Product Data Sheet
June 2013
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Rosemount 3051CF DP Flowmeters

- Up to 1.80% volumetric flow accuracy at 8:1 turndown
- Available with HART®, FOUNDATION™ fieldbus, and Profibus Protocols
- 5-year stability
- 100 millisecond Response Time
- Installation Flexibility-Coplanar Platform

ROSEMOUNT

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Rosemount 3051CF Flowmeter Series

Rosemount 3051CF Flowmeters combine the proven 3051C pressure transmitter and the latest primary element technology: Annubar Averaging Pitot Tube, Compact Conditioning Orifice Plate, and Integral Orifice Plate.

This ordering table contains the following Rosemount 3051CF configurations:

Configuration	Transmitter Output Code
4-20 mA HART® -3051 -Enhanced 3051(1)	A
FOUNDATION™ fieldbus	F
PROFIBUS PA	W

(1) The enhanced 4-20 mA HART device can be ordered with Transmitter Output option code A plus any of the following new option codes: DA0, M4, QT, DZ, CR, CS, CT, HR5, HR7.

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Rosemount 3051CFA Annubar Flowmeter

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	Annubar Flowmeter	
Measurement Type		
Standard		**Standard**
D	Differential Pressure	★
Fluid Type		
Standard		**Standard**
L	Liquid	★
G	Gas	★
S	Steam	★
Line Size		
Standard		**Standard**
020	2-in. (50 mm)	★
025	2 1/2-in. (63.5 mm)	★
030	3-in. (80 mm)	★
035	3 1/2-in. (89 mm)	★
040	4-in. (100 mm)	★
050	5-in. (125 mm)	★
060	6-in. (150 mm)	★
070	7-in. (175 mm)	★
080	8-in. (200 mm)	★
100	10-in. (250 mm)	★
120	12-in. (300 mm)	★
Expanded		
140	14-in. (350 mm)	
160	16-in. (400 mm)	
180	18-in. (450 mm)	
200	20-in. (500 mm)	
240	24-in. (600 mm)	
300	30-in. (750 mm)	
360	36-in. (900 mm)	
420	42-in. (1066 mm)	
480	48-in. (1210 mm)	
600	60-in. (1520 mm)	
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 (See "Pipe I.D. range code" on page 40)		
Standard		**Standard**
C	Range C from the Pipe I.D. table	★
D	Range D from the Pipe I.D. table	★

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Expanded		
A	Range A from the Pipe I.D. table	
B	Range B from the Pipe I.D. table	
E	Range E from the Pipe I.D. table	
Z	Non-standard Pipe I.D. Range or Line Sizes greater than 12 inches	
Pipe Material / Mounting Assembly Material		
Standard		**Standard**
C	Carbon steel (A105)	★
S	316 Stainless Steel	★
0	No Mounting (Customer Supplied)	★
Expanded		
G	Chrome-Moly Grade F-11	
N	Chrome-Moly Grade F-22	
J	Chrome-Moly Grade F-91	
Piping Orientation		
Standard		**Standard**
H	Horizontal Piping	★
D	Vertical Piping with Downwards Flow	★
U	Vertical Piping with Upwards Flow	★
Annubar Type		
Standard		**Standard**
P	Pak-Lok	★
F	Flanged with opposite side support	★
Expanded		
L	Flange-Lok	
G	Gear-Drive Flo-Tap	
M	Manual Flo-Tap	
Sensor Material		
Standard		**Standard**
S	316 Stainless Steel	★
Expanded		
H	Alloy C-276	
Sensor Size		
Standard		**Standard**
1	Sensor size 1 — Line sizes 2-in. (50 mm) to 8-in. (200 mm)	★
2	Sensor size 2 — Line sizes 6-in. (150 mm) to 96-in. (2400 mm)	★
3	Sensor size 3 — Line sizes greater than 12-in. (300 mm)	★
Mounting Type		
Standard		**Standard**
T1	Compression or Threaded Connection	★
A1	150# RF ANSI	★
A3	300# RF ANSI	★
A6	600# RF ANSI	★
D1	DN PN16 Flange	★
D3	DN PN40 Flange	★
D6	DN PN100 Flange	★

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Expanded				
A9[(1)]	900# RF ANSI			
AF[(1)]	1500# RF ANSI			
AT[(1)]	2500 # RF ANSI			
R1	150# RTJ Flange			
R3	300# RTJ Flange			
R6	600# RTJ Flange			
R9[(1)]	900# RTJ Flange			
RF[(1)]	1500# RTJ Flange			
RT[(1)]	2500# RTJ Flange			
Opposite Side Support or Packing Gland				
Standard				**Standard**
0	No opposite side support or packing gland (Required for Pak-Lok and Flange-Lok models)			★
	Opposite Side Support – Required for Flanged Models			
C	NPT Threaded Opposite Support Assembly – Extended Tip			★
D	Welded Opposite Support Assembly – Extended Tip			★
Expanded				
	Packing Gland – Required for Flo-Tap Models			
	Packing Gland Material	*Rod Material*	*Packing Material*	
J[(2)]	Stainless Steel Packing Gland / Cage Nipple	Carbon Steel	PTFE	
K[(2)]	Stainless Steel Packing Gland / Cage Nipple	Stainless Steel	PTFE	
L[(2)]	Stainless Steel Packing Gland / Cage Nipple	Carbon Steel	Graphite	
N[(2)]	Stainless Steel Packing Gland / Cage Nipple	Stainless Steel	Graphite	
R	Alloy C-276 Packing Gland / Cage Nipple	Stainless Steel	Graphite	
Isolation Valve for Flo-Tap Models				
Standard				**Standard**
0	Not Applicable or Customer Supplied			★
Expanded				
1	Gate Valve, Carbon Steel			
2	Gate Valve, Stainless Steel			
5	Ball Valve, Carbon Steel			
6	Ball Valve, Stainless Steel			
Temperature Measurement				
Standard				**Standard**
T	Integral RTD – not available with Flanged model greater than class 600#			★
0	No Temperature Sensor			★
Transmitter Connection Platform				
Standard				**Standard**
3	Direct-mount, Integral 3-valve Manifold– not available with Flanged model greater than class 600			★
5	Direct -mount, 5-valve Manifold – not available with Flanged model greater than class 600			★
7	Remote-mount NPT Connections ($^1/_2$-in. NPT)			★
Expanded				
6	Direct-mount, high temperature 5-valve Manifold – not available with Flanged model greater than class 600			
8	Remote-mount SW Connections ($^1/_2$-in.)			

Table 1. Rosemount 3051CFA Annubar Flowmeter Ordering Information

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Differential Pressure Range			
Standard			**Standard**
1	0 to 25 in H_2O (0 to 62,3 mbar)		★
2	0 to 250 in H_2O (0 to 623 mbar)		★
3	0 to 1000 in H_2O (0 to 2,5 bar)		★
Transmitter Output			
Standard			**Standard**
A[3]	4–20 mA with digital signal based on HART Protocol		★
F	FOUNDATION fieldbus Protocol		★
W[4]	Profibus PA Protocol		★
Transmitter Housing Material		**Conduit Entry Size**	
Standard			**Standard**
A	Aluminum	1/2-14 NPT	★
B	Aluminum	M20 x 1.5	★
J	SST	1/2-14 NPT	★
K	SST	M20 x 1.5	★
Expanded			
D	Aluminum	G1/2	
M	SST	G1/2	
Transmitter Performance Class			
Standard			**Standard**
1	1.8% flow rate accuracy, 8:1 flow turndown, 5-yr. stability		★

Options (Include with selected model number)

Pressure Testing		
Expanded		
P1[5]	Hydrostatic Testing with Certificate	
PX[5]	Extended Hydrostatic Testing	
Special Cleaning		
Expanded		
P2	Cleaning for Special Services	
PA	Cleaning per ASTM G93 Level D (Section 11.4)	
Material Testing		
Expanded		
V1	Dye Penetrant Exam	
Material Examination		
Expanded		
V2	Radiographic Examination	
Flow Calibration		
Expanded		
W1	Flow Calibration (Average K)	
Special Inspection		
Standard		**Standard**
QC1	Visual & Dimensional Inspection with Certificate	★
QC7	Inspection & Performance Certificate	★

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Surface Finish		
Standard		**Standard**
RL	Surface finish for Low Pipe Reynolds # in Gas & Steam	★
RH	Surface finish for High Pipe Reynolds # in Liquid	★
Material Traceability Certification		
Standard		**Standard**
Q8[6]	Material Traceability Certification per EN 10474:2004 3.1	★
Code Conformance[7]		
Expanded		
J2	ANSI/ASME B31.1	
J3	ANSI/ASME B31.3	
Materials Conformance		
Expanded		
J5[8]	NACE MR-0175 / ISO 15156	
Country Certification		
Standard		**Standard**
J6	European Pressure Directive (PED)	★
Expanded		
J1	Canadian Registration	
Installed in Flanged Pipe Spool Section		
Expanded		
H3	150# Flanged Connection with Rosemount Standard Length and Schedule	
H4	300# Flanged Connection with Rosemount Standard Length and Schedule	
H5	600# Flanged Connection with Rosemount Standard Length and Schedule	
Instrument Connections for Remote Mount Options		
Standard		**Standard**
G2	Needle Valves, Stainless Steel	★
G6	OS&Y Gate Valve, Stainless Steel	★
Expanded		
G1	Needle Valves, Carbon Steel	
G3	Needle Valves, Alloy C-276	
G5	OS&Y Gate Valve, Carbon Steel	
G7	OS&Y Gate Valve, Alloy C-276	
Special Shipment		
Standard		**Standard**
Y1	Mounting Hardware Shipped Separately	★
Special Dimensions		
Expanded		
VM	Variable Mounting	
VT	Variable Tip	
VS	Variable length Spool Section	
PlantWeb Control Functionality		
Standard		**Standard**
A01[9]	FOUNDATION fieldbus Advanced Control Function Block Suite	★

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PlantWeb Diagnostic Functionality		
Standard		**Standard**
D01[9]	FOUNDATION fieldbus Diagnostics Suite	★
DA0[10][11]	Power Advisory HART Diagnostic	★
Product Certifications		
Standard		**Standard**
C6	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
E2	INMETRO Flameproof	★
E3[12]	China Flameproof	★
E5	FM Explosion-proof, Dust Ignition-proof	★
E7[12]	IECEx Flameproof, Dust Ignition-proof	★
E8	ATEX Flameproof, Dust	★
I1[12]	ATEX Intrinsic Safety	★
I2[12]	INMETRO Intrinsic Safety	★
I3[12]	China Intrinsic Safety	★
I7[12]	IECEx Intrinsic Safety	★
I5	FM Intrinsically Safe, Division 2	★
IA	ATEX FISCO Intrinsic Safety; for FOUNDATION fieldbus protocol only	★
K5	FM Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E5 and I5)	★
K6[12]	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E6 and I6)	★
K7[12]	IECEx Flameproof , Dust Ignition-proof, Intrinsic Safety, and Type n (combination of I7, N7 and E7)	★
K8[12]	ATEX Flameproof, Intrinsic Safety, Type n, Dust (combination of E8, I1 and N1)	★
KB	FM and CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of K5 and C6)	★
KD[12]	FM, CSA, and ATEX Explosion-proof, Intrinsically Safe (combination of K5, C6, I1, and E8)	★
N1[12]	ATEX Type n	★
N7	IECEx Type n	★
ND[12]	ATEX Dust	★
Shipboard Approvals		
Standard		**Standard**
SBS	American Bureau of Shipping	★
Sensor Fill Fluid and O-ring Options		
Standard		**Standard**
L1	Inert Sensor Fill Fluid	★
L2	Graphite-Filled (PTFE) O-ring	★
LA	Inert Sensor Fill Fluid and Graphite-Filled (PTFE) O-ring	★
Display and Interface Options		
Standard		**Standard**
M4[13]	LCD Display with Local Operator Interface	★
M5	LCD Display	★
Transmitter Calibration Certification		
Standard		**Standard**
Q4	Calibration Certificate for Transmitter	★
Quality Certification for Safety		
Standard		**Standard**
QS[15]	Prior-use certificate of FMEDA data	★
QT[10][11]	Safety certified to IEC 61508 with certificate of FMEDA	★

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Transient Protection		
Standard		**Standard**
T1[14]	Transient terminal block	★
Manifold for Remote Mount Option		
Standard		**Standard**
F2	3-Valve Manifold, Stainless Steel	★
F6	5-Valve Manifold, Stainless Steel	★
Expanded		
F1	3-Valve Manifold, Carbon Steel	
F3	3-Valve Manifold, Alloy C-276	
F5	5-Valve Manifold, Carbon Steel	
F7	5-Valve Manifold, Alloy C-276	
Alarm Limit		
Standard		**Standard**
C4[15][16]	NAMUR Alarm and Saturation Levels, High Alarm	★
CN[15][16]	NAMUR Alarm and Saturation Levels, Low Alarm	★
CR[10][11]	Custom alarm and saturation signal levels, high alarm (requires C1 and Configuration Data Sheet)	★
CS[10][11]	Custom alarm and saturation signal levels, low alarm (requires C1 and Configuration Data Sheet)	★
CT[10][11]	Low alarm (standard Rosemount alarm and saturation levels)	★
Configuration Buttons		
Standard		**Standard**
D4[11]	Analog Zero and Span	★
DZ[11]	Digital Zero Trim	★
Ground Screw		
Standard		**Standard**
V5[17]	External Ground Screw Assembly	★
HART Revision Configuration		
Standard		**Standard**
HR5[10][11] (18)	Configured for HART Revision 5	★
HR7[10][11] (19)	Configured for HART Revision 7	★
Typical Model Number: 3051CFA D L 060 D C H P S 2 T1 0 0 0 3 2 A A 1		

(1) Available in remote mount applications only.

