Product Data Sheet
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Rosemount DP Flowmeters and Primary Elements

- Multivariable capabilities allow for real time fully compensated mass and energy flow
- Fully-Integrated wireless flowmeters allow for easy installation
- Minimize permanent pressure loss and save energy with Annubar® Technology
- Reduce straight pipe requirements to two diameters upstream and downstream from most flow disturbances with Conditioning Orifice Plate Technology
- Improve accuracy and repeatability in small line sizes with Integral Orifice Plate Technology

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Contents

DP Flowmeter Selection Guide . . . . . page 4
Rosemount 3051SF DP Flowmeters . . . . . page 7
Rosemount 3051SFA Annubar® Flowmeter ordering information . . . . . page 7
Rosemount 3051SFC Compact Orifice Flowmeter ordering information . . . . . page 18
Rosemount 3051SFP Integral Orifice Flowmeter ordering information . . . . . page 26
Performance specifications . . . . . page 35
Dynamic performance . . . . . page 36
Functional specifications . . . . . page 38
Physical specifications . . . . . page 43
3051SF Wireless Certifications . . . . . page 59
Rosemount 3051CF Flowmeter Series . . . . . page 61
Rosemount 3051CFA Annubar® Flowmeter . . . . . page 61
Rosemount 3051CFC Compact Flowmeter ordering information . . . . . page 70
Rosemount 3051CFP Integral Orifice Flowmeter ordering information . . . . . page 76
Performance specifications . . . . . page 83
Functional specifications . . . . . page 85
Physical specifications . . . . . page 89
3051 Product Certifications . . . . . page 91
Additional Certifications . . . . . page 97
Rosemount 2051CF Flowmeter Series . . . . . page 101
Rosemount 2051CFA Annubar Flowmeter ordering information . . . . . page 101
Rosemount 2051CFC Compact Flowmeter ordering information . . . . . page 109
Rosemount 2051CFP Integral Orifice Flowmeter ordering information . . . . . page 115
Performance specifications . . . . . page 122
Functional specifications . . . . . page 123
Physical specifications . . . . . page 128
Product Certifications . . . . . page 129
2051CF HART Protocol . . . . . page 129
2051CF Fieldbus protocol . . . . . page 133
Rosemount 485 Annubar® Primary Element . . . . . page 139
Ordering information . . . . . page 139
Performance specifications . . . . . page 145
Functional specifications . . . . . page 145
Physical specifications . . . . . page 146

Rosemount 585 Annubar Primary Element ..... page 150
Ordering information ..... page 150
Performance specifications ..... page 156
Functional specifications ..... page 156
Physical specifications ..... page 157
Rosemount 405 Compact Primary Element ..... page 159
Ordering information ..... page 159
Performance specifications ..... page 162
Functional specifications ..... page 162
Physical specifications ..... page 163
Rosemount 1595 Conditioning Orifice Plate ..... page 165
Ordering information ..... page 165
Performance specifications ..... page 168
Functional specifications ..... page 168
Physical specifications ..... page 168
Rosemount 1195 Integral Orifice Primary Element ..... page 171
Ordering information ..... page 171
Performance specifications ..... page 175
Functional specifications ..... page 175
Physical specifications ..... page 175
Rosemount 1495 Orifice Plate ..... page 177
Ordering information ..... page 177
Rosemount 1496 Orifice Flange Union ..... page 181
Ordering information ..... page 181
Functional specifications ..... page 185
Physical specifications ..... page 185
Dimensional Drawings ..... page 197

DP Flowmeter Selection Guide

Rosemount integrated DP Flowmeters arrive fully assembled, configured, and leak tested for out-of-the-box installation.

Rosemount 3051SF Flowmeters enable best-in-class flow measurement utilizing advanced functionality

- Up to 0.80% mass flow rate accuracy
- Multi-variable capabilities allow for real time fully compensated mass and energy flow
- Advanced diagnostics predict and prevent abnormal process conditions
- Installation ready wireless flow solution
- Ultra for Flow measures %-of-reading performance over 14:1 flow turndown
- 15-year stability, 15-year warranty
- SIL3 Capable: IEC 61508 certified by an accredited 3rd party agency for use in safety instrumented systems up to SIL 3 (minimum requirement of single use [1oo1] for SIL 2 and redundant use [1oo2] for SIL 3)

Rosemount 3051CF Flowmeters combine the proven 3051C pressure transmitter and the latest primary element technology

- Up to 1.65% volumetric flow accuracy at 8:1 turndown
- Available with HART®, *Wireless*HART®, FOUNDATION™ fieldbus, and PROFIBUS® Protocols
- 10-year stability
- SIL3 Capable: IEC 61508 certified by an accredited 3rd party agency for use in safety instrumented systems up to SIL 3 (minimum requirement of single use [1oo1] for SIL 2 and redundant use [1oo2] for SIL 3)

Rosemount 2051CF Flowmeters combine the 2051C pressure transmitter and the latest primary element technology

- Up to 2.00% volumetric flow accuracy at 5:1 turndown
- Available with HART, *Wireless*HART, and FOUNDATION fieldbus Protocols
- 3-year stability

Rosemount Annubar Primary Element Technology

- Energy savings gained through minimal permanent pressure loss
- Innovative T-shape design providing accuracies up to ±0.75% of flow rate (485 Annubar Primary Element)
- Variety of sensor materials for optimal compatibility with the process fluid
- Handles applications where conditions exceed the structural limitations of other primary elements
- Symmetrical sensor design allows bi-directional flow measurement (585 Annubar Primary Element)
- 405A Compact Annubar primary element easily installs like an orifice plate
- Integral thermowell allows temperature measurement without additional pipe penetrations for 485 and 405A models.

Rosemount Conditioning Orifice Plate Technology

- Reduce straight pipe requirements to two diameters upstream and downstream from most flow disturbances
- Discharge coefficient uncertainty as low as ±0.5%
- Integral thermowell allows temperature measurement without an additional pipe penetration with the compact design
- Reduce installation costs compared to traditional orifice plates with the compact design
- Conditioning orifice plate is based on AGA, ASME and ISO industry standards
- Available in various plate styles providing installation flexibility

Rosemount Integral Orifice Plate Technology

- Improves accuracy and repeatability in $^{1}/_{2}$-in., 1-in., and $1^{1}/_{2}$-in. line sizes
- Self-centering plate design eliminates installation errors that are magnified in small line sizes
- Precision honed pipe sections allow accuracy of up to ±0.75% of flow rate
- Installation flexibility with numerous process connections
- Integral thermowell allows temperature measurement without an additional pipe penetration

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 1-4)
- 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 34
Dimensional Drawings: page 197

Rosemount 3051SFA Annubar® Flowmeter ordering information

- 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.

Specification and selection of product materials, options, or components must be made by the purchaser of the equipment. See page 43 for more information on Material Selection.

Table 1. Rosemount 3051SFA Annubar Flowmeter Ordering Information

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

Model	Product description	Measurement type		• = Available — = Unavailable
		D	1-7	
3051SFA	Annubar Flowmeter	•	•	
Measurement type				
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	•	—	★
5	Process Variables Only (No Flow Calculations) – Differential & Static Pressures w/ Temperature	—	•	
6	Process Variables Only (No Flow Calculations) – Differential & Static Pressures	—	•	
7	Process Variables Only (No Flow Calculations) – Differential Pressure & Temperature	—	•	

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Fluid type		**D**	**1-7**	
L	Liquid	•	•	★
G	Gas	•	•	★
S	Steam	•	•	★
Line size				
020	2-in. (50 mm)	•	•	★
025	$2^1/_2$-in. (63.5 mm)	•	•	★
030	3-in. (80 mm)	•	•	★
035	$3^1/_2$-in. (89 mm)	•	•	★
040	4-in. (100 mm)	•	•	★
050	5-in. (125 mm)	•	•	★
060	6-in. (150 mm)	•	•	★
070	7-in. (175 mm)	•	•	★
080	8-in. (200 mm)	•	•	★
100	10-in. (250 mm)	•	•	★
120	12-in. (300 mm)	•	•	★
140	14-in. (350 mm)	•	•	
160	16-in. (400 mm)	•	•	
180	18-in. (450 mm)	•	•	
200	20-in. (500 mm)	•	•	
240	24-in. (600 mm)	•	•	
300	30-in. (750 mm)	•	•	
360	36-in. (900 mm)	•	•	
420	42-in. (1066 mm)	•	•	
480	48-in. (1210 mm)	•	•	
600	60-in. (1520 mm)	•	•	
720	72-in. (1820 mm)	•	•	
780	78-in. (1950 mm)	•	•	
840	84-in. (2100 mm)	•	•	
900	90-in. (2250 mm)	•	•	
960	96-in. (2400 mm)	•	•	
Pipe I.D. range				
C	Range C from the Pipe I.D. table	•	•	★
D	Range D from the Pipe I.D. table	•	•	★
A	Range A from the Pipe I.D. table	•	•	
B	Range B from the Pipe I.D. table	•	•	

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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		**D**	**1-7**	
C	Carbon steel (A105)	•	•	★
S	316 Stainless Steel	•	•	★
0[(1)]	No Mounting (customer supplied)	•	•	★
G	Chrome-Moly Grade F-11	•	•	
N	Chrome-Moly Grade F-22	•	•	
J	Chrome-Moly Grade F-91	•	•	
Piping orientation				
H	Horizontal Piping	•	•	★
D	Vertical Piping with Downwards Flow	•	•	★
U	Vertical Piping with Upwards Flow	•	•	★
Annubar type				
P	Pak-Lok	•	•	★
F	Flanged with opposite side support	•	•	★
L	Flange-Lok	•	•	
G	Gear-Drive Flo-Tap	•	•	
M	Manual Flo-Tap	•	•	
Sensor material				
S	316 Stainless Steel	•	•	★
H	Alloy C-276	•	•	
Sensor size				
1	Sensor size 1 — Line sizes 2-in. (50 mm) to 8-in. (200 mm)	•	•	★
2	Sensor size 2 — Line sizes 6-in. (150 mm) to 96-in. (2400 mm)	•	•	★
3	Sensor size 3 — Line sizes greater than 12-in. (300 mm)	•	•	
Mounting type				
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	•	•	★
A9[(2)]	900# RF ANSI	•	•	

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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				**D**	**1-7**	
0	No opposite side support or packing gland (required for Pak-Lok and Flange-Lok models)			•	•	★
	Opposite Side Support (required for Flanged Models)					
C	NPT Threaded Opposite Support Assembly – Extended Tip			•	•	★
D	Welded Opposite Support Assembly – Extended Tip			•	•	★
	Packing Gland – Required for Flo-Tap Models					
	Packing gland material	Rod material	Packing material			
J[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						
0[1]	Not Applicable or Customer Supplied			•	•	★
1	Gate Valve, Carbon Steel			•	•	
2	Gate Valve, Stainless Steel			•	•	
5	Ball Valve, Carbon Steel			•	•	
6	Ball Valve, Stainless Steel			•	•	
Temperature measurement						
T[4]	Integral RTD – not available with Flanged model greater than class 600#			•	•	★
0[5]	No Temperature Sensor			•	•	★
R[4]	Remote Thermowell and RTD			•	•	

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Transmitter connection platform				**D**	**1-7**	
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)			•	•	★
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						
1	0 to 25 in H_2O (0 to 62,16 mbar)			•	•	★
2	0 to 250 in H_2O (0 to 621,60 mbar)			•	•	★
3	0 to 1000 in H_2O (0 to 2,48 bar)			•	•	★
Static pressure range						
A[(6)]	None			•	•	★
D	Absolute 0 to 800 psia (0 to 55,15 bar)			–	•	★
E[(7)]	Absolute 0 to 3626 psia (0 to 250,00 bar)			–	•	★
J	Gage -14.2 to 800 psig (-0.98 to 55,15 bar)			–	•	★
K[(7)]	Gage -14.2 to 3626 psig (-0.98 to 250,00 bar)			–	•	★
Transmitter output						
A	4–20 mA with digital signal based on HART protocol			•	•	★
F	FOUNDATION fieldbus protocol (requires PlantWeb® housing)			•	–	★
X[(8)(9)]	Wireless (requires wireless options and Wireless PlantWeb housing)			•	•	★
Transmitter housing style		**Material**	**Conduit entry size**			
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	•	–	★

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2F	Junction Box housing with output for remote display and interface	Aluminum	M20 x 1.5	•	–	★
2J	Junction Box housing	SST	1/2-14 NPT	•	–	★
2M	Junction Box housing with output for remote display and interface	SST	1/2-14 NPT	•	–	★
5A[10]	Wireless PlantWeb housing	Aluminum	1/2-14 NPT	•	•	★
5J[10]	Wireless PlantWeb housing	SST	1/2-14 NPT	•	•	★
7J[8][11]	Quick Connect (A size Mini, 4-pin male termination)	N/A	N/A	•	–	★
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	•	–	
Performance class[12]				**D**	**1-7**	
3051S MultiVariable™ SuperModule™, Measurement Types 1, 2, 5, and 6						
3[13]	Ultra for Flow: 0.8% flow rate accuracy, 14:1 flow turndown, 10-year stability, 15-year limited 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, 15-year stability, 15-year limited warranty			•	•	★
2	Classic: up to 1.4% flow rate accuracy, 8:1 flow turndown, 15-year stability			•	•	★
3[13]	Ultra for Flow: 0.8% flow rate accuracy, 14:1 flow turndown, 15-year stability, 15-year limited warranty			•	•	★

Wireless options[9] (requires option code X and wireless PlantWeb housing)

Update rate, operating frequency and protocol	**D**	**1-7**	
WA	User Configurable Update Rate	•	–	★
Operating frequency and protocol			
3	2.4 GHz DSSS, IEC 62591 (*Wireless*HART)	•	–	★
Omni-directional wireless antenna			
WK	External Antenna	•	–	★
WM	Extended Range, External Antenna	•	–	★
WN	High-Gain, Remote Antenna	•	–	
SmartPower™ Adapter			
1[14]	Adapter for Black Power Module (I.S. Power Module Sold Separately)	•	–	★

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Other options (include with selected model number)

Extended product warranty		D	1-7	
WR3	3-year limited warranty	•	•	★
WR5	5-year limited warranty	•	•	★
Pressure testing				
P1[15]	Hydrostatic Testing with Certificate	•	•	
PX[15]	Extended Hydrostatic Testing	•	•	
Special cleaning				
P2	Cleaning for Special Services	•	•	
PA	Cleaning per ASTM G93 level D (section 11.4)	•	•	
Material testing				
V1	Dye Penetrant Exam	•	•	
Material examination				
V2	Radiographic Examination	•	•	
Flow calibration				
W1	Flow Calibration (Average K)	•	•	
WZ	Special Calibration	•	•	
Special inspection				
QC1	Visual & Dimensional Inspection with Certificate	•	•	★
QC7	Inspection & Performance Certificate	•	•	★
Surface finish				
RL	Surface finish for Low Pipe Reynolds Number in Gas & Steam	•	•	★
RH	Surface finish for High Pipe Reynolds Number in Liquid	•	•	★
Material traceability certification				
Q8[16]	Material Traceability Certificate per EN 10204:2004 3.1	•	•	★
Code conformance				
J2[17]	ANSI / ASME B31.1	•	•	
J3[17]	ANSI / ASME B31.3	•	•	
Material conformance				
J5[18]	NACE MR-0175/ISO 15156	•	•	
Country certification				
J6	European Pressure Directive (PED)	•	•	★
J1	Canadian Registration	•	•	

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Installed in flanged pipe spool section		**D**	**1-7**	
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				
G2	Needle Valves, Stainless Steel	•	•	★
G6	OS&Y Gate Valve, Stainless Steel	•	•	★
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				
Y1	Mounting Hardware Shipped Separately	•	•	★
Special dimensions				
VM	Variable Mounting	•	•	
VT	Variable Tip	•	•	
VS	Variable length Spool Section	•	•	
Transmitter calibration certification				
Q4	Calibration Certificate for Transmitter	•	•	★
QP	Calibration Certificate & Tamper Evident Seal	•	•	★
Quality certification for safety				
QS[(21)(28)]	Prior-use Certificate of FMEDA data	•	—	★
QT[(20)(21)(28)]	Safety certified to IEC 61508 with certificate of FMEDA data	•	—	★
Product certifications				
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; Nonincendive	•	•	★
K5	FM Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E5 and I5)	•	•	★

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E6[19]	CSA Explosion-proof, Dust Ignition-proof, Division 2	•	•	★
I6	CSA Intrinsically Safe	•	•	★
K6[19]	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	•	•	★
EM	Technical Regulations Customs Union (EAC) Flameproof	•	•	★
IM	Technical Regulations Customs Union (EAC) Intrinsic Safety	•	•	★
KM	Technical Regulations Customs Union (EAC) Flameproof, Intrinsic Safety	•	•	★
KC	FM and ATEX Explosion-proof, Intrinsically Safe, Division 2 (combination of E5, E1, I5, and I1)	•	•	★
KD[19]	FM, CSA, and ATEX Explosion-proof, Intrinsically Safe (combination of E5, I5, E6, I6, E1, and I1)	•	•	★
Shipboard approvals		**D**	**1-7**	
SBS	American Bureau of Shipping	•	•	★
SBV	Bureau Veritas (BV) Type Approval	•	•	★
SDN	Det Norske Veritas (DNV) Type Approval	•	•	★
SLL	Lloyds Register (LR) Type Approval	•	•	★
Sensor fill fluid and O-ring options				
L1	Inert Sensor Fill Fluid	•	•	★
L2	Graphite-Filled (PTFE) O-ring	•	•	★
LA	Inert Sensor Fill Fluid and Graphite-Filled (PTFE) O-ring	•	•	★
Digital display[20]				
M5	PlantWeb LCD display (requires PlantWeb housing)	•	•	★
M7[21][22][23]	Remote mount LCD display and interface, PlantWeb housing, no cable; SST bracket	•	–	★
M8[21][22]	Remote mount LCD display and interface, PlantWeb housing, 50 ft. (15 m) cable; SST bracket	•	–	★
M9[21][22]	Remote mount LCD display and interface, PlantWeb housing, 100 ft. (31 m) cable; SST bracket	•	–	★
Transient protection				
T1[24]	Transient terminal block	•	•	★
Manifold for remote mount option				
F2	3-Valve Manifold, Stainless Steel	•	•	★
F6	5-Valve Manifold, Stainless Steel	•	•	★

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F1	3-Valve Manifold, Carbon Steel	•	•	
F3	3-Valve Manifold, Alloy C-276	•	•	
F5	5-Valve Manifold, Carbon Steel	•	•	
F7	5-Valve Manifold, Alloy C-276	•	•	
PlantWeb control functionality		**D**	**1-7**	
A01	FOUNDATION fieldbus Advanced Control Function Block Suite	•	–	★
PlantWeb diagnostic functionality				
D01	FOUNDATION fieldbus Diagnostics Suite	•	–	★
DA2(25)	Advanced HART Diagnostic Suite	•	–	★
PlantWeb enhanced measurement functionality				
H01(26)	FOUNDATION fieldbus Fully Compensated Mass Flow Block	•	–	★
Cold temperature				
BRR(27)	-60 °F (-51 °C) Cold Temperature Start-up	–	•	★
Alarm limit(21)(28)				
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				
D1(21)(28)(29)	Hardware Adjustments (zero, span, alarm, security)	•	–	★
D4(30)	External Ground Screw Assembly	•	•	★
DA(21)(28)(29)	Hardware Adjustments (zero, span, alarm, security) & External Ground Screw Assembly	•	–	★
Conduit plug				
DO	316 SST Conduit Plug	•	•	★
Conduit electrical connector				
GE(31)	M12, 4-pin, Male Connector (eurofast®)	•	•	★
GM(31)	A size Mini, 4-pin, Male Connector (minifast®)	•	•	★
Typical model number: 3051SFA D L 060 D C H P S 2 T1 0 0 0 3 2A A 1A 3				

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

(2) Available in remote mount applications only.

(3) 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 codes 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) Only intrinsically safe approval codes apply.

(9) Only available with Measurement Types D and 6.

(10) Only available with output code X.

(11) Only available with output code A.

(12) For detailed specifications see "Specifications" on page 35.

(13) Only available with differential pressure ranges 2 and 3, and silicone fill fluid.

(14) Long-life Power Module must be shipped separately, order Power Module 701PBKKF.

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

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

(17) Not available with Transmitter Connection Platform 6.

(18) 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.

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

(20) Not available with housing code 7J.

(21) Not available with output code X. Only available with Measurement Type D.

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

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

(24) 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.

(25) Includes Hardware Adjustments (option code D1) as standard. Not available with output code X. Only available with Measurement Type D.

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

(27) -58 °F (50 °C) for Measurement Type 1-7.

(28) Not available with output code F.

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

(30) This assembly is included with options E1, N1, K1, ND, E4, E7, N7, K7, E2, E3, KA, KC, KD, IA, IE, N3, T1, EM, and KM.

(31) Not available with Housing code 5A, 5J, or 7J. Available with Intrinsically Safe approvals only. For FM Intrinsically Safe; Nonincendive (option code I5) or FM FISCO Intrinsically Safe (option code IE), install in accordance with Rosemount drawing 03151-1009.

Rosemount 3051SFC Compact Orifice Flowmeter ordering information

- Compact conditioning flowmeters reduce straight piping requirements to 2D upstream and 2D downstream from most flow disturbances.
- Simple installation of compact flowmeters between any existing raised-face flanges

Specification and selection of product materials, options, or components must be made by the purchaser of the equipment. See page 43 for more information on Material Selection.

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	•	•	
Measurement type				
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	•	—	★
5	Process Variables Only (No Flow Calculations) – Differential & Static Pressures w/ Temperature	—	•	
6	Process Variables Only (No Flow Calculations) – Differential & Static Pressures	—	•	
7	Process Variables Only (No Flow Calculations) – Differential Pressure & Temperature	—	•	
Primary element technology				
A	Annubar Averaging Pitot Tube	•	•	★
C	Conditioning Orifice Plate	•	•	★
P	Orifice Plate	•	•	★
Material type				
S	316 SST	•	•	★
Line size				
005(1)	1/2-in. (15 mm)	•	•	★
010(1)	1-in. (25 mm)	•	•	★
015(1)	1 1/2-in. (40 mm)	•	•	★
020	2-in. (50 mm)	•	•	★
030	3-in. (80 mm)	•	•	★
040	4-in. (100 mm)	•	•	★
060	6-in. (150 mm)	•	•	★

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.

