

Rosemount 3051SF DP Flowmeters



- Direct or remote mount configurations available
- 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 percent-of-reading performance over 14:1 flow turndown
- 10-year stability, 12-year warranty

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, Wireless, and FOUNDATION fieldbus protocols
- Ultra for Flow for improved flow performance across wider flow ranges
- Integral temperature measurement (Option Code T)
- Advanced Diagnostics (Option Code DA2)
- Direct or remote mount configurations available

Additional Information

Specifications: [page 29](#)

Dimensional Drawings: [page 50](#)

Contents

Rosemount 3051SF DP Flowmeters [page 2](#)

 Rosemount 3051SFA Annubar Flowmeter Ordering Information [page 3](#)

 Rosemount 3051SFC Compact Orifice Flowmeter Ordering Information [page 13](#)

 Rosemount 3051SFP Integral Orifice Flowmeter Ordering Information [page 21](#)

3051SF Series Specifications [page 29](#)

3051SF Measurement Type 1-7 Certifications [page 40](#)

3051SF Measurement Type D Certifications [page 43](#)

3051SF Wireless Certifications [page 48](#)

Dimensional Drawings [page 50](#)

Installation and Flowmeter Orientation [Click Here](#)



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
		D	1-7	— = Unavailable
3051SFA	Annubar Flowmeter	•	•	
Measurement Type				
Standard				Standard
1	Fully Compensated Mass & Energy Flow Calculations – Differential & Static Pressures w/Temperature	—	•	★
2	Compensated Flow Calculations – Differential & Static Pressures	—	•	★
3	Compensated Flow Calculations – Differential Pressure & Temperature	—	•	★
4	Compensated Flow Calculations – Differential Pressure	—	•	★
D	Differential Pressure	•	—	★
Expanded				
5	Process Variables Only (No Flow Calculations) – Differential & Static Pressures with Temperature	—	•	
6	Process Variables Only (No Flow Calculations) – Differential & Static Pressures	—	•	
7	Process Variables Only (No Flow Calculations)	—	•	
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)	•	•	

Table 1. Rosemount 3051 SFA 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.

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)	•	•	
Expanded				
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				
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				
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				
H	Horizontal Piping	•	•	★
D	Vertical Piping with Downwards Flow	•	•	★
U	Vertical Piping with Upwards Flow	•	•	★
Annubar Type		D	1-7	
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				
S	316 Stainless Steel	•	•	★

Table 1. Rosemount 3051 SFA 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						
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			•	•	★
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						
	<i>Packing Gland Material</i>	<i>Rod Material</i>	<i>Packing Material</i>			
J ⁽³⁾	Stainless Steel Packing Gland / Cage Nipple	Carbon Steel	PTFE	•	•	
K ⁽³⁾	Stainless Steel Packing Gland / Cage Nipple	Stainless Steel	PTFE	•	•	
L ⁽³⁾	Stainless Steel Packing Gland / Cage Nipple	Carbon Steel	Graphite	•	•	
N ⁽³⁾	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				D	1-7	
Standard						Standard
0 ⁽¹⁾	Not Applicable or Customer Supplied			•	•	★

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.

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 ⁽⁴⁾	Integral RTD – not available with Flanged model greater than class 600#	•	•	★
0 ⁽⁵⁾	No Temperature Sensor	•	•	★
Expanded				
R ⁽⁴⁾	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 ₂ O (0 to 62.3 mbar)	•	•	★
2	0 to 250 in H ₂ O (0 to 623 mbar)	•	•	★
3	0 to 1000 in H ₂ O (0 to 2.5 bar)	•	•	★
Static Pressure Range				
Standard				Standard
A ⁽⁶⁾	None	•	•	★
D	Absolute 0 to 800 psia (0 to 55.2 bar)	—	•	★
E ⁽⁷⁾	Absolute 0 to 3626 psia (0 to 250 bar)	—	•	★
J	Gage -14.2 to 800 psig (-0.979 to 55.2 bar)	—	•	★
K ⁽⁷⁾	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 ⁽⁸⁾	Wireless (Requires wireless options and Wireless Plantweb housing)	•	—	★

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.

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	•	—	★
				D	1-7	
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 ⁽⁹⁾	Wireless PlantWeb housing	Aluminum	1/2-14 NPT	•	—	★
5J ⁽⁹⁾	Wireless PlantWeb housing	SST	1/2-14 NPT	•	—	★
7J ⁽⁸⁾⁽¹⁰⁾	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: 1.15% 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 0.95% flow rate accuracy, 8:1 flow turndown, 10-year stability, limited 12-year warranty			•	—	★
2	Classic: up to 1.4% flow rate accuracy, 8:1 flow turndown, 5-year stability			•	—	★
3 ⁽¹¹⁾	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				
WA	User Configurable Update Rate		•	—
Operating Frequency and Protocol				
Standard				
3	2.4 GHz DSSS, IEC 62591 (WirelessHART)		•	—

Table 1. Rosemount 3051 SFA 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.

Omnidirectional Wireless Antenna				
Standard				
WK	External Antenna	•	—	★
WM	Extended Range, External Antenna	•	—	★
Expanded				
WN	High-Gain, Remote Antenna	•	—	
SmartPower™				
Standard				
1 ⁽¹²⁾	Adapter for Black Power Module (I.S. Power Module Sold Separately)	•	—	★

Other Options (Include with selected model number)

Pressure Testing				
Expanded				
p1 ⁽¹³⁾	Hydrostatic Testing with Certificate	•	•	
pX ⁽¹³⁾	Extended Hydrostatic Testing	•	•	
Special Cleaning				
Expanded				
P2	Cleaning for Special Services	•	•	
PA	Cleaning per ASTM G93 level D (section 11.4)	•	•	
Material Testing		D	1-7	
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				
QC1	Visual & Dimensional Inspection with Certificate	•	•	★
QC7	Inspection & Performance Certificate	•	•	★
Surface Finish				
Standard				
RL	Surface finish for Low Pipe Reynolds Number in Gas & Steam	•	•	★
RH	Surface finish for High Pipe Reynolds Number in Liquid	•	•	★
Material Traceability Certification				
Standard				
Q8 ⁽¹⁴⁾	Material Traceability Certificate per EN 10204:2004 3.1	•	•	★
Code Conformance				
Expanded				
J2 ⁽¹⁵⁾	ANSI / ASME B31.1	•	•	
J3 ⁽¹⁵⁾	ANSI / ASME B31.3	•	•	

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.

Material Conformance				
Expanded				
J5 ⁽¹⁶⁾	NACE MR-0175 / ISO 15156	•	•	
Country Certification				
Standard				
J6	European Pressure Directive (PED)	•	•	Standard ★
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				
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				
Y1	Mounting Hardware Shipped Separately	•	•	★
Special Dimensions		D	1-7	
Expanded				
VM	Variable Mounting	•	•	
VT	Variable Tip	•	•	
VS	Variable length Spool Section	•	•	
Transmitter Calibration Certification				
Standard				
Q4	Calibration Certificate for Transmitter	•	•	★
QP	Calibration Certificate & Tamper Evident Seal	•	•	★
Quality Certification For Safety				
Standard				
QS ⁽¹⁹⁾⁽²⁵⁾	Prior-use Certificate of FMEDA data	•	—	★
QT ⁽¹⁸⁾⁽¹⁹⁾⁽²⁵⁾	Safety certified to IEC 61508 with certificate of FMEDA data	•	—	★
Product Certifications				
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)	•	•	★

Table 1. Rosemount 3051 SFA 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.

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 ⁽¹⁷⁾	CSA Explosion-proof, Dust Ignition-proof, Division 2	•	•	★
Standard				Standard
I6	CSA Intrinsically Safe	•	•	★
K6 ⁽¹⁷⁾	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 ⁽¹⁷⁾	ATEX and CSA Explosion-proof, Intrinsically Safe, Division 2 (combination of E1, I1, E6, and I6)	•	•	★
KB ⁽¹⁷⁾	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 ⁽¹⁷⁾	FM, CSA, and ATEX Explosion-proof, Intrinsically Safe (combination of E5, I5, E6, I6, E1, and I1)	•	•	★
Shipboard Approvals				
Standard				Standard
SBS	American Bureau of Shipping	•	•	★
Sensor Fill Fluid and O-ring Options				
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⁽¹⁸⁾				
Standard				Standard
M5	PlantWeb LCD display (Requires PlantWeb housing)	•	•	★
M7 ⁽¹⁹⁾⁽²⁰⁾⁽²¹⁾	Remote mount LCD display and interface, PlantWeb housing, no cable; SST bracket	•	•	★
M8 ⁽¹⁹⁾⁽²⁰⁾	Remote mount LCD display and interface, PlantWeb housing, 50 ft. (15 m) cable; SST bracket	•	•	★
M9 ⁽¹⁹⁾⁽²⁰⁾	Remote mount LCD display and interface, PlantWeb housing, 100 ft. (31 m) cable; SST bracket	•	•	★
Transient Protection				
Standard				Standard
T1 ⁽²²⁾	Transient terminal block	•	•	★
Manifold for Remote Mount Option		D	1-7	
Standard				Standard
F2	3-Valve Manifold, Stainless Steel	•	•	★
F6	5-Valve Manifold, Stainless Steel	•	•	★

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.

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				
Standard				Standard
A01	FOUNDATION fieldbus Advanced Control Function Block Suite	•	—	★
PlantWeb Diagnostic Functionality				
Standard				Standard
D01	FOUNDATION fieldbus Diagnostics Suite	•	—	★
DA2 ⁽²³⁾	Advanced HART Diagnostic Suite	•	—	★
PlantWeb Enhanced Measurement Functionality				
Standard				Standard
H01 ⁽²⁴⁾	FOUNDATION fieldbus Fully Compensated Mass Flow Block	•	—	★
Cold Temperature				
Standard				Standard
BRR	-60 °F (-51 °C) Cold Temperature Start-up	—	•	★
Alarm Limit⁽¹⁹⁾⁽²⁵⁾				
Standard				Standard
C4	NAMUR Alarm & Saturation Levels, High Alarm	•	•	★
C5	NAMUR Alarm & 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 ⁽¹⁹⁾⁽²⁵⁾⁽²⁶⁾	Hardware Adjustments (zero, span, alarm, security)	•	—	★
D4	External Ground Screw Assembly	•	•	★
DA ⁽¹⁹⁾⁽²⁵⁾⁽²⁶⁾	Hardware Adjustments (zero, span, alarm, security) & External Ground Screw Assembly	•	—	★
Conduit Plug				
Standard				Standard
DO	316 SST Conduit Plug (<i>standard for all 3051SF Models</i>)	•	•	★
Conduit Electrical Connector				
Standard				Standard
GE ⁽²⁷⁾	M12, 4-pin, Male Connector (<i>eurofast</i> [®])	•	•	★
GM ⁽²⁷⁾	A size Mini, 4-pin, Male Connector (<i>minifast</i> [®])	•	•	★
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) The cage nipple is constructed of 304SST.