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

(3) HART Revision 5 is the default HART output. The Enhanced 3051 can be factory or field configured to HART Revision 7. To order HART Revision 7 factory configured, add option code HR7.

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

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

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

(7) Not available with Transmitter Connection Platform 6.

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

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

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

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

(12) Not available with Low Power code M.

(13) Available only with output code W - Profibus PA.

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

(15) Not available with FOUNDATION fieldbus (Output Code F) or Profibus (Output Code W).

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

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

(18) Configures the HART output to HART Revision 5. The device can be field configured to HART Revision 7 if needed.

(19) Configures the HART output to HART Revision 7. The device can be field configured to HART Revision 5 if needed.

Rosemount 3051CFC Compact Flowmeter

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

Table 2. Rosemount 3051CFC Compact Flowmeter Ordering Information

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

Model	Product Description	
3051CFC	Compact Flowmeter	
Measurement Type		
Standard		**Standard**
D	Differential Pressure	★
Primary Element Technology		
Standard		**Standard**
A	Annubar® Averaging Pitot Tube	★
C	Conditioning Orifice Plate	★
P	Orifice Plate	★
Material Type		
Standard		**Standard**
S	316 SST	★
Line Size		
Standard		**Standard**
005[1]	1/2-in. (15 mm)	★
010[1]	1-in. (25 mm)	★
015[1]	1 1/2-in. (40 mm)	★
020	2-in. (50 mm)	★
030	3-in. (80 mm)	★
040	4-in. (100 mm)	★
060	6-in. (150 mm)	★
080	8-in. (200 mm)	★
100[2][3]	10-in. (250 mm)	★
120[2][3]	12-in. (300 mm)	★
Primary Element Type		
Standard		**Standard**
N000	Annubar Sensor Size 1	★
N040	0.40 Beta Ratio	★
N065[4]	0.65 Beta Ratio	★
Temperature Measurement		
Standard		**Standard**
0	No Temperature Sensor	★
T[5]	Integral RTD	★
Transmitter Connection Platform		
Standard		**Standard**
3	Direct-mount	★
7	Remote-mount, NPT Connections	★

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.
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Differential Pressure Range			
Standard			**Standard**
1	0 to 25 in H_2O (0 to 62,3 mbar)		★
2	0 to 250 in H_2O (0 to 623 mbar)		★
3	0 to 1000 in H_2O (0 to 2,5 bar)		★
Transmitter Output			
Standard			**Standard**
A[6]	4–20 mA with digital signal based on HART Protocol		★
F	FOUNDATION fieldbus Protocol		★
W[7]	Profibus PA Protocol		★
Transmitter Housing Material		**Conduit Entry Size**	
Standard			**Standard**
A	Aluminum	1/2-14 NPT	★
B	Aluminum	M20 x 1.5	★
J	SST	1/2-14 NPT	★
K	SST	M20 x 1.5	★
Expanded			
D	Aluminum	G1/2	
M	SST	G1/2	
Transmitter Performance Class			
Standard			**Standard**
1	Up to ±1.65% flow rate accuracy, 8:1 flow turndown, 5-year stability		★

Options (Include with selected model number)

Installation Accessories		
Standard		**Standard**
AB	ANSI Alignment Ring (150#) (Only required for 10-in. (250 mm) and 12-in. (300mm) line sizes)	★
AC	ANSI Alignment Ring (300#) (Only required for 10-in. (250 mm) and 12-in. (300mm) line sizes)	★
AD	ANSI Alignment Ring (600#) (Only required for 10-in. (250 mm) and 12-in. (300mm) line sizes)	★
DG	DIN Alignment Ring (PN16)	★
DH	DIN Alignment Ring (PN40)	★
DJ	DIN Alignment Ring (PN100)	★
Expanded		
JB	JIS Alignment Ring (10K)	
JR	JIS Alignment Ring (20K)	
JS	JIS Alignment Ring (40K)	
Remote Adapters		
Standard		**Standard**
FE	Flange Adapters 316 SST (1/2-in NPT)	★
High Temperature Application		
Expanded		
HT	Graphite Valve Packing (Tmax = 850 °F)	
Flow Calibration		
Expanded		
WC[8]	Flow Calibration, 3 Pt, Conditioning Orifice Option C (All Pipe Schedules)	
WD[9][10]	Flow Calibration, 10 Pt, Conditioning Option C (All Schedules), Annubar Option A (Schedule 40)	

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.
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Pressure Testing		
Expanded		
P1	Hydrostatic Testing with Certificate	
Special Cleaning		
Expanded		
P2[11]	Cleaning for Special Services	
PA	Cleaning per ASTM G93 Level D (Section 11.4)	
Special Inspection		
Standard		**Standard**
QC1	Visual & Dimensional Inspection with Certificate	★
QC7	Inspection and Performance Certificate	★
Transmitter Calibration Certification		
Standard		**Standard**
Q4	Calibration Certificate for Transmitter	★
Quality Certification for Safety		
Standard		**Standard**
QS[12]	Prior-use Certificate of FMEDA data	★
QT[13][14]	Safety certified to IEC 61508 with certificate of FMEDA	★
Material Traceability Certification		
Standard		**Standard**
Q8	Material Traceability Certification per EN 10204:2004 3.1	★
Code Conformance		
Expanded		
J2	ANSI/ASME B31.1	
J3	ANSI/ASME B31.3	
J4	ANSI/ASME B31.8	
Materials Conformance		
Expanded		
J5[15]	NACE MR-0175 / ISO 15156	
Country Certification		
Expanded		
J1	Canadian Registration	
Product Certifications		
Standard		**Standard**
C6	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
E2	INMETRO Flameproof	★
E3[16]	China Flameproof	★
E5	FM Explosion-proof, Dust Ignition-proof	★
E7[16]	IECEx Flameproof, Dust Ignition-proof	★
E8	ATEX Flameproof, Dust	★
I1[16]	ATEX Intrinsic Safety	★
I2[16]	INMETRO Intrinsic Safety	★
I3[16]	China Intrinsic Safety	★
I7[16]	IECEx Intrinsic Safety	★
I5	FM Intrinsically Safe, Division 2	★
IA	ATEX FISCO Intrinsic Safety; for FOUNDATION fieldbus protocol only	★

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K5	FM Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E5 and I5)	★
K6[16]	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E6 and I6)	★
K7[16]	IECEx Flameproof , Dust Ignition-proof, Intrinsic Safety, and Type n (combination of I7, N7 and E7)	★
K8[16]	ATEX Flameproof, Intrinsic Safety, Type n, Dust (combination of E8, I1 and N1)	★
KB	FM and CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of K5 and C6)	★
KD[16]	FM, CSA, and ATEX Explosion-proof, Intrinsically Safe (combination of K5, C6, I1, and E8)	★
N1[16]	ATEX Type n	★
N7	IECEx Type n	★
ND[16]	ATEX Dust	★
Shipboard Approvals		
Standard		**Standard**
SBS	American Bureau of Shipping	★
Sensor Fill Fluid and O-ring Options		
Standard		**Standard**
L1	Inert Sensor Fill Fluid	★
L2	Graphite-Filled (PTFE) O-ring	★
LA	Inert Sensor Fill Fluid and Graphite-Filled (PTFE) O-ring	★
Display and Interface Options		
Standard		**Standard**
M4[17]	LCD Display with Local Operator Interface	★
M5	LCD Display	★
Transient Protection		
Standard		**Standard**
T1[18]	Transient terminal block	★
Manifold for Remote Mount Option		
Standard		**Standard**
F2	3-Valve Manifold, Stainless Steel	★
F6	5-Valve Manifold, Stainless Steel	★
PlantWeb Control Functionality		
Standard		**Standard**
A01[19]	FOUNDATION fieldbus Advanced Control Function Block Suite	★
PlantWeb Diagnostic Functionality		
Standard		**Standard**
D01[19]	FOUNDATION fieldbus Diagnostic Suite	★
DA0[13][14]	Power Advisory HART Diagnostic	★
Alarm Limit		
Standard		**Standard**
C4[20][21]	NAMUR Alarm and Saturation Levels, High Alarm	★
CN[20][21]	NAMUR Alarm and Saturation Levels, Low Alarm	★
CR[13][14]	Custom alarm and saturation signal levels, high alarm (requires C1 and Configuration Data Sheet)	★
CS[13][14]	Custom alarm and saturation signal levels, low alarm (requires C1 and Configuration Data Sheet)	★
CT[13][14]	Low alarm (standard Rosemount alarm and saturation levels)	★
Configuration Buttons		
Standard		**Standard**
D4[14]	Analog Zero and Span	★
DZ[14]	Digital Zero Trim	★

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Ground Screw		
Standard		**Standard**
V5[22]	External Ground Screw Assembly	★
HART Revision Configuration		
Standard		**Standard**
HR5[13][14] (23)	Configured for HART Revision 5	★
HR7[13][14] (24)	Configured for HART Revision 7	★
Typical Model Number: 3051CFC D C S 060 N 065 0 3 2 A A 1 WC E5 M5		

(1) Available with primary element technology P only

(2) For the 10-in. (250 mm) and 12-in. (300 mm) line size, 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 A.

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

(5) Available with Primary Element Technology A only.

(6) HART Revision 5 is the default HART output. The Enhanced 3051 can be factory or field configured to HART Revision 7. To order HART Revision 7 factory configured, add option code HR7.

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

(8) Available with primary element technology C only.

(9) Available with primary element technology C or A only.

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

(11) Available with primary element technology C or P only

(12) Not available with FOUNDATION fieldbus (Output Code F) or Profibus (Output Code W).

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

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

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

(16) Not available with Low Power code M.

(17) Available only with output code W - Profibus PA.

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

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

(20) Not available with FOUNDATION fieldbus (Output Code F) or Profibus (Output Code W).

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

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

(23) Configures the HART output to HART Revision 5. The device can be field configured to HART Revision 7 if needed.

(24) Configures the HART output to HART Revision 7. The device can be field configured to HART Revision 5 if needed.