080	8-in. (200 mm)			•	•	★
100[2][3]	10-in. (250 mm)			•	•	★
120[2][3]	12-in. (300 mm)			•	•	★
Primary element type				**D**	**1-7**	
N000	Annubar Sensor Size 1			•	•	★
N040	0.40 Beta Ratio (β)			•	•	★
N050	0.50 Beta Ratio (β)			•	•	★
N065[4]	0.65 Beta Ratio (β)			•	•	★
Temperature measurement						
T[6]	Integral RTD			—	•	★
0[5]	No Temperature Sensor			•	•	★
R[6]	Remote Thermowell and RTD			•	•	
Transmitter connection platform						
3	Direct-mount			•	•	★
7	Remote-mount, NPT Connections			•	•	★
Differential pressure range						
1	0 to 25 inH_2O (0 to 62,16 mbar)			•	•	★
2	0 to 250 inH_2O (0 to 621,60 mbar)			•	•	★
3	0 to 1000 inH_2O (0 to 2,48 bar)			•	•	★
Static pressure range						
A[7]	None			•	•	★
D	Absolute 0 to 800 psia (0 to 55,15 bar)			—	•	★
E[8]	Absolute 0 to 3626 psia (0 to 250,00 bar)			—	•	★
J	Gage -14.2 to 800 psig (-0,98 to 55,15 bar)			—	•	★
K[8]	Gage -14.2 to 3626 psig (-0,98 to 250,00 bar)			—	•	★
Transmitter output						
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**			
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	•	•	★

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.

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	•	–	★
Transmitter housing style		**Material**	**Conduit entry size**	**D**	**1-7**	
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)			•	–	★
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	•	–	
Performance class[14]						
3051S MultiVariable SuperModule, Measurement Types 1, 2, 5, and 6				•	•	
3[15]	Ultra for Flow: 0.75% flow rate accuracy, 14:1 flow turndown, 10-yr stability, 15-yr limited 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, 15-yr stability, 15-yr limited warranty			•	•	★
2	Classic: 1.40% flow rate accuracy, 8:1 flow turndown, 15-yr stability			•	•	★
3[15]	Ultra for Flow: 0.75% flow rate accuracy, 14:1 flow turndown, 15-yr stability, 15-yr limited warranty			•	•	★

Wireless options[11] (requires option code X and wireless PlantWeb housing)

Update rate, operating frequency, and protocol		**D**	**1-7**	
WA	User Configurable Update Rate	•	–	★
Operating frequency and protocol				
3	2.4 GHz DSSS, IEC 62591 (*Wireless*HART)	•	–	★
Omni-directional wireless antenna				
WK	External Antenna	•	–	★
WM	Extended Range, External Antenna	•	–	★

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.

WN	High-Gain, Remote Antenna	•	–	
SmartPower		**D**	**1-7**	
1[16]	Adapter for Black Power Module (I.S. Power Module Sold Separately)	•	–	★

Other options (include with selected model number)

Extended product warranty		**D**	**1-7**	
WR3	3-year limited warranty	•	•	★
WR5	5-year limited warranty	•	•	★
Installation accessories				
A	ANSI Alignment Ring (150#) (only required for 10-in. (250 mm) and 12-in. (300mm) line sizes)	•	•	★
Installation accessories				
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)	•	•	★
B	JIS Alignment Ring (10K)	•	•	
R	JIS Alignment Ring (20K)	•	•	
S	JIS Alignment Ring (40K)	•	•	
Remote adapters				
E	Flange adapters 316 SST ($^1/_2$-in. NPT)	•	•	★
High temperature applications				
T	Graphite Valve Packing (Tmax = 850 °F)	•	•	
Flow calibration				
WC[17]	Flow Calibration, 3 Pt, Conditioning Option C (all pipe schedules)	•	•	
WD[18][19]	Flow Calibration, 10 Pt, Conditioning Option C (all schedules), Annubar Option A (Schedule 40)	•	•	
Pressure testing				
P1	Hydrostatic Testing with Certificate	•	•	
Special cleaning				
P2[20]	Cleaning for Special Processes	•	•	
PA	Cleaning per ASTM G93 Level D (section 11.4)	•	•	

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.

Special inspection		**D**	**1-7**	
QC1	Visual & Dimensional Inspection with Certificate	•	•	★
QC7	Inspection & Performance Certificate	•	•	★
Transmitter calibration certification				
Q4	Calibration Data Certificate for Transmitter	•	•	★
QP	Calibration Certificate and Tamper Evident Seal	•	•	★
Quality certification for safety				
QS[(21)(22)]	Prior-use certificate of FMEDA data	•	–	★
QT[(21)(22)(25)]	Safety Certified to IEC 61508 with certificate of FMEDA data	•	–	★
Material traceability certifications				
Q8	Material Traceability Certification per EN 10204:2004 3.1	•	•	★
Code conformance				
J2	ANSI/ASME B31.1	•	•	
J3	ANSI/ASME B31.3	•	•	
J4	ANSI/ASME B31.8	•	•	
Material conformance				
J5[(23)]	NACE MR-0175/ISO 15156	•	•	
Country certification				
J1	Canadian Registration	•	•	
Product certifications				
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; Nonincendive	•	•	★
K5	FM Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E5 and I5)	•	•	★
E6[(24)]	CSA Explosion-proof, Dust Ignition-proof, Division 2	•	•	★
I6	CSA Intrinsically Safe	•	•	★
K6[(24)]	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E6 and I6)	•	•	★

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.

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	•	•	★
EM	Technical Regulations Customs Union (EAC) Flameproof	•	•	★
IM	Technical Regulations Customs Union (EAC) Intrinsic Safety	•	•	★
KM	Technical Regulations Customs Union (EAC) Flameproof, Intrinsic Safety	•	•	★
KA[(24)]	ATEX and CSA Flameproof, Intrinsically Safe, Division 2 (combination of E1, I1, E6, and I6)	•	•	★
KB[(24)]	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[(24)]	FM, CSA, and ATEX Explosion-proof, Intrinsically Safe (combination of E5, E6, E1, I5, I6, and I1)	•	•	★
Shipboard approvals		**D**	**1-7**	
SBS	American Bureau of Shipping	•	•	★
SBV	Bureau Veritas (BV) Type Approval	•	•	★
SDN	Det Norske Veritas (DNV) Type Approval	•	•	★
SLL	Lloyds Register (LR) Type Approval	•	•	★
Sensor fill fluid and O-ring options				
L1	Inert Sensor Fill Fluid	•	•	★
L2	Graphite-filled (PTFE) O-ring	•	•	★
LA	Inert sensor fill fluid and graphite-filled (PTFE) O-ring	•	•	★
Digital display[(25)]				
M5	PlantWeb LCD display	•	•	★
M7[(22)(26)(27)]	Remote mount LCD display and interface, PlantWeb housing, no cable, SST bracket	•	–	★
M8[(22)(26)]	Remote mount LCD display and interface, PlantWeb housing, 50 ft. (15m) cable, SST bracket	•	–	★
M9[(22)(26)]	Remote mount LCD display and interface, PlantWeb housing, 100 ft. (31m) cable, SST bracket	•	–	★
Transient protection				
T1[(28)]	Transient terminal block	•	•	★
Manifold for remote mount option				
F2	3-Valve Manifold, SST	•	•	★
F6	5-Valve Manifold, SST	•	•	★

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.

PlantWeb control functionality		**D**	**1-7**	
A01	FOUNDATION fieldbus Advanced Control Function Block Suite	•	—	★
PlantWeb diagnostic functionality				
D01	FOUNDATION fieldbus Diagnostics Suite	•	—	★
DA2(29)	Advanced HART Diagnostic Suite	•	—	★
PlantWeb enhanced measurement functionality				
H01(30)	FOUNDATION fieldbus Fully Compensated Mass Flow Block	•	—	★
Cold temperature				
BRR(31)	-60 °F (-51 °C) Cold Temperature Start-up	•	•	★
Alarm limit(21)(22)				
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				
D1(21)(22)(32)	Hardware adjustments (zero, span, alarm, security).	•	—	★
D4(33)	External ground screw assembly	•	•	★
DA(21)(22)(32)	Hardware adjustments (zero, span, alarm, security) and external ground screw assembly	•	—	★
Conduit plug				
DO	316 SST Conduit Plug	•	•	★
Conduit electrical connector				
ZE(34)	M12, 4-pin, Male Connector (eurofast)	•	•	★
ZM(34)	A size Mini, 4-pin, Male Connector (minifast)	•	•	★
Typical model number: 3051SFC 1 C S 060 N 065 T 3 2 J A 1A 3				

(1) Available with primary element technology P only.

(2) For the 10-in. (250 mm) and 12-in. (300 mm) line sizes, the alignment ring must be ordered (Installation Accessories).

(3) 10-in. (250 mm) and 12-in. (300 mm) line sizes not available with Primary Element Technology code A.

(4) For 2-in. (50 mm) line size the beta ratio is 0.6 for Primary Element Technology code C.

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

(6) Only available with Measurement Type codes 1, 3, 5, 7.

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

(8) For Measurement Type codes 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) Only intrinsically safe approval codes apply.

(11) Only available with Measurement Types D and 6.

(12) Only available with output code X.

(13) Available with output code A only.

(14) For detailed specifications see "Specifications" on page 35.

(15) Only available with differential pressure ranges 2 and 3, and silicone fill fluid.

(16) Long-life Power Module must be shipped separately, order Power Module 701PBKKF.

(17) Available with Primary Element Technology code C only.

(18) Available with Primary Element Technology codes C or A only.

(19) For Annubar Option A, consult factory for pipe schedules other than Sch. 40.

(20) Available with primary element technology C or P only.

(21) Not available with Output Protocol code F.

(22) Not available with output code X. Only available with Measurement Type D.

(23) 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.

(24) Not available with M20 or G½ conduit entry size.

(25) Not available with housing code 7J.

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

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

(28) 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.

(29) Includes Hardware Adjustments (option code D1) as standard. Not available with output code X. Only available with Measurement Type D.

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

(31) -58°F (50°C) for Measurement Type 1-7.

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

(33) This assembly is included with options EP, KP, E1, N1, K1, ND, E4, E7, K7, E3, KA, KC, KD, IA, T1, EM, and KM.

(34) Not available with Housing code 5A, 5J, or 7J. Available with Intrinsically Safe approvals only. For FM Intrinsically Safe; Nonincendive (option code I5) or FM FISCO Intrinsically Safe (option code IE), install in accordance with Rosemount drawing 03151-1009.

Rosemount 3051SFP Integral Orifice Flowmeter ordering information

- 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

Specification and selection of product materials, options, or components must be made by the purchaser of the equipment.
See page 43 for more information on Material Selection.

Table 3. Rosemount 3051SFP Integral Orifice Flowmeter Ordering Information

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

Model	Product description	Measurement type		• = Available — = Unavailable
		D	1-7	
3051SFP	Integral Orifice Flowmeter	•	•	
Measurement type				
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	•	—	★
5	Process Variables Only (No Flow Calculations) – Differential & Static Pressures w/ Temperature	—	•	
6	Process Variables Only (No Flow Calculations) – Differential & Static Pressures	—	•	
7	Process Variables Only (No Flow Calculations) – Differential Pressure & Temperature	—	•	
Body material				
S	316 SST	•	•	★
Line size				
005	1/2-in. (15 mm)	•	•	★
010	1-in. (25 mm)	•	•	★
015	1 1/2-in. (40 mm)	•	•	★
Process connection				
T1	NPT Female Body (not available with Thermowell and RTD)	•	•	★
S1(1)	Socket Weld Body (not available with 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	•	•	★

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.

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	•	•	
Process connection		**D**	**1-7**	
A6	Pipe Ends: Flanged, RF, ANSI Class 600, slip-on	•	•	
R1	Pipe Ends: Flanged, RTJ, ANSI Class 150, slip-on	•	•	
R3	Pipe Ends: Flanged, RTJ, ANSI Class 300, slip-on	•	•	
R6	Pipe Ends: Flanged, RTJ, ANSI Class 600, slip-on	•	•	
P9	Special Process Connection	•	•	
Orifice plate material				
S	316 SST	•	•	★
H	Alloy C-276	•	•	
M	Alloy 400	•	•	
Bore size option				
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	•	•	★
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	•	•	

Table 3. Rosemount 3051SFP Integral Orifice Flowmeter Ordering Information

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

Transmitter connection platform				**D**	**1-7**	
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			•	•	★
D4	Direct-mount, 3-valve Manifold, Alloy C-276			•	•	
D6	Direct-mount, 5-valve Manifold, Alloy C-276			•	•	
R4	Remote-mount, 3-valve Manifold, Alloy C-276			•	•	
R6	Remote-mount, 5-valve Manifold, Alloy C-276			•	•	
Differential pressure range						
1	0 to 25 inH_2O (0 to 62,16 mbar)			•	•	★
2	0 to 250 inH_2O (0 to 621,60 mbar)			•	•	★
3	0 to 1000 inH_2O (0 to 2,48 bar)			•	•	★
Static pressure range						
A[(2)]	None			•	•	★
D	Absolute 0 to 800 psia (0 to 55,15 bar)			–	•	★
E[(3)]	Absolute 0 to 3626 psia (0 to 250,00 bar)			–	•	★
J	Gage -14.2 to 800 psig (-0,98 to 55,15 bar)			–	•	★
K[(3)]	Gage -14.2 to 3626 psig (-0,98 to 250,00 bar)			–	•	★
Transmitter output						
A	4–20 mA with digital signal based on HART protocol			•	•	★
F	FOUNDATION fieldbus (requires PlantWeb housing)			•	–	★
X[(4)(5)]	Wireless (requires wireless options and wireless PlantWeb housing)			•	•	★
Transmitter housing style		**Material**	**Conduit entry size**			
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	•	–	★

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.

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[6]	Wireless PlantWeb housing	Aluminum	1/2–14 NPT	•	•	★
5J[6]	Wireless PlantWeb housing	SST	1/2–14 NPT	•	•	★
7J[4][7]	Quick Connect (A size Mini, 4-pin male termination)			•	–	★
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	•	–	
Performance class[8]				**D**	**1-7**	
3051S MultiVariable SuperModule, Measurement Types 1, 2, 5, and 6						
3[9]	Ultra for Flow: 0.95% flow rate accuracy, 14:1 flow turndown, 10-year stability, 15-year limited warranty			•	•	★
Performance class [8]						
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, 15-year stability, 15-year limited warranty			•	•	★
2	Classic: 1.50% flow rate accuracy, 8:1 flow turndown, 15-year stability			•	•	★
3[9]	Ultra for Flow: 0.95% flow rate accuracy, 14:1 flow turndown, 15-year stability, 15-year limited warranty			•	•	★

Wireless options[5] (requires option code X and wireless PlantWeb housing)

Update rate, operating frequency and protocol	**D**	**1-7**	
WA	User Configurable Update Rate	•	•	★
Operating frequency and protocol			
3	2.4 GHz DSSS, IEC 62591 (*Wireless*HART)	•	•	★
Omni-directional wireless antenna			
WK	External Antenna	•	•	★
WM	Extended Range, External Antenna	•	•	★
WN	High-Gain, Remote Antenna	•	•	
SmartPower			
1[10]	Adapter for Black Power Module (I.S. Power Module Sold Separately)	•	•	★

Table 3. Rosemount 3051SFP Integral Orifice Flowmeter Ordering Information

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

Other options (include with selected model number)

Extended product warranty		D	1-7	
WR3	3-year limited warranty	•	•	★
WR5	5-year limited warranty	•	•	★
Transmitter/body bolt material				
G[11]	High temperature Option (850 °F (454 °C))	•	•	
Temperature sensor				
T[12]	Thermowell and RTD	•	•	★
Optional connection				
G1	DIN 19213 Transmitter Connection	•	•	★
Pressure testing				
P1[13]	Hydrostatic Testing with Certificate	•	•	
Special cleaning				
P2	Cleaning for Special Services	•	•	
PA	Cleaning per ASTM G93 Level D (Section 11.4)	•	•	
Material testing				
V1	Dye Penetrant Exam	•	•	
Material examination				
V2	Radiographic Examination (available only with Process Connection code W1, W3, and W6)	•	•	
Flow calibration				
WD[14]	Discharge Coefficient Verification	•	•	
WZ[14]	Special Calibration	•	•	
Special inspection				
QC1	Visual & Dimensional Inspection with Certificate	•	•	★
QC7	Inspection & Performance Certificate	•	•	★
Material traceability certification				
Q8	Material certification per EN 10204:2004 3.1	•	•	★
Code conformance				
J2[15]	ANSI/ASME B31.1	•	•	
J3[15]	ANSI/ASME B31.3	•	•	
J4[15]	ANSI/ASME B31.8	•	•	
Materials conformance				
J5[16]	NACE MR-0175/ISO 15156	•	•	

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.

Country certification		**D**	**1-7**	
J6	European Pressure Directive (PED)	•	•	★
J1	Canadian Registration	•	•	
Transmitter calibration certification				
Q4	Calibration Data Certificate for Transmitter	•	•	★
Quality certification for safety				
QS[17][18]	Prior-use Certificate of FMEDA data	•	–	★
QT[17][18][20]	Safety-certified to IEC 61508 with Certificate of FMEDA data	•	–	★
Product certifications				
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; Nonincendive	•	•	★
K5	FM Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E5 and I5)	•	•	★
E6[19]	CSA Explosion-proof, Dust Ignition-proof, Division 2	•	•	★
I6	CSA Intrinsically Safe	•	•	★
Product certifications				
K6[19]	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	•	•	★
EM	Technical Regulations Customs Union (EAC) Flameproof	•	•	★
IM	Technical Regulations Customs Union (EAC) Intrinsic Safety	•	•	★
KM	Technical Regulations Customs Union (EAC) Flameproof, Intrinsic Safety	•	•	★
KA[19]	ATEX and CSA Flameproof, Intrinsically Safe, Division 2 (combination of E1, I1, E6, and I6)	•	•	★

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.

KB[19]	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[19]	FM, CSA, and ATEX Explosion-proof, Intrinsically Safe (combination of E5, I5, E6, I6, E1, and I1)	•	•	★
Shipboard approvals		**D**	**1-7**	
SBS	American Bureau of Shipping	•	•	★
SBV	Bureau Veritas (BV) Type Approval	•	•	★
SDN	Det Norske Veritas (DNV) Type Approval	•	•	★
SLL	Lloyds Register (LR) Type Approval	•	•	★
Sensor fill fluid and O-ring options				
L1	Inert Sensor Fill Fluid	•	•	★
L2	Graphite-filled (PTFE) O-ring	•	•	★
LA	Inert sensor fill fluid and graphite-filled (PTFE) O-ring	•	•	★
Digital display[20]				
M5	PlantWeb LCD display (requires PlantWeb housing)	•	•	★
M7[17][21][22]	Remote mount LCD display and interface, PlantWeb housing, no cable, SST bracket	•	–	★
M8[17][22]	Remote mount LCD display and interface, PlantWeb housing, 50 ft. (15 m) cable, SST bracket	•	–	★
M9[17][22]	Remote mount LCD display and interface, PlantWeb housing, 100 ft. (31 m) cable, SST bracket	•	–	★
Transient protection				
T1[23]	Transient terminal block	•	•	★
PlantWeb control functionality				
A01	FOUNDATION fieldbus Advanced Control Function Block Suite	•	–	★
PlantWeb diagnostic functionality				
D01	FOUNDATION fieldbus Diagnostics Suite	•	–	★
DA2[24]	Advanced HART Diagnostics Suite	•	–	★
PlantWeb enhanced measurement functionality				
H01[25]	FOUNDATION fieldbus Fully Compensated Mass Flow Block	•	–	★
Cold temperature				
BRR[26]	-60 °F (-51 °C) Cold Temperature Start-up	–	•	★
Alarm limit[17][18]				
C4	NAMUR Alarm & Saturation Levels, High Alarm	•	•	★
C5	NAMUR Alarm & Saturation Levels, Low Alarm	•	•	★

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.

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		**D**	**1-7**	
D1[17][18][27]	Hardware Adjustments (zero, span, alarm, security)	•	–	★
D4[28]	External ground screw assembly	•	•	★
DA[17][18][27]	Hardware adjustments (zero, span, alarm, security) & External Ground Screw Assembly	•	–	★
Conduit plug				
DO	316 SST Conduit Plug	•	•	★
Conduit electrical connector				
GE[29]	M12, 4-pin, Male Connector (eurofast)	•	•	
GM[29]	A size Mini, 4-pin, Male Connector (minifast)	•	•	
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 codes 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) Only intrinsically safe approval codes apply.

(5) Only available with Measurement Types D and 6.

(6) Only available with output code X.

(7) Only available with output code A.

(8) For detailed specifications see "Specifications" on page 35.

(9) Only available with differential pressure ranges 2 and 3, and silicone fill fluid.

(10) Long-life Power Module must be shipped separately, order Power Module 701PBKKF.

(11) Not available with $1\frac{1}{2}$-in. (38 mm) line size.

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

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

(14) Not available for bore sizes 0010, 0014, 0020, 0034, 0066, or 0109.

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

(16) 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.

(17) Not available with output code X. Only available with Measurement Type D.

(18) Not available with output code F.

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

(20) Not available with housing code 7J.

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

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

(23) Not available with Housing code 5A, 5J, or 7J. The T1 option is not needed with FISCO Product Certifications.

(24) Includes Hardware Adjustments (option code D1) as standard. Not available with output code X. Only available with Measurement Type D.

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

(26) -58 °F (50 °C) for Measurement Type 1-7.

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

(28) This assembly is included with options EP, KP, E1, N1, K1, ND, E4, E7, K7, E3, KA, KC, KD, IA, T1, EM, and KM

(29) Not available with Housing code 5A, 5J, or 7J. Available with Intrinsically Safe approvals only. For FM Intrinsically Safe; Nonincendive (option code I5) or FM FISCO Intrinsically Safe (option code IE), install in accordance with Rosemount drawing 03151-1009.

