.40
12	100	0.20, 0.40	24	120	0.20, 0.40
12	120	0.20, 0.40	24	140	0.20, 0.40
12	140	0.20, 0.40	24	160	0.20, 0.40
12	160	0.20, 0.40	24	XXS	0.20, 0.40
12	XXS	0.20, 0.40			

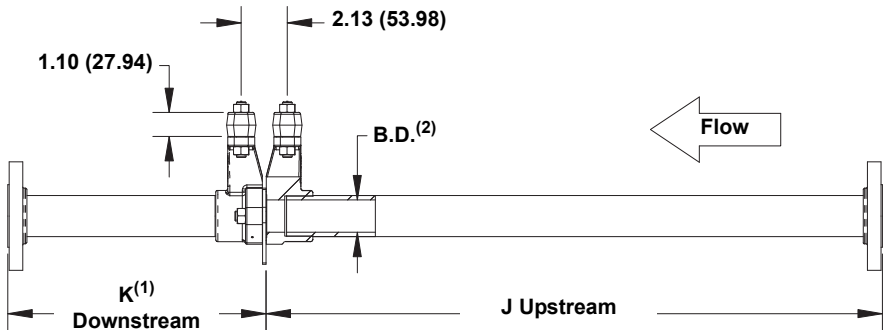
1195 DIMENSIONAL DRAWINGS

Rosemount 1195 Integral Orifice Plate

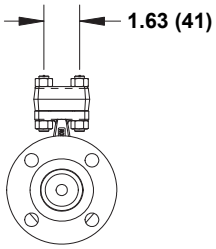
Top View



Bottom View



End View



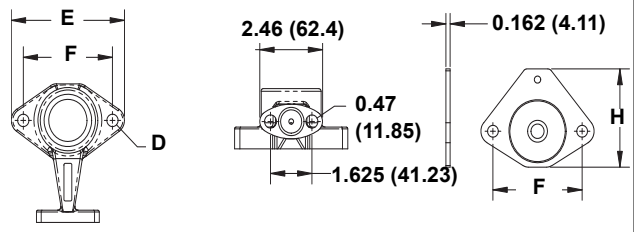
Dimensions are in inches (millimeters).

	Line Size		
Dimension	**1/2-in. (15 mm)**	**1-in. (25 mm)**	**1 1/2-in. (40 mm)**
J (Beveled/Threaded pipe ends)	12.54 (318.4)	20.24 (514.0)	28.44 (722.4)
J (RF slip-on, RTJ slip-on, RF-DIN slip-on)	12.62 (320.4)	20.32 (516.0)	28.52 (724.4)
J (RF 150#, weld-neck)	14.37 (364.9)	22.37 (568.1)	30.82 (782.9)
J (RF 300#, weld-neck)	14.56 (369.8)	22.63 (574.7)	31.06 (789.0)
J (RF 600#, weld-neck)	14.81 (376.0)	22.88 (581.0)	31.38 (797.1)
K ((RF slip-on, RTJ slip-on, RF-DIN slip-on)(1)	5.82 (147.8)	8.83 (224.2)	11.99 (304.6)
K (RF 150#, weld-neck)	7.57 (192.3)	10.88 (276.3)	14.29 (363.1)
K (RF 300#, weld-neck)	7.76 (197.1)	11.14 (282.9)	14.53 (369.2)
K (RF 600#, weld-neck)	8.01 (203.4)	11.39 (289.2)	14.85 (377.2)
B.D.(Bore Diameter)(2)	0.664 (16.86)	1.097 (27.86)	1.567 (39.80)
Dimensions are in inches (millimeters).			

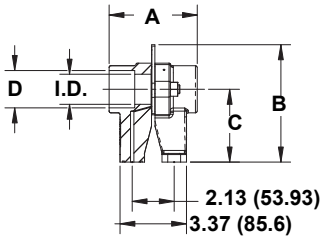
(1) Downstream length shown here includes plate thickness of 0.162-in. (4.11 mm).

(2) B.D is diameter of the precision bored portion of the upstream and downstream piping.

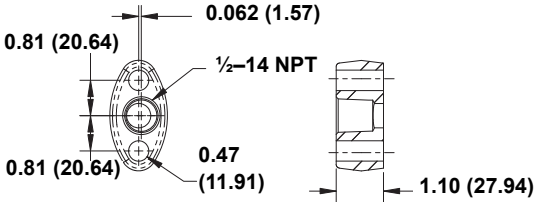
Orifice Plate



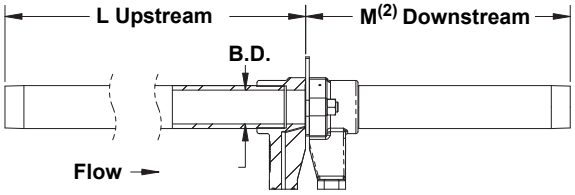
Socket-Weld or Threaded Body



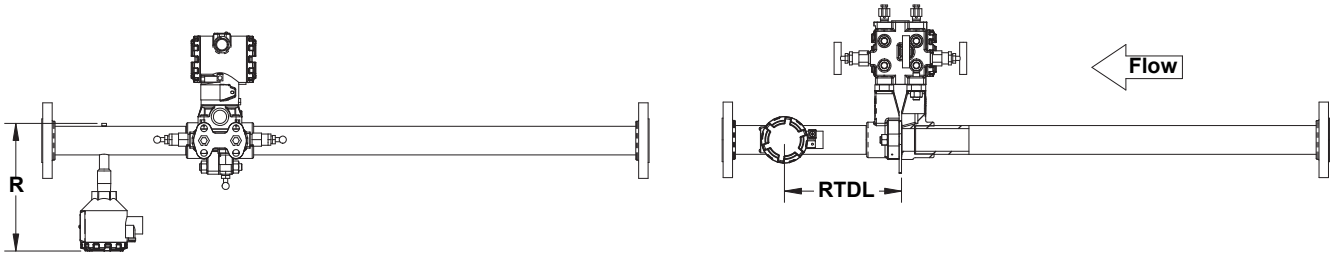
Remote Adapter



NPT / Beveled Piping (Prepared for welding)



Temperature Sensor



	Line Size					
Dimension	**1/2-in. (12.7 mm)**		**1-in. (25.4 mm)**		**1 1/2-in. (38.1 mm)**	
A	3.4-in.	86 mm	3.8-in.	97 mm	4.5-in.	114 mm
B	4.7-in.	119.4 mm	5.2-in.	132 mm	5.9-in.	149.9 mm
C	3.0-in.	76 mm	3.3-in.	84 mm	3.7-in.	94 mm
D(1)	0.805-in.	20.45 mm	1.280-in.	32.51 mm	1.865-in.	47.37 mm
E	3.6-in.	91 mm	3.9-in.	99 mm	4.4-in.	112 mm
F	2.6-in.	66 mm	3.0-in.	76 mm	3.5-in.	89 mm
H	2.5-in.	64 mm	3.0-in.	76 mm	3.5-in.	89 mm
L	12.54-in.	318.4 mm	20.24-in.	514 mm	28.44-in.	722.4 mm
M	5.74-in.	145.7 mm	8.75-in.	222.2mm	11.91-in.	302.6 mm
R	7.4-in.	187.96 mm	7.8-in.	198.12 mm	8.4-in.	213.36 mm
RTDL	3.11-in.	78.9 mm	5.25-in.	133.4 mm	7.50-in.	190.5 mm
B.D. (Bore Diameter)(2)	0.664-in.	16.87 mm	1.097-in.	27.86 mm	1.567-in.	39.80 mm
I.D. (Inside Diameter)	0.622-in.	15.80 mm	1.049-in.	26.64 mm	1.500-in.	38.10 mm

(1) To improve pipe perpendicularity for gasket sealing, socket diameter "D" is smaller than standard pipe O.D. Pipe O.D. must be machined smaller than socket diameter "D" to ensure proper fit.

(2) B.D is diameter of the precision bored portion of the upstream and downstream piping.

Installation and Flowmeter Orientation

Table 80. Annubar Straight Run Requirements[1]

Upstream (inlet) side	Annubar Products			
	3051SFA, 3051CFA, 2051CFA, 485, 585[2]			
	Without Straightening Vanes[3]		With Straightening Vanes[4]	
	In Plane	Out Plane	From Disturbance	From Straightening Vane
Reducer	12	12	8	4
Expander	18	18	8	4
Single Elbow (90°) or tee	8	10	8	4
Two Elbows in plane	11	16	8	4
Two Elbow out of plane	23	28	8	4
Butterfly Valve (75-100% open)	30	30	8	4
Ball / Gate Valve full open	8	10	8	4
Downstream (outlet) side	4	4	4	4

(1) Consult an Emerson Process Management representative if a disturbance is not listed or if multiple disturbances are present.

(2) Consult the factory for instructions regarding use in square or rectangular ducts.

(3) In Plane means the Annubar is in the same plane as the elbow. Out of Plane means the bar is perpendicular to the plane of the upstream elbow. Refer to Figure 1 on page 152.

(4) Use straightening vane to reduce the required straight run length.

Table 81. Conditioning Orifice Plate and Compact Orifice Plate Straight Run Requirements[1]

Upstream (inlet) side	Conditioning Orifice Plate Products		Compact Orifice Plate Products	
	3051SFC_C, 3051CFCDC, 2051CFCDC, 1595, 405C[2]		3051SFC_P, 3051CFCDP, 2051CFCDP, 405P[3][4]	
	0.4 Beta	0.65 Beta	0.4 Beta	0.65 Beta
Reducer	2	2	5	12
Expander	6	8	12	28
Single Elbow (90°) or tee	2	2	16	44
Two Elbows in plane	2	2	10	44
Two Elbow out of plane	2	2	50	60
Butterfly Valve (75-100% open)	2	5	16[5]	44[5]
Ball / Gate Valve full open	2	2	12	18
Downstream (outlet) side	2	2	6	7

(1) Consult an Emerson Process Management representative if a disturbance is not listed or if multiple disturbances are present.

(2) For any Beta greater than 0.40, use beta 0.65 recommended lengths. For any Beta ratio less than or equal to 0.40, use beta 0.4 recommended lengths.

(3) Recommended lengths represented in pipe diameters per ISO 5167.

(4) Refer to ISO 5167 for recommended lengths when using flow straighteners.

(5) Recommended lengths not per ISO 5167. Butterfly valves are not listed in the ISO specification.

Table 82. Integral Orifice Plate Straight Run Requirements[1][2]

	3051SFP, 3051CFP, 2051CFP, 1195[1][2]											
	<0.20 Beta		0.40 Beta		0.50 Beta		0.60 Beta		0.67 Beta		0.75 Beta	
Upstream (inlet) side	**A[3]**	**B[4]**	**A**	**B**	**A**	**B**	**A**	**B**	**A**	**B**	**A**	**B**
Reducer	5	-	5	-	8	5	9	5	12	6	13	8
Expander	6	-	12	8	20	9	26	11	28	14	36	18
Single Elbow (90°) or tee	6	3	16	3	22	9	42	13	44	20	44	20
Two Elbows in plane	10	-	10	-	18	10	30	18	44	18	44	18
Two Elbow out of plane	34	17	50	25	75	34	65	18	60	18	75	18
Butterfly Valve	12	6	12	6	12	6	14	7	18	9	24	12
Gate Valve full open	12	6	12	6	12	6	14	7	18	9	24	12
Downstream (outlet) side	4	2	6	3	6	3	7	3.5	7	3.5	8	4

(1) Recommended lengths are guidelines based on ISO 5167.

(2) Straight run represents distance from the face of the orifice plate to the disturbance.

(3) Straight run represents distance from the face of the orifice plate to the disturbance.

(4) Recommended lengths represented in pipe diameters corresponding to an additional +0.5% discharge coefficient uncertainty.

3051SFA, 3051CFA, 2051CFA, 485 Drill Hole Size According to Sensor Size

Sensor Size	Diameter
1	3/4-in. (19 mm)
2	1 5/16-in. (34 mm)
3	2 1/2-in. (64 mm)

585 Drill Hole Size According to Sensor Size

Sensor Size	Hole Diameter	
11	7/8-in. (23 mm)	+ 1/32-in (0,80 mm)
		– 0.00
22	1 5/16-in. (34 mm)	+ 1/16-in. (1,59 mm)
		– 0.00
44	2 1/2-in. (64 mm)	+ 1/16-in. (1,59 mm)
		– 0.00

Orifice Plate Pipe Orientation

Pipe orientation for both 3051SFC, 3051CFC,2051CFC, 405C, 405P, 3051SFP, 3051CFP, 2051CFP AND 1195.

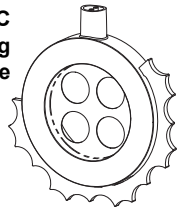
Orientation/ Flow Direction	Process[1]		
	Gas	Liquid	Steam
Horizontal	D/R	D/R	D/R
Vertical Up	R	D/R	R
Vertical Down	D/R	NR	NR

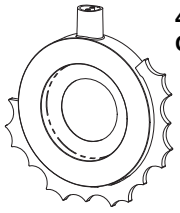
(1) D = Direct mount acceptable (recommended)
R = Remote mount acceptable
NR = Not recommended

Compact Flowmeter Pipe Centering

Improper centering of any orifice type device can cause an error of up to ±5% in small line sizes. A centering mechanism (centering ring) independent of flange rating comes standard with the 405 Compact Flowmeter Series.

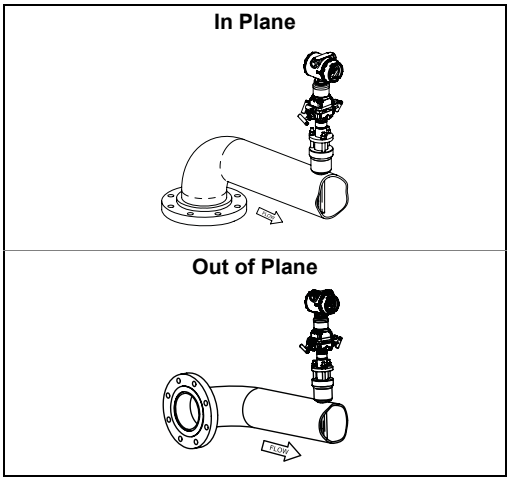
405C Conditioning Orifice





405P Compact Orifice

Figure 1. Annubar In plane and Out of plane

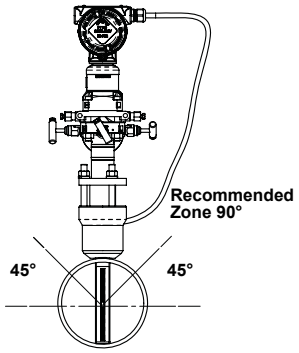


Annubar Flowmeter Orientation

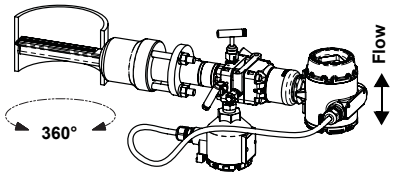
For 3051SFA, 3051CFA, 2051CFA, 485, 585

Annubar Direct Mount Flowmeter Orientation (Recommended)(1)

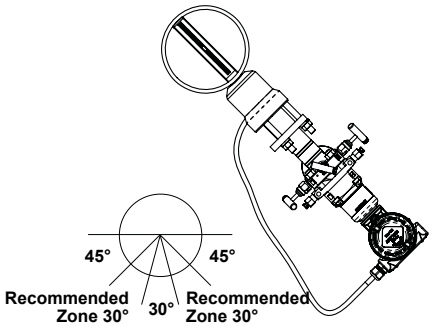
Gas (Horizontal)



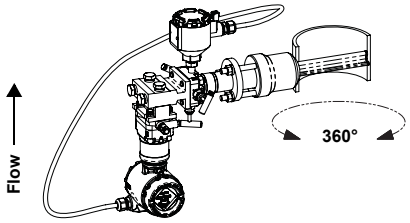
Gas (Vertical)



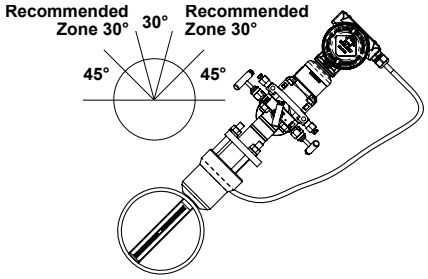
Liquid and Steam (Horizontal)



Steam (Vertical)



Top Mounting for Steam (Horizontal)(2)

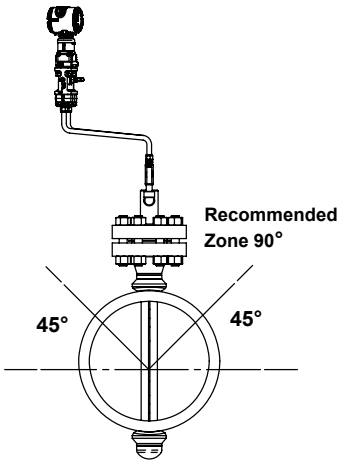


(1) The flowmeter orientation recommendations may vary for the Manual and Gear-Drive Flo-Tap Annubar Types.

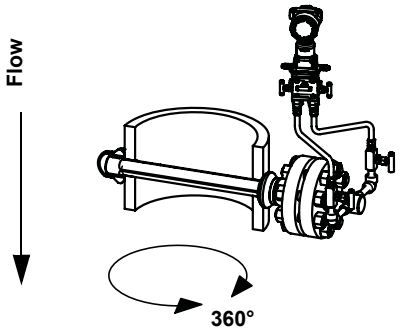
(2) Note: This mounting orientation is not recommended for the 585 Annubar Type L (Main Stream Line). For 585 Main Steam Line, use Liquid and Steam (Horizontal) orientation for mounting recommendations.

Annubar Remount Mount Flowmeter Orientation (Recommended)(1)

Gas (Horizontal)

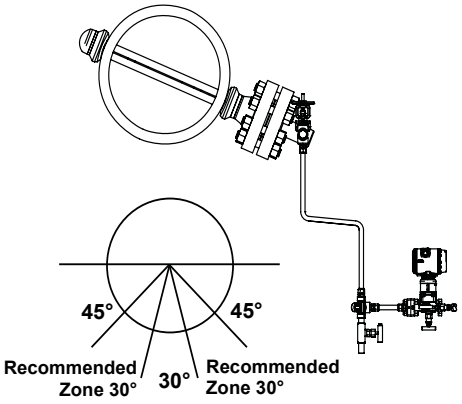


Gas (Vertical)

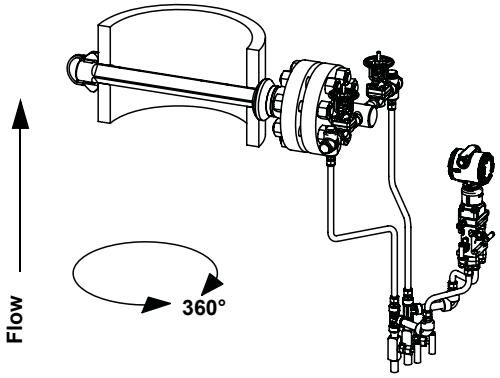


Note: Can also be mounted for Gas Vertical up applications.

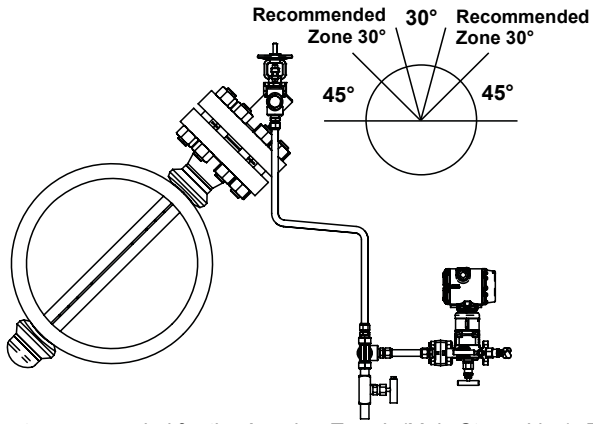
Liquid and Steam (Horizontal)



Steam (Vertical)



Top Mounting for Steam (Horizontal)



Note: This mounting orientation is not recommended for the Annubar Type L (Main Steam Line). For 585 Main Steam Line, use Liquid and Steam (Horizontal) orientation for mounting recommendations.

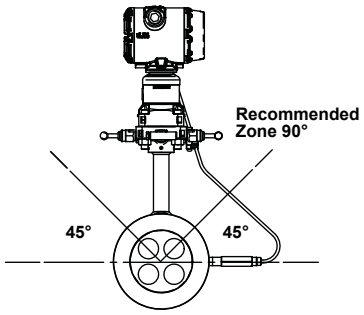
(1) The flowmeter orientation recommendations may vary for the Gear-Drive Flo-Tap Annubar Type.

405 Flowmeter Orientation

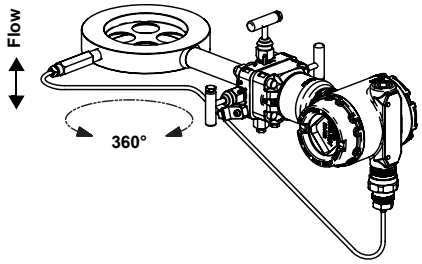
For 3051SFC, 3051CFC, 2051CFC, 405C, 405P

405 Direct Mount Flowmeter Orientation (Recommended)

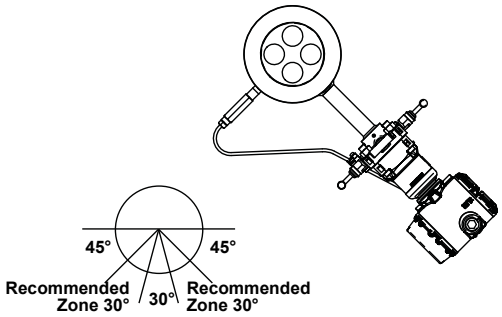
Gas (Horizontal)



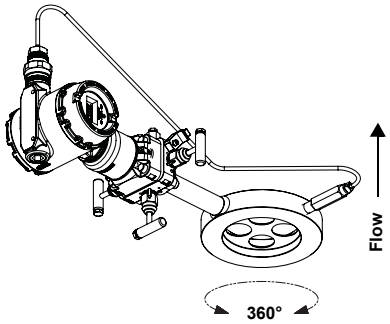
Gas (Vertical)



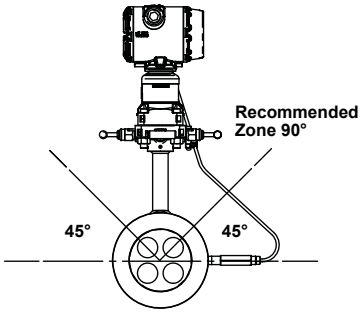
Liquid and Steam (Horizontal)



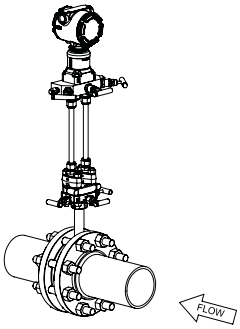
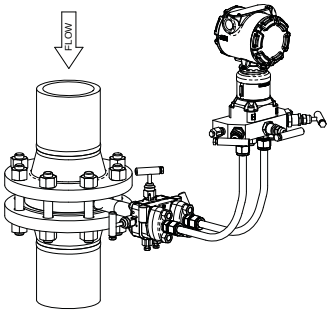
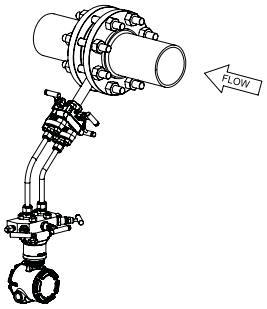
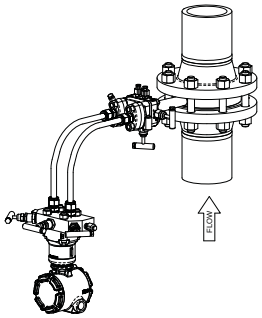
Steam (Vertical)



Top Mounting for Steam (Horizontal)



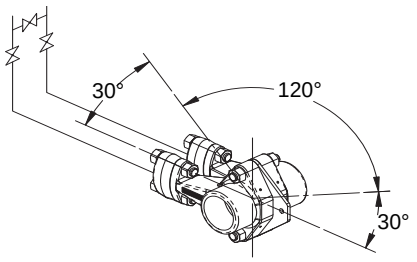
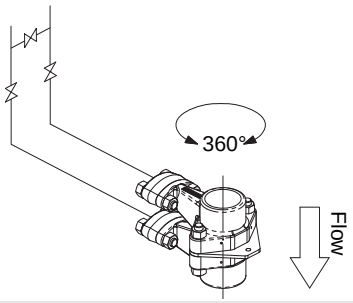
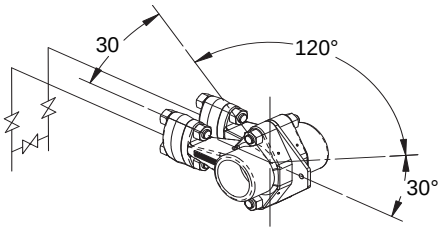
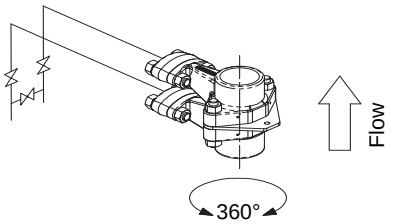
405 Remote Mount Flowmeter Orientation (Recommended)

Gas and Top Mounting for Steam (Horizontal)	Gas (Vertical)
	
Liquid and Steam (Horizontal)	**Liquid and Steam (Vertical)**
	

1195 Integral Orifice Flowmeter Orientation

For 3051SFP, 3051CFP, 2051CFP, 1195

1195 Flowmeter Orientation (Recommended)

Gas (Horizontal)	Gas (Vertical)
	
Liquid and Steam (Horizontal)	**Liquid (Vertical)**
	

Product Data Sheet
00813-0100-4485, Rev AA
April 2010

Rosemount DP Flow

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00813-0100-4485 Rev AA, 4/10

EMERSON™
Process Management

Product Data Sheet
00813-0100-4016, Rev JA
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Rosemount DP Level Transmitters and Remote Seals

FOR ROSEMOUNT 3051S, 3051, AND 2051 TRANSMITTERS

APPLICATIONS

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

WirelessHART HART COMMUNICATION PROTOCOL FOUNDATION CE

Contents

Proven, Reliable, and Innovative DP Level Technologies

To meet your application requirements, the combination of Rosemount level transmitters and remote seals deliver an unsurpassed product offering that is easy to specify, order, and install. The Rosemount 1199 offering defined in this product data sheet highlights the 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.

WHAT IS A SEAL SYSTEM?

A diaphragm seal system consists of a pressure transmitter, one or two diaphragm seals, a fill fluid, and either a direct mount or capillary style connection.

During operation, the thin, flexible diaphragm and fill fluid separate the pressure sensing element of the transmitter from the process medium. The capillary tubing or direct mount flange connects the diaphragm to the transmitter.

When process pressure is applied, the diaphragm is displaced, transferring the measured pressure through the filled system, through the capillary tubing, to the transmitter element. This transferred pressure displaces the sensing diaphragm of the pressure transmitter. This displacement is proportional to the process pressure and is converted electronically to an appropriate 4-20 mA, digital HART, or FOUNDATION fieldbus output signal.

WHY USE DIAPHRAGM SEALS?

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 normal operating ranges of the transmitter and cannot be brought into those limits with impulse piping.
- The process is **corrosive** and would require frequent transmitter replacement or specific exotic materials of construction.
- The process contains **suspended solids** or is **viscous** and may plug the impulse piping.
- The application requires the use of **Hygienic connections.**
- There is a need for easier cleaning of the process from the connections to **avoid contamination** between batches.
- There is a need to **replace wet/ dry legs** to reduce maintenance on applications where the reference leg is not stable or often needs to be refilled/drained.
- There is a need to make **density** or **interface measurements.**
- The process medium may **freeze** or **solidify** in the transmitter or impulse piping.

Balanced System **Tuned-System Assemblies**

Proven Best Practices Deliver Tuned-System™ Assemblies for DP-Level Installations

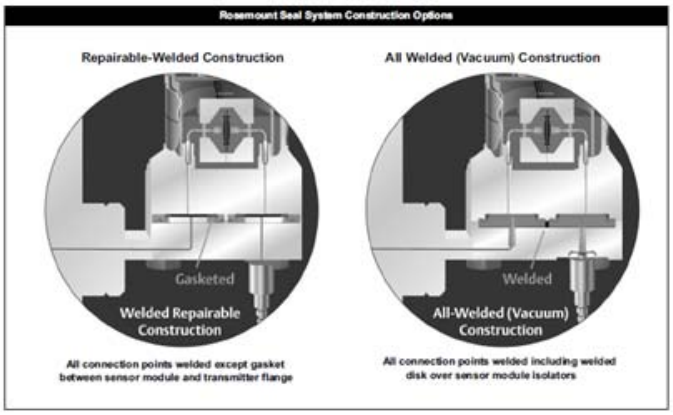
- Reduced installed cost by 20% by eliminating excess capillary and transmitter mounting hardware
- Reduced risk with up-front quantified performance reports
- Improved performance by 30%
- Time response improved by over 80%

Rosemount 3051S_L, 3051L, and 2051L Liquid Level Transmitters

- Welded system provides best-in-class system reliability
- Flush, 2-in. (50 mm), 4-in. (100 mm), and 6-in. (150 mm) extended diaphragms
- Multiple fill fluids and wetted materials available
- Level and volume units, process alerts

Reliable System Construction that is 100% Helium Leak Tested

- Most flexible offering with Tuned-System Assemblies, Balanced System Assemblies, direct mount, capillary, and Thermal Optimizer construction
- Capillary ID sizes: 0.03–in. (0.7 mm), 0.04–in. (1.1 mm), and 0.07–in. (1.75 mm)
- Welded-repairable construction is the industry leading, robust design for most applications.
- All Welded construction designed for high temperature and high vacuum (below 6 psi-a or 414 mbar-a) applications.