Rosemount 3051CFP Integral Orifice Flowmeter

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

Table 3. Rosemount 3051CFP Integral Orifice Flowmeter Ordering Information

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

Model	Product Description	
3051CFP	Integral Orifice Flowmeter	
Measurement Type		
Standard		**Standard**
D	Differential Pressure	★
Body Material		
Standard		**Standard**
S	316 SST	★
Line Size		
Standard		**Standard**
005	1/2-in. (15 mm)	★
010	1-in. (25 mm)	★
015	1 1/2-in. (40 mm)	★
Process Connection		
Standard		**Standard**
T1	NPT Female Body (Not Available with Remote Thermowell and RTD)	★
S1(1)	Socket Weld Body (Not Available with Remote Thermowell and RTD)	★
P1	Pipe Ends: NPT Threaded	★
P2	Pipe ends: Beveled	★
D1	Pipe Ends: Flanged, DIN PN16, slip-on	★
D2	Pipe Ends: Flanged, DIN PN40, slip-on	★
D3	Pipe Ends: Flanged, DIN PN100, slip-on	★
W1	Pipe Ends: Flanged, RF, ANSI Class 150, weld-neck	★
W3	Pipe Ends: Flanged, RF, ANSI Class 300, weld-neck	★
W6	Pipe Ends: Flanged, RF, ANSI Class 600, weld-neck	★
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	★
Expanded		
R1	Pipe Ends: Flanged, RTJ, ANSI Class 150, slip-on	
R3	Pipe Ends: Flanged, RTJ, ANSI Class 300, slip-on	
R6	Pipe Ends: Flanged, RTJ, ANSI Class 600, slip-on	
Orifice Plate Material		
Standard		**Standard**
S	316 SST	★
Expanded		
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		
Standard		**Standard**
0066	0.066-in. (1.68 mm) for 1/2-in. Pipe	★
0109	0.109-in. (2.77 mm) for 1/2-in. Pipe	★
0160	0.160-in. (4.06 mm) for 1/2-in. Pipe	★
0196	0.196-in. (4.98 mm) for 1/2-in. Pipe	★
0260	0.260-in. (6.60 mm) for 1/2-in. Pipe	★
0340	0.340-in. (8.64 mm) for 1/2-in. Pipe	★
0150	0.150-in. (3.81 mm) for 1-in. Pipe	★
0250	0.250-in. (6.35 mm) for 1-in. Pipe	★
0345	0.345-in. (8.76 mm) for 1-in. Pipe	★
0500	0.500-in. (12.70 mm) for 1-in. Pipe	★
0630	0.630-in. (16.00 mm) for 1-in. Pipe	★
0800	0.800-in. (20.32 mm) for 1-in. Pipe	★
0295	0.295-in. (7.49 mm) for 1 1/2-in. Pipe	★
0376	0.376-in. (9.55 mm) for 1 1/2-in. Pipe	★
0512	0.512-in. (13.00 mm) for 1 1/2-in. Pipe	★
0748	0.748-in. (19.00 mm) for 1 1/2-in. Pipe	★
1022	1.022-in. (25.96 mm) for 1 1/2-in. Pipe	★
1184	1.184-in. (30.07 mm) for 1 1/2-in. Pipe	★
Expanded		
0010	0.010-in. (0.25 mm) for 1/2-in. Pipe	
0014	0.014-in. (0.36 mm) for 1/2-in. Pipe	
0020	0.020-in. (0.51 mm) for 1/2-in. Pipe	
0034	0.034-in. (0.86 mm) for 1/2-in. Pipe	
Transmitter Connection Platform		
Standard		**Standard**
D3	Direct-mount, 3-Valve Manifold, SST	★
D5	Direct-mount, 5-Valve Manifold, SST	★
R3	Remote-mount, 3-Valve Manifold, SST	★
R5	Remote-mount, 5-Valve Manifold, SST	★
Expanded		
D4	Direct-mount, 3-Valve Manifold, Alloy C-276	
D6	Direct-mount, 5-Valve Manifold, Alloy C-276	
D7	Direct-mount, High Temperature, 5-Valve Manifold, SST	
R4	Remote-mount, 3-Valve Manifold, Alloy C-276	
R6	Remote-mount, 5-Valve Manifold, Alloy C-276	
Differential Pressure Ranges		
Standard		**Standard**
1	0 to 25 in H_2O (0 to 62,3 mbar)	★
2	0 to 250 in H_2O (0 to 623 mbar)	★
3	0 to 1000 in H_2O (0 to 2,5 bar)	★
Transmitter Output		
Standard		**Standard**
A[(2)]	4–20 mA with digital signal based on HART Protocol	★
F	FOUNDATION fieldbus Protocol	★
W[(3)]	Profibus PA Protocol	★

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 Housing Material		**Conduit Entry Size**	
Standard			**Standard**
A	Aluminum	1/2-14 NPT	★
B	Aluminum	M20 x 1.5	★
J	SST	1/2-14 NPT	★
K	SST	M20 x 1.5	★
Expanded			
D	Aluminum	G1/2	
M	SST	G1/2	
Transmitter Performance Class			
Standard			**Standard**
1	Up to ±1.8% flow rate accuracy, 8:1 flow turndown, 5-year stability		★

Options (Include with selected model number)

Transmitter Body / Bolt Material		
Expanded		
GT[4]	High Temperature (850 °F / 454 °C)	
Temperature Sensor		
Expanded		
RT[5]	Thermowell and RTD	
Optional Connection		
Standard		**Standard**
G1	DIN 19213 Transmitter Connection	★
Pressure Testing		
Expanded		
P1[6] [7]	Hydrostatic Testing with Certificate	
Special Cleaning		
Expanded		
P2	Cleaning for Special Services	
PA	Cleaning per ASTM G93 Level D (Section 11.4)	
Material Testing		
Expanded		
V1	Dye Penetrant Exam	
Material Examination		
Expanded		
V2	Radiographic Examination	
Flow Calibration		
Expanded		
WD[8]	Discharge Coefficient Verification	
Special Inspection		
Standard		**Standard**
QC1	Visual & Dimensional Inspection with Certificate	★
QC7	Inspection and Performance Certificate	★

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.

Material Traceability Certification		
Standard		**Standard**
Q8	Material Traceability Certification per EN 10204:2004 3.1	★
Code Conformance		
Expanded		
J2[9]	ANSI/ASME B31.1	
J3[9]	ANSI/ASME B31.3	
J4[9]	ANSI/ASME B31.8	
Materials Conformance		
Expanded		
J5[10]	NACE MR-0175 / ISO 15156	
Country Certification		
Standard		**Standard**
J6	European Pressure Directive (PED)	★
Expanded		
J1	Canadian Registration	
Transmitter Calibration Certification		
Standard		**Standard**
Q4	Calibration Certificate for Transmitter	★
Quality Certification for Safety		
Standard		**Standard**
QS[11]	Prior-use Certificate of FMEDA data	★
QT[12][13]	Safety certified to IEC 61508 with certificate of FMEDA	★
Product Certifications		
Standard		**Standard**
C6	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
E2	INMETRO Flameproof	★
E3[14]	China Flameproof	★
E5	FM Explosion-proof, Dust Ignition-proof	★
E7[14]	IECEx Flameproof, Dust Ignition-proof	★
E8	ATEX Flameproof, Dust	★
I1[14]	ATEX Intrinsic Safety	★
I2[14]	INMETRO Intrinsic Safety	★
I3[14]	China Intrinsic Safety	★
I7[14]	IECEx Intrinsic Safety	★
I5	FM Intrinsically Safe, Division 2	★
IA	ATEX FISCO Intrinsic Safety; for FOUNDATION fieldbus protocol only	★
K5	FM Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E5 and I5)	★
K6[14]	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E6 and I6)	★
K7[14]	IECEx Flameproof , Dust Ignition-proof, Intrinsic Safety, and Type n (combination of I7, N7 and E7)	★
K8[14]	ATEX Flameproof, Intrinsic Safety, Type n, Dust (combination of E8, I1 and N1)	★
KB	FM and CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of K5 and C6)	★
KD[14]	FM, CSA, and ATEX Explosion-proof, Intrinsically Safe (combination of K5, C6, I1, and E8)	★
N1[14]	ATEX Type n	★
N7	IECEx Type n	★
ND[14]	ATEX Dust	★

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.

Shipboard Approvals		
Standard		**Standard**
SBS	American Bureau of Shipping	★
Sensor Fill Fluid and O-ring Options		
Standard		**Standard**
L1	Inert Sensor Fill Fluid	★
L2	Graphite-Filled (PTFE) O-ring	★
LA	Inert Sensor Fill Fluid and Graphite-Filled (PTFE) O-ring	★
Display and Interface Options		
Standard		**Standard**
M4(15)	LCD Display with Local Operator Interface	★
M5	LCD Display	★
Transient Protection		
Standard		**Standard**
T1(16)	Transient terminal block	★
PlantWeb Control Functionality		
Standard		**Standard**
A01(17)	FOUNDATION fieldbus Advanced Control Function Block Suite	★
PlantWeb Diagnostic Functionality		
Standard		**Standard**
D01(17)	FOUNDATION fieldbus Diagnostic Suite	★
DA0(12)(13)	Power Advisory HART Diagnostic	★
Alarm Limit		
Standard		**Standard**
C4(18)(19)	NAMUR Alarm and Saturation Levels, High Alarm	★
CN(18)(19)	NAMUR Alarm and Saturation Levels, Low Alarm	★
CR(12)(13)	Custom alarm and saturation signal levels, high alarm (requires C1 and Configuration Data Sheet)	★
CS(12)(13)	Custom alarm and saturation signal levels, low alarm (requires C1 and Configuration Data Sheet)	★
CT(12)(13)	Low alarm (standard Rosemount alarm and saturation levels)	★
Configuration Buttons		
Standard		**Standard**
D4(13)	Analog Zero and Span	★
DZ(13)	Digital Zero Trim	★
Ground Screw		
Standard		**Standard**
V5(20)	External Ground Screw Assembly	★
HART Revision Configuration		
Standard		**Standard**
HR5(12)(13)(21)	Configured for HART Revision 5	★
HR7(12)(13)(22)	Configured for HART Revision 7	★
Typical Model Number: 3051CFP D S 010 W1 S 0500 D3 2 A A 1 E5 M5		

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

(2) HART Revision 5 is the default HART output. The Enhanced 3051 can be factory or field configured to HART Revision 7. To order HART Revision 7 factory configured, add option code HR7.

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

(4) Not available with $1^1/_2$-in. (38 mm) line size.

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

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

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

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

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

(10) 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.

(11) Not available with FOUNDATION fieldbus (Output Code F) or Profibus (Output Code W).

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

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

(14) Not available with Low Power code M.

(15) Available only with output code W - Profibus PA.

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

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

(18) Not available with FOUNDATION fieldbus (Output Code F) or Profibus (Output Code W).

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

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

(21) Configures the HART output to HART Revision 5. The device can be field configured to HART Revision 7 if needed.

(22) Configures the HART output to HART Revision 7. The device can be field configured to HART Revision 5 if needed.

3051CF specifications

3051CF 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	Uncalibrated	±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 =0.4	±1.75% of Flow Rate at 8:1 flow turndown
	β =0.65	±1.95% of Flow Rate at 8:1 flow turndown
3051CFC Compact Orifice Flowmeter – Orifice Option P(2)		
Ranges 2-3	β =0.4	±2.00% of Flow Rate at 8:1 flow turndown
	β =0.65	±2.00% of Flow Rate at 8:1 flow turndown
3051CFP Integral Orifice Flowmeter		
Ranges 2-3	β <0.1	±3.00% of Flow Rate at 8:1 flow turndown
	0.1<β <0.2	±1.95% of Flow Rate at 8:1 flow turndown
	0.2<β <0.6	±1.75% of Flow Rate at 8:1 flow turndown
	0.6<β <0.8	±2.15% of Flow Rate at 8:1 flow turndown

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

(2) For smaller line sizes, see Rosemount Compact Orifice.

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

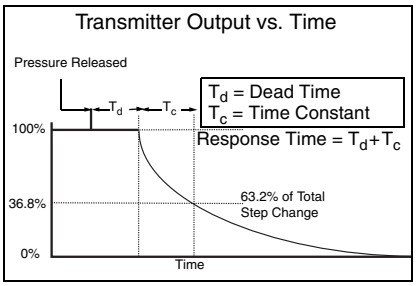
Long term stability

Models	Long Term Stability
3051CF Ranges 2-5	±0.125% of URL for 5 years ±50 °F (28 °C) temperature changes, and up to 1000 psi (6,9 MPa) line pressure.
3051CF Low/Draft Range 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: 3051T: 3051L:	100 ms 255 ms 700 ms 100 ms See Instrument Toolkit®	152 ms 307 ms N/A 152 ms See Instrument Toolkit	
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.

RFI effects

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

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.

3051CF functional specifications

Range and sensor limits

Table 4. 3051CD, 3051CG, 3051CF, and 3051L Range and Sensor Limits

Range	Minimum Span		Range and Sensor Limits
	3051CF	Upper (URL)	Lower (LRL)
			3051CD Differential 3051CF Flowmeters
0	0.1 inH_2O (0,25 mbar)	3.0 inH_2O (7,47 mbar)	-3.0 inH_2O (-7,47 mbar)
1	0.5 inH_2O (1,2 mbar)	25 inH_2O (62,3 mbar)	-25 inH_2O (-62,1 mbar)
2	2.5 inH_2O (6,2 mbar)	250 inH_2O (0,62 bar)	-250 inH_2O (-0,62 bar)
3	10 inH_2O (24,9 mbar)	1000 inH_2O (2,49 bar)	-1000 inH_2O (-2,49 bar)
4	3 psi (0,20 bar)	300 psi (20,6 bar)	-300 psi (-20,6 bar)
5	20 psi (1,38 bar)	2000 psi (137,9 bar)	- 2000 psi (-137,9 bar)

4-20 mA HART (output code A)

Output

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

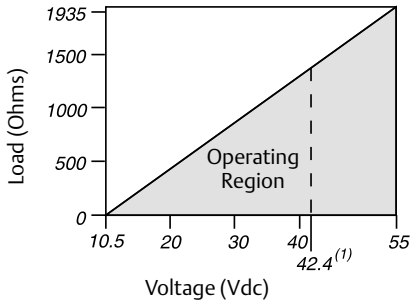
Power Supply

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

Load limitations

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

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



Communication requires a minimum loop resistance of 250 ohms.