Specifications

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	Standard	±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	β = 0.4	±1.10% of Flow Rate	±0.75% of Flow Rate
	β = 0.50, 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	β = 0.4	±1.45% of Flow Rate	±1.30% of Flow Rate
	β = 0.50, 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	Bore < 0.160	±2.65% of Flow Rate	±2.55% of Flow Rate
	0.160 ≤ Bore < 0.500	±1.70% of Flow Rate	±1.55% of Flow Rate
	0.500 ≤ Bore ≤ 1.000	±1.25% of Flow Rate	±1.05% of Flow Rate
	1.000 < Bore	±1.70% of Flow Rate	±1.55% of Flow Rate

(1) Measurement Types 2 - 4 assume 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

(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	β = 0.4	±1.10% of Flow Rate	±0.9% of Flow Rate	±0.75% of Flow Rate
	β = 0.50, 0.65	±1.40% of Flow Rate	±1.25% of Flow Rate	±1.15% of Flow Rate

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

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	β = 0.4	±1.80% of Flow Rate	±1.35% of Flow Rate	±1.30% of Flow Rate
	β = 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	Bore < 0.160	±2.70% of Flow Rate	±2.65% of Flow Rate	±2.60% of Flow Rate
	0.160 ≤ Bore < 0.500	±1.80% of Flow Rate	±1.70% of Flow Rate	±1.60% of Flow Rate
	0.500 ≤ Bore ≤ 1.000	±1.35% of Flow Rate	±1.25% of Flow Rate	±1.15% of Flow Rate
	1.000 < Bore	±1.80% 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.

Dynamic performance

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

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

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

Dead time (1)

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

(1) For Option Code DA2, dead time is 90 milliseconds (nominal).

Update rate (1)

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

(1) Does not apply to Wireless (output code X). See "Wireless self-organizing networks" on page 41 for wireless update rate.

Mounting position effects

Models		Ultra, Ultra for Flow, Classic and Classic MV
3051SF_3, 4, 7, or D		Zero shifts up to ±1.25 inH_2O (3,11 mbar), which can be zeroed Span: no effect
3051SF_1, 2, 5, or 6	DP Sensor:	Zero shifts up to ±1.25 inH_2O (3,11 mbar), which can be zeroed Span: no effect
	GP/AP Sensor:	Zero shifts to ±2.5 inH_2O (6,22 mbar), which can be zeroed Span: no effect

Vibration effect 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

Electromagnetic compatibility (EMC)

Meets all relevant requirements of EN 61326 and NAMUR NE-21.(2)(3)

Transient protection (Option T1)

Meets IEEE C62.41.2-2002, Location Category B

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

Meets IEEE C37.90.1-2002 Surge Withstand Capability

SWC 2.5 kV crest, 1.0 MHz wave form

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

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

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

Functional specifications

Range and sensor limits

Flowmeter with coplanar sensor module

Range	DP Sensor (3051SF_3, 4, or 7)	
	Lower (LRL)	Upper (URL)
1	0 inH_2O (0 mbar)	25.00 inH_2O (62,16 mbar)
2	0 inH_2O (0 bar)	250.00 inH_2O (621,60 mbar)
3	0 inH_2O (0 bar)	1000.00 inH_2O (2,48 bar)

Flowmeter with MultiVariable sensor module

Range	DP Sensor (3051SF1, 2, 5, or 6)	
	Lower (LRL)	Upper (URL)
1	0 inH_2O (0 mbar)	25.00 inH_2O (62,16 mbar)
2	0 inH_2O (0 bar)	250.00 inH_2O (621,60 mbar)
3	0 inH_2O (0 bar)	1000.00 inH_2O (2,48 bar)
Range	**Static Pressure Sensor (GP/AP)**	
	Lower (LRL)	**Upper (URL)[1]**
3	GP[2]: -14.20 psig (0,97 bar) AP: 0.50 psia (34,47 mbar)	GP: 800.00 psig (55,15 bar) AP: 800.00 psia (55,15 bar)
4	GP[2]: -14.20 psig (0,97 bar) AP: 0.50 psia (34,47 mbar)	GP: 3626.00 psig (250,00 bar) AP: 3626.00 psia (250,00 bar)

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

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

Process Temperature RTD Interface (3051SF_1, 3, 5 or 7)[1]	
Lower (LRL)	Upper (URL)
-328 °F (-200 °C)	1562 °F (850 °C)

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

Minimum span limits

Transmitter with coplanar sensor module (single variable)

Range	DP Sensor (3051SF_D, 3, 4 or 7)	
	Ultra & Ultra for Flow	Classic
1	0.5 inH_2O (1,24 mbar)	0.5 inH_2O (1,24 mbar)
2	1.3 inH_2O (3,23 mbar)	2.5 inH_2O (6,22 mbar)
3	5.0 inH_2O (12,43 mbar)	10.0 inH_2O (24,86 mbar)

Transmitter with MultiVariable sensor module

Range	DP Sensor (3051SF_1, 2, 5, or 6)	
	Ultra for Flow	**Classic MV**
1	0.5 inH_2O (1,24 mbar)	0.5 inH_2O (1,24 mbar)
2	1.3 inH_2O (3,23 mbar)	2.5 inH_2O (6,22 mbar)
3	5.0 inH_2O (12,43 mbar)	10.0 inH_2O (24,86 mbar)
Range	**Static Pressure Sensor (GP/AP)**	
	Ultra for Flow	**Classic MV**
3	4.0 psi (275,79 mbar)	8.0 psi (551,58 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 = 52 °F (11 °C)

Service

3051SF_5, 6, 7, or D (direct process variable output):

Liquid, gas, and steam applications

3051SF_1, 2, 3, or 4 (mass and energy flow output):

Some fluid types are only supported by certain measurement types

Fluid compatibility with pressure and temperature compensation • **Available** — Not available

Ordering code		Fluid types			
	Measurement type	**Liquids**	**Saturated steam**	**Superheated steam**	**Gas and natural gas**
1	DP / P/ T (Full Compensation)	•	•	•	•
2	DP / P	•	•	•	•
3	DP / T	•	•	—	—
4	DP only	•	•	—	—

4–20 mA/HART

Zero and span adjustment

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

Output

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

Power supply

External power supply required.

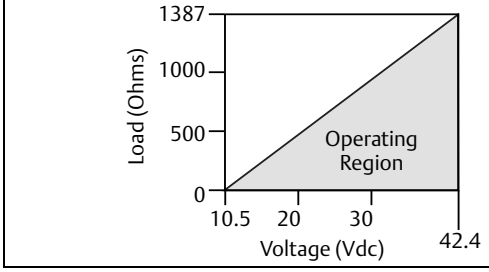
- 3051SF_D: 10.5 to 42.4 Vdc with no load
- 3051SF_D with Advanced HART Diagnostics Suite: 12 to 42.4 Vdc with no load
- 3051SF_1-7: 12 to 42.4 Vdc with no load

Load limitations

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

3051SF_D

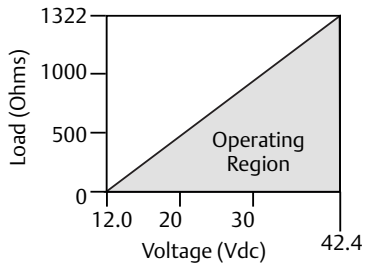
Maximum Loop Resistance = 43.5 * (Power Supply Voltage – 10.5)



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

3051SF_1-7 and 3051SF_D with HART Diagnostics (Option Code DA2)

Maximum Loop Resistance = 43.5 * (Power Supply Voltage – 12.0)



The Field Communicator requires a minimum loop resistance of 250W 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 display 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	N/A
Transducer	N/A
LCD display Block	N/A
Analog Input 1, 2	20 milliseconds
PID with Auto-tune	35 milliseconds
Input Selector	20 milliseconds
Arithmetic	20 milliseconds
Signal Characterizer	20 milliseconds
Integrator	20 milliseconds
Output Splitter	20 milliseconds
Control Selector	20 milliseconds

Fully compensated mass flow block (Option Code H01)

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

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

*Wireless*HART, 2.4 GHz DSSS.

Local display

The optional 5-digit LCD display 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

*Wireless*HART, 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 (137,90 bar)
2	3626 psi (250,00 bar)
3	3626 psi (250,00 bar)

(1) The overpressure limit of a DP Sensor with the P9 option is 4500 psig (310,26 bar). The overpressure limit of a DP Sensor with the P0 option is 6092 psig (420,00 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 (110,32 bar)	1600 psi (110,32 bar)	1600 psi (110,32 bar)
Range 4 GP/AP	2000 psi (137,90 bar)	3626 psi (250,00 bar)	3626 psi (250,00 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 137,90 bar)
2	0.5 psia to 3626 psig (0,03 to 250,00 bar)
3	0.5 psia to 3626 psig (0,03 to 250,00 bar)

(1) The static pressure limit of a DP Sensor with the P9 option is 4500 psig (310,26 bar). The static pressure limit of a DP Sensor with the P0 option is 6092 psig (420,00 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 (55,15 bar)	800 psi (55,15 bar)	800 psi (55,15 bar)
Range 4 GP/AP	2000 psi (137,90 bar)	3626 psi (250,00 bar)	3626 psi (250,00 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 display updates will be slower at temperatures below -4 °F (-20 °C).

Storage

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

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 in^3 (0,08 cm^3)

Damping [1]

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

(1) Does not apply to wireless Option Code X.

Failure mode alarm

HART 4-20 mA (output Option Code A)

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

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

Alarm configuration

	High alarm	Low alarm
Default	≥ 21.75 mA	≤ 3.75 mA
NAMUR compliant[1]	≥ 22.5 mA	≤ 3.6 mA
Custom levels[2]	20.2 - 23.0 mA	3.4 - 3.8 mA

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

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

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, G$^1/_2$, 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

Flange

- A182 Gr 316/316L
- 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
- Alloy 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

Nitirile Butadiene (NBR)

Wireless antenna

PBT/ polycarbonate (PC) integrated omni-directional antenna

Power module

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

Pipe I.D. Range Codes

For pipes with an Inner Diameter (I.D.) Range/Pipe Wall Thickness not found in this table or with a line size greater than 12-in. (300 mm), choose Option Code Z and specify the exact pipe dimensions (I.D. and Pipe Wall Thickness) on the Configuration Data Sheet (see document 00806-0100-4010). The Emerson Process Management sizing program will determine this code, based on the application piping.

	Line size			I.D. range	Pipe wall thickness		I.D. range code
	Nominal	Max. O.D.	Option code		ANSI pipes	Non-ANSI pipes	
	2-in. (50 mm)	2.625-in. (66.68 mm)	020	1.784 to 1.841-in. (45.31 to 46.76 mm)	0.065 to 0.545-in. (1.7 to 13.8 mm)	0.065 to 0.488-in. (1.7 to 12.4 mm)	A
				1.842 to 1.938-in. (46.79 to 49.23 mm)		0.065 to 0.449-in. (1.7 to 11.4 mm)	B
				1.939 to 2.067-in. (49.25 to 52.50 mm)		0.065 to 0.417-in. (1.7 to 10.6 mm)	C
				2.068 to 2.206-in. (52.53 to 56.03 mm)		0.065 to 0.407-in. (1.7 to 10.3 mm)	D
	2 1/2-in. (63.5 mm)	3.188-in. (80.98 mm)	025	2.207 to 2.322-in. (56.06 to 58.98 mm)	0.083 to 0.563-in. (2.1 to 14.3 mm)	0.083 to 0.448-in. (2.1 to 11.4 mm)	B
				2.323 to 2.469-in. (59.00 to 62.71 mm)		0.083 to 0.417-in. (2.1 to 10.6 mm)	C
				2.470 to 2.598-in. (62.74 to 65.99 mm)		0.083 to 0.435-in. (2.1 to 11.0 mm)	D
				2.599 to 2.647-in. (66.01 to 67.23 mm)		0.083 to 0.515-in. (2.1 to 13.1 mm)	E
	3-in. (80 mm)	3.75-in. (95.25 mm)	030	2.648 to 2.751-in. (67.26 to 69.88 mm)	0.083 to 0.563-in. (2.1 to 14.3 mm)	0.083 to 0.460-in. (2.1 to 11.7 mm)	A
				2.752 to 2.899-in. (69.90 to 73.63 mm)		0.083 to 0.416-in. (2.1 to 10.6 mm)	B
				2.900 to 3.068-in. (73.66 to 77.93 mm)		0.083 to 0.395-in. (2.1 to 10.0 mm)	C
				3.069 to 3.228-in. (77.95 to 81.99 mm)		0.083 to 0.404-in (2.1 to 10.3 mm)	D
	3 1/2-in. (89 mm)	4.25-in. (107.95 mm)	035	3.229 to 3.333-in. (82.02 to 84.66 mm)	0.120 to 0.600-in. (3.0 to 15.2 mm)	0.120 to 0.496-in. (3.0 to 12.6 mm)	B
				3.334 to 3.548-in. (84.68 to 90.12 mm)		0.120 to 0.386-in. (3.0 to 9.8 mm)	C
				3.549 to 3.734-in. (90.14 to 94.84 mm)		0.120 to 0.415-in. (3.0 to 10.5 mm)	D
	4-in. (100 mm)	5.032-in. (127.81 mm)	040	3.735 to 3.825-in. (94.87 to 97.16 mm)	0.120 to 0.600-in. (3.0 to 15.2 mm)	0.120 to 0.510-in. (3.0 to 13.0 mm)	B
				3.826 to 4.026-in. (97.18 to 102.26 mm)		0.120 to 0.400-in. (3.0 to 10.2 mm)	C
				4.027 to 4.237-in. (102.29 to 107.62 mm)		0.120 to 0.390-in. (3.0 to 9.9 mm)	D
				4.238 to 4.437-in. (107.65 to 112.70 mm)		0.120 to 0.401-in. (3.0 to 10.2 mm)	E
	5-in. (125 mm)	6.094-in. (154.79 mm)	050	4.438 to 4.571-in. (112.73 to 116.10 mm)	0.134 to 0.614-in. (3.4 to 15.6 mm)	0.134 to 0.481-in. (3.4 to 12.2 mm)	A
				4.572 to 4.812-in. (116.13 to 122.22 mm)		0.134 to 0.374-in. (3.4 to 9.5 mm)	B
				4.813 to 5.047-in. (122.25 to 128.19 mm)		0.134 to 0.380-in. (3.4 to 9.7 mm)	C
				5.048 to 5.249-in. (128.22 to 133.32 mm)		0.134 to 0.413-in. (3.4 to 10.5 mm)	D

	Line size			I.D. range	Pipe wall thickness		I.D. range code
	Nominal	Max. O.D.	Option code		ANSI pipes	Non-ANSI pipes	
Sensor Size 1	6-in. (150 mm)	6.93-in. (176.02 mm)	060	5.250 to 5.472-in. (133.35 to 138.99 mm)	0.134 to 0.614-in. (3.4 to 15.6 mm)	0.134 to 0.3919-in. (3.4 to 9.9 mm)	A
				5.473 to 5.760-in. (139.01 to 146.30 mm)		0.134 to 0.327-in. (3.4 to 8.3 mm)	B
				5.761 to 6.065-in. (146.33 to 154.05 mm)		0.134 to 0.31-in. (3.4 to 7.9 mm)	C
				6.066 to 6.383-in. (154.08 to 162.13 mm)		0.134 to 0.297-in. (3.4 to 7.5 mm)	D
Sensor Size 2	6-in. (150 mm)	6.93-in. (176.02 mm)	060	5.250 to 5.472-in. (133.35 to 139.99 mm)	0.134 to 1.354-in. (3.4 to 34.4 mm)	0.134 to 1.132-in. (3.4 to 28.7 mm)	A
				5.473 to 5.760-in. (139.01 to 146.30 mm)		0.134 to 1.067-in. (3.4 to 27.1 mm)	B
				5.761 to 6.065-in. (146.33 to 154.05 mm)		0.134 to 1.05-in. (3.4 to 26.7 mm)	C
				6.066 to 6.383-in. (154.08 to 162.13 mm)		0.134 to 1.037-in. (3.4 to 26.3 mm)	D
Sensor Size 1	7-in. (180 mm)	7.93-in. (201.42 mm)	070	6.384 to 6.624-in. (162.15 to 168.25 mm)	0.134 to 0.614-in. (3.4 to 15.6 mm)	0.134 to 0.374-in. (3.4 to 9.5 mm)	B
				6.625 to 7.023-in. (168.28 to 178.38 mm)		0.134 to 0.216-in. (3.4 to 5.5 mm)	C
				7.024 to 7.392-in. (178.41 to 187.76 mm)		0.134 to 0.246-in. (3.4 to 6.2 mm)	D
Sensor Size 2	7-in. (180 mm)	7.93-in. (201.42 mm)	070	6.384 to 6.624-in. (162.15 to 168.25 mm)	0.134 to 1.354-in. (3.4 to 34.4 mm)	0.134 to 1.114-in. (3.4 to 28.3 mm)	B
				6.625 to 7.023-in. (168.28 to 178.38 mm)		0.134 to 0.956-in. (3.4 to 24.3 mm)	C
				7.024 to 7.392-in. (178.41 to 187.76 mm)		0.134 to 0.986-in. (3.4 to 25.0 mm)	D
Sensor Size 1	8-in. (200 mm)	9.688-in. (246.08 mm)	080	7.393 to 7.624-in. (187.78 to 193.65 mm)	0.250 to 0.73-in. (6.4 to 18.5 mm)	0.250 to 0.499-in. (6.4 to 12.6 mm)	B
				7.625 to 7.981-in. (193.68 to 202.72 mm)		0.250 to 0.374-in. (6.4 to 9.5 mm)	C
				7.982 to 8.400-in. (202.74 to 213.36 mm)		0.250 to 0.312-in. (6.4 to 7.9 mm)	D
				8.401 to 8.766-in. (213.39 to 222.66 mm)		0.250 to 0.364-in. (6.4 to 9.2 mm)	E
Sensor Size 2	8-in. (200 mm)	9.688-in. (246.08 mm)	080	7.393 to 7.624-in. (187.78 to 193.65 mm)	0.250 to 1.47-in. (6.4 to 37.3 mm)	0.250 to 1.239-in. (6.4 to 31.4 mm)	B
				7.625 to 7.981-in. (193.68 to 202.72 mm)		0.250 to 1.114-in. (6.4 to 28.3 mm)	C
				7.982 to 8.400-in. (202.74 to 213.36 mm)		0.250 to 1.052-in. (6.4 to 26.7 mm)	D
				8.401 to 8.766-in. (213.39 to 222.66 mm)		0.250 to 1.104-in. (6.4 to 28.0 mm)	E
	10-in. (250 mm)	11.75-in. (298.45 mm)	100	8.767 to 9.172-in. (222.68 to 232.97 mm)	0.250 to 1.470-in. (6.4 to 37.3 mm)	0.250 to 1.065-in. (6.4 to 27.1 mm)	A
				9.173 to 9.561-in. (232.99 to 242.85 mm)		0.250 to 1.082-in. (6.4 to 27.5 mm)	B
				9.562 to 10.020-in. (242.87 to 254.51 mm)		0.250 to 1.012-in. (6.4 to 25.7 mm)	C
				10.021 to 10.546-in. (254.53 to 267.87 mm)		0.250 to 0.945-in. (6.4 to 24.0 mm)	D
				10.547 to 10.999-in. (267.89 to 279.37 mm)		0.250 to 1.018-in. (6.4 to 25.9 mm)	E
	12-in. (300 mm)	13.0375-in. (331.15 mm)	120	11.000 to 11.373-in. (279.40 to 288.87 mm)	0.250 to 1.470-in. (6.4 to 37.3 mm)	0.250 to 1.097-in. (6.4 to 27.9 mm)	B
				11.374 to 11.938-in. (288.90 to 303.23 mm)		0.250 to 0.906-in. (6.4 to 23.0 mm)	C
				11.939 to 12.250-in. (303.25 to 311.15 mm)		0.250 to 1.159-in. (6.4 to 29.4 mm)	D

Rosemount 3051SMV/3051SFx (Measurement Type 1-7) Certifications

European Directive Information

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

Ordinary Location Certification from FM Approvals

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

North America

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

United States of America

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

I5 FM Intrinsic Safety (IS) and Nonincendive (NI)
Certificate: 3031960
Standards: FM Class 3600 – 1998, FM Class 3610 – 2007, FM Class 3611 – 2004, FM Class 3810 – 2005, NEMA 250 – 1991
Markings: IS CL I, DIV 1, GP A, B, C, D; CL II, DIV 1, GP E, F, G; Class III; Class 1, Zone 0 AEx ia IIC T4; NI CL 1, DIV 2, GP A, B, C, D; T4(-50°C ≤ Ta ≤ +70°C) when connected per Rosemount drawing 03151-1206; Type 4x

Note
Transmitters marked with NI CL 1, DIV 2 can be installed in Division 2 locations using general Division 2 wiring methods or Nonincendive Field Wiring (NIFW). See Drawing 03151-1206.

Canada

E6 CSA Explosionproof, Dust-Ignitionproof, and Division 2
Certificate: 1143113
Standards: CAN/CSA C22.2 No. 0-10, CSA Std C22.2 No. 25-1966, CSA Std C22.2 No. 30-M1986, CAN/CSA C22.2 No. 94-M91, CSA Std C22.2 No. 142-M1987, CSA Std C22.2 No. 213-M1987, ANSI/ISA 12.27.01-2003, CSA Std C22.2 No. 60529:05
Markings: Explosionproof Class I, Division 1, Groups B, C, D; Dust-Ignitionproof Class II, Division 1, Groups E, F, G; Class III; suitable for Class I, Division 2, Groups A, B, C, D; Type 4x

I6 CSA Intrinsically Safe
Certificate: 1143113
Standards: CAN/CSA C22.2 No. 0-10, CSA Std C22.2 No. 30-M1986, CAN/CSA C22.2 No. 94-M91, CSA Std C22.2 No. 142-M1987, CSA Std C22.2 No. 157-92, ANSI/ISA 12.27.01-2003, CSA Std C22.2 No. 60529:05
Markings: Intrinsically Safe Class I, Division 1; suitable for Class 1, Zone 0, IIC, T3C; when connected per Rosemount drawing 03151-1207; Type 4x

Europe

E1 ATEX Flameproof
Certificate: KEMA 00ATEX2143X
Standards: EN 60079-0:2012, EN 60079-1: 2007, EN 60079-26:2007
Markings: II 1/2 G Ex d IIC T6...T4 Ga/Gb, T6(-60 °C ≤ Ta ≤ +70 °C), T5/T4(-60 °C ≤ Ta ≤ +80 °C)

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

Special Conditions for Safe Use (X):

1. The device contains a thin wall diaphragm. Installation, maintenance and use shall take into account the environmental conditions to which the diaphragm will be subjected. The manufacturer's instructions for installation and maintenance shall be followed in detail to assure safety during its expected lifetime.
2. For information on the dimensions of the flameproof joints the manufacturer shall be contacted.