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

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

- (6) Required for Measurement Type codes 3, 4, 7, and D.
- (7) 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).
- (8) 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).
- (9) Only available with output code X.
- (10) Available with output code A only.
- (11) Only available with differential pressure ranges 2 and 3, and silicone fill fluid.
- (12) Long-life Power Module must be shipped separately, order Part No. 00753-9220-0001.
- (13) Applies to assembled flowmeter only, mounting not tested.
- (14) Instrument Connections for Remote Mount Options and Isolation Valves for Flo-tap Models are not included in the Material Traceability Certification.
- (15) Not available with Transmitter Connection Platform 6.
- (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) Not available with M20 or G ½ conduit entry size.
- (18) Not available with housing code 7J.
- (19) Not available with output code X.
- (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 Housing code 5A, 5J, 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.
- (23) Includes Hardware Adjustments (option code D1) as standard. Not available with output code X.
- (24) Requires Rosemount Engineering Assistant version 5.5.1 to configure.
- (25) Not available with Output Protocol code F.
- (26) Not available with housing style codes 2E, 2F, 2G, 2M, 5A, 5J, or 7J.
- (27) Not available with Housing code 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 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				
1	Fully Compensated Mass & Energy Flow Calculations – Differential & Static Pressures w/ Temperature	—	•	★
2	Compensated Flow Calculations – Differential & Static Pressures	—	•	★
3	Compensated Flow Calculations – Differential Pressure & Temperature	—	•	★
4	Compensated Flow Calculations – Differential Pressure	—	•	★
D	Differential Pressure	•	—	★
Expanded				
5	Process Variables Only (No Flow Calculations) – Differential & Static Pressures with Temperature	—	•	
6	Process Variables Only (No Flow Calculations) – Differential & Static Pressures	—	•	
7	Process Variables Only (No Flow Calculations)	—	•	
Primary Element Technology				
Standard				
A	Annubar® Averaging Pilot Tube	•	•	★
C	Conditioning Orifice Plate	•	•	★
P	Orifice Plate	•	•	★
Material Type				
Standard				
S	316 SST	•	•	★
Line Size				
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 ⁽²⁾⁽³⁾	10-in. (250 mm) ⁽²⁾⁽³⁾	•	•	★
120 ⁽²⁾⁽³⁾	12-in. (300 mm) ⁽²⁾⁽³⁾	•	•	★

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.

Primary Element Type							
Standard						Standard	
N000	Annubar Sensor Size 1			•	•	★	
N040	0.40 Beta Ratio (β)			•	•	★	
N065 ⁽⁴⁾	0.65 Beta Ratio (β)			•	•	★	
Temperature Measurement							
Standard						Standard	
T ⁽⁶⁾	Integral RTD			—	•	★	
0 ⁽⁵⁾	No Temperature Sensor			•	•	★	
Expanded							
R ⁽⁶⁾	Remote Thermowell and RTD			•	•		
Transmitter Connection Platform				D	1-7		
Standard						Standard	
3	Direct-mount			•	•	★	
7	Remote-mount, NPT Connections			•	•	★	
Differential Pressure Range							
Standard						Standard	
1	0 to 25 inH ₂ O (0 to 62.3 mbar)			•	•	★	
2	0 to 250 inH ₂ O (0 to 623 mbar)			•	•	★	
3	0 to 1000 inH ₂ O (0 to 2.5 bar)			•	•	★	
Static Pressure Range							
Standard						Standard	
A ⁽⁷⁾	None			•	•	★	
D	Absolute 0 to 800 psia (0 to 55.2 bar)			—	•	★	
E ⁽⁸⁾	Absolute 0 to 3626 psia (0 to 250 bar)			—	•	★	
J	Gage -14.2 to 800 psig (-0.979 to 55.2 bar)			—	•	★	
K ⁽⁸⁾	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 ⁽⁹⁾	FOUNDATION fieldbus protocol			•	—	★	
X ⁽¹⁰⁾⁽¹¹⁾	Wireless			•	—	★	
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	•	—	★

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.

		Material	Conduit Entry Size			
Standard						Standard
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 ⁽¹²⁾	Wireless PlantWeb housing	Aluminum	1/2-14 NPT	•	—	★
5J ⁽¹²⁾	Wireless PlantWeb housing	SST	1/2-14 NPT	•	—	★
7J ⁽¹⁰⁾⁽¹³⁾	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: 0.75% flow rate accuracy, 14:1 flow turndown, 10-yr stability, limited 12-yr warranty			•	•	★
5	Classic MV: 1.10% flow rate accuracy, 8:1 flow turndown, 5-yr stability			—	•	★
3051S Single Variable SuperModule, Measurement Types 3, 4, 7, and D				•	•	
1	Ultra: 0.90% flow rate accuracy, 8:1 flow turndown, 10-yr stability, limited 12-yr warranty			•	—	★
2	Classic: 1.40% flow rate accuracy, 8:1 flow turndown, 5-yr stability			•	—	★
3 ⁽¹⁴⁾	Ultra for Flow: 0.75% 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				
WA	User Configurable Update Rate	•	—	★
Operating Frequency and Protocol				
Standard				
3	2.4 GHz DSSS, IEC 62591 (WirelessHART)	•	—	★
Omnidirectional Wireless Antenna				
Standard				
WK	External Antenna	•	—	★
WM	Extended Range, External Antenna	•	—	★
Expanded				
WN	High-Gain, Remote Antenna	•	—	
SmartPower™				
Standard				
1 ⁽¹⁵⁾	Adapter for Black Power Module (I.S. Power Module Sold Separately)	•	—	★

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.

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 ⁽¹⁶⁾	Flow Calibration, 3 Pt, Conditioning Option C (All Pipe Schedules)	•	•	
WD ⁽¹⁷⁾ (18)	Flow Calibration, 10 Pt, Conditioning Option C (All Schedules), Annubar Option A (Schedule 40)	•	•	
Pressure Testing				
Expanded				
P1	Hydrostatic Testing with Certificate	•	•	
Special Cleaning				
		D	1-7	
Expanded				
p2 ⁽¹⁹⁾	Cleaning for Special Processes	•	•	
PA	Cleaning per ASTM G93 Level D (section 11.4)	•	•	
Special Inspection				
Standard				Standard
QC1	Visual & Dimensional Inspection with Certificate	•	•	★
QC7	Inspection & Performance Certificate	•	•	★
Transmitter Calibration Certification				
Standard				Standard
Q4	Calibration Data Certificate for Transmitter	•	•	★
QP	Calibration Certificate and Tamper Evident Seal	•	•	★
Quality Certification for Safety				
Standard				Standard
QS ⁽²⁰⁾⁽²¹⁾	Prior-use certificate of FMEDA data	•	—	★
QT ⁽²⁰⁾⁽²¹⁾⁽²⁴⁾	Safety Certified to IEC 61508 with certificate of FMEDA data	•	—	★

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.

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 ⁽²²⁾	NACE MR-0175 / 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 ⁽²³⁾	CSA Explosion-proof, Dust Ignition-proof, Division 2	•	•	★
I6	CSA Intrinsically Safe	•	•	★
K6 ⁽²³⁾	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	•	•	★
Standard				Standard
KA ⁽²³⁾	ATEX and CSA Flameproof, Intrinsically Safe, Division 2 (combination of E1, I1, E6, and I6)	•	•	★
KB ⁽²³⁾	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 ⁽²³⁾	FM, CSA, and ATEX Explosion-proof, Intrinsically Safe (combination of E5, E6, E1, I5, I6, and I1)	•	•	★
Shipboard Approvals		D	1-7	
Standard				Standard
SBS	American Bureau of Shipping	•	•	★

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.

Sensor Fill Fluid and O-ring Options				
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⁽²⁴⁾				
Standard				Standard
M5	PlantWeb LCD display	•	•	★
M7 ⁽²¹⁾⁽²⁵⁾⁽²⁶⁾	Remote mount LCD display and interface, PlantWeb housing, no cable, SST bracket	•	•	★
M8 ⁽²¹⁾⁽²⁵⁾	Remote mount LCD display and interface, PlantWeb housing, 50 ft. (15m) cable, SST bracket	•	•	★
M9 ⁽²¹⁾⁽²⁵⁾	Remote mount LCD display and interface, PlantWeb housing, 100 ft. (31m) cable, SST bracket	•	•	★
Transient Protection				
Standard				Standard
T1 ⁽²⁷⁾	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 ⁽²⁸⁾	Advanced HART Diagnostic Suite	•	—	★
PlantWeb Enhanced Measurement Functionality				
Standard				Standard
H01 ⁽²⁹⁾	FOUNDATION fieldbus Fully Compensated Mass Flow Block	•	—	★
Cold Temperature				
Standard				Standard
BRR	-60 °F (-51 °C) Cold Temperature Start-up	•	•	★
Alarm Limit⁽²⁰⁾⁽²¹⁾				
Standard				Standard
C4	NAMUR Alarm & Saturation Levels, High Alarm	•	•	★
C5	NAMUR Alarm & 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 ⁽²⁰⁾⁽²¹⁾⁽³⁰⁾	Hardware Adjustments (zero, span, alarm, security)	•	—	★
D4	External ground screw assembly	•	•	★
DA ⁽²⁰⁾⁽²¹⁾⁽³⁰⁾	Hardware adjustments (zero, span, alarm, security) and external ground screw assembly	•	—	★

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.

Conduit Plug				
Standard				Standard
DO	316 SST Conduit Plug	•	•	★
Conduit Electrical Connector				
Standard				Standard
ZE ⁽³¹⁾	M12, 4-pin, Male Connector (eurofast)	•	•	★
ZM	A size Mini, 4-pin, Male Connector (minifast)	•	•	★
Typical Model Number: 3051SFC 1 C S 060 N 065 T 3 2 J A 1 A 3				

- (1) Available with primary element technology P only.
- (2) For the line sizes 10-in. (250 mm) and 12-in. (300 mm) line size, the alignment ring must be ordered (Installation Accessories).
- (3) For the line sizes 10-in. (250 mm) and 12-in. (300 mm) line sizes not available with Primary Element Technology A.
- (4) For 2-in. (50 mm) line sizes the Primary Element Type is 0.6 for Primary Element Technology Code C.
- (5) Required for Measurement Type codes 2, 4, 6, and D.
- (6) Only available with Transmitter Feature Board Measurement Type: 1, 3, 5, 7.
- (7) Required for Measurement Type codes 3, 4, 7, and D.
- (8) 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).
- (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) Requires wireless options and wireless PlantWeb housing.
- (12) Only available with output code X.
- (13) Available with output code A only.
- (14) Only available with differential pressure ranges 2 and 3, and silicone fill fluid.
- (15) Long-life Power Module must be shipped separately, order Part No. 00753-9220-0001.
- (16) Available with primary element technology C only.
- (17) Available with primary element technology C or A only.
- (18) For Annubar Option A, consult factory for pipe schedules other than Sch. 40
- (19) Available with primary element technology C or P only.
- (20) Not available with Output Protocol code F.
- (21) Not available with output code X.
- (22) 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.
- (23) Not available with M20 or G ½ conduit entry size.
- (24) Not available with housing code 7J.