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

Zero and span adjustment requirements

Zero and span values can be set anywhere within the range limits stated in Table 4.

Span must be greater than or equal to the minimum span stated in Table 4.

Indication

Optional two line LCD display

FOUNDATION fieldbus (output code F)

Power Supply

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

Current draw

17.5 mA for all configurations (including LCD display option)

Indication

Optional two line LCD display

FOUNDATION fieldbus Function Block

Execution times

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

FOUNDATION fieldbus parameters

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

Standard function blocks

Resource block
Contains hardware, electronics, and diagnostic information.

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

LCD block
Configures the local display.

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

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

Backup Link Active Scheduler (LAS)

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

Advanced control function block suite (option code A01)

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

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

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

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

FOUNDATION fieldbus diagnostics suite (option code D01)

The Rosemount 3051C FOUNDATION fieldbus Diagnostics provide Abnormal Situation Prevention (ASP) indication. The integral statistical process monitoring (SPM) technology calculates the mean and standard deviation of the process variable 22 times per second. The 3051C ASP algorithm uses these values and highly flexible configuration options for customization to many user-defined or application specific abnormal situations. The detection of plugged impulse lines is the first available predefined application.

Profibus PA (output code W)

Profile version

3.02

Power Supply

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

Current draw

17.5 mA for all configurations (including LCD display option)

Output update rate

Four times per second

Standard Function blocks

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

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

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

Indication

Optional two line LCD display

Local Operator Interface

Optional external configuration buttons

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/CG/CF

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

Rosemount 3051CA

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

Rosemount 3051TG/TA

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

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

Table 5. 3051L and Level Flange Rating Limits

Standard	Type	CS Rating	SST Rating
ANSI/ASME	Class 150	285 psig	275 psig
ANSI/ASME	Class 300	740 psig	720 psig
ANSI/ASME	Class 600	1480 psig	1440 psig
At 100 °F (38 °C), the rating decreases with increasing temperature, per ANSI/ASME B16.5.			
DIN	PN 10-40	40 bar	40 bar
DIN	PN 10/16	16 bar	16 bar
DIN	PN 25/40	40 bar	40 bar
At 248 °F (120 °C), the rating decreases with increasing temperature, per DIN 2401.			

Static pressure limit

Rosemount 3051CD only

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

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

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

Burst pressure limits

3051CF

10000 psig (69 MPa)

3051T Inline

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

Range 5: 26000 psig (179 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	$3.9 \le I \le 20.8$	$I \ge 21.75$ mA	$I \le 3.75$ mA
M	$0.97 \le V \le 5.2$	$V \ge 5.4$ V	$V \le 0.95$ V

NAMUR-Compliant Operation			
Output Code	**Linear Output**	**Fail High**	**Fail Low**
A	$3.8 \le I \le 20.5$	$I \ge 22.5$ mA	$I \le 3.6$ mA

Output code F and W

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

Temperature limits

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))
- Integral temperature measurement is not available with Flanged mounting type greater than class 600

Remote Mount Transmitter

- Up to 2500# ANSI (6000 psig at 100 °F (416 bar at 38 °C)).

(1) Static pressure selection may effect pressure limitations.

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 6. 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 36 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

3051CF physical specifications

Electrical connections

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

Process connections

For 3051CFA-Annubar sensor material

- 316 Stainless Steel
- Alloy C-276
- Alloy 800H
- PVDF (KYNAR)

For 3051CFC-Material of construction

Table 7. 1595 Materials of Construction

Code	Description	ASTM	UNS	DIN (W.-Nr.)
S	316/316L SST	A240 Gr 316/316L	S31600 / S31603	1.4401/1.4404 (1.4436/1.4435)
H	Alloy C-276	B575 Gr N10376	N10276	2.4819
M	Alloy 400	B127 Gr N04400	N04400	2.4360

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, B622 UNS N10276, Alloy C-276

Flange

- A182 Gr 316/316L, SB-564 UNS N10276, Alloy C-276
- Flange pressure limits are per ANSI B16.5
- Flange face finish per ANSI B16.5, 125 to 250 RMS

Body bolts/studs

- ASTM A193 Gr B8M studs
- ASTM A193 Gr B8M Class 2 body studs provided for high temperature option code G

Transmitter connection studs

- ASTM A193 Gr B8M studs

Gaskets/O-rings

- Glass filled PTFE
- Inconel® X-750 provided for high temperature option code G
- Gaskets and O-rings must be replaced each time the 3051SFP is disassembled for installation or maintenance.

Orifice type

Square edge–orifice bore sizes

- 0.066-in. and larger

Quadrant edge–orifice bore sizes (for 1/2-in. (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
316L SST	•
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

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

Sensor module fill fluid

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

Process fill fluid (3051L only)

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

Paint

Polyurethane

Cover O-rings

Nitirile Butadiene (NBR)

3051CF product certifications

Approved Manufacturing Locations

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

European Directive Information

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

ATEX Directive (94/9/EC)

All 3051 transmitters comply with the ATEX Directive.

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

3051CA4; 3051CG2, 3, 4, 5; 3051CD2, 3, 4, 5
(also with P9 option)

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

All other 3051Pressure Transmitters

— Sound Engineering Practice

Transmitter Attachments: Diaphragm Seal - Process Flange - Manifold

— Sound Engineering Practice

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

All 3051 Pressure Transmitters meet all of the requirements of EN61326 and NAMUR NE-21

Ordinary Location Certification for Factory Mutual

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

3051CF HART Protocol

Hazardous Locations Certifications

North American Certifications

FM Approvals

E5 Explosion-Proof and Dust Ignition Proof
Certificate No: 0T2H0.AE
Applicable Standards: FM Class 3600 – 1998, FM Class 3615 – 2006, FM Class 3810 – 2005, ANSI/NEMA 250 - 2003
Markings: Explosion-Proof for Class I, Division 1, Groups B, C, and D.
Dust Ignition-Proof for Class II, Division 1, Groups E, F, G; and Class III, Division 1.
T5 (Ta = -50 °C to +85 °C), Factory Sealed, Enclosure Type 4x

I5 Intrinsically Safe and Non-Incendive
Certificate No: 1Q4A4.AX
Applicable Standards: FM Class 3600 – 1998, FM Class 3610 – 2010, FM Class 3611 – 2004, FM Class 3810 – 2005
Markings: Intrinsically Safe for use in Class I, Division 1, Groups A, B, C, and D; Class II, Division 1, Groups E, F, and G; Class III, Division 1 when connected per Rosemount drawing 03031-1019 and 00375-1130 (When used with a Field Communicator); Non-incendive for Class I, Division 2, Groups A, B, C, and D.
Temperature Code: T4 (Ta = -50 °C to +40 °C), T3 (Ta = -50 °C to +85 °C), Enclosure Type 4x.

Special Conditions for Safe Use:

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.

Canadian Standards Association (CSA)

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

E6 Explosion-Proof, Dust Ignition Proof and Class I Division 2
Certificate No.: 1053834
Applicable Standards: CSA Std. C22.2 No. 142 – M1987, CSA Std. C22.2 No. 30 – M1986, CSA Std. C22.2 No. 213 – M1987, ANSI/ISA 12.27.01-2003.
Markings: Explosion-Proof for Class I, Division 1, Groups B, C, and D.
Dust-Ignition-Proof for Class II and Class III, Division 1, Groups E, F, and G.
Suitable for Class I, Division 2 Groups A, B, C, and D.
Enclosure type 4X, factory sealed. Single Seal (See Drawing 03031-1053).

C6 Intrinsically Safe
Certificate No.: 1053834
Applicable Standards: CSA Std. C22.2 No. 142 – M1987, CSA Std. C22.2 No. 157 – 92, ANSI/ISA 12.27.01-2003.
Markings: Intrinsically safe for Class I, Division 1, Groups A, B, C, and D when connected in accordance with Rosemount drawings 03031-1024. Temperature Code T3C. Enclosure Type 4X, Single Seal. Single Seal (See Drawing 03031-1053).

European Certifications

I1 ATEX Intrinsic Safety and Dust
Certificate No.: BAS 97ATEX1089X, Baseefa11ATEX0275
Applicable Standards: EN60079-0:2012, EN60079-1:2007, EN60079-26:2007, EN60079-31: 2009
Markings: Ex II 1 GD, Ex ia IIC T4 Ga (–60 ≤ Ta ≤ +70 °C), Ex ia IIC T5 Ga (–60 ≤ Ta ≤ +40 °C)
Ex ta IIIC T50 °C T_{500} 60°C Da, IP66,
CE 1180

Table 8. Input Parameters

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

Table 9. RTD Assembly (3051CFx Option T or R)

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

Special Conditions for Safe Use (X):

1.) 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 Non-incendive/Type n and Dust
Certification No.: BAS 00ATEX3105X
Applicable Standards: EN60079-0:2012, EN60079-15:2010, EN60079-31:2009
Markings: Ex II 3 GD, Ex nA IIC Gc T5 (–40 ≤ Ta ≤ 70 °C), Ex ta IIIC T50 °C T_{500} 60°C Da, IP66
CE 1180

Specific Conditions for Safe Use (X):

1.) The apparatus is not capable of withstanding the 500 V insulation test required by EN60079-15. This must be taken into account when installing the apparatus.

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

E8 ATEX Flameproof and Dust
Certification No.: KEMA00ATEX2013X, Baseefa11ATEX0275
Applicable Standards: EN60079-0:2012, EN60079-1:2007, EN60079-26:2007, EN60079-31: 2009
Markings: Ex II 1/2 G, Ex d IIC T6 (–50 ≤ Ta ≤ 65 °C) Ga/Gb, Ex d IIC T5 (–50 ≤ Ta ≤ 80 °C) Ga/Gb,
Ex II 1D Ex ta IIIC T50 °C T_{500} 60 °C Da
CE 1180

Process Temp	Ambient Temp	Temp Class
-50 to 65	-50 to 65	T6
-50 to 80	-50 to 80	T5

Special Conditions for Safe Use:

1.) In case of repair, contact the manufacturer for information on the dimensions of the flameproof joints.

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

3.) The capacitance of the wrap around label to the enclosure, 1.6E-9 F, exceeds the limit in Table 9 of IEC 60079-0. The user shall determine suitability for the specific application.

IECEx Certifications

I7 IECEx Intrinsic Safety
Certification No.: IECEx BAS 09.0076X
Applicable Standards: IEC60079-0:2011, IEC 60079-11:2011
Markings: Ex ia IIC T5 Ga (-60°C ≤ Ta ≤ 40°C), Ex ia IIC T4 Ga (-60°C ≤ Ta ≤ 70°C)
Ui = 30V, Ii = 200mA, Pi = 0.9W, Ci = 0.012 μF, Li = 0

Table 10. Input Parameters

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

Table 11. RTD Assembly (3051CFx Option T or R)

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

Special Conditions for Safe Use (X):

1.) If the apparatus is fitted with an optional 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.

E7 IECEx Flame-proof and Dust
Certification No.: IECEx KEM 09.0034X, IECEx BAS 10.0034
Applicable Standards: IEC60079-0:2011, IEC60079-1:2007-04, IEC60079-26:2006, IEC60079-31:2008
Markings: Ex d IIC T5...T6 Ga/Gb, T5 (-50 °C ≤ Ta ≤ 80 °C)/T6 (-50 °C ≤ Ta ≤ 65 °C)
Ex ta IIIC T50°C T_{500}60°C Da

Process Temp	Ambient Temp	Temp Class
-50 to 65	-50 to 65	T6
-50 to 80	-50 to 80	T5

Conditions of Certification (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.) The capacitance of the wrap around label to the enclosure, 1.6E-9 F, exceeds the limit in Table 9 of IEC 60079-0. The user shall determine suitability for the specific application.

