

# Rosemount™ 2051 Pressure Transmitter



- Rosemount Coplanar™ platform enables integration of primary elements, manifolds, and remote seal solutions
- Best in Class performance with up to 0.05% high accuracy option
- IEC 62591 (*WirelessHART*®) Protocol enables cost effective installations
- Local Operator Interface (LOI) offers easy to use configuration capabilities at the transmitter
- Protocols available include HART® 4–20 mA, FOUNDATION™ Fieldbus, PROFIBUS® PA, HART 1–5 Vdc Low Power
- Selectable HART Revision prepares your plant for the latest HART capabilities while ensuring seamless integration with today's systems
- SIL2 safety certification to IEC 61508 is available with the full 4–20 mA HART offering to simplify compliance

# Rosemount 2051 Pressure Transmitter product offering



## Foundation of reliable measurement

- Differential, gage, and absolute pressure measurement
- Select from an extensive offering of DP Flowmeters, liquid level, manifolds and flanges
- Available with variety of protocols and materials

## Best-in-class capabilities extended to IEC 62591 (WirelessHART)

- Cost effectively implement wireless on the industry's most proven platform
- Optimize safety with the industry's only intrinsically safe power module
- Eliminate wiring design and construction complexities to lower costs by 40–60 percent
- Quickly deploy new pressure, level, and flow measurements in 70 percent less time

## Innovative, integrated DP Flowmeters

- Fully assembled and leak tested for out-of-the-box installation
- Reduce straight pipe requirements, lower permanent pressure loss, and achieve accurate measurement in small line sizes
- Up to two percent volumetric flow accuracy at 5:1 turndown

## Proven, reliable, and innovative DP Level technologies

- Connect to virtually any process with a comprehensive offering of process connections, fill fluids, direct mount or capillary connections and materials.
- Quantify and optimize total system performance with QZ option.
- Optimize level measurement with cost efficient Tuned-System™ Assemblies

## Instrument manifolds — quality, convenient, and easy

- Designed and engineered for optimal performance with Rosemount transmitters
- Save installation time and money with factory assembly
- Offers a variety of styles, materials, and configurations

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# Rosemount 2051C Coplanar Pressure Transmitter



Rosemount 2051C Coplanar Pressure Transmitter

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

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

**Additional information**

- Specifications: [page 43](#)
- Certifications: [page 54](#)
- Dimensional Drawings: [page 62](#)

Specification and selection of product materials, options, or components must be made by the purchaser of the equipment. See [page 51](#) for more information on material selection.

**Table 1. Rosemount 2051C Coplanar Pressure Transmitters Ordering Information**

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

Model	Transmitter type		
2051C	Coplanar Pressure Transmitter		
<b>Measurement type</b>			
D	Differential		★
G	Gage		★
<b>Pressure range</b>			
	<b>Rosemount 2051CD</b>	<b>Rosemount 2051CG</b>	
1	–25 to 25 inH <sub>2</sub> O (–62,2 to 62,2 mbar)	–25 to 25 inH <sub>2</sub> O (–62,2 to 62,2 mbar)	★
2	–250 to 250 inH <sub>2</sub> O (–623 to 623 mbar)	–250 to 250 inH <sub>2</sub> O (–623 to 623 mbar)	★
3	–1000 to 1000 inH <sub>2</sub> O (–2,5 to 2,5 bar)	–393 to 1000 inH <sub>2</sub> O (–0,98 to 2,5 bar)	★
4	–300 to 300 psi (–20,7 to 20,7 bar)	–14.2 to 300 psi (–0,98 to 20,7 bar)	★
5	–2000 to 2000 psi (–137,9 to 137,9 bar)	–14.2 to 2000 psi (–0,98 to 137,9 bar)	★

**Table 1. Rosemount 2051C Coplanar Pressure Transmitters Ordering Information**

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

<b>Transmitter output</b>				
A <sup>(1)</sup>	4–20 mA with digital signal based on HART Protocol			★
F	FOUNDATION Fieldbus Protocol			★
W	PROFIBUS PA Protocol			★
X	Wireless			★
M	Low Power, 1–5 Vdc with digital signal based on HART Protocol			
<b>Materials of construction</b>				
	<b>Process flange type</b>	<b>Flange material</b>	<b>Drain/vent</b>	
2	Coplanar	SST	SST	★
3 <sup>(2)</sup>	Coplanar	Cast C-276	Alloy C-276	★
5	Coplanar	Plated CS	SST	★
7 <sup>(2)</sup>	Coplanar	SST	Alloy C-276	★
8 <sup>(2)</sup>	Coplanar	Plated CS	Alloy C-276	★
0	Alternate process connection			★
<b>Isolating diaphragm</b>				
2 <sup>(2)</sup>	316L SST			★
3 <sup>(2)</sup>	Alloy C-276			★
5 <sup>(3)(4)</sup>	Tantalum			
<b>O-ring</b>				
A	Glass-filled PTFE			★
B	Graphite-filled PTFE			★
<b>Sensor fill fluid</b>				
1	Silicone			★
2 <sup>(4)</sup>	Inert			★
<b>Housing material</b>			<b>Conduit entry size</b>	
A	Aluminum		1/2–14 NPT	★
B	Aluminum		M20 × 1.5	★
J	SST		1/2–14 NPT	★
K <sup>(5)</sup>	SST		M20 × 1.5	★
P <sup>(6)</sup>	Engineered polymer		No conduit entries	★
D	Aluminum		G1/2	
M <sup>(5)</sup>	SST		G1/2	

**Table 1. Rosemount 2051C Coplanar Pressure Transmitters Ordering Information**

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

**Wireless options** (requires wireless output code X and engineered polymer housing code P)

<b>Wireless transmit rate, operating frequency and protocol</b>		
WA3	User configurable transmit rate, 2.4 GHz <i>Wireless</i> HART	★
<b>Antenna and SmartPower™</b>		
WP5	Internal antenna, compatible with green power module (I.S. power module sold separately)	★