- (25) Not available with output code F, option code DA2, or option code QT.
- (26) See the 3051S Reference Manual (document number 00809-0100-4801) for cable requirements. Contact an Emerson Process Management representative for additional information.
- (27) Not available with Housing code 00, 5A, 5J, 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.
- (28) Includes Hardware Adjustments (option code D1) as standard. Not available with output code X.
- (29) Requires Rosemount Engineering Assistant version 5.5.1 to configure.
- (30) Not available with housing style codes 2E, 2F, 2G, 2M, 5A, 5J, or 7J.
- (31) Not available with Housing code 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 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
		D	1-7	— = Unavailable
3051SFP	Integral Orifice Flowmeter	•	•	
Measurement Type				
Standard				Standard
1	Fully Compensated Mass & Energy Flow Calculations – Differential & Static Pressures w/ Temperature	—	•	★
2	Compensated Flow Calculations – Differential & Static Pressures	—	•	★
3	Compensated Flow Calculations – Differential Pressure & Temperature	—	•	★
4	Compensated Flow Calculations – Differential Pressure	—	•	★
D	Differential Pressure	•	—	★
Expanded				
5	Process Variables Only (No Flow Calculations) – Differential & Static Pressures with Temperature	—	•	
6	Process Variables Only (No Flow Calculations) – Differential & Static Pressures	—	•	
7	Process Variables Only (No Flow Calculations)	—	•	
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	•	•	★
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	•	•	★

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				
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	•	•	★
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				

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.

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 inH ₂ O (0 to 62.3 mbar)		•	•	★
2	0 to 250 inH ₂ O (0 to 623 mbar)		•	•	★
3	0 to 1000 inH ₂ O (0 to 2.5 bar)		•	•	★
Static Pressure Range					
Standard					Standard
A ⁽²⁾	None		•	•	★
D	Absolute 0 to 800 psia (0 to 55.2 bar)		—	•	★
E ⁽³⁾	Absolute 0 to 3626 psia (0 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)		—	•	★
Transmitter Output			D	1-7	
Standard					Standard
A	4–20 mA with digital signal based on HART protocol		•	•	★
F	FOUNDATION fieldbus (Requires PlantWeb housing)		•	—	★
χ ⁽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 ⁽⁵⁾	Wireless PlantWeb Housing	Aluminum	1/2-14 NPT	•	—
5J ⁽⁵⁾	Wireless PlantWeb Housing	SST	1/2-14 NPT	•	—
7J ⁽⁴⁾⁽⁶⁾	Quick Connect (A size Mini, 4-pin male termination)		•	—	★
Expanded					

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.

1C	PlantWeb Housing	Aluminum	G ^{1/2}	•	•	
1L	PlantWeb Housing	SST	G ^{1/2}	•	•	
2C	Junction Box Housing	Aluminum	G ^{1/2}	•	—	
2G	Junction Box Housing with output for remote display and interface	Aluminum	G ^{1/2}	•	—	
Transmitter Performance Class						
Standard						Standard
3051S MultiVariable SuperModule, Measurement Types 1, 2, 5, and 6						
3 ⁽⁷⁾	Ultra for Flow: 0.95% flow rate accuracy, 14:1 flow turndown, 10-year stability, limited 12-year warranty			•	•	★
5	Classic MV: 1.25% 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: 1.50% flow rate accuracy, 8:1 flow turndown, 5-year stability			•	•	★
3 ⁽⁷⁾	Ultra for Flow: 0.95% 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						Standard
3	2.4 GHz DSSS, IEC 62591 (WirelessHART)			•	—	★
Omnidirectional Wireless Antenna						
Standard						Standard
WK	External Antenna			•	—	★
WM	Extended Range, External Antenna			•	—	★
Expanded						
WN	High-Gain, Remote Antenna			•	—	
SmartPower™				D	1-7	
Standard						Standard
1 ⁽⁸⁾	Adapter for Black Power Module (I.S. Power Module Sold Separately)			•	—	★

Other Options (Include with selected model number)

Transmitter / Body Bolt Material				D	1-7	
Expanded						
G ⁽⁹⁾	High temperature Option (850 °F (454 °C))			•	•	
Temperature Sensor						
Standard						Standard
T ⁽¹⁰⁾	Thermowell and RTD			•	•	★
Optional Connection						
Standard						Standard
G1	DIN 19213 Transmitter Connection			•	•	★
Pressure Testing						
Expanded						

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.

p1 ⁽¹¹⁾ (12)	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 ⁽¹³⁾	Discharge Coefficient Verification	•	•	
WZ ⁽¹³⁾	Special Calibration	•	•	
Special Inspection				
Standard				Standard
QC1	Visual & Dimensional Inspection with Certificate	•	•	★
QC7	Inspection & Performance Certificate	•	•	★
Material Traceability Certification				
Standard				Standard
Q8	Material certification per EN 10204:2004 3.1	•	•	★
Code Conformance				
Expanded				
J2 ⁽¹⁴⁾	ANSI / ASME B31.1	•	•	
J3 ⁽¹⁴⁾	ANSI / ASME B31.3	•	•	
J4 ⁽¹⁴⁾	ANSI / ASME B31.8	•	•	
Materials Conformance				
Expanded				
J5 ⁽¹⁵⁾	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 Data Certificate for Transmitter	•	•	★
Quality Certification for Safety				
Standard				Standard
Q5 ⁽¹⁶⁾ (17)	Prior-use 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.

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 ⁽¹⁸⁾	CSA Explosion-proof, Dust Ignition-proof, Division 2	•	•	★
I6	CSA Intrinsically Safe	•	•	★
K6 ⁽¹⁸⁾	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E6 and I6)	•	•	★
Standard				Standard
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	•	•	★
Standard				Standard
I3	China Intrinsic Safety	•	•	★
KA ⁽¹⁸⁾	ATEX and CSA Flameproof, Intrinsically Safe, Division 2 (combination of E1, I1, E6, and I6)	•	•	★
KB ⁽¹⁸⁾	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 ⁽¹⁸⁾	FM, CSA, and ATEX Explosion-proof, Intrinsically Safe (combination of E5, I5, E6, I6, E1, and I1)	•	•	★
Shipboard Approvals				
Standard				Standard
SBS	American Bureau of Shipping	•	•	★
Sensor Fill Fluid and O-ring Options				
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⁽¹⁹⁾				
Standard				Standard

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.

M5	PlantWeb LCD display (Requires PlantWeb housing)	•	•	★
M7 ⁽¹⁶⁾⁽²⁰⁾⁽²¹⁾	Remote mount LCD display and interface, PlantWeb housing, no cable, SST bracket	•	—	★
M8 ⁽¹⁶⁾⁽²¹⁾	Remote mount LCD display and interface, PlantWeb housing, 50 ft. (15 m) cable, SST bracket	•	—	★
M9 ⁽¹⁶⁾⁽²¹⁾	Remote mount LCD display and interface, PlantWeb housing, 100 ft. (31 m) cable, SST bracket	•	—	★
Transient Protection				
Standard				Standard
T1 ⁽²²⁾	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 ⁽²³⁾	Advanced HART Diagnostics Suite	•	—	★
PlantWeb Enhanced Measurement Functionality				
Standard				Standard
H01 ⁽²⁴⁾	FOUNDATION fieldbus Fully Compensated Mass Flow Block	•	—	★
Cold Temperature				
Standard				Standard
BRR	-60 °F (-51 °C) Cold Temperature Start-up	—	•	★
Alarm Limit⁽¹⁶⁾⁽¹⁷⁾				
Standard				Standard
C4	NAMUR Alarm & Saturation Levels, High Alarm	•	•	★
C5	NAMUR Alarm & 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 ⁽¹⁶⁾⁽¹⁷⁾⁽²⁵⁾	Hardware Adjustments (zero, span, alarm, security)	•	—	★
D4	External ground screw assembly	•	•	★
DA ⁽¹⁶⁾⁽¹⁷⁾⁽²⁵⁾	Hardware adjustments (zero, span, alarm, security) & External Ground Screw Assembly	•	—	★
Conduit Plug				
DO	316 SST Conduit Plug			
Conduit Electrical Connector				
Expanded				
CE ⁽²⁶⁾	M12, 4-pin, Male Connector (<i>euromast</i> [®])	•	•	
GM ⁽²⁶⁾	A size Mini, 4-pin, Male Connector (<i>minifast</i> [®])	•	•	
Typical Model Number: 3051SFP 1 S 010 W3 S 0150 D3 1 J A 1A 3 M5				

(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 X.
 - (6) Only available with output code A.
 - (7) Only available with differential pressure ranges 2 and 3, and silicone fill fluid.
 - (8) Long-life Power Module must be shipped separately, order Part No. 00753-9220-0001.
 - (9) Not available with 1¹/₂-in. (38 mm) line size.
 - (10) Thermowell material is the same as the body material.
 - (11) Does not apply to Process Connection codes T1 and S1.
 - (12) Option P1 may not be ordered in combination with P2 or PA.
 - (13) Not available for bore sizes 0010, 0014, 0020, 0034, 0066, or 0109.
 - (14) Not available with DIN Process Connection codes D1, D2, or D3.
 - (15) 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.
 - (16) Not available with output code X.
 - (17) Not available with Output Protocol code F.
 - (18) Not available with M20 or G ½ conduit entry size.
 - (19) Not available with housing code 7J.
 - (20) See the 3051S Reference Manual (document number 00809-0100-4801) for cable requirements. Contact an Emerson Process Management representative for additional information.
 - (21) Not available with output code F, option code DA2, or option code QT.
 - (22) Not available with Housing code 5A, 5J, or 7J. The T1 option is not needed with FISCO Product Certifications, transient protection is included with the FISCO Product Certification code IA.
 - (23) Includes Hardware Adjustments (option code D1) as standard. Not available with output code X.
 - (24) Requires Rosemount Engineering Assistant version 5.5.1 to configure.
 - (25) Not available with housing style codes 2E, 2F, 2G, 2M, 5A, 5J, or 7J.
 - (26) Not available with Housing code 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).