N7 IECEx Type 'n'
Certification No.: IECEx BAS 09.0077X
Applicable Standards: IEC60079-0:2011, IEC60079-15:2010
Markings: Ex nA IIC T5 Gc (-40 ≤ Ta ≤ 70 °C)

Conditions of Certification (X):

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

Inmetro certifications

E2 Flameproof
Certificate No: CEPEL 97.0073X (Mfg USA and Singapore)
Certificate No: CEPEL 07.1383X (Mfg Brazil)
Applicable Standards: IEC60079-0:2008, IEC60079-1:2009, IEC60079-26:2008, IEC60529:2009
Markings: Ex d IIC T6 Ga/Gb (-50°C ≤ Ta ≤ +65°C)
Ex d IIC T5 Ga/Gb (-50°C ≤ Ta ≤ +80°C)
IP66W

I2 Intrinsic Safety
Certificate No.: CEPEL 97.0072X (Mfg USA and Singapore)
Certificate No.: CEPEL 07.1412X (Mfg Brazil)
Applicable Standards: IEC60079-0:2008, IEC60079-11:2009, IEC60079-26:2008, IEC60529:2009
Markings: Ex ia IIC Ga T5 (-20°C ≤ Ta ≤ +40°C)
Ex ia IIC Ga T4 (-20°C ≤ Ta ≤ +70°C)
IP66W, Ui=30V, Ii= 200mA, Pi=0.9W, Ci =0.012uF, Li=Desprezivel

Specific Conditions for Safe Use (X):

See Certificate.

China certifications

E3 Flameproof
NEPSI Certificate No.: GYJ101313X
Applicable Standards: GB3836.1-2000, GB3836.2-2000
Markings: Ex d II C T5/T6,
T5: -50 °C □Ta □+80 °C
T6: -50 °C □Ta □+65 °C

Specific Conditions for Safe Use (X):

1. Symbol "X" is used to denote specific conditions of use:

a. 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.

2. The relation between T code and ambient temperature range is:

Transmitter Model	T Code	Temperature Range
Using 644 temperature transmitter	T4	-40 °C □Ta □+65 °C
No 644 temperature transmitter	T5	-50 °C □Ta □+80 °C
	T6	-50 °C □Ta □+65 °C

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

4. During installation, use and maintenance of the product, observe the warning "Don't open the cover when the circuit is alive".

5. During installation, there should be no present mixture harmful to the flameproof housing.

6. Cable entry and conduit, certified by NEPSI with type of protection Ex d IIC and appropriate thread form, should be applied when installed in hazardous locations. Blanking elements should be used on the redundant cable entries.

7. End users are not permitted to change any internal components, but to settle the problem in conjunction with the manufacturer to avoid damage to the product.

8. Maintenance should be done in non-hazardous locations.

9. 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".

I3 Intrinsic Safety
NEPSI Certificate No.: GYJ101312X
Applicable Standards: GB3836.1-2000, GB3836.4-2000
Markings: Ex ia IIC T4/T5
T4: -60°C □Ta □+70°C
T5: -60°C □Ta □+40°C

Specific 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:

Transmitter Model		T Code	Temperature Range
Using 644 temperature transmitter		T4	-40 °C □Ta □+60 °C
No 644 temperature transmitter	Revision1 3051C	T5	-60 °C □Ta □+40 °C
		T4	-60 °C □Ta □+70 °C
	Revision5 3051C	T4	-60 °C □Ta □+70 °C
	Fieldbus/FISCO Version	T4	-60 °C □Ta □+60 °C

3. Intrinsically safe parameters:

Transmitter Model	Maximum input voltage: U_i (V)	Maximum input current: I_i (mA)	Maximum input power: P_i (W)	Maximum internal parameters:	
				C_i (nF)	L_i (μH)
Revision1/ 5 3051C	30	200	0.9	12	0
3051 Fieldbus	30	300	1.3	0	0
3051 Fieldbus FISCO	17.5	380	5.32	5	10

Note
FISCO parameters apply to both Group IIC and IIB.

When 644 temperature transmitter is used, the 644 temperature transmitter should be used with Ex-certified associated apparatus to establish an 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 temperature transmitter and associated apparatus should be shielded cables (the cables must have an insulated shield). The shield has to be grounded reliably in a non-hazardous area.

4. 3051CF series Flowmeter comply with the requirements for FISCO field devices specified in IEC60079-27:2008. For the connection on an intrinsically safe circuit in accordance to the FISCO model, FISCO parameters of 3051CF series Flowmeter are listed in the table above.

5. The product should be used with Ex-certified associated apparatus to establish an 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 shields). The shield has to be grounded reliably in a non-hazardous area.

7. End users are not permitted to change any internal components, but to settle the problem in conjunction with the manufacturer to avoid damage to the product.

8. 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”.

Combinations of Certifications

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

KB K5 and C6 combination

KD K5, C6, I1, and E8 combination

K5 E5 and I5 combination

K6 C6, I1, and E8 combination

K7 E7, I7, and N7 combination

K8 E8, I1, and N1 combination

3051CF Foundation Fieldbus and Profibus PA protocols

Hazardous locations certifications

North American certifications

FM approvals

E5 Explosion-Proof and Dust Ignition Proof
Certificate No: 0T2H0.AE
Applicable Standards: FM Class 3600 – 1998, FM Class 3615 – 2006, FM Class 3810 – 2005, ANSI/NEMA 250 - 2003

Markings: Explosion-Proof for Class I, Division 1, Groups B, C, and D.

Dust-Ignition-Proof for Class II, Division 1, Groups E, F, G; and Class III, Division 1.
T5 (Ta = -50 °C to +85 °C), Factory Sealed, Enclosure Type 4x

I5 Intrinsically Safe and Non-Incendive
Certificate No: 1Q4A4.AX
Applicable Standards: FM Class 3600 – 1998, FM Class 3610 – 2010, FM Class 3611 – 2004, FM Class 3810 – 2005
Markings: Intrinsically Safe for use in Class I, Division 1, Groups A, B, C, and D; Class II, Division 1, Groups E, F, and G; Class III, Division 1 when connected per Rosemount drawing 03031-1019 and 00375-1130 (When used with a Field Communicator); Non-incendive for Class I, Division 2, Groups A, B, C, and D.
Temperature Code: T4 (Ta = -50 °C to +60 °C), Enclosure Type 4x.

Special Conditions for Safe Use:

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.

Canadian Standards Association (CSA)

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

E6 Explosion-Proof, Dust Ignition Proof and Class I Division 2
Certificate No.: 1053834
Applicable Standards: CSA Std. C22.2 No. 142 – M1987, CSA Std. C22.2 No. 30 – M1986, CSA Std. C22.2 No. 213 – M1987, ANSI/ISA 12.27.01-2003.
Markings: Explosion-Proof for Class I, Division 1, Groups B, C, and D.
Dust-Ignition-Proof for Class II and Class III, Division 1, Groups E, F, and G.
Suitable for Class I, Division 2 Groups A, B, C, and D.
Enclosure type 4X, factory sealed. Single Seal (See Drawing 03031-1053).

C6 Intrinsically Safe
Certificate No.: 1053834
Applicable Standards: CSA Std. C22.2 No. 142 – M1987, CSA Std. C22.2 No. 157 – 92, ANSI/ISA 12.27.01-2003.
Markings: Intrinsically safe for Class I, Division 1, Groups A, B, C, and D when connected in accordance with Rosemount drawings 03031-1024. Temperature Code T3C. Enclosure Type 4X, Single Seal. Single Seal (See Drawing 03031-1053).

European Certifications

I1 ATEX Intrinsic Safety and Dust
Certificate No.: BAS 97ATEX1089X
Applicable Standards: EN60079-0:2012, EN60079-11: 2012, EN60079-31: 2009,
Markings: ⟨Ex⟩ II 1 GD, Ex ia IIC T4 Ga (–60 ≤ Ta ≤ +60 °C), Ex ta IIIC T50 °C T_{500} 60°C Da,
CE 1180

Table 12. Input Parameters

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

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

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

Special Conditions for Safe Use (X):

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.

IA ATEX FISCO Intrinsic Safety
Certificate No.: BAS 97ATEX1089X
Applicable Standards: EN60079-0:2012, EN60079-11: 2012, EN60079-31: 2009,
Markings: ⟨Ex⟩ II 1 GD, Ex ia IIC T4 Ga (–60 ≤ Ta ≤ +60 °C), Ex ta IIIC T50 °C T_{500} 60°C Da, IP66,
CE 1180

Table 14. Input Parameters

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

Special Conditions for Safe Use (X):

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 Non-incendive/Type n and Dust
Certification No.: BAS 00ATEX3105X
Applicable Standards: EN60079-0:2012, EN60079-15:2010, EN60079-31:2009
Markings: ⟨Ex⟩ II 3 GD, Ex nA IIC Gc T5 (–40 ≤ Ta ≤ 70 °C), Ex ta IIIC T50 °C T_{500} 60°C Da, IP66
CE 1180

Specific Conditions for Safe Use (X):

1.) The apparatus is not capable of withstanding the 500 V insulation test required by EN60079-15. This must be taken into account when installing the apparatus.

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

E8 ATEX Flameproof and Dust
Certification No.: KEMA00ATEX2013X, Baseefa11ATEX0275
Applicable Standards: EN60079-0: 2012, EN60079-1: 2007, EN60079-26: 2007
Markings: ⟨Ex⟩ II 1/2 G, Ex d IIC T6 (–50 ≤ Ta ≤ 65 °C) Ga/Gb, Ex d IIC T5 (–50 ≤ Ta ≤ 80 °C) Ga/Gb,
⟨Ex⟩ II 1D Ex IIIC T50 °C T_{500}60 °C Da
CE

Process Temp	Ambient Temp	Temp Class
-50 to 65	-50 to 65	T6
-50 to 80	-50 to 80	T5

Special Conditions for Safe Use (X):

1.) In case of repair, contact the manufacturer for information on the dimensions of the flameproof joints.

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

3.) The capacitance of the wrap around label to the enclosure, 1.6E-9 F, exceeds the limit in Table 9 of IEC 60079-0. The user shall determine suitability for the specific application.

IECEx Certifications

I7 IECEx Intrinsic Safety
Certification No.: IECEx BAS 09.0076X
Applicable Standards: IEC60079-0:2011, IEC 60079-11:2011
Markings: Ex ia IIC T4 Ga (-60°C ≤ Ta ≤ 60°C)

Table 15. Input Parameters

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

Table 16. RTD Assembly (3051CFx Option T or R)

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

Conditions of Certification (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.

E7 IECEx Flameproof and Dust
Certification No.: IECEx KEM 09.0034X, IECEx BAS 10.0034
Applicable Standards: IEC60079-0:2011, IEC60079-1:2007-04, IEC60079-26:2006,
Markings: Ex d IIC T5...T6 Ga/Gb, T5 (-50 °C ≤ Ta ≤ 80 °C)/T6 (-50 °C ≤ Ta ≤ 65 °C)
Ex ta IIIC T50 °C T_{500}60 °C Da

Process Temp	Ambient Temp	Temp Class
-50 to 65	-50 to 65	T6
-50 to 80	-50 to 80	T5

Conditions of Certification (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.) The capacitance of the wrap around label to the enclosure, 1.6E-9 F, exceeds the limit in Table 9 of IEC 60079-0. The user shall determine suitability for the specific application.

N7 IECEx Type 'n'
Certification No.: IECEx BAS 09.0077X
Applicable Standards: IEC60079-0:2011, IEC60079-15:2010
Markings: Ex nA IIC T5 Gc (-40 ≤ Ta ≤ 70 °C)

Conditions of Certification (X):

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

Inmetro certifications

E2 Flameproof
Certificate No: CEPEL 97.0073X (Mfg USA and Singapore)
Certificate No: CEPEL 07.1383X (Mfg Brazil)
Applicable Standards: IEC60079-0:2008, IEC60079-1:2009, IEC60079-26:2008, IEC60529:2009
Markings: Ex d IIC T6 Ga/Gb (-50°C ≤ Ta ≤ +65°C)
Ex d IIC T5 Ga/Gb (-50°C ≤ Ta ≤ +80°C)
IP66W

I2 Intrinsic Safety
Certificate No.: CEPEL 97.0072X (Mfg USA and Singapore)
Certificate No.: CEPEL 07.1412X (Mfg Brazil)
Applicable Standards: IEC60079-0:2008, IEC60079-11:2009, IEC60079-26:2008, IEC60529:2009
Markings: Ex ia IIC Ga T4 (-20°C ≤ Ta ≤ +60°C)
IP66W

Table 17. Input Parameters

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

Specific Conditions for Safe Use (X):

See Certificate.

China certifications

E3 Flameproof
NEPSI Certificate No.: GYJ101313X
Applicable Standards: GB3836.1-2000, GB3836.2-2000
Markings: Ex d II C T5/T6,
T5: -50 °C □Ta □+80 °C
T6: -50 °C □Ta □+65 °C

Specific Conditions for Safe Use (X):

1. Symbol "X" is used to denote specific conditions of use:

a. 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.

2. The relation between T code and ambient temperature range is

:

Transmitter Model	T Code	Temperature Range
Using 644 temperature transmitter	T4	-40 °C □Ta □+65 °C
No 644 temperature transmitter	T5	-50 °C □Ta □+80 °C
	T6	-50 °C □Ta □+65 °C

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

4. During installation, use and maintenance of the product, observe the warning "Don't open the cover when the circuit is alive".