- Thermal Optimizer designed for high process temperature and cold ambient temperature applications
- Most variety of fill fluids that meets industry and hygienic applications

Robust Seal Design

- Backup convolutions on the seal body protect diaphragm integrity and minimize oil volume
- Recessed diaphragms reduce potential for handling damage
- Advanced welding techniques improve reliability
- Advanced manufacturing techniques ensure air-free, leak-tight system that is stable over time

SST Armored, PVC Coated, Support Tube with Compression Fitting (Ordering Codes M, N, and P)

SST Armored, Support Tube without Compression Fitting (Ordering Codes H, J, and K)

SST Armored, PVC Coated (Ordering Codes E, F, and G)

SST Armored (Ordering Codes B, C and D)

Rosemount 3051S Liquid Level Transmitter

3051S Liquid Level Transmitter

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

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

Product features and capabilities include:

- Variety of process connections
- Quantified performance for the entire transmitter / seal assembly (QZ option)
- 4-20 mA HART®, FOUNDATION™ fieldbus, and WirelessHART™ protocols

Additional Information
Specifications: page 64
Certifications: page 74
Dimensional Drawings: page 87

Table 1. Rosemount 3051S 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**			
3051S	Liquid Level Transmitter			
Performance Class				
Standard				**Standard**
1	Ultra: 0.065% span accuracy, 100:1 rangedown, 12-year limited warranty			★
2	Classic: 0.065% span accuracy, 100:1 rangedown			★
Connection Type				
Standard				**Standard**
L	Level			★
Measurement Type				
Standard				**Standard**
D	Differential			★
G	Gage			★
A	Absolute			★
Pressure Range				
	Differential (LD)	**Gage (LG)**	**Absolute (LA)**	
Standard				**Standard**
2A	-250 to 250 inH_2O (-623 to 623 mbar)	-250 to 250 inH_2O (-623 to 623 mbar)	0 to 150 psia (10 bar)	★
3A	-1000 to 1000 inH_2O (-2,5 to 2,5 bar)	-393 to 1000 inH_2O (-0,98 to 2,5 bar)	0 to 800 psia (55 bar)	★
4A	-300 to 300 psi (-20,7 to 20,7 bar)	-14.2 to 300 psig (-0,98 to 21 bar)	0 to 4000 psia (276 bar)	★
5A	-2000 to 2000 psi (-137,9 to 137,9 bar)	-14.2 to 2000 psig (-0,98 to 137,9 bar)	N/A	★
Transmitter Output				
Standard				**Standard**
A	4-20 mA with digital signal based on HART protocol			★
F[1]	FOUNDATION fieldbus protocol			★
X[2]	Wireless (Requires wireless options and wireless PlantWeb housing)			★

Table 1. Rosemount 3051S 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 Style		**Material**	**Conduit Entry Size**	
Standard				**Standard**
00	None (SuperModule spare part, order output code A)			★
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 housing with output for remote interface	Aluminum	1/2–14 NPT	★
2F	Junction Box housing with output for remote interface	Aluminum	M20 x 1.5	★
2J	Junction Box housing	SST	1/2–14 NPT	★
2M	Junction Box housing with output for remote interface	SST	1/2–14 NPT	★
5A	Wireless PlantWeb housing	Aluminum	1/2–14 NPT	★
5J	Wireless PlantWeb housing	SST	1/2–14 NPT	★
7J[3]	Quick Connect (A size Mini, 4-pin male termination)	SST		★
Expanded				
1C	PlantWeb housing	Aluminum	G1/2	
1L	PlantWeb housing	SST	G1/2	
2C	Junction Box housing	Aluminum	G1/2	
2G	Junction Box housing with output for remote interface	Aluminum	G1/2	
Seal System Type				
Standard				**Standard**
1	Direct-mount seal system			★
High Pressure Side Extension (Between Transmitter Flange and Seal)				
Standard				**Standard**
0	Direct-Mount (No Extension)			★
Sensor Module Configuration (Low Side)				
Standard				**Standard**
1[4]	Tuned-System Assembly, One Capillary Remote Seal (Requires 1199 model number, see Table 7 on page 27 for seal information)			★
2	316L SST isolator / SST transmitter flange			★
3	Alloy C-276 isolator / SST transmitter flange			★
Capillary Length				
Standard				**Standard**
0	None			★
Seal Fill Fluid (High Side)		**Temperature Limits (Ambient Temperature of 70° F (21° C))**		
Standard				**Standard**
A	Syltherm XLT	-102 to 293 °F (-75 to 145 °C)		★
C	Silicone 704	32 to 401 °F (0 to 205 °C)		★
D	Silicone 200	-49 to 401 °F (-45 to 205 °C)		★
H	Inert (Halocarbon)	-49 to 320 °F (-45 to 160 °C)		★
G	Glycerine and Water	5 to 203 °F (-15 to 95 °C)		★
N	Neobee M-20	5 to 401 °F (-15 to 205 °C)		★
P	Propylene Glycol and Water	5 to 203 F (-15 to 95 °C)		★
Process Connection Style				
Standard				**Standard**
FF	Flush Flanged Seal			★
EF	Extended Flanged Seal			★

Table 1. Rosemount 3051S 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 (High Side)				
	Flush Flanged Seal	**Extended Flanged Seal**		
Standard				**Standard**
G	2-in./DN 50	—		★
7	3-in.	3-in./DN 80, 2.58-in. diaphragm		★
J	DN 80	—		★
9	4-in./DN 100	4-in./DN 100, 3.5-in. diaphragm		★
Flange Rating (High Side)				
Standard				**Standard**
1	ANSI/ASME B16.5 Class 150			★
2	ANSI/ASME B16.5 Class 300			★
4	ANSI/ASME B16.5 Class 600			★
G	PN 40 per EN 1092-1			★
E	PN 10/16 per EN 1092-1, Available with DN 100 only			★
Isolator, Flange Material (High Side)				
	Flush Flanged Seal Isolator	**Extended Flanged Seal Isolator and Wetted Parts**	**Flange Material**	
Standard				**Standard**
CA	316L SST	316L SST	CS	★
DA	316L SST	316L SST	SST	★
CB	Alloy C-276	Alloy C-276	CS	★
DB	Alloy C-276	Alloy C-276	SST	★
CC	Tantalum - seam welded[5]	—	CS	★
DC	Tantalum - seam welded[5]	—	SST	★
Lower Housing Material for FF, Extension Length for EF (High Side)[6]				
	Flush Flanged Seal	**Extended Flanged Seal**		
Standard				**Standard**
0	None	—		★
2	—	2-in. (50 mm)		★
4	—	4-in. (100 mm)		★
6	—	6-in. (150 mm)		★
A	316 SST	—		★
B	Alloy C-276	—		★
D	Carbon Steel	—		★
Flushing Connection Quantity and Size (Lower Housing, High Side)				
	Flush Flanged Seal	**Extended Flanged Seal**		
Standard				**Standard**
0	None	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)	—		★

Wireless Options (Requires option code X and wireless PlantWeb housing)

Update Rate		
Standard		**Standard**
WA	User Configurable Update Rate	★
Operating Frequency and Protocol		
Standard		**Standard**
3	2.4 GHz DSSS, WirelessHART	★

Table 1. Rosemount 3051S 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.

Omnidirectional Wireless Antenna		
Standard		**Standard**
WK	Long Range, Integral Antenna	★
WM	Extended Range, Integral Antenna	★
SmartPower™		
Standard		**Standard**
1(7)	Power Module Adapter, Intrinsically Safe (Power Module separate)	★

Other Options (Include with selected model number)

Diaphragm Thickness		
Expanded		
SC	0.006-in. (150 µm) available with 316L SST and Alloy C-276	
Flushing Plug, Vent/Drain Valve		
Standard		**Standard**
SD	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)	★
Gasket Material		
Standard		**Standard**
SJ	PTFE gasket (for use with flushing connection ring)	★
Expanded		
SN	Grafoil® gasket (for use with flushing connection ring)	
Code Conformance		
Standard		**Standard**
ST(8)	Wetted Materials Compliance to NACE MRO175/ISO 15156, MRO103	★
PlantWeb Control Functionality		
Standard		**Standard**
A01(11)	FOUNDATION fieldbus Advanced Control Function Block Suite	★
PlantWeb Diagnostic Functionality		
Standard		**Standard**
D01(11)	FOUNDATION fieldbus Diagnostics Suite	★
DA2(9)(11)	Advanced HART Diagnostics Suite	★
Software Configuration		
Standard		**Standard**
C1(10)	Custom software configuration (Requires Configuration Data Sheet)	★
Gage Pressure Calibration		
Standard		**Standard**
C3	Gage Pressure Calibration (3051SxLA4 only)	★
Alarm Limit		
Standard		**Standard**
C4(10)(11)	NAMUR alarm and saturation levels, high alarm	★
C5(10)(11)	NAMUR alarm and saturation levels, low alarm	★
C6(10)(11)	Custom alarm and saturation signal levels, high alarm (Requires C1 and Configuration Data Sheet)	★
C7(10)(11)	Custom alarm and saturation signal levels, low alarm (Requires C1 and Configuration Data Sheet)	★
C8(10)(11)	Low alarm (standard Rosemount alarm and saturation levels)	★
Hardware Adjustments		
Standard		**Standard**
D1(10)(11)(12)	Hardware adjustments (zero, span, alarm, security)	★
Flange Adapter		
Standard		**Standard**
D2	1/2-14 NPT flange adapter	★
Expanded		
D9	RC 1/2 SST flange adapter	

Table 1. Rosemount 3051S 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.

Custody Transfer		
Standard		**Standard**
D3[13]	Measurement Canada Accuracy Approval	★
Ground Screw		
Standard		**Standard**
D4	External ground screw assembly	★
Drain/Vent Valve		
Standard		**Standard**
D5	Delete transmitter drain/vent valves (install plugs)	★
Conduit Plug		
Standard		**Standard**
D0[14]	316 SST Conduit Plug	★
Product Certifications[15]		
Standard		**Standard**
E1	ATEX Flameproof	★
E2	INMETRO Flameproof	★
E3	China Flameproof	★
E4	TIIS Flameproof	★
E5	FM Explosion-proof, Dust Ignition-proof	★
E6[16]	CSA Explosion-proof, Dust Ignition-proof, Division 2	★
E7	IECEx Flameproof, Dust Ignition-proof	★
I1	ATEX Intrinsic Safety	★
I2	INMETRO Intrinsic Safety	★
I3	China Intrinsic Safety	★
I4[17]	TIIS Intrinsic Safety	★
I5	FM Intrinsically Safe, Division 2	★
I6	CSA Intrinsically Safe	★
I7	IECEx Intrinsic Safety	★
IA	ATEX FISCO Intrinsic Safety (FOUNDATION fieldbus protocol only)	★
IE	FM FISCO Intrinsically Safe (FOUNDATION fieldbus protocol only)	★
IF	CSA FISCO Intrinsically Safe (FOUNDATION fieldbus protocol only)	★
IG	IECEx FISCO Intrinsic Safety (FOUNDATION fieldbus protocol only)	★
K1	ATEX Flameproof, Intrinsic Safety, Type n, Dust	★
K2	INMETRO Flameproof, Intrinsic Safety	★
K5	FM Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
K6[16]	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
K7	IECEx Flameproof, Dust Ignition-proof, Intrinsic Safety, Type n	★
KA[16]	ATEX and CSA Flameproof, Intrinsically Safe, Division 2	★
KB[16]	FM and CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
KC	FM and ATEX Explosion-proof, Intrinsically Safe, Division 2	★
KD[16]	FM, CSA, and ATEX Explosion-proof, Intrinsically Safe	★
N1	ATEX Type n	★
N7	IECEx Type n	★
ND	ATEX Dust	★
Sensor Fill Fluid		
Standard		**Standard**
L1[18]	Inert sensor fill fluid	★
O-ring		
Standard		**Standard**
L2	Graphite-filled PTFE o-ring	★

Table 1. Rosemount 3051S 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.

Bolting Material		
Standard		**Standard**
L4	Austenitic 316 SST bolts	★
L5(8)	ASTM A193, Grade B7M bolts	★
L6	Alloy K-500 bolts	★
L7(8)	ASTM A453, Class D, Grade 660 bolts	★
L8	ASTM A193, Class 2, Grade B8M bolts	★
Display Type(19)		
Standard		**Standard**
M5	PlantWeb LCD Display	★
M7(11)(20)(21)	Remote mount LCD display and interface, PlantWeb housing, no cable, SST bracket	★
M8(11)(20)	Remote mount LCD display and interface, PlantWeb housing, 50 ft. (15 m) cable, SST bracket	★
M9(11)(20)	Remote mount LCD display and interface, PlantWeb housing, 100 ft. (31 m) cable, SST bracket	★
Pressure Testing		
Expanded		
P1	Hydrostatic testing with certificate	
Special Cleaning		
Expanded		
P2	Cleaning for special services	
P3	Cleaning for less than 1PPM chlorine/fluorine	
Calibration Certification		
Standard		**Standard**
Q4	Calibration certificate	★
QP	Calibration certificate and tamper evident seal	★
Material Traceability Certification		
Standard		**Standard**
Q8	Material traceability certification per EN 10204 3.1	★
Quality Certification for Safety		
Standard		**Standard**
QS(10)(11)	Prior-use certificate of FMEDA data	★
QT(22)	Safety certified to IEC 61508 with certificate of FMEDA data	★
Transient Protection		
Standard		**Standard**
T1(23)(24)	Transient terminal block	★
Toolkit Total System Performance Reports		
Standard		**Standard**
QZ	Remote Seal System Performance Calculation Report	★
Conduit Electrical Connector		
Standard		**Standard**
GE(25)	M12, 4-pin, Male Connector (eurofast®)	★
GM(25)	A size Mini, 4-pin, Male Connector (minifast®)	★
Typical Model Number for EF seal: 3051S2LD 2A A 1A 1 0 2 0 D EF 7 1 DA 2 0		

(1) Requires PlantWeb housing.

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

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

(4) With option code 1, user must select Seal Location option code M in Table 7.

(5) Not recommended for use with spiral wound metallic gaskets (see 1199 product data sheet, document 00813-0100-4016 for additional options).

(6) Standard gasket for lower housing consists of non-asbestos fiber.

(7) Long-life Power Module must be shipped separately, order Part No. 00753-9220-0001.

(8) 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.

(9) Requires PlantWeb housing and output code A. Includes Hardware Adjustments as standard.

(10) Not available with output code F.

(11) Not available with output code X.

(12) Not available with housing style codes 00, 2E, 2F, 2G, 2M, 5A, 5J, or 7J.

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

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

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

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

(17) Only available with output code X.

(18) Only available on differential and gage measurement types. Silicone fill fluid is standard.

(19) Not available with Housing 7J.

(20) Not available with output code F, option code DA1, or option code QT.

(21) See the 3051S Reference Manual (document number 00809-0100-4801) for cable requirements. Contact an Emerson Process Management representative for additional information.

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

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

(24) 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.

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

Rosemount 3051L Liquid Level Transmitter

3051L Flange-Mounted Liquid Level Transmitter

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

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

Product features and capabilities include:

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

Additional Information
Specifications: page 64
Certifications: page 79
Dimensional Drawings: page 87

Table 2. Rosemount 3051L 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**			
3051L	Liquid Level Transmitter			
Pressure Range				
Standard				**Standard**
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				
Standard				**Standard**
A	4–20 mA with Digital Signal Based on *HART* Protocol			★
F	FOUNDATION fieldbus Protocol			★
W	Profibus – PA Protocol			★
Expanded				
M(1)	Low-Power 1–5 V dc with Digital Signal Based on *HART* Protocol (See Option Code C2 for 0.8–3.2 V dc Output)			
Process Connection Size, Material, Extension length (High Side)				
Standard				**Standard**
Code	**Process Connection Size**	**Material**	**Extension Length**	★
G0(2)	2-in./DN 50	316L SST	Flush Mount Only	★
H0(2)	2-in./DN 50	Alloy C-276	Flush Mount Only	★
J0	2-in./DN 50	Tantalum	Flush Mount Only	★
A0(2)	3-in./DN 80	316L SST	Flush Mount	★
A2(2)	3-in./DN 80	316L SST	2-in./50 mm	★
A4(2)	3-in./DN 80	316L SST	4-in./100 mm	★
A6(2)	3-in./DN 80	316L SST	6-in./150 mm	★
B0(2)	4-in./DN 100	316L SST	Flush Mount	★
B2(2)	4-in./DN 100	316L SST	2-in./50 mm	★
B4(2)	4-in./DN 100	316L SST	4-in./100 mm	★

Table 2. Rosemount 3051L 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.

B6[2]	4-in./DN 100	316L SST	6-in./150 mm	★
C0[2]	3-in./DN 80	Alloy C-276	Flush Mount	★
C2[2]	3-in./DN 80	Alloy C-276	2-in./50 mm	★
C4[2]	3-in./DN 80	Alloy C-276	4-in./100 mm	★
C6[2]	3-in./DN 80	Alloy C-276	6-in./150 mm	★
D0[2]	4-in./DN 100	Alloy C-276	Flush Mount	★
D2[2]	4-in./DN 100	Alloy C-276	2-in./50 mm	★
D4[2]	4-in./DN 100	Alloy C-276	4-in./100 mm	★
D6[2]	4-in./DN 100	Alloy C-276	6-in./150 mm	★
E0	3-in./DN 80	Tantalum	Flush Mount Only	★
F0	4-in./DN 100	Tantalum	Flush Mount Only	★
Mounting Flange Size, Rating, Material (High Side)				
	Size	**Rating**	**Material**	
Standard				**Standard**
M	2-in.	ANSI/ASME B16.5 Class 150	CS	★
A	3-in.	ANSI/ASME B16.5 Class 150	CS	★
B	4-in.	ANSI/ASME B16.5 Class 150	CS	★
N	2-in.	ANSI/ASME B16.5 Class 300	CS	★
C	3-in.	ANSI/ASME B16.5 Class 300	CS	★
D	4-in.	ANSI/ASME B16.5 Class 300	CS	★
P	2-in.	ANSI/ASME B16.5 Class 600	CS	★
E	3-in.	ANSI/ASME B16.5 Class 600	CS	★
X[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	★
Z[2]	2-in.	ANSI/ASME B16.5 Class 600	SST	★
L[2]	3-in.	ANSI/ASME B16.5 Class 600	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[2]	DN 50	PN 10-40 per EN 1092-1	SST	★
T[2]	DN 80	PN 40 per EN 1092-1	SST	★
U[2]	DN 100	PN 40 per EN 1092-1	SST	★
W[2]	DN 100	PN 10/16 per EN 1092-1	SST	★
7[2]	4 in.	ANSI/ASME B16.5 Class 600	SST	★
Expanded				
1	—	10K per JIS B2238	CS	
2	—	20K per JIS B2238	CS	
3	—	40K per JIS B2238	CS	
4[2]	—	10K per JIS B2238	316 SST	
5[2]	—	20K per JIS B2238	316 SST	
6[2]	—	40K per JIS B2238	316 SST	

Process Fill-High Pressure Side		**Specific Gravity**	**Temperature Limits (Ambient Temperature of 70° F (21° C))**	
Standard				**Standard**
A	Syltherm XLT	0.85	-102 to 293 °F (-75 to 145 °C)	★
C	Silicone 704	1.07	32 to 401 °F (0 to 205 °C)	★
D	Silicone 200	0.93	-49 to 401 °F (-45 to 205 °C)	★
H	Inert (Halocarbon)	1.85	-49 to 320 °F (-45 to 160 °C)	★

Table 2. Rosemount 3051L 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.

G	Glycerine and Water	1.13	5 to 203 °F (-15 to 95 °C)		★
N	Neobee M-20	0.92	5 to 401 °F (-15 to 205 °C)		★
P	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**	
Standard					**Standard**
11[2]	Gage	SST	316L SST	Silicone	★
21[2]	Differential	SST	316L SST	Silicone	★
22[2]	Differential	SST	Alloy C-276	Silicone	★
2A[2]	Differential	SST	316L SST	Inert (Halocarbon)	★
2B[2]	Differential	SST	Alloy C-276	Inert (Halocarbon)	★
31[2]	Tuned-System Assembly with Remote Seal	None	316L SST	Silicone *(Requires Option Code S1)*	★
O-ring					
Standard					**Standard**
A	Glass-filled PTFE				★
Housing Material			**Conduit Entry Size**		
Standard					**Standard**
A	Aluminum		½–14 NPT		★
B	Aluminum		M20 × 1.5		★
J	SST		½–14 NPT		★
K	SST		M20 × 1.5		★
Expanded					
D	Aluminum		G½		
M	SST		G½		

Options (Include with selected model number)

PlantWeb Control Functionality		
Standard		**Standard**
A01	FOUNDATION fieldbus Advanced Control Function Block Suite	★
PlantWeb Diagnostic Functionality		
Standard		**Standard**
D01	FOUNDATION fieldbus Diagnostics Suite	★
Seal Assemblies		
Standard		**Standard**
S1[3]	Assembled to One Rosemount 1199 Seal (Requires 1199M)	★
Product Certifications		
Standard		**Standard**
E5	FM Explosion-proof, Dust Ignition-proof	★
I5	FM Intrinsically Safe, Division 2	★
K5	FM Explosion-proof, Dust Ignition-proof, Intrinsically Safe, and Division 2	★
I1[4]	ATEX Intrinsic Safety and Dust	★
N1[4]	ATEX Type n Certification and Dust	★
E8	ATEX Flameproof and Dust Certification	★
E4[4]	TIIS Flameproof	★
C6	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, and Division 2	★
K6[4]	CSA and ATEX Explosion-proof, Intrinsically Safe, and Division 2 (combination of C6 and K8)	★
KB	FM and CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, and Division 2 (combination of K5 and C6)	★

Table 2. Rosemount 3051L 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.

K7	SAA Flameproof, Dust Ignition-proof, Intrinsic Safety, and Type n (combination of I7, N7 and E7)	★
K8[4]	ATEX Flame-proof and Intrinsic Safety Approvals (combination of I1 and E8)	★
KD[4]	FM, CSA, and ATEX Explosion-proof, Intrinsically Safe (combination of K5, C6, I1, and E8)	★
I7	SAA Intrinsic Safety	★
E7	SAA Flameproof, Dust Ignition-proof	★
N7	SAA Type n Certification	★
IA	ATEX FISCO Intrinsic Safety	★
IE	FM FISCO Intrinsically Safe	★
E2	INMETRO Flameproof	★
I2	INMETRO Intrinsic Safety	★
K2	INMETRO Flameproof, Intrinsic Safety	★
Bolting Material		
Standard		**Standard**
L4	Austenitic 316 SST Bolts	★
L5	ASTM A 193, Grade B7M bolts	★
L6	Alloy K-500 Bolts	★
L8	ASTM A 193 Class 2, Grade B8M Bolts	★
Display Type		
Standard		**Standard**
M5	LCD Display for Aluminum Housing (Housing Codes A, B, C, and D only)	★
M6	LCD Display for SST Housing (Housing Codes J, K, L, and M only)	★
Calibration Certification		
Standard		**Standard**
Q4	Calibration Certificate	★
QP	Calibration Certificate and tamper evident seal	★
QG	Calibration Certificate and GOST Verification Certificate	★
Material Traceability Certification		
Standard		**Standard**
Q8	Material Traceability Certification per EN 10204 3.1	★
Quality Certification for Safety		
Standard		**Standard**
QS[5]	Prior-use certificate of FMEDA data	★
Toolkit Total System Performance Reports		
Standard		**Standard**
QZ	Remote Seal System Performance Calculation Report	★
Conduit Electrical Connector		
Standard		**Standard**
GE	M12, 4-pin, Male Connector (eurofast®)	★
GM	A size Mini, 4-pin, Male Connector (minifast®)	★
Hardware Adjustments		
Standard		**Standard**
J1[6][7]	Local Zero Adjustment Only	★
J3[6][7]	No Local Zero or Span Adjustment	★
Transient Protection		
Standard		**Standard**
T1[8]	Transient Protection Terminal Block	★
Software Configuration		
Standard		**Standard**
C1[6]	Custom Software Configuration (Completed CDS 00806-0100-4001 required with order)	★

Table 2. Rosemount 3051L 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.

Low Power Output				
Standard				**Standard**
C2[6]	0.8–3.2 V dc Output with Digital Signal Based on HART Protocol (Available with Output code M only)			★
Alarm Limit				
Standard				**Standard**
C4[6][9]	NAMUR alarm and saturation levels, high alarm			★
CN[6][9]	NAMUR alarm and saturation levels, low alarm			★
CR	Custom alarm and saturation signal levels, high alarm			★
CS	Custom alarm and saturation signal levels, low alarm			★
CT	Low alarm (standard Rosemount alarm and saturation levels)			★
Conduit Plug				
Standard				**Standard**
D0	316 SST Conduit Plug			★
Ground Screw				
Standard				**Standard**
V5[10]	External Ground Screw Assembly			★
Lower Housing Flushing Connection Options				
	Ring Material	**Number**	**Size (NPT)**	
Standard				**Standard**
F1	316 SST	1	1/4-18 NPT	★
F2	316 SST	2	1/4-18 NPT	★
F3	Alloy C-276	1	1/4-18 NPT	★
F4	Alloy C-276	2	1/4-18 NPT	★
F7	316 SST	1	1/2-14 NPT	★
F8	316 SST	2	1/2-14 NPT	★
F9	Alloy C-276	1	1/2-14 NPT	★
F0	Alloy C-276	2	1/2-14 NPT	★
Typical Model Number: 3051L 2 A A0 D 21 A A F1				

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

(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.

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

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

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

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

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

(8) 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.

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

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

Rosemount 2051L Liquid Level Transmitter

Tuned-System Assembly Comprised of 2051L with 1199 Flanged Seal

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

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

Product features and capabilities include:

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

Additional Information
Specifications: page 64
Certifications: page 84
Dimensional Drawings: page 87

Table 3. 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			
Standard			**Standard**
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			
Standard			**Standard**
A	4–20 mA with Digital Signal Based on HART Protocol		★
F	FOUNDATION fieldbus Protocol		★
Expanded			
M	Low-Power, 1–5 Vdc with Digital Signal Based on HART Protocol		
Process Connection Size, Diaphragm Material (High Side)			
	Process Connection Size	**Diaphragm**	
Standard			**Standard**
G[1]	2 in./DN 50	316L SST	★
H[1]	2 in./DN 50	Alloy C-276	★
J	2 in./DN 50	Tantalum	★
A[1]	3 in./DN 80	316L SST	★
B[1]	4 in./DN 100	316L SST	★
C[1]	3 in./DN 80	Alloy C-276	★
D[1]	4 in./DN 100	Alloy C-276	★
E	3 in./DN 80	Tantalum	★
F	4 in./DN 100	Tantalum	★

Table 3. 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.

Extension Length (High Side)					
Standard					**Standard**
0	None, Flush Mount				★
2	2 in./50 mm				★
4	4 in./100 mm				★
6	6 in./150 mm				★
Mounting Flange Size, Rating, Material (High Side)					
	Size	**Rating**	**Material**		
Standard					**Standard**
M	2-in.	ANSI/ASME B16.5 Class 150	CS		★
A	3-in.	ANSI/ASME B16.5 Class 150	CS		★
B	4-in.	ANSI/ASME B16.5 Class 150	CS		★
N	2-in.	ANSI/ASME B16.5 Class 300	CS		★
C	3-in.	ANSI/ASME B16.5 Class 300	CS		★
D	4-in.	ANSI/ASME B16.5 Class 300	CS		★
X(1)	2-in.	ANSI/ASME B16.5 Class 150	SST		★
F(1)	3-in.	ANSI/ASME B16.5 Class 150	SST		★
G(1)	4-in.	ANSI/ASME B16.5 Class 150	SST		★
Y(1)	2-in.	ANSI/ASME B16.5 Class 300	SST		★
H(1)	3-in.	ANSI/ASME B16.5 Class 300	SST		★
J(1)	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(1)	DN50	PN 10-40 per EN 1092-1	SST		★
T(1)	DN80	PN 40 per EN 1092-1	SST		★
Seal Fill Fluid (High Side)		**Specific Gravity**	**Temperature Limits (Ambient Temperature of 70 °F (21 °C))**		
Standard					**Standard**
A	Syltherm XLT	0.85	-102 to 293 °F (-75 to 145 °C)		★
C	Silicone 704	1.07	32 to 401 °F (0 to 205 °C)		★
D	Silicone 200	0.93	-49 to 401 °F (-45 to 205 °C)		★
H	Inert (Halocarbon)	1.85	-49 to 320 °F (-45 to 160 °C)		★
G	Glycerin and Water	1.13	5 to 203 °F (-15 to 95 °C)		★
N	Neobee M-20	0.92	5 to 401 °F (-15 to 205 °C)		★
P	Propylene Glycol and Water	1.02	5 to 203 °F (-15 to 95 °C)		★
Sensor Module Configuration, Flange Adapter (Low Side)					
	Configuration	**Flange Adapter**			
Standard					**Standard**
1(1)	Gage	SST			★
2(1)	Differential	SST			★
3(1)	Tuned-System Assembly with Remote Seal	None			★
Sensor Module Diaphragm Material, Sensor Fill Fluid (Low Side)					
	Diaphragm Material	**Sensor Fill Fluid**			
Standard					**Standard**
1(1)	316L SST	Silicone			★
2(1)	Alloy C-276	Silicone			★
7(1)	Alloy C-276	Silicone			★
A(1)	316L SST	Inert (Halocarbon)			★
B(1)	Alloy C-276	Inert (Halocarbon)			★
G(1)	Alloy C-276	Inert (Halocarbon)			★

Table 3. 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.

O-ring			
Standard			**Standard**
A	Glass-filled PTFE		★
Housing Material, Conduit Entry Size			
	Housing Material	**Conduit Entry Size**	
Standard			**Standard**
A	Aluminum	½–14 NPT	★
B	Aluminum	M20 × 1.5	★
J	SST	½–14 NPT	★
K	SST	M20 × 1.5	★
Expanded			
D	Aluminum	G½	
M	SST	G½	

Options (Include with selected model number)

PlantWeb Control Functionality		
Standard		**Standard**
A01	FOUNDATION fieldbus Advanced Control Function Block Suite	★
Seal Assemblies		
Standard		**Standard**
S1[2]	Assemble to One Rosemount 1199 Seal (Requires 1199M)	★
Product Certifications		
Standard		**Standard**
E1[3]	ATEX Flameproof	★
E2[3]	INMETRO Flameproof	★
E3[3]	China Flameproof	★
E5	FM Explosion-proof, Dust Ignition-proof	★
E6	CSA Explosion-proof, Dust Ignition-proof, Division 2	★
E7[3]	IECEx Flameproof	★
I1[3]	ATEX Intrinsic Safety	★
I2[3]	INMETRO Intrinsically Safe	★
I3[3]	China Intrinsic Safety	★
I5	FM Intrinsically Safe, Division 2	★
I6	CSA Intrinsically Safe	★
I7[3]	IECEx Intrinsic Safety	★
IA[4]	ATEX FISCO Intrinsic Safety	★
IE[4]	FM FISCO Intrinsically Safe	★
IF[4]	CSA FISCO Intrinsically Safe	★
IG[4]	IECEx FISCO Intrinsically Safe	★
K1[3]	ATEX Flameproof, Intrinsic Safety, Type n, Dust	★
K5	FM Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
K6	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
K7[3]	IECEx Flameproof, Intrinsic Safety, Type n	★
KA[3]	ATEX and CSA Flameproof, Intrinsically Safe, Division 2	★
KB	FM and CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
KC[3]	FM and ATEX Explosion-proof, Intrinsically Safe, Division 2	★
KD[3]	FM, CSA, and ATEX Explosion-proof, Intrinsically Safe	★
N1[3]	ATEX Type n	★
N7[3]	IECEx Type n	★
ND[3]	ATEX Dust	★

Table 3. 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.

Digital Display				
Standard				**Standard**
M5	LCD display			★
Hardware Adjustments				
Standard				**Standard**
D4[5]	Zero and Span Hardware Adjustments			★
Flange Adapters				
Standard				**Standard**
DF[6]	1/2-14 NPT Flange Adapters			★
Conduit Plug				
Standard				**Standard**
DO[7]	316 SST Conduit Plug			★
Ground Screw				
Standard				**Standard**
V5[8]	External Ground Screw Assembly			★
Transient Protection				
Standard				**Standard**
T1[9]	Transient Terminal Block			★
Software Configuration				
Standard				**Standard**
C1[10]	Custom Software Configuration (Requires completed Configuration Data Sheet)			★
Alarm Limit				
Standard				**Standard**
C4[10][11]	NAMUR alarm and saturation levels, high alarm			★
CN[10][12]	NAMUR alarm and saturation levels, low alarm			★
Calibration Certification				
Standard				**Standard**
Q4	Calibration Certificate			★
Material Traceability Certification				
Standard				**Standard**
Q8	Material Traceability Certification per EN 10204 3.1			★
Quality Certification for Safety				
Standard				**Standard**
QS[10]	Prior-use certificate of FMEDA data			★
Toolkit Total System Performance Reports				
Standard				**Standard**
QZ	Remote Seal System Performance Calculation Report			★
Lower Housing Flushing Connection Ring Material		**Number**	**Size (NPT)**	
Standard				**Standard**
F1	316 SST	1	1/4-18 NPT	★
F2	316 SST	2	1/4-18 NPT	★
F3[12]	Alloy C-276	1	1/4-18 NPT	★
F4[12]	Alloy C-276	2	1/4-18 NPT	★
F7	316 SST	1	1/2-14 NPT	★
F8	316 SST	2	1/2-14 NPT	★
F9	Alloy C-276	1	1/2-14 NPT	★
F0	Alloy C-276	2	1/2-14 NPT	★
Typical Model Number:	**2051L 2 A A0 X D 21 A A B4 M5 F1**			

(1) 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.

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

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

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

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

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

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

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

(9) 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.

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

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

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

Rosemount 1199 Direct Mount Seal Systems

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

Rosemount 1199 Direct Mount Seals are used commonly at the bottom of the vessel. Their advanced design minimizes oil volume improving performance and eliminates the need for mounting hardware.