**Options** (include with selected model number)

<b>Extended product warranty</b>		
WR3	3-year limited warranty	★
WR5	5-year limited warranty	★
<b>HART revision configuration<sup>(18)</sup></b>		
HR5 <sup>(7)</sup>	Configured for HART Revision 5	★
HR7 <sup>(8)</sup>	Configured for HART Revision 7	★
<b>PlantWeb control functionality</b>		
A01	FOUNDATION Fieldbus advanced control function block suite	★
<b>Alternate flange<sup>(9)</sup></b>		
H2	Traditional flange, 316 SST, SST drain/vent	★
H3 <sup>(2)</sup>	Traditional flange, Cast C-276, Alloy C-276 drain/vent	★
H7 <sup>(2)</sup>	Traditional flange, 316 SST, Alloy C-276 drain/vent	★
HJ	DIN compliant traditional flange, SST, 7/16-in. adapter/manifold bolting	★
FA	Level flange, SST, 2-in., ANSI Class 150, vertical mount	★
FB	Level flange, SST, 2-in., ANSI Class 300, vertical mount	★
FC	Level flange, SST, 3-in., ANSI Class 150, vertical mount	★
FD	Level flange, SST, 3-in., ANSI Class 300, vertical mount	★
FP	DIN level flange, SST, DN 50, PN 40, vertical mount	★
FQ	DIN level flange, SST, DN 80, PN 40, vertical mount	★
<b>Alternate flange<sup>(9)</sup></b>		
HK <sup>(10)</sup>	DIN compliant traditional flange, SST, 10 mm adapter/manifold bolting	
HL	DIN compliant traditional flange, SST, 12 mm adapter/manifold bolting	
<b>Manifold assembly<sup>(10)(11)</sup></b>		
S5	Assemble to Rosemount 305 Integral Manifold	★
S6	Assemble to Rosemount 304 Manifold or connection system	★

**Table 1. Rosemount 2051C Coplanar Pressure Transmitters Ordering Information**

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

<b>Integral mount primary element<sup>(10)(11)</sup></b>		
S4 <sup>(12)</sup>	Assemble to Rosemount 405A, 485, or 585 Annubar™ Primary Element or 1195 Integral Orifice Primary Element	★
S3	Assemble to Rosemount 405C or 405P Compact Orifice Plate	★
<b>Seal assemblies<sup>(11)</sup></b>		
S1 <sup>(13)</sup>	Assemble to one Rosemount 1199 Diaphragm Seal	★
S2 <sup>(14)</sup>	Assemble to two Rosemount 1199 Diaphragm Seals	★
<b>Mounting brackets</b>		
B1	Traditional flange bracket for 2-in. pipe mounting, CS bolts	★
B2	Traditional flange bracket for panel mounting, CS bolts	★
B3	Traditional flange flat bracket for 2-in. pipe mounting, CS bolts	★
B4	Coplanar flange bracket for 2-in. pipe or panel mounting, all SST	★
B7	B1 bracket with Series 300 SST bolts	★
B8	B2 bracket with Series 300 SST bolts	★
B9	B3 bracket with Series 300 SST bolts	★
BA	SST B1 bracket with Series 300 SST bolts	★
BC	SST B3 bracket with Series 300 SST bolts	★
<b>Product certifications</b>		
E1 <sup>(5)</sup>	ATEX Flameproof	★
E2 <sup>(5)</sup>	INMETRO Flameproof	★
E3 <sup>(5)</sup>	China Flameproof	★
E4 <sup>(5)</sup>	TIIS Flameproof	★
E5	FM Explosion-proof, Dust Ignition-proof	★
E6	CSA Explosion-proof, Dust Ignition-proof, Division 2	★
E7 <sup>(5)</sup>	IECEX Flameproof	★
EW	India (CCOE) Flameproof Approval	★
I1 <sup>(5)</sup>	ATEX Intrinsic Safety	★
I2 <sup>(5)</sup>	INMETRO Intrinsically Safe	★
I3 <sup>(5)</sup>	China Intrinsic Safety	★
I4 <sup>(5)(6)</sup>	TIIS Intrinsic Safety	★
I5	FM Intrinsically Safe, Division 2	★
I6	CSA Intrinsically Safe	★
I7 <sup>(5)</sup>	IECEX Intrinsic Safety	★
IA <sup>(15)</sup>	ATEX FISCO Intrinsic Safety	★
IE <sup>(15)</sup>	FM FISCO Intrinsically Safe	★
IF <sup>(15)</sup>	CSA FISCO Intrinsically Safe	★

**Table 1. Rosemount 2051C Coplanar Pressure Transmitters Ordering Information**

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

IG <sup>(15)</sup>	IECEX FISCO Intrinsically Safe	★
IW <sup>(5)</sup>	India (CCOE) Intrinsically Safe	★
K1 <sup>(5)</sup>	ATEX Flameproof, Intrinsic Safety, Type n, Dust	★
K2	INMETRO Flameproof and Intrinsic Safety	★
K5	FM Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
K6	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
K7 <sup>(5)</sup>	IECEX Flameproof, Intrinsic Safety, Type n and Dust	★
KA <sup>(5)</sup>	ATEX and CSA Flameproof, Intrinsically Safe, Division 2	★
KB	FM and CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
KC <sup>(5)</sup>	FM and ATEX Explosion-proof, Intrinsically Safe, Division 2	★
KD <sup>(5)</sup>	FM, CSA, and ATEX Explosion-proof, Intrinsically Safe	★
N1 <sup>(5)</sup>	ATEX Type n	★
N7 <sup>(5)</sup>	IECEX Type n	★
ND <sup>(5)</sup>	ATEX Dust	★
EM	Technical Regulations Customs Union (EAC) Flameproof	★
IM	Technical Regulations Customs Union (EAC) Intrinsic Safety	★
KM	Technical Regulations Customs Union (EAC) Flameproof and Intrinsic Safety	★
<b>Drinking water approval</b>		
DW <sup>(16)</sup>	NSF drinking water approval	★
<b>Shipboard approvals<sup>(4)</sup></b>		
SBS	American Bureau of Shipping (ABS) type approval	★
SBV	Bureau Veritas (BV) type approval	★
SDN	Det Norske Veritas (DNV) type approval	★
SLL	Lloyds Register (LR) type approval	★
<b>Bolting materials</b>		
L4	Austenitic 316 SST bolts	★
L5	ASTM A 193, Grade B7M bolts	★
L6	Alloy K-500 bolts	★
L8	ASTM A 193 Class 2, Grade B8M bolts	★
<b>Display and interface options</b>		
M4 <sup>(17)</sup>	LCD display with local operator interface	★
M5	LCD display	★
<b>Hardware adjustments</b>		
D4 <sup>(18)</sup>	Zero and span configuration buttons	★
DZ <sup>(19)</sup>	Digital zero trim	★