5. During installation, there should be no present mixture harmful to the flameproof housing.

6. Cable entry and conduit, certified by NEPSI with type of protection Ex d IIC and appropriate thread form, should be applied when installed in hazardous locations. Blanking elements should be used on the redundant cable entries.

7. End users are not permitted to change any internal components, but to settle the problem in conjunction with the manufacturer to avoid damage to the product.

8. Maintenance should be done in non-hazardous locations.

9. 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”.

I3 Intrinsic Safety
NEPSI Certificate No.: GYJ101312X
Applicable Standards: GB3836.1-2000, GB3836.4-2000
Markings: Ex ia IIC T4 (-60°C □Ta □+60°C)

Specific 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:

Transmitter Model		T Code	Temperature Range
Using 644 temperature transmitter		T4	-40 °C □Ta □+60 °C
No 644 temperature transmitter	Revision1 3051C	T5	-60 °C □Ta □+40 °C
		T4	-60 °C □Ta □+70 °C
	Revision5 3051C	T4	-60 °C □Ta □+70 °C
	Fieldbus/FISCO Version	T4	-60 °C □Ta □+60 °C

3. Intrinsically safe parameters:

Transmitter Model	Maximum input voltage: U_i (V)	Maximum input current: I_i (mA)	Maximum input power: P_i (W)	Maximum internal parameters:	
				C_i (nF)	L_i (μH)
Revision1/5 3051C	30	200	0.9	12	0
3051 Fieldbus	30	300	1.3	0	0
3051 Fieldbus FISCO	17.5	380	5.32	5	10

Note
FISCO parameters apply to both Group IIC and IIB.

When 644 temperature transmitter is used, the 644 temperature transmitter should be used with Ex-certified associated apparatus to establish an 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 temperature transmitter and associated apparatus should be shielded cables (the cables must have an insulated shield). The shield has to be grounded reliably in a non-hazardous area.

4. 3051CF series Flowmeter comply with the requirements for FISCO field devices specified in IEC60079-27:2008. For the connection on an intrinsically safe circuit in accordance to the FISCO model, FISCO parameters of 3051CF series Flowmeter are listed in the table above.

5. The product should be used with Ex-certified associated apparatus to establish an 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 shields). The shield has to be grounded reliably in a non-hazardous area.

7. End users are not permitted to change any internal components, but to settle the problem in conjunction with the manufacturer to avoid damage to the product.

8. 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”.

Combinations of Certifications

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

K5 – E5, I5

K6 – E5, I5, E6, C6, E1, I1

K7 – E7, I7, N7

K8 – E8, I1

KB – E5, I5, E1, I1

KD – E5, I5, E6, C6, I1

Pipe I.D. range code

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.

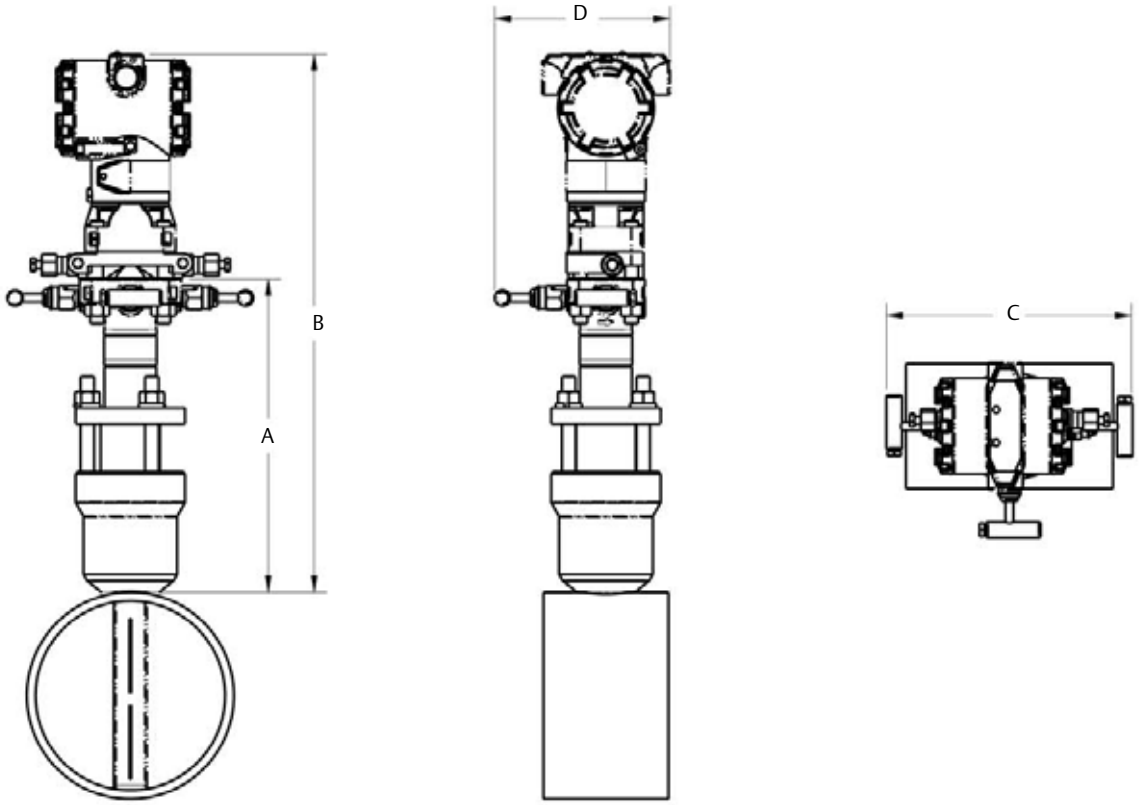
	Line Size			Inner Diameter (I.D.) Range	Pipe Wall Thickness		I.D. Range Code
	Nominal	Max. O.D.	Option Code		ANSI Pipes	Non-ANSI Pipes	
	2-in. (50 mm)	2.625-in. (66.68 mm)	020	1.784 to 1.841-in. (45.31 to 46.76 mm)	0.065 to 0.545-in. (1.7 to 13.8 mm)	0.065 to 0.488-in. (1.7 to 12.4 mm)	A
				1.842 to 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

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

Dimensional drawings

Rosemount 3051CFA Pak-Lok Annubar Flowmeter(1)

Front View	Side View	Top View



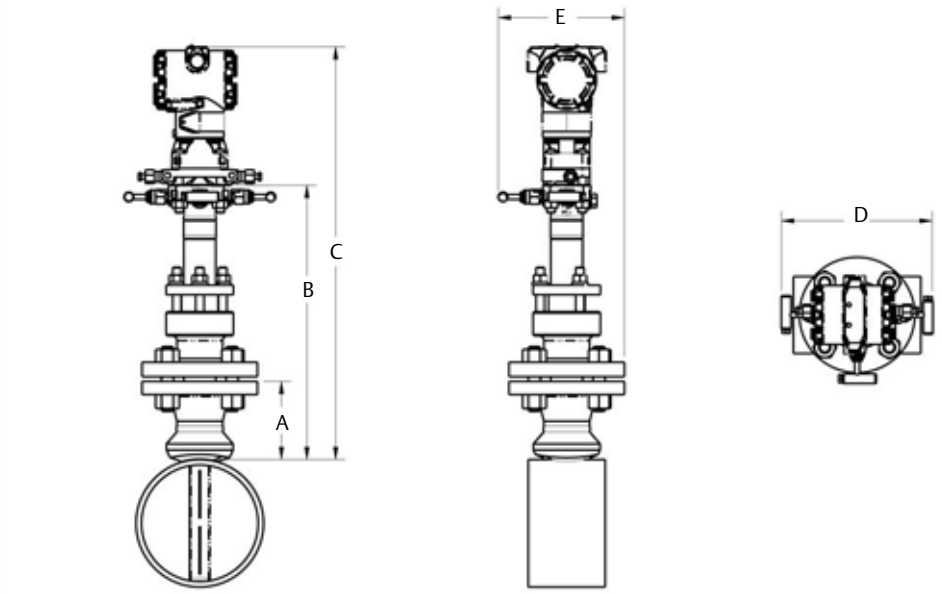
(1) The Pak-Lok Annubar model is available up to 600# ANSI (1440 psig at 100 °F (99 bar at 38 °C)).

Table 18. 3051CFA Pak-Lok Annubar Flowmeter Dimensional Data

Sensor Size	A (Max)	B (Max)	C (Max)	D (Max)
1	8.50 (215.9)	14.60 (370.8)	9.00 (228.6)	6.00 (152.4)
2	11.0 (279.4)	16.35 (415.3)	9.00 (228.6)	6.00 (152.4)
3	12.00 (304.8)	19.10 (485.1)	9.00 (228.6)	6.00 (152.4)
Dimensions are in inches (millimeters)				

Rosemount 3051CFA Flange-Lok Annubar Flowmeter(1)

Front View	Side View	Top View



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

Table 19. 3051CFA Flange-Lok Annubar Flowmeter Dimensional Data

Sensor Size	Flange Size and Rating	A ± 0.125 (3.2)	B ± 0.25 (6.4)	C (Max)	D (Max)	E (Max)
1	1 1/2 – 150#	3.88 (98.6)	12.25 (311.2)	19.35 (491.5)	9.00 (228.6)	6.30 (160.0)
1	1 1/2 – 300#	4.13 (104.9)	12.25 (311.2)	19.35 (491.5)	9.00 (228.6)	6.86 (174.2)
1	1 1/2 – 600#	4.44 (112.8)	12.25 (311.2)	19.35 (491.5)	9.00 (228.6)	6.86 (174.2)
1	DN40/PN16	3.09 (78.5)	12.25 (311.2)	19.35 (491.5)	9.00 (228.6)	6.86 (174.2)
1	DN40/PN40	3.21 (81.5)	12.25 (311.2)	19.35 (491.5)	9.00 (228.6)	6.86 (174.2)
1	DN40/ PN100	3.88 (98.6)	12.25 (311.2)	19.35 (491.5)	9.00 (228.6)	6.86 (174.2)
2	2 – 150#	4.13 (104.9)	14.25 (362.0)	21.35 (542.3)	9.00 (228.6)	6.80 (172.7)
2	2 – 300#	4.38 (111.3)	14.25 (362.0)	21.35 (542.3)	9.00 (228.6)	7.05 (179.1)
2	2 – 600#	4.75 (120.7)	14.25 (362.0)	21.35 (542.3)	9.00 (228.6)	7.05 (179.1)
2	DN50/PN16	3.40 (86.4)	14.25 (362.0)	21.35 (542.3)	9.00 (228.6)	7.05 (179.1)
2	DN50/PN40	3.52 (89.4)	14.25 (362.0)	21.35 (542.3)	9.00 (228.6)	7.05 (179.1)
2	DN50/ PN100	4.30 (109.2)	14.25 (362.0)	21.35 (542.3)	9.00 (228.6)	7.05 (179.1)
3	3 – 150#	4.63 (117.6)	17.50 (444.5)	24.60 (624.8)	9.00 (228.6)	7.55 (191.8)
3	3 – 300#	5.00 (127.0)	17.50 (444.5)	24.60 (624.8)	9.00 (228.6)	7.93 (201.3)
3	3 – 600#	5.38 (136.7)	17.50 (444.5)	24.60 (624.8)	9.00 (228.6)	7.93 (201.3)
3	DN80/PN16	3.85 (97.8)	17.50 (444.5)	24.60 (624.8)	9.00 (228.6)	7.93 (201.3)
3	DN80/PN40	4.16 (105.7)	17.50 (444.5)	24.60 (624.8)	9.00 (228.6)	7.93 (201.3)
3	DN80/ PN100	4.95 (125.7)	17.50 (444.5)	24.60 (624.8)	9.00 (228.6)	7.93 (201.3)
Dimensions are in inches (millimeters)						