I1 ATEX Intrinsic Safety
Certificate: Baseefa08ATEX0064X
Standards: EN 60079-0: 2012, EN 60079-11: 2012
Markings: Ⓔx II 1 G Ex ia IIC T4 Ga, T4(-60°C ≤ Ta ≤ +70°C)

	HART	SuperModule only	RTD (for 3051SFx)
Voltage U_i	30 V	7.14 V	30 V
Current I_i	300 mA	300 mA	2.31 mA
Power P_i	1 W	887 mW	17.32 mW
Capacitance C_i	12 nF	0.11 µF	0
Inductance L_i	0	0	0

Special Conditions for Safe Use (X):

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

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

Special Conditions for Safe Use (X):

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

N1 ATEX Type n
Certificate: Baseefa08ATEX0065X
Standards: EN 60079-0: 2012, EN 60079-15: 2010
Markings: Ⓔx II 3 G Ex nA IIC T4 Gc, (-40 °C ≤ Ta ≤ 70 °C), V_{max} = 45V

Special Condition for Safe Use (X):

1. If fitted with a 90V transient suppressor, the equipment is not capable of withstanding the 500V electrical strength test as defined in Clause 6.5.1 of EN 60079-15:2010. This must be taken into account during installation.

International

E7 IECEx Flameproof and Dust
Certificate: IECEx KEM 08.0010X (Flameproof)
Standards: IEC 60079-0:2011, IEC 60079-1: 2007, IEC 60079-26:2006
Markings: Ex d IIC T6...T4 Ga/Gb, T6(-60°C ≤ Ta ≤ +70°C), T5/T4(-60°C ≤ Ta ≤ +80°C)

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

Special Conditions for Safe Use (X):

1. The device contains a thin wall diaphragm. Installation, maintenance and use shall take into account the environmental conditions to which the diaphragm will be subjected. The manufacturer's instructions for installation and maintenance shall be followed in detail to assure safety during its expected lifetime.
2. For information on the dimensions of the flameproof joints the manufacturer shall be contacted.

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

Special Conditions for Safe Use (X):

1. Cable entries must be used which maintain the ingress protection of the enclosure to at least IP66.
2. Unused cable entries must be filled with suitable blanking plugs which maintain the ingress protection of the enclosure to at least IP66.

3. Cable entries and blanking plugs must be suitable for the ambient temperature range of the apparatus and capable of withstanding a 7J impact test.
4. The 3051S- SuperModule must be securely screwed in place to maintain the ingress protection of the enclosure.

I7 IECEx Intrinsic Safety
Certificate: IECEx BAS 08.0025X
Standards: IEC 60079-0: 2011, IEC 60079-11: 2011
Markings: Ex ia IIC T4 Ga, T4(-60 °C ≤ Ta ≤ +70 °C)

	HART	SuperModule only	RTD (for 3051SFx)
Voltage U_i	30 V	7.14 V	30 V
Current I_i	300 mA	300 mA	2.31 mA
Power P_i	1 W	887 mW	17.32 mW
Capacitance C_i	12 nF	0.11 µ F	0
Inductance L_i	0	0	0

Special Conditions for Safe Use (X):

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

N7 IECEx Type n
Certificate: IECEx BAS 08.0026X
Standards:IEC 60079-0: 2011, IEC 60079-15: 2010
Markings:Ex nA IIC T5 Gc, (-40 °C ≤ Ta ≤ 70 °C)

Special Condition for Safe Use (X):

1. If fitted with a 90V transient suppressor, the equipment is not capable of withstanding the 500V electrical strength test as defined in Clause 6.5.1 of IEC 60079-15:2010. This must be taken into account during installation.

Brazil

E2 INMETRO Flameproof
Certificate: CEPEL 03.0140X [Mfg USA, Singapore, Germany], CEPEL 07.1413X [Mfg Brazil]
Standards: ABNT NBR IEC 60079-0:2008, ABNT NBR IEC 60079-1:2009, ABNT NBR IEC 60529:2009
Markings: Ex d IIC T* Ga/Gb, T6(-40 °C ≤ T_a ≤ +65 °C), T5(-40 °C ≤ T_a ≤ +80 °C), IP66(Al)/IP66W(SST)

Special Conditions for Safe Use (X):

1. For ambient temperature above 60 °C, cable wiring must have minimum isolation temperature of 90 °C, to be in accordance to equipment operation temperature.
2. The device contains a thin wall diaphragm. Installation, maintenance and use shall take into account the environmental conditions to which the diaphragm will be subjected. The manufacturer's instructions for installation and maintenance shall be followed in detail to assure safety during its expected lifetime.

I2 INMETRO Intrinsic Safety
Certificate: NCC 12.1158X [Mfg USA, Germany]
Standards: ABNT NBR IEC 60079-0:2008, ABNT NBR IEC 60079-11:2009, ABNT NBR IEC 60079-26:2008
Markings: Ex ia IIC T4 Ga, T4(-60 °C ≤ T_a ≤ +70 °C), IP66(Al)/IP66W(SST)

Special Conditions for Safe Use (X):

1. If the equipment is fitted with the optional 90V transient suppressor, it is incapable of withstanding the 500V isolation from earth test and this must be taken into account during installation.
2. For processes with temperatures above 135 °C, the user must assess whether the SuperModule temperature class is suitable for such applications, because in this situation there is a risk of the SuperModule temperature being above T4.

	HART	SuperModule only	RTD (for 3051SFx)
Voltage U_i	30 V	7.14 V	30 V
Current I_i	300 mA	300 mA	2.31 mA
Power P_i	1 W	887 mW	17.32 mW
Capacitance C_i	12 nF	0.11 µ F	0
Inductance L_i	0	0	0

China

E3 China Flameproof and Dust Ignition-proof
Certificate: 3051SMV: GYJ14.1039X [Mfg USA, China, Singapore] 3051SFx: GYJ071086 [Mfg USA, China, Singapore]
Standards: 3051SMV: GB3836.1-2010, GB3836.2-2010, GB3836.20-2010
3051SFx: GB3836.1-2000, GB3836.2-2000, GB12476.1-2000
Markings: 3051SMV: Ex d IIC T6/T5 Ga/Gb
3051SFx: Ex d IIC T6/T5; Ex d IIB+H2T3~T5; DIP A21 T_A T3~T5

I3 China Intrinsic Safety
Certificate: 3051SMV: GYJ14.1040X [Mfg USA, China, Singapore]
3051SFx: GYJ11.1707X [Mfg USA, China, Singapore]
Standards: 3051SMV: GB3836.1-2010, GB3836.4-2010, GB3836.20-2010
3051SFx: GB3836.1/4-2010, GB3836.20-2010, GB12476.1-2000
Markings: 3051SMV: Ex ia IIC T4 Ga
3051SFx: Ex ia IIC T4 Ga, DIP A20 T_A105 °C IP66

Japan

E4 Japan Flameproof
Certificate:TC19070, TC19071, TC19072, TC19073
Markings: Ex d IIC T6

Technical Regulation Customs Union (EAC)

EM, IM, KM Contact an Emerson Process Management representative for additional information.

Combinations

K1 Combination of E1, I1, N1, and ND

K2 Combination of E2 and I2

K5 Combination of E5 and I5

K6 Combination of E6 and I6

K7 Combination of E7, I7, and N7

KA Combination of E1, I1, E6, and I6

KB Combination of E5, I5, E6, and I6

KC Combination of E1, I1, E5, and I5

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

Additional Certifications

SBS American Bureau of Shipping (ABS) Type Approval
Certificate: 00-HS145383-6-PDA
Intended Use: Measure gauge or absolute pressure of liquid, gas or vapor applications on ABS classed vessels, marine, and offshore installations.
ABS Rules: 2013 Steel Vessels Rules 1-1-4/7.7, 1-1-A3, 4-8-3/1.7, 4-8-3/1.11.1, 4-8-3/13.1

D3 Custody Transfer – Measurement Canada Accuracy
Approval Certificate: AG-0501, AV-2380C

Rosemount 3051S/3051SFx (Measurement Type D)

European Directive Information

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

Ordinary Location Certification from FM Approvals

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

North America

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

United States of America

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

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

Special Condition for Safe Use (X):

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

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

IE FM FISCO Field Device
Certificate:3012350
Standards: FM Class 3600 – 2011, FM Class 3610 – 2010, FM Class 3611 – 2004, FM Class 3810 – 2005, NEMA 250 –2003
Markings: IS CL I, DIV 1, GP A, B, C, D; (-50 °C ≤ Ta ≤ +60 °C); when connected per Rosemount drawing 03151-1006; Type 4x

Special Condition for Safe Use (X):

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

Canada

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

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

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

Europe

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

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

Special Conditions for Safe Use (X):

1. The device contains a thin wall diaphragm. Installation, maintenance and use shall take into account the environmental conditions to which the diaphragm will be subjected. The manufacturer's instructions for installation and maintenance shall be followed in detail to assure safety during its expected lifetime.
2. For information on the dimensions of the flameproof joints, the manufacturer shall be contacted.

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

Input Parameters

Model	Ui	Ii	Pi	Ci	Li
SuperModule	30 V	300 mA	1.0 W	30 nF	0
3051S...A; 3051SF...A; 3051SAL...C	30 V	300 mA	1.0 W	12 nF	0
3051S...F; 3051SF...F	30 V	300 mA	1.3 W	0	0
3051S ...F...IA; 3051SF ...F...IA	17.5 V	380 mA	5.32 W	0	0
3051S ...A...M7, M8, or M9; 3051SF ...A...M7, M8, or M9; 3051SAL...C... M7, M8, or M9	30 V	300 mA	1.0 W	11.4 nF	60 µ H
3051SAL or 3051SAM	30 V	300 mA	1.0 W	11.4 nF	33 µH
3051SAL...M7, M8, or M9 3051SAM...M7, M8, or M9	30 V	300 mA	1.0 W	11.4 nF	93 µH
RTD Option for 3051SF	5 V	500 mA	0.63 W	-	-

Special Conditions for Safe Use (X):

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

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

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

Special Conditions for Safe Use (X):

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

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

Special Conditions for Safe Use (X):

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

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

Special Condition for Safe Use (X):

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

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

International

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

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

Special Conditions for Safe Use (X):

1. The device contains a thin wall diaphragm. Installation, maintenance and use shall take into account the environmental conditions to which the diaphragm will be subjected. The manufacturer's instructions for installation and maintenance shall be followed in detail to assure safety during its expected lifetime.
2. For information on the dimensions of the flameproof joints the manufacturer shall be contacted.

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

Special Conditions for Safe Use (X):

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

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

Model	Ui	Ii	Pi	Ci	Li
SuperModule	30 V	300 mA	1.0 W	30 nF	0
3051S...A; 3051SF...A; 3051SAL...C	30 V	300 mA	1.0 W	12 nF	0
3051S...F; 3051SF...F	30 V	300 mA	1.3 W	0	0
3051S ...F...IA; 3051SF ...F...IA	17.5 V	380 mA	5.32 W	0	0
3051S ...A...M7, M8, or M9; 3051SF ...A...M7, M8, or M9; 3051SAL...C... M7, M8, or M9	30 V	300 mA	1.0 W	11.4 nF	60 µ H
3051SAL or 3051SAM	30 V	300 mA	1.0 W	11.4 nF	33 µH
3051SAL...M7, M8, or M9 3051SAM...M7 , M8, or M9	30 V	300 mA	1.0 W	11.4 nF	93 µ H
RTD Option for 3051SF	5 V	500 mA	0.63 W	-	-

Special Conditions for Safe Use (X):

1. The Model 3051S Transmitters fitted with transient protection are not capable of withstanding the 500V test as defined in Clause 6.3.13 of IEC 60079-11:2011. This must be taken into account during installation.
2. The terminal pins of the Model 3051S SuperModule must be provided with a degree of protection of at least IP20 in accordance with IEC/EN 60529.
3. The Model 3051S enclosure may be made of aluminum alloy and given a protective polyurethane paint finish; however, care should be taken to protect it from impact or abrasion if located in a zone 0 area.

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

1. If the apparatus is fitted with an optional 90V transient suppressor, it is not capable of withstanding the 500V insulation test required by clause 6.6.13 of IEC60079-11. This must be taken into account when installing the apparatus.
2. It is a condition of safe use that the following parameters shall be taken into account during installation.

Input parameters

Model	Ui	Ii	Pi	Ci	Li
SuperModule	30 V	300 mA	1.0 W	30 nF	0
3051S...A; 3051SF...A; 3051SAL...C	30 V	300 mA	1.0 W	12 nF	0
3051S...F; 3051SF...F	30 V	300 mA	1.3 W	0	0
3051S ...F...IA; 3051SF ...F...IA	17.5 V	380 mA	5.32 W	0	0
3051S ...A...M7, M8, or M9; 3051SF ...A...M7, M8, or M9; 3051SAL...C... M7, M8, or M9	30 V	300 mA	1.0 W	11.4 nF	60 µ H
3051SAL or 3051SAM	30 V	300 mA	1.0 W	11.4 nF	33 µ H
3051SAL...M7, M8, or M9 3051SAM...M7 , M8, or M9	30 V	300 mA	1.0 W	11.4 nF	93 µ H
RTD Option for 3051SF	5 V	500 mA	0.63 W	-	-

3. It is a condition of manufacture that only the apparatus fitted with housings, junction boxes, covers and sensor module housings made out of stainless steel are used in Group I applications.

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

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

Special Conditions for Safe Use (X):

1. The Model 3051S Transmitters fitted with transient protection are not capable of withstanding the 500V test as defined in Clause 6.3.13 of IEC 60079-11:2011. This must be taken into account during installation.
2. The terminal pins of the Model 3051S SuperModule must be provided with a degree of protection of at least IP20 in accordance with IEC/EN 60529.
3. The Model 3051S enclosure may be made of aluminum alloy and given a protective polyurethane paint finish; however, care should be taken to protect it from impact or abrasion if located in a zone 0 area.

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

Special Conditions for Safe Use (X):

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

Brazil

E2 INMETRO Flameproof
Certificate: CEPEL 03.0140X [Mfg USA, Singapore, Germany], CEPEL 07.1413X [Mfg Brazil]
Standards: ABNT NBR IEC 60079-0:2008, ABNT NBR IEC 60079-1:2009, ABNT NBR IEC 60529:2009
Markings: Ex d IIC T* Ga/Gb, T6(-40 °C ≤ Ta ≤ +65 °C), T5(-40 °C ≤ Ta ≤ +80 °C), IP66(Al)/IP66W(SST)

Special Conditions for Safe Use (X):

1. For ambient temperature above 60 °C, cable wiring must have minimum isolation temperature of 90 °C, to be in accordance to equipment operation temperature.
2. The device contains a thin wall diaphragm. Installation, maintenance and use shall take into account the environmental conditions to which the diaphragm will be subjected. The manufacturer's instructions for installation and maintenance shall be followed in detail to assure safety during its expected lifetime.

I2 INMETRO Intrinsic Safety
Certificate: CEPEL 05.0722X [Mfg USA, Singapore, Germany], CEPEL 07.1414X [Mfg Brazil]
Standards: ABNT NBR IEC 60079-0:2008, ABNT NBR IEC 60079-11:2009, ABNT NBR IEC 60079-26:2008, ABNT NBR IEC 60529:2009
Markings: Ex ia IIC T4 Ga, T4(-20 °C ≤ Ta ≤ +70 °C), IP66(Al)/IP66W(SST)

Special Conditions for Safe Use (X):

1. The Model 3051S Transmitters fitted with transient protection are not capable of withstanding the 500V test as defined in Clause 6.4.12 of IEC 60079-11. This must be taken into account during installation.

	HART	Fieldbus	RTD (for 3051SFx)
Voltage U_i	30 V	30 V	5 V
Current I_i	300 mA	300 mA	500 mA
Power P_i	1 W	1.3 W	0.63 W
Capacitance C_i	12 nF	0	0
Inductance L_i	0	0	0

IB INMETRO FISCO
Certificate: CEPEL 05.0722X [Mfg USA, Singapore, Germany], CEPEL 07.1414X [Mfg Brazil]
Standards: ABNT NBR IEC 60079-0:2008, ABNT NBR IEC 60079-11:2009, ABNT NBR IEC 60079-26:2008, ABNT NBR IEC 60529:2009
Markings: Ex ia IIC T4 Ga, T4(-20 °C ≤ Ta ≤ +40 °C), IP66(Al)/IP66W(SST)

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

Special Condition for Safe Use (X):

1. The Model 3051S Transmitters fitted with transient protection are not capable of withstanding the 500V test as defined in Clause 6.4.12 of IEC 60079-11. This must be taken into account during installation.

China

E3 China Flameproof and Dust Ignition-proof
Certificate: 3051S: GYJ091035 [Mfg USA], GYJ111400X [Mfg China, Singapore]
3051SFx: GYJ071086 [Mfg USA, China, Singapore]
Standards: 3051S: GB3836.1-2000, GB3836.2-2000, GB12476.1-20003051SFx: GB3836.1-2000, GB3836.2-2000, GB12476.1-2000
Markings: 3051S: Ex d IIC T5/T6; DIP A20T_A105°C; IP66
3051SFx: Ex d IIC T5/T6; Ex d IIB+H_2T3~T5; DIP A21 T_A T3~T5

Special Conditions for Safe Use (X):

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

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

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

- GB3836.13-1997 "Electrical apparatus for explosive gas atmospheres Part 13: Repair and overhaul for apparatus used in explosive gas atmospheres"
- GB3836.15-2000 "Electrical apparatus for explosive gas atmospheres Part 15: Electrical installations in hazardous area (other than mines)"
- GB50257-1996 "Code for construction and acceptance of electric device for explosion atmospheres and fire hazard electrical equipment installation engineering"
- GB15577-1995 "Safe regulation for explosive dust atmospheres"
- GB12476.2-2006 "Electrical apparatus for use in the presence of combustible dust – Part 1-2: Electrical apparatus protected by enclosures and surface temperature limitation – Selection, installation and maintenance"

I3 China Intrinsic Safety

Certificate: 3051S: GYJ111401X [Mfg USA, China, Singapore]
3051SF: GYJ11.1707X [Mfg USA, China, Singapore]
Standards: 3051S: GB3836.1-2000, GB3836.4-2000
3051SF: GB3836.1/4-2010, GB3836.20-2010 GB12476.1-2000
Markings: 3051S: Ex ia IIC T4
3051SF: Ex ia IIC T4 Ga, DIP A20 T_A105 °C IP66

Special Conditions for Safe Use (X):

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

2. The ambient temperature range is:

Output code	Ambient temperature
A	-50 °C ≤ Ta ≤+70 °C
F	-50 °C ≤ Ta ≤+60 °C

3. Intrinsically safe parameters:

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

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

- GB3836.13-1997 “Electrical apparatus for explosive gas atmospheres Part 13: Repair and overhaul for apparatus used in explosive gas atmospheres”
- GB3836.15-2000 “Electrical apparatus for explosive gas atmospheres Part 15: Electrical installations in hazardous area (other than mines)”
- GB3836.16-2006 “Electrical apparatus for explosive gas atmospheres Part 16: Inspection and maintenance of electrical installation (other than mines)”
- GB50257-1996 “Code for construction and acceptance of electric device for explosion atmospheres and fire hazard electrical equipment installation engineering”

N3 China Type n

Certificate: 3051S: GYJ101112X [Mfg China]
3051SF: GYJ101125X [Mfg China]
Standards: GB3836.1-2000, GB3836.8-2003
Markings: Ex nL IIC T5

Special Conditions for Safe Use (X):

1. Symbol “X” is used to denote specific conditions of use: The apparatus is not capable of withstanding the 500V test to earth for one minute. This must be taken into consideration during installation.
2. The ambient temperature range is: -40 °C ≤ Ta ≤ 70 °C.
3. Cable glands, conduit or blanking plugs, certified by NEPSI with Ex e or Ex n protection type and IP66 degree of protection provided by enclosure, should be used on external connections and redundant cable entries.
4. Energy limiting parameters:

Model	Terminal	Maximum input voltage: U_i (V)	Maximum input current: I_i (mA)	Maximum input power: P_i (W)	Maximum internal parameters: C_i (nF)	Maximum internal parameters: L_i (uH)
3051S-C/T	1 to 5	30	300	1	30	0
3051S HART, 4-20mA/SIS	+,- and CAN	30	300	1	11.4	0
3051S fieldbus/Profibus	+ and -	30	300	1.3	0	0
3051S FISCO	+ and -	17.5	380	5.32	0	0
Remote Mount Housing	+ and -	30	300	1	24	60

Note
Remote Mount Housing is for direct connection to the Model 3051S HART Terminals +,- and CAN by a cable whose maximum capacitance and inductance do not exceed 24nF and 60uH respectively.

5. 3051S type Pressure Transmitter comply to the requirements for FISCO field devices specified in IEC60079-27:2008. For the connection of an intrinsically safe circuit in accordance FISCO model, FISCO parameters of 3051S type Pressure Transmitter are listed in the table above.
6. The product should be used with associated energy-limited apparatus certified by NEPSI in accordance with GB 3836.1-2000 and GB 3836.8-2003 to establish explosion protection system that can be used in explosive gas atmospheres.
7. The cables between this product and associated energy-limited apparatus should be shielded cables (the cables must have insulated shield). The shielded has to be grounded reliably in non-hazardous area.
8. Maintenance should be done in non-hazardous location.