**Table 1. Rosemount 2051C Coplanar Pressure Transmitters Ordering Information**

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

<b>Flange adapters<sup>(20)</sup></b>		
DF	1/2–14 NPT flange adapters	★
<b>Conduit plug<sup>(4)(21)</sup></b>		
DO	316 SST conduit plug	★
<b>RC 1/4 RC 1/2 process connection<sup>(22)</sup></b>		
D9	RC 1/4 flange with RC 1/2 flange adapter - SST	
<b>Ground screw<sup>(4)(23)</sup></b>		
V5	External ground screw assembly	★
<b>Performance<sup>(24)</sup></b>		
P8	High performance option	★
<b>Transient protection<sup>(4)(25)</sup></b>		
T1	Transient protection terminal block	★
<b>Software configuration<sup>(19)</sup></b>		
C1	Custom Software Configuration (Completed Rosemount 2051 <a href="#">Configuration Data Sheet</a> or Rosemount 3051 <a href="#">Configuration Data Sheet</a> for Wireless required with order)	★
<b>Alarm limit<sup>(18)</sup></b>		
C4 <sup>(26)</sup>	NAMUR alarm and saturation levels, high alarm	★
CN <sup>(26)</sup>	NAMUR alarm and saturation levels, low alarm	★
CR	Custom Alarm and saturation signal levels, high alarm (requires C1 and Configuration Data Sheet)	★
CS	Custom Alarm and saturation signal levels, low alarm (requires C1 and Configuration Data Sheet)	★
CT	Low Alarm (standard Rosemount alarm and saturation levels)	★
<b>Pressure testing</b>		
P1	Hydrostatic testing with certificate	
<b>Cleaning process area</b>		
P2	Cleaning for special service	
P3	Cleaning for < 1 PPM Chlorine/Flourine	
<b>Maximum static line pressure</b>		
P9	4500 psig (310 bar) static pressure limit (2051CD Ranges 2–5 only)	★
<b>Calibration certification</b>		
Q4	Calibration certificate	★
QG	Calibration certificate and GOST verification certificate	★
QP	Calibration certification and tamper evident seal	★

**Table 1. Rosemount 2051C Coplanar Pressure Transmitters Ordering Information**

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

<b>Material traceability certification</b>		
Q8	Material traceability certification per EN 10204 3.1	★
<b>Quality certification for safety<sup>(27)</sup></b>		
QS	Prior-use certificate of FMEDA data	★
QT	Safety certified to IEC 61508 with certificate of FMEDA	★
<b>Surface finish</b>		
Q16	Surface finish certification for sanitary remote seals	★
<b>Toolkit total system performance reports</b>		
QZ	Remote seal system performance calculation report	★
<b>Conduit electrical connection<sup>(4)</sup></b>		
GE	M12, 4-pin, male connector (eurofast®)	★
GM	A size mini, 4-pin, male connector (minifast®)	★
<b>NACE certificate<sup>(28)</sup></b>		
Q15	Certificate of compliance to NACE® MR0175/ISO 15156 for wetted materials	★
Q25	Certificate of compliance to NACE MR0103 for wetted materials	★
<b>Typical model number: 2051C D 2 A 2 2 A 1 A B4 M5</b>		

- HART Revision 5 is the default HART output. The Rosemount 2051 with Selectable HART can be factory or field configured to HART Revision 7. To order HART Revision 7 factory configured, add option code HR7.
- Materials of Construction comply with recommendations per NACE MR0175/ISO 15156 for sour oil field production environments. Environmental limits apply to certain materials. Consult latest standard for details. Selected materials also conform to NACE MR0103 for sour refining environments. Order with Q15 or Q25 to receive a NACE certificate.
- Available in Ranges 2–5 only.
- Not available with output code X.
- Not available with low power output code M.
- Only available with output code X.
- Configures the HART output to HART Revision 5. The device can be field configured to HART Revision 7 if needed.
- Configures the HART output to HART Revision 7. The device can be field configured to HART Revision 5 if needed.
- Requires 0 code in Materials of Construction for alternate process connection.
- Not valid with optional code P9 for 4500 psi static pressure.
- “Assemble-to” items are specified separately and require a completed model number.
- Process flange limited to coplanar (codes 2, 3, 5, 7, 8) or traditional (H2, H3, H7).
- Not valid with optional code D9 for RC<sup>1</sup>/<sub>2</sub> adapters.
- Not valid with optional codes DF or D9 for adapters.
- Only valid with FOUNDATION Fieldbus output code F.
- Not available with Alloy C-276 isolator (3 code), tantalum isolator (5 code), all cast C-276 flanges, all plated CS flanges, all DIN flanges, all Level flanges, assemble-to manifolds (S5 and S6 codes), assemble-to seals (S1 and S2 codes), assemble-to primary elements (S3 and S4 codes), surface finish certification (Q16 code), and remote seal system report (QZ code).
- Not available with FOUNDATION Fieldbus output code F or wireless output code X.
- Only Available with HART 4–20 mA (output codes A and M).
- Only available with HART 4–20 mA output(output codes A) and wireless output (output code X).
- Not valid with alternate process connection options S3, S4, S5, S6.
- Transmitter is shipped with 316 SST conduit plug (uninstalled) in place of standard carbon steel conduit plug.
- Not available with alternate process connection: DIN flanges and Level flanges.
- The V5 option is not needed with the T1 option; external ground screw assembly is included with the T1 option.

24. Available with 4–20 mA HART output code A, wireless output code X, FOUNDATION Fieldbus output code F, Rosemount 2051C Ranges 2–5 or Rosemount 2051T Ranges 1–4, SST and Alloy C 276 diaphragms and silicone fill fluid. High performance option includes 0.05% reference accuracy, and five year stability. See [Performance specifications](#) for details.
25. The T1 option is not needed with FISCO Product Certifications; transient protection is included in the FISCO product certification codes IA and IE.
26. NAMUR-Compliant operation is pre-set at the factory and cannot be changed to standard operation in the field.
27. Only available with HART 4–20 mA output (output code A).
28. NACE-Compliant wetted materials are identified by [Footnote 2](#).

# Rosemount 2051T In-line Pressure Transmitter



Rosemount 2051T In-line Wireless Pressure Transmitter

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

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

**Additional information**

- Specifications: [page 43](#)
- Certifications: [page 54](#)
- Dimensional Drawings: [page 62](#)

Specification and selection of product materials, options, or components must be made by the purchaser of the equipment. See [page 51](#) for more information on material selection.