Rosemount 3051CFA Flanged Annubar Flowmeter

Front View	Side View	Top View

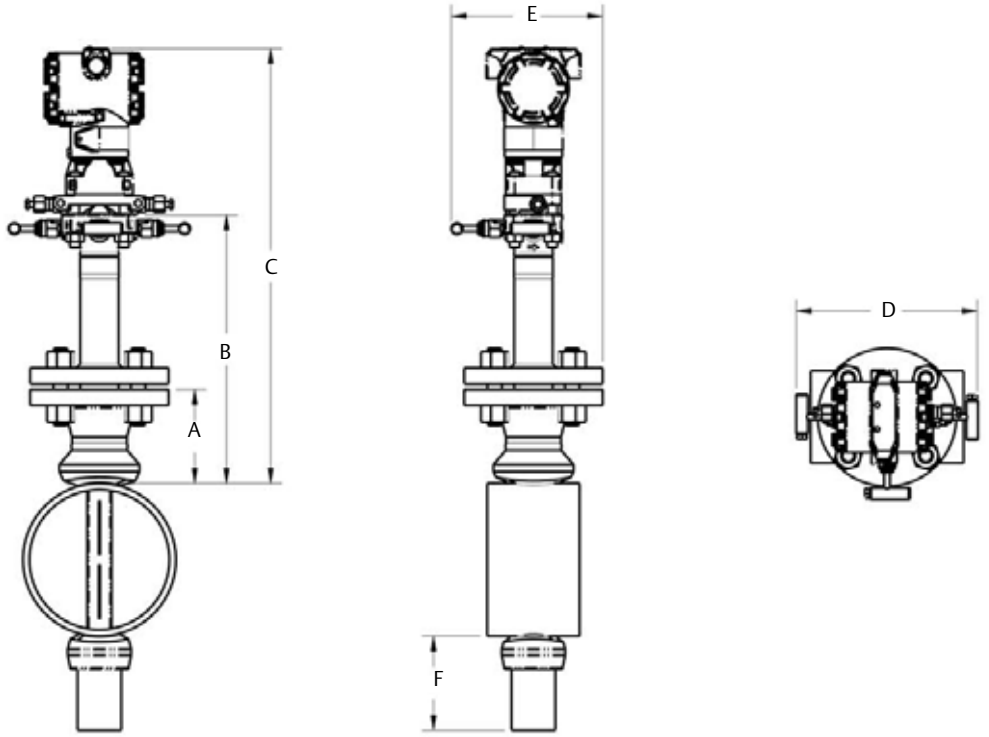


Table 20. 3051CFA Flanged Annubar Flowmeter Dimensional Data

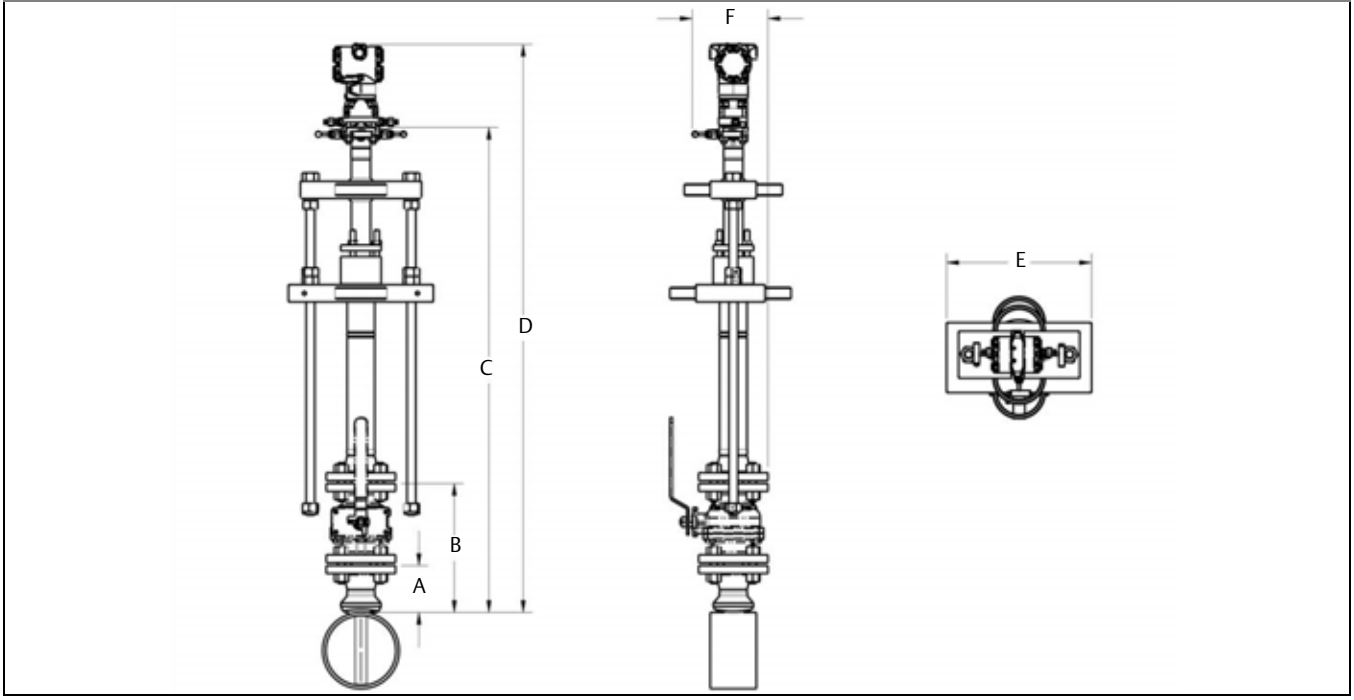
Sensor Size	Flange Size and Rating	A ± 0.125 (3.2)	B ± 0.25 (6.4)	C ± 0.25 (6.4)	D (Max)	E (Max)	F (Max)
1	1 1/2 – 150#	3.88 (98.6)	11.00 (279.4)	18.10 (459.7)	9.00 (228.6)	6.30 (160.0)	3.50 (88.9)
1	1 1/2 – 300#	4.13 (104.9)	11.00 (279.4)	18.10 (459.7)	9.00 (228.6)	6.86 (174.2)	3.50 (88.9)
1	1 1/2 – 600#	4.44 (112.8)	11.00 (279.4)	18.10 (459.7)	9.00(228.6)	6.86 (174.2)	3.50 (88.9)
1	DN40/PN16	3.09 (78.5)	11.00 (279.4)	18.10 (459.7)	9.00 (228.6)	6.86 (174.2)	3.50 (88.9)
1	DN40/PN40	3.21 (81.5)	11.00 (279.4)	18.10 (459.7)	9.00 (228.6)	6.86 (174.2)	3.50 (88.9)
1	DN40/ PN100	3.88 (98.6)	11.00 (279.4)	18.10 (459.7)	9.00(228.6)	6.86 (174.2)	3.50 (88.9)
1	1 1/2 – 900#	4.94 (125.5)	9.31 (236.5)	—	—	—	3.50 (88.9)
1	1 1/2 – 1500#	4.94 (125.5)	9.31 (236.5)	—	—	—	3.50 (88.9)
1	1 1/2 – 2500#	6.76 (171.7)	11.63 (295.4)	—	—	—	4.00 (101.6)
2	2 – 150#	4.13 (104.9)	12.00 (304.8)	19.10 (458.1)	9.00 (228.6)	6.80 (172.7)	5.00 (127.0)
2	2 – 300#	4.38 (111.3)	12.00 (304.8)	19.10 (458.1)	9.00 (228.6)	7.05 (179.1)	5.00 (127.0)
2	2 – 600#	4.75 (120.7)	12.00 (304.8)	19.10 (458.1)	9.00 (228.6)	7.05 (179.1)	5.00 (127.0)
2	DN50/PN16	3.40 (86.4)	12.00 (304.8)	19.10 (458.1)	9.00 (228.6)	7.05 (179.1)	5.00 (127.0)
2	DN50/PN40	3.52 (89.4)	12.00 (304.8)	19.10 (458.1)	9.00 (228.6)	7.05 (179.1)	5.00 (127.0)
2	DN50/ PN100	4.30 (109.3)	12.00 (304.8)	19.10 (458.1)	9.00 (228.6)	7.05 (179.1)	5.00 (127.0)
2	2 – 900#	5.88 (149.4)	10.50 (266.7)	—	—	—	5.00 (127.0)
2	2 – 1500#	5.88 (149.4)	10.50 (266.7)	—	—	—	5.00 (127.0)
2	3 – 2500#	9.88 (251.0)	15.63 (397.0)	—	—	—	4.50 (114.3)
3	3 – 150#	4.63 (117.6)	13.50 (342.9)	20.60 (523.2)	9.00 (228.6)	7.55 (191.8)	4.00 (101.6)

Table 20. 3051CFA Flanged Annubar Flowmeter Dimensional Data

Sensor Size	Flange Size and Rating	A ± 0.125 (3.2)	B ± 0.25 (6.4)	C ± 0.25 (6.4)	D (Max)	E (Max)	F (Max)
3	3 – 300#	5.00 (127.0)	13.50 (342.9)	20.60 (523.2)	9.00 (228.6)	7.93 (201.3)	4.00 (101.6)
3	3 – 600#	5.38 (136.7)	13.50 (342.9)	20.60 (523.2)	9.00 (228.6)	7.93 (201.3)	4.00 (101.6)
3	DN80/PN16	3.85 (97.8)	13.50 (342.9)	20.60 (523.2)	9.00 (228.6)	7.93 (201.3)	4.00 (101.6)
3	DN80/PN40	4.16 (105.7)	13.50 (342.9)	20.60 (523.2)	9.00 (228.6)	7.93 (201.3)	4.00 (101.6)
3	DN80/ PN100	4.95 (125.7)	13.50 (342.9)	20.60 (523.2)	9.00 (228.6)	7.93 (201.3)	4.00 (101.6)
3	4 – 900#	8.19 (208.0)	13.06 (331.8)	—	—	—	7.00 (177.8)
3	4 – 1500#	8.56 (217.4)	13.81 (350.8)	—	—	—	7.00 (177.8)
3	4 – 2500#	11.19 (284.2)	17.31 (439.7)	—	—	—	7.00 (177.8)
Dimensions are in inches (millimeters)							

Rosemount 3051CFA Flanged Flo-Tap Annubar Flowmeter(1)

Front View	Side View	Top View



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

Table 21. 3051CFA Flanged Flo-Tap Annubar Flowmeter Dimensional Data

Sensor Size	Flange Size and Rating	A ± 0.125 (3.2)	B ± 0.25 (6.4)	C[I] (Max) (Gear Drive)	C[I] (Max) (Manual)	D (Max)	E (Max)	F (Max)
1	1 1/2 – 150#	3.88 (98.6)	10.50 (266.7)	—	17.77 (451.4)	C +7.10 (180.3)	10.50 (266.7)	6.30 (160.0)
1	1 1/2 – 300#	4.13 (104.9)	11.75 (298.5)	—	17.77 (451.4)	C +7.10 (180.3)	10.50 (266.7)	6.86 (174.2)
1	1 1/2 – 600#	4.44 (112.8)	14.06 (357.2)	—	17.77 (451.4)	C +7.10 (180.3)	10.50 (266.7)	6.86 (174.2)
1	DN40/PN16(1)	3.09 (78.5)	See Note 1.	—	17.77 (451.4)	C +7.10 (180.3)	10.50 (266.7)	6.86 (174.2)
1	DN40/PN40	3.21 (81.5)	See Note 1.	—	17.77 (451.4)	C +7.10 (180.3)	10.50 (266.7)	6.86 (174.2)
1	DN40/PN100	3.88 (98.6)	See Note 1.	—	17.77 (451.4)	C +7.10 (180.3)	10.50 (266.7)	6.86 (174.2)
2	2 – 150#	4.13 (104.9)	11.25 (285.8)	24.44 (620.8)	21.20 (538.5)	C +7.10 (180.3)	12.56 (319.0)	6.80 (172.7)
2	2 – 300#	4.38 (111.3)	13.00 (330.2)	24.44 (620.8)	21.20 (538.5)	C +7.10 (180.3)	12.56 (319.0)	7.05 (179.1)
2	2 – 600#	4.75 (120.7)	16.38 (416.0)	24.44 (620.8)	21.20 (538.5)	C +7.10 (180.3)	12.56 (319.0)	7.05 (179.1)
2	DN50/PN16	3.40 (86.4)	See Note 1.	24.44 (620.8)	21.20 (538.5)	C +7.10 (180.3)	12.56 (319.0)	7.05 (179.1)
2	DN50/PN40	3.52 (89.4)	See Note 1.	24.44 (620.8)	21.20 (538.5)	C +7.10 (180.3)	12.56 (319.0)	7.05 (179.1)
2	DN50/PN100	4.30 (109.2)	See Note 1.	24.44 (620.8)	21.20 (538.5)	C +7.10 (180.3)	12.56 (319.0)	7.05 (179.1)
3	3 – 150#	4.63 (117.6)	12.75 (323.9)	26.37 (669.8)	23.14 (587.8)	C +7.10 (180.3)	14.13 (358.9)	7.55 (191.8)
3	3 – 300#	5.00 (127.0)	16.25 (412.8)	26.37 (669.8)	23.14 (587.8)	C +7.10 (180.3)	14.13 (358.9)	7.93 (201.3)
3	3 – 600#	5.38 (136.7)	19.50 (495.3)	26.37 (669.8)	23.14 (587.8)	C +7.10 (180.3)	14.13 (358.9)	7.93 (201.3)
3	DN80/PN16	3.85 (97.8)	See Note 1.	26.37 (669.8)	23.14 (587.8)	C +7.10 (180.3)	14.13 (358.9)	7.93 (201.3)
3	DN80/PN40	4.16 (105.7)	See Note 1.	26.37 (669.8)	23.14 (587.8)	C +7.10 (180.3)	14.13 (358.9)	7.93 (201.3)
3	DN80/PN100	4.95 (125.7)	See Note 1.	26.37 (669.8)	23.14 (587.8)	C +7.10 (180.3)	14.13 (358.9)	7.93 (201.3)
	Dimensions are in inches (millimeters)							