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 Assemblies 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 73
Dimensional Drawings: page 87

Rosemount 1199 Direct Mount Seal

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

Table 4. When ordering Rosemount 1199 Direct and Remote Mount Seals, please make sure to add the correct seal system ordering code to the transmitter model

Transmitter Model	2 Seals	1 Seal
3051S_C	B12	B11
3051C - Welded-Repairable	S2	S1
3051C - All Welded	S8 or S9	S7 or S0
2051C	S2	S1
3051T, 2051T, 2088	—	S1

A 1199 Direct Mount Seal consists of 2 parts. First, specify the direct mount connection model codes found on page 21. Then, specify a remote seal found on page 23.

Ordering Codes

1199 _____

Direct Mount Connection page 21 — Seal Connection page 23

Table 5. Rosemount 1199 Direct Mount Seal Systems Ordering Information

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

Model	Product Description			
1199	Seal Systems			
Connection Type		**Seal System**	**Seal Location**	
Standard				**Standard**
3051S and 2051C Coplanar Transmitters (3051S_C and 2051C)				
W	Welded-Repairable	One or Two Seal System	High Side of Transmitter	★
R(1)	All Welded	One Seal System	High Side of Transmitter	★
T(1)	All Welded	Two Seal System	High Side of Transmitter	★

Table 5. 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.

All In-Line Transmitters (3051S_T, 3051T, 2051T, 2088)						
W	All Welded	One or Two Seal System		High Side of Transmitter		★
3051C Coplanar Transmitters (3051C)						
W	Determined by Transmitter Code	One or Two Seal System		High Side of Transmitter		★
			Temperature Limits (Ambient Temperature of 70 °F (21 °C))			
Fill Fluid		**Specific Gravity**	**Direct Mount No Extension**	**Direct Mount 2-inch (50 mm) Extension**	**Direct Mount 4-inch (100 mm) Extension**	**Thermal Optimizer**
Standard						**Standard**
A	Sylltherm XLT	0.85	–102 to 293 °F –75 to 145 °C	–102 to 293 °F –75 to 145 °C	–102 to 293 °F –75 to 145 °C	–102 to 293 °F –75 to 145 °C ★
C	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	32 to 599 °F 0 to 315 °C ★
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 ★
H	Halocarbon (Inert)	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(2)	Glycerin and Water	1.13	5 to 203 °F –15 to 95 °C	5 to 203 °F –15 to 95 °C	5 to 203 °F –15 to 95 °C	5 to 203 °F –15 to 95 °C ★
N(2)	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	5 to 437 °F –15 to 225 °C ★
P(2)	Propylene Glycol/Water	1.02	5 to 203 °F –15 to 95 °C	5 to 203 °F –15 to 95 °C	5 to 203 °F –15 to 95 °C	5 to 203 °F –15 to 95 °C ★
Seal Connection Type						
Standard						**Standard**
A	Direct Mount					★
Direct Mount Connection Type						
	Extension Length		**Seal System**		**Connection Type**	
Standard						**Standard**
All Coplanar Transmitters (3051S_C, 3051C and 2051C)						
94	Direct Mount, No Extension		Tuned-System Assembly, two seals		Welded-Repairable	★
93	Direct Mount, No Extension		One Seal System		Welded-Repairable	★
96	Direct Mount, No Extension		Tuned-System Assembly, two seals		All Welded	★
97	Direct Mount, No Extension		One Seal System		All Welded	★
B4	Direct Mount, 2 in. (50 mm) Extension		Tuned-System Assembly, two seals		Welded-Repairable	★
B3	Direct Mount, 2 in. (50 mm) Extension		One Seal System		Welded-Repairable	★
B6	Direct Mount, 2 in. (50 mm) Extension		Tuned-System Assembly, two seals		All Welded	★
B7	Direct Mount, 2 in. (50 mm) Extension		One Seal System		All Welded	★
D4	Direct Mount, 4 in. (100 mm) Extension		Tuned-System Assembly, two seals		Welded-Repairable	★
D3	Direct Mount, 4 in. (100 mm) Extension		One Seal System		Welded-Repairable	★
D6	Direct Mount, 4 in. (100 mm) Extension		Tuned-System Assembly, two seals		All Welded	★
D7	Direct Mount, 4 in. (100 mm) Extension		One Seal System		All Welded	★
All In-Line Transmitters (3051S_T, 3051T, 2051T, 2088)						
95	Direct Mount, No Extension		One Seal System		All Welded	★
D5	Thermal Optimizer		One Seal System		All Welded	★

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

(2) This is a food grade fill fluid.

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.

● = Transmitter Availability
— = Unavailable

Flanged Seal Assemblies			Inline	Coplanar Extensions 0 in.	Coplanar Extensions 2-in.	Coplanar Extensions 4-in.	Process Connections	
Standard								**Standard**
	page 32	FFW Flush Flanged Seal	●	(1)	●	●	2-in. / DN 50 / 50A 3-in. / DN 80 / 80A 4-in. / DN 100 / 100A	★
	page 35	RFW Flanged Seal	●	—	●	●	1/2-in. / DN 15 3/4-in. 1-in. / DN 25 / 25A 1 1/2-in. / DN 40 / 40A	★
	page 38	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	★
Expanded								
	page 42	FCW Flush Flanged Seal – Ring Type Joint (RTJ) Gasket Surface	●	(1)	●	●	2-in. 3-in.	
	page 44	RCW Ring Type Joint (RTJ) Flanged Seal	●	—	●	●	½-in. ¾-in. 1-in. 1 ½-in.	
	page 46	FUW and FVW Flush Flanged Type Seals	●	●	●	●	DN 50 DN 80	

Threaded Seal Assemblies			Inline	Coplanar Extensions 0 in.	Coplanar Extensions 2-in.	Coplanar Extensions 4-in.	Process Connections	
Standard								**Standard**
	page 47	RTW Threaded Seal	●	—	●	●	¼ –18 NPT 3/8 –18 NPT ½ –14 NPT ¾ –14 NPT 1 – 11.5 NPT 1 ¼ –11.5 NPT 1 ½ –11.5 NPT G1/2 A DIN 16288 R1/2 per ISO 7/1	★
Expanded								
	page 50	HTS Male Threaded Seal	●	●	●	●	G1 G1 ½ G2 1-11.5 NPT 1 ½ -11.5 NPT 2-11.5 NPT	

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

Hygienic Seal Assemblies			Inline	Coplanar Extensions			Process Connections	
				0 in.	2-in.	4-in.		
Standard								**Standard**
	page 51	SCW Hygienic Tri-Clover Style Tri-Clamp Seal	●	●	●	●	1 ½-in. 2-in. 2 ½-in. 3-in. 4-in.	★
	page 52	SSW Hygienic Tank Spud Seal	●	●	●	●	2-in. Extension 6-in. Extension	★
Expanded								
	page 53	STW Hygienic Thin Wall Tank Spud Seal	●	—	●	●	0.8 in Extension	
	page 54	EES Hygienic Flanged Tank Spud Extended Seal	●	●	●	●	DN 50 DN 80	
	page 55	VCS Tri-clamp® In-Line Seal	●	—	—	—	1-in. 1 ½-in. 2-in. 3-in. 4-in.	
	page 56	SVS Varivent Compatible Hygienic Connection Seal	●	●	●	●	Tuchenhagen Varivent® Compatible	
	page 57	SHP Hygienic Cherry-Burrell “I” Line Seal	●	—	—	—	2-in. 3-in.	
	page 58	SLS Dairy Process Connection - Female Thread Seal per DIN 11851	●	—	—	—	DN 40 DN 50	

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

Specialty Seal Assemblies			Inline	Coplanar Extensions			Process Connections	
				0 in.	2-in.	4-in.		
Expanded								
	page 59	WSP Saddle Seal	●	—	●	●	2-in. 3-in. 4-in. or Larger	
 	page 60	UCP Male Threaded Pipe Mount Seals and PMW Paper Mill Sleeve Seals	●	●	—	—	1 ½-in. with Threaded Knurled Nut 1-in. with Cap Screw Retainer	
	page 61	CTW Chemical Tee Seal	●	—	●	●	Retro-fit	
	page 62	TFS Wafer Style In-Line Seal	●	—	—	—	1-in. / DN 25 1 ½-in. / DN 40 2-in. / DN 50 3-in. / DN 80 4-in. / DN 100	
	page 63	WFW Flow-Thru Flanged Seal	●	—	●	●	1-in. 2-in. 3-in.	

(1) Available with ANSI Class 300 or less.

Rosemount 1199 Remote Mount Seal Systems

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

Rosemount 1199 Remote Mount Seals are used commonly at the top of the vessel when a DP measurement is required. They are 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 64
Certifications: page 74
Dimensional Drawings: page 87

Rosemount 1199 Remote Mount Seal

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

Table 6. When ordering Rosemount 1199 Direct and Remote Mount Seals, please make sure to add the correct seal system ordering code to the transmitter model

Transmitter Model	2 Seals	1 Seal
3051S_C	B12	B11
3051C - Welded-Repairable	S2	S1
3051C - All Welded	S8 or S9	S7 or S0
2051C	S2	S1
3051T, 2051T, 2088	—	S1

A 1199 Remote Mount Seal consists of 2 parts. First, specify the capillary model codes found on page 27. Then, specify a remote seal found on page 28.

Ordering Codes

1199 _

Remote Mount Connection page 27 Seal Connection page 28

Capillary/Fill Fluid

NOTE:
Use Table 7 for Capillary Type Connections. Use Table 5 for Direct Mount Type Connections.

Table 7. Rosemount 1199 Remote Mount Seal Systems Ordering Information

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

Model	Product Description			
1199	Seal System			
Connection Type		**Seal System**	**Seal Location**	
Standard				**Standard**
3051S and 2051 Coplanar Transmitters (3051S_C and 2051C)				
W	Welded-Repairable	One or Two Seal System	High Side of Transmitter	★
M	Welded-Repairable	One or Two Seal System	Low Side of Transmitter	★
D	Welded-Repairable	Two Seal System	Balanced System - Same Seal on Low and High Side	★
R[1]	All Welded	One Seal System	High Side of Transmitter	★
T[1]	All Welded	Two Seal System	High Side of Transmitter	★
S[1]	All Welded	Two Seal System	Low Side of Transmitter	★
All In-Line Transmitters (3051S_T, 3051T, 2051T, 2088)				
W	All Welded	One or Two Seal System	High Side of Transmitter	★
3051 Coplanar Transmitters (3051C)				
W	Determined by Transmitter Code	One or Two Seal System	High Side of Transmitter	★
M	Determined by Transmitter Code	One or Two Seal System	Low Side of Transmitter	★
D	Determined by Transmitter Code	Two Seal System	Balanced System - Same Seal on Low and High Side	★
Fill Fluid		**Specific Gravity**	**Temperature Limits (Ambient Temperature of 70 °F (21 °C))**	
Standard				**Standard**
A[2]	Syltherm XLT	0.85	–75 to 145 °C (–102 to 293 °F)	★
C[2]	Silicone 704	1.07	0 to 315 °C (32 to 599 °F)	★
D	Silicone 200	0.93	–45 to 205 °C (–49 to 401 °F)	★
H	Inert (Halocarbon)	1.85	–45 to 160 °C (–49 to 320 °F)	★
G[3]	Glycerin and Water	1.13	–15 to 95 °C (5 to 203 °F)	★
N[3]	Neobee M-20	0.92	–15 to 225 °C (5 to 437 °F)	★
P[3]	Propylene Glycol and Water	1.02	–15 to 95 °C (5 to 203 °F)	★
Seal Connection Type / Capillary ID, Description				
Standard				**Standard**
B	0.03-in. (0.711 mm) ID, SST Armored			★
C	0.04-in. (1.092 mm) ID, SST Armored			★
D	0.075-in. (1.905 mm) ID, SST Armored			★
E	0.03-in. (0.711 mm) ID, SST Armored, PVC Coated			★
F	0.04-in. (1.092 mm) ID, SST Armored, PVC Coated			★
G	0.075-in. (1.905 mm) ID, SST Armored, PVC Coated			★
H	0.03-in. (0.711 mm) ID, SST Armored, 4-in. Support Tube without Compression Fitting			★
J	0.04-in. (1.092 mm) ID, SST Armored, 4-in. Support Tube without Compression Fitting			★
K	0.075-in. (1.905 mm) ID, SST Armored, 4-in. Support Tube without Compression Fitting			★
M[4]	0.03-in. (0.711 mm) ID, SST Armored, PVC Coated, Support Tube with Compression Fitting			★
N[4]	0.04-in. (1.092 mm) ID, SST Armored, PVC Coated, Support Tube with Compression Fitting			★
P[4]	0.075-in. (1.905 mm) ID, SST Armored, PVC Coated, Support Tube with Compression Fitting			★
Capillary Length / Direct Mount				
Standard				**Standard**
01	1 ft (0.3 m)			★
05	5 ft (1.5 m)			★

Table 7. 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.

10	10 ft (3.0 m)	★
15	15 ft (4.5 m)	★
20	20 ft (6.1 m)	★
51	0.5 m (1.6 ft)	★
52	1.0 m (3.3 ft)	★
53	1.5 m (4.9 ft)	★
54	2.0 m (6.6 ft)	★
55	2.5 m (8.2 ft)	★
56	3.0 m (9.8 ft)	★
57	3.5 m (11.5 ft)	★
58	4.0 m (13.1 ft)	★
59	5.0 m (16.4 ft)	★
60	6.0 m (19.7 ft)	★
Expanded		
25	25 ft (7.6 m)	
30	30 ft (9.1 m)	
35	35 ft (10.7 m)	
40	40 ft (12.2 m)	
45	45 ft (13.7 m)	
50	50 ft (15.2 m)	
61	7.0 m (23 ft)	
62	8.0 m (26.2 ft)	
63	9.0 m (29.5 ft)	
64	10.0 m (32.8 ft)	
65	11.0 m (36.1 ft)	
66	12.0 m (39.4 ft)	
67	13.0 m (42.6 ft)	
68	14.0 m (45.9 ft)	
69	15.0 m (49.2 ft)	

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

(2) Not available with Capillary Seal connection inside diameter codes B, E, H, or M.

(3) This is a food grade fill fluid.

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

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

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

Flanged Seal Assemblies			**Process Connections**	
Standard				**Standard**
	page 32	FFW Flush Flanged Seal	2-in. / DN 50 / 50A 3-in. / DN 80 / 80A 4-in. / DN 100 / 100A	★
	page 35	RFW Flanged Seal	1/2-in. / DN 15 3/4-in. 1-in. / DN 25 / 25A 1 1/2-in. / DN 40 / 40A	★

★ 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 38	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 40	PFW Pancake Seal	2-in. / DN50 3-in. / DN 80	★
Expanded				
	page 42	FCW Flush Flanged Seal – Ring Type Joint (RTJ) Gasket Surface	2-in. 3-in.	
	page 44	RCW Ring Type Joint (RTJ) Flanged Seal	½-in. ¾-in. 1-in. 1 ½-in.	
	page 46	FUW and FVW Flush Flanged Type Seals	DN 50 DN 80	
Threaded Seal Assemblies			**Process Connections**	
Standard				**Standard**
	page 47	RTW Threaded Seal	¼ –18 NPT 3/8 –18 NPT ½ –14 NPT ¾ –14 NPT 1 – 11.5 NPT 1 ¼ –11.5 NPT 1 ½ –11.5 NPT G 1/2 A DIN 16288 R 1/2 per ISO 7/1	★
Expanded				
	page 50	HTS Male Threaded Seal	G1 G1 ½ G2 1-11.5 NPT 1 ½ -11.5 NPT 2-11.5 NPT	

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

Hygienic Seal Assemblies			Process Connections	
Standard				**Standard**
	page 51	SCW Hygienic Tri-Clover Style Tri-Clamp Seal	1 ½-in. 2-in. 2 ½-in. 3-in. 4-in.	★
	page 52	SSW Hygienic Tank Spud Seal	2-in. Extension 6-in. Extension	★
Expanded				
	page 53	STW Hygienic Thin Wall Tank Spud Seal	0.8 in Extension	
	page 54	EES Hygienic Flanged Tank Spud Extended Seal	DN 50 DN 80	
	page 55	VCS Tri-clamp® In-Line Seal	1-in. 1 ½-in. 2-in. 3-in. 4-in.	
	page 56	SVS Varivent Compatible Hygienic Connection Seal	Tuchenhagen Varivent Compatible	
	page 57	SHP Hygienic Cherry-Burrell “I” Line Seal	2-in. 3-in.	
	page 58	SLS Dairy Process Connection - Female Thread Seal per DIN 11851	DN 40 DN 50	

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

Specialty Seal Assemblies			Process Connections	
Expanded				
	page 59	WSP Saddle Seal	2-in. 3-in. 4-in. or Larger	
 	page 60	UCP Male Threaded Pipe Mount Seals and PMW Paper Mill Sleeve Seals	1 ½-in. with Threaded Knurled Nut 1-in. with Cap Screw Retainer	
	page 61	CTW Chemical Tee Seal	Retro-fit	
	page 62	TFS Wafer Style In-Line Seal	1-in. / DN 25 1 ½-in. / DN 40 2-in. / DN 50 3-in. / DN 80 4-in. / DN 100	
	page 63	WFW Flow-Thru Flanged Seal	1-in. 2-in. 3-in.	

Flanged Seal Assemblies

FFW FLUSH FLANGED SEAL

Table 8. FFW Flush Flanged Seal – Ordering Information

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

Code	Industry Standards			
Standard				**Standard**
A	ANSI/ASME B16.5 (American National Standards Institute/American Society of Mechanical Engineers)			★
D	EN 1092-1 (European Standard)			★
Expanded				
J	JIS B2238 (Japanese Industrial Standard)			
Process Connection Style				
Standard				**Standard**
FFW	Flush Flanged Seal			★
Process Connection Size				
	ANSI/ASME B16.5	**EN 1092-1**	**JIS B2238**	
Standard				**Standard**
G	2-in.	DN 50	50 A	★
7	3-in.	—	80 A	★
J	—	DN 80	—	★
9	4-in.	DN 100	100 A	★
Flange / Pressure Rating				
	ANSI/ASME B16.5	**EN 1092-1**	**JIS B2238**	
Standard				**Standard**
1	Class 150	—	10K	★
2	Class 300	—	20K	★
4	Class 600	—	40K	★
G	—	PN 40	—	★
Expanded				
E	—	PN 10 / 16 (DN 100 only)	—	
5	Class 900	—	—	
6	Class 1500	—	—	
7	Class 2500	—	—	
H	—	PN 63	—	
J	—	PN 100	—	
K	—	PN 160	—	
Diaphragm and Wetted, Upper Housing, Flange Material				
	Diaphragm and Wetted	**Upper Housing**	**Flange**	
Standard				**Standard**
CA[(1)(2)]	316L SST	316L SST	CS	★
DA[(2)]	316L SST	316L SST	316 SST	★
CB[(1)(3)]	Alloy C-276, seam welded	316L SST	CS	★
DB[(3)]	Alloy C-276, seam welded	316L SST	316 SST	★
CC[(1)]	Tantalum, seam welded	316L SST	CS	★
DC	Tantalum, seam welded	316L SST	316 SST	★
C3[(1)(2)(3)(4)]	Tantalum, brazed	316L SST	CS	★
D3[(1)(2)(3)(4)]	Tantalum, brazed	316L SST	316 SST	★
Expanded				
MB[(1)(2)]	Alloy C-276, solid faceplate	Alloy C-276 / 316L SST	CS	

Table 8. 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.

KB[1][2]	Alloy C-276, solid faceplate	Alloy C-276 / 316L SST	316 SST	
DJ	Alloy B	316L SST	316 SST	
DF	304L SST	316L SST	316 SST	
DV	Alloy 400	316L SST	316 SST	
RH[2]	Titanium Grade 4	Titanium GR.4	316 SST	
DH[5]	Titanium Grade 4	316L SST	316 SST	
DE	Alloy 600	316L SST	316 SST	
DP	Nickel 201	316L SST	316 SST	
WW[2][6]	316Ti SST (WNr 1.4571)	316Ti SST (WNr 1.4571)	316Ti SST (WNr 1.4571)	
DZ[5]	Zirconium 702	316L SST	316 SST	
D4	Alloy C-22	316L SST	316 SST	
D5	Duplex 2507 SST	316L SST	316 SST	
Flushing Connection Ring Material (Lower Housing)[7]				
Standard				**Standard**
0	None			★
A	316L SST			★
B	Alloy C-276			★
Expanded				
2	Duplex 2205 SST			
H	Titanium Grade 4			
6	Nickel 201			
V	Alloy 400			
Flushing Connection Options, Quantity (Size)				
Standard				**Standard**
0	None			★
1	1 (1/4-18 NPT)			★
3	2 (1/4-18 NPT)			★
7	1 (1/2-14 NPT)			★
9	2 (1/2-14 NPT)			★

Options (Include with selected model number)

Gasket Material		
Standard		**Standard**
J	PTFE gasket (for use with flushing connection ring)	★
Expanded		
N	Grafoil gasket (for use with flushing connection ring)	
K	Barium Sulfate filled PTFE gasket (for use with flushing connection ring)	
Flushing Plug, Vent/Drain Valve		
Standard		**Standard**
D	Alloy C-276 plug(s) for flushing connection(s)	★
G	316 SST plug(s) for flushing connection(s)	★
H	316 SST vent/drain for flushing connection(s)	★
Diaphragm Thickness		
Expanded		
C	0.006-in. (150 µm) available with 316L SST, Alloy C-276, and Duplex 2507 SST for abrasive applications	
7	0.002-in. (50 µm) available with 316L SST and Alloy C-276	
Mounting Flange		
Expanded		
4	Flat face, flush flanged	
Code Conformance		
Standard		**Standard**
T[8]	Wetted Materials Compliance to NACE MRO175/ISO 15156, MRO103	★

Table 8. 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.

Cold Temp Application		
Standard		**Standard**
B	Extra Fill For Cold Temp Application	★
Diaphragm Coating		
Expanded		
U(9)	0.001-in. (25 µm) gold plated Diaphragm	
V(10)	PTFE coated diaphragm for nonstick purposes only	
Capillary Change		
Expanded		
2	Radial capillary connection	
Alternate Design		
Expanded		
E(11)	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) Operating temperature limited to 150 °C (302 °F).

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

(7) Supplied standard with ThermoTork TN9000.

(8) 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.

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

(10) Not available with transmitter option code Q8, for Material Traceability per EN 10204 3.1 of the transmitter / seal assembly.

(11) 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, and D5.

RFW FLANGED SEAL

Table 9. RFW Flanged Seal Ordering Information

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

Code	Industry Standard			
Standard				**Standard**
A	ANSI/ASME B16.5 (American National Standards Institute/American Society of Mechanical Engineers)			★
D	EN 1092-1 (European Standard)			★
Expanded				
J	JIS B2238 (Japanese Industrial Standard)			
Process Connection Style				
Standard				**Standard**
RFW	Flanged Seal			★
Process Connection Size				
Standard				**Standard**
	ANSI/ASME B16.5	**EN 1092-1**	**JIS B2238**	
2	1-in.	—	25A	★
4	1 1/2-in.	—	40A	★
D	—	DN 25	—	★
F	—	DN 40	—	★
Expanded				
1	1/2-in.	—	—	
A	3/4-in.	—	—	
B	—	DN 15	—	
Flange/Pressure Rating				
	ANSI/ASME B16.5	**EN 1092-1**	**JIS B2238**	
Standard				**Standard**
1	Class 150	—	10K	★
2	Class 300	—	20K	★
4	Class 600	—	40K	★
G	—	PN 40	—	★
Expanded				
5	Class 900	—	—	
6	Class 1500	—	—	
7	Class 2500	—	—	
H	—	PN 63	—	
J	—	PN 100	—	
K	—	PN 160	—	
Diaphragm, Upper Housing, Flange Material				
	Diaphragm	**Upper Housing**	**Flange**	
Standard				**Standard**
CA	316L SST	316L SST	CS	★
DA	316L SST	316L SST	316 SST	★
CB	Alloy C-276	316L SST	CS	★
DB	Alloy C-276	316L SST	316 SST	★
CC	Tantalum	316L SST	CS	★
DC	Tantalum	316L SST	316 SST	★
Expanded				
DF	304L SST	316L SST	316 SST	
DJ	Alloy B	316L SST	316 SST	

Table 9. 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.

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	Titanium Grade 4	Titanium Grade 4	316 SST	
DH	Titanium Grade 4	316L SST	316 SST	
D4	Alloy C-22	316L SST	316 SST	
D5	Duplex 2507 SST	316L SST	316 SST	
DZ	Zirconium 702	316L SST	316 SST	
Flushing Connection Ring Material (Lower Housing)(1)				
Standard				**Standard**
A	316L SST			★
B	Alloy C-276			★
D	Plated CS			★
Expanded				
2	Duplex 2205			
F	304L SST			
H	Titanium Grade 4			
V	Alloy 400			
C	Tantalum lined 316L SST (no flushing connection allowed)			
Flushing Connection Options, Quantity Size				
Standard				**Standard**
5	None			★
1	1 (1/4-18 NPT)			★
3	2 (1/4-18 NPT)			★
Expanded				
7	1 (1/2-14 NPT)			
9	2 (1/2-14 NPT)			

Options (Include with selected model number)

Gasket Material		
Standard		**Standard**
J	PTFE gasket	★
Expanded		
N	Grafoil® gasket	
K	Barium Sulfate filled PTFE gasket	
R	Ethylene Propylene gasket	
Flushing Plug, Vent/Drain Valve		
Standard		**Standard**
D	Alloy C-276 plug(s) for flushing connection(s)	★
G	316 SST plug(s) for flushing connection(s)	★
H	316 SST vent/drain for flushing connection(s)	★
Diaphragm Thickness		
Expanded		
C	0.006-in. (150 µm) available with 316L SST, Alloy C-276, and Duplex 2507 SST for abrasive applications	
Bolt Material		
Expanded		
3	304 SST Bolts (Only available for Stud Bolt Design)	
Code Conformance		
Standard		**Standard**
T(2)	Wetted Materials Compliance to NACE MRO175/ISO 15156, MRO103	★

Table 9. 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.

Gasket Surface Finish		
Expanded		
1	Gasket Surface Ra 125 Max.	
Cold Temperature Application		
Standard		**Standard**
B	Extra Fill For Cold Temp Application	★
Diaphragm Coating		
Expanded		
U(3)	0.001-in. (25 µm) Gold plated diaphragm	
V(4)	PTFE coated diaphragm for nonstick purposes only	
Large Diaphragm Size		
Expanded		
9	4.1-in. (104 mm) Diaphragm Diameter	
Typical Model Number: 1199 W DC 1 0 A RFW 2 1 DA A 5		

(1) Supplied with C4401 Aramid fiber gasket.

(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.

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

(4) Not available with transmitter option code Q8, for Material Traceability per EN 10204 3.1 of the transmitter / seal assembly.

EFW EXTENDED FLANGED SEAL

Table 10. EFW Extended Flanged Seal Ordering Information

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

Code	Industry Standard				● = Available — = Unavailable							
Standard												**Standard**
A	ANSI/ASME B16.5 (American National Standards Institute/American Society of Mechanical Engineers)											★
D	EN 1092-1 (European Standard)											★
Expanded												
J	JIS B2238 (Japanese Industrial Standards)											
Process Connection Style												
Standard												**Standard**
EFW	Extended Flanged Seal											★
Process Connection Size												
	ANSI/ASME B16.5		**EN 1092-1**		**JIS B2238**		**Extension Diameters**					
Standard												**Standard**
7	3-in.		DN 80		80A		2.58-in. (66 mm)					★
9	4-in.		DN 100		100A		3.50-in. (89 mm)					★
Expanded												
4	1 1/2-in.		DN 40		40A		1.45-in. (37 mm)					
G	2-in.		DN 50		50A		1.90-in. (49 mm)					
H	3-in. (Headbox)		DN 80 (Headbox)		—		2.875-in. (74 mm)					
K	4-in. (Headbox)		DN 100 (Headbox)				3.780-in. (97 mm)					
Flange/Pressure Rating												
	ANSI/ASME B16.5		**EN 1092-1**		**JIS B2238**							
Standard												**Standard**
1	Class 150		—		10K							★
2	Class 300		—		20K							★
4	Class 600		—		40K							★
G	—		PN 40		—							★
Expanded												
E	—		PN 10/16 (DN 100 only)		—							
5	Class 900		—		—							
6	Class 1500		—		—							
7	Class 2500		—		—							
H	—		PN 63		—							
J	—		PN 100		—							
K	—		PN 160		—							
Diaphragm, Extension and Gasket Surface, Upper Housing, Flange Material					**Available with Process Connection Code**							
Code	**Diaphragm**	**Extension/ Gasket Surface**	**Upper Housing**	**Mounting Flange**	**7**	**9**	**4**	**G**	**H**	**K**		
Standard												**Standard**
DA	316L SST	316L SST	316L SST	316 SST	●	●	●	●	●	●		★
CA	316L SST	316L SST	316L SST	CS	●	●	●	●	●	●		★
DB	Alloy C-276	Alloy C-276	316L SST	316 SST	●	●	●	●	●	●		★
CB	Alloy C-276	Alloy C-276	316L SST	CS	●	●	●	●	●	●		★

Table 10. 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.

Expanded												
DM	Alloy C-276	316L SST	316L SST	316 SST	●	●	●	●	●	●		
DD	Tantalum	316L SST	316L SST	316 SST	●	●	—	—	—	—		
DC	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**	
Standard			**Standard**
0	0-in.	0 mm	★
2	2-in.	50 mm	★
4	4-in.	100 mm	★
6	6-in.	150 mm	★
Expanded			
8	8-in.	200 mm	
1	1-in.	25 mm	
3	3-in.	75 mm	
5	5-in.	125 mm	
7	7-in.	175 mm	
9	9-in.	225 mm	
Fractional Extension Length			
	ANSI/ASME B16.5	**EN 1092-1 / JIS B2238**	
Standard			**Standard**
0	0-in.	0 mm	★

Options (Include with selected model number)

Diaphragm Thickness		
Expanded		
C	0.006-in. (150 µm) available with 316L SST, Alloy C-276, and Duplex 2507 SST for abrasive applications	
Code Conformance		
Standard		**Standard**
T(1)	Wetted Materials Compliance to NACE MRO175/ISO 15156, MRO103	★
Gasket Surface Finish		
Expanded		
1	Gasket Surface Ra 125 Max.	
Cold Temperature Application		
Standard		**Standard**
B	Extra Fill For Cold Temperature Application	★
Diaphragm Coating		
Expanded		
U(2)	0.001-in. (25 µm) Gold plated diaphragm	
V(3)	PTFE coated diaphragm for nonstick purposes only	
Typical Model Number: 1199 W DC 1 0 A EFW 7 1 DA 2 0		

(1) 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.

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

(3) Not available with transmitter option code Q8, for Material Traceability per EN 10204 3.1 of the transmitter / seal assembly.