**Table 2. Rosemount 2051T In-line Pressure Transmitter Ordering Information**

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

Model	Transmitter type		
2051T	In-line Pressure Transmitter		★
<b>Pressure type</b>			
G	Gage		★
A <sup>(1)</sup>	Absolute		★
<b>Pressure range</b>			
	<b>Rosemount 2051TG</b>	<b>Rosemount 2051TA</b>	★
1	-14.7 to 30 psi (-1,0 to 2,1 bar)	0 to 30 psi (0 to 2,1 bar)	★
2	-14.7 to 150 psi (-1,0 to 10,3 bar)	0 to 150 psi (0 to 10,3 bar)	★
3	-14.7 to 800 psi (-1,0 to 55 bar)	0 to 800 psi (0 to 55 bar)	★
4	-14.7 to 4000 psi (-1,0 to 276 bar)	0 to 4000 psi (0 to 276 bar)	★
5	-14.7 to 10000 psi (-1,0 to 689 bar)	0 to 10000 psi (0 to 689 bar)	★

**Table 2. Rosemount 2051T In-line Pressure Transmitter Ordering Information**

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

Transmitter output			
A <sup>(2)</sup>	4–20 mA with Digital Signal Based on HART Protocol		★
F	FOUNDATION Fieldbus Protocol		★
W	PROFIBUS PA Protocol		★
X	Wireless		★
M	Low-Power, 1–5 Vdc with Digital Signal Based on HART Protocol		
Process connection style			
2B	1/2–14 NPT female		★
2C <sup>(3)</sup>	G1/2 A DIN 16288 male		★
2F <sup>(4)</sup>	Coned and threaded, compatible with autoclave type F-250-C (Range 5 only)		
Isolating diaphragm		Process connection wetted parts material	
2 <sup>(5)</sup>	316L SST	316L SST	★
3 <sup>(5)</sup>	Alloy C-276	Alloy C-276	★
Sensor fill fluid			
1	Silicone		★
2 <sup>(4)</sup>	Inert		★
Housing material		Conduit entry size	
A	Aluminum	1/2–14 NPT	★
B	Aluminum	M20 × 1.5	★
J	SST	1/2–14 NPT	★
K <sup>(6)</sup>	SST	M20 × 1.5	★
P <sup>(7)</sup>	Engineered polymer	No conduit entries	★
D	Aluminum	G1/2	
M <sup>(6)</sup>	SST	G1/2	

### Wireless options (requires wireless output code X and engineered polymer housing code P)

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

**Table 2. Rosemount 2051T In-line Pressure Transmitter Ordering Information**

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

**Options** (include with selected model number)

<b>Extended product warranty</b>		
WR3	3-year limited warranty	★
WR5	5-year limited warranty	★
<b>HART revision configuration<sup>(18)</sup></b>		
HR5 <sup>(8)</sup>	Configured for HART Revision 5	★
HR7 <sup>(9)</sup>	Configured for HART Revision 7	★
<b>PlantWeb control functionality</b>		
A01	FOUNDATION Fieldbus advanced control function block suite	★
<b>Manifold assemblies<sup>(10)</sup></b>		
S5	Assemble to Rosemount 306 Integral Manifold	★
<b>Seal assemblies<sup>(10)</sup></b>		
S1 <sup>(10)</sup>	Assemble to one Rosemount 1199 Diaphragm Seal	★
<b>Mounting bracket</b>		
B4	Bracket for 2-in. pipe or panel mounting, All SST	★
<b>Product certifications</b>		
E1 <sup>(6)</sup>	ATEX Flameproof	★
E2 <sup>(6)</sup>	INMETRO Flameproof	★
E3 <sup>(6)</sup>	China Flameproof	★
E4 <sup>(6)</sup>	TIIS Flameproof	★
E5	FM Explosion-proof, Dust Ignition-proof	★
E6	CSA Explosion-proof, Dust Ignition-proof, Division 2	★
E7 <sup>(6)</sup>	IECEX Flameproof	★
EW <sup>(6)</sup>	India (CCOE) Flameproof Approval	★
I1 <sup>(6)</sup>	ATEX Intrinsic Safety	★
I2 <sup>(6)</sup>	INMETRO Intrinsically Safe	★
I3 <sup>(6)</sup>	China Intrinsic Safety	★
I4 <sup>(6)(7)</sup>	TIIS Intrinsic Safety	★
I5	FM Intrinsically Safe, Division 2	★
I6	CSA Intrinsically Safe	★
I7 <sup>(6)</sup>	IECEX Intrinsic Safety	★
IA <sup>(13)</sup>	ATEX FISCO Intrinsic Safety	★
IE <sup>(11)</sup>	FM FISCO Intrinsically Safe	★
IF <sup>(11)</sup>	CSA FISCO Intrinsically Safe	★

**Table 2. Rosemount 2051T In-line Pressure Transmitter Ordering Information**

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

IG <sup>(11)</sup>	IECEx FISCO Intrinsically Safe	★
IW <sup>(6)</sup>	India (CCOE) Intrinsic Safety Approval	★
K1 <sup>(6)</sup>	ATEX Flameproof, Intrinsic Safety, Type n, Dust	★
K5	FM Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
K6	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
K7 <sup>(6)</sup>	IECEx Flameproof, Intrinsic Safety, Type n, Dust	★
KA <sup>(6)</sup>	ATEX and CSA Flameproof, Intrinsically Safe, Division 2	★
KB	FM and CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
KC <sup>(6)</sup>	FM and ATEX Explosion-proof, Intrinsically Safe, Division 2	★
KD <sup>(6)</sup>	FM, CSA, and ATEX Explosion-proof, Intrinsically Safe	★
N1 <sup>(6)</sup>	ATEX Type n	★
N7 <sup>(6)</sup>	IECEx Type n	★
ND <sup>(6)</sup>	ATEX Dust	★
EM	Technical Regulations Customs Union (EAC) Flameproof	★
IM	Technical Regulations Customs Union (EAC) Intrinsic Safety	★
KM	Technical Regulations Customs Union (EAC) Flameproof and Intrinsic Safety	★
<b>Drinking water approval<sup>(12)</sup></b>		
DW	NSF drinking water approval	★
<b>Shipboard approvals<sup>(4)</sup></b>		
SBS	American Bureau of Shipping (ABS) type approval	★
SBV	Bureau Veritas (BV) type approval	★
SDN	Det Norske Veritas (DNV) type approval	★
SLL	Lloyds Register (LR) type approval	★
<b>Display and interface options</b>		
M4 <sup>(13)</sup>	LCD display with local operator interface	★
M5	LCD display	★
<b>Hardware adjustments</b>		
D4 <sup>(14)</sup>	Zero and span configuration buttons	★
DZ <sup>(15)</sup>	Digital zero trim	★
<b>Wireless SST sensor module<sup>(7)</sup></b>		
WSM	Wireless SST sensor module	★
<b>Conduit plug<sup>(4)(16)</sup></b>		
DO	316 SST conduit plug	★