9. End users are not permitted to change any components inside, but to settle the problem in conjunction with manufacturer to avoid damage to the product.
10. When installation, use and maintenance of this product, observe following standards:

- GB3836.13-1997 "Electrical apparatus for explosive gas atmospheres Part 13: Repair and overhaul for apparatus used in explosive gas atmospheres"
- GB3836.15-2000 "Electrical apparatus for explosive gas atmospheres Part 15: Electrical installations in hazardous area (other than mines)"
- GB3836.16-2006 "Electrical apparatus for explosive gas atmospheres Part 16: Inspection and maintenance of electrical installation (other than mines)"
- GB50257-1996 "Code for construction and acceptance of electric device for explosion atmospheres and fire hazard electrical equipment installation engineering".

Japan

E4 Japan Flameproof

Certificate: TC15682, TC15683, TC15684, TC15685, TC15686, TC15687, TC15688, TC15689, TC15690, TC17099, TC17100, TC17101, TC17102, TC18876
Markings: Ex d IIC T6

Republic of Korea

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

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

Technical Regulation Customs Union (EAC)

EM, IM, KM Contact an Emerson Process Management representative for additional information.

Combinations

K1 Combination of E1, I1, N1, and ND

K2 Combination of E2 and I2

K5 Combination of E5 and I5

K6 Combination of E6 and I6

K7 Combination of E7, I7, and N7

KA Combination of E1, I1, E6, and I6

KB Combination of E5, I5, E6, and I6

KC Combination of E1, I1, E5, and I5

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

KG Combination of IA, IE, IF, and IG

KM Combination of EM and IM

KP Combination of EP and IP

Additional Certifications

SBS American Bureau of Shipping (ABS) Type Approval
Certificate: 00-HS145383-6-PDA
Intended Use: Measure gauge or absolute pressure of liquid, gas or vapor applications on ABS classed vessels, marine, and offshore installations.
ABS Rules: 2013 Steel Vessels Rules 1-1-4/7.7, 1-1-A3, 4-8-3/1.7,
4-8-3/1.11.1, 4-8-3/13.1

SBV Bureau Veritas (BV) Type Approval
Certificate: 31910/A0 BV
Requirements: Bureau Veritas Rules for the Classification of Steel Ships
Application: Class Notations: AUT-UMS, AUT-CCS, AUT-PORT and AUT-IMS

SDN Det Norske Veritas (DNV) Type Approval
Certificate: A-13243
Intended Use: Det Norske Veritas' Rules for Classification of Ships, High Speed & Light Craft, and Det Norske Veritas' Offshore Standards

Application:

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

SLL Lloyds Register (LR) Type Approval
Certificate: 11/60002(E3)
Application: Environmental categories ENV1, ENV2, ENV3, and ENV5

D3 Custody Transfer – Measurement Canada Accuracy Approval Certificate: AG-0501, AV-2380C

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 America

FM approvals

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

CSA - Canadian Standards Association

Process sealing

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

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

Europe

I1 ATEX Intrinsic Safety
Certificate: BAS01ATEX1303X ⟨Ex⟩ II 1G
Ex ia IIC T4(T_a = -60 °C to 70 °C)
IP66
For use with Rosemount SmartPower options 00753-9220-0001 only.

Special Condition for Safe Use (X):

1. 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

I7 IECEx Intrinsic Safety
Certificate: 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 Condition for Safe Use (X):

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

Rosemount 3051CF Flowmeter Series

Rosemount 3051CFA Annubar® Flowmeter

The Rosemount 3051CFA Annubar Flowmeter utilizes the T-shaped sensor design that delivers best in class accuracy and performance while meeting the needs of diverse process applications, whether it is high accuracy for precision control or high strength for severe flow applications. Main capabilities include:

- Up to 1.8% of flow rate accuracy
- Available in 2 to 96-in. (50 - 2400 mm) line sizes
- Fully assembled and leak tested for out-of-the-box installation
- Power Advisory can proactively detect degraded electrical loop integrity issues (Option Code DA0)
- Local Operator Interface with straightforward menus and built-in configuration buttons (Option Code M4)

See "Specifications" on page 83 and options for more details on each configuration.

Additional information:
Specifications: page 83
Certifications: page 91
Dimensional Drawings: page 205

Table 1. Rosemount 3051CFA Annubar Flowmeter Ordering Information

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

Model	Product description	
3051CFA[(1)]	Annubar Flowmeter	
Measurement type		
D	Differential Pressure	★
Fluid type		
L	Liquid	★
G	Gas	★
S	Steam	★
Line size		
020	2-in. (50 mm)	★
025	2 1/2-in. (63.5 mm)	★
030	3-in. (80 mm)	★
035	3 1/2-in. (89 mm)	★
040	4-in. (100 mm)	★
050	5-in. (125 mm)	★
060	6-in. (150 mm)	★

Table 1. Rosemount 3051CFA Annubar Flowmeter Ordering Information

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

070	7-in. (175 mm)	★
080	8-in. (200 mm)	★
100	10-in. (250 mm)	★
120	12-in. (300 mm)	★
140	14-in. (350 mm)	
160	16-in. (400 mm)	
180	18-in. (450 mm)	
200	20-in. (500 mm)	
240	24-in. (600 mm)	
300	30-in. (750 mm)	
360	36-in. (900 mm)	
420	42-in. (1066 mm)	
480	48-in. (1210 mm)	
600	60-in. (1520 mm)	
720	72-in. (1820 mm)	
780	78-in (1950 mm)	
840	84-in. (2100 mm)	
900	90-in. (2250 mm)	
960	96-in (2400 mm)	
Pipe I.D. range		
C	Range C from the Pipe I.D. Range Codes table	★
D	Range D from the Pipe I.D. Range Codes table	★
A	Range A from the Pipe I.D. Range Codes table	
B	Range B from the Pipe I.D. Range Codes table	
E	Range E from the Pipe I.D. Range Codes table	
Z	Non-standard Pipe I.D. Range Codes or Line Sizes greater than 12 inches	
Pipe material/mounting assembly material		
C	Carbon steel (A105)	★
S	316 Stainless Steel	★
0	No Mounting (customer supplied)	★
G	Chrome-Moly Grade F-11	
N	Chrome-Moly Grade F-22	
J	Chrome-Moly Grade F-91	

Table 1. Rosemount 3051CFA Annubar Flowmeter Ordering Information

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

Piping orientation		
H	Horizontal Piping	★
D	Vertical Piping with Downwards Flow	★
U	Vertical Piping with Upwards Flow	★
Annubar type		
P	Pak-Lok	★
F	Flanged with opposite side support	★
L	Flange-Lok	
G	Gear-Drive Flo-Tap	
M	Manual Flo-Tap	
Sensor material		
S	316 Stainless Steel	★
H	Alloy C-276	
Sensor size		
1	Sensor size 1 — Line sizes 2-in. (50 mm) to 8-in. (200 mm)	★
2	Sensor size 2 — Line sizes 6-in. (150 mm) to 96-in. (2400 mm)	★
3	Sensor size 3 — Line sizes greater than 12-in. (300 mm)	★
Mounting type		
T1	Compression or Threaded Connection	★
A1	150# RF ANSI	★
A3	300# RF ANSI	★
A6	600# RF ANSI	★
D1	DN PN16 Flange	★
D3	DN PN40 Flange	★
D6	DN PN100 Flange	★
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		
0	No opposite side support or packing gland (required for Pak-Lok and Flange-Lok models)	★

Table 1. Rosemount 3051CFA Annubar Flowmeter Ordering Information

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

	Opposite Side Support – Required for Flanged Models			
C	NPT Threaded Opposite Support Assembly – Extended Tip			★
D	Welded Opposite Support Assembly – Extended Tip			★
	Packing Gland – Required for Flo-Tap Models			
	Packing Gland Material	*Rod Material*	*Packing Material*	
J[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				
0	Not Applicable or Customer Supplied			★
1	Gate Valve, Carbon Steel			
2	Gate Valve, Stainless Steel			
5	Ball Valve, Carbon Steel			
6	Ball Valve, Stainless Steel			
Temperature measurement				
T	Integral RTD – not available with Flanged model greater than class 600#			★
0	No Temperature Sensor			★
R	Remote Thermowell and RTD			
Transmitter connection platform				
3	Direct-mount, Integral 3-valve Manifold– not available with Flanged model greater than class 600			★
5	Direct -mount, 5-valve Manifold – not available with Flanged model greater than class 600			★
7	Remote-mount NPT Connections ($^1/_2$-in. NPT)			★
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				
1	0 to 25 in H_2O (0 to 62,16 mbar)			★
2	0 to 250 in H_2O (0 to 621,60 mbar)			★
3	0 to 1000 in H_2O (0 to 2,48 bar)			★
Transmitter output				
A[4]	4–20 mA with digital signal based on HART Protocol			★
F	FOUNDATION™ fieldbus Protocol			★
W[5]	PROFIBUS® PA Protocol			★
X[6]	Wireless (requires wireless options and engineered polymer housing)			★
M[7]	Low-Power 1-5 Vdc with Digital Signal Based on HART® Protocol			

Table 1. Rosemount 3051CFA Annubar Flowmeter Ordering Information

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

Transmitter housing material		**Conduit entry size**	
A	Aluminum	1/2-14 NPT	★
B	Aluminum	M20 x 1.5	★
J	SST	1/2-14 NPT	★
K	SST	M20 x 1.5	★
P[8]	Engineered polymer	No conduit entries	★
D[9]	Aluminum	G1/2	
M[9]	SST	G1/2	
Transmitter performance class			
1	1.8% flow rate accuracy, 8:1 flow turndown, 5-yr. stability		★

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

Wireless transmit rate, operating frequency, and protocol		
WA3	User Configurable Transmit Rate, 2.4GHz *Wireless*HART®	★
Antenna and SmartPower™		
WP5	Internal Antenna, Compatible with Green Power Module (I.S. Power Module Sold Separately)	★

HART Revision configuration (requires HART Protocol Output Code A)

HR5[4]	Configured for HART Revision 5	★
HR7[4]	Configured for HART Revision 7	★

Options (include with selected model number)

Extended product warranty		
WR3	3-year limited warranty	★
WR5	5-year limited warranty	★
Pressure testing		
P1[10]	Hydrostatic Testing with Certificate	
PX[10]	Extended Hydrostatic Testing	
Special cleaning		
P2	Cleaning for Special Services	
PA	Cleaning per ASTM G93 Level D (Section 11.4)	
Material testing		
V1	Dye Penetrant Exam	

Table 1. Rosemount 3051CFA Annubar Flowmeter Ordering Information

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

Material examination		
V2	Radiographic Examination	
Flow calibration		
W1	Flow Calibration (Average K)	
Special inspection		
QC1	Visual & Dimensional Inspection with Certificate	★
QC7	Inspection & Performance Certificate	★
Surface finish		
RL	Surface finish for Low Pipe Reynolds # in Gas & Steam	★
RH	Surface finish for High Pipe Reynolds # in Liquid	★
Material traceability certification		
Q8[(11)]	Material Traceability Certification per EN 10474:2004 3.1	★
Code conformance[(12)]		
J2	ANSI/ASME B31.1	
J3	ANSI/ASME B31.3	
Materials conformance		
J5[(13)]	NACE MR-0175 / ISO 15156	
Country certification		
J6	European Pressure Directive (PED)	★
J1	Canadian Registration	
Installed in flanged pipe spool section		
H3	150# Flanged Connection with Rosemount Standard Length and Schedule	
H4	300# Flanged Connection with Rosemount Standard Length and Schedule	
H5	600# Flanged Connection with Rosemount Standard Length and Schedule	
Instrument connections for remote mount options		
G2	Needle Valves, Stainless Steel	★
G6	OS&Y Gate Valve, Stainless Steel	★
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		
Y1	Mounting Hardware Shipped Separately	★

Table 1. Rosemount 3051CFA Annubar Flowmeter Ordering Information

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

Special dimensions		
VM	Variable Mounting	
VT	Variable Tip	
VS	Variable length Spool Section	
PlantWeb control functionality		
A01[14]	FOUNDATION fieldbus Control Function Block Suite	★
PlantWeb diagnostic functionality		
DA0[15]	Power Advisory HART Diagnostic	★
D01[14]	FOUNDATION fieldbus Diagnostics Suite	★
Product certifications		
E8	ATEX Flameproof, Dust	★
I1[16]	ATEX Intrinsic Safety and Dust	★
IA	ATEX FISCO Intrinsic Safety; for FOUNDATION fieldbus or PROFIBUS PA protocols only	★
N1	ATEX Type n and Dust	★
K8	ATEX Flameproof, Intrinsic Safety, Type n, Dust (combination of E8, I1 and N1)	★
E5	FM Explosion-proof, Dust Ignition-proof	★
I5[17]	FM Intrinsically Safe, Nonincendive	★
IE	FM FISCO Intrinsically Safe; for FOUNDATION fieldbus or PROFIBUS PA protocols only	★
K5	FM Explosion-proof, Dust Ignition-proof, Intrinsically Safe, and Division 2 (combination of E5 and I5)	★
C6	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, and Division 2	★
I6 [8]	CSA Intrinsically Safe	★
K6	CSA and ATEX Explosion-proof, Intrinsically Safe, and Division 2 (combination of C6, E8, and I1)	★
E7	IECEx Flameproof, Dust Ignition-proof	★
I7	IECEx Intrinsic Safety	★
N7	IECEx Type n	★
K7	IECEx Flameproof, Dust Ignition-proof, Intrinsic Safety, and Type n (combination of I7, N7 and E7)	★
E2	INMETRO Flameproof	★
I2	INMETRO Intrinsic Safety	★
IB	INMETRO FISCO intrinsically safe; for FOUNDATION fieldbus or PROFIBUS PA protocols only	★
K2	INMETRO Flameproof, Intrinsic Safety	★
E3	China Flameproof	★
I3	China Intrinsic Safety	★
KB	FM and CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, and Division 2 (combination of K5 and C6)	★
KD	CSA, FM, and ATEX Explosion-proof, Intrinsically Safe (combination of K5, C6, I1, and E8)	★

Table 1. Rosemount 3051CFA Annubar Flowmeter Ordering Information

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

Sensor fill fluid and O-ring options		
L1[18]	Inert Sensor Fill Fluid (silicone fill fluid is standard)	★
L2	Graphite-Filled (PTFE) O-ring	★
LA[18]	Inert Sensor Fill Fluid and Graphite-Filled (PTFE) O-ring	★
Shipboard approvals		
SBS[18]	American Bureau of Shipping	★
SLL[18][19]	Lloyds Register (LR)	
Display and interface options		
M4[20]	LCD Display with Local Operator Interface	★
M5	LCD Display	★
Transmitter calibration certification		
Q4	Calibration Certificate for Transmitter	★
Quality certification for safety		
QS[15]	Prior-use certificate of FMEDA data	★
QT[15]	Safety certified to IEC 61508 with certificate of FMEDA	★
Transient protection		
T1[18][21]	Transient terminal block	★
Manifold for remote mount option		
F2	3-Valve Manifold, Stainless Steel	★
F6	5-Valve Manifold, Stainless Steel	★
F1	3-Valve Manifold, Carbon Steel	
F3	3-Valve Manifold, Alloy C-276	
F5	5-Valve Manifold, Carbon Steel	
F7	5-Valve Manifold, Alloy C-276	
Lower power output		
C2	0.8-3.2 Vdc Output with Digital Signal based on HART Protocol (Available with Output code M only)	
Alarm levels		
C4[15]	NAMUR Alarm and Saturation Levels, High Alarm	★
CN[15]	NAMUR Alarm and Saturation Levels, Low Alarm	★
CR[15]	Custom alarm and saturation signal levels, high alarm	★
CS[15]	Custom alarm and saturation signal levels, low alarm	★
CT[15]	Rosemount Standard low alarm	★
Configuration buttons		
D4[15]	Analog Zero and Span	★
DZ[22]	Digital Zero Trim	★

Table 1. Rosemount 3051CFA Annubar Flowmeter Ordering Information

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

Ground screw		
V5[18][23]	External Ground Screw Assembly	★
Typical model number: 3051CFA D L 060 D C H P S 2 T1 0 0 0 3 2 A A 1		

(1) Select Configuration Buttons (option code D4 or DZ) or Local Operator Interface (option code M4) if local configuration buttons are required.

(2) Available in remote mount applications only.

(3) The cage nipple is constructed of 304 SST.

(4) Option HR5 configures the HART output to HART Revision 5. Option HR7 configures the HART output to HART Revision 7. The device can be field configured to HART Revision 5 or 7 if desired. HART Revision 5 is the default HART output.

(5) For local addressing and configuration, M4 (Local Operator Interface) is required.

(6) Requires wireless options and engineered polymer housing. Available approvals are FM Intrinsically Safe, (option code I5), CSA Intrinsically Safe (option code I6), ATEX Intrinsic Safety (option code I1), and IECEx Intrinsic Safety (option code I7).

(7) Only available with C6, E2, E5, I5, K5, KB and E8 approval. Not available with GE, GM, SBS, DA0, M4, D4, DZ, QT, HR5, HR7, CR, CS, CT.

(8) Only available with Wireless Output (output code X).

(9) Not available with Product certifications options E8, K8, E5, K5, C6, K6, E7, K7, E2, K2, E3, KB, KD.

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

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

(12) Not available with Transmitter Connection Platform 6.

(13) Materials of Construction comply with metallurgical requirements within NACE MR0175/ISO for sour oil field production environments. Environmental limits apply to certain materials. Consult latest standard for details. Selected materials also conform to NACE MR0103 for sour refining environments.

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

(15) Only available with 4-20 mA HART Output (output Code A).

(16) Dust approval not applicable to output code X. See "IEC 62591 (WirelessHART Protocol)" on page 97 for wireless approvals

(17) Nonincendive certification not provided with Wireless output option code (X).

(18) Not available with Wireless Output (output code X).

(19) Only available with product certifications E7, E8, I1, I7, IA, K7, K8, KD, N1, N7

(20) Not available with FOUNDATION Fieldbus (Output Code F) or Wireless Output (output code X) or Low Power (output code M).

(21) The T1 option is not needed with FISCO Product Certifications, transient protection is included with the FISCO Product Certification codes IA, IB, and IE.

(22) Only available with 4-20 mA HART Output (output code A) and Wireless output (Output Code X).

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

Rosemount 3051CFC Compact Flowmeter ordering information

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

Table 2. Rosemount 3051CFC Compact Flowmeter Ordering Information

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

Model	Product description	
3051CFC[(1)]	Compact Flowmeter	
Measurement type		
D	Differential Pressure	★
Primary element technology		
A	Annubar Averaging Pitot Tube	★
C	Conditioning Orifice Plate	★
P	Orifice Plate	★
Material type		
S	316 SST	★
Line size		
005[(2)]	1/2-in. (15 mm)	★
010[(2)]	1-in. (25 mm)	★
015[(2)]	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[(3)(4)]	10-in. (250 mm)	★
120[(3)(4)]	12-in. (300 mm)	★
Primary element type		
N000	Annubar Sensor Size 1	★
N040	0.40 Beta Ratio	★
N050	0.50 Beta Ratio	
N065[(5)]	0.65 Beta Ratio	★
Temperature measurement		
0	No Temperature Sensor	★
R	Remote Thermowell and RTD	
T[(6)]	Integral Temperature	

Table 2. Rosemount 3051CFC Compact Flowmeter Ordering Information

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

Transmitter connection platform		
3	Direct-mount	★
7	Remote-mount, NPT Connections	★
Differential pressure range		
1	0 to 25 in H_2O (0 to 62,16 mbar)	★
2	0 to 250 in H_2O (0 to 621,60 mbar)	★
3	0 to 1000 in H_2O (0 to 2,48 bar)	★
Transmitter output		
A[7]	4–20 mA with digital signal based on HART Protocol	★
F	FOUNDATION fieldbus Protocol	★
W[8]	PROFIBUS PA Protocol	★
X[9]	Wireless (requires wireless options and engineered polymer housing)	★
M[10]	Low-Power 1-5 Vdc with Digital Signal Based on HART Protocol	

Transmitter housing material		**Conduit entry size**	
A	Aluminum	1/2-14 NPT	★
B	Aluminum	M20 x 1.5	★
J	SST	1/2-14 NPT	★
K	SST	M20 x 1.5	★
P[11]	Engineered polymer	No conduit entries	★
D[12]	Aluminum	G1/2	
M[12]	SST	G1/2	

Transmitter performance class		
1	Up to ±1.65% flow rate accuracy, 8:1 flow turndown, 5-year stability	★

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

Wireless transmit rate, operating frequency, and protocol		
WA3	User Configurable Transmit Rate, 2.4GHz *Wireless*HART	★
Antenna and SmartPower		
WP5	Internal Antenna, Compatible with Green Power Module (I.S. Power Module Sold Separately)	★

HART Revision Configuration (requires HART Protocol Output Code A)

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

Table 2. Rosemount 3051CFC Compact Flowmeter Ordering Information

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

Options (include with selected model number)

Extended product warranty		
WR3	3-year limited warranty	★
WR5	5-year limited warranty	★
Installation accessories		
AB	ANSI Alignment Ring (150#) (only required for 10-in. [250 mm] and 12-in. [300mm] line sizes)	★
AC	ANSI Alignment Ring (300#) (only required for 10-in. [250 mm] and 12-in. [300mm] line sizes)	★
AD	ANSI Alignment Ring (600#) (only required for 10-in. [250 mm] and 12-in. [300mm] line sizes)	★
DG	DIN Alignment Ring (PN16)	★
DH	DIN Alignment Ring (PN40)	★
DJ	DIN Alignment Ring (PN100)	★
JB	JIS Alignment Ring (10K)	
JR	JIS Alignment Ring (20K)	
JS	JIS Alignment Ring (40K)	
Remote adapters		
FE	Flange Adapters 316 SST (1/2-in NPT)	★
High temperature application		
HT	Graphite Valve Packing (Tmax = 850 °F)	
Flow calibration		
WC[13]	Flow Calibration, 3 pt, Conditioning Orifice Option C (all pipe schedules)	
WD[13][14]	Flow Calibration, 10 pt, Conditioning Option C (all schedules), Annubar Option A (Schedule 40)	
Pressure testing		
P1	Hydrostatic Testing with Certificate	
Special cleaning		
P2[15]	Cleaning for Special Services	
PA	Cleaning per ASTM G93 Level D (Section 11.4)	
Special inspection		
QC1	Visual & Dimensional Inspection with Certificate	★
QC7	Inspection and Performance Certificate	★
Transmitter calibration certification		
Q4	Calibration Certificate for Transmitter	★
Quality certification for safety		
QS[16]	Prior-use certificate of FMEDA data	★
QT[16]	Safety certified to IEC 61508 with certificate of FMEDA	★