PFW PANCAKE SEAL

Table 11. PFW Pancake Seal Ordering Information

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

Code	Industry Standard			
Standard				**Standard**
A	ANSI/ASME B16.5 (American National Standards Institute/American Society of Mechanical Engineers)			★
D	EN 1092-1 (European Standard)			★
Process Connection Style				
Standard				**Standard**
PFW	Pancake Seal			★
Process Connection Size				
	ANSI	**EN 1092-1**		
Standard				**Standard**
G	2-in.	DN 50		★
7	3-in.	—		★
J	—	DN 80		★
Flange/Pressure Rating				
	ANSI	**EN 1092-1**		
Standard				**Standard**
0	None, Seal Rated to 6,250 psi or Flange Rating			★
1	Class 150	—		★
2	Class 300	—		★
4	Class 600	—		★
G	—	—		★
Expanded				
5	Class 900	—		
6	Class 1500	—		
7	Class 2500	—		
H	—	PN 63		
J	—	PN 100		
Diaphragm and Wetted, Upper Housing, Flange Material				
	Diaphragm and Wetted	**Upper Housing**	**Flange**	
Standard				**Standard**
LA[1]	316L SST	316L SST	None	★
CA[1]	316L SST	316L SST	CS	★
DA[1]	316L SST	316L SST	316 SST	★
LB	Alloy C-276, Seam Welded	316L SST	None	★
CB	Alloy C-276, Seam Welded	316L SST	CS	★
DB	Alloy C-276, Seam Welded	316L SST	316 SST	★
LC	Tantalum, Seam Welded	316L SST	None	★
CC	Tantalum, Seam Welded	316L SST	CS	★
DC	Tantalum, Seam Welded	316L SST	316 SST	★
Flushing Connection Ring Material (Lower Housing)[2]				
Standard				**Standard**
0	None			★
A	316L SST			★
B	Alloy C-276			★

Table 11. PFW Pancake Seal Ordering Information

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

Flushing Connection Options, Quantity (Size)		
Standard		**Standard**
0	None	★
1	1 ($^1/_4$-18 NPT)	★
3	2 ($^1/_4$-18 NPT)	★
7	1 ($^1/_2$-14 NPT)	★
9	2 ($^1/_2$-14 NPT)	★

Options (Include with selected model number)

Gasket Material		
Standard		**Standard**
J	PTFE gasket	★
Expanded		
N	Grafoil® gasket	
K	Barium Sulfate filled PTFE gasket	
Flushing Plug, Vent/Drain Valve		
Standard		**Standard**
D	Alloy C-276 plug(s) for flushing connection(s)	★
G	316 SST plug(s) for flushing connection(s)	★
H	316 SST vent/drain for flushing connection(s)	★
Diaphragm Thickness		
Expanded		
C	0.006-in. (150 µm) available with 316L SST, Alloy C-276, and Duplex 2507 SST for abrasive applications	
Code Conformance		
Standard		**Standard**
T(3)	Wetted Materials Compliance to NACE MRO175/ISO 15156, MRO103	★
Gasket Surface Finish		
Expanded		
1	Gasket Surface Ra 125 Max.	
Cold Temperature Application		
Standard		**Standard**
B	Extra Fill For Cold Temp Application	★
Diaphragm Coating		
Expanded		
U(4)	0.001-in. (25 µm) Gold plated diaphragm	
V(5)	PTFE coated diaphragm for nonstick purposes only	
Typical Model Number: 1199 W DC 1 0 A PFW 7 1 DA 0 0		

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

(2) Supplied standard with Thermo Torque TN9000 gasket.

(3) Materials of Construction comply with metallurgical requirements highlighted within NACE 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.

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

(5) Not available with transmitter option code Q8, for Material Traceability per EN 10204 3.1 of the transmitter / seal assembly.

FCW FLUSH FLANGED SEAL – RING TYPE JOINT (RTJ) GASKET SURFACE

Table 12. FCW Flush Flanged Seal – Ring Type Joint (RTJ) Gasket Surface Ordering Information
This seal is part of the Expanded offering and is subject to additional delivery lead time.

Code	Industry Standards		
Expanded			
A	ANSI/ASME B16.5 (American National Standards Institute/American Society of Mechanical Engineers)		
Process Connection Style			
Expanded			
FCW	Flush Flanged Seal - Ring Type Joint Gasket Surface		
Process Connection Size			
Expanded			
G	2-in.		
7	3-in.		
Flange/Pressure Rating			
Expanded			
1	Class 150		
2	Class 300		
4	Class 600		
5	Class 900		
6	Class 1500		
7	Class 2500		
Diaphragm and Wetted, Upper Housing, Flange Material			
	Diaphragm and Wetted	**Upper Housing**	**Flange**
Expanded			
DA	316L SST	316L SST	316 SST
KB	Alloy C-276	316L SST	316 SST
K5	Duplex 2507 SST/Duplex 2205	316L SST	316 SST
Flushing Connection Ring Material (Lower Housing)			
Expanded			
0	None		
A	316L SST		
B	Alloy C-276		
2	Duplex 2205 SST		
Flushing Connection Options			
Expanded			
0	None		
1	1 ($^1/_4$-18 NPT)		
3	2 ($^1/_4$-18 NPT)		
7	1 ($^1/_2$-14 NPT)		
9	2 ($^1/_2$-14 NPT)		
Options (Include with selected model number)			
Flushing Plug, Vent/Drain Valve			
Expanded			
D	Alloy C-276 plug(s) for flushing connection(s)		
G	316 SST plug(s) for flushing connection(s)		
H	316 SST vent/drain for flushing connection(s)		
Diaphragm Thickness			
Expanded			
C	0.006-in. (150 µm) available with 316L SST, Alloy C-276, and Duplex 2507 SST for abrasive applications		
7	0.002-in. (50 µm) available with 316L SST and Alloy C-276		

Table 12. 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 Conformance	
Expanded	
T[1]	Wetted Materials Compliance to NACE MRO175/ISO 15156, MRO103
Cold Temp Application	
Expanded	
B	Extra Fill For Cold Temp Application
Diaphragm Coating	
Expanded	
U[2]	0.001-in. (25 µm) Gold plated diaphragm
V[3]	PTFE coated diaphragm for nonstick purposes only
Alternate Design	
Expanded	
E	One Piece Design
Typical Model Number: 1199 W DC 1 0 A FCW 7 1 DA 0 0	

(1) Materials of Construction comply with metallurgical requirements highlighted within NACE 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.

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

(3) Not available with transmitter option code Q8, for Material Traceability per EN 10204 3.1 of the transmitter / seal assembly.

RCW RING TYPE JOINT (RTJ) FLANGED SEAL

Table 13. RCW Ring Type Joint Flanged Seal Ordering Information

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

Code	Industry Standard		
Expanded			
A	ANSI/ASME B16.5 (American National Standards Institute/American Society of Mechanical Engineers)		
Process Connection Style			
Expanded			
RCW	Flanged Seal - Ring Type Joint Gasket Surface		
Process Connection Size			
Expanded			
1	1/2-in.		
A	3/4-in.		
2	1-in.		
4	1 1/2-in.		
Flange/Pressure Rating			
Expanded			
1	Class 150		
2	Class 300		
4	Class 600		
5	Class 900		
6	Class 1500		
7	Class 2500		
Diaphragm, Upper Housing, Flange Material			
	Diaphragm	**Upper Housing**	**Flange**
Expanded			
DA	316L SST	316L SST	316 SST
DB	Alloy C-276	316L SST	316 SST
DC	Tantalum	316L SST	316 SST
DE	Alloy 600	316L SST	316 SST
DF	304L SST	316L SST	316 SST
DJ	Alloy B316L SST	316L SST	316 SST
DV	Alloy 400	316L SST	316 SST
DP	Nickel 201	316L SST	316 SST
RH	Titanium Grade 4	Titanium Grade 4	316 SST
DH(1)	Titanium Grade 4	316L SST	316 SST
D4	Alloy 22	316L SST	316 SST
D5	Duplex 2507 SST	316L SST	316 SST
DZ(1)	Zirconium 702	316L SST	316 SST
DK	Alloy 20	316L SST	316 SST
Flushing Connection Ring Material (Lower Housing)			
Expanded			
A	316L SST		
B	Alloy C-276		
F	304L SST		
H	Titanium Grade 4		
2	Duplex 2205 SST		
V	Alloy 400		

Table 13. RCW Ring Type Joint Flanged Seal Ordering Information

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

Flushing Connection Options	
Expanded	
5	None
1	1 (1/4-18 NPT)
3	2 (1/4-18 NPT)
7	1 (1/2-14 NPT)
9	2 (1/2-14 NPT)

Options (Include with selected model number)

Gasket Material	
Expanded	
J	PTFE gasket
N	Grafoil® gasket
K	Barium Sulfate filled PTFE gasket
R	Ethylene Propylene gasket
Flushing Plug, Vent/Drain Valve	
Expanded	
D	Alloy C-276 plug(s) for flushing connection(s)
G	316 SST plug(s) for flushing connection(s)
H	316 SST vent/drain for flushing connection(s)
Diaphragm Thickness	
Expanded	
C	0.006-in. (150 µm) available with 316L SST, Alloy C-276, and Duplex 2507 SST for abrasive applications
Bolt Material (Optional)	
Expanded	
3	304 SST Bolts (Only available for Stud Bolt Design)
Code Conformance	
Expanded	
T(2)	Wetted Materials Compliance to NACE MRO175/ISO 15156, MRO103
Cold Temperature Application	
Expanded	
B	Extra Fill For Cold Temp Application
Diaphragm Coating	
Expanded	
U(3)	0.001-in. (25 µm) Gold plated diaphragm
V(4)	PTFE coated diaphragm for nonstick purposes only
Large Diaphragm Size	
Expanded	
9	4.1-in. (104 mm) Diaphragm Diameter
Typical Model Number: 1199 W DC 1 0 A RCW 2 1 DA A 5	

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

(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.

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

(4) Not available with transmitter option code Q8, for Material Traceability per EN 10204 3.1 of the transmitter / seal assembly.

FUW AND FVW FLUSH FLANGED TYPE SEALS

Table 14. FUW and FVW Flush Flanged Type Seals – EN Ordering Information

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

Code	Industry Standard		
Expanded			
D	EN 1092-1 (European Standard)		
Process Connection Style			
Expanded			
FUW	Flush Flanged, EN 1092-1 Type D (Groove)		
FVW	Flush Flanged, EN 1092-1 Type C (Tongue)		
Process Connection Size			
Expanded			
G	DN50		
J	DN 80		
Flange/Pressure Rating			
Expanded			
G	PN 40		
Diaphragm and Wetted, Upper Housing, Flange Material			
	Diaphragm and Wetted	**Upper Housing**	**Flange**
Expanded			
DA(1)	316L SST	316L SST	316 SST
KB(2)	Alloy C-276	316L SST	316 SST
DC(1)	Tantalum	316L SST	316 SST
Flushing Connection Ring Material (Lower Housing)			
Expanded			
0	None		
Flushing Connection Options, Quantity (Size)			
Expanded			
0	None		

Options (Include with selected model number)

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

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

(2) Only available with two-piece design.

Threaded Seal Assemblies

RTW THREADED SEAL

Table 15. RTW Threaded Seal Ordering Information

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

Code	Industry Standard			
Standard				**Standard**
A	ANSI/ASME B1.20.1 (American National Standards Institute/American Society of Mechanical Engineers)			★
D	EN 10226-1 (European Standard)			★
Process Connection Style				
Standard				**Standard**
RTW	Threaded (standard thread is female, for male select Option code 9)			★
Process Connection Size				
	ANSI/ASME B1.20.1	**EN 10226-1**		
Standard				**Standard**
3	1/2-14 NPT	—		★
4	3/4-14 NPT	—		★
5	1-11.5 NPT	—		★
7(1)	1 1/2-11.5 NPT	—		★
Expanded				
1	1/4-18 NPT	—		
C	—	Parallel thread: G 1/2A DIN 16288		
2	3/8-18 NPT	—		
6(1)	1 1/4-11.5 NPT	—		
N	—	Tapered thread: R 1/2 per ISO 7/1		
Pressure Rating				
	ANSI/ASME B1.20.1	**EN 10226-1**		
Standard				**Standard**
0	2500 psi	172 bar		★
Expanded				
2(2)	5000 psi	344 bar		
3(2)(3)	10000 psi	—		
Diaphragm, Upper Housing, Flange Material				
	Diaphragm	**Upper Housing**	**Flange**	
Standard				**Standard**
CA	316L SST	316L SST	CS	★
DA	316L SST	316L SST	316 SST	★
CB	Alloy C-276	316L SST	CS	★
DB	Alloy C-276	316L SST	316 SST	★
CC	Tantalum	316L SST	CS	★
DC	Tantalum	316L SST	316 SST	★
Expanded				
DJ	Alloy B	316L SST	316 SST	
DF	304L SST	316L SST	316 SST	
DP	Nickel 201	316L SST	316 SST	

Table 15. RTW Threaded Seal Ordering Information

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

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	Zirconium 702	Zirconium 702	316 SST	
Flushing Connection Ring Material (Lower Housing)[6][7]				
Standard				**Standard**
A	316L SST			★
B	Alloy C-276			★
Expanded				
D	Plated Carbon Steel			
2	Duplex 2205 SST			
H	Titanium Grade 4			
V	Alloy 400			
F	304L SST			
Flushing Connection Options				
Standard				**Standard**
5	None			★
1	1 (1/4-18 NPT)			★
3	2 (1/4-18 NPT)			★
Expanded				
7	1 (1/2-14 NPT)			
9	2 (1/2-14 NPT)			

Options (Include with selected model number)

Gasket Material		
Standard		**Standard**
J	PTFE gasket (for use with flushing connection ring)	★
N	Grafoil® gasket (for use with flushing connection ring)	★
R	Ethylene Propylene gasket (for use with flushing connection ring)	★
Expanded		
K	Barium Sulfate filled PTFE gasket (for use with flushing connection ring)	
Flushing Plug, Vent/Drain Valve		
Standard		**Standard**
D	Alloy C-276 plug(s) for flushing connection(s)	★
G	316 SST plug(s) for flushing connection(s)	★
H	316 SST vent/drain for flushing connection(s)	★
Diaphragm Thickness		
Expanded		
C	0.006-in. (150 µm) available with 316L SST, Alloy C-276, and Duplex 2507 SST for abrasive applications	
Bolt Material		
Standard		**Standard**
3	304 SST Bolts	★
Expanded		
4	316 SST Bolts	
Code Conformance		
Standard		**Standard**
T	Wetted Materials Compliance to NACE MRO175/ISO 15156, MRO103	★

Table 15. RTW Threaded Seal Ordering Information

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

Cold Temperature Application		
Standard		**Standard**
B	Extra Fill For Cold Temp Application	★
Diaphragm Coating		
Expanded		
U(8)	0.001-in. (25 µm) Gold plated diaphragm	
V(9)	PTFE coated diaphragm for nonstick purposes only	
Special Threads in Lower Housing		
Expanded		
9	Male Threads	
Typical Model Number: 1199 W DC 1 0 A RTW 3 0 DA A 5		

(1) Flushing connection not available.

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

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

(4) Not available with welded capillary connections.

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

(6) Supplied with C4401 aramid fiber gasket.

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

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

(9) Not available with transmitter option code Q8, for Material Traceability per EN 10204 3.1 of the transmitter / seal assembly.

HTS MALE THREADED SEAL

Table 16. HTS Male Threaded Flush Type Seal Ordering Information(1)

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

Code	Industry Standard	
Expanded		
A	ANSI/ASME B1.20.1 (American National Standards Institute/American Society of Mechanical Engineers)	
D	EN 10226-1 (European Standard)	
Process Connection Style		
Expanded		
HTS	Male Threaded Seal	
Process Connection Size, Pressure Rating		
	ANSI/ASME B1.20.1	**EN 10226-1**
Expanded		
5A	1-11,5 NPT, 8700 psi (600 bar)	—
7A	1½-11,5 NPT, 6000 psi (414 bar)	—
9A	2-11,5 NPT, 4000 psi (276 bar)	—
EA	—	G1, 455 bar (6598 psi)
GA	—	G1 1/2, BSP, 400 bar (5800 psi)
JA	—	G2, BSP, 280 bar (4060 psi)
Diaphragm and Wetted, Upper Housing Material		
	Diaphragm and Wetted	**Upper Housing**
Expanded		
LA00	316L SST	316L SST
Typical Model Number: 1199 W DC 1 0 A HTS 7 A LA 0 0		

(1) Consult an Emerson Process Management representative for use with low calibrated spans.

Hygienic Seal Assemblies

SCW HYGIENIC TRI-CLOVER STYLE TRI-CLAMP SEAL

Table 17. SCW Hygienic Tri-Clover Style Tri-Clamp Seal Ordering Information

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

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

Options (Include with selected model number)

Surface Finish		
Expanded		
D	10 µin. (0.25 µm) R_a surface finish	
G	15 µin. (0.375 µm) R_a surface finish	
H	20 µin. (0.50 µm) R_a surface finish	
Non-Hygienic Fill Fluid		
Expanded		
P	Non-Hygienic fill fluid (does not conform to 3-A Standard 74)	
Clamp and Gasket Material		
Expanded		
2	High Pressure Ladish Clamp & Buna N gasket	
3	Buna N gasket	
Polishing		
Expanded		
6	Electro polishing	
Typical Model Number: 1199 W NC 1 0 S SCW 7 0 LA 0 0		

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

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

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

SSW HYGIENIC TANK SPUD SEAL

Table 18. SSW Hygienic Tank Spud Seal Ordering Information

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

Code	Industry Standard		
Standard			**Standard**
S	Hygienic Seal (Conforms to 3-A Standard 74-03)		★
Process Connection Style			
Standard			**Standard**
SSW(1)	Tank Spud Seal		★
Process Connection Size, Pressure Rating			
Standard			**Standard**
A0	4-in. Sch. 5 Tri-Clamp, 600 psi (41 bar)		★
Upper Housing			
Standard			**Standard**
A	316L SST		★
Diaphragm and Wetted, Extension Material			
	Diaphragm and Wetted	**Extension**	
Standard			**Standard**
AL	316L SST(2)	316L SST(2)	★
Expanded			
BB	Alloy C-276	316L SST	★
Extension Length			
Standard			**Standard**
2	2-in.		★
6	6-in.		★

Options (Include with selected model number)

Surface Finish		
Expanded		
G(3)	15 µin. (0.375 µm) diaphragm surface finish	
H	20 µin.(0.5 µm) diaphragm surface finish	
Diaphragm Thickness		
Expanded		
C	0.006-in. (150 µm)	
Tanks Spud		
Standard		**Standard**
1	Tank Spud Included with Shipment	★
Non-Hygienic Fill Fluid		
Expanded		
P	Non-Hygienic fill fluid (Does not conform to 3-A Standard 74)	
Non-Hygienic Fill Fluid		
Expanded		
3	Buna N O-ring instead of Standard Ethylene Propylene O-ring (Conforms to 3-A Standard 74)	
4	Viton® O-ring, instead of Standard Ethylene Propylene O-ring (Conforms to 3-A Standard 74)	
Non-Hygienic Fill Fluid		
Expanded		
6	Electro polishing	
Typical Model Number: 1199 W NC 1 0 S SSW A 0 AA L 2		

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

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

(3) Requires Option code 6, Electro polishing.

STW HYGIENIC THIN WALL TANK SPUD SEAL

Table 19. STW Hygienic Thin Wall Tank Spud Seal Ordering Information

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

Code	Industry Standard	
Expanded		
S	Hygienic Seal (Conforms to 3-A Standard 74-03)	
Process Connection Style		
Expanded		
STW(1)	Thin Wall Tank Spud Seal	
Process Connection Size, Pressure Rating		
Expanded		
B0	4-in. Tri-Clamp, 600 psi (41 bar)	
Diaphragm and Wetted, Extension Material		
	Diaphragm and Wetted	**Extension**
Expanded		
LA00	316L SST	316L SST
BB00	Alloy C-276	Alloy C-276
Options (Include with selected model number)		
Surface Finish		
Expanded		
G(2)	15 μin. (0.375 μm) diaphragm surface finish	
H	20 μin.(0.5 μm) diaphragm surface finish	
Non-Hygienic Fill Fluid		
Expanded		
P	Non-Hygienic fill fluid (Does not conform to 3-A Standard 74)	
Non-Hygienic Fill Fluid		
Expanded		
6	Electro polishing	
Typical Model Number: 1199 W NC 1 0 S STW B 0 LA 0 0		

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

(2) Requires Option code 6, Electro polishing.

EES HYGIENIC FLANGED TANK SPUD EXTENDED SEAL

Table 20. EES Hygienic Flanged Tank Spud Extended Seal Ordering Information

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

Code	Industry Standard	
Expanded		
S	Hygienic Seal (Conforms to 3-A Standard 74-03)	
Process Connection Style		
Expanded		
EES	Flanged Tank Spud Seal	
Process Connection Size, Pressure Rating		
Expanded		
GG	DN 50, PN 40	
JG	DN 80, PN 40	
Diaphragm and Wetted, Extension Material		
	Diaphragm and Wetted	**Extension**
Expanded		
LA	316L SST	316L SST
LB	Alloy C-276	316L SST
Extension Length(1)		
Expanded		
10	25 mm (1-in.)	
Options (Include with selected model number)		
Surface Finish		
Expanded		
G(2)	15 µ-in. (0.375 µm) Ra surface finish	
H	20 µ-in. (0.50 µm) Ra surface finish	
Gasket Material		
Expanded		
1	Viton O-ring, instead of Standard Ethylene Propylene O-ring (Conforms to 3-A Standard 74)	
Cold Temperature Application		
Expanded		
B	Extra Fill For Cold Temperature Application	
Cold Temperature Application		
Expanded		
6	Electro polishing	
Typical Model Number: 1199 W NC 1 0 S EES J G LA 1 0		

(1) Other extension lengths are available upon request.

(2) Requires Option code 6, Electro polishing

VCS TRI-CLAMP® IN-LINE SEAL

Table 21. VCS Tri-Clamp In-Line Seal Ordering Information

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

Code	Industry Standard	
Expanded		
S	Hygienic Seal (Conforms to 3-A Standard 74-03)	
Process Connection Style		
Expanded		
VCS(1)	In-Line Tri-Clover Style Tri-Clamp Seal	
Process Connection Size		
Expanded		
20(2)	1-in.	
30(3)	1½-in.	
50	2-in.	
70	3-in.	
90	4-in.	
Diaphragm and Wetted, Upper Housing Material		
	Diaphragm and Wetted	**Upper Housing**
Expanded		
LA00	316L SST	316L SST
Options (Include with selected model number)		
Surface Finish		
Expanded		
G(4)	15 µin. (0.375 µm) Ra surface finish	
H	20 µ-in. (0.50 µm) Ra surface finish	
Non-Hygienic Fill Fluid		
Expanded		
P	Non-Hygienic fill fluid (does not conform to 3-A Standard 74)	
Polishing		
Expanded		
6	Electro polishing	
Typical Model Number: 1199 W NC 1 0 S VCS 7 0 LA 0 0		

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

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

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

(4) Requires Option code 6, Electro polishing.

SVS VARIVENT COMPATIBLE HYGIENIC CONNECTION SEAL

Table 22. SVS Varivent® Compatible Hygienic Connection Seal Ordering Information

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

Code	Industry Standard	
Expanded		
S	Hygienic Seal (Conforms to 3-A Standard 74-03)	
Process Connection Style		
Expanded		
SVS	Tuchenhagen Varivent Compatible Seal	
Process Connection Size		
Expanded		
V0(1)	Varivent® Type N DN 40-162	
Diaphragm and Wetted, Upper Housing Material		
	Diaphragm and Wetted	**Upper Housing**
Expanded		
LA00	316L SST	316L SST
Options (Include with selected model number)		
Non-Hygienic Fill Fluid		
Expanded		
P	Non-Hygienic fill fluid (does not conform to 3-A Standard 74)	
Cold Temperature Application		
Expanded		
B	Extra Fill For Cold Temperature Application	
Polishing		
Expanded		
6	Electro polishing	
Typical Model Number: 1199 W NC 1 0 S SVS V 0 LA 0 0		

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

SHP Hygienic Cherry-Burrell “I” LINE SEAL

Table 23. SHP Hygienic Cherry-Burrell “I” Line Seal Ordering Information

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

Code	Industry Standard	
Expanded		
S	Hygienic Seal (Conforms to 3-A Standard 74-03)	
Process Connection Style		
Expanded		
SHP(1)	Cherry-Burrell “I” Line Style Seal	
Process Connection Size		
Expanded		
50(2)	2-in.	
70	3-in.	
Diaphragm and Wetted, Upper Housing Material		
	Diaphragm and Wetted	**Upper Housing**
Expanded		
AA00	316L SST	316L SST
Options (Include with selected model number)		
Non-Hygienic Fill Fluid		
Expanded		
P	Non-Hygienic fill fluid (does not conform to 3-A Standard 74)	
Typical Model Number: 1199 W NC 1 0 S SHP 7 0 AA 0 0		

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

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

SLS DAIRY PROCESS CONNECTION - FEMALE THREAD SEAL PER DIN 11851

Table 24. SLS Hygienic Dairy Process Connection Female Thread Seal Ordering Information

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

Code	Industry Standard	
Expanded		
S	Hygienic Seal (Conforms to 3-A Standard 74-03)	
Process Connection Style		
Expanded		
SLS	Dairy Process Connection - Female Thread	
Process Connection Size, Pressure Rating		
Expanded		
F0[(1)]	DIN 11851 with coupling nut DN 40, PN 40	
G0[(2)]	DIN 11851 with coupling nut DN 50, PN 25	
Diaphragm and Wetted, Upper Housing Material		
	Diaphragm and Wetted	**Upper Housing**
Expanded		
LA00	316L SST	316L SST
Options (Include with selected model number)		
Polishing		
Expanded		
6	Electro polishing	
Typical Model Number: 1199 W HC 1 0 S SLS J 0 LA 0 0		

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

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

Specialty Seal Assemblies

WSP SADDLE SEAL

Table 25. WSP Saddle Seal Ordering Information

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

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

Options (Include with selected model number)

Gasket Material	
Expanded	
J	PTFE gasket
N	Grafoil® gasket
Code Conformance	
Expanded	
T	Wetted Materials Compliance to NACE MRO175/ISO 15156, MRO103
Diaphragm Coating	
Expanded	
V(3)	PTFE Coated Diaphragm for nonstick purposes (316L SST and Alloy C-276 diaphragms only)
Typical Model Number: 1199 W DC 1 0 N WSP 7 1 LA L N	

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

(2) Supplied with C4401 Aramid fiber gasket.

(3) Not available with transmitter option code Q8, for Material Traceability per EN10204 3.1 of the transmitter / seal assembly.

UCP MALE THREADED PIPE MOUNT SEALS AND PMW PAPER MILL SLEEVE SEALS

Table 26. UCP and PMW Threaded Pipe Mount Seal Ordering Information

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

Industry Standard		
Expanded		
N	Non-Industry Standard	
Process Connection Style		
Expanded		
UCP	Male Threaded Pipe Mount Seal	
PMW	Paper Mill Sleeve	
Process Connection Size, Pressure Rating		
Expanded		
30(1)	1 1/2-in., Threaded Knurled Nut, 600 psi at 100° F (41 bar at 38° C) (UCP only)	
50(2)	1-in., Cap Screw Retainer, 300 psi at 100° F (21 bar at 38° C) (PMW only)	
Diaphragm and Wetted, Upper Housing Material		
	Diaphragm and Wetted	**Upper Housing**
Expanded		
AA	316L SST	316L SST
BB	Alloy C-276	Alloy C-276
Lower Housing Material		
Expanded		
00	None	
A0	316L SST	
B0	Alloy C-276	
Options (Include with selected model number)		
Diaphragm Coating		
Expanded		
V(3)	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).

(3) Not available with transmitter option code Q8, for Material Traceability per EN10204 3.1 of the transmitter / seal assembly.

CTW CHEMICAL TEE SEAL

Table 27. CTW Chemical Tee Seal Ordering Information

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

Code	Industry Standard	
Expanded		
N	Non-Industry Standard	
Process Connection Style		
Expanded		
CTW	Chemical Tee Seal	
Maximum Working Pressure (Flange Rating)		
Expanded		
20	300 psi (21 bar)	
Diaphragm and Wetted, Upper Housing Material		
	Diaphragm and Wetted	**Upper Housing**
Expanded		
AA	316L SST	316L SST
BB	Alloy C-276	Alloy C-276
Lower Housing		
Expanded		
00	None	
Options (Include with selected model number)		
Code Conformance		
Expanded		
T	Wetted Materials Compliance to NACE MRO175/ISO 15156, MRO103	
Diaphragm Coating		
Expanded		
V(1)	PTFE coated diaphragm for nonstick purposes only	
Typical Model Number: 1199 W NC 1 0 N CTW 2 0 AA 0 0		

(1) Not available with transmitter option code Q8, for Material Traceability per EN10204 3.1 of the transmitter / seal assembly.

TFS WAFER STYLE IN-LINE SEAL

Table 28. TFS Wafer Style In-Line Seal Ordering Information

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

Code	Industry Standard	
Expanded		
A	ANSI/ASME B16.5 (American National Standards Institute/American Society of Mechanical Engineers)	
D	EN 1092-1 (European Standard)	
Process Connection Style		
Expanded		
TFS	Wafer Style In-Line Seal	
Process Connection Size		
	ANSI/ASME B16.5	**EN 1092-1**
Expanded		
G	2-in.	DN 50
7	3-in.	—
J	—	DN 80
9	4-in.	—
2(1)	1-in.	—
4(2)	1½-in.	—
D(1)	—	DN 25
F(2)	—	DN 40
K	—	DN 100
Pressure Rating		
Expanded		
0	Flange not supplied, seal rated to carbon steel Class 2500, PN 160	
Diaphragm and Wetted, Upper Housing Material		
	Diaphragm and Wetted	**Upper Housing**
Expanded		
LA	316L SST	316L SST
LB	Alloy C-276	316L SST
Housing Body Length		
Expanded		
00	3.54-in. (90 mm)	
Typical Model Number: 1199 W DC 1 0 A TFS 7 0 LA 0 0		

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

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

WFW FLOW-THRU FLANGED SEAL

Table 29. WFW Flow-Thru Flanged Seal Ordering Information

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

Code	Industry Standard	
Expanded		
A	ANSI/ASME B16.5 (American National Standards Institute/American Society of Mechanical Engineers)	
Process Connection Style		
Expanded		
WFW(1)	Flow-Thru Flanged Seal	
Process Connection Size(2)		
Expanded		
G	2-in.	
7	3-in.	
2	1-in.	
Flange Rating(2)		
Expanded		
1	Class 150(2)	
Diaphragm, Upper Housing Material		
	Diaphragm	**Upper Housing(2)**
Expanded		
LA	316L SST	316L SST
Lower Housing Material(1)		
Expanded		
L	316L SST	
Pipe Schedule(2)		
Expanded		
N	40/40S	
Options (Include with selected model number)		
Gasket Material		
Expanded		
J	PTFE O-ring	
K	Barium Sulfate filled PTFE gasket	
N	Grafoil® gasket	
R	Ethylene Propylene gasket	
Bolt Material		
Expanded		
3	304 SST bolts	
Code Conformance		
Expanded		
T	Wetted Materials Compliance to NACE MRO175/ISO 15156, MRO103	
Cold Temperature Application		
Expanded		
B	Extra Fill For Cold Temperature Application	
Typical Model Number: 1199 W DC 1 0 A TFS 7 0 LA 0 0		

(1) Supplied with C4401 Aramid fiber gasket.

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

Specifications

LIQUID LEVEL TRANSMITTER SPECIFICATIONS

Performance Specifications

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

Conformance to Specification (±3σ (Sigma))

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

Reference Accuracy(1)

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

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

3051S_L	±0.065% of span; For spans less than 10:1, $\pm\left[0.015 + 0.005\left(\frac{URL}{span}\right)\right]$% of span
3051L All Ranges	±0.075% of span For spans less than 10:1, accuracy = $\pm\left[0.025 + 0.005\left(\frac{URL}{Span}\right)\right]$% of Span
2051L Ranges 2-4	±0.075% of span For spans less than 10:1, accuracy = $\pm\left[0.025 + 0.005\left(\frac{URL}{Span}\right)\right]$% 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.

Warranty(1)

Models(1)	Ultra	Classic
3051S_L	12-year limited warranty(2)	1-year limited warranty(3)

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

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

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

3051S_L	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).
3051L	Measurement effect due to vibrations is negligible except at resonance frequencies. When at resonance frequencies, vibration effect is less than ±0.1% of URL per g when tested between 15 and 2000 Hz in any axis relative to pipe-mounted process conditions.
2051L	Less than ±0.1% of URL when tested per the requirements of IEC60770-1 field or pipeline with high vibration level (10-60 Hz 0.21mm displacement peak amplitude / 60-2000 Hz 3g).

Power Supply Effect

Less than ±0.005% of calibrated span per volt.