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⁾⁽²⁾

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_A Compact Annubar Flowmeter - Annubar Option A			
		Classic MV (8:1 flow turndown)	Ultra for Flow (14:1 flow turndown)
Ranges 2-3	Uncalibrated	±1.60% of Flow Rate	±1.55% of Flow Rate
	Calibrated	±1.00% 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	$\beta = 0.4$	±1.10% of Flow Rate	±0.75% of Flow Rate
	$\beta = 0.65$	±1.45% of Flow Rate	±1.15% of Flow Rate
3051SFC Compact Orifice Flowmeter - Orifice Option P ⁽³⁾			
		Classic MV (8:1 flow turndown)	Ultra for Flow (14:1 flow turndown)
Ranges 2-3	$\beta = 0.4$	±1.45% of Flow Rate	±1.30% of Flow Rate
	$\beta = 0.65$	±1.45% of Flow Rate	±1.30% of Flow Rate
3051SFP Integral Orifice Flowmeter			
		Classic MV (8:1 flow turndown)	Ultra for Flow (14:1 flow turndown)
Ranges 2-3	$\beta < 0.1$	±2.65% of Flow Rate	±2.60% of Flow Rate
	$0.1 < \beta < 0.2$	±1.60% of Flow Rate	±1.40% of Flow Rate
	$0.2 < \beta < 0.6$	±1.25% of Flow Rate	±0.95% of Flow Rate
	$0.6 < \beta < 0.8$	±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.

(2) Range 1 flowmeters experience an additional uncertainty up to 0.9%. Consult your Emerson Process Management Representative for exact specifications.

(3) For line size less than 2 in. (50 mm) or greater than 8 in. (200 mm), add an additional 0.5% uncertainty.

Table 5. Flow Performance - Flow Reference Accuracy (Measurement Type D)⁽¹⁾⁽²⁾⁽³⁾

3051SFA Annubar Flowmeter				
		Classic (8:1 flow turndown)	Ultra (8:1 flow turndown)	Ultra for Flow (14:1 flow turndown)
Ranges 2-3		±1.25% of Flow Rate	±0.95% of Flow Rate	±0.80% of Flow Rate
3051SFC_A Compact Annubar Flowmeter - Annubar Option A				
		Classic (8:1 flow turndown)	Ultra (8:1 flow turndown)	Ultra for Flow (14:1 flow turndown)
Ranges 2-3	Uncalibrated	±1.70% of Flow Rate	±1.65% of Flow Rate	±1.55% of Flow Rate
	Calibrated	±1.25% 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	$\beta = 0.4$	±1.10% of Flow Rate	±0.9% of Flow Rate	±0.75% of Flow Rate
	$\beta = 0.65$	±1.40% of Flow Rate	±1.25% of Flow Rate	±1.15% of Flow Rate
3051SFC Compact Orifice Flowmeter – Orifice Option P⁽⁴⁾				
		Classic (8:1 flow turndown)	Ultra (8:1 flow turndown)	Ultra for Flow (14:1 flow turndown)
Ranges 2-3	$\beta = 0.4$	±1.80% of Flow Rate	±1.35% of Flow Rate	±1.30% of Flow Rate
	$\beta = 0.65$	±1.80% of Flow Rate	±1.35% of Flow Rate	±1.30% of Flow Rate
3051SFP Integral Orifice Flowmeter				
		Classic (8:1 flow turndown)	Ultra (8:1 flow turndown)	Ultra for Flow (14:1 flow turndown)
Ranges 2-3	$\beta < 0.1$	±2.70% of Flow Rate	±2.65% of Flow Rate	±2.60% of Flow Rate
	$0.1 < \beta < 0.2$	±1.80% of Flow Rate	±1.45% of Flow Rate	±1.40% of Flow Rate
	$0.2 < \beta < 0.6$	±1.50% of Flow Rate	±1.05% of Flow Rate	±0.95% of Flow Rate
	$0.6 < \beta < 0.8$	±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.
- (3) Range 1 flowmeters experience an additional uncertainty up to 0.9%. Consult your Emerson Process Management Representative for exact specifications.
- (4) For line size less than 2 in. (50 mm) or greater than 8 in. (200 mm), add an additional 0.5% uncertainty.

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	DP Range 1: 310 ms	DP Ranges 2-5: 145 ms
Range 1: 255 ms	DP Range 2: 170 ms	DP Range 1: 300 ms
Range 0: 700 ms	DP Range 3: 155 ms	DP Range 0: 745 ms
	AP & GP: 240 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.	<p>DP: 22 updates per sec.</p> <p>AP & GP: 11 updates per sec.</p> <p>RTD Interface: 1 update per sec.</p> <p><u>Calculated Variables:</u></p> <p>Mass / Volumetric Flow Rate: 22 updates per sec.</p> <p>Energy Flow Rate: 22 updates per sec.</p> <p>Totalized Flow: 1 update per sec.</p>

(1) Does not apply to Wireless (output code X). See [“Wireless Self-Organizing Networks” on page 36](#) 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 ₂ O (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 ₂ O (3,11 mbar), which can be zeroed Span: no effect
	GP/AP Sensor: Zero shifts to ±2.5 inH ₂ O (6,22 mbar), which can be zeroed Span: no effect

Vibration Effect for 3051SFA, 3051SFC, and 3051SFP

Less than ±0.1% of URL when tested per the requirements of IEC60770-1 field with general application or pipeline with low vibration level (10-1000 Hz test frequency range, 0.15mm displacement peak amplitude, 20m/s² acceleration amplitude).⁽¹⁾

Power supply effect

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

(1) Stainless steel temperature housing is not recommended with primary element technology A in application with mechanical vibration.

Electromagnetic Compatibility (EMC)

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

Transient Protection (Option T1)

Meets IEEE C62.41.2-2002, Location Category B

6 kV crest (0.5 μ s - 100 kHz)

3 kA crest (8 \times 20 microseconds)

6 kV crest (1.2 \times 50 microseconds)

Meets IEEE C37.90.1-2002 Surge Withstand Capability

SWC 2.5 kV crest, 1.0 MHz wave form

(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.

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 ₂ O (0 mbar)	25 inH ₂ O (62,3 mbar)
2	0 inH ₂ O (0 bar)	250 inH ₂ O (0,62 bar)
3	0 inH ₂ O (0 bar)	1000 inH ₂ O (2,49 bar)

Flowmeter with MultiVariable Sensor Module

Range	DP Sensor (3051SF1, 2, 5, or 6)	
	Lower (LRL)	Upper (URL)
1	0 inH ₂ O (0 mbar)	25.0 inH ₂ O (62,3 mbar)
2	0 inH ₂ O (0 bar)	250.0 inH ₂ O (0,62 bar)
3	0 inH ₂ O (0 bar)	1000.0 inH ₂ O (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 ₂ O (1,24 mbar)	0.5 inH ₂ O (1,24 mbar)
2	1.3 inH ₂ O (3,11 mbar)	2.5 inH ₂ O (6,23 mbar)
3	5.0 inH ₂ O (12,4 mbar)	10.0 inH ₂ O (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 ₂ O (1,24 mbar)	0.5 inH ₂ O (1,24 mbar)
2	1.3 inH ₂ O (3,11 mbar)	2.5 inH ₂ O (6,23 mbar)
3	5.0 inH ₂ O (12,4 mbar)	10.0 inH ₂ O (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	Measurement Type	Fluid Types			
		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.

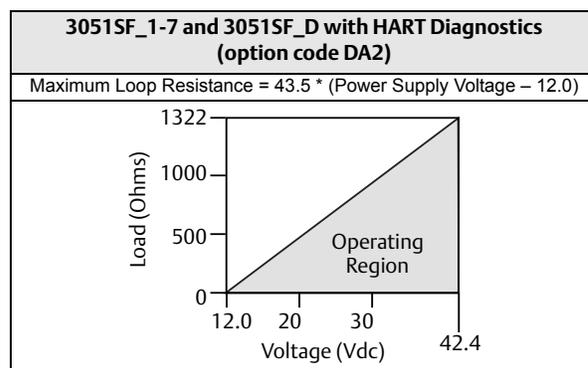
Power Supply

External power supply required.

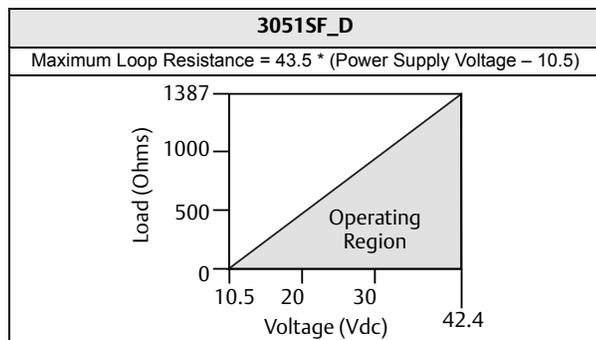
- 3051SF_D: 10.5 to 42.4 Vdc with no load
- 3051SF_D with Advanced HART Diagnostics Suite: 12 to 42.4 Vdc with no load
- 3051SF_1-7: 12 to 42.4 Vdc with no load

Load Limitations

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



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



The Field 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 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.

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

3051SFA 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

3051SFC 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

3051SFP Process Temperature Limits

Standard (direct/remote mount):

- -40 to 450 °F (-40 to 232 °C)

Extended (remote mount only with option code G):

- -148 to 850 °F (-100 to 454 °C)

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 in³ (0,08 cm³)

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.

Physical Specifications

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%.

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

3051SFA Wetted Parts - Annubar Sensor Material

- 316 Stainless Steel
- Alloy C-276

3051SFC Wetted Parts - 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.

3051SFP Wetted Parts - 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.

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

Nitrile Butadiene (NBR)

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

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 through 5 and/or Static Pressure Range 4 or options P0 and P9.

QS Certificate of Assessment - EC No.
 59552-2009-CE-HOU-DNV,

Module H Conformity Assessment
 — 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; $T_a = 85^\circ\text{C}$; 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; $T_a = 70^\circ\text{C}$;
 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. T5 ($T_a = -40^\circ\text{C}$ to 85°C).

I6 Intrinsically Safe for Class I, Division 1, Groups A, B, C, and D, T3C; 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  II 1G
 Ex ia IIC T4 ($-60^\circ\text{C} \leq T_{\text{amb}} \leq +70^\circ\text{C}$)
 cE 1180

Field Connection / 4-20 mA Loop Parameters

$U_i = 30\text{ V}$
 $I_i = 300\text{ mA}$
 $P_i = 1.0\text{ W}$
 $C_i = 14.8\text{ nF}$
 $L_i = 0$

RTD Connection Parameters

$U_O = 30\text{ V}$
 $I_O = 2.31\text{ mA}$
 $P_O = 17.32\text{ mW}$
 $C_i = 0$
 $L_i = 0$

Special conditions for safe use (x)

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

N1 ATEX Type n
 Certificate No.: Baseefa 08ATEX0065X  II 3 G
 Ex nA nL IIC T4 (-40 °C ≤ T_{amb} ≤ +70 °C)
 U_i = 45 Vdc max
 U_O = 30 V (RTD Connection)
 IP66
 CE

Special conditions for safe use (x)

If fitted with a 90 V transient suppressor, the equipment is not capable of withstanding the 500 V electrical strength test as defined in Clause 6.8.1 of EN 60079-15:2005. This must be taken into account during installation.