Table 2. Rosemount 3051CFC Compact Flowmeter Ordering Information

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

Material traceability certification		
Q8	Material Traceability Certification per EN 10204:2004 3.1	★
Code conformance		
J2	ANSI/ASME B31.1	
J3	ANSI/ASME B31.3	
J4	ANSI/ASME B31.8	
Materials conformance		
J5[17]	NACE MR-0175/ISO 15156	
Country certification		
J1	Canadian Registration	
Product certifications		
E8	ATEX Flameproof, Dust	★
I1[18]	ATEX Intrinsic Safety and Dust	★
IA	ATEX FISCO Intrinsic Safety; for FOUNDATION fieldbus or PROFIBUS PA protocols only	★
N1	ATEX Type n and Dust	★
K8	ATEX Flameproof, Intrinsic Safety, Type n, Dust (combination of E8, I1 and N1)	★
E5	FM Explosion-proof, Dust Ignition-proof	★
I5[19]	FM Intrinsically Safe, Nonincendive	★
IE	FM FISCO Intrinsically Safe; for FOUNDATION fieldbus or PROFIBUS PA protocols only	★
K5	FM Explosion-proof, Dust Ignition-proof, Intrinsically Safe, and Division 2 (combination of E5 and I5)	★
C6	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, and Division 2	★
I6[11]	CSA Intrinsically Safe	★
K6	CSA and ATEX Explosion-proof, Intrinsically Safe, and Division 2 (combination of C6, E8, and I1)	★
E7	IECEx Flameproof, Dust Ignition-proof	★
I7	IECEx Intrinsic Safety	★
N7	IECEx Type n	★
K7	IECEx Flameproof, Dust Ignition-proof, Intrinsic Safety, and Type n (combination of I7, N7 and E7)	★
E2	INMETRO Flameproof	★
I2	INMETRO Intrinsic Safety	★
IB	INMETRO FISCO intrinsically safe; for FOUNDATION fieldbus or PROFIBUS PA protocols only	★
K2	INMETRO Flameproof, Intrinsic Safety	★
E3	China Flameproof	★
I3	China Intrinsic Safety	★
KB	FM and CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, and Division 2 (combination of K5 and C6)	★
KD	CSA, FM, and ATEX Explosion-proof, Intrinsically Safe (combination of K5, C6, I1, and E8)	★

Table 2. Rosemount 3051CFC Compact Flowmeter Ordering Information

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

Sensor fill fluid and O-ring options		
L1[20]	Inert Sensor Fill Fluid	★
L2	Graphite-Filled (PTFE) O-ring	★
LA[20]	Inert Sensor Fill Fluid and Graphite-Filled (PTFE) O-ring	★
Shipboard approvals		
SBS[20]	American Bureau of Shipping	★
SLL[20][21]	Lloyds Register (LR)	
Display and interface options		
M4[22]	LCD Display with Local Operator Interface	★
M5	LCD Display	★
Transient protection		
T1[20][23]	Transient terminal block	★
Manifold for remote mount option		
F2	3-Valve Manifold, Stainless Steel	★
F6	5-Valve Manifold, Stainless Steel	★
PlantWeb control functionality		
A01[24]	FOUNDATION fieldbus Control Function Block Suite	★
PlantWeb diagnostic functionality		
DA0[15]	Power Advisory HART Diagnostic	★
D01[24]	FOUNDATION fieldbus Diagnostic Suite	★
Low power output		
C2	0.8-3.2 Vdc Output with Digital Signal Based on HART Protocol (available with Output code M only)	
Alarm levels		
C4[16]	NAMUR Alarm and Saturation Levels, High Alarm	★
CN[16]	NAMUR Alarm and Saturation Levels, Low Alarm	★
CR[16]	Custom alarm and saturation signal levels, high alarm	★
CS[16]	Custom alarm and saturation signal levels, low alarm	★
CT[16]	Rosemount Standard low alarm	★
Ground screw		
V5[20][25]	External Ground Screw Assembly	★

Table 2. Rosemount 3051CFC Compact Flowmeter Ordering Information

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

Configuration buttons		
D4[16]	Analog Zero and Span	★
DZ[26]	Digital Zero Trim	★
Typical model number: 3051CFC D C S 060 N 065 0 3 2 A A 1 WC E5 M5		

(1) Select Configuration Buttons (option code D4 or DZ) or Local Operator Interface (option code M4) if local configuration buttons are required.

(2) Available with Primary Element Technology P only.

(3) 10-in. (250 mm) and 12-in. (300 mm) line sizes not available with Primary Element Technology A.

(4) For the 10-in. (250 mm) and 12-in. (300 mm) line size, the alignment ring must be ordered (Installation Accessories).

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

(6) Available with Primary Element Technology A only.

(7) Option HR5 configures the HART output to HART Revision 5. Option HR7 configures the HART output to HART Revision 7. The device can be field configured to HART Revision 5 or 7 if desired. HART Revision 5 is the default HART output.

(8) For local addressing and configuration, M4 (Local Operator Interface) is required.

(9) Requires wireless options and engineered polymer housing. Available approvals are FM Intrinsically Safe, (option code I5), CSA Intrinsically Safe (option code I6), ATEX Intrinsic Safety (option code I1), and IECEx Intrinsic Safety (option code I7).

(10) Only available with C6, E2, E5, I5, K5, KB and E8 approval. Not available with GE, GM, SBS, DA0, M4, D4, DZ, QT, HR5, HR7, CR, CS, CT.

(11) Only available with Wireless Output (output code X).

(12) Not available with Product certifications options E8, K8, E5, K5, C6, K6, E7, K7, E2, K2, E3, KB, KD.

(13) Available with Primary Element Technology C only.

(14) For Annubar option A, consult factory for pipe schedules other than schedule 40.

(15) Available with Primary Element Technology C or P only.

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

(17) 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.

(18) Dust approval not applicable to output code X. See "IEC 62591 (WirelessHART Protocol)" on page 97 for wireless approvals

(19) Nonincendive certification not provided with Wireless output option code (X).

(20) Not available with Wireless output (output code X).

(21) Only available with product certifications E7, E8, I1, I7, IA, K7, K8, KD, N1, N7

(22) Not available with output code F - FOUNDATION fieldbus or Wireless output (output code X) or Low Power (output code M).

(23) The T1 option is not needed with FISCO Product Certifications, transient protection is included with the FISCO Product Certification code IA, IB, and IE.

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

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

(26) Only available with 4-20 mA HART Output (output code A) and Wireless output (output code X).

Rosemount 3051CFP Integral Orifice Flowmeter ordering information

- 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 3051CFP Integral Orifice Flowmeter Ordering Information

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

Model	Product description	
3051CFP[(1)]	Integral Orifice Flowmeter	
Measurement type		
D	Differential Pressure	★
Body material		
S	316 SST	★
Line size		
005	1/2-in. (15 mm)	★
010	1-in. (25 mm)	★
015	1 1/2-in. (40 mm)	★
Process connection		
T1	NPT Female Body (not available with Thermowell and RTD)	★
S1[(2)]	Socket Weld Body (not available with Thermowell and RTD)	★
P1	Pipe Ends: NPT Threaded	★
P2	Pipe ends: Beveled	★
D1	Pipe Ends: Flanged, DIN PN16, slip-on	★
D2	Pipe Ends: Flanged, DIN PN40, slip-on	★
D3	Pipe Ends: Flanged, DIN PN100, slip-on	★
W1	Pipe Ends: Flanged, RF, ANSI Class 150, weld-neck	★
W3	Pipe Ends: Flanged, RF, ANSI Class 300, weld-neck	★
W6	Pipe Ends: Flanged, RF, ANSI Class 600, weld-neck	★
A1	Pipe Ends: Flanged, RF, ANSI Class 150, slip-on	
A3	Pipe Ends: Flanged, RF, ANSI Class 300, slip-on	
A6	Pipe Ends: Flanged, RF, ANSI Class 600, slip-on	
R1	Pipe Ends: Flanged, RTJ, ANSI Class 150, slip-on	
R3	Pipe Ends: Flanged, RTJ, ANSI Class 300, slip-on	
R6	Pipe Ends: Flanged, RTJ, ANSI Class 600, slip-on	
Orifice plate material		
S	316 SST	★
H	Alloy C-276	
M	Alloy 400	

Table 3. Rosemount 3051CFP Integral Orifice Flowmeter Ordering Information

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

Bore size option		
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	★
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		
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	★
D4	Direct-mount, 3-Valve Manifold, Alloy C-276	
D6	Direct-mount, 5-Valve Manifold, Alloy C-276	
R4	Remote-mount, 3-Valve Manifold, Alloy C-276	
R6	Remote-mount, 5-Valve Manifold, Alloy C-276	
Differential pressure ranges		
1	0 to 25 in H_2O (0 to 62,16 mbar)	★
2	0 to 250 in H_2O (0 to 621,60 mbar)	★
3	0 to 1000 in H_2O (0 to 2,48 bar)	★

Table 3. Rosemount 3051CFP Integral Orifice Flowmeter Ordering Information

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

Transmitter output			
A[3]	4–20 mA with digital signal based on HART Protocol		★
F	FOUNDATION fieldbus Protocol		★
W[4]	PROFIBUS PA Protocol		★
X[5]	Wireless		★
M[6]	Low-Power 1-5 Vdc with Digital Signal Based on HART Protocol		
Transmitter housing material		**Conduit entry size**	
A	Aluminum	1/2-14 NPT	★
B	Aluminum	M20 x 1.5	★
J	SST	1/2-14 NPT	★
K	SST	M20 x 1.5	★
P[7]	Engineered polymer	No conduit entries	★
D[8]	Aluminum	G1/2	
M[8]	SST	G1/2	
Transmitter performance class			
1	up to ±1.8% flow rate accuracy, 8:1 flow turndown, 5-year stability		★

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

Wireless transmit rate, operating frequency, and protocol		
WA3	User Configurable Transmit Rate, 2.4GHz *Wireless*HART	★
Antenna and SmartPower		
WP5	Internal Antenna, Compatible with Green Power Module (I.S. Power Module Sold Separately)	★

HART revision configuration (requires HART Protocol Output Code A)

HR5[3]	Configured for HART Revision 5	★
HR7[3]	Configured for HART Revision 7	★

Options (include with selected model number)

Extended product warranty		
WR3	3-year limited warranty	★
WR5	5-year limited warranty	★
Transmitter body/bolt material		
GT	High Temperature (850 °F/454 °C)	
Temperature sensor		
RT[9]	Thermowell and RTD	

Table 3. Rosemount 3051CFP Integral Orifice Flowmeter Ordering Information

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

Optional connection		
G1	DIN 19213 Transmitter Connection	★
Pressure testing		
P1[(10)(11)]	Hydrostatic Testing with Certificate	
Special cleaning		
P2	Cleaning for Special Services	
PA	Cleaning per ASTM G93 Level D (Section 11.4)	
Material testing		
V1	Dye Penetrant Exam	
Material examination		
V2	Radiographic Examination	
Flow calibration		
WD[(12)]	Discharge Coefficient Verification	
Special inspection		
QC1	Visual & Dimensional Inspection with Certificate	★
QC7	Inspection and Performance Certificate	★
Material traceability certification		
Q8	Material Traceability Certification per EN 10204:2004 3.1	★
Code conformance		
J2[(13)]	ANSI/ASME B31.1	
J3[(13)]	ANSI/ASME B31.3	
J4[(13)]	ANSI/ASME B31.8	
Materials conformance		
J5[(14)]	NACE MR-0175 / ISO 15156	
Country certification		
J6	European Pressure Directive (PED)	★
J1	Canadian Registration	
Transmitter calibration certification		
Q4	Calibration Certificate for Transmitter	★
Quality certification for safety		
QS[(15)]	Prior-use certificate of FMEDA data	★
QT[(15)]	Safety certified to IEC 61508 with certificate of FMEDA	★

Table 3. Rosemount 3051CFP Integral Orifice Flowmeter Ordering Information

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

Product certifications		
E8	ATEX Flameproof, Dust	★
I1[16]	ATEX Intrinsic Safety and Dust	★
IA	ATEX FISCO Intrinsic Safety; for FOUNDATION fieldbus or PROFIBUS PA protocols only	★
N1	ATEX Type n and Dust	★
K8	ATEX Flameproof, Intrinsic Safety, Type n, Dust (combination of E8, I1 and N1)	★
E5	FM Explosion-proof, Dust Ignition-proof	★
I5[17]	FM Intrinsically Safe, Nonincendive	★
IE	FM FISCO Intrinsically Safe; for FOUNDATION fieldbus or PROFIBUS PA protocols only	★
K5	FM Explosion-proof, Dust Ignition-proof, Intrinsically Safe, and Division 2 (combination of E5 and I5)	★
C6	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, and Division 2	★
I6[7]	CSA Intrinsically Safe	★
K6	CSA and ATEX Explosion-proof, Intrinsically Safe, and Division 2 (combination of C6, E8, and I1)	★
E7	IECEx Flameproof, Dust Ignition-proof	★
I7	IECEx Intrinsic Safety	★
N7	IECEx Type n	★
K7	IECEx Flameproof, Dust Ignition-proof, Intrinsic Safety, and Type n (combination of I7, N7 and E7)	★
E2	INMETRO Flameproof	★
I2	INMETRO Intrinsic Safety	★
IB	INMETRO FISCO intrinsically safe; for FOUNDATION fieldbus or PROFIBUS PA protocols only	★
K2	INMETRO Flameproof, Intrinsic Safety	★
E3	China Flameproof	★
I3	China Intrinsic Safety	★
KB	FM and CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, and Division 2 (combination of K5 and C6)	★
KD	CSA, FM, and ATEX Explosion-proof, Intrinsically Safe (combination of K5, C6, I1, and E8)	★
Sensor fill fluid and O-ring options		
L1[18]	Inert Sensor Fill Fluid	★
L2	Graphite-Filled (PTFE) O-ring	★
LA[18]	Inert Sensor Fill Fluid and Graphite-Filled (PTFE) O-ring	★
Shipboard approvals		
SBS[18]	American Bureau of Shipping	★
SLL[18][19]	Lloyds Register (LR)	
Display and interface options		
M4[20]	LCD Display with Local Operator Interface	★
M5	LCD Display	★

Table 3. Rosemount 3051CFP Integral Orifice Flowmeter Ordering Information

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

Transient protection		
T1[18][21]	Transient terminal block	★
PlantWeb control functionality		
A01[22]	FOUNDATION fieldbus Control Function Block Suite	★
PlantWeb diagnostic functionality		
DA0[15]	Power Advisory HART Diagnostic	★
D01[22]	FOUNDATION fieldbus Diagnostic Suite	★
Low power output		
C2	0.8-3.2 Vdc Output with Digital Signal Based on HART Protocol (available with Output code M only)	
Alarm levels		
C4[15]	NAMUR Alarm and Saturation Levels, High Alarm	★
CN[15]	NAMUR Alarm and Saturation Levels, Low Alarm	★
CR[15]	Custom alarm and saturation signal levels, high alarm	★
CS[15]	Custom alarm and saturation signal levels, low alarm	★
CT[15]	Rosemount Standard low alarm	★
Ground screw		
V5[18][23]	External Ground Screw Assembly	★
Configuration buttons		
D4[15]	Analog Zero and Span	★
DZ[24]	Digital Zero Trim	★
Typical model number: 3051CFP D S 010 W1 S 0500 D3 2 A A 1 E5 M5		

(1) Select Configuration Buttons (option code D4 or DZ) or Local Operator Interface (option code M4) if local configuration buttons are required.

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

(3) Option HR5 configures the HART output to HART Revision 5. Option HR7 configures the HART output to HART Revision 7. The device can be field configured to HART Revision 5 or 7 if desired. HART Revision 5 is the default HART output.

(4) For local addressing and configuration, M4 (Local Operator Interface) is required.

(5) Requires wireless options and engineered polymer housing. Available approvals are FM Intrinsically Safe, (option code I5), CSA Intrinsically Safe (option code I6), ATEX Intrinsic Safety (option code I1), and IECEx Intrinsic Safety (option code I7).

(6) Only available with C6, E2, E5, I5, K5, KB and E8 approval. Not available with GE, GM, SBS, DA0, M4, D4, DZ, QT, HR5, HR7, CR, CS, CT.

(7) Only available with Wireless Output (output code X).

(8) Not available with Product certifications options E8, K8, E5, K5, C6, K6, E7, K7, E2, K2, E3, KB, KD.

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

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

(11) Option P1 may not be ordered in combination with P2 or PA.

(12) Not available for bore sizes 0010, 0014, 0020, 0034, 0066, or 0109.

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

(14) Materials of Construction comply with metallurgical requirements within NACE MR0175/ISO for sour oil field production environments. Environmental limits apply to certain materials. Consult latest standard for details. Selected materials also conform to NACE MR0103 for sour refining environments.

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

(16) Dust approval not applicable to output code X. See "IEC 62591 (WirelessHART Protocol)" on page 97 for wireless approvals

(17) Nonincendive certification not provided with Wireless output option code (X).

(18) Not available with Wireless Output (output code X).

(19) Only available with product certifications E7, E8, I1, I7, IA, K7, K8, KD, N1, N7.

(20) Not available with FOUNDATION fieldbus (Output Code F) or Wireless output (output code X) or Low Power (output code M).

(21) The T1 option is not needed with FISCO Product Certifications, transient protection is included with the FISCO Product Certification code IA, IB, and IE.

(22) Only valid with FOUNDATION fieldbus Output Code F.

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

(24) Only available with 4-20 mA output (Output Code A) and Wireless output (Output Code X).

Specifications

Performance specifications

This product data sheet covers both HART, FOUNDATION fieldbus and PROFIBUS PA protocols unless specified.

For zero-based spans, reference conditions, silicone oil fill, glass-filled PTFE o-rings, SST materials, coplanar flange (3051C) or $^1/_2$ in.- 14 NPT (3051T) process connections, digital trim values set to equal range points.

Conformance to specification (±3σ [Sigma])

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

Flow performance - flow reference accuracy (1)

3051CFA Annubar Flowmeter		
Ranges 2-3		±1.80% of Flow Rate at 8:1 flow turndown
3051CFC_A Compact Annubar Flowmeter - Annubar Option A		
Ranges 2-3	Standard	±2.10% of Flow Rate at 8:1 flow turndown
	Calibrated	±1.80% of Flow Rate at 8:1 flow turndown
3051CFC Compact Orifice Flowmeter – Conditioning Option C		
Ranges 2-3	β = 0.40	±1.75% of Flow Rate at 8:1 flow turndown
	β = 0.50, 0.65	±1.95% of Flow Rate at 8:1 flow turndown
3051CFC Compact Orifice Flowmeter - Orifice Option P		
Ranges 2-3	β = 0.4	±2.00% of Flow Rate at 8:1 flow turndown
	β = 0.50, 0.65	±2.00% of Flow Rate at 8:1 flow turndown
3051CFP Integral Orifice Flowmeter		
Ranges 2-3	Bore < 0.160	±3.00% of Flow Rate at 8:1 flow turndown
	0.160 ≤ Bore < 0.500	±1.95% of Flow Rate at 8:1 flow turndown
	0.500 ≤ Bore ≤ 1.000	±1.75% of Flow Rate at 8:1 flow turndown
	1.000 < Bore	±2.15% of Flow Rate at 8:1 flow turndown

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

Total performance

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

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

Models	Total performance
3051CF Ranges 2-5	±0.15% of span

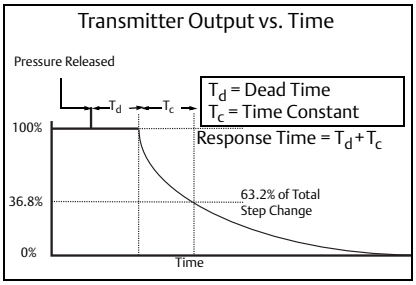
Long term stability

Models	Long term stability
3051CF Ranges 2-5	±0.2% of URL for 10 years ±50 °F (28 °C) temperature changes, and up to 1000 psi (6,9 MPa) line pressure
3051CF Low/Draft Range Ranges 0-1	±0.2% of URL for 1 year

Dynamic performance

	4 - 20 mA HART[1] 1 - 5 Vdc HART Low Power	FOUNDATION fieldbus and PROFIBUS PA Protocols [3]	Typical HART Transmitter Response Time
Total response time ($T_d + T_c$)[2]:			
3051CF, Ranges 2-5: Range 1: Range 0:	100 ms 255 ms 700 ms	152 ms 307 ms N/A	
Dead Time (Td)	45 ms (nominal)	97 ms	
Update Rate	22 times per second	22 times per second	

(1) Dead time and update rate apply to all models and ranges; analog output only.
(2) Nominal total response time at 75 °F (24 °C) reference conditions.
(3) Transducer block response time, Analog Input block execution time not included.



Vibration effect for 3051CFA, 3051CFC, and 3051CFP

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, 20 m/s2 acceleration amplitude).[1]

Power supply effect

Less than ±0.005% of calibrated span per volt.

Electromagnetic Compatibility (EMC)

Meets all relevant requirements of EN 61326 and Namur NE-21.

Transient protection (Option Code T1)

Meets IEEE C62.41, Category Location B

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

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

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

Functional specifications

Range and sensor limits

Table 4. 3051CF Range and Sensor Limits

Range	Minimum span	Upper (URL)	Lower (LRL)
1	0.50 inH_2O (1,24 mbar)	25.00 inH_2O (62,16 mbar)	-25.00 inH_2O (-62,16 mbar)
2	1.67 inH_2O (4,15 mbar)	250.00 inH_2O (621,60 mbar)	-250.00 inH_2O (-621,60 bar)
3	6.67 inH_2O (16,58 mbar)	1000.00 inH_2O (2,48 bar)	-1000.00 inH_2O (-2,48 bar)

4-20 mA HART (output code A)

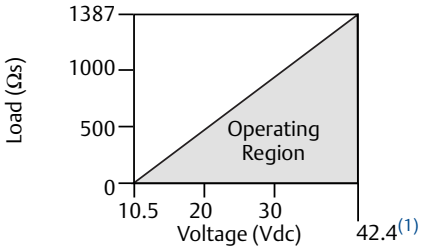
Power supply

External power supply required. Standard transmitter (4-20mA) operates on 10.5-42.4 Vdc with no load

Load limitations

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

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



Communication requires a minimum loop resistance of 250 ohms.