**Table 2. Rosemount 2051T In-line Pressure Transmitter Ordering Information**

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

<b>Ground screw<sup>(4)(17)</sup></b>		
V5	External ground screw assembly	★
<b>Performance<sup>(18)</sup></b>		
P8	High performance option	★
<b>Terminal blocks<sup>(4)(19)</sup></b>		
T1	Transient protection terminal block	★
<b>Software configuration<sup>(15)</sup></b>		
C1	Custom Software Configuration (Completed Rosemount 2051 <a href="#">Configuration Data Sheet</a> or Rosemount 3051 <a href="#">Configuration Data Sheet</a> for Wireless required with order)	★
<b>Alarm limits<sup>(14)</sup></b>		
C4 <sup>(20)</sup>	Analog output levels compliant with NAMUR recommendation NE 43, alarm high	★
CN <sup>(21)</sup>	Analog output levels compliant with NAMUR recommendation NE 43, alarm low	★
CR	Custom alarm and saturation signal levels, high alarm (requires C1 and Configuration Data Sheet)	★
CS	Custom alarm and saturation signal levels, low alarm (requires C1 and Configuration Data Sheet)	★
CT	Low alarm (standard Rosemount alarm and saturation levels)	★
<b>Pressure testing</b>		
P1	Hydrostatic testing with certificate	
<b>Cleaning process area<sup>(22)</sup></b>		
P2	Cleaning for special service	
P3	Cleaning for <1 PPM Chlorine/Fluorine	
<b>Calibration certification</b>		
Q4	Calibration certificate	★
QG	Calibration certificate and GOST verification certificate	★
QP	Calibration certificate and tamper evident seal	★
<b>Material traceability certification</b>		
Q8	Material traceability certification per EN 10204 3.1	★
<b>Quality certification for safety<sup>(21)</sup></b>		
QS	Prior-use certificate of FMEDA data	★
QT	Safety certified to IEC 61508 with certificate of FMEDA	★
<b>Surface finish</b>		
Q16	Surface finish certification for sanitary remote seals	★
<b>Toolkit total system performance reports</b>		
QZ	Remote seal system performance calculation report	★

**Table 2. Rosemount 2051T In-line Pressure Transmitter Ordering Information**

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

<b>Conduit electrical connector<sup>(4)</sup></b>		
GE	M12, 4-pin, male connector (eurofast)	★
GM	A size mini, 4-pin, male connector (minifast)	★
<b>NACE certificate<sup>(23)</sup></b>		
Q15	Certificate of compliance to NACE MR0175/ISO 15156 for wetted materials	★
Q25	Certificate of compliance to NACE MR0103 for wetted materials	★
<b>Typical model number:</b>	<b>2051T G 3 A 2B 2 1 A B4 M5</b>	

1. Wireless output (code X) only available in absolute measurement type (code A) in range 1–5 with 1/2–14 NPT process connection (code 2B), and housing code (code P).
2. HART Revision 5 is the default HART output. The Rosemount 2051 with Selectable HART can be factory or field configured to HART Revision 7. To order HART Revision 7 factory configured, add option code HR7.
3. Wireless output (code X) only available in G<sup>1</sup>/2 A DIN 16288 Male process connection (code 2C) with range 1–4, 316 SST isolating diaphragm (code 2), silicone fill fluid (code 1), and housing code (code P).
4. Not available with output code X.
5. Materials of Construction comply with recommendations per NACE MR0175/ISO 15156 for sour oil field production environments. Environmental limits apply to certain materials. Consult latest standard for details. Selected materials also conform to NACE MR0103 for sour refining environments. Order with Q15 or Q25 to receive a NACE certificate.
6. Not available with low power output code M.
7. Only available with output code X.
8. Configures the HART output to HART Revision 5. The device can be field configured to HART Revision 7 if needed.
9. Configures the HART output to HART Revision 7. The device can be field configured to HART Revision 5 if needed.
10. “Assemble-to” items are specified separately and require a completed model number.
11. Only valid with FOUNDATION Fieldbus output code F.
12. Not available with coned and threaded connection (2F code), assemble-to manifold (S5 code), assemble-to seal (S1 code), surface finish certification (Q16 code), remote seal system report (QZ code).
13. Not available with FOUNDATION Fieldbus output code F or wireless output code X.
14. Only Available with HART (output codes A and M).
15. Only available with HART 4–20 mA output (output code A) and wireless output (output code X).
16. Transmitter is shipped with 316 SST conduit plug (uninstalled) in place of standard carbon steel conduit plug.
17. The V5 option is not needed with the T1 option; external ground screw assembly is included with the T1 option.
18. Available with 4–20 mA HART output code A, wireless output code X, FOUNDATION Fieldbus output code F, Rosemount 2051C Ranges 2–5 or Rosemount 2051T Ranges 1–4, SST and Alloy C 276 diaphragms and silicone fill fluid. High performance option includes 0.05% reference accuracy, and five year stability. See [Performance specifications](#) for details.
19. The T1 option is not needed with FISCO Product Certifications; transient protection is included in the FISCO product certification codes IA and IE.
20. NAMUR-Compliant operation is pre-set at the factory and cannot be changed to standard operation in the field.
21. Only available with HART 4–20 mA output (output code A).
22. Not valid with alternate process connection S5.
23. NACE Compliant wetted materials are identified by [Footnote 2](#).

## Rosemount 2051CF Flowmeters



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

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

## Rosemount 2051CFA Annubar Flowmeter



### Additional information

Specifications: [page 43](#)

Certifications: [page 54](#)

Dimensional Drawings: [page 62](#)

Specification and selection of product materials, options, or components must be made by the purchaser of the equipment. See [page 51](#) for more information on material selection.