Electromagnetic Compatibility (EMC)

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

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

Transient Protection (Option T1)

3051S_L	Meets IEEE C62.41.2-2002, Location Category B 6 kV crest (0.5 μs - 100 kHz) 3 kA crest (8 × 20 microseconds) 6 kV crest (1.2 × 50 microseconds) Meets IEEE C37.90.1-2002 Surge Withstand Capability SWC 2.5 kV crest, 1.0 MHz wave form
3051L	Meets IEEE C62.41, Category B 6 kV crest (0.5 μs - 100 kHz) 3 kV crest (8 × 20 microseconds) 6 kV crest (1.2 × 50 microseconds) Meets IEEE C37.90.1, Surge Withstand Capability SWC 2.5 kV crest, 1.25 MHz wave form General Specifications: Response Time: < 1 nanosecond Peak Surge Current: 5000 amps to housing Peak Transient Voltage: 100 V dc Loop Impedance: < 25 ohms Applicable Standards: IEC61000-4-4, IEC61000-4-5 NOTE: Calibrations at 68 °F (20 °C) per ASME Z210.1 (ANSI)
2051L	Meets IEEE C62.41, Category Location B 6 kV crest (0.5 μs - 100 kHz) 3 kV crest (8 × 20 microseconds) 6 kV crest (1.2 × 50 microseconds)

Functional Specifications

Range and Sensor Limits

Table 30. 3051S_LD, LG Range and Sensor Limits

Range	Minimum Span		Range Limits		
				Lower (LRL)	
	Ultra	Classic	Upper (URL)	3051S_LG(1)(2)	3051S_LD(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 3051S_L Ultra, use Classic minimum span.

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

Table 31. 3051S_LA 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 3051S_L Ultra, use Classic minimum span.

Table 32. 3051L Range and Sensor Limits

Range	Minimum Span	Range and Sensor Limits		
		Upper (URL)	Lower (LRL)	
			3051L Differential	3051L Gage
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)	0.5 psia (34,5 mbar abs)
4	3 psi (0,20 bar)	300 psi (20,6 bar)	–300 psi (–20,6 bar)	0.5 psia (34,5 mbar abs)
5	20 psi (1,38 bar)	2000 psi (137,9 bar)	NA	NA

Table 33. 2051L Range and Sensor Limits

Range	Minimum Span	Range and Sensor Limits		
		Upper (URL)	Lower (LRL)	
			2051L Differential	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 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.

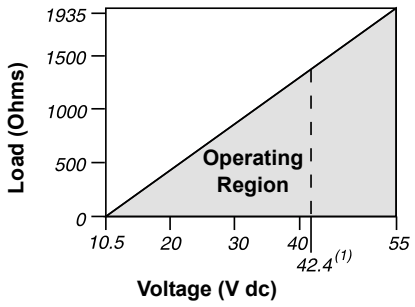
Power Supply

External power supply required. Standard transmitter (4–20 mA) operates on 10.5 to 55 V dc with no load.

Load Limitations

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

Max. Loop Resistance = 43.5 (Power Supply Voltage – 10.5) Ω



Communication requires a minimum loop resistance of 250 ohms.

(1) For CSA approval, power supply must not exceed 42.4 V.

FOUNDATION fieldbus (output code F) and Profibus (output code W)

Power Supply

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

Current Draw

17.5 mA for all configurations (including LCD display option)

FOUNDATION fieldbus Function Block Execution Times

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

(1) PID with Auto-tune.

FOUNDATION fieldbus Parameters

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

Standard Function Blocks

Resource Block

Contains hardware, electronics, and diagnostic information.

Transducer Block

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

LCD Block

Configures the local display.

2 Analog Input Blocks

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

PID Block

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

Backup Link Active Scheduler (LAS)

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

Advanced Control Function Block Suite (Option Code A01)

Input Selector Block

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

Arithmetic Block

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

Signal Characterizer Block

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

Integrator Block

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

FOUNDATION fieldbus Diagnostics Suite (Option Code D01)

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

3051S_L Wireless Self-Organizing Networks

Output

WirelessHART, 2.4 GHz DSSS.
Wireless, 2.4 GHz DSSS or 900 MHz FHSS.

Local Display (WirelessHART only)

The optional five-digit LCD can display user-selectable information such as primary variable in engineering units, percent of range, sensor module temperature, and electronics temperature. Display updates at up to once per minute.

Local Display

The optional five-digit LCD can display primary variable in engineering units. Display updates at update rate up to once per minute.

Update Rate

WirelessHART, user selectable 8 sec. to 60 min.
Wireless, user selectable 15 sec. to 60 min.

Power Module (WirelessHART only)

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.

Power Module

Field replaceable, keyed connection eliminates the risk of incorrect installation, Intrinsically Safe Lithium-thionyl chloride Power Module with polybutadine terephthalate (PBT) enclosure. Five-year life at one minute update rate, ten-year life at ten 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 34. 3051L and Level Flange Rating Limits

Standard	Type	CS Rating	SST Rating
ANSI/ASME	Class 150	285 psig	275 psig
ANSI/ASME	Class 300	740 psig	720 psig
ANSI/ASME	Class 600	1480 psig	1440 psig
At 100 °F (38 °C), the rating decreases with increasing temperature, per ANSI/ASME B16.5.			
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 248 °F (120 °C), the rating decreases with increasing temperature, per DIN 2401.			

Temperature Limits

Ambient

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

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

Storage

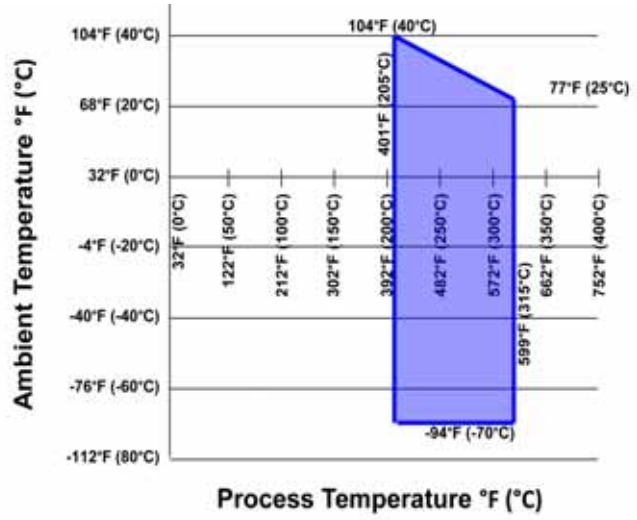
-50 to 185 °F (-46 to 85 °C)
With LCD display: -40 to 185 °F (-40 to 85 °C)
With Wireless Output: -40 to 185 °F (-40 to 85 °C)

Process Temperature Limits

Table 35. Fill Fluid Specifications

Fill Fluid	Specific Gravity	Coeff. Of therm. Exp. (cc/cc/°C)	Viscosity at 25 °C Centistokes	Temperature limits (Ambient temperature of 70 °F (21 °C))				
				Direct Mount no extension	Direct Mount 2-in. (50mm) extension	Direct Mount 4-in. (100mm) extension	Thermal Optimizer	Capillary
200 Silicone	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
704 Silicone	1.07	0.00095	44	32 to 401 °F 0 to 205 °C	32 to 464 °F 0 to 240 °C	32 to 500 °F 0 to 260 °C	32 to 599 °F 0 to 315 °C	32 to 599 °F 0 to 315 °C
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
Syltherm® XLT Silicone	0.85	0.001199	1.6	–102 to 293 °F –75 to 145 °C	–102 to 293 °F –75 to 145 °C	–102 to 293 °F –75 to 145 °C)	–102 to 293 °F –75 to 145 °C	–102 to 293 °F –75 to 145 °C
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
Propylene 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
Neobee M–20	0.92	0.001008	9.8	5 to 401 °F –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

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



Humidity Limits

0–100% relative humidity

Turn-On Time

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

Volumetric Displacement

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

Damping(1)

Software damping is in addition to sensor module response time.

3051S_L	Analog output response to a step change is user-selectable from 0 to 60 seconds for one time constant.
3051L	Analog output response to a step input change is user-selectable from 0 to 36 seconds for one time constant.
2051L	Analog output response to a step input change is user-selectable from 0 to 25.6 seconds for one time constant.

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

Physical Specifications

Electrical Connections

1/2–14 NPT, PG 13.5, G1/2, and M20 × 1.5 conduit. HART interface connections fixed to terminal block.

Non-Wetted Parts

	3051S_L	3051L	2051L
Electrical Housing	Low-copper aluminum alloy or SST: CF-3M (Cast 316L SST) or CF-8M (Cast 316 SST) NEMA 4X, IP 66, IP 68 (66 ft (20 m) for 168 hours) Note: IP 68 not available with Wireless Output.	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, IP68
Coplanar Sensor Module Housing	SST: CF-3M (Cast 316L SST)	CF-3M (Cast version of 316L SST, material per ASTM-A743)	CF-3M (Cast version of 316L SST)
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 3051S_CA). In-Line series uses Fluorinert® FC-43.	Silicone 200 or Fluorocarbon oil (Halocarbon or Fluorinert® FC-43 for 3051T)	Silicone 200 or Fluorocarbon oil (Halocarbon or Fluorinert® FC-43 for 2051T)
Process Fill Fluid	Syltherm XLT, Silicone 704, Silicone 200, inert, glycerin and water, Neobee M-20, propylene glycol and water.	Syltherm XLT, Silicone 704, Silicone 200, inert, glycerin and water, Neobee M-20 or propylene glycol and water	Syltherm XLT, Silicone 704, Silicone 200, inert, glycerin and water, Neobee M-20 or propylene glycol and water
Paint for Aluminum Housing	Polyurethane	Polyurethane	Polyurethane
Cover O-ring	Buna-N	Buna-N	Buna-N
Wireless Antenna	PBT/ polycarbonate (PC) integrated omnidirectional antenna	N/A	N/A
Power Module	Field replaceable, keyed connection eliminates the risk of incorrect installation, Intrinsically Safe Lithium-thionyl chloride Power Module with PBT enclosure	N/A	N/A

Shipping Weights

Table 36. 3051S_L Weights Without SuperModule Platform, Housing, or Transmitter Options

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

Table 37. 3051S_L Transmitter Option Weights

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

(1) Includes LCD display and display cover.

(2) Display only.

Table 38. 3051L Weights without Options

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

Table 39. 3051L Transmitter Options Weights

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

Table 40. 2051L Weights without Options

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

Table 41. 2051L Transmitter Options Weights

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

SEAL SPECIFICATIONS

Functional Specifications

Hygienic Seal Approvals

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

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

Hygienic O-Rings: The EPDM, Viton, and Buna N o-rings for the SSW Tank Spud Seal meet 3-A Hygienic Standard Number 18 Class 1 requirements. The EPDM o-ring also meets USP class VI approval requirements.

Surface Finish Certification (Q16 Option)

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

NACE Standard (T Option)

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

Material Traceability (Q8 Option)

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

Performance Specifications

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

Remote Seal System Performance Calculation Report (QZ Option)

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

Physical Specifications

Material of Construction

Remote seal materials of construction (diaphragm, upper housing, flange, lower housing/flushing connection, bolts, and gaskets/o-rings) are listed for each remote seal type. Fill fluids specifications are listed in Table 35.

Tagging

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

Calibration

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

Custom Configurations

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

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

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

Rosemount 3051S_L Certifications

Approved Manufacturing Locations

Rosemount Inc. — Chanhassen, Minnesota USA

Emerson Process Management GmbH & Co. — Wessling, Germany

Emerson Process Management Asia Pacific Private Limited — Singapore

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

Emerson Process Management LTDA — Sorocaba, Brazil

Emerson Process Management (India) Pvt. Ltd. — Daman, India

Ordinary Location Certification for FM

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

European Directive Information

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

ATEX Directive (94/9/EC)

Emerson Process Management complies with the ATEX Directive.

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

Models 3051S_CA4; 3051S_CD2, 3, 4, 5; *(also with P9 option)*
Pressure Transmitters — QS Certificate of Assessment - EC No. PED-H-100, Module H Conformity Assessment

All other Model 3051S Pressure Transmitters — Sound Engineering Practice

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

Primary Elements, Flowmeter — See appropriate Primary Element QIG

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

EN 61326-1:1997 + A1, A2, and A3 – Industrial

Radio and Telecommunications Terminal Equipment Directive (R&TTE)(1999/5/EC)

Emerson Process Management complies with the R&TTE Directive.

HART & FOUNDATION Fieldbus Hazardous Locations Certifications

North American Certifications

FM Approvals

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

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

Canadian Standards Association (CSA)

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

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

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

European Certifications

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

Input Parameters

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

Special conditions for safe use (x)

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

N1 ATEX Type n
Certificate No.: BAS01ATEX3304X Ⓔx II 3 G
Ex nL IIC T5 (T_a = -40 °C TO 70 °C)
Ui = 45 Vdc max
Ci = 11.4 nF
Li = 0
For remote display, Ci = 0, Li = 60 µH
IP66
CE

Special conditions for safe use (x)

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

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

ND ATEX Dust
Certificate No.: BAS01ATEX1374X Ⓔx II 1 D
Ex tD A20 T105°C (-20 °C ≤ T_{amb} ≤ 85 °C)
V_{max} = 42.4 volts max
A = 22 mA
IP66
CE 1180

Special conditions for safe use (x)

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

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

Special conditions for safe use (x)

1. Appropriate ex d blanking plugs, 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. The 3051S does not comply with the requirements of EN 60079-1 Clause 5.2, Table 2 for all joints. Contact Emerson Process Management for information on the dimensions of flameproof joints.

Japanese Certifications

E4 TIIS Flameproof
Ex d IIC T6

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

China (NEPSI) Certifications

I3 China Intrinsic Safety, Dust Ignition-proof
Certificate No. (manufactured in Chanhassen, MN): GYJ081078
Certificate No. (manufactured in Beijing, China): GYJ06367
Certificate No. (manufactured in Singapore): GYJ06365
Certificate No. (3051SFx RTC, BMMC, SMMC): GYJ071293
Ex ia IIC T4
DIP A21 T_A T4 IP66

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

Input Parameters

Loop / Power	Groups
U_i = 30 V	HART / FOUNDATION fieldbus/ Remote Display / Quick Connect / HART Diagnostics
I_i = 300 mA	HART / FOUNDATION fieldbus/ Remote Display / Quick Connect / HART Diagnostics
P_i = 1.0 W	HART / Remote Display / Quick Connect / HART Diagnostics
P_i = 1.3 W	FOUNDATION fieldbus
C_i = 38 nF	SuperModule Platform
C_i = 11.4 nF	HART / HART Diagnostics / Quick Connect
C_i = 0	FOUNDATION fieldbus / Remote Display
L_i = 0	HART / FOUNDATION fieldbus / Quick Connect / HART Diagnostics
L_i = 60 µH	Remote Display
RTD Assembly (3051SFx Option T or R)	
U_i = 5 Vdc I_i = 500 mA P_i = 0.63W	

E3 China Flameproof, Dust Ignition-proof
Certificate No. (manufactured in Chanhassen, MN): GYJ091035
Certificate No. (manufactured in Beijing, China): GYJ06366
Certificate No. (manufactured in Singapore): GYJ06364
Certificate No. (3051SFx RTC, BMMC, SMMC): GYJ071086
Ex d IIB+H_2 T3~T5
DIP A21 T_A T3~T5 IP66

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

INMETRO Certifications

I2 Brazilian Approval (INMETRO Approval) - Intrinsic Safety
Certificate number: CEPEL-EX-0722/05X
(manufacturing in Chanhassen, MN and Singapore)
Certificate number: CEPEL-EX-1414/07X
(manufacturing in Brazil)
INMETRO Marking: BR-Ex ia IIC T4 IP66

Special conditions for safe use (x)

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

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

Special conditions for safe use (x)

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

IECEx Certifications

E7 IECEx Flameproof and Dust (each listed separately)

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

Special conditions for safe use (x)

1. Appropriate ex d blanking plugs, 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. The 3051S does not comply with the requirements of IEC 60079-1 Clause 5.2, Table 2 for all joints. Contact Emerson Process Management for information on the dimensions of flameproof joints.

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

Special conditions for safe use (x)

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

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

Input Parameters

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

Special conditions for safe use (x)

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

N7 IECEx Type n
Certificate No.: IECExBAS04.0018X
Ex nC IIC T4 (T_a = -40 °C to 70 °C)
Ui = 45 Vdc MAX
IP66

Special conditions for safe use (x)
The apparatus is not capable of withstanding the 500 V insulation test required by Clause 8 of IEC 60079-15.

Combinations of Certifications

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

K1 Combination of E1, I1, N1, and ND

K2 Combination of E2 and I2

K5 Combination of E5 and I5

K6 Combination of E6 and I6

K7 Combination of E7, I7, and N7

KA Combination of E1, I1, E6, and I6

KB Combination of E5, I5, I6 and E6

KC Combination of E5, E1, I5 and I1

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

3051L Product Certifications

Approved Manufacturing Locations

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

European Directive Information

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

ATEX Directive (94/9/EC)

All 3051 transmitters comply with the ATEX Directive.

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

3051CA4; 3051CG2, 3, 4, 5; 3051CD2, 3, 4, 5 *(also with P9 option)*; 3051HD2, 3, 4, 5; 3051HG2, 3, 4, 5; 3051PD2, 3; and 3051PG2, 3, 4, 5 Pressure Transmitters
— QS Certificate of Assessment - EC No. PED-H-100 Module H Conformity Assessment

All other 3051/3001 Pressure Transmitters

— Sound Engineering Practice

Transmitter Attachments: Diaphragm Seal - Process Flange - Manifold

— Sound Engineering Practice

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

All 3051 Pressure Transmitters meet all of the requirements of EN61326: 1997 - A1, A2, and A3 and NAMUR NE-21

Ordinary Location Certification for Factory Mutual

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

HART PROTOCOL

Hazardous Locations Certifications

North American Certifications

FM Approvals

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

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

Canadian Standards Association (CSA)

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

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

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

European Certifications

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

TABLE 42. Input Parameters

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

TABLE 43. RTD Assembly (3051CFx Option T or R)

U_i = 5 Vdc
I_i = 500 mA
P_i = 0.63W

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

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

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

E8 ATEX Flame-Proof and Dust
Certification No.: KEMA 00ATEX2013X ⟨Ex⟩ II $^1/_2$ GD
Ex d IIC T6 (–50 ≤ T_a ≤ 65 °C)
T5 (–50 ≤ T_a ≤ 80 °C)
Dust rating: Ex tD A20/A21 T90 °C, IP66
CE 1180
Vmax = 55 V dc

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

Japanese Certifications

E4 TIIS Flame-Proof
Ex d IIC T6

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

Australian Certifications

I7 SAA Intrinsic Safety
Certification No.: AUS Ex 1249X
Ex ia IIC T4 (T_{amb} = 70 °C)
IP66
When connected per Rosemount drawing 03031-1026

TABLE 44. Input Parameters

U_i = 30V
I_i = 200 mA
I_i = 160 mA (output code A with T1)
P_i = 0.9W
C_i = 0.01 µF
C_i = 0.042 µF (output code M)
L_i = 10 µH
L_i = 1.05 mH (output code A with T1)
L_i = 0.75 mH (output code M with T1)

TABLE 45. RTD Assembly (3051CFx Option T or R)

U_i = 5 Vdc
I_i = 500 mA
P_i = 0.63W

Special Conditions for Safe Use (X):
The apparatus may only be used with a passive current limited power source Intrinsic Safety application. The power source must be such that Po ≤ (Uo * Io) / 4. Modules using transient protection in the terminal assembly (T1 transient protection models) with the apparatus enclosure is to be electrically bonded to the protective earth. The conductor used for the connection shall be equivalent to a copper conductor of 4 mm^2, minimum cross-sectional area.

E7 SAA Explosion-Proof (Flame-Proof)
Certification No.: AUS Ex 03.1347X
Ex d IIC T6 (T_{amb} = 40 °C)
T5 (T_{amb} = 80 °C)
DIP A21 T6 (T_{amb} = 40 °C)
T5 (T_{amb} = 80°C)
IP66

Special Conditions for Safe Use (X):
It is a condition of safe use for transmitter enclosures having cable entry thread other than metric conduit thread that the equipment be utilized with an appropriate certified thread adaptor.

N7 SAA Type n (Non-sparking)
Certification No.: AUS Ex 1249X
Ex n IIC T4 (T_{amb} = 70 °C)
IP66

Special Conditions for Safe Use (X):
Where the equipment is installed such that there is an unused conduit entry, it must be sealed with a suitable blanking plug to maintain the IP66 degree of protection. Any blanking plug used with the equipment shall be of a type which requires the use of a tool to effect its removal. Voltage source shall not exceed 55V dc.

Combinations of Certifications

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

K5 **E5** and **I5** combination

KB **K5** and **C6** combination

KD **K5**, **C6**, **I1**, and **E8** combination

K6 **C6**, **I1**, and **E8** combination

K8 **E8** and **I1** combination

K7 **E7**, **I7**, and **N7** combination

FIELDBUS PROTOCOL

Hazardous Locations Certifications

North American Certifications

FM Approvals

E5 Explosion-Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition-Proof for Class II, Division 1, Groups E, F, and G. Dust-Ignition-Proof for Class III, Division 1.

I5 Intrinsically Safe for use in Class I, Division 1, Groups A, B, C, and D; Class II, Division 1, Groups E, F, and G; Class III, Division 1 when connected per Rosemount drawing 03031-1019; Non-incendive for Class I, Division 2, Groups A, B, C, and D.

Temperature Code:T4 (Ta = 60 °C), T3 (Ta = 85 °C), Enclosure Type 4X
For input parameters see control drawing 03031-1019.

Canadian Standards Association (CSA)

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

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

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

European Certifications

I1 ATEX Intrinsic Safety and Dust
Certification No.: BAS 98ATEX1355X ⟨Ex⟩ II 1 GD
Ex ia IIC T4 (T_{amb} = –60 to +60 °C)
Dust Rating: Ex tD A20 T70 °C (T_{amb} –20 to 40 °C) IP66
CE 1180

TABLE 46. Input Parameters

U_i = 30V
I_i = 300 mA
P_i = 1.3 W
C_i = 0 µF

TABLE 47. RTD Assembly (3051CFx Option T or R)

U_i = 5 Vdc
I_i = 500 mA
P_i = 0.63W

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

IA ATEX FISCO Intrinsic Safety
Certification No.: BAS 98ATEX1355X ⟨Ex⟩ II 1 G
Ex ia IIC T4 (T_{amb} = –60 to +60 °C)
IP66
CE 1180

TABLE 48. Input Parameters

U_i = 17.5 V
I_i = 380 mA
P_i = 5.32 W
C_i = ≤ 5 µF
L_i = ≤ 10 µH

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

N1 ATEX Type n and Dust
Certification No.: BAS 98ATEX3356X ⟨Ex⟩ II 3 GD
U_i = 40 Vdc max
Ex nA nL IIC T5 (T_a = –40°C to 70 °C)
Dust rating: Ex tD A22 T80 °C (T_{amb} = –20 to 40 °C) IP66

Special Conditions for Safe Use (X):
The device is not capable of withstanding the 500V insulation test required by Clause 6.8.1 of EN60079-15. This must be taken into account when installing the apparatus.

E8 ATEX Flame-Proof and Dust
Certification No.: KEMA 00ATEX2013X ⟨Ex⟩ II $^1/_2$ GD
Ex d IIC T6 (T_{amb} = –50 to 65 °C)
T5 (T_{amb} = –50 to 80 °C)
Dust rating: Ex tD A20/21 T90 °C, IP66
CE 1180
Vmax = 55 V dc

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

Japanese Certifications

E4 TIIS Flame-Proof
Ex d IIC T6

Certificate	Description
C15852	3051C/D/1 FOUNDATION Fieldbus — no display
C15853	3051C/D/1 FOUNDATION Fieldbus — with display

Australian Certifications

I7 SAA Intrinsic Safety
Certification No.: AUS Ex 1249X
Ex ia IIC T4 (T_{amb} = 60 °C)
IP66
When connected per Rosemount drawing 03031-1026.

TABLE 49. Input Parameters

U_i = 30 V
I_i = 300 mA
P_i = 1.3 W
C_i = 0 µF
L_i = 0 µH

TABLE 50. RTD Assembly (3051CFx Option T or R)

U_i = 5 Vdc
I_i = 500 mA
P_i = 0.63W

Special Conditions for Safe Use (X):
The apparatus may only be used with a passive current limited power source Intrinsic Safety application. The power source must be such that Po ≤ (Uo * Io) / 4. Modules using transient protection in the terminal assembly (T1 transient protection models) the apparatus enclosure is to be electrically bonded to the protective earth. The conductor used for the connection shall be equivalent to a copper conductor of 4 mm^2, minimum cross-sectional area.

E7 SAA Explosion-Proof (Flame-Proof)
Certification No.: AUS Ex 1347X
Ex d IIC T6 (T_{amb} = 40 °C)
DIP A21 T6 (T_{amb} = 40 °C)
T5 (T_{amb} = 80 °C)
IP66

Special Conditions for Safe Use (X):
It is a condition of safe use for transmitter enclosures having cable entry threads other than metric conduit threads that the equipment be utilized with an appropriate certified threaded adaptor.

N7 SAA Type n (Non-sparking)
Certification No.: AUS Ex 1249X
Ex n IIC T4 (T_{amb} = 70 °C)
IP66

Special Conditions for Safe Use (X):
Where the equipment is installed such that there is an unused conduit entry, it must be sealed with a suitable blanking plug to maintain the IP40 degree of protection. Any blanking plug used with the equipment shall be of a type which requires the use of a tool to effect its removal. Voltage source shall not exceed 35V dc.

Combinations of Certifications

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

K5 **E5** and **I5** combination
KB **K5** and **C6** combination
KD **K5**, **C6**, **I1**, and **E8** combination
K6 **C6**, **I1**, and **E8** combination
K8 **E8** and **I1** combination
K7 **E7**, **I7**, and **N7** combination

2051L Product Certifications

Approved Manufacturing Locations

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

European Directive Information

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

ATEX Directive (94/9/EC)
All 2051 transmitters comply with the ATEX Directive.

European Pressure Equipment Directive (PED) (97/23/EC)
2051CG2, 3, 4, 5; 2051CD2, 3, 4, 5 (also with P9 option)
— QS Certificate of Assessment - EC No. PED-H-100 Module H Conformity Assessment

All other 2051 Pressure Transmitters
— Sound Engineering Practice

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

Electro Magnetic Compatibility (EMC) (2004/108/EC)
All 2051 Pressure Transmitters meet all of the requirements of IECEN61326:2006 and NAMUR NE-21.

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

HART PROTOCOL

Hazardous Locations Certifications

North American Certifications

FM Approvals

E5 Explosion-Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition-Proof for Class II, Division 1, Groups E, F, and G. Dust-Ignition-Proof for Class III, Division 1.
T5 (Ta = 85 °C), Factory Sealed, Enclosure Type 4X

I5 Intrinsically Safe for use in Class I, Division 1, Groups A, B, C, and D; Class 1, Zone 0 AEx ia T4; Class II, Division 1, Groups E, F, and G; Class III, Division 1 when connected per Rosemount drawing 02051-1009; Non-incendive for Class I, Division 2, Groups A, B, C, and D.
Temperature Code:T4 (Ta = 70 °C),
Enclosure Type 4X
For input parameters see control drawing 02051-1009.

Canadian Standards Association (CSA)

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

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

I6 Intrinsically safe approval. Intrinsically safe for Class I, Division 1, Groups A, B, C, and D when connected in accordance with Rosemount drawing 02051-1008.
Temperature Code T3C; Ex ia IIC T3C.
Dust-Ignition-Proof for Class II and Class III, Division 1, Groups E, F, and G. Suitable for Class I, Division 2 Groups A, B, C, and D hazardous locations. Enclosure type 4X, factory sealed
For input parameters see control drawing 02051-1008.

European Certifications

I1 ATEX Intrinsic Safety
Certification No. Baseefa08ATEX0129X ⟨Ex⟩ II 1 G
Ex ia IIC T4 (–60 ≤ T_a ≤ +70 °C)
IP66 IP68
CE 1180

TABLE 51. Input Parameters

U_i = 30V
I_i = 200 mA
P_i = 1.0W
C_i = 0.012 µF
L_i = 10 µH

TABLE 52. RTD Assembly (2051CFx Option T or R)

U_i = 5 Vdc
I_i = 500 mA
P_i = 0.63W

Special Conditions for Safe Use (X):
When the optional transient protection terminal block is installed, the apparatus is not capable of withstanding the 500V insulation test required by Clause 6.3.12 of EN60079-11. This must be taken into account when installing the apparatus.

N1 ATEX Type n
Certification No. Baseefa08ATEX0130X ⟨Ex⟩ II 3 G
Ex nAnL IIC T4 (–40 ≤ T_a ≤ +70 °C)
U_i = 42.4 Vdc max
IP66
CE

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

E1 ATEX Flame-Proof
Certification No. KEMA 08ATEX0090X ⟨Ex⟩ II 1/2 G
Ex d IIC T6 (–50 ≤ T_a ≤ 65 °C)
Ex d IIC T5 (–50 ≤ T_a ≤ 80 °C)
IP66
CE 1180
Vmax = 42.4 V dc

Special Conditions for Safe Use (X):
This device contains a thin wall diaphragm. Installation, maintenance, and use shall take into account the environmental conditions to which the diaphragm will be subjected. The manufacturer's instructions for installation and maintenance shall be followed in detail to assure safety during its expected lifetime.
The Ex d blanking elements, cable glands, and wiring shall be suitable for a temperature of 90 °C.
In case of repair, contact the manufacturer for information on the dimensions of the flameproof joints.

ND ATEX Dust
Certification No. Baseefa08ATEX0182X ⟨Ex⟩ II 1 D
Dust Rating: II 1 D Ex tD A20 T115 °C (-20 °C ≤ T_a ≤ 85 °C)
IP66 IP68
Vmax = 42.4 V dc
A = 22 mA
CE 1180

Special Conditions for Safe Use (X):
1. The user must ensure that the maximum rated voltage and current (42.4 volts, 22 milliampere, DC) are not exceeded. All connections to other apparatus or associated apparatus shall have control over this voltage and current equivalent to a category "ib" circuit according to EN 60079-1.
2. Cable entries must be used which maintain the ingress protection of the enclosure to at least IP66.
3. Unused cable entries must be filled with suitable blanking plugs which maintain the ingress protection of the enclosure to at least IP66.
4. Cable entries and blanking plugs must be suitable for the ambient range of the apparatus and capable of withstanding a 7J impact test.

IECEx Certifications

I7 IECEx Intrinsic Safety
Certification No. IECExBAS08.0045X II 1 G
Ex ia IIC T4 (–60 ≤ T_a ≤ +70 °C)
CE 1180

TABLE 53. Input Parameters

U_i = 30V
I_i = 200 mA
P_i = 1.0W
C_i = 0.012 µF
L_i = 10 µH

TABLE 54. RTD Assembly (2051CFx Option T or R)

U_i = 5 Vdc
I_i = 500 mA
P_i = 0.63W

Special Conditions for Safe Use (X):
When the optional transient protection terminal block is installed, the apparatus is not capable of withstanding the 500V insulation test required by Clause 6.3.12 of IEC60079-11. This must be taken into account when installing the apparatus.

E7 IECEx Explosion-Proof (Flame-Proof)
Certification No. IECEx KEM 08.0024X II $^1/_2$ G
Ex d IIC T6 (–50 ≤ T_a ≤ 65 °C)
Ex d IIC T5 (–50 ≤ T_a ≤ 80 °C)
CE 1180
Vmax = 42.4 V dc

Special Conditions for Safe Use (X):
This device contains a thin wall diaphragm. Installation, maintenance, and use shall take into account the environmental conditions to which the diaphragm will be subjected. The manufacturer's instructions for installation and maintenance shall be followed in detail to assure safety during its expected lifetime.
The Ex d blanking elements, cable glands, and wiring shall be suitable for a temperature of 90 °C.
In case of repair, contact the manufacturer for information on the dimensions of the flameproof joints.