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

Indication

Optional two line LCD/LOI Display

Optional configuration buttons

Configuration buttons need to be specified:
Digital Zero trim (option code DZ) changes digital value of the transmitter and is used for performing a sensor zero trim.
Analog Zero Span (option code D4) changes analog value and can be used to rerange the transmitter with an applied pressure.

Output

Two-wire 4-20mA, user selectable for linear or square root output. Digital process variable superimposed on 4-20 mA signal, available to any host that conforms to HART protocol. The 3051 comes with Selectable HART Revisions. Digital communications based on HART Revision 5 (default) or Revision 7 (option code HR7) protocol can be selected. The HART revision can be switched in the field using any HART based configuration tool or the optional local operator interface (M4).

Power advisory diagnostics

Power Advisory Diagnostics pro-actively detect and notify you of degraded electrical loop integrity before it can affect your process operation. Example loop problems that can be detected include water in the terminal compartment, corrosion of terminals, improper grounding, and unstable power supplies. The Device Dashboard presents the diagnostics in a graphical, task-based interface that provides single-click access to critical process/device information and descriptive graphical troubleshooting.

Local operator interface

The LOI utilizes a 2 button menu with internal and external configuration buttons. Internal buttons are always configured for Local Operator Interface. External Buttons can be configured for either LOI (option code M4), Analog Zero and Span (option code D4) or Digital Zero Trim (option code DZ). See Rosemount 3051 product manual (00809-0100-4007) for LOI configuration menu.

FOUNDATION fieldbus (output code F)

Power supply

External power supply required; transmitters operate on 9.0 to 32.0 V dc transmitter terminal voltage. FISCO transmitters operate on 9.0 to 17.5 V dc.

Current draw

17.5 mA for all configurations (including LCD display option)

Indication

Optional 2-line LCD display

FOUNDATION fieldbus block execution times

Block	Execution time
Resource	N/A
Sensor and SPM Transducer	N/A
LCD Display	N/A
Analog Input 1, 2	20 milliseconds
PID	25 milliseconds
Input Selector	20 milliseconds
Arithmetic	20 milliseconds
Signal Characterizer	20 milliseconds
Integrator	20 milliseconds
Output Splitter	20 milliseconds
Control Selector	20 milliseconds

FOUNDATION fieldbus parameters

Links	25 (max.)
Virtual Communications Relationships (VCR)	20 (max.)

FOUNDATION fieldbus function blocks (option A01)

Resource block

The resource block contains diagnostic, hardware, and electronics information. There are no linkable inputs or outputs to the Resource Block.

Sensor transducer block

The sensor transducer block contains sensor information and the ability to calibrate the pressure sensor or recall factory calibration.

LCD transducer block

The LCD transducer block is used to configure the LCD display meter.

Analog input (AI) block

The AI block processes the measurements from the sensor and makes them available to other function blocks. The output value from the AI block is in engineering units and contains a status indicating the quality of the measurement. The AI Block is widely used for scaling functionality.

Input selector (ISEL) block

The ISEL block can be used to select the first good, hot backup, maximum, minimum, or average of as many as eight input values and place it at the output. The block supports signal status propagation.

Integrator (INT) block

The INT block integrates one or two variables over time. The block compares the integrated or accumulated value to pre-trip and trip limits and generates discrete output signals when the limits are reached.

The INT block is used as a totalizer. This block will accept up to two inputs, has six options how to totalize the inputs, and two trip outputs.

Arithmetic (ARTH) block

The ARTH block provides the ability to configure a range extension function for a primary input. It can also be used to compute nine different arithmetic functions including flow with partial density compensation, electronic remote seals, hydrostatic tank gaging, ratio control, and others.

Signal characterizer (SGCR) block

The SGCR block characterizes or approximates any function that defines an input/output relationship. The function is defined by configuring as many as twenty X,Y coordinates. The block interpolates an output value for a given input value using the curve defined by the configured coordinates. Two separate analog input signals can be processed simultaneously to give two corresponding separate output values using the same defined curve.

PID block

The PID function block combines all of the necessary logic to perform proportional/integral/derivative (PID) control. The block supports mode control, signal scaling and limiting, feed forward control, override tracking, alarm limit detection, and signal status propagation.

Control selector block

The control selector function block selects one of two or three inputs to be the output. The inputs are normally connected to the outputs of PID or other function blocks. One of the inputs would be considered normal and the other two overrides.

Output splitter block

The output splitter function block provides the capability to drive two control outputs from a single input. It takes the output of one PID or other control block to control two valves or other actuators.

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.

FOUNDATION fieldbus Diagnostics Suite (option code D01)

The 3051C FOUNDATION fieldbus Diagnostics Suite features SPM technology to detect changes in the process, process equipment, or installation conditions (such as plugged impulse lines) of the transmitter. This is done by modeling the process noise signature (using the statistical values of mean and standard deviation) under normal conditions and then comparing the baseline values to current values over time. If a significant change in the current values is detected, the transmitter can generate an alert.

PROFIBUS PA (output code W)

Profile version

3.02

Power supply

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

Current draw

17.5 mA for all configurations (including LCD display option)

Output update rate

Four times per second

Standard function blocks

Analog input (AI block)

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

Physical block

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

Transducer block

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

Indication

Optional 2-line LCD display

Local operator interface

Optional external configuration buttons

Wireless (output code X)

Output

IEC 62591 (*Wireless*HART), 2.4 GHz DSSS

Wireless radio (internal antenna, WP5 option)

- Frequency: 2.400 - 2.485 GHz
- Channels: 15
- Modulation: IEEE 802.15.4 compliant DSSS
- Transmission: Maximum of 10 dBm EIRP

Local display

The optional 3-line, 7-digit LCD display can display user-selectable information such as primary variable in engineering units, scaled variable, percent of range, sensor module temperature, and electronics temperature. The display updates based on the wireless update rate.

Digital zero trim

Digital Zero trim (option DZ) is an offset adjustment to compensate for mounting position effects, up to 5% of URL.

Update rate

User selectable 1 sec. to 60 min.

Wireless sensor module for in-line transmitters

The 3051 Wireless transmitter requires the engineered polymer housing to be selected. The standard sensor module will come with aluminum material. If stainless steel is required, the option WSM must be selected.

Power module

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

1-5 Vdc HART low power (output code M)

Output

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

Power consumption

3.0 mA, 18-36 mW

Minimum load impedance

100 kΩ (V_{out} wiring)

Indication

Optional 5-digit LCD display

Overpressure limits

Rosemount 3051CD

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

Static pressure limit

Rosemount 3051CD

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

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

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

Burst pressure limits

3051CF

10000 psig (69 MPa)

Failure mode alarm

If self-diagnostics detect a sensor or microprocessor failure, the analog signal is driven either high or low to alert the user. High or low failure mode is user-selectable with a jumper on the transmitter. The values to which the transmitter drives its output in failure mode depend on whether it is factory-configured to standard or NAMUR-compliant operation. The values for each are as follows:

Standard operation			
Output code	**Linear output**	**Fail high**	**Fail low**
A	3.9 ≤ I ≤ 20.8	I ≥ 21.75 mA	I ≤ 3.75 mA
M	0.97 ≤ V ≤ 5.2	V ≥ 5.4 V	V ≤ 0.95 V

NAMUR-compliant operation			
Output code	**Linear output**	**Fail high**	**Fail low**
A	3.8 ≤ I ≤ 20.5	I ≥ 22.5 mA	I ≤ 3.6 mA

Low power output

1-5 Vdc HART Low Power (output code M)

Output

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

Power consumption

3.0 mA, 18-36 mW

Minimum load impedance

100 kΩ (V_{out} wiring)

Indication

Optional 5-digit LCD display

Output code F, W, and X

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

Temperature limits

For 3051CFA temperature limits

Process temperature limits

Direct mount transmitter

- 500 °F (260 °C)
- 750 °F (398 °C) when used with a direct mount, high temperature 5-valve manifold (Transmitter Connection Platform code 6). Maximum temperature limit for steam processes is 650 °F (343 °C).
- 400 °F (204 °C) when top mounted in steam service

Remote mount transmitter

- 1250 °F (677 °C) – Alloy C-276 Sensor Material (For superheated steam applications above 1000 °F (538 °C), it is recommended that the Rosemount 585 with Alloy 800H sensor material is used.)
- 850 °F (454 °C) – Stainless Steel Sensor Material

Pressure and temperature limits [(1)]

Direct mount transmitter

- Up to 600# ANSI (1440 psig at 100 °F [99 bar at 38 °C])

Remote mount transmitter

- Up to 2500# ANSI (6000 psig at 100 °F [416 bar at 38 °C]).
- Integral temperature measurement is not available with Flanged mounting type greater than class 600

(1) Static pressure selection may effect pressure limitations.

For 3051CFC temperature limits

Process temperature limits

Direct mount transmitter

- -40 to 450 °F (-40 to 232 °C)
- Up to 400 °F (204 °C) when top mounted in steam service

Remote mount transmitter

- -148 to 850 °F (-100 to 454 °C) – Stainless Steel

Differential pressure limits

Maximum differential pressure (DP) up to 800 inH_2O (2 bar).

Note
When the temperature is 400-850 °F (204-454 °C), the DP Limit should be 400 inH2O (1 bar).

For 3051CFP temperature limits

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)

Table 5. 3051 Transmitter Temperature Limits

3051CF	
Silicone Fill Sensor(1)	
With Coplanar Flange	–40 to 250 °F (–40 to 121 °C)(2)

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

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

Humidity limits

0–100% relative humidity

Turn-on time

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

Volumetric displacement

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

Damping

4-20 mA HART

Analog output response to a step input change is user-selectable from 0 to 60 seconds for one time constant. This software damping is in addition to sensor module response time.

FOUNDATION fieldbus

Transducer block: 0.4 seconds fixed

AI Block: user configurable

PROFIBUS PA

AI Block only: user configurable

Physical specifications

Electrical connections

$^1/_2$–14 NPT, PG 13.5, G$^1/_2$, and M20 × 1.5 (CM20) conduit. *HART* interface connections fixed to terminal block.

Process connections

For 3051CFA-Annubar sensor material

- 316 Stainless Steel
- Alloy C-276

For 3051CFC-material of construction

- 316/316L SST

For 3051CFP-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

Flange

- A182 Gr 316/316L
- 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
- Alloy X-750 provided for high temperature Option Code G
- Gaskets and O-rings must be replaced each time the 3051SFP is disassembled for installation or maintenance.

Orifice type

Square edge–orifice bore sizes

- 0.066-in. and larger

Quadrant edge–orifice bore sizes (for 1/2-in. (15 mm) line size only)

- 0.034-in. (0.86 mm)
- 0.020-in. (0.51 mm)
- 0.014-in. (0.35 mm)
- 0.010-in. (0.25 mm)

Note
Integral orifice bodies contain corner tapped pressure ports.

Process-wetted parts

Drain/vent valves

316 SST, Alloy C-276, or Alloy 400 material (Alloy 400 not available with 3051L)

Process flanges and adapters

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

Wetted O-rings

Glass-filled PTFE or Graphite-filled PTFE

Process isolating diaphragms

Isolating diaphragm material	3051CD 3051CG
Alloy C-276	•
Alloy 400	•
Tantalum	•
Gold-plated Alloy 400	•
Gold-plated SST	•

Non-wetted parts

Electronics housing

Low-copper aluminum or CF-8M (Cast version of 316 SST). Enclosure Type 4X, IP 65, IP 66, IP 68

Coplanar sensor module housing

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

Bolts

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

Sensor module fill fluid

Silicone oil (D.C. 200)

Paint

Polyurethane

Cover O-rings

Nitirile Butadiene (NBR)

3051 Product Certifications

European Directive Information

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

Ordinary Location Certification for FM Approvals

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

North America

E5 FM Explosionproof (XP) and Dust-Ignitionproof (DIP)
Certificate: 0T2H0.AE

Standards: FM Class 3600 – 1998, FM Class 3615 – 2006, FM Class 3810 – 2005, ANSI/NEMA 250 – 2003

Markings: XP CL I, DIV 1, GP B, C, D; DIP CL II, DIV 1, GP E, F, G; CL III; T5(-50 °C ≤ Ta ≤ +85 °C); Factory Sealed; Type 4X

I5 FM Intrinsic Safety (IS) and Nonincendive (NI)
Certificate: 1Q4A4.AX

Standards: FM Class 3600 – 2011, FM Class 3610 – 2010, FM Class 3611 – 2004, FM Class 3810 – 2005

Markings: IS CL I, DIV 1, GP A, B, C, D; CL II, DIV 1, GP E, F, G; Class III; DIV 1 when connected per Rosemount drawing 03031-1019; NI CL 1, DIV 2, GP A, B, C, D; T4(-50 °C ≤ Ta ≤ +70 °C) [HART], T5(-50 °C ≤ Ta ≤ +40 °C) [HART]; T4(-50 °C ≤ Ta ≤ +60 °C) [Fieldbus/PROFIBUS]; Type 4x

Special Conditions for Safe Use (X):

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

IE FM FISCO
Certificate: 1Q4A4.AX

Standards: FM Class 3600 – 2011, FM Class 3610 – 2010, FM Class 3611 – 2004, FM Class 3810 – 2005

Markings: IS CL I, DIV 1, GP A, B, C, D when connected per Rosemount drawing 03031-1019 (-50 °C ≤ Ta ≤ +60 °C); Type 4x

Special Conditions for Safe Use (X):

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

C6 CSA Explosionproof, Dust-Ignitionproof, Intrinsic Safety and Nonincendive
Certificate: 1053834

Standards: ANSI/ISA 12.27.01-2003, CSA Std. C22.2 No. 30 -M1986, CSA Std. C22.2 No.142-M1987, CSA Std. C22.2. No.157-92, CSA Std. C22.2 No. 213 - M1987, CAN/CSA C22.2 No. 0-10, CSA Std C22.2 No. 25-1966, CAN/CSA-C22.2 No. 94-M91, CAN/CSA-E60079-0-07, CAN/CSA-E60079-1-07

Markings: Explosionproof for Class I, Division 1, Groups B, C and D; Suitable for Class I, Zone 1, Group IIB+H2, T5; Dust-Ignitionproof Class II, Division 1, Groups E, F, G; Class III Division 1; Intrinsically Safe Class I, Division 1 Groups A, B, C, D when connected in accordance with Rosemount drawing 03031-1024, Temperature Code T3C; Suitable for Class I, Zone 0; Class I Division 2 Groups A, B, C and D, T5; Suitable for Class I Zone 2, Group IIC; Type 4X; Factory Sealed; Single Seal (See drawing 03031-1053)

E6 CSA Explosionproof, Dust-Ignitionproof and Division 2
Certificate: 1053834

Standards: ANSI/ISA 12.27.01-2003, CSA Std. C22.2 No. 30 -M1986, CSA Std. C22.2 No.142-M1987, CSA Std. C22.2 No. 213 - M1987, CAN/CSA C22.2 No. 0-10, CSA Std C22.2 No. 25-1966, CAN/CSA-C22.2 No. 94-M91, CAN/CSA-C22.2 No. 157-92, CAN/CSA-E60079-0-07, CAN/CSA-E60079-1-07

Markings: Explosionproof Class I, Division 1, Groups B, C and D; Suitable for Class I, Zone 1, Group IIB+H2, T5; Dust-Ignitionproof for Class II and Class III, Division 1, Groups E, F and G; Class I, Division 2, Groups A, B, C and D; Suitable for Class I Zone 2, Group IIC; Type 4X; Factory Sealed; Single Seal (See drawing 03031-1053)

Europe

E8 ATEX Flameproof and Dust

Certificate: KEMA00ATEX2013X; Baseefa11ATEX0275X

Standards Used: EN60079-0:2012, EN60079-1:2007, EN60079-26:2007, EN60079-31:2009

Markings: ⟨Ex⟩ II 1/2 G, Ex d IIC T6/T5 Ga/Gb, T6(-50 °C ≤ Ta ≤ +65 °C), T5(-50 °C ≤ Ta ≤ +80 °C); ⟨Ex⟩ II 1 D Ex ta IIIC T95 °C T_{500} 105 °C Da (-20 °C ≤ Ta ≤ +85 °C)

Process Temperature

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

Special Conditions for Safe Use (X):

1. 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 information on the dimensions of the flameproof joints the manufacturer shall be contacted.
3. Some variants of the equipment have reduced markings on the nameplate. Refer to the Certificate for full equipment marking.

I1 ATEX Intrinsic Safety and Dust

Certificate: BAS97ATEX1089X; Baseefa11ATEX0275X

Standards: EN60079-0:2012, EN60079-11:2012, EN60079-31:2009

Markings: HART: ⟨Ex⟩ II 1 G Ex ia IIC T5/T4 Ga T5(-60 °C ≤ Ta ≤ +40 °C), T4(-60 °C ≤ Ta ≤ +70 °C)
Fieldbus/PROFIBUS: ⟨Ex⟩ II 1 G Ex ia Ga IIC T4(-60°C ≤ Ta ≤ +60°C)
DUST: ⟨Ex⟩ II 1 D Ex ta IIIC T95 °C T_{500} 105 °C Da (-20 °C ≤ Ta ≤ +85 °C)

Input parameters

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

Special Conditions for Safe Use (X):

1. The apparatus is not capable of withstanding the 500 V insulation test required by EN60079-11. This must be taken into account when installing the apparatus.
2. The enclosure may be made of aluminum alloy and given a protective polyurethane paint finish; however care should be taken to protect it from impact or abrasion if located in Zone 0.
3. Some variants of the equipment have reduced markings on the nameplate. Refer to the Certificate for full equipment marking.

IA ATEX FISCO

Certificate: BAS97ATEX1089X

Standards: EN60079-0:2012, EN60079-11:2009

Markings: ⟨Ex⟩ II 1 G Ex ia IIC Ga T4(-60 °C ≤ Ta ≤ +60 °C)

Input parameters

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

Special Conditions for Safe Use (X):

1. The apparatus is not capable of withstanding the 500 V insulation test required by EN60079-11. This must be taken into account when installing the apparatus.
2. The enclosure may be made of aluminum alloy and given a protective polyurethane paint finish; however care should be taken to protect it from impact or abrasion if located in Zone 0.

N1 ATEX Type n and Dust

Certificate: BAS00ATEX3105X; Baseefa11ATEX0275X

Standards: EN60079-0:2012, EN60079-15:2010, EN60079-31:2009

Markings: ⟨Ex⟩ II 3 G Ex nA IIC T5 Gc (-40 °C ≤ Ta ≤ +70 °C); ⟨Ex⟩ II 1 D Ex ta IIIC T95 °C T_{500} 105 °C Da (-20 °C ≤ Ta ≤ +85 °C)

Special Conditions for Safe Use (X):

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

International

E7 IECEx Flameproof and Dust

Certificate: IECEx KEM 09.0034X; IECEx BAS 10.0034X

Standards: IEC60079-0:2011, IEC60079-1:2007-04, IEC60079-26:2006, IEC60079-31:2008

Markings: Ex d IIC T6/T5 Ga/Gb, T6(-50 °C ≤ Ta ≤ +65 °C), T5(-50 °C ≤ Ta ≤ +80 °C); Ex ta IIIC T95 °C T_{500}105 °C Da (-20 °C ≤ Ta ≤ +85 °C)

Process Temperature

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

Special Conditions for Safe Use (X):

1. 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 information on the dimensions of the flameproof joints the manufacturer shall be contacted.
3. Some variants of the equipment have reduced markings on the nameplate. Refer to the Certificate for full equipment marking.

I7 IECEx Intrinsic Safety

Certificate: IECEx BAS 09.0076X

Standards: IEC60079-0:2011, IEC60079-11:2011

Markings: HART: Ex ia IIC T5/T4 Ga, T5(-60 °C ≤ Ta ≤ +40 °C), T4(-60 °C ≤ Ta ≤ +70 °C) Fieldbus/PROFIBUS: Ex ia IIC Ga T4(-60 °C ≤ Ta ≤ +60 °C)

Input parameters

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

Special Conditions for Safe Use (X):

1. If the apparatus is fitted with an optional 90V transient suppressor, it is not capable of withstanding the 500V insulation test required by IEC 60079-11. This must be taken into account when installing the apparatus.
2. The enclosure may be made of aluminum alloy and given a protective polyurethane paint finish; however, care should be taken to protect it from impact or abrasion if located in Zone 0.

IECEx Mining (Special A0259)

Certificate: IECEx TSA 14.0001X

Standards: IEC60079-0:2011, IEC60079-11:2011

Markings: Ex ia I Ma (-60 °C ≤ Ta ≤ +70 °C)

Input parameters

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

Special Conditions for Safe Use (X):

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

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

Special Condition for Safe Use (X):

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

Brazil

E2 INMETRO Flameproof

Certificate: UL-BR 13.0643X

Standards: ABNT NBR IEC60079-0:2008 + Errata 1:2011, ABNT NBR IEC60079-1:2009 + Errata 1:2011, ABNT NBR IEC60079-26:2008 + Errata 1:2008

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

Special Conditions for Safe Use (X):

1. This device contains a thin wall diaphragm. Installation, maintenance and use shall take into account the environmental conditions to which the diaphragm will be subjected. The manufacturer's instructions for installation and maintenance shall be followed in detail to assure safety during its expected lifetime.
2. In case of repair, contact the manufacturer for information on the dimensions of the flameproof joints.
3. The capacitance of the wrap around label, being 1.6nF, exceeds the limit in Table 9 of ABNT NBR IEC 60079-0. The user shall determine suitability for the specific application.