ND ATEX Dust
 Certificate No.: BAS01ATEX1374X  II 1 D
 Ex tD A20 IP66 T105°C (-20 °C ≤ T_{amb} ≤ 85 °C)
 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 temperature range of the apparatus and capable of withstanding a 7J impact test.
4. The 3051S SuperModule must be securely screwed in place to maintain the ingress protection of the enclosure.

E1 ATEX Flameproof
 Certificate No.: KEMA00ATEX2143X  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. The Ex d blanking elements, cable glands and wiring shall be suitable for a temperature of 90 °C.
2. Transmitter Model 3051S contains a thin wall diaphragm. Installation, maintenance and use shall take into account the environmental conditions to which the diaphragm will be subjected. The manufacturer's instructions for maintenance shall be followed in detail to assure safety during its expected lifetime.
3. In case of repair, contact the manufacturer for information on the dimensions of the flameproof joints.

Japanese Certifications

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

Brazil Certifications

E2 INMETRO Flameproof
 Certificate number: NCC 5886/09X
 BR-Ex d IIC T5/T6 Gb IP66W
 T6 (-50 °C to 65 °C)
 T5 (-50 °C to 80 °C)

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.

I2 INMETRO Intrinsic Safety
 Certificate No. NCC 5870/09X
 BR-Ex ia IIC T4 (-60 °C ≤ T_a ≤ 70 °C) Ga IP66W

Field Connection / 4-20 mA Loop Parameters

U_i = 30 V
 I_i = 300 mA
 P_i = 1.0 W
 C_i = 14.8 nF
 L_i = 0

RTD Connection Parameters

U_O = 30 V
 I_O = 2.31 mA
 P_O = 17.32 mW
 C_i = 0
 L_i = 0

Special conditions for safe use (x)

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

China Certifications

- E3 China Flameproof
NEPSI Certificate No.: GYJ091001
Ex d IIC T5/T6
T6 (-50 °C to 65 °C)
T5 (-50 °C to 80 °C)

NOTE

Refer to Appendix B of the 3051S MultiVariable Reference Manual (document number 00809-0100-4803) for Special Conditions for Safe Use.

- I3 China Intrinsic Safety
NEPSI Certificate No.: GYJ091002X
Ex ia IIC T4 (-60 °C to 70 °C)

Field Connection / 4-20 mA Loop Parameters

- $U_i = 30 \text{ V}$
 $I_i = 300 \text{ mA}$
 $P_i = 1.0 \text{ W}$
 $C_i = 14.8 \text{ nF}$
 $L_i = 0$

RTD Connection Parameters

- $U_O = 30 \text{ V}$
 $I_O = 2.31 \text{ mA}$
 $P_O = 17.32 \text{ mW}$
 $C_i = 0$
 $L_i = 0$

NOTE

Refer to Appendix B of the 3051S MultiVariable Reference Manual (document number 00809-0100-4803) for Special Conditions for Safe Use.

IECEx Certifications

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

Field Connection / 4-20 mA Loop Parameters

- $U_i = 30 \text{ V}$
 $I_i = 300 \text{ mA}$
 $P_i = 1.0 \text{ W}$
 $C_i = 14.8 \text{ nF}$
 $L_i = 0$

RTD Connection Parameters

- $U_O = 30 \text{ V}$
 $I_O = 2.31 \text{ mA}$
 $P_O = 17.32 \text{ mW}$
 $C_i = 0$
 $L_i = 0$

Special conditions for safe use (x)

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

- N7 IECEx Type n
Certificate No.: IECExBAS08.0026X
Ex nAnL IIC T4 (-40 °C ≤ T_a ≤ 70 °C)
U_i = 45 Vdc MAX
U_O = 30 V (RTD Connection)
IP66

Special conditions for safe use (x)

If fitted with a 90 V transient suppressor, the equipment is not capable of withstanding the 500 V electrical strength test as defined in Clause 6.8.1 of EN 60079-15:2005. This must be taken into account during installation.

- 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)

Special conditions for safe use (x)

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

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

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. — Mumbai, India
 Emerson Process Management, Emerson FZE — Dubai, United Arab Emirates

Ordinary location certification for FM

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

European directive Information

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

ATEX Directive (94/9/EC)

Emerson Process Management complies with the ATEX Directive.

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

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

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

All other Model 3051S Pressure Transmitters — Sound Engineering Practice

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

Primary Elements, Flowmeter

— See appropriate Primary Element QIG

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

EN 61326-1:2006

EN 61326-2-3:2006

HART & FOUNDATION Fieldbus

Hazardous Locations Certifications

North American Certifications

FM Approvals

- E5 Explosion-proof for Class I, Division 1, Groups B, C, and D, T5 ($T_a = 85^\circ\text{C}$); Dust Ignition-proof for Class II and Class III, Division 1, Groups E, F, and G, T5 ($T_a = 85^\circ\text{C}$); hazardous locations; enclosure Type 4X, conduit seal not required when installed according to Rosemount drawing 03151-1003.
- 15/IE Intrinsically Safe for use in Class I, Division 1, Groups A, B, C, and D, T4 ($T_a = 70^\circ\text{C}$ for output options A or X; $T_a = 60^\circ\text{C}$ 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 ($T_a = 70^\circ\text{C}$ for output options A or X; $T_a = 60^\circ\text{C}$ 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 ($T_a = 70^\circ\text{C}$ for output options A or X; $T_a = 60^\circ\text{C}$ 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.
- 16/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 Ⓢ 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
 Ⓢ 1180

Input parameters

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

Special conditions for safe use (x)

- 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 60079-11. This must be considered during installation.
- 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 Ⓢ II 3 G
 Ex nL IIC T4 (T_a = -40 °C TO 70 °C)
 U_i = 45 Vdc max
 C_i = 11.4 nF (Transmitter Output Option A)
 C_i = 0 (Transmitter Output Option F)
 L_i = 0

For remote display, C_i = 0, L_i = 60 μH

IP66

Ⓢ

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 Ⓢ II 1 D
 Ex tD A20 IP66 T105°C (-20 °C ≤ T_{amb} ≤ 85 °C)
 V_{max} = 42.4 volts max
 IP66
 Ⓢ 1180

Special conditions for safe use (x)

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

E1 ATEX Flameproof

Certificate No.: KEMA00ATEX2143X Ⓢ 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
 Ⓢ 1180

Special conditions for safe use (x)

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

Japanese Certifications

E4 TIIS Flameproof
Ex d IIC T6

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

China Certifications

E3 China Flameproof, Dust Ignition-proof
NEPSI 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+H₂ 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.

I3 China Intrinsic Safety, Dust Ignition-proof
NEPSI 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
$U_i = 30 \text{ V}$	HART / FOUNDATION fieldbus / Remote Display / Quick Connect / HART Diagnostics
$I_i = 300 \text{ mA}$	HART / FOUNDATION fieldbus / Remote Display / Quick Connect / HART Diagnostics
$P_i = 1.0 \text{ W}$	HART / Remote Display / Quick Connect / HART Diagnostics
$P_i = 1.3 \text{ W}$	FOUNDATION fieldbus
$C_i = 38 \text{ nF}$	SuperModule Platform
$C_i = 11.4 \text{ nF}$	HART / HART Diagnostics / Quick Connect
$C_i = 0$	FOUNDATION fieldbus / Remote Display
$L_i = 0$	SuperModule Platform / FOUNDATION fieldbus
$L_i = 2.4 \mu\text{H}$	HART / Quick Connect / HART Diagnostics
$L_i = 58.2 \mu\text{H}$	Remote Display
RTD Assembly (3051SFx Option T or R)	
$U_i = 5$ Vdc	
$I_i = 500$ mA	
$P_i = 0.63$ W	

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

Loop / Power	Transmitter Output
$U_i = 30 \text{ V}$	HART / FOUNDATION fieldbus
$I_i = 300 \text{ mA}$	HART / FOUNDATION fieldbus
$P_i = 1.0 \text{ W}$	HART
$P_i = 1.3 \text{ W}$	FOUNDATION fieldbus
$C_i = 11.4 \text{ nF}$	HART
$C_i = 0 \text{ nF}$	FOUNDATION fieldbus
$L_i = 0 \mu\text{H}$	HART ⁽¹⁾ / FOUNDATION fieldbus

(1) For remote meter option (M7, M8, M9), $L_i = 60 \mu\text{H}$.

NOTE

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

Brazil Certifications

I2 INMETRO Intrinsic Safety

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

Special conditions for safe use (x)

The apparatus, excluding the Types 3051S-T and 3051S-C (In-line and Coplanar SuperModule Platforms respectively), is not capable of withstanding the 500V test as defined in Clause 6.4.12 of IEC60079-11. This must be considered during installation.

E2 INMETRO Flameproof

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

Special conditions for safe use (x)

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

IECEX Certifications

E7 IECEX Flameproof and Dust (each listed separately)

IECEX Flameproof
 Certificate No.: IECEXKEM08.0010X
 Ex d IIC T5 or T6 Ga/Gb
 T6 (-50 °C ≤ T_{amb} ≤ 65 °C)
 T5 (-50 °C ≤ T_{amb} ≤ 80 °C)
 V_{max} = 42.4V

Special conditions for safe use (x)

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

IECEX Dust
 Certificate No. IECEXBAS09.0014X
 Ex tD A20 IP66 T105 °C (-20 °C ≤ T_a ≤ 85 °C)
 V_{max} = 42.4 V
 A = 22 mA
 IP66

Special conditions for safe use (x)

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

I7/IG IECEX Intrinsic Safety

Certificate No.: IECEXBAS04.0017X
 Ex ia IIC T4 (T_a = -60 °C to 70 °C) -HART/Remote Display/Quick Connect/HART Diagnostics
 Ex ia IIC T4 (T_a = -60 °C to 70 °C) -FOUNDATION fieldbus
 Ex ia IIC T4 (T_a = -60 °C to 40 °C) -FISCO
 IP66

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

Input Parameters

Loop / Power	Groups
$P_i = 1.0 \text{ W}$	HART / Remote Display / Quick Connect / HART Diagnostics
$P_i = 1.3 \text{ W}$	FOUNDATION fieldbus
$P_i = 5.32 \text{ W}$	FISCO
$C_i = 30 \text{ nF}$	SuperModule Platform
$C_i = 11.4 \text{ nF}$	HART / HART Diagnostics / Quick Connect
$C_i = 0$	FOUNDATION fieldbus / Remote Display / FISCO
$L_i = 0$	HART / FOUNDATION fieldbus/ FISCO / Quick Connect / HART Diagnostics
$L_i = 60 \mu \text{ H}$	Remote Display
RTD Assembly (3051Sfx Option T or R)	
$U_i = 5 \text{ Vdc}$	
$I_i = 500 \text{ mA}$	
$P_i = 0.63 \text{ W}$	

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

Special conditions for safe use (x)

1. The 3051S HART 4-20 mA, 3051S FOUNDATION fieldbus, and 3051S FISCO are not capable of withstanding the 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 (-40 °C □ T_a □ +70 °C)