N7 IECEx Type n
Certification No. IECExBAS08.0046X II 3 G
Ex nAnL IIC T4 (–40 ≤ T_a ≤ +70 °C)
U_i = 42.4 Vdc max
CE

Special Conditions for Safe Use (X):

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

TIIS Certifications

E4 TIIS Flame-Proof
Ex d IIC T6

TC18872	Coplanar with Display
TC18873	Coplanar no display

Inmetro Certifications

E2 Flame-Proof
BR-Ex d IIC T6/T5

I2 Intrinsic Safety
BR-Ex ia IIC T4

GOST - Russia Certifications

IM Intrinsic Safety
Consult factory for availability

EM Flame-Proof
Consult factory for availability

China (NEPSI) Certifications

E3 Flame-Proof
Certificate No.: GYJ081230
Ex d IIC T5/T6

I3 Intrinsic Safety
Certificate No.: GYJ081231X
Ex ia IIC T4

TABLE 55. Input Parameters

U_i = 30V
I_i = 200 mA
P_i = 1.0W
C_i = 0.012 µF
L_i = 10 µH

CCoE Certifications

IW Intrinsic Safety
Ex ia IIC T4

EW Flame-Proof
Ex d IIC T5 or T6

Combinations of Certifications

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

K1 **E1, I1, N1,** and **ND** combination

K4 **E4** and **I4** combination

K5 **E5** and **I5** combination

K6 **I6** and **E6** combination

K7 **E7, I7,** and **N7** combination

KA **E1, I1, E6,** and **I6** combination

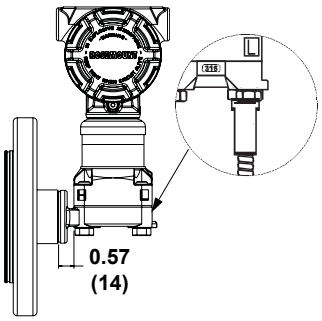
KB **E5, I5, E6,** and **I6** combination

KC **E1, I1, E5,** and **I5** combination

KD **E1, I1, E5, I5, E6,** and **I6** combination

Dimensional Drawings

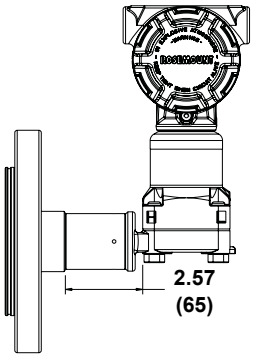
Rosemount 1199 Direct Mount Connection Types for General Purpose Seal Systems



Rosemount 3051
One-Seal System
1199 _ _ _ 93
1199 _ _ _ 97

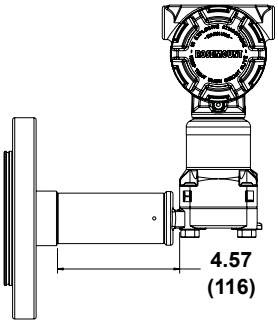
Rosemount 3051
Two-Seal System
1199 _ _ _ 94
1199 _ _ _ 96
(Add Low Side Capillary)

Low Side Capillary Connection



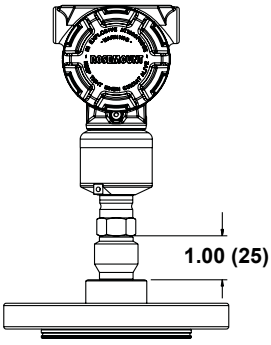
Rosemount 3051
One-Seal System
1199 _ _ _ B3 (2-in. Connection)
1199 _ _ _ B7 (2-in. Connection)

Rosemount 3051
Two-Seal System
1199 _ _ _ B4 (2-in. Conn.)
1199 _ _ _ B6 (2-in. Conn.)
(Add Low Side Capillary)

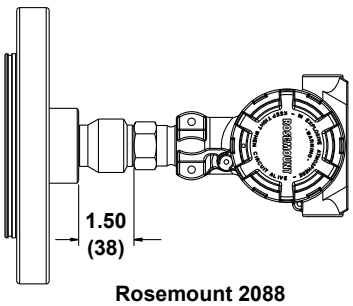


Rosemount 3051
One-Seal System
1199 _ _ _ D3 (4-in. Connection)
1199 _ _ _ D7 (4-in. Connection)

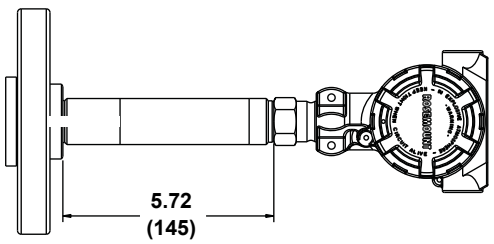
Rosemount 3051
Two-Seal System
1199 _ _ _ D4 (4-in. Conn.)
1199 _ _ _ D6 (4-in. Conn.)
(Add Low Side Capillary)



Rosemount 3051T
1199 _ _ _ 95



Rosemount 2088
1199 _ _ _ 95



Rosemount 2088
1199 _ _ _ D5

NOTES
Dimensions are in inches (millimeters).
Transmitters are shown with Flush Flanged (FFW) Seals.

Figure 2. FFW Flush Flanged Seal - Two-Piece Design (shown with flushing ring)

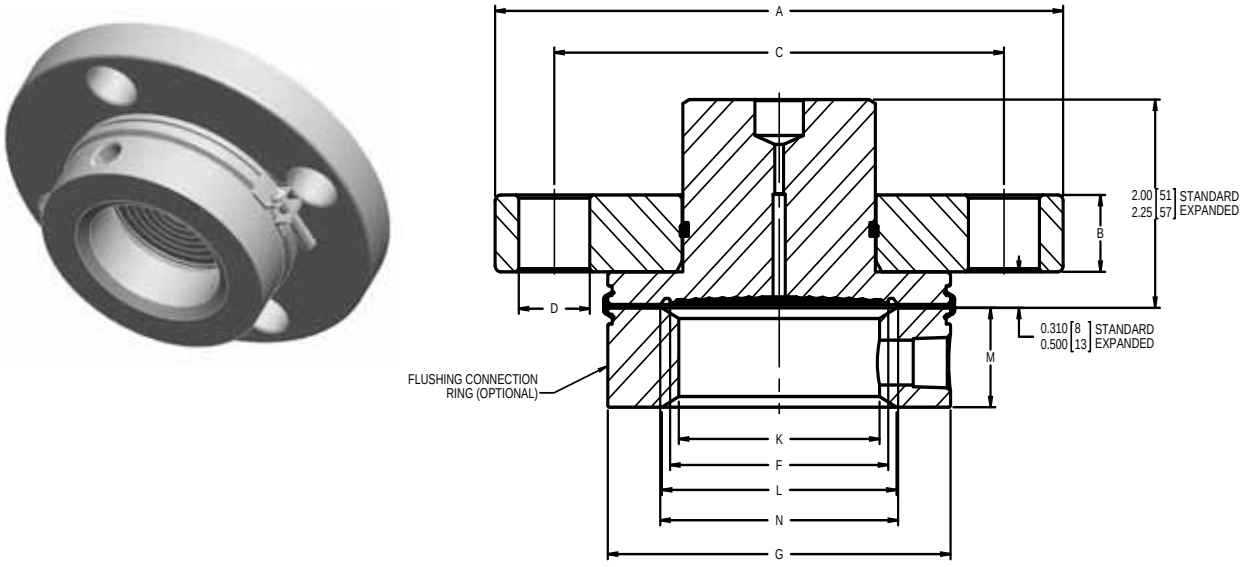


Table 56. Dimensional Table for FFW Flush Flanged Raised Face Seals Two Piece (Upper Housing and Flange) Design(1)

	Pipe Size	Class	Flange Diameter "A"	Flange Thickness "B"	Bolt Circle "C"	Bolts	Bolt Hole Diameter "D"	Standard Diaphragm Diameter "F"	Raised Face Diameter "G"
ANSI/ ASME	2-in.	150 lb.	6.00 (152)	0.69 (18)	4.75 (121)	4	0.75 (19)	2.30 (58)	3.62 (92)
		300 lb.	6.50 (165)	0.82 (21)	5.00 (127)	8	0.75 (19)	2.30 (58)	3.62 (92)
		600 lb.	6.50 (165)	1.00 (25)	5.00 (127)	8	0.75 (19)	2.30 (58)	3.62 (92)
	3-in.	150 lb.	7.50 (191)	0.88 (22)	6.00 (152)	4	0.75 (19)	3.50 (89)	5.00 (127)
		300 lb.	8.25 (210)	1.06 (27)	6.62 (168)	8	0.88 (22)	3.50 (89)	5.00 (127)
		600 lb.	8.25 (210)	1.25 (32)	6.62 (168)	8	0.88 (22)	3.50 (89)	5.00 (127)
	4-in.	150 lb.	9.00 (229)	0.88 (22)	7.50 (191)	8	0.75 (19)	3.50 (89)	6.20 (157)
		300 lb.	10.0 (254)	1.19 (30)	7.88 (200)	8	0.88 (22)	3.50 (89)	6.20 (157)
		600 lb.	10.75 (273)	1.50 (38)	8.50 (216)	8	1.00 (25)	3.50 (89)	6.20 (157)
EN1092-1	DN 50	PN 40	6.50 (165)	0.79 (20)	4.92 (125)	4	0.71 (18)	2.30 (58)	4.00 (102)
		PN 63	7.08 (180)	1.02 (26)	5.31 (135)	4	0.87 (22)	2.30 (58)	4.00 (102)
		PN 100	7.68 (195)	1.10 (28)	5.71 (145)	4	1.02 (26)	2.30 (58)	4.00 (102)
	DN 80	PN 40	7.87 (200)	0.94 (24)	6.30 (160)	8	0.71 (18)	3.50 (89)	5.43 (138)
		PN 63	8.46 (215)	1.10 (28)	6.69 (170)	8	0.88 (22)	3.50 (89)	5.43 (138)
		PN 100	9.06 (230)	1.26 (32)	7.09 (180)	8	1.02 (26)	3.50 (89)	5.43 (138)
	DN 100	PN 16	8.66 (220)	0.79 (20)	7.09 (180)	8	0.71 (18)	3.50 (89)	6.20 (157)
		PN 40	9.25 (235)	0.94 (24)	7.48 (190)	8	0.87 (22)	3.50 (89)	6.20 (157)
		PN 63	9.84 (250)	1.18 (30)	7.87 (200)	8	1.02 (26)	3.50 (89)	6.20 (157)
JIS	JIS 50A	10K	6.10 (155)	0.55 (14)	4.72 (120)	4	0.75 (19)	2.30 (58)	3.62 (92)
		20K	6.10 (155)	0.63 (16)	4.72 (120)	8	0.75 (19)	2.30 (58)	3.62 (92)
		40K	6.50 (165)	0.94 (24)	5.12 (130)	8	0.75 (19)	2.30 (58)	4.00 (102)
	JIS 80A	10K	7.28 (185)	0.63 (16)	5.91 (150)	8	0.75 (19)	3.50 (89)	5.00 (127)
		20K	7.87 (200)	0.79 (20)	6.30 (160)	8	0.91 (23)	3.50 (89)	5.00 (127)
		40K	8.27 (210)	1.18 (30)	6.69 (170)	8	0.91 (23)	3.50 (89)	5.43 (138)
	JIS 100A	10K	8.27 (210)	0.63 (16)	6.89 (175)	8	0.75 (19)	3.50 (89)	6.20 (157)
		20K	8.86 (225)	0.87 (22)	7.28 (185)	8	0.91 (23)	3.50 (89)	6.20 (157)
		40K	9.84 (250)	1.34 (34)	8.07 (205)	8	0.98 (25)	3.50 (89)	6.20 (157)

(1) Dimensions are in inches (millimeters).

Table 57. Dimensional Table for FFW Flush Flanged Raised Face Seals Two Piece (Upper Housing and Flange) Design(1)

	Pipe Size	INNER DIAMETER "K"	BEVELED EDGE "L"	THICKNESS WITH 1/4-NPT F.C. "M"	THICKNESS WITH 1/2-NPT F.C. "M"	MINIMUM GASKET I.D. "N"
ANSI / ASME	2-in.	2.12 (54)	2.48 (63)	0.97 (25)	1.30 (33)	2.51 (64)
		2.12 (54)	2.48 (63)	0.97 (25)	1.30 (33)	2.51 (64)
		2.12 (54)	2.48 (63)	0.97 (25)	1.30 (33)	2.51 (64)
	3-in.	3.60 (91)	—	0.97 (25)	1.30 (33)	3.70 (94)
		3.60 (91)	—	0.97 (25)	1.30 (33)	3.70 (94)
		3.60 (91)	—	0.97 (25)	1.30 (33)	3.70 (94)
	4-in.	3.60 (91)	—	0.97 (25)	1.30 (33)	3.70 (94)
		3.60 (91)	—	0.97 (25)	1.30 (33)	3.70 (94)
		3.60 (91)	—	0.97 (25)	1.30 (33)	3.70 (94)
EN1092-1	DN 50	2.40 (61)	—	0.97 (25)	1.30 (33)	2.51 (64)
		2.40 (61)	—	0.97 (25)	1.30 (33)	2.51 (64)
		2.40 (61)	—	0.97 (25)	1.30 (33)	2.51 (64)
	DN 80	3.60 (91)	—	0.97 (25)	1.30 (33)	3.70 (94)
		3.60 (91)	—	0.97 (25)	1.30 (33)	3.70 (94)
		3.60 (91)	—	0.97 (25)	1.30 (33)	3.70 (94)
	DN 100	3.60 (91)	—	0.97 (25)	1.30 (33)	3.70 (94)
		3.60 (91)	—	0.97 (25)	1.30 (33)	3.70 (94)
		3.60 (91)	—	0.97 (25)	1.30 (33)	3.70 (94)
JIS	JIS 50A	2.12 (54)	2.48 (63)	0.97 (25)	1.30 (33)	2.51 (64)
		2.12 (54)	2.48 (63)	0.97 (25)	1.30 (33)	2.51 (64)
		2.40 (61)	—	0.97 (25)	1.30 (33)	2.51 (64)
	JIS 80A	3.60 (91)	—	0.97 (25)	1.30 (33)	3.70 (94)
		3.60 (91)	—	0.97 (25)	1.30 (33)	3.70 (94)
		3.60 (91)	—	0.97 (25)	1.30 (33)	3.70 (94)
	JIS 100A	3.60 (91)	—	0.97 (25)	1.30 (33)	3.70 (94)
		3.60 (91)	—	0.97 (25)	1.30 (33)	3.70 (94)
		3.60 (91)	—	0.97 (25)	1.30 (33)	3.70 (94)

(1) Dimensions are in inches (millimeters).

Figure 3. FFW Flush Flanged Seal - One-Piece Design (shown with flushing ring)

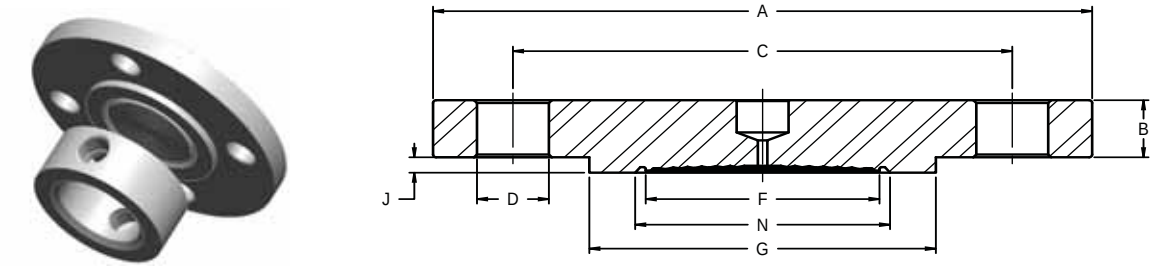


Table 58. Dimensional Table for FFW Flush Flanged Seals One Piece (Upper Housing and Flange) Design (Option code E)(1)

	Pipe Size	Class	Flange Diameter "A"	Flange Thickness "B"	Bolt Circle "C"	Bolts	Bolt Hole Diameter "D"	Standard Diaphragm Diameter "F"	Raised Face Diameter "G"	Raised Face Height "J"	MINIMUM GASKET I.D. "N"
ANSI / ASME	2-in.	150 lb.	6.00 (152)	0.69 (18)	4.75 (121)	4	0.75 (19)	2.30 (58)	3.62 (92)	0.06 (1.5)	2.51 (64)
		300 lb.	6.50 (165)	0.82 (21)	5.00 (127)	8	0.75 (19)	2.30 (58)	3.62 (92)	0.06 (1.5)	2.51 (64)
		600 lb.	6.50 (165)	1.00 (25)	5.00 (127)	8	0.75 (19)	2.30 (58)	3.62 (92)	0.25 (6.4)	2.51 (64)
	3-in.	150 lb.	7.50 (191)	0.88 (22)	6.00 (152)	4	0.75 (19)	3.50 (89)	5.00 (127)	0.06 (1.5)	3.70 (94)
		300 lb.	8.25 (210)	1.06 (27)	6.62 (168)	8	0.88 (22)	3.50 (89)	5.00 (127)	0.06 (1.5)	3.70 (94)
		600 lb.	8.25 (210)	1.25 (32)	6.62 (168)	8	0.88 (22)	3.50 (89)	5.00 (127)	0.25 (6.4)	3.70 (94)
	4-in.	150 lb.	9.00 (229)	0.88 (22)	7.50 (191)	8	0.75 (19)	3.50 (89)	6.20 (157)	0.06 (1.5)	3.70 (94)
		300 lb.	10.00 (254)	1.19 (30)	7.88 (200)	8	0.88 (22)	3.50 (89)	6.20 (157)	0.06 (1.5)	3.70 (94)
		600 lb.	10.75 (273)	1.50 (38)	8.50 (216)	8	1.00 (25)	3.50 (89)	6.20 (157)	0.25 (6.4)	3.70 (94)
EN1092-1	DN 50	PN 40	6.50 (165)	0.79 (20)	4.92 (125)	4	0.71 (18)	2.30 (58)	4.00 (102)	0.12 (3.0)	2.51 (64)
		PN 63	7.08 (180)	1.02 (26)	5.31 (135)	4	0.87 (22)	2.30 (58)	4.00 (102)	0.12 (3.0)	2.51 (64)
		PN 100	7.68 (195)	1.10 (28)	5.71 (145)	4	1.02 (26)	2.30 (58)	4.00 (102)	0.12 (3.0)	2.51 (64)
	DN 80	PN 40	7.87 (200)	0.94 (24)	6.30 (160)	8	0.71 (18)	3.50 (89)	5.43 (138)	0.12 (3.0)	3.70 (94)
		PN 63	8.46 (215)	1.10 (28)	6.69 (170)	8	0.88 (22)	3.50 (89)	5.43 (138)	0.12 (3.0)	3.70 (94)
		PN 100	9.06 (230)	1.26 (32)	7.09 (180)	8	1.02 (26)	3.50 (89)	5.43 (138)	0.12 (3.0)	3.70 (94)
	DN 100	PN 16	8.66 (220)	0.79 (20)	7.09 (180)	8	0.71 (18)	3.50 (89)	6.20 (157)	0.12 (3.0)	3.70 (94)
		PN 40	9.25 (235)	0.94 (24)	7.48 (190)	8	0.87 (22)	3.50 (89)	6.20 (157)	0.12 (3.0)	3.70 (94)
		PN 63	9.84 (250)	1.18 (30)	7.87 (200)	8	1.02 (26)	3.50 (89)	6.20 (157)	0.12 (3.0)	3.70 (94)
JIS	JIS 50A	10K	6.10 (155)	0.55 (14)	4.72 (120)	4	0.75 (19)	2.30 (58)	3.62 (92)	0.08 (2.0)	2.51 (64)
		20K	6.10 (155)	0.63 (16)	4.72 (120)	8	0.75 (19)	2.30 (58)	3.62 (92)	0.08 (2.0)	2.51 (64)
		40K	6.50 (165)	0.94 (24)	5.12 (130)	8	0.75 (19)	2.30 (58)	4.00 (102)	0.08 (2.0)	2.51 (64)
	JIS 80A	10K	7.28 (185)	0.63 (16)	5.91 (150)	8	0.75 (19)	3.50 (89)	5.00 (127)	0.08 (2.0)	3.70 (94)
		20K	7.87 (200)	0.79 (20)	6.30 (160)	8	0.91 (23)	3.50 (89)	5.00 (127)	0.08 (2.0)	3.70 (94)
		40K	8.27 (210)	1.18 (30)	6.69 (170)	8	0.91 (23)	3.50 (89)	5.43 (138)	0.08 (2.0)	3.70 (94)
	JIS 100A	10K	8.27 (210)	0.63 (16)	6.89 (175)	8	0.75 (19)	3.50 (89)	6.20 (157)	0.08 (2.0)	3.70 (94)
		20K	8.86 (225)	0.87 (22)	7.28 (185)	8	0.91 (23)	3.50 (89)	6.20 (157)	0.08 (2.0)	3.70 (94)
		40K	9.84 (250)	1.34 (34)	8.07 (205)	8	0.98 (25)	3.50 (89)	6.20 (157)	0.08 (2.0)	3.70 (94)

(1) Dimensions are in inches (millimeters).

Figure 4. FFW Flush Flanged Seal - Flushing Connection Ring (Lower Housing)

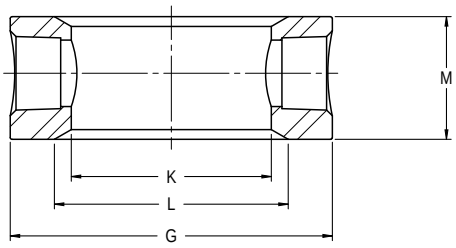


Table 59. Dimensional Table for FFW Flushing Connection Ring (Lower Housing)(1)

	Pipe Size	OUTER DIAMETER "G"	Inner Diameter "K"	Beveled Edge "L"	Thickness with 1/4–NPT F.C. "M"	Thickness with 1/2–NPT F.C. "M"
ANSI / ASME	2-in.	3.62 (92)	2.12 (54)	2.48 (63)	0.97 (25)	1.30 (33)
		3.62 (92)	2.12 (54)	2.48 (63)	0.97 (25)	1.30 (33)
		3.62 (92)	2.12 (54)	2.48 (63)	0.97 (25)	1.30 (33)
	3-in.	5.00 (127)	3.60 (91)	—	0.97 (25)	1.30 (33)
		5.00 (127)	3.60 (91)	—	0.97 (25)	1.30 (33)
		5.00 (127)	3.60 (91)	—	0.97 (25)	1.30 (33)
	4-in.	6.20 (157)	3.60 (91)	—	0.97 (25)	1.30 (33)
		6.20 (157)	3.60 (91)	—	0.97 (25)	1.30 (33)
		6.20 (157)	3.60 (91)	—	0.97 (25)	1.30 (33)
EN1092-1	DN 50	4.00 (102)	2.40 (61)	—	0.97 (25)	1.30 (33)
		4.00 (102)	2.40 (61)	—	0.97 (25)	1.30 (33)
		4.00 (102)	2.40 (61)	—	0.97 (25)	1.30 (33)
	DN 80	5.43 (138)	3.60 (91)	—	0.97 (25)	1.30 (33)
		5.43 (138)	3.60 (91)	—	0.97 (25)	1.30 (33)
		5.43 (138)	3.60 (91)	—	0.97 (25)	1.30 (33)
	DN 100	6.20 (157)	3.60 (91)	—	0.97 (25)	1.30 (33)
		6.20 (157)	3.60 (91)	—	0.97 (25)	1.30 (33)
		6.20 (157)	3.60 (91)	—	0.97 (25)	1.30 (33)
JIS	JIS 50A	3.62 (92)	2.12 (54)	2.48 (63)	0.97 (25)	1.30 (33)
		3.62 (92)	2.12 (54)	2.48 (63)	0.97 (25)	1.30 (33)
		4.00 (102)	2.40 (61)	—	0.97 (25)	1.30 (33)
	JIS 80A	5.00 (127)	3.60 (91)	—	0.97 (25)	1.30 (33)
		5.00 (127)	3.60 (91)	—	0.97 (25)	1.30 (33)
		5.43 (138)	3.60 (91)	—	0.97 (25)	1.30 (33)
	JIS 100A	6.20 (157)	3.60 (91)	—	0.97 (25)	1.30 (33)
		6.20 (157)	3.60 (91)	—	0.97 (25)	1.30 (33)
		6.20 (157)	3.60 (91)	—	0.97 (25)	1.30 (33)

(1) Dimensions are in inches (millimeters).

Figure 5. RFW Flanged Seal (For smaller process connection)

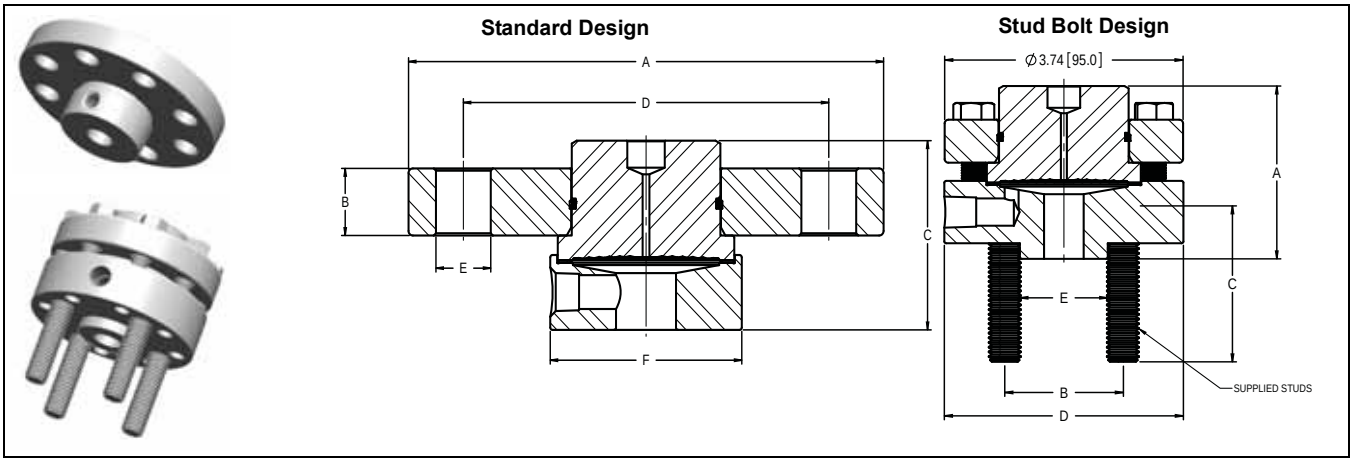


Table 60. RFW Flanged Seal Standard Design Dimensions(1)(2)

	Pipe Size / Class	Class	Flange Diameter (A)	Flange Thickness (B)	Overall Height (C)		Bolt Circle Diameter (D)	Bolt Hole Diameter (E)	Lower Housing Diameter (F)
					No or 1/4-in. NPT flush connection	1/2-in. NPT flush connection			
ANSI / ASME	1/2-in.	2500 lb.	5.25 (133.4)	1.19 (30.2)	2.45 (62.2)	2.79 (70.9)	3.50 (88.9)	0.875 (22.2)	2.62 (66.5)
	3/4-in.	300/600 lb.	4.62 (117.3)	0.62 (15.7)	2.45 (62.2)	2.79 (70.9)	3.25 (82.6)	0.75 (19.5)	2.62 (66.5)
	1-in.	150 lb.	4.25 (107.9)	0.50 (12.7)	2.45 (62.2)	2.79 (70.9)	3.12 (79.3)	0.625 (15.9)	2.62 (66.5)
		300 lb.	4.88 (124.0)	0.62 (15.8)	2.45 (62.2)	2.79 (70.9)	3.50 (88.9)	0.75 (19.5)	2.62 (66.5)
		600 lb.	4.88 (124.0)	0.69 (17.5)	2.45 (62.2)	2.79 (70.9)	3.50 (88.9)	0.75 (19.5)	2.62 (66.5)
	1 1/2-in.	150 lb.	5.00 (127.0)	0.62 (15.8)	2.45 (62.2)	2.79 (70.9)	3.88 (98.6)	0.625 (15.9)	2.88 (73.2)
		300 lb.	6.12 (155.4)	0.75 (19.1)	2.45 (62.2)	2.79 (70.9)	4.50 (114)	0.875 (22.2)	2.88 (73.2)
		600 lb.	6.12 (155.4)	0.88 (22.4)	2.45 (62.2)	2.79 (70.9)	4.50 (114)	0.875 (22.2)	2.88 (73.2)
EN 1092-1	DN 25	PN 40	4.53 (115)	0.71 (18.0)	2.45 (62.2)	2.79 (70.9)	3.35 (85)	0.55 (14)	2.68 (68.1)
	DN 40	PN 40	5.91 (150)	0.71 (18.0)	2.45 (62.2)	2.79 (70.9)	4.33 (110)	0.71 (18)	3.47 (88.1)
JIS	25A	10K	4.92 (125)	0.55 (14)	2.45 (62.2)	2.79 (70.9)	3.54 (90)	0.75 (19)	2.62 (66.5)
		20K	4.92 (125)	0.63 (16)	2.45 (62.2)	2.79 (70.9)	3.54 (90)	0.75 (19)	2.62 (66.5)
		40K	5.12 (130)	0.87 (22)	2.45 (62.2)	2.79 (70.9)	3.74 (95)	0.75 (19)	2.88 (73.2)
	40A	10K	5.51 (140)	0.63 (16)	2.45 (62.2)	2.79 (70.9)	4.13 (105)	0.75 (19)	3.46 (88.0)
		20K	5.51 (140)	0.71 (18)	2.45 (62.2)	2.79 (70.9)	4.13 (105)	0.75 (19)	3.46 (88.0)
		40K	6.30 (160)	0.94 (24)	2.45 (62.2)	2.79 (70.9)	4.72 (120)	0.91 (23)	3.62 (92.0)

(1) Dimensions are in inches (millimeters).

(2) Lower housing is loose on standard design, consult factory for retained lower housing options.

Table 61. RFW Flanged Seal Stud Bolt Design Dimensions(1)

	Pipe Size / Class	Class	Overall Height (A)		Stud Circle Diameter (B)	Stud (Size, Length) (C)	Lower Housing Diameter (D)	Raised Face Diameter (E)
			No or 1/4-in. NPT flush connection	**1/2-in. NPT flush connection**				
ANSI / ASME	1/2-in.	150 lb.	2.52 (64.0)	2.82 (71.6)	2.38 (60.5)	1/2-13NC, 2.5-in.	3.74 (95.0)	1.38 (35.1)
	1/2-in.	300/600 lb.	2.77 (70.4)	2.87 (72.9)	2.62 (66.5)	1/2-13NC, 2.5-in.	3.75 (95.3)	1.38 (35.1)
	3/4-in.	150 lb.	2.52 (64.0)	2.82 (71.6)	2.75 (69.9)	1/2-13NC, 2.5-in.	3.88 (98.6)	1.69 (42.9)
EN 1092-1	DN 15	PN 40	2.52 (64.0)	2.82 (71.6)	2.56 (65)	M12x1.75, 60mm	3.74 (95.0)	1.77 (45.0)
	DN 15	PN 100/160	2.52 (64.0)	2.82 (71.6)	2.95 (75)	M12x1.75, 60mm	4.13 (105)	1.77 (45.0)

(1) Upper and lower housing installed bolt torque with CS or SST bolts is 23 ft-lbs. (31 Nm).