I2 INMETRO Intrinsic Safety

Certificate: UL-BR 13.0584X

Standards: ABNT NBR IEC60079-0:2008 + Errata 1:2011, ABNT NBR IEC60079-11:2009

Markings: HART: Ex ia IIC T5/T4 Ga, T5(-60 °C ≤ Ta ≤ +40 °C), T4(-60 °C ≤ Ta ≤ +70 °C)
Fieldbus/PROFIBUS: Ex ia IIC T4 Ga (-60 °C ≤ Ta ≤ +60 °C)

Input parameters

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

Special Conditions for Safe Use (X):

1. If the equipment is fitted with an optional 90V transient suppressor, it is not capable of withstanding the 500V insulation test required by ABNT NBR IRC 60079-11:2008. This must be taken into account when installing the equipment.
2. The enclosure may be made of aluminum alloy and given a protective polyurethane paint finish; however, care should be taken to protect it from impact or abrasion if located in Zone 0.

IB INMETRO FISCO

Certificate: UL-BR 13.0584X

Standards: ABNT NBR IEC60079-0:2008 + Errata 1:2011, ABNT NBR IEC60079-11:2009

Markings: Ex ia IIC T4 Ga (-60 °C ≤ Ta ≤ +60 °C)

Input parameters

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

Special Conditions for Safe Use (X):

1. If the equipment is fitted with an optional 90V transient suppressor, it is not capable of withstanding the 500V insulation test required by ABNT NBR IRC 60079-11:2008. This must be taken into account when installing the equipment.
2. The enclosure may be made of aluminum alloy and given a protective polyurethane paint finish; however, care should be taken to protect it from impact or abrasion if located in Zone 0.

China

E3 China Flameproof

Certificate: GYJ14.1041X; GYJ10.1313X [Flowmeters]

Standards: GB3836.1-2000, GB3836.2-2010, GB12476-2000

Markings: Ex d IIC T6/T5, T6(-50 °C ≤ Ta ≤ +65 °C), T5(-50 °C ≤ Ta ≤ +80 °C)

Special Conditions for Safe Use (X):

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

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

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

2. The earth connection facility in the enclosure should be connected reliably.

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

   GB3836.13-1997 "Electrical apparatus for explosive gas atmospheres Part 13: Repair and overhaul for apparatus used in explosive gas atmospheres"
   GB3836.15-2000 "Electrical apparatus for explosive gas atmospheres Part 15: Electrical installations in hazardous area (other than mines)"
   GB3836.16-2006 "Electrical apparatus for explosive gas atmospheres Part 16: Inspection and maintenance of electrical installation (other than mines)"
   GB50257-1996 "Code for construction and acceptance of electric device for explosion atmospheres and fire hazard electrical equipment installation engineering".
   GB12476.2-2006 "Electrical apparatus for use in the presence of combustible dust Part 1-2: Electrical apparatus protected by enclosures and surface temperature limitation-Selection, installation and maintenance"
   GB15577-2007 "Safety regulations for dust explosion prevention and protection"

I3 China Intrinsic Safety

Certificate: GYJ13.1362X; GYJ101312X [Flowmeters]

Standards: GB3836.1-2010, GB3836.4-2010, GB3836.20-2010, GB12476.1-2000

Markings: Ex ia IIC Ga T4/T5

Special Conditions for Safe Use (X):

1. Symbol "X" is used to denote specific conditions of use:
   a. If the apparatus is fitted with an optional 90V transient suppressor, it is not capable of withstanding the 500V insulation test for 1 minute. This must be taken into account when installing the apparatus.
   b. The enclosure may be made of aluminum alloy and given a protective polyurethane paint finish; however, care should be taken to protect it from impact or abrasion if located in Zone 0.
2. The relation between T code and ambient temperature range is:

Model	T code	Temperature range
HART	T5	-60 °C ≤ Ta ≤ +40 °C
HART	T4	-60 °C ≤ Ta ≤ +70 °C
Fieldbus/PROFIBUS/ FISCO	T4	-60 °C ≤ Ta ≤ +60 °C
Flowmeter with 644 Temp Housing	T4	-40 °C ≤ Ta ≤ +60 °C

3. Intrinsically Safe parameters
   Input parameters

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

Note 1: FISCO parameters apply to both Group IIC and IIB.
Note 2: [For Flowmeters] When 644 Temperature Transmitter is used, it should be used with Ex-certified associated apparatus to establish explosion protection system that can be used in explosive gas atmospheres. Wiring and terminals should comply with the instruction manual of both 644 Temperature Transmitter and associated apparatus. The cables between 644 Temperatures Transmitter and associated apparatus should be shielded cables (the cables must have insulated shield). The shielded cable has to be grounded reliably in a non-hazardous area.

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

used in explosive gas atmospheres"
GB3836.15-2000 "Electrical apparatus for explosive gas atmospheres Part 15: Electrical installations in hazardous area (other than mines)"
GB3836.16-2006 "Electrical apparatus for explosive gas atmospheres Part 16: Inspection and maintenance of electrical installation (other than mines)"
GB50257-1996 "Code for construction and acceptance of electric device for explosion atmospheres and fire hazard electrical equipment installation engineering".
GB12476.2-2006 "Electrical apparatus for use in the presence of combustible dust Part 1-2: Electrical apparatus protected by enclosures and surface temperature limitation-Selection, installation and maintenance"
GB15577-2007 "Safety regulations for dust explosion prevention and protection"

N3 China Type n

Certificate: GYJ101111X

Standards: GB3836.1-2000, GB3836.8-2003

Markings: Ex nA IIC T5 (-40 °C ≤ Ta ≤ +70 °C)

Special Conditions for Safe Use (X):

1. Symbol "X" is used to denote specific conditions of use: The apparatus is not capable of withstanding the 500V test to earth for one minute. The must be taken into consideration during installation.
2. The ambient temperature range is -40 °C ≤ Ta ≤ +70 °C.
3. Maximum input voltage: 55V
4. Cable glands, conduit or blanking plugs, certified by NEPSI with Ex e or Ex n protection type and IP66 degree of protection provided by enclosure, should be used on external connections and redundant cable entries.
5. Maintenance should be done in non-hazardous location.
6. End users are not permitted to change any internal components but to settle the problem in conjunction with manufacturer to avoid damage to the product.
7. During installation, use and maintenance of this product, observe the following standards:
GB3836.13-1997 "Electrical apparatus for explosive gas atmospheres Part 13: Repair and overhaul for apparatus used in explosive gas atmospheres"
GB3836.15-2000 "Electrical apparatus for explosive gas atmospheres Part 15: Electrical installations in hazardous area (other than mines)"
GB3836.16-2006 "Electrical apparatus for explosive gas atmospheres Part 16: Inspection and maintenance of electrical installation (other than mines)"
GB50257-1996 "Code for construction and acceptance of electric device for explosion atmospheres and fire hazard electrical equipment installation engineering"

Japan

E4 Japan Flameproof

Certificate: TC20577, TC20578, TC20583, TC20584 [HART]; TC20579, TC20580, TC20581, TC20582 [Fieldbus]

Markings: Ex d IIC T5

Technical Regulations Customs Union (EAC)

EM, IM, KM Contact an Emerson Process Management representative for further information.

Combinations

K2 Combination of E2 and I2

K5 Combination of E5 and I5

K6 Combination of C6, E8, and I1

K7 Combination of E7, I7, and N7

K8 Combination of E8, I1, and N1

KB Combination of E5, I5, and C6

KD Combination of E8, I1, E5, I5, and C6

Conduit Plugs and Adapters

IECEx Flameproof and Increased Safety

Certificate: IECEx FMG 13.0032X

Standards: IEC60079-0:2011, IEC60079-1:2007, IEC60079-7:2006-2007

Markings: Ex de IIC Gb

ATEX Flameproof and Increased Safety

Certificate: FM13ATEX0076X

Standards: EN60079-0:2012, EN60079-1:2007, IEC60079-7:2007

Markings: II 2 G Ex de IIC Gb

Conduit plug thread sizes

Thread	Identification mark
M20 x 1.5	M20
1/2 - 14 NPT	1/2 NPT
G1/2A	G1/2

Thread adapter thread sizes

Male thread	Identification mark
M20 x 1.5 – 6H	M20
1/2 - 14 NPT	1/2 – 14 NPT
3/4 - 14 NPT	3/4 – 14 NPT
Female thread	**Identification mark**
M20 x 1.5 – 6H	M20
1/2 - 14 NPT	1/2 – 14 NPT
PG 13.5	PG 13.5

Special Conditions for Safe Use (X):

1. When the thread adapter or blanking plug is used with an enclosure in type of protection increased safety "e" the entry thread shall be suitably sealed in order to maintain the ingress protection rating (IP) of the enclosure.
2. The blanking plug shall not be used with an adapter.
3. Blanking Plug and Threaded Adapter shall be either NPT or Metric thread forms. G½ and PG 13.5 thread forms are only acceptable for existing (legacy) equipment installations.

Additional Certifications

SBS American Bureau of Shipping (ABS) Type Approval

Certificate: 09-HS446883A-PDA

Intended Use: Measure gauge or absolute pressure of liquid, gas or vapor applications on ABS classed vessels, marine, and offshore installations.

ABS Rules: 2011 Steel Vessels Rules 1-1-4/7.7, 4-8-3/13.1, 1-1-A3, 4-8-3/1.7, 4-8-3/1.11.1

SBV Bureau Veritas (BV) Type Approval

Certificate: 23155/A3 BV

Requirements: Bureau Veritas Rules for the Classification of Steel Ships

Application: Class notations: AUT-UMS, AUT-CCS, AUT-PORT and AUT-IMS; Pressure transmitter type 3051 cannot be installed on diesel engines

SDN Det Norske Veritas (DNV) Type Approval

Certificate: A-13245

Intended Use: Det Norske Veritas' Rules for Classification of Ships, High Speed & Light Craft and Det Norske Veritas' Offshore Standards

Application:

Location classes	
Type	3051
Temperature	D
Humidity	B
Vibration	A
EMC	B
Enclosure	D

SLL Lloyds Register (LR) Type Approval

Certificate: 11/60002

Application: Environmental categories ENV1, ENV2, ENV3 and ENV5

C5 Custody Transfer - Measurement Canada Accuracy Approval

Certificate: AG-0226; AG-0454; AG-0477

IEC 62591 (*Wireless*HART Protocol)

Approved Manufacturing Locations

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

European Directive Information

The most recent revision of the EC declaration of conformity can be found at www.rosemount.com.

Telecommunication Compliance

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

FCC and IC

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

Ordinary Location Certification 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).

North American Certifications

Factory Mutual (FM) approvals

I5 FM Intrinsically Safe
Certificate No: 3046325
Applicable Standards: Class 3600:2011, Class 3610:2010, Class 3810: 2005, Add: ANSI/ISA 60079-0 2009,ANSI/ISA 60079-11:2009 ANSI/NEMA 250:2003, ANSI/IEC 60529:2004
Markings: Intrinsically Safe for Class I, Division I, Groups A, B, C, D
Zone Marking: Class I Zone 0, AEx ia IIC
T4 (-40 °C to 70 °C)
Intrinsically Safe when installed according to Rosemount Drawing 03031-1062
Enclosure Type 4X/IP66/IP67/IP68

Special Conditions for Safe Use (X):

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

CSA - Canadian Standards Association

I6 CSA Intrinsically Safe
Certificate No: 2526009
Applicable Standards: CSA C22.2 No. 0-M91, CSA C22.2 No. 159-92, CSA C22.2 No. 94-M91, CSA C22.2 No. 142-M1987, CSA C22.2 No. 157-92, CSA C22.2 No. 60529-05
Markings: Intrinsically Safe For Class I, Division I, Groups A, B, C, D
T4 (-40 °C to 70 °C)
Intrinsically safe when installed according to Rosemount drawing 03031-1063
Enclosure Type 4X/IP66/IP68

European Certifications

I1 ATEX Intrinsic Safety
Certificate No: Baseefa12ATEX0228X
Applicable Standards: EN60079-11:2012, EN60079-0:2012
Markings: Ex ia IIC T4 Ga (-40 °C ≤ Ta ≤ 70 °C)
Ⓔx II 1G
IP66/68
CE 1180

Special Conditions for Safe Use (X):

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

I7 IECEx Intrinsic Safety
Certificate No: IECEx BAS 12.0124X
Applicable Standards: IEC60079-11:2011, IEC60079-0:2011
Markings: Ex ia IIC T4 Ga (-40 °C ≤ Ta ≤ 70 °C)
IP66/68

Special Conditions for Safe Use (X):

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

Pipe I.D. Range Codes

For pipes with an Inner Diameter (I.D.) Range/Pipe Wall Thickness not found in this table or with a line size greater than 12-in. (300 mm), choose Option Code Z and specify the exact pipe dimensions (I.D. and Pipe Wall Thickness) on the Configuration Data Sheet (see document 00806-0100-4010). The Emerson Process Management sizing program will determine this code, based on the application piping.

	Line size			I.D. range	Pipe wall thickness		I.D. range code
	Nominal	Max. O.D.	Option code		ANSI pipes	Non-ANSI pipes	
	2-in. (50 mm)	2.625-in. (66.68 mm)	020	1.784 to 1.841-in. (45.31 to 46.76 mm)	0.065 to 0.545-in. (1.7 to 13.8 mm)	0.065 to 0.488-in. (1.7 to 12.4 mm)	A
				1.842 to 1.938-in. (46.79 to 49.23 mm)		0.065 to 0.449-in. (1.7 to 11.4 mm)	B
				1.939 to 2.067-in. (49.25 to 52.50 mm)		0.065 to 0.417-in. (1.7 to 10.6 mm)	C
				2.068 to 2.206-in. (52.53 to 56.03 mm)		0.065 to 0.407-in. (1.7 to 10.3 mm)	D
	2 1/2-in. (63.5 mm)	3.188-in. (80.98 mm)	025	2.207 to 2.322-in. (56.06 to 58.98 mm)	0.083 to 0.563-in. (2.1 to 14.3 mm)	0.083 to 0.448-in. (2.1 to 11.4 mm)	B
				2.323 to 2.469-in. (59.00 to 62.71 mm)		0.083 to 0.417-in. (2.1 to 10.6 mm)	C
				2.470 to 2.598-in. (62.74 to 65.99 mm)		0.083 to 0.435-in. (2.1 to 11.0 mm)	D
				2.599 to 2.647-in. (66.01 to 67.23 mm)		0.083 to 0.515-in. (2.1 to 13.1 mm)	E
	3-in. (80 mm)	3.75-in. (95.25 mm)	030	2.648 to 2.751-in. (67.26 to 69.88 mm)	0.083 to 0.563-in. (2.1 to 14.3 mm)	0.083 to 0.460-in. (2.1 to 11.7 mm)	A
				2.752 to 2.899-in. (69.90 to 73.63 mm)		0.083 to 0.416-in. (2.1 to 10.6 mm)	B
				2.900 to 3.068-in. (73.66 to 77.93 mm)		0.083 to 0.395-in. (2.1 to 10.0 mm)	C
				3.069 to 3.228-in. (77.95 to 81.99 mm)		0.083 to 0.404-in (2.1 to 10.3 mm)	D
	3 1/2-in. (89 mm)	4.25-in. (107.95 mm)	035	3.229 to 3.333-in. (82.02 to 84.66 mm)	0.120 to 0.600-in. (3.0 to 15.2 mm)	0.120 to 0.496-in. (3.0 to 12.6 mm)	B
				3.334 to 3.548-in. (84.68 to 90.12 mm)		0.120 to 0.386-in. (3.0 to 9.8 mm)	C
				3.549 to 3.734-in. (90.14 to 94.84 mm)		0.120 to 0.415-in. (3.0 to 10.5 mm)	D
	4-in. (100 mm)	5.032-in. (127.81 mm)	040	3.735 to 3.825-in. (94.87 to 97.16 mm)	0.120 to 0.600-in. (3.0 to 15.2 mm)	0.120 to 0.510-in. (3.0 to 13.0 mm)	B
				3.826 to 4.026-in. (97.18 to 102.26 mm)		0.120 to 0.400-in. (3.0 to 10.2 mm)	C
				4.027 to 4.237-in. (102.29 to 107.62 mm)		0.120 to 0.390-in. (3.0 to 9.9 mm)	D
				4.238 to 4.437-in. (107.65 to 112.70 mm)		0.120 to 0.401-in. (3.0 to 10.2 mm)	E
	5-in. (125 mm)	6.094-in. (154.79 mm)	050	4.438 to 4.571-in. (112.73 to 116.10 mm)	0.134 to 0.614-in. (3.4 to 15.6 mm)	0.134 to 0.481-in. (3.4 to 12.2 mm)	A
				4.572 to 4.812-in. (116.13 to 122.22 mm)		0.134 to 0.374-in. (3.4 to 9.5 mm)	B
				4.813 to 5.047-in. (122.25 to 128.19 mm)		0.134 to 0.380-in. (3.4 to 9.7 mm)	C
				5.048 to 5.249-in. (128.22 to 133.32 mm)		0.134 to 0.413-in. (3.4 to 10.5 mm)	D

	Line size			I.D. range	Pipe wall thickness		I.D. range code
	Nominal	Max. O.D.	Option code		ANSI pipes	Non-ANSI pipes	
Sensor Size 1	6-in. (150 mm)	6.93-in. (176.02 mm)	060	5.250 to 5.472-in. (133.35 to 138.99 mm)	0.134 to 0.614-in. (3.4 to 15.6 mm)	0.134 to 0.3919-in. (3.4 to 9.9 mm)	A
				5.473 to 5.760-in. (139.01 to 146.30 mm)		0.134 to 0.327-in. (3.4 to 8.3 mm)	B
				5.761 to 6.065-in. (146.33 to 154.05 mm)		0.134 to 0.31-in. (3.4 to 7.9 mm)	C
				6.066 to 6.383-in. (154.08 to 162.13 mm)		0.134 to 0.297-in. (3.4 to 7.5 mm)	D
Sensor Size 2	6-in. (150 mm)	6.93-in. (176.02 mm)	060	5.250 to 5.472-in. (133.35 to 139.99 mm)	0.134 to 1.354-in. (3.4 to 34.4 mm)	0.134 to 1.132-in. (3.4 to 28.7 mm)	A
				5.473 to 5.760-in. (139.01 to 146.30 mm)		0.134 to 1.067-in. (3.4 to 27.1 mm)	B
				5.761 to 6.065-in. (146.33 to 154.05 mm)		0.134 to 1.05-in. (3.4 to 26.7 mm)	C
				6.066 to 6.383-in. (154.08 to 162.13 mm)		0.134 to 1.037-in. (3.4 to 26.3 mm)	D
Sensor Size 1	7-in. (180 mm)	7.93-in. (201.42 mm)	070	6.384 to 6.624-in. (162.15 to 168.25 mm)	0.134 to 0.614-in. (3.4 to 15.6 mm)	0.134 to 0.374-in. (3.4 to 9.5 mm)	B
				6.625 to 7.023-in. (168.28 to 178.38 mm)		0.134 to 0.216-in. (3.4 to 5.5 mm)	C
				7.024 to 7.392-in. (178.41 to 187.76 mm)		0.134 to 0.246-in. (3.4 to 6.2 mm)	D
Sensor Z2	7-in. (180 mm)	7.93-in. (201.42 mm)	070	6.384 to 6.624-in. (162.15 to 168.25 mm)	0.134 to 1.354-in. (3.4 to 34.4 mm)	0.134 to 1.114-in. (3.4 to 28.3 mm)	B
				6.625 to 7.023-in. (168.28 to 178.38 mm)		0.134 to 0.956-in. (3.4 to 24.3 mm)	C
				7.024 to 7.392-in. (178.41 to 187.76 mm)		0.134 to 0.986-in. (3.4 to 25.0 mm)	D
Sensor Size 1	8-in. (200 mm)	9.688-in. (246.08 mm)	080	7.393 to 7.624-in. (187.78 to 193.65 mm)	0.250 to 0.73-in. (6.4 to 18.5 mm)	0.250 to 0.499-in. (6.4 to 12.6 mm)	B
				7.625 to 7.981-in. (193.68 to 202.72 mm)		0.250 to 0.374-in. (6.4 to 9.5 mm)	C
				7.982 to 8.400-in. (202.74 to 213.36 mm)		0.250 to 0.312-in. (6.4 to 7.9 mm)	D
				8.401 to 8.766-in. (213.39 to 222.66 mm)		0.250 to 0.364-in. (6.4 to 9.2 mm)	E
Sensor Size 2	8-in. (200 mm)	9.688-in. (246.08 mm)	080	7.393 to 7.624-in. (187.78 to 193.65 mm)	0.250 to 1.47-in. (6.4 to 37.3 mm)	0.250 to 1.239-in. (6.4 to 31.4 mm)	B
				7.625 to 7.981-in. (193.68 to 202.72 mm)		0.250 to 1.114-in. (6.4 to 28.3 mm)	C
				7.982 to 8.400-in. (202.74 to 213.36 mm)		0.250 to 1.052-in. (6.4 to 26.7 mm)	D
				8.401 to 8.766-in. (213.39 to 222.66 mm)		0.250 to 1.104-in. (6.4 to 28.0 mm)	E
	10-in. (250 mm)	11.75-in. (298.45 mm)	100	8.767 to 9.172-in. (222.68 to 232.97 mm)	0.250 to 1.470-in. (6.4 to 37.3 mm)	0.250 to 1.065-in. (6.4 to 27.1 mm)	A
				9.173 to 9.561-in. (232.99 to 242.85 mm)		0.250 to 1.082-in. (6.4 to 27.5 mm)	B
				9.562 to 10.020-in. (242.87 to 254.51 mm)		0.250 to 1.012-in. (6.4 to 25.7 mm)	C
				10.021 to 10.546-in. (254.53 to 267.87 mm)		0.250 to 0.945-in. (6.4 to 24.0 mm)	D
				10.547 to 10.999-in. (267.89 to 279.37 mm)		0.250 to 1.018-in. (6.4 to 25.9 mm)	E
	12-in. (300 mm)	13.0375-in. (331.15 mm)	120	11.000 to 11.373-in. (279.40 to 288.87 mm)	0.250 to 1.470-in. (6.4 to 37.3 mm)	0.250 to 1.097-in. (6.4 to 27.9 mm)	B
				11.374 to 11.938-in. (288.90 to 303.23 mm)		0.250 to 0.906-in. (6.4 to 23.0 mm)	C
				11.939 to 12.250-in. (303.25 to 311.15 mm)		0.250 to 1.159-in. (6.4 to 29.4 mm)	D