IP66

Special conditions for safe use (x)

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

Combinations of Certifications

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

K1 Combination of E1, I1, N1, and ND

K2 Combination of E2 and I2

K5 Combination of E5 and I5

K6 Combination of E6 and I6

K7 Combination of E7, I7, and N7

KA Combination of E1, I1, E6, and I6

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. — Mumbai, 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 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 20 cm 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. 59552-2009-CE-HOU-DNV,
 Module H Conformity Assessment
 All other Model 3051S Pressure Transmitters

— Sound Engineering Practice
 Transmitter Attachments: Diaphragm Seal - Process Flange - Manifold — Sound Engineering Practice
 Primary Elements, Flowmeter
 — See appropriate Primary Element QIG

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

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

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

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

- 11 ATEX Intrinsic Safety
 Certificate No.: BAS01ATEX1303X  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 

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

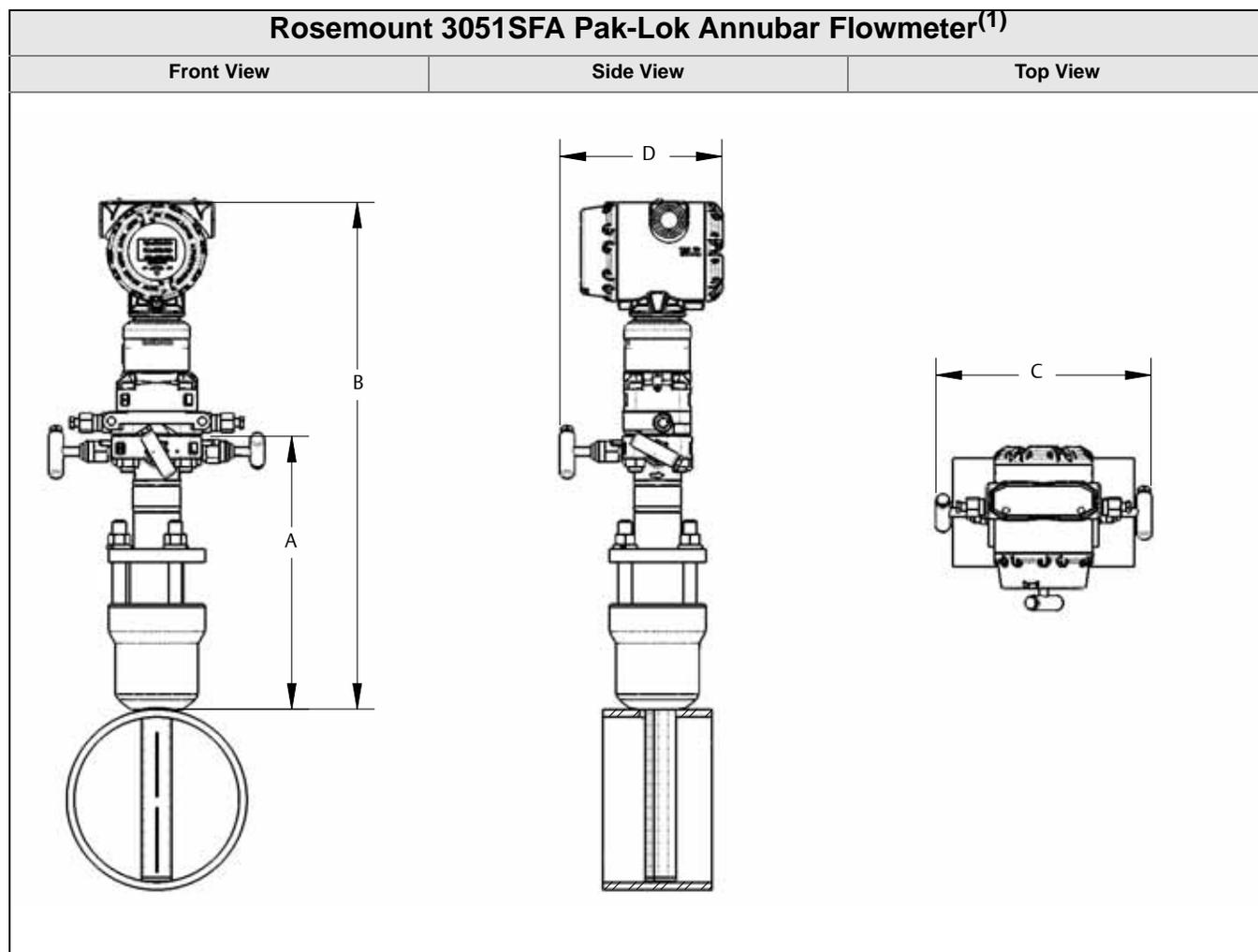
- 17 IECEx Intrinsic Safety
 Certificate No.: IECEx BAS 04.0017X
 Ex ia IIC T4 (T_a = -60 °C to 70 °C)
 For use with Rosemount SmartPower options
 00753-9220-0001 only.
 IP66

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.

Dimensional Drawings

3051SF Dimensional Drawings

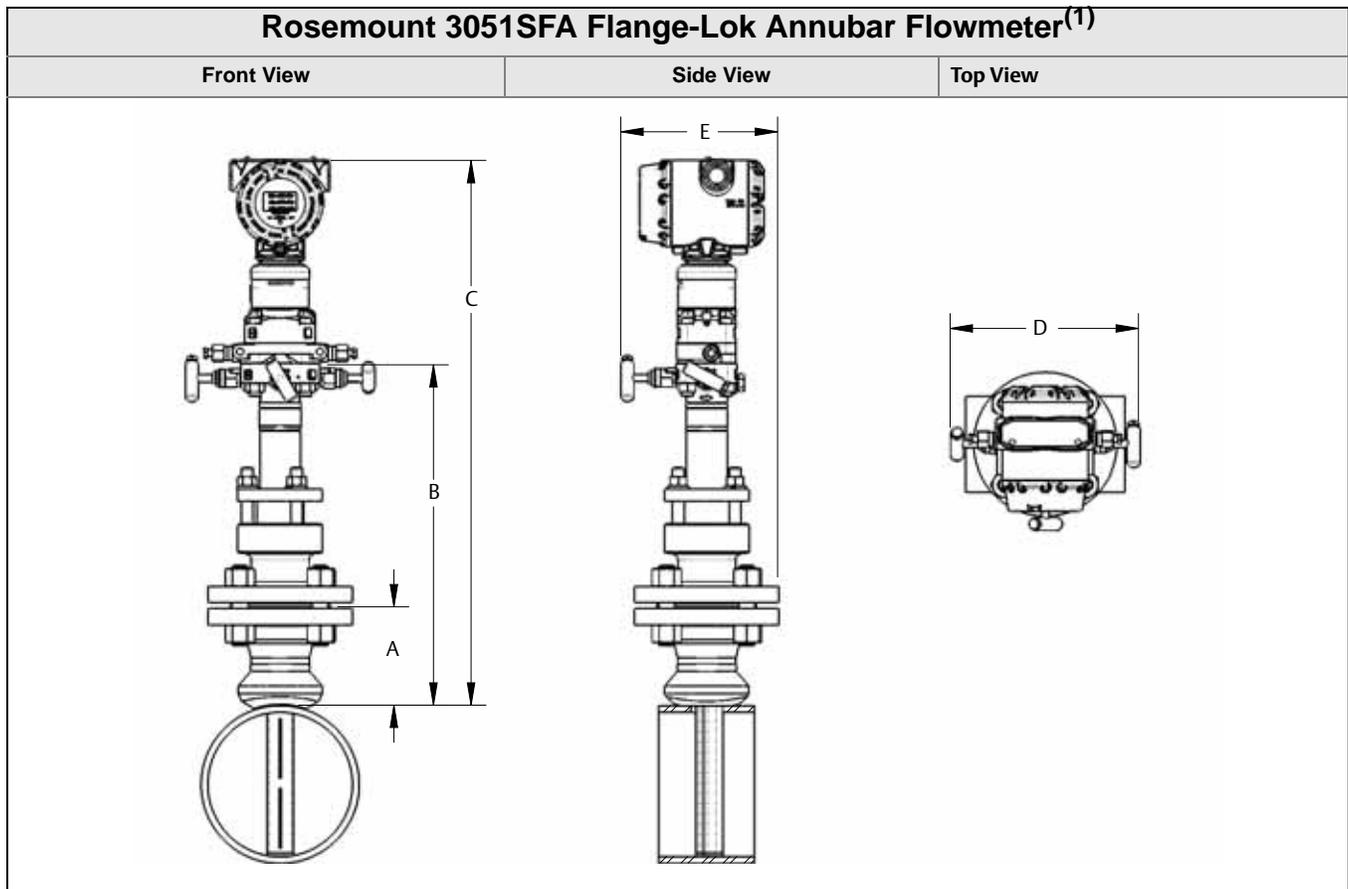


(1) The Pak-Lok Annubar model is rated equivalent to 600# ANSI (1440 psig at 100 °F (99 bar at 38 °C)).

Table 6. 3051SFA 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)



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

Table 7. 3051SFA 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	1½ – 150#	3.88 (98.6)	12.25 (311.2)	20.78 (527.8)	9.00 (228.6)	6.30 (160.0)
1	1½ – 300#	4.13 (104.9)	12.25 (311.2)	20.78 (527.8)	9.00 (228.6)	6.86 (174.2)
1	1½ – 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)