**Table 3. Rosemount 2051CFA Annubar Flowmeter Ordering Information**

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

Model	Product description	
2051CFA	Annubar Flowmeter	
<b>Measurement type</b>		
D	Differential pressure	★
<b>Fluid type</b>		
L	Liquid	★
G	Gas	★
S	Steam	★
<b>Line size</b>		
020	2-in. (50 mm)	★
025	2½-in. (63,5 mm)	★
030	3-in. (80 mm)	★
035	3½-in. (89 mm)	★
040	4-in. (100 mm)	★

**Table 3. Rosemount 2051 CFA 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.

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)	★
<b>Pipe I.D. range<sup>(1)</sup></b>		
C	Range C from the pipe I.D. table	★
D	Range D from the pipe I.D. table	★
A	Range A from the pipe I.D. table	
B	Range B from the pipe I.D. table	
E	Range E from the pipe I.D. table	
Z	Non-standard pipe I.D. range or line sizes greater than 12-in.	
<b>Pipe material/mounting assembly material</b>		
C	Carbon steel (A105)	★
S	316 stainless steel	★
0 <sup>(2)</sup>	No mounting (customer supplied)	
G	Chrome-Moly Grade F-11	
N	Chrome-Moly Grade F-22	
J	Chrome-Moly Grade F-91	
<b>Piping orientation</b>		
H	Horizontal piping	★
D	Vertical piping with downwards flow	★
U	Vertical piping with upwards flow	★
<b>Annubar type</b>		
P	Pak-Lok	★
F	Flanged with opposite side support	★
<b>Sensor material</b>		
S	316 stainless steel	★
<b>Sensor size</b>		
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)	★

**Table 3. Rosemount 2051 CFA 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.

<b>Mounting type</b>		
T1	Compression or threaded connection	★
A1	Class 150 RF ANSI	★
A3	Class 300 RF ANSI	★
A6	Class 600 RF ANSI	★
D1	DN PN16 flange	★
D3	DN PN40 flange	★
D6	DN PN100 flange	★
R1	Class 150 RTJ flange	
R3	Class 300 RTJ flange	
R6	Class 600 RTJ flange	
<b>Opposite side support or packing gland</b>		
0	No opposite side support or packing gland (required for Pak-Lok and Flange-Lok models)	★
<b>Opposite side support (required for flanged models)</b>		
C	NPT threaded opposite support assembly — extended tip	★
D	Welded opposite support assembly — extended tip	★
<b>Isolation valve for Flo-Tap models</b>		
0 <sup>(2)</sup>	Not applicable or customer supplied	★
<b>Temperature measurement</b>		
T	Integral RTD – not available with flanged model greater than Class 600	★
0	No temperature sensor	★
R	Remote thermowell and RTD	
<b>Transmitter connection platform</b>		
3	Direct mount, Integral 3-valve manifold — not available with flanged model greater than Class 600	★
5	Direct mount, 5-valve manifold — not available with flanged model greater than Class 600	★
7	Remote mount NPT connections (1/2-in. FNPT)	★
8	Remote mount SW connections (1/2-in.)	
<b>Differential pressure range</b>		
1	0 to 25 in H <sub>2</sub> O (0 to 62,3 mbar)	★
2	0 to 250 in H <sub>2</sub> O (0 to 623 mbar)	★
3	0 to 1000 in H <sub>2</sub> O (0 to 2,5 bar)	★
<b>Transmitter output</b>		
A <sup>(3)</sup>	4–20 mA with digital signal based on HART Protocol	★
F	FOUNDATION Fieldbus Protocol	★

**Table 3. Rosemount 2051 CFA 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.

W	PROFIBUS PA Protocol		★
X	Wireless		★
M	Low-Power, 1–5 Vdc with digital signal based on HART Protocol		
<b>Transmitter housing material</b>		<b>Conduit entry size</b>	
A	Aluminum	1/2–14 NPT	★
B	Aluminum	M20 × 1.5	★
J	SST	1/2–14 NPT	★
K <sup>(4)</sup>	SST	M20 × 1.5	★
P <sup>(5)</sup>	Engineered polymer	No conduit entries	★
D	Aluminum	G1/2	
M <sup>(4)</sup>	SST	G1/2	
<b>Transmitter performance class</b>			
1	2.0% flow rate accuracy, 5:1 flow turndown, 2-year stability		★

### Wireless options (requires wireless output code X and engineered polymer housing code P)

<b>Wireless transmit rate, operating frequency and protocol</b>			
WA3	User configurable transmit rate, 2.4 GHz WirelessHART		★
<b>Antenna and SmartPower</b>			
WP5	Internal antenna, compatible with green power module (I.S. power module sold separately)		★

### Options (include with selected model number)

<b>Extended product warranty</b>			
WR3	3-year limited warranty		★
WR5	5-year limited warranty		★
<b>Special cleaning<sup>(4)</sup></b>			
P2	Cleaning for special services		
PA	Cleaning per ASTM G93 Level D (Section 11.4)		
<b>Material testing<sup>(4)</sup></b>			
V1	Dye penetrant exam		
<b>Material examination<sup>(4)</sup></b>			
V2	Radiographic examination		
<b>Special inspection<sup>(4)</sup></b>			
QC1	Visual and dimensional inspection with certificate		★
QC7	Inspection and performance certificate		★