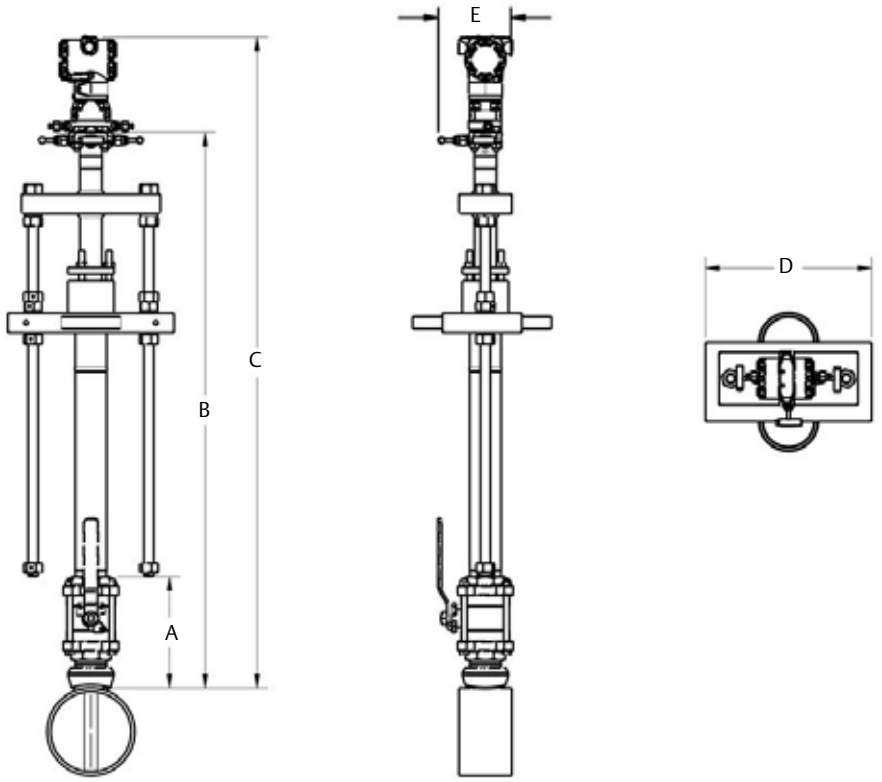
(1) DIN Valves are not offered.

Note: Customer Supplied.
Inserted, C Dimension = Pipe I.D. + Wall Thickness + B + C[I]

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

Rosemount 3051CFA Threaded Flo-Tap Annubar Flowmeter(1)

Front View	Side View	Top View



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

Table 22. 3051CFA Threaded Flo-Tap Annubar Flowmeter Dimensional Data

Sensor Size	A ± 0.50 (12.7)	B[I] (Max) (Gear Drive)	B[I] (Max) (Manual)	C (Max)	D (Max)	E (Max)
1	7.51 (190.9)	—	16.96 (430.8)	B + 7.10 (180.3)	10.50 (266.7)	6.00 (152.4)
2	8.17 (207.5)	23.62 (599.9)	20.39 (517.9)	B + 7.10 (180.3)	12.56 (319.0)	6.00 (152.4)
Sensor Size 3 is not available in a Threaded Flo-Tap.						
Dimensions are in inches (millimeters)						

Inserted, B Dimension = Pipe I.D. + Wall Thickness + A + B[I]
Retracted, B Dimension = 2 x (Pipe I.D. + Wall Thickness + A) + B[I]

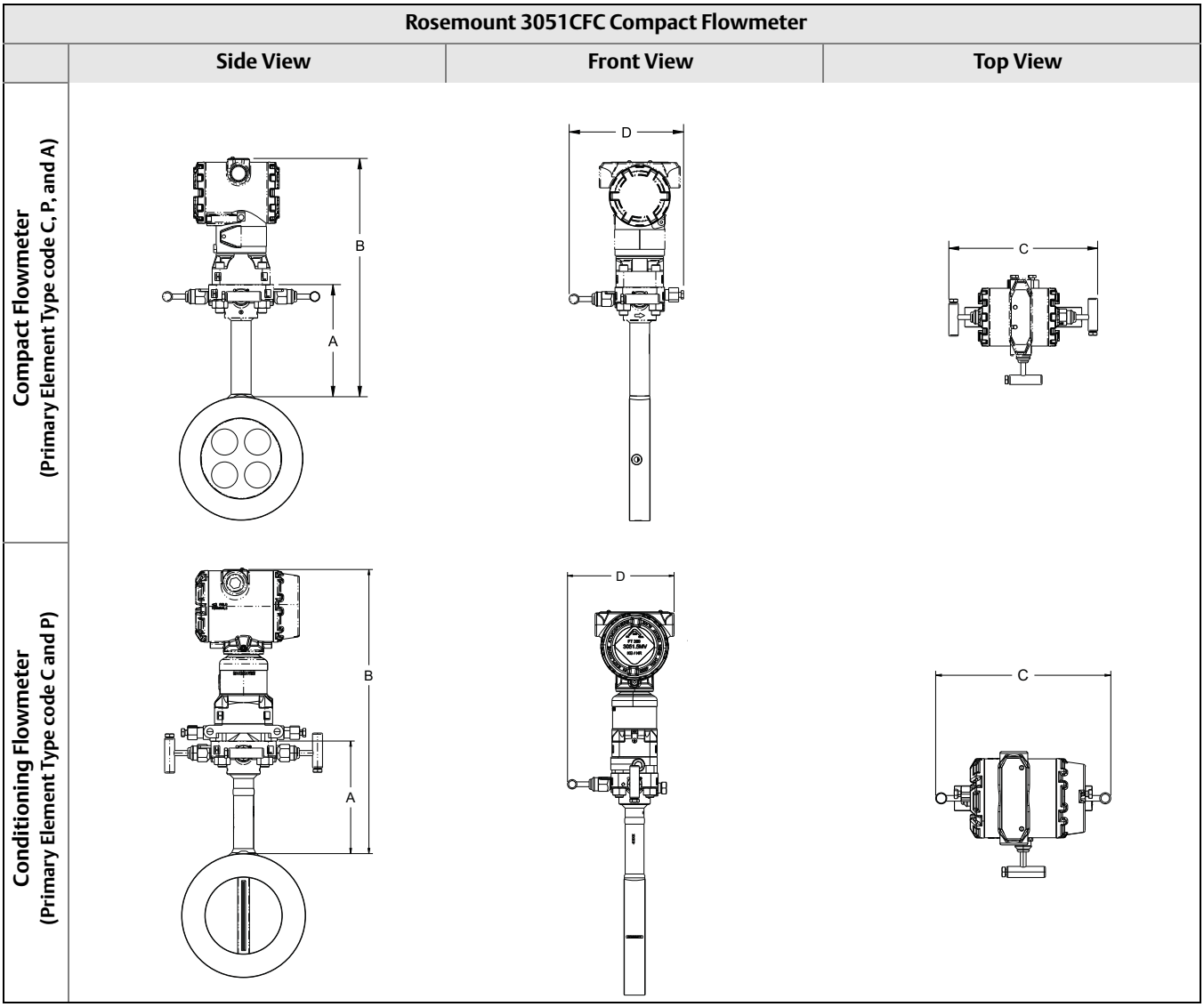


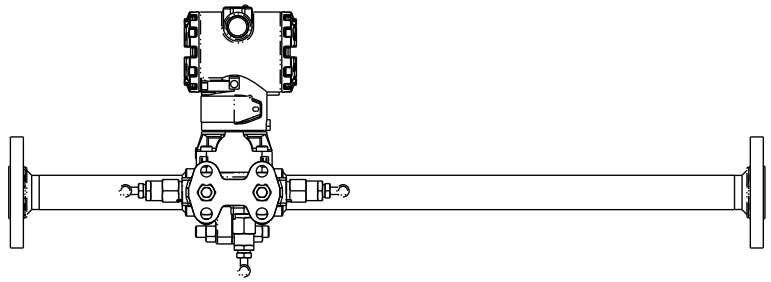
Table 23. 3051CFC Compact Dimensional Data(1)

Primary Element Type	A	B	Transmitter Height	C	D
Type A	5.62 (143)	Transmitter Height + A	7.38 (188)	7.75 (197) - closed 8.25 (210) - open	6.00 (152) - closed 6.25 (159) - open
Type P and C	5.62 (143)	Transmitter Height + A	6.55 (166)	7.75 (197) - closed 8.25 (210) - open	6.00 (152) - closed 6.25 (159) - open

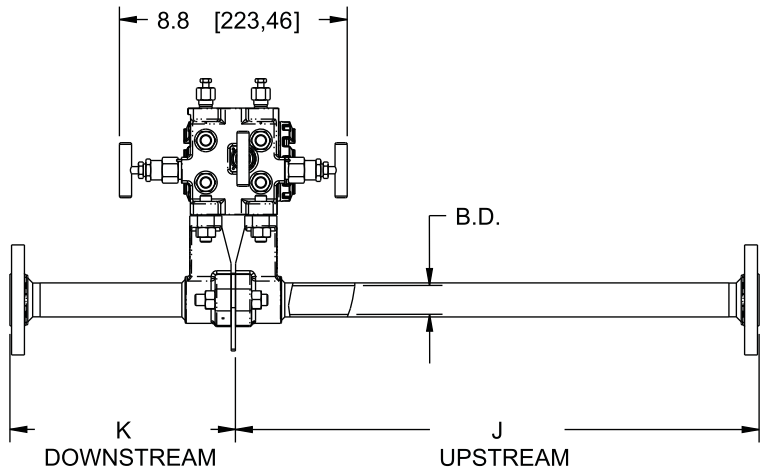
(1) Measurement in inches (millimeters).

Rosemount 3051CFP Integral Orifice Flowmeter

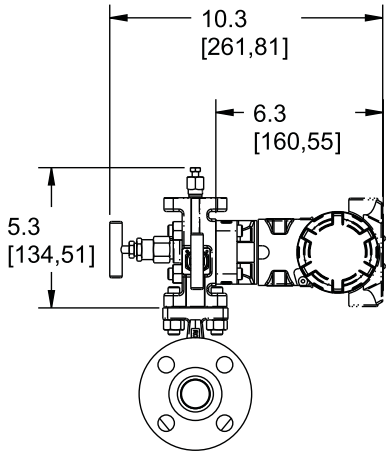
Side View



Bottom View



Front View



Dimensions are in inches (millimeters).

Table 24. 3051CFP Integral Orifice Dimensional Data

	Line Size		
Dimension	**1/2-in. (15 mm)**	**1-in. (25 mm)**	**1 1/2-in. (40 mm)**
J (Beveled/Threaded pipe ends)	12.54 (318.4)	20.24 (514.0)	28.44 (722.4)
J (RF slip-on, RTJ slip-on, RF-DIN slip on)	12.62 (320.4)	20.32 (516.0)	28.52 (724.4)
J (RF 150#, weld neck)	14.37 (364.9)	22.37 (568.1)	30.82 (782.9)
J (RF 300#, weld neck)	14.56 (369.8)	22.63 (574.7)	31.06 (789.0)
J (RF 600#, weld neck)	14.81 (376.0)	22.88 (581.0)	31.38 (797.1)
K (Beveled/Threaded pipe ends)	5.74 (145.7)	8.75 (222.2)	11.91 (302.6)
K (RF slip-on, RTJ slip-on, RF-DIN slip on)(1)	5.82 (147.8)	8.83 (224.2)	11.99 (304.6)
K (RF 150#, weld neck)	7.57 (192.3)	10.88 (276.3)	14.29 (363.1)
K (RF 300#, weld neck)	7.76 (197.1)	11.14 (282.9)	14.53 (369.2)
K (RF 600#, weld neck)	8.01 (203.4)	11.39 (289.2)	14.85 (377.2)
B.D. (Bore Diameter)	0.664 (16.87)	1.097 (27.86)	1.567 (39.80)
Dimensions are in inches (millimeters).			

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

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