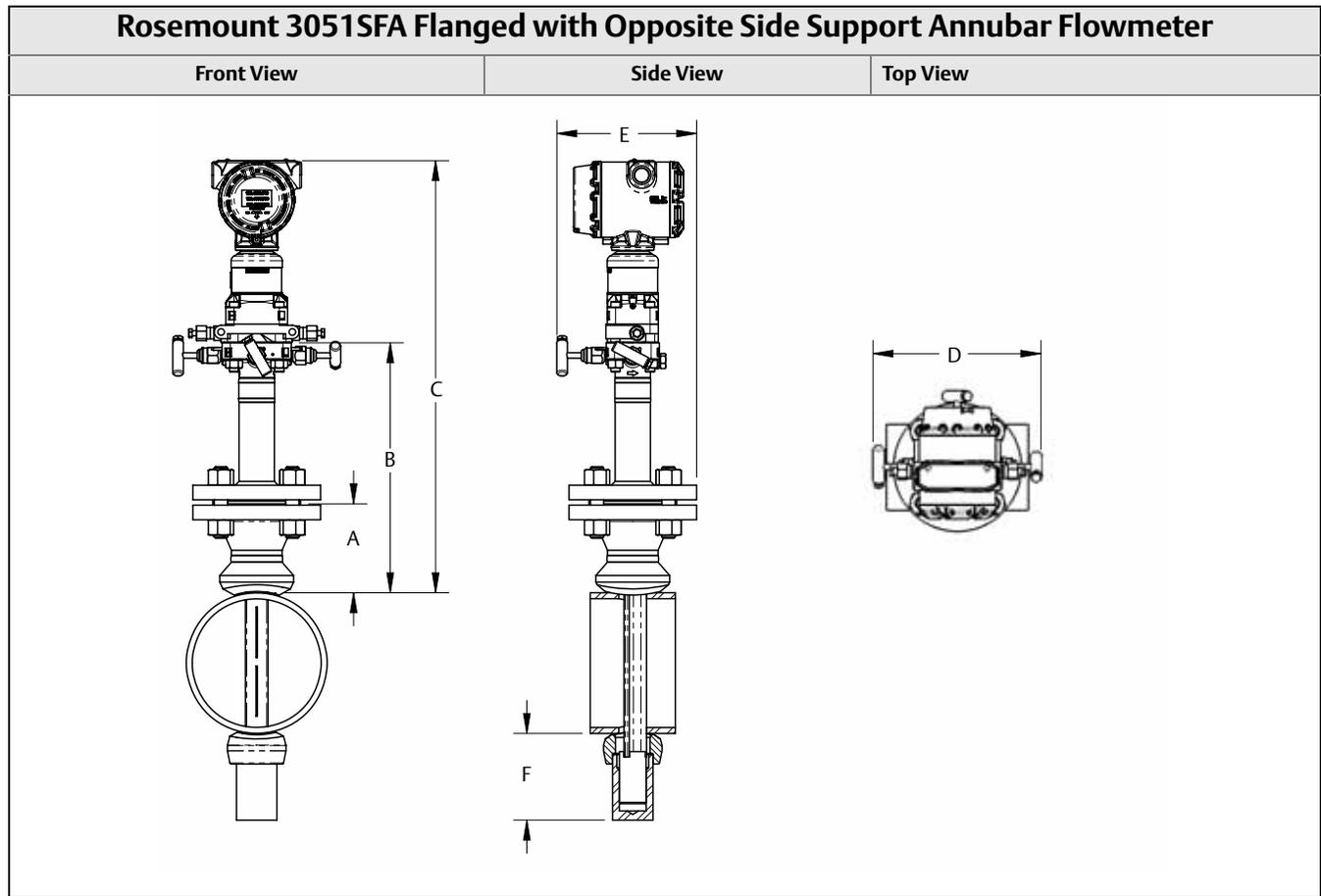
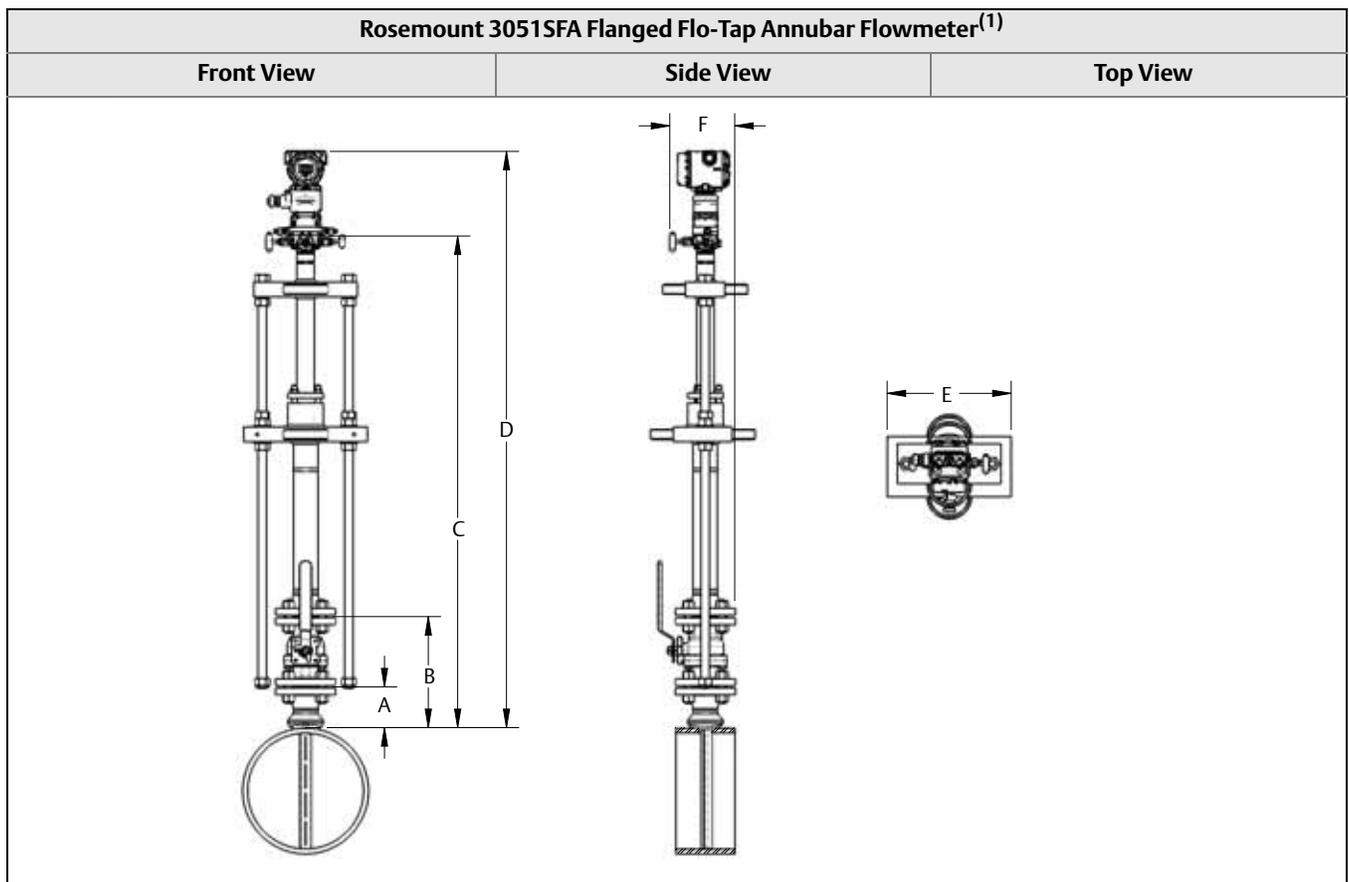


Table 8. 3051SFA Flanged Annubar Flowmeter Dimensional Data

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	1½ - 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	1½ - 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	1½ - 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	1½ - 900#	4.94 (125.5)	9.31 (236.5)	—	—	—	3.50 (88.9)
1	1½ - 1500#	4.94 (125.5)	9.31 (236.5)	—	—	—	3.50 (88.9)
1	1½ - 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 8. 3051SFA 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)
<i>Dimensions are in inches (millimeters)</i>							



(1) The Flanged Flo-Tap Annubar Flowmeter is available with either the manual or gear drive options.

Table 9. 3051SFA Flanged Flo-Tap Annubar Flowmeter Dimensional Data

Sensor Size	Flange Size and Rating	A ± 0.125 (3.2)	B ± 0.25 (6.4)	C ¹ (Max) (Gear Drive)	C ¹ (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)

Table 9. 3051SFA Flanged Flo-Tap Annubar Flowmeter Dimensional Data

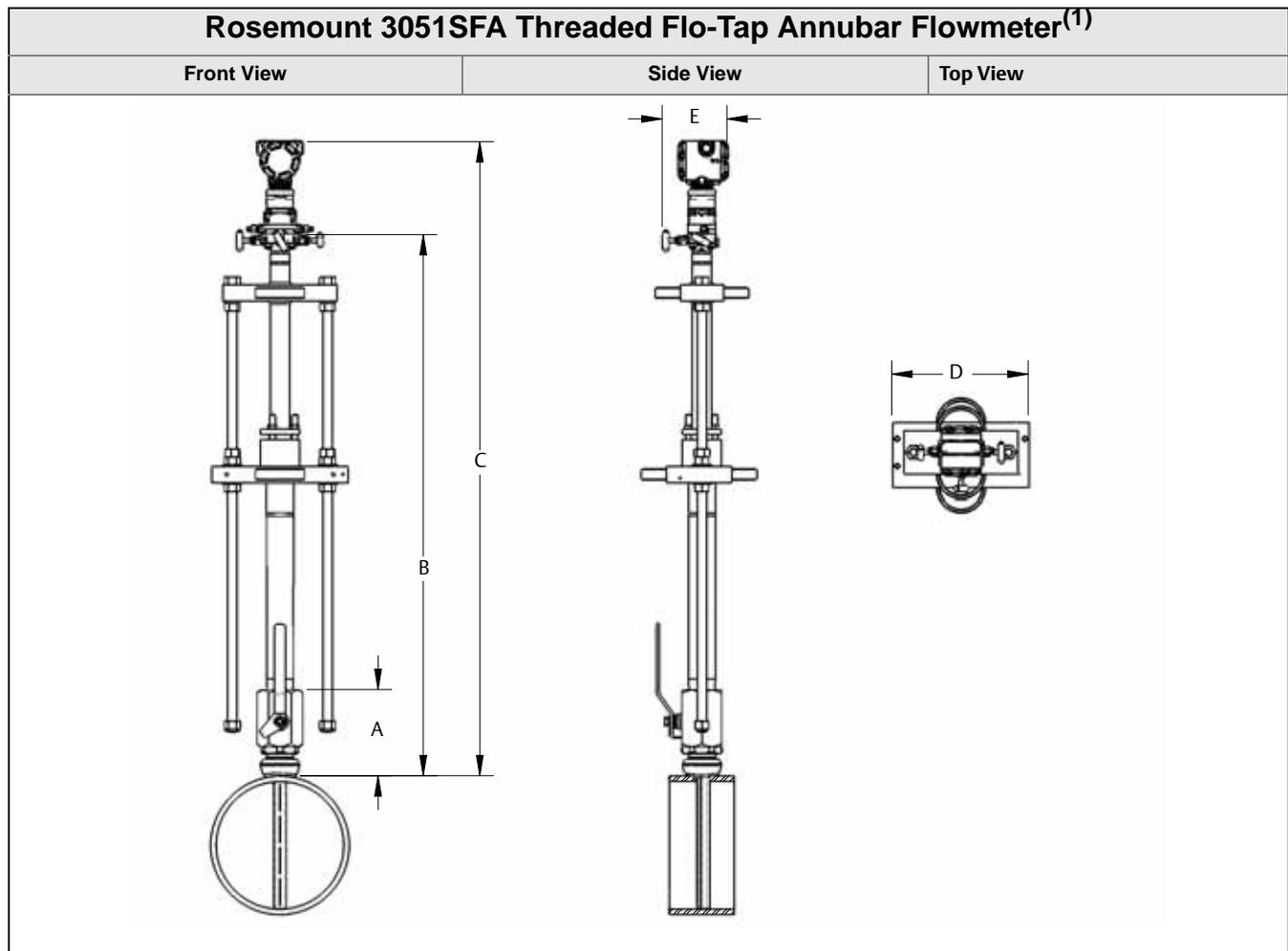
Sensor Size	Flange Size and Rating	A ± 0.125 (3.2)	B ± 0.25 (6.4)	C ¹ (Max) (Gear Drive)	C ¹ (Max) (Manual)	D (Max)	E (Max)	F (Max)
2	2 – 300#	4.38 (111.3)	13.00 (330.2)	24.44 (620.8)	21.20 (538.5)	C + 8.53 (216.7)	12.56 (319.0)	7.05 (179.1)
2	2 – 600#	4.75 (120.7)	16.38 (416.0)	24.44 (620.8)	21.20 (538.5)	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 + C¹

Retracted, C Dimension = 2 x (Pipe I.D. + Wall Thickness + B) + C¹



(1) The Threaded Flo-Tap Annubar Flowmeter is available with both the manual and gear drive options.