**Table 3. Rosemount 2051 CFA 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.

<b>Surface finish<sup>(4)</sup></b>		
RL	Surface finish for low pipe Reynolds number in gas and steam	★
RH	Surface finish for high pipe Reynolds number in liquid	★
<b>Material traceability certification<sup>(4)(6)</sup></b>		
Q8	Material traceability certification per EN 10474:2004 3.1	★
<b>Code conformance<sup>(4)</sup></b>		
J2	ANSI/ASME B31.1	
J3	ANSI/ASME B31.3	
<b>Materials conformance<sup>(4)(6)</sup></b>		
J5	NACE MR-0175/ISO 15156	
<b>Country certification<sup>(4)</sup></b>		
J6	European Pressure Directive (PED)	★
J1	Canadian registration	
<b>Instrument connections for remote mount options<sup>(4)</sup></b>		
G2	Needle valves, stainless steel	★
G6	OS&Y gate valve, stainless steel	★
G1	Needle valves, carbon steel	
G3	Needle valves, Alloy C-276	
G5	OS&Y gate valve, carbon steel	
G7	OS&Y gate valve, Alloy C-276	
<b>Special shipment<sup>(4)</sup></b>		
Y1	Mounting hardware shipped separately	★
<b>Product certifications</b>		
E1 <sup>(4)</sup>	ATEX Flameproof	★
E2 <sup>(4)</sup>	INMETRO Flameproof	★
E3 <sup>(4)</sup>	China Flameproof	★
E5	FM Explosion-proof, Dust Ignition-proof	★
E6	CSA Explosion-proof, Dust Ignition-proof, Division 2	★
E7 <sup>(4)</sup>	IECEX Flameproof	★
I1 <sup>(4)</sup>	ATEX Intrinsic Safety	★
I2 <sup>(4)</sup>	INMETRO Intrinsically Safe	★
I3 <sup>(4)</sup>	China Intrinsic Safety	★
I5	FM Intrinsically Safe, Division 2	★
I6	CSA Intrinsically Safe	★

**Table 3. Rosemount 2051 CFA 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.

I7 <sup>(4)</sup>	IECEX Intrinsic Safety	★
IA <sup>(4)(6)</sup>	ATEX FISCO Intrinsic Safety; for FOUNDATION Fieldbus protocol only	★
IE <sup>(4)(6)</sup>	FM FISCO Intrinsically Safe	★
IF <sup>(4)(6)</sup>	CSA FISCO Intrinsically Safe	★
IG <sup>(4)(6)</sup>	IECEX FISCO Intrinsically Safe	★
K1 <sup>(4)</sup>	ATEX Flameproof, Intrinsic Safety, Type n, Dust	★
K5	FM Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E5 and I5)	★
K6	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E6 and I6)	★
K7 <sup>(4)</sup>	IECEX Flameproof, Dust Ignition-proof, Intrinsic Safety, Type n (combination of E7, I7, and N7)	★
KA <sup>(4)</sup>	ATEX and CSA Flameproof, Intrinsically Safe, Division 2	★
KB	FM and CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E5, E6, I5, and I6)	★
KC <sup>(4)</sup>	FM and ATEX Explosion-proof, Intrinsically Safe, Division 2	★
KD <sup>(4)</sup>	FM, CSA, and ATEX Explosion-proof, Intrinsically Safe (combination of E5, I5, E6, I6, E1, and I1)	★
N1 <sup>(4)</sup>	ATEX Type n	★
N7 <sup>(4)</sup>	IECEX Type n	★
ND <sup>(4)</sup>	ATEX Dust	★
<b>Sensor fill fluid and O-ring options<sup>(4)</sup></b>		
L1 <sup>(7)</sup>	Inert sensor fill fluid	★
L2	Graphite-filled (PTFE) O-ring	★
LA <sup>(7)</sup>	Inert sensor fill fluid and graphite-filled (PTFE) O-ring	★
<b>Display and interface options<sup>(4)</sup></b>		
M4 <sup>(8)</sup>	LCD display with local operator interface	★
M5	LCD display	★
<b>Transmitter calibration certification<sup>(4)</sup></b>		
Q4	Calibration certificate for transmitter	★
<b>Quality certification for safety<sup>(4)(9)</sup></b>		
QS	Prior-use certificate of FMEDA data	★
QT	Safety certified to IEC 61508 with certificate of FMEDA	★
<b>Transient protection<sup>(4)(7)(10)</sup></b>		
T1	Transient terminal block	★
<b>Manifold for remote mount option<sup>(4)</sup></b>		
F2	3-valve manifold, stainless steel	★
F6	5-valve manifold, stainless steel	★
F1	3-valve manifold, carbon steel	
F5	5-valve manifold, carbon steel	

**Table 3. Rosemount 2051 CFA 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.

<b>PlantWeb control functionality<sup>(4)(6)</sup></b>		
A01	FOUNDATION Fieldbus advanced control function block suite	★
<b>Hardware adjustments<sup>(4)</sup></b>		
D4 <sup>(11)</sup>	Zero and span hardware adjustments	★
DZ <sup>(12)</sup>	Digital zero trim	★
<b>Alarm limit<sup>(4)(11)</sup></b>		
C4 <sup>(13)</sup>	NAMUR alarm and saturation levels, high alarm	★
CN <sup>(13)</sup>	NAMUR alarm and saturation levels, low alarm	★
CR	Custom alarm and saturation signal levels, high alarm (requires C1 and Configuration Data Sheet)	★
CS	Custom alarm and saturation signal levels, low alarm (requires C1 and Configuration Data Sheet)	★
CT	Low alarm (standard Rosemount alarm and saturation levels)	★
<b>Ground screw<sup>(4)(7)(14)</sup></b>		
V5	External ground screw assembly	★
<b>HART revision configuration<sup>(4)(11)</sup></b>		
HR5 <sup>(15)</sup>	Configured for HART Revision 5	★
HR7 <sup>(16)</sup>	Configured for HART Revision 7	★
<b>Typical model number: 2051CFA D L 060 D C H P S 2 T1 0 0 0 3 2A A 1A 3</b>		

- See the Rosemount DP Flowmeters and Primary Elements [Product Data Sheet](#) for Pipe I.D. table.
- Provide the "A" dimension for flanged ([page 68](#)) and Pak-Lok ([page 68](#)).
- HART Revision 5 is the default HART output. The Rosemount 2051 with Selectable HART can be factory or field configured to HART Revision 7. To order HART Revision 7 factory configured, add option code HR7.
- Not available with low power output code M.
- Only available with output code X.
- Only valid with FOUNDATION Fieldbus output code F.
- Not available with output code X.
- Not available with FOUNDATION Fieldbus (output code F) or wireless (output code X).
- Only available with 4–20 mA HART (output code A).
- Not available with housing code 00, 5A or 7J. The T1 option is not needed with FISCO Product Certifications, transient protection is included with the FISCO Product Certification code IA.
- Only available with 4–20 mA HART (output codes A and M).
- Only available with HART 4–20 mA output (output codes A and M) and wireless output (output code X).
- NAMUR-Compliant operation is pre-set at the factory and cannot be changed to standard operation in the field.
- The V5 option is not needed with the T1 option; external ground screw assembly is included with the T1 option.
- Configures the HART output to HART Revision 5. The device can be field configured to HART Revision 7 if needed.
- Configures the HART output to HART Revision 7. The device can be field configured to HART Revision 5 if needed.