Figure 6. EFW Extended Flanged Seal - Extended Flanged Assembly

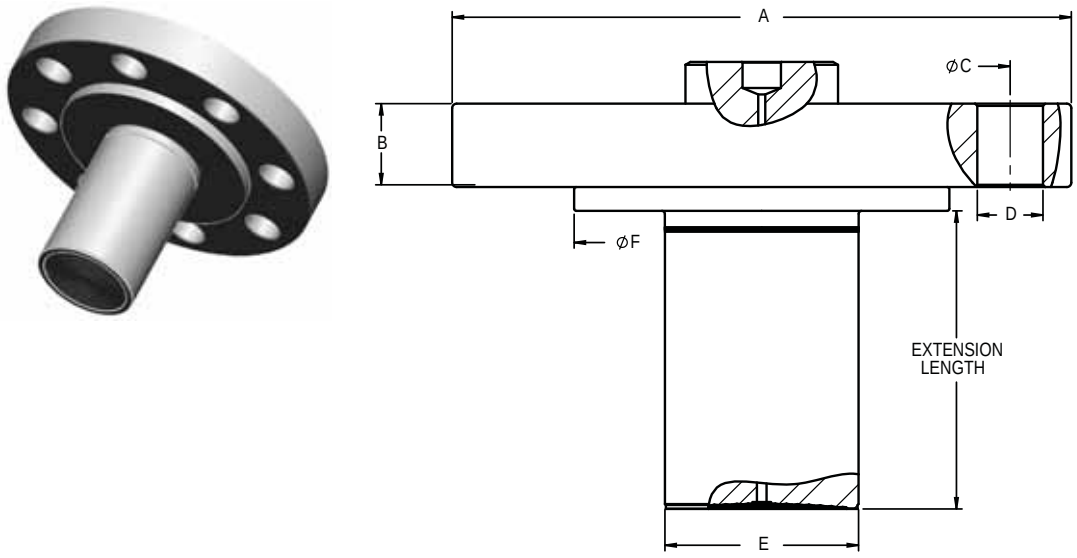


Table 62. EFW Extended Flanged Seal Dimensions(1)

	Pipe Size	Class	Flange Diameter "A"	Flange Thickness "B"	Bolt Circle "C"	Bolts	Bolt Hole Diameter "D"	Raised Face Diameter "F"
ANSI / ASME	1 1/2-in.	150 lb.	5.00 (127)	0.62 (16)	3.88 (99)	4	0.63 (16)	2.88 (73)
		300 lb.	6.12 (156)	0.75 (19)	4.50 (114)	4	0.88 (22)	2.88 (73)
		600 lb.	6.12 (156)	0.88 (22)	4.50 (114)	4	0.88 (22)	2.88 (73)
	2-in.	150 lb.	6.00 (152)	0.69 (18)	4.75 (121)	4	0.75 (19)	3.62 (92)
		300 lb.	6.50 (165)	0.82 (21)	5.00 (127)	8	0.75 (19)	3.62 (92)
		600 lb.	6.50 (165)	1.00 (25)	5.00 (127)	8	0.75 (19)	3.62 (92)
	3-in.	150 lb.	7.50 (191)	0.88 (22)	6.00 (125)	4	0.75 (19)	5.00 (127)
		300 lb.	8.25 (210)	1.06 (27)	6.62 (168)	8	0.88 (22)	5.00 (127)
		600 lb.	8.25 (210)	1.25 (32)	6.62 (168)	8	0.88 (22)	5.00 (127)
	4-in.	150 lb.	9.00 (229)	0.88 (22)	7.50 (191)	8	0.75 (19)	6.20 (158)
		300 lb.	10.00 (254)	1.19 (30)	7.88 (200)	8	0.88 (22)	6.20 (158)
		600 lb.	10.75 (273)	1.50 (38)	8.50 (216)	8	1.00 (25)	6.20 (158)
EN 1092-1	DN 50	PN 40	6.50 (165)	0.79 (20)	4.92 (125)	4	0.71 (18)	4.00 (102)
		PN 63	7.08 (180)	1.02 (26)	5.31 (135)	4	0.87 (22)	4.00 (102)
		PN 100	7.68 (195)	1.10 (28)	5.71 (145)	4	1.02 (26)	4.00 (102)
	DN 80	PN 40	7.87 (200)	0.94 (24)	6.30 (160)	8	0.71 (18)	5.43 (138)
		PN 63	8.46 (215)	1.10 (28)	6.69 (170)	8	0.88 (22)	5.43 (138)
		PN 100	9.06 (230)	1.26 (32)	7.09 (180)	8	1.02 (26)	5.43 (138)
	DN 100	PN 16	8.66 (220)	0.79 (20)	7.09 (180)	8	0.71 (18)	6.20 (158)
		PN 40	9.25 (235)	0.94 (24)	7.48 (190)	8	0.87 (22)	6.20 (158)
		PN 63	9.84 (250)	1.18 (30)	7.87 (200)	8	1.02 (26)	6.20 (158)
JIS	JIS 50A	10K	6.10 (155)	0.55 (14)	4.72 (120)	4	0.75 (19)	3.62 (92)
		20K	6.10 (155)	0.63 (16)	4.72 (120)	8	0.75 (19)	3.62 (92)
		40K	6.50 (165)	0.94 (24)	5.12 (130)	8	0.75 (19)	4.00 (102)
	JIS 80A	10K	7.28 (185)	0.63 (16)	5.91 (150)	8	0.75 (19)	5.00 (127)
		20K	7.87 (200)	0.79 (20)	6.30 (160)	8	0.91 (23)	5.00 (127)
		40K	8.27 (210)	1.18 (30)	6.69 (170)	8	0.91 (23)	5.43 (138)
	JIS 100A	10K	8.27 (210)	0.63 (16)	6.89 (175)	8	0.75 (19)	6.20 (158)
		20K	8.86 (225)	0.87 (22)	7.28 (185)	8	0.91 (23)	6.20 (158)
		40K	9.84 (250)	1.34 (34)	8.07 (205)	8	0.98 (25)	6.20 (158)

(1) Dimensions are in inches (millimeters).

Process Connection Size[1]			
ANSI B16.5	**EN 1092-1**	**JIS B2238**	**Diameter (E)**
3-in.	DN 80	80 A	2.58 (66)
4-in.	DN 100	100 A	3.50 (89)
1 ½-in.	DN 40	40 A	1.45 (37)
2-in.	DN 50	50 A	1.90 (49)
3-in. Headbox	DN 80 Headbox	—	2.875 (74)
4-in. Headbox	DN100 Headbox	—	3.78 (97)

(1) Dimensions are in inches (millimeters).

Figure 7. PFW Pancake Seal

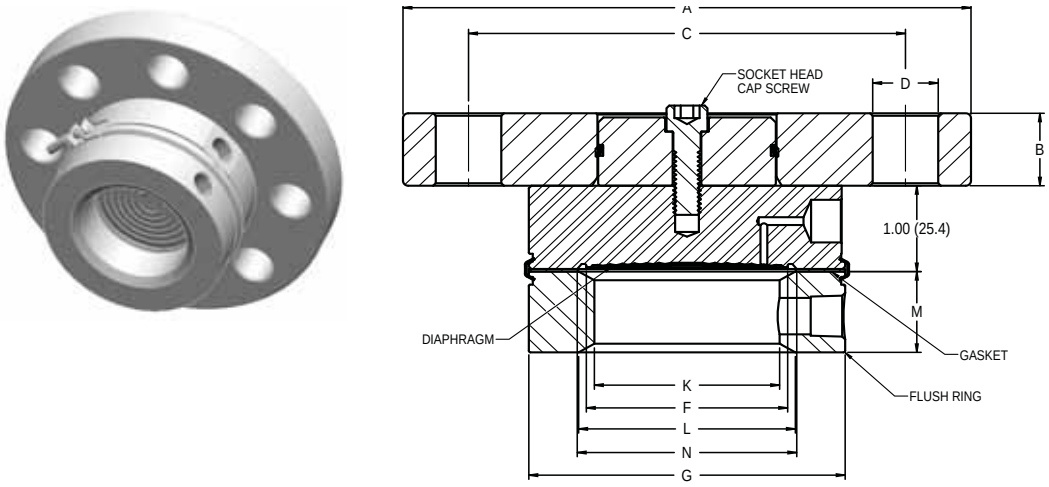


Table 63. PFW Pancake Seal Dimensions(1)

	Pipe Size	Class	Flange Diameter "A"	Flange Thickness "B"	QTY. of Bolts	Bolt Circle "C"	Bolt Hole Size "D"	Standard Diaphragm Diameter "F"
ANSI / ASME	2-in.	150 lb.	6.00 (152.4)	0.69 (17.5)	4	4.75 (120.7)	0.750 (19.05)	2.30 (58.4)
		300 lb.	6.50 (165.1)	0.81 (20.6)	8	5.00 (127.0)	0.750 (19.05)	2.30 (58.4)
		600 lb.	6.50 (165.1)	1.00 (25.4)	8	5.00 (127.0)	0.750 (19.05)	2.30 (58.4)
	3-in.	150 lb.	7.50 (190.5)	0.88 (22.4)	4	6.00 (152.4)	0.750 (19.05)	3.50 (88.9)
		300 lb.	8.25 (209.6)	1.06 (26.9)	8	6.62 (168.1)	0.875 (22.23)	3.50 (88.9)
		600 lb.	8.25 (209.6)	1.25 (31.8)	8	6.62 (168.1)	0.875 (22.23)	3.50 (88.9)
EN1092-1	DN 50	PN40	6.50 (165)	0.79 (20)	4	4.92 (125)	0.71 (18))	2.30 (58)
		PN63	7.09 (180)	1.02 (26)	4	5.31 (135)	0.87 (22)	2.30 (58)
	DN 80	PN40	7.87 (200)	0.94 (24)	8	6.30 (160)	0.71 (18)	3.50 (89)
		PN63	8.46 (215)	1.10 (28)	8	6.69 (170)	0.87 (22)	3.50 (89)

(1) Dimensions are in inches (millimeters).

	Pipe Size	Outer Diameter "G"	Inner Diameter "K"	Beveled Diameter "L"	Thickness with 1/4-NPT F.C. "M"	Thickness with 1/2-NPT F.C. "M"	Minimum Gasket I.D. "N"
ANSI / ASME	2-in.	3.62 (92)	2.12 (54)	2.48 (63)	0.97 (25)	1.30 (33)	2.51 (64)
		3.62 (92)	2.12 (54)	2.48 (63)	0.97 (25)	1.30 (33)	2.51 (64)
		3.62 (92)	2.12 (54)	2.48 (63)	0.97 (25)	1.30 (33)	2.51 (64)
	3-in.	5.00 (127)	3.60 (91)	—	0.97 (25)	1.30 (33)	3.70 (94)
		5.00 (127)	3.60 (91)	—	0.97 (25)	1.30 (33)	3.70 (94)
		5.00 (127)	3.60 (91)	—	0.97 (25)	1.30 (33)	3.70 (94)
EN1092-1	DN 50	4.00 (102)	2.40 (61)	—	0.97 (25)	1.30 (33)	2.51 (64)
		4.00 (102)	2.40 (61)	—	0.97 (25)	1.30 (33)	2.51 (64)
	DN 80	5.43 (138)	3.60 (91)	—	0.97 (25)	1.30 (33)	3.70 (94)
		5.43 (138)	3.60 (91)	—	0.97 (25)	1.30 (33)	3.70 (94)

Figure 8. FCW Flush Flanged Seal – Ring Type Joint (RTJ) Gasket Surface Two-Piece Design (shown with flushing ring)

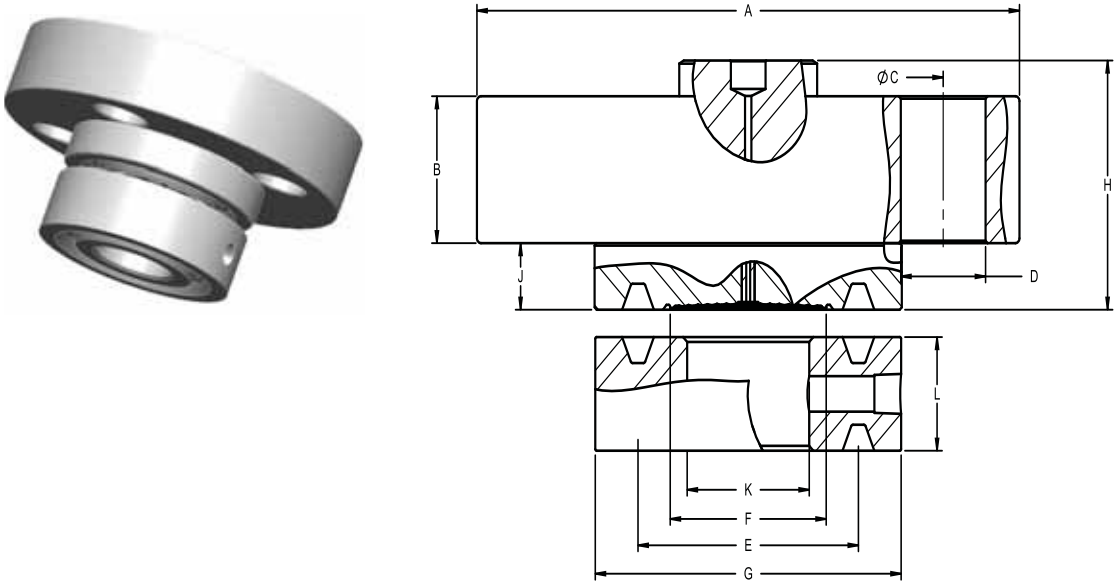


Table 64. Dimensional Table for FCW 2-Piece Flange Type Flush Diaphragm Seal(1)

	Pipe Size	Class	Flange Diameter "A"	Flange Thickness "B"	Bolt Circle Diameter "C"	Bolt Hole Diameter "D"	Overall Height "H"	Raised Face Height "J"
ANSI / ASME	2-in.	150 lb.	6.00 (152)	0.69 (18)	4.75 (121)	0.75 (19)	2.43 (61.7)	0.68 (17.3)
		300 lb.	6.50 (165)	0.82 (21)	5.00 (127)	0.75 (19)	2.43 (61.7)	0.68 (17.3)
		600 lb.	6.50 (165)	1.00 (25)	5.00 (127)	0.75 (19)	2.43 (61.7)	0.68 (17.3)
		1500 lb	8.50 (216)	1.50 (38)	6.50 (165)	1.00 (25)	2.57 (65.3)	0.82 (20.8)
		2500 lb	9.25 (235)	2.00 (51)	6.75 (171)	1.12 (28)	3.07 (78.0)	0.82 (20.8)
	3-in.	150 lb.	7.50 (191)	0.88 (22)	6.00 (168)	0.75 (19)	2.43 (61.7)	0.68 (17.3)
		300 lb.	8.25 (210)	1.06 (27)	6.62 (168)	0.88 (22)	2.43 (61.7)	0.68 (17.3)
		600 lb.	8.25 (210)	1.25 (32)	6.62 (168)	0.88 (22)	2.43 (61.7)	0.68 (17.3)
		900 lb	9.50 (241)	1.50 (38)	7.50 (191)	1.00 (25)	2.57 (65.3)	0.82 (20.8)
		1500 lb	10.50 (267)	1.88 (48)	8.00 (203)	1.25 (32)	3.07 (78.0)	0.82 (20.8)
		2500 lb	12.00 (305)	2.62 (67)	9.00 (229)	1.38 (35)	4.07 (103.4)	0.82 (20.8)

(1) Dimensions are in inches (millimeters).

	Pipe Size	RTJ Diameter "E"	Standard Diaphragm Diameter "F"	Outer Diameter "G"	Inner Diameter "K"	Thickness with 1/4-NPT F.C. "L"	Thickness with 1/2-NPT F.C. "L"
ANSI / ASME	2-in.	3.250 (83)	2.30 (58.4)	4.00 (102)	2.12 (54)	1.4 (36)	1.7 (43)
		3.250 (83)	2.30 (58.4)	4.25 (108)	2.12 (54)	1.4 (36)	1.7 (43)
		3.250 (83)	2.30 (58.4)	4.25 (108)	2.12 (54)	1.4 (36)	1.7 (43)
		3.750 (95)	2.30 (58.4)	4.88 (124)	2.12 (54)	1.4 (36)	1.7 (43)
		4.000 (102)	3.50 (88.9)	5.25 (133)	2.12 (54)	1.4 (36)	1.7 (43)
	3-in.	4.500 (114)	3.50 (88.9)	5.25 (133)	3.60 (91)	1.5 (38)	1.8 (46)
		4.875 (124)	3.50 (88.9)	5.75 (146)	3.60 (91)	1.5 (38)	1.8 (46)
		4.875 (124)	3.50 (88.9)	5.75 (146)	3.60 (91)	1.5 (38)	1.8 (46)
		4.875 (124)	3.50 (88.9)	6.12 (155)	3.60 (91)	1.5 (38)	1.8 (46)
		5.375 (137)	3.50 (88.9)	6.62 (168)	3.60 (91)	1.5 (38)	1.8 (46)
		5.000 (127)	3.50 (88.9)	6.62 (168)	3.60 (91)	1.5 (38)	1.8 (46)

Figure 9. RCW Flanged Remote Seal Ring Type Joint (RTJ) and Flushing Connection Ring

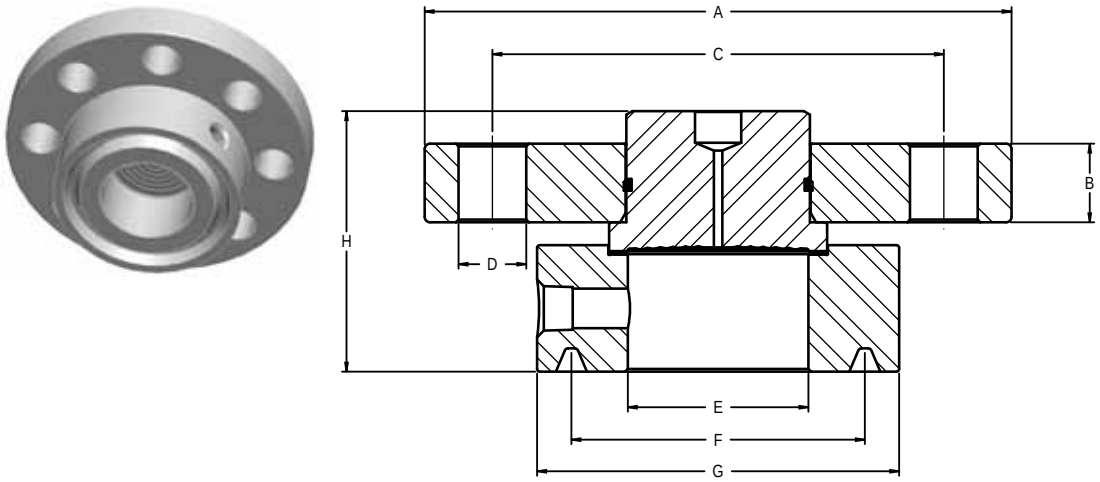


Table 65. RCW Flanged Remote Seal Dimensions(1)

	Pipe Size	Class	Flange Diameter (A)	Flange Thickness (B)	Bolt Circle Diameter (C)	Bolt Hole Diameter (D)	Lower Housing Inner Diameter (E)	RTJ Groove (F)	Lower Housing Outer Diameter (G)	Overall Height (H)	
										No or 1/4-in. NPT flush connection	1/2-in. NPT flush connection
ANSI / ASME	1/2-in.	2500 lb.	5.25 (133.4)	1.19 (30.2)	3.50 (88.9)	0.88 (22.2)	0.62 (15.7)	1.69 (42.9)	2.64 (67.1)	2.88 (73.2)	3.18 (80.8)
	3/4-in.	300/600 lb.	4.62 (117)	0.62 (15.8)	3.25 (82.6)	0.75 (19.1)	0.82 (20.8)	1.69 (42.9)	2.64 (67.1)	2.88 (73.2)	3.18 (80.8)
	3/4-in.	900/1500 lb.	5.12 (130)	1.00 (25.4)	3.50 (88.9)	0.88 (22.2)	0.82 (20.8)	1.75 (44.5)	2.64 (67.1)	2.88 (73.2)	3.18 (80.8)
	3/4-in.	2500 lb.	5.50 (140)	1.25 (31.8)	3.75 (95.3)	0.88 (22.2)	0.82 (20.8)	2.00 (50.8)	2.90 (73.7)	2.88 (73.2)	3.18 (80.8)
	1-in.	150 lb	4.25 (108)	0.50 (12.7)	3.12 (79.3)	0.625 (15.9)	1.05 (26.7)	1.88 (47.6)	2.64 (67.1)	2.88 (73.2)	3.18 (80.8)
	1-in.	300 lb	4.88 (124)	0.62 (15.8)	3.50 (88.9)	0.75 (19.1)	1.05 (26.7)	2.00 (50.8)	2.77 (70.4)	2.88 (73.2)	3.18 (80.8)
	1-in.	600 lb.	4.88 (124)	0.69 (17.5)	3.50 (88.9)	0.75 (19.1)	1.05 (26.7)	2.00 (50.8)	2.77 (70.4)	2.88 (73.2)	3.18 (80.8)
	1-in.	900/1500 lb.	5.88 (149)	1.12 (28.5)	4.00 (102)	1.00 (25.4)	1.05 (26.7)	2.00 (50.8)	2.83 (71.9)	2.88 (73.2)	3.18 (80.8)
	1-in.	2500 lb.	6.25 (159)	1.38 (35.1)	4.25 (108)	1.00 (25.4)	1.05 (26.7)	2.38 (60.3)	3.27 (83.1)	2.88 (73.2)	3.18 (80.8)
	1 1/2-in.	150 lb	5.00 (127)	0.62 (15.8)	3.88 (98.6)	0.63 (15.9)	1.61 (40.9)	2.56 (65.1)	3.27 (83.1)	2.88 (73.2)	3.18 (80.8)
	1 1/2-in.	300 lb	6.12 (155)	0.75 (19.1)	4.50 (114)	0.88 (22.2)	1.61 (40.9)	2.69 (68.3	3.58 (90.9)	2.88 (73.2)	3.18 (80.8)
	1 1/2-in.	600 lb.	6.12 (155)	0.88 (22.4)	4.50 (114)	0.88 (22.2)	1.61 (40.9)	2.69 (68.3	3.58 (90.9)	2.88 (73.2)	3.18 (80.8)
	1 1/2-in.	900/1500 lb.	7.00 (178)	1.25 (31.8)	4.88 (123.9)	1.13 (28.6)	1.61 (40.9)	2.69 (68.3	3.64 (92.5)	2.88 (73.2)	3.18 (80.8)
	1 1/2-in.	2500 lb.	8.00 (203)	1.75 (44.5)	5.75 (146)	1.25 (31.8)	1.61 (40.9)	3.25 (82.6)	4.52 (115)	2.88 (73.2)	3.18 (80.8)

(1) Dimensions are in inches (millimeters).

Figure 10. FUW Flush Flanged Type Seal - EN1092-1 Type D

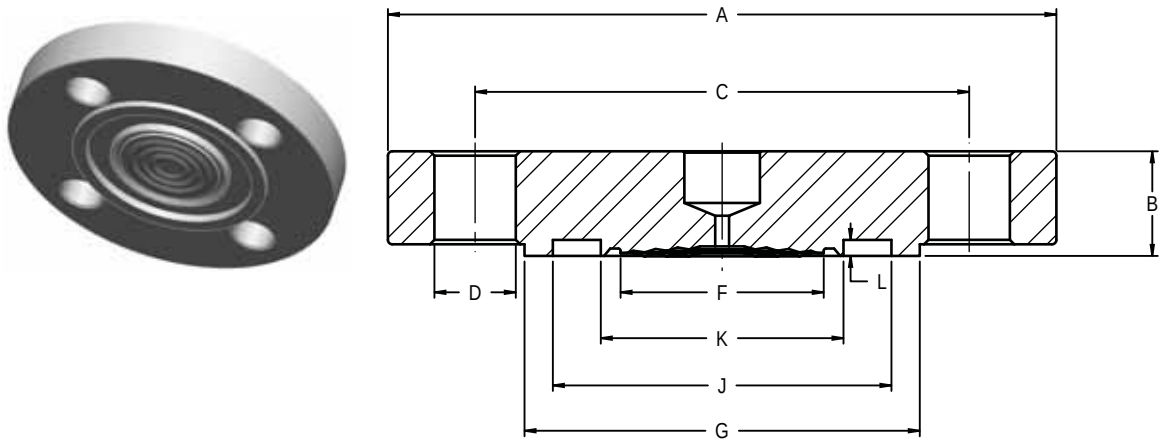


Table 66. FUW Flush Flanged Type Seal Dimensions(1)

EN 1092-1	Pipe Size	Class	Flange Diameter "A"	Flange Thickness "B"	Bolt Circle "C"	Bolt Diameter "D"	Bolts	Standard Diaphragm Diameter "F"	Raised Face Diameter "G"	Groove O.D. "J"	Groove I.D. "K"	Groove Depth "L"
	DN 50	PN 40	6.50 (165)	0.79 (20)	4.92 (125)	0.71 (18)	4	2.30 (58)	4.00 (102)	3.46 (88)	2.83 (72)	0.16 (4.0)
	DN 80	PN 40	7.87 (200)	0.94 (24)	6.30 (160)	0.71 (18)	8	3.50 (89)	5.43 (138)	4.76 (121)	4.13 (105)	0.16 (4.0)

(1) Measurement in inches (millimeters).

Figure 11. FVW Flush Flanged Type Seal - EN1092-1 Type C

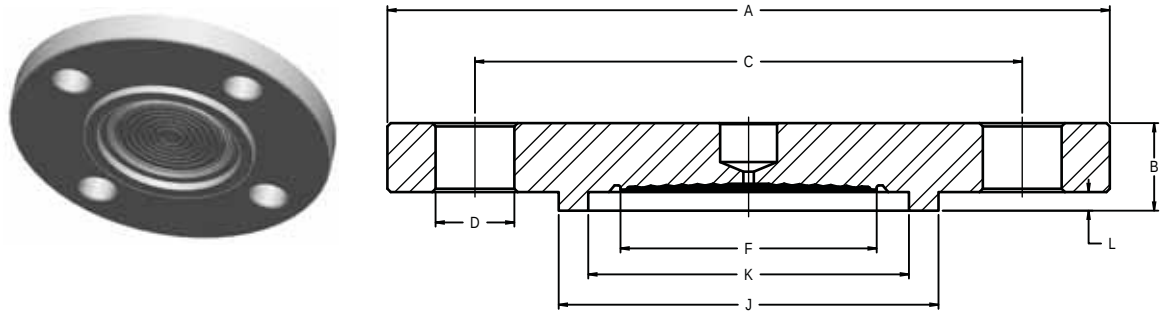
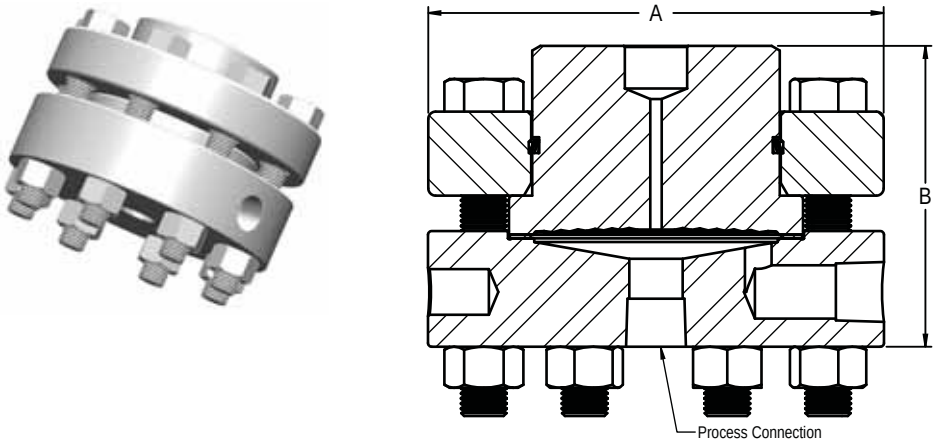


Table 67. FVW Flush Flanged Type Seal Dimensions(1)

EN 1092-1	Pipe Size	Class	Flange Diameter "A"	Flange Thickness "B"	Bolt Circle "C"	Bolt Diameter "D"	Bolts	Standard Diaphragm Diameter "F"	Tongue O.D. "J"	Tongue I.D. "K"	Tongue Height "L"
	DN 50	PN 40	6.50 (165)	0.79 (20)	4.92 (125)	0.71 (18)	4	2.30 (58)	3.43 (87)	2.87 (73)	0.18 (4.5)
	DN 80	PN 40	7.87 (200)	0.94 (24)	6.30 (160)	0.71 (18)	8	3.50 (89)	4.72 (120)	4.17 (106)	0.18 (4.5)

(1) Measurement in inches (millimeters).

Figure 12. RTW Threaded Seal



Dimensions are in inches (millimeters)

Table 68. RTW Threaded Seal Dimensions(1)

Rating	Overall Diameter (A)	Overall Height (B)	
		No or 1/4-in. NPT flush connection	1/2-in. NPT flush connection
2500 psi (172 bar)	3.74 (95.0)	2.47 (62.7)	2.82 (71.6)
5000 psi (345 bar)	3.74 (95.0)	1.95 (49.5)	2.31 (58.6)
10000 psi (690 bar)	4.00 (101.6)	1.95 (49.5)	—

(1) Dimensions are in inches (millimeters).

Figure 13. HTS Threaded Flush Type Seal

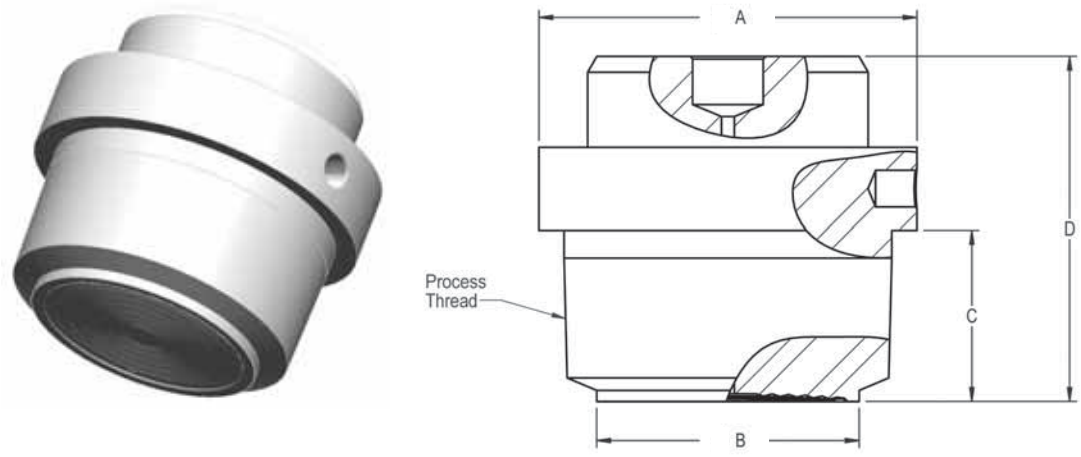


Table 69. HTS Threaded Flush Type Seal Dimensions(1)

Process Type	Connection Size	Outer Diameter (A)	Diaphragm Diameter (B)	Length (C)	Overall Height (D)
ANSI NPT	1-in NPT	2.03 (51.6)	1.10 (27.9)	1.24 (31.5)	2.50 (63.5)
	1 1/2-in. NPT	2.36 (59.9)	1.70 (43.2)	1.24 (31.5)	2.50 (63.5)
	2-in. NPT	2.74 (69.6)	1.90 (48.3)	1.24 (31.5)	2.50 (63.5)
EN 10226 BSP	G1 BSP	2.03 (51.6)	1.10 (27.9)	0.87 (22.0)	2.15 (54.6)
	G1 1/2 BSP	2.36 (59.9)	1.70 (43.2)	0.98 (24.9)	2.24 (56.9)
	G2 BSP	2.74 (69.6)	1.90 (48.3)	1.24 (31.5)	2.50 (63.5)

(1) Dimensions are in inches (millimeters).