Table 10. 3051SFA Threaded Flo-Tap Annubar Flowmeter Dimensional Data

Sensor Size	A ± 0.50 (12.7)	B ^l (Max) (Gear Drive)	B ^l (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)
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)
<i>Sensor Size 3 is not available in a Threaded Flo-Tap.</i>						
<i>Dimensions are in inches (millimeters)</i>						

Inserted, B Dimension = Pipe I.D. + Wall Thickness + A + B^l

Retracted, B Dimension = 2 x (Pipe I.D. + Wall Thickness + A) + B^l

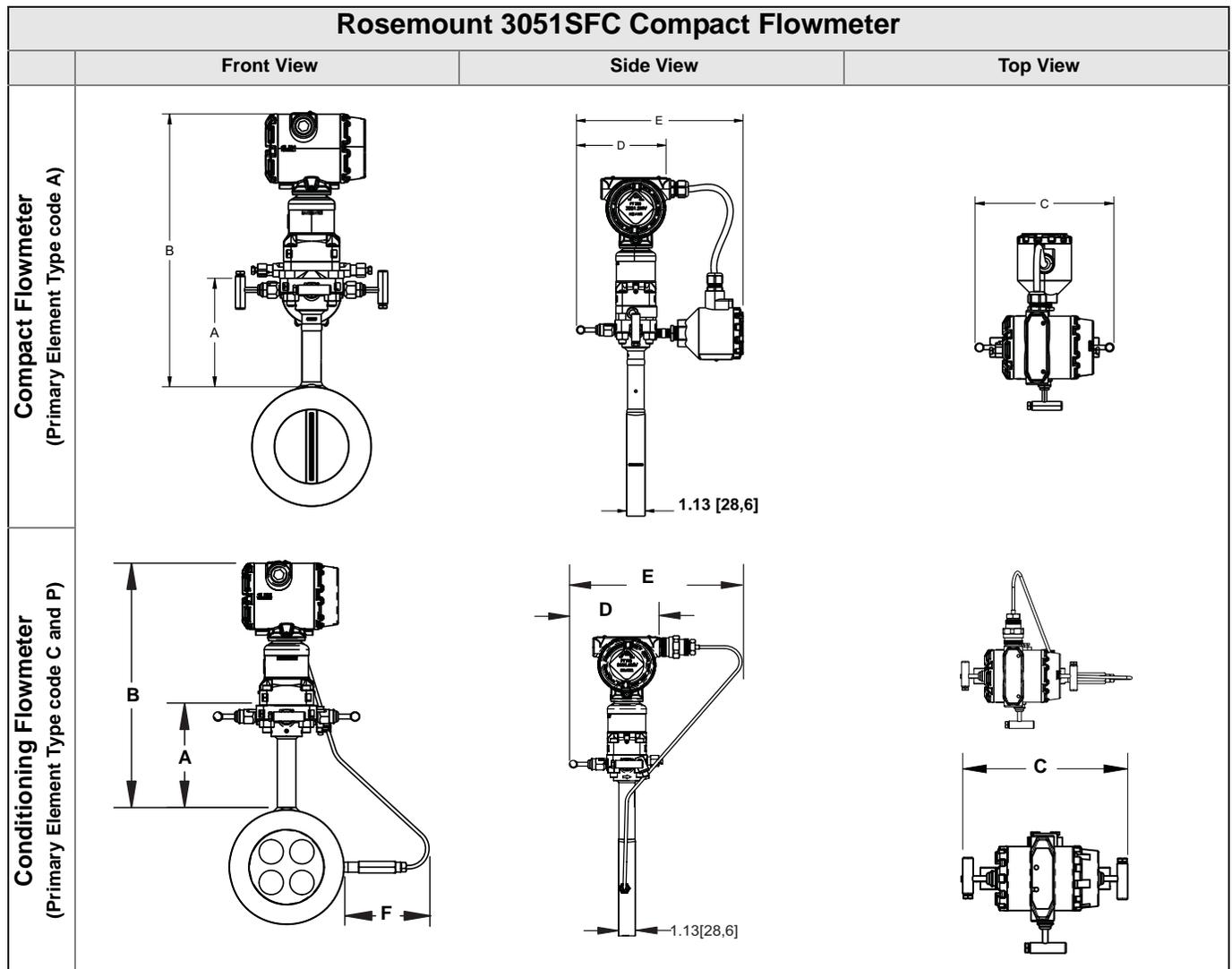


Table 11. 3051SFC Compact Dimensional Data⁽¹⁾

Primary Element Type	A	B	Transmitter Height	C	D	E	F
Type A	5.62 (143)	Transmitter Height + A	8.53 (217)	7.75 (197) - closed 8.25 (210) - open	6.00 (152) - closed 6.25 (159) - open	10.0 (254)- closed 10.25 (260.3)-open	
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).

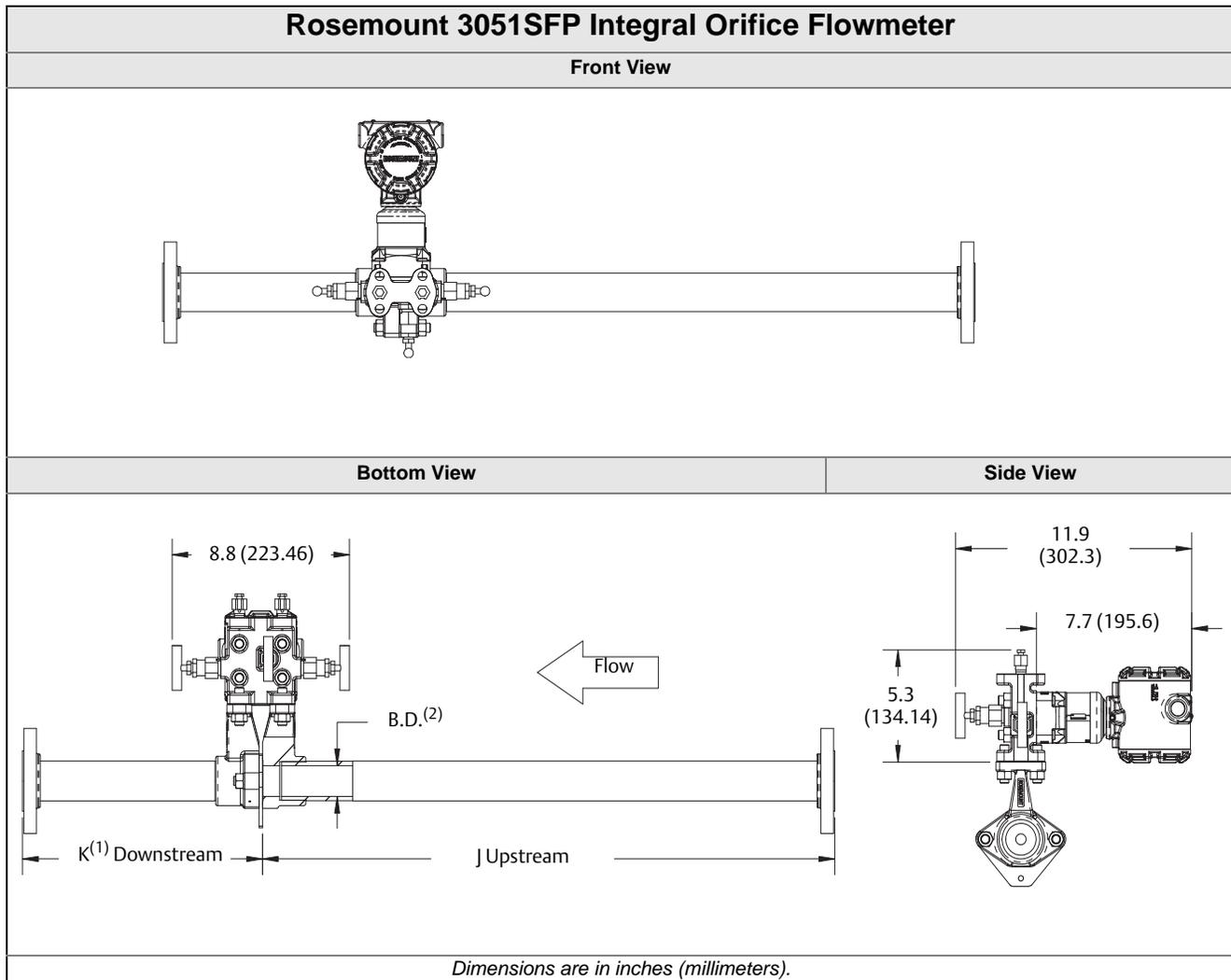


Table 12. 3051SFP Integral Orifice Flowmeter Dimensional Data

Dimension	Line Size		
	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).

Emerson Process Management

Rosemount Inc.
8200 Market Boulevard
Chanhassen, MN 55317 USA
T (U.S.) 1-800-999-9307
T (International) (952) 906-8888
F (952) 906-8889
www.rosemount.com

Emerson Process Management

Blegistrasse 23
P.O. Box 1046
CH 6341 Baar
Switzerland
T +41 (0) 41 768 6111
F +41 (0) 41 768 6300
www.rosemount.com

Emerson Process Management

Asia Pacific Pte Ltd
1 Pandan Crescent
Singapore 128461
T +65 6777 8211
F +65 6777 0947
Service Support Hotline: +65 6770 8711
Email: Enquiries@AP.EmersonProcess.com
www.rosemount.com

Emerson Process Management

Latin America
1300 Concord Terrace, Suite 400
Sunrise Florida 33323 USA
T + 1 954 846 5030
www.rosemount.com

Standard Terms and Conditions of Sale can be found at www.rosemount.com/terms_of_sale

The Emerson logo is a trade mark and service mark of Emerson Electric Co.

Rosemount and the Rosemount logotype are registered trademarks of Rosemount Inc.

PlantWeb is a registered trademark of one of the Emerson Process Management group of companies.

HART and WirelessHART are registered trademarks of the HART Communication Foundation

Modbus is a trademark of Modicon, Inc.

All other marks are the property of their respective owners.

© 2013 Rosemount Inc. All rights reserved.