Figure 14. SCW Tri-Clamp Seal

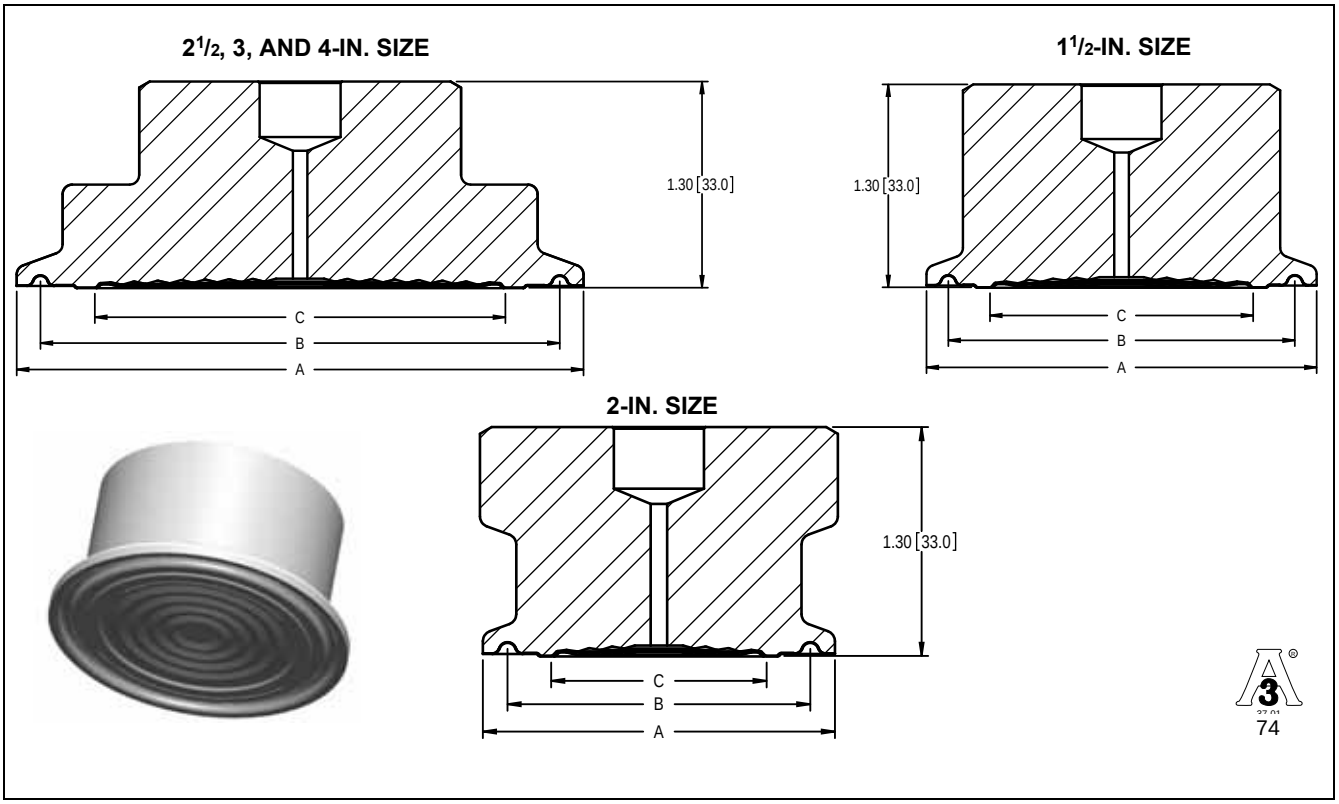


Table 70. SCW Tri-Clamp Seal Dimensions(1)

Pipe Size	Outer Diameter (A)	O-RIng Groove Diameter (B)	Diaphragm Diameter (C)
1 1/2-in.	2.000 (50.80)	1.720 (43.69)	1.214 (30.84)
2-in.	2.500 (63.50)	2.220 (56.39)	1.675 (42.55)
2 1/2-in.	3.047 (77.39)	2.780 (70.61)	2.072 (52.63)
3-in.	3.580 (90.93)	3.280 (83.31)	2.582 (65.58)
4-in.	4.680 (118.87)	4.350 (110.49)	3.662 (93.01)

(1) Dimensions are in inches (millimeters).

Figure 15. SSW Tank Spud Seal

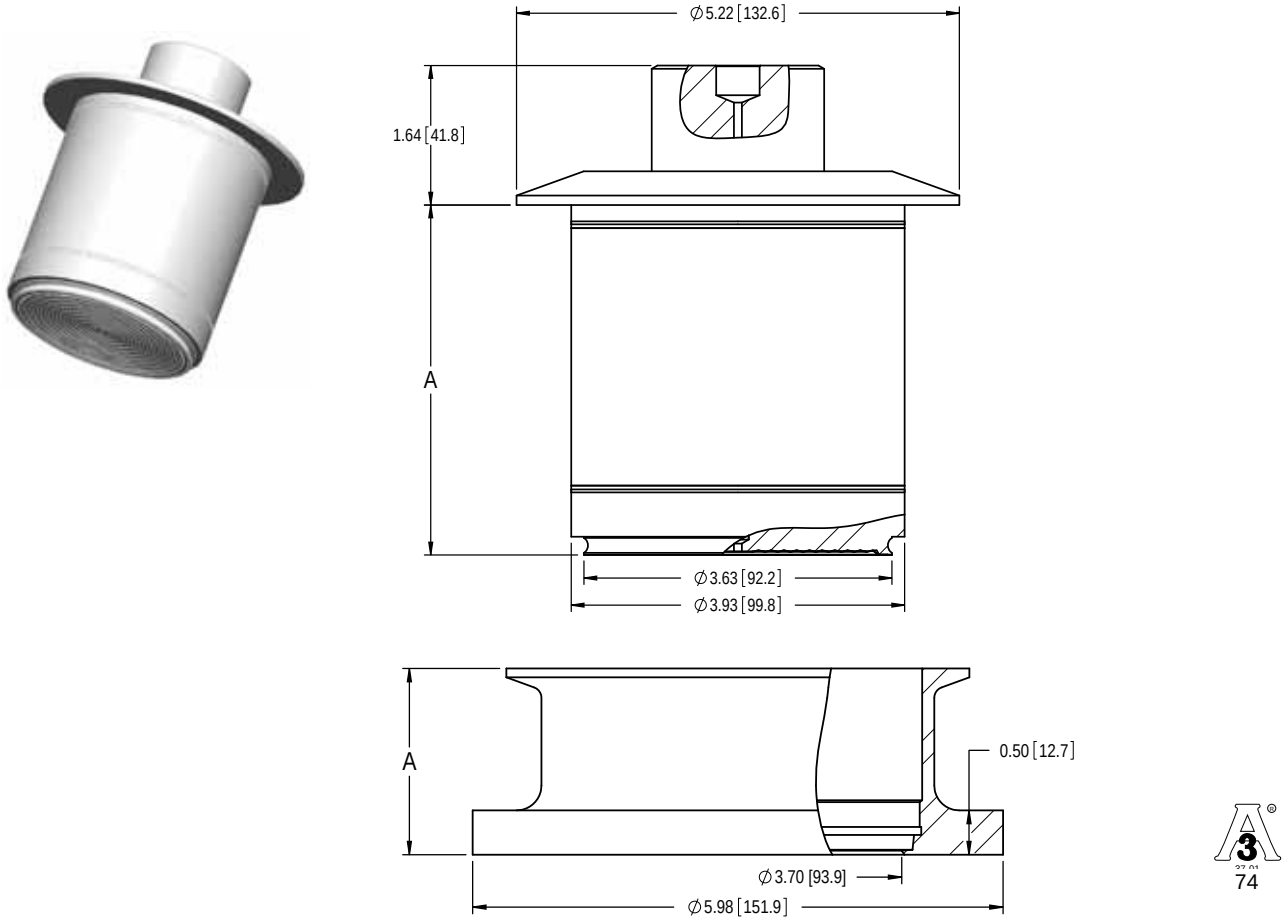
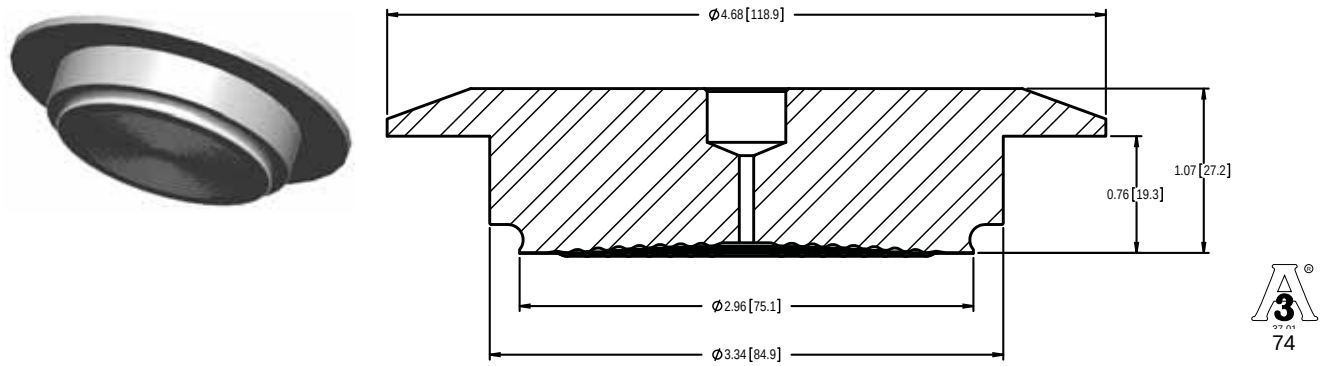


Table 71. SSW Tank Spud Seal Dimensions(1)

Pipe Size	Length	A
4-in. SCH 5	2-in. Long	2.10 (53.3)
	6-in. Long	6.10 (154.9)

(1) Dimensions are in inches (millimeters).

Figure 16. STW Hygienic Thin Wall Tank Spud Seal



Dimensions are in inches (millimeters)

Figure 17. EES Hygienic Flanged Tank Spud Extended Seal

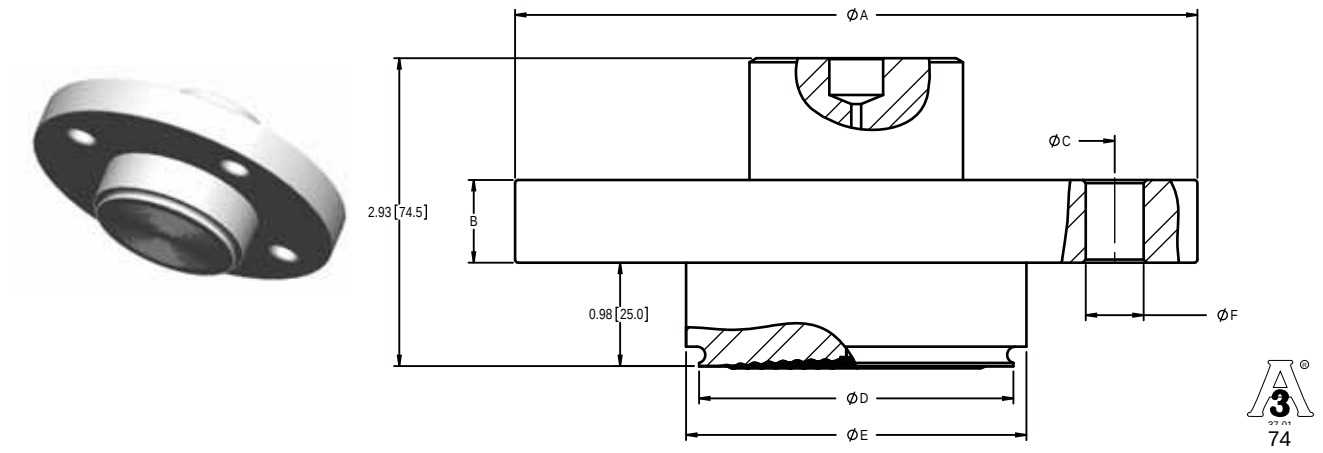


Table 72. EES Hygienic Flanged Tank Spud Extended Seal Dimensions(1)

Pipe Size	A	B	Bolts	C	D	E	F
DN50	6.50 (165.0)	0.79 (20.0)	4	4.92 (125.0)	2.99 (76.0)	3.24 (82.3)	0.55 (14.0)
DN80	7.87 (200.0)	0.94 (24.0)	8	6.30 (160.0)	4.04 (102.7)	4.24 (107.8)	0.55 (14.0)

(1) Dimensions are in inches (millimeters).

Figure 18. VCS Tri-clamp In-Line Seal

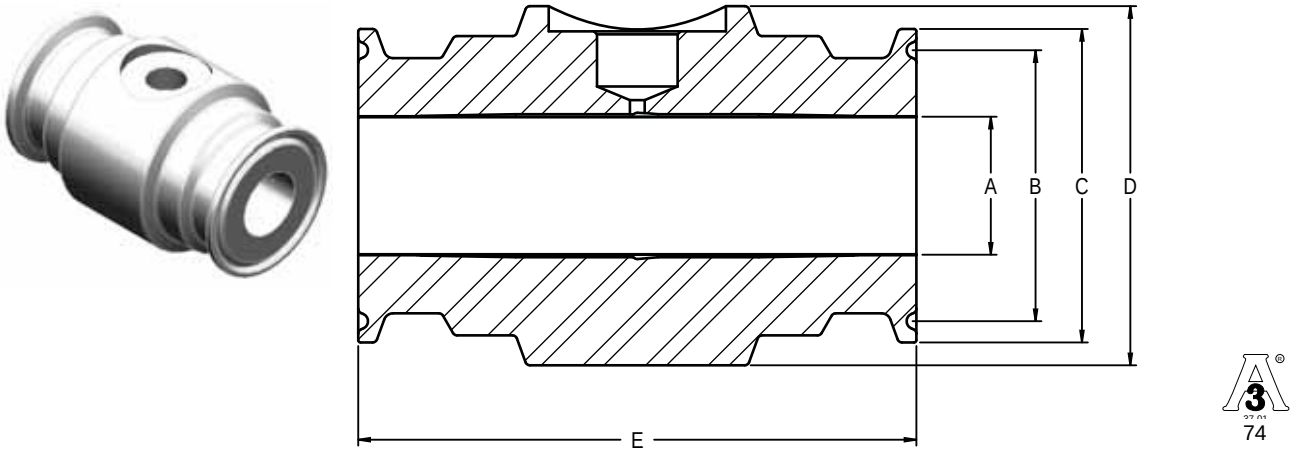
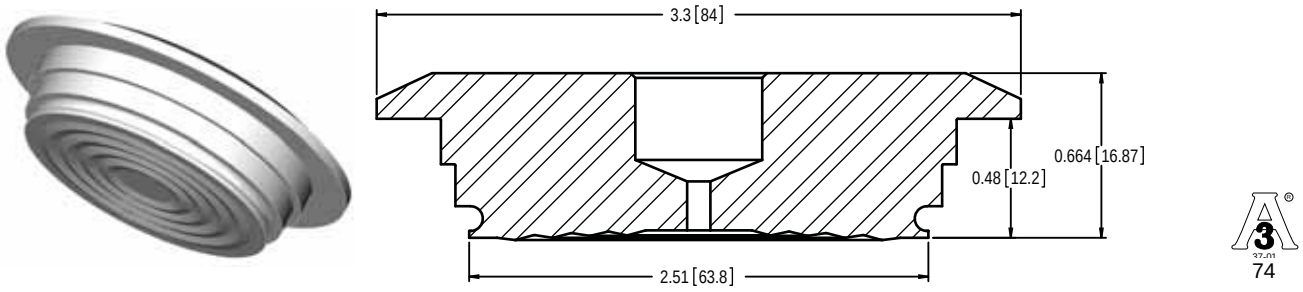


Table 73. VCS Tri-clamp In-Line Seal Dimensions(1)

Pipe Size	A	B	C	D	E
1-in.	0.870 (22.10)	1.720 (43.69)	1.990 (50.55)	2.28 (57.9)	3.54 (90.0)
1½-in.	1.370 (34.80)	1.720 (43.69)	1.990 (50.55)	2.73 (69.3)	3.54 (90.0)
2-in.	1.870 (47.50)	2.220 (56.39)	2.520 (64.01)	3.19 (81.0)	3.54 (90.0)
3-in.	2.870 (72.90)	3.280 (83.31)	3.580 (90.93)	4.14 (105.2)	3.54 (90.0)
4-in.	3.820 (97.03)	4.350 (110.49)	4.690 (119.13)	5.06 (128.5)	3.54 (90.0)

(1) Dimensions are in inches (millimeters).

Figure 19. SVS Varivent Compatible Connection Seal



Dimensions are in inches (millimeters)

Figure 20. SHP Cherry-Burrell “I” Line Seal

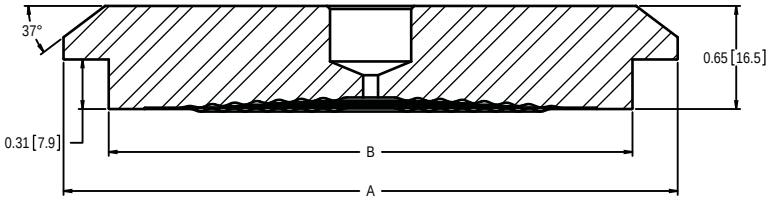


Table 74. SHP Cherry-Burrell “I” Line Seal Dimensions(1)

Size	A	B
2-in.	2.640 (67.06)	2.240 (56.90)
3-in.	3.875 (98.43)	3.305 (83.95)

(1) Dimensions are in inches (millimeters).

Figure 21. SLS Hygienic Dairy Process Connection Female Thread Seal per DIN 11851

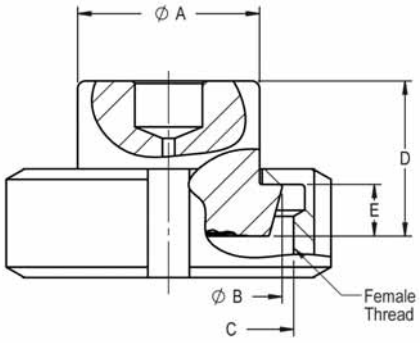
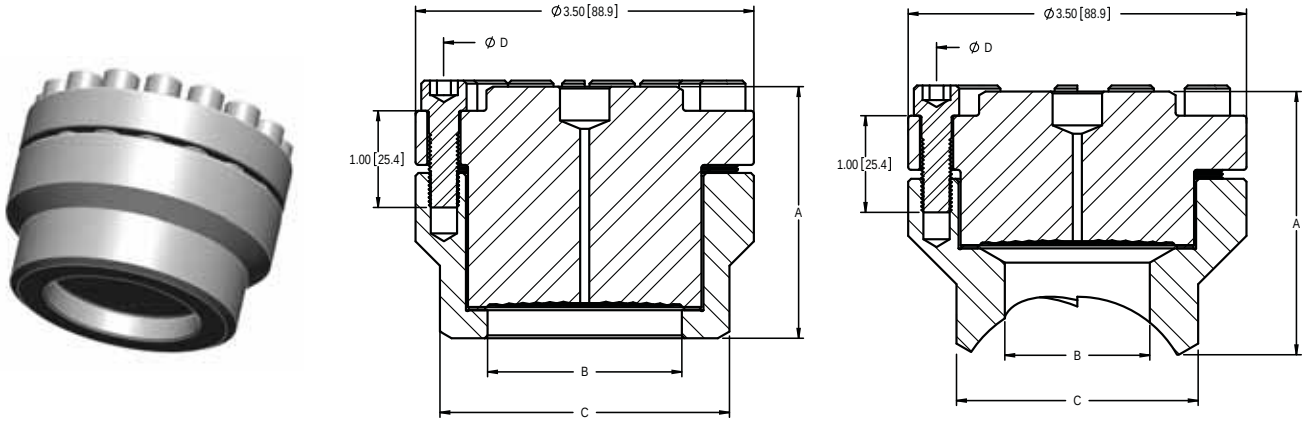


Table 75. SLS Hygienic Dairy Process Connection Female Thread Seal per DIN 11851 Dimensions(1)

Female Thread	Process Size / Rating	A	B	Thread (C)	D	E
DIN 11851	DN 40 PN 40	1.89 (48.0)	2.20 (56.0)	Rd 65 X 1/6-in.	1.18 (30.0)	0.39 (10.0)
	DN 50 PN 25	2.40 (61.0)	2.70 (68.5)	Rd 78 X 1/6-in.	1.22 (31.0)	0.43 (11.0)

(1) Dimensions are in inches (millimeters).

Figure 22. WSP Saddle Seal



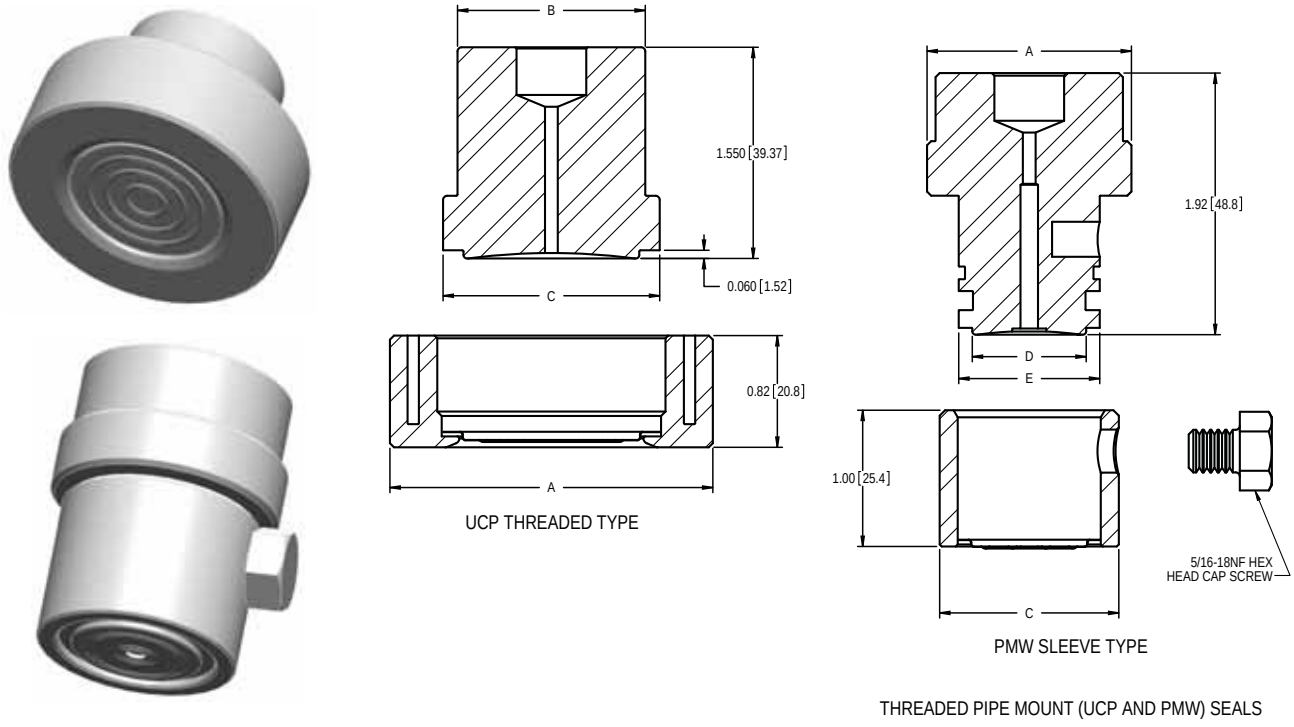
Dimensions are in inches (millimeters)

Table 76. WSP Saddle Seal Dimensions[(1)]

Size	A	B	C	D	
				6 Bolts	8 Bolts
2-in.	2.72 (69.1)	1.50 (38.1)	2.50 (63.5)	2.99 (75.9)	2.91 (78.0)
3-in.	2.46 (62.5)	2.01 (51.1)	3.02 (76.7)	2.99 (75.9)	2.91 (78.0)
4-in. and larger	2.60 (66.0)	2.01 (51.1)	3.00 (76.1)	2.99 (75.9)	2.91 (78.0)

(1) Dimensions are in inches (millimeters).

Figure 23. UCP and PMW Threaded Pipe Mount Seals



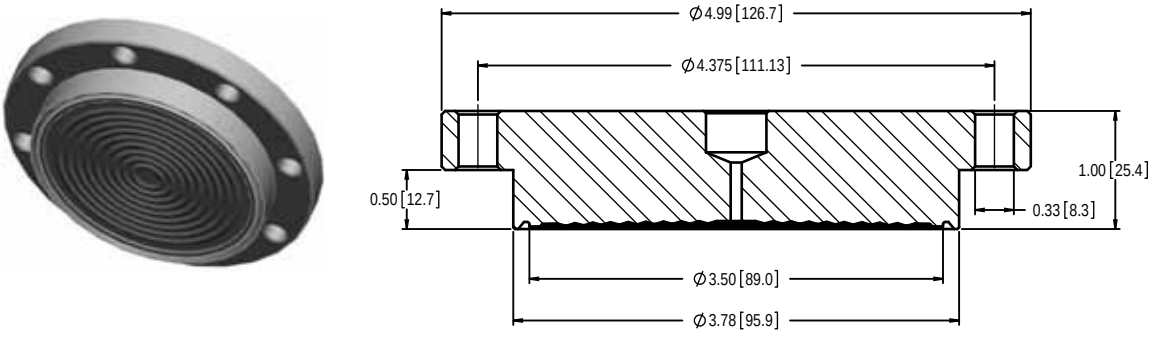
Dimensions are in inches (millimeters)

Table 77. UCP and PMW Threaded Pipe Mount Seals Dimensions(1)

Size	Diameter (A)	Diameter (B)	Diameter (C)	Diameter (D)	Diameter (E)
Sleeve 1-in. Pipe	1.50 (38.1)	—	1.32 (33.5)	0.85 (21.6)	1.05 (26.7)
Threaded M44 X 1.25	2.37 (60.2)	1.38 (35.1)	1.59 (40.4)	—	—

(1) Dimensions are in inches (millimeters).

Figure 24. CTW Chemical Tee Seal



Dimensions are in inches (millimeters)

Figure 25. TFS Wafer Style In-Line Seal

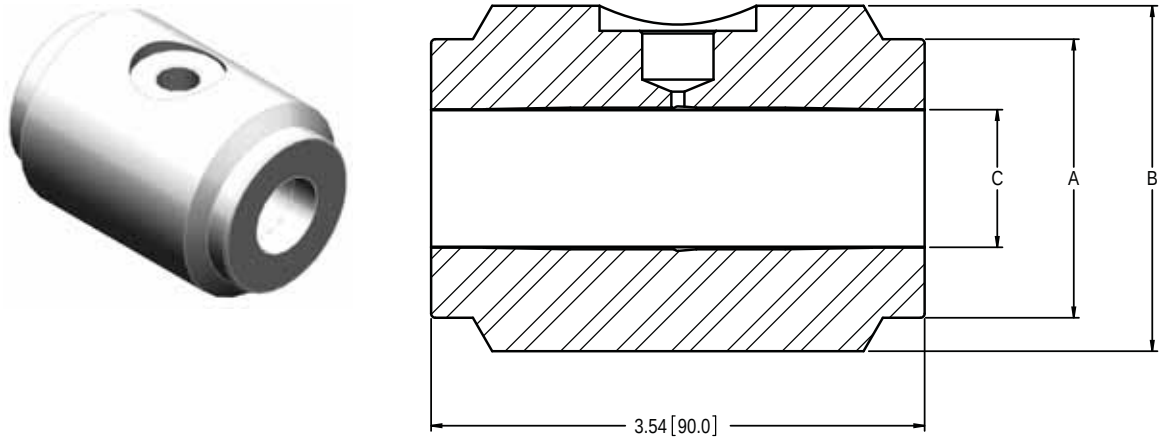
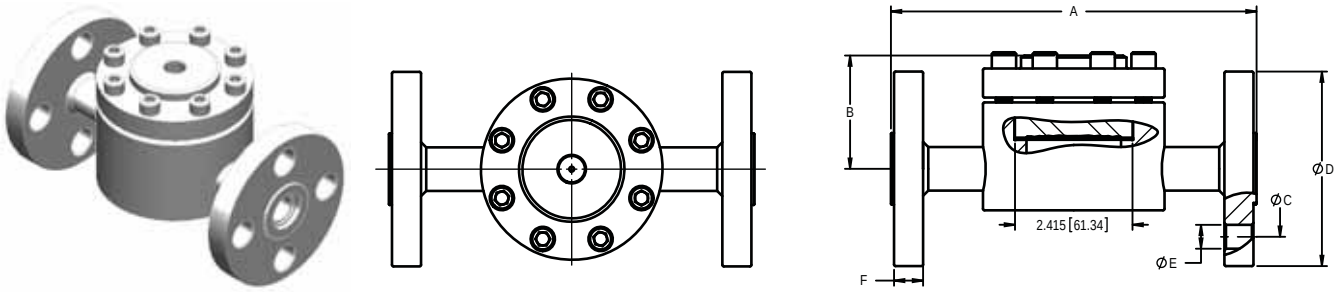


Table 78. TFS Wafer Style In-Line Seal Dimensions(1)

Pipe Size	A	B	C
1-in.	2.00 (50.8)	2.64 (67.0)	1.090 (27.69)
1 1/2-in.	2.88 (73.2)	3.23 (82.0)	1.614 (41.00)
2-in.	3.62 (91.9)	3.74 (95.0)	2.070 (52.58)
2 1/2-in.	4.12 (104.6)	4.21 (107.1)	2.480 (62.99)
3-in.	5.00 (127.0)	5.00 (127.0)	3.070 (77.98)
4-in.	6.00 (152.4)	6.00 (152.4)	4.000 (101.60)
DN25	2.68 (68.0)	2.72 (69.0)	1.090 (27.69)
DN40	3.46 (88.0)	3.46 (88.0)	1.614 (41.00)
DN50	4.02 (102.0)	4.09 (104.0)	1.992 (50.60)
DN80	5.43 (138.0)	5.47 (139.0)	3.236 (82.19)
DN100	6.38 (162.0)	6.46 (164.0)	4.216 (107.09)

(1) Dimensions are in inches (millimeters).

Figure 26. WFW Flow-Thru Flanged Seal



Dimensions are in inches (millimeters)

Table 79. WFW Flow-Thru Flanged Seal Dimensions (1)

Class (lb.)	Nominal Pipe Size (in.)	Overall Length ± 0.05	Upper to Centerline Height	Bolt Circle Diameter	Outside Diameter	Bolt Hole	Flange Thickness
		A	B	C	D	E	F
150	1	7.00 (177.8)	2.28 (57.91)	3.12 (79)	4.25 (108)	0.62 (16)	0.50 (13)
	2	9.00 (228.6)	3.21 (81.6)	4.75 (121)	6.00 (152)	0.75 (19)	0.69 (18)
	3	11.00 (279.4)	3.50 (88.9)	6.00 (152)	7.50 (191)	0.75 (19)	0.88 (22)

(1) Dimensions are in inches (millimeters).

Rosemount DP Level

Product Data Sheet
00813-0100-4016, Rev JA
April 2010

Rosemount Level Solutions

Emerson provides a complete range of Rosemount products for level measurement applications.

Pressure – Level or Interface Measurement

Emerson has a complete line of Rosemount pressure transmitters and remote seals for measuring level or interfaces in liquid applications. Optimize performance with direct mount, Tuned Seal systems:

- Rosemount 3051S_L, 3051L, and 2051L Liquid Level Transmitters
- Rosemount 1199 Remote Diaphragm Seals with direct mount or capillary connections

Vibrating Fork Switches – Point Level Detection

The Rosemount 2100 Series is developed for reliable point level detection of liquids and consists of:

- Rosemount 2110 Compact Vibrating Fork Liquid Level Switch
- Rosemount 2120 Full-featured Vibrating Fork Liquid Level Switch

Guided Wave Radar – Level and Interface Measurement

Multivariable, loop-powered Guided Wave Radar transmitters with a wide range of probe styles to fit different liquids and solids applications. The product line consists of:

- Rosemount 3300 Series – Versatile and easy-to-use transmitter with proven reliability
- Rosemount 5300 Series – Accurate, superior performance transmitter with FOUNDATION™ fieldbus support

Non-contacting Radar – Level Measurement

The Rosemount non-contacting radar family consists of:

- Rosemount 5400 Series Transmitters – Loop-powered superior performance transmitter with a wide range of antennas, for liquid level measurement in most applications and process conditions
- Rosemount 5600 Series Transmitters – Power of 4-wire give maximum sensitivity and performance for solids, challenging reactors, rapid level changes and excessive process conditions.

Non-contacting Ultrasonic – Level Measurement

The Rosemount 3100 Series ultrasonic level transmitters provide continuous non-contacting level measurement of liquids. The range consisits of:

- Rosemount 3101 for simple continuous level measurement
- Rosemount 3102 for continuous measurement with two integral relays for local control functionality
- Rosemount 3105 Intrinsically safe certified version for hazardous areas

Many other special order transmitter/seal configurations, materials and fill fluids are available that are not covered in this document. Contact your Rosemount representative or consult factory for additional information.

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