## Rosemount 2051CFC Compact Flowmeter



### Additional information

Specifications: [page 43](#)

Certifications: [page 54](#)

Dimensional Drawings: [page 62](#)

Specification and selection of product materials, options, or components must be made by the purchaser of the equipment. See [page 51](#) for more information on material selection.

**Table 4. Rosemount 2051CFC Compact Flowmeter Ordering Information**

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

Model	Product description	
2051CFC	Compact Flowmeter	
<b>Measurement type</b>		
D	Differential pressure	★
<b>Primary element technology</b>		
A	Annubar averaging pitot tube	
C	Conditioning orifice plate	★
P	Orifice plate	★
<b>Material type</b>		
S	316 SST	★
<b>Line size</b>		
005 <sup>(1)</sup>	1/2-in. (15 mm)	★
010 <sup>(1)</sup>	1-in. (25 mm)	★
015 <sup>(1)</sup>	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 <sup>(2)(3)</sup>	10-in. (250 mm)	★
120 <sup>(2)(3)</sup>	12-in. (300 mm)	★
<b>Primary element type</b>		
N000	Annubar sensor size 1	★
N040	0.40 Beta ratio	★
N050	0.50 Beta ratio	★
N065 <sup>(4)</sup>	0.65 Beta ratio	★

**Table 4. Rosemount 2051CFC Compact Flowmeter Ordering Information**

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

Temperature measurement			
0	No temperature sensor	★	
T <sup>(5)</sup>	Integral RTD		
R	Remote thermowell and RTD		
Transmitter connection platform			
3	Direct mount	★	
7	Remote mount, NPT connections	★	
Differential pressure range			
1	0 to 25 in H <sub>2</sub> O (0 to 62,3 mbar)	★	
2	0 to 250 in H <sub>2</sub> O (0 to 623 mbar)	★	
3	0 to 1000 in H <sub>2</sub> O (0 to 2,5 bar)	★	
Transmitter output			
A <sup>(6)</sup>	4–20 mA with digital signal based on HART Protocol	★	
F	FOUNDATION Fieldbus Protocol	★	
W	PROFIBUS PA Protocol	★	
X	Wireless	★	
M	Low-Power, 1–5 Vdc with Digital Signal Based on HART Protocol		
Transmitter housing material		Conduit entry size	
A	Aluminum	1/2–14 NPT	★
B	Aluminum	M20 × 1.5	★
J	SST	1/2–14 NPT	★
K <sup>(7)</sup>	SST	M20 × 1.5	★
P <sup>(8)</sup>	Engineered polymer	No conduit entries	★
D	Aluminum	G <sup>1</sup> / <sub>2</sub>	
M <sup>(7)</sup>	SST	G <sup>1</sup> / <sub>2</sub>	
Transmitter performance class			
1	up to ±2.25% flow rate accuracy, 5:1 flow turndown, 2-year stability	★	

### Wireless options (requires wireless output code X and engineered polymer housing code P)

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

**Table 4. Rosemount 2051CFC Compact Flowmeter Ordering Information**

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

**Options** (include with selected model number)

<b>Extended product warranty</b>		
WR3	3-year limited warranty	★
WR5	5-year limited warranty	★
<b>Installation accessories<sup>(7)</sup></b>		
AB	ANSI alignment ring (Class 150) [only required for 10-in. (250 mm) and 12-in. (300 mm) line sizes]	★
AC	ANSI alignment ring (Class 300) [only required for 10-in. (250 mm) and 12-in. (300 mm) line sizes]	★
AD	ANSI alignment ring (Class 600) [only required for 10-in. (250 mm) and 12-in. (300 mm) line sizes]	★
DG	DIN alignment ring (PN16)	★
DH	DIN alignment ring (PN40)	★
DJ	DIN alignment ring (PN100)	★
JB	JIS alignment ring (10K)	
JR	JIS alignment ring (20K)	
JS	JIS alignment ring (40K)	
<b>Remote adapters<sup>(7)</sup></b>		
FE	Flange adapters 316 SST (1/2-in. NPT)	★
<b>High temperature application<sup>(7)</sup></b>		
HT	Graphite valve packing ( $T_{max} = 850\text{ }^{\circ}\text{F}$ )	
<b>Flow calibration<sup>(7)(9)</sup></b>		
WC	Flow calibration, 3 Pt, conditioning orifice option C (all pipe schedules)	
WD	Flow calibration, 10 Pt, conditioning option C (all schedules), Annubar option A (Schedule 40)	
<b>Pressure testing<sup>(7)</sup></b>		
P1	Hydrostatic Testing with certificate	
<b>Special cleaning<sup>(7)</sup></b>		
P2	Cleaning for special services	
PA	Cleaning per ASTM G93 Level D (Section 11.4)	
<b>Special inspection<sup>(7)</sup></b>		
QC1	Visual and dimensional inspection with certificate	★
QC7	Inspection and performance certificate	★
<b>Transmitter calibration certification<sup>(7)</sup></b>		
Q4	Calibration certificate for Transmitter	★

**Table 4. Rosemount 2051 CFC 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.

<b>Quality certification for safety<sup>(7)(10)</sup></b>		
QS	Prior-use certificate of FMEDA data	★
QT	Safety certified to IEC 61508 with certificate of FMEDA	★
<b>Material traceability certification<sup>(7)</sup></b>		
Q8	Material traceability certification per EN 10204:2004 3.1	★
<b>Code conformance<sup>(7)</sup></b>		
J2	ANSI/ASME B31.1	
J3	ANSI/ASME B31.3	
J4	ANSI/ASME B31.8	
<b>Materials conformance<sup>(7)(11)</sup></b>		
J5	NACE MR-0175/ISO 15156	
<b>Country certification<sup>(7)</sup></b>		
J1	Canadian registration	
<b>Product certifications</b>		
E1 <sup>(7)</sup>	ATEX Flameproof	★
E2 <sup>(7)</sup>	INMETRO Flameproof	★
E3 <sup>(7)</sup>	China Flameproof	★
E5	FM Explosion-proof, Dust Ignition-proof	★
E6	CSA Explosion-proof, Dust Ignition-proof, Division 2	★
E7 <sup>(7)</sup>	IECEx Flameproof	★
I1 <sup>(7)</sup>	ATEX Intrinsic Safety	★
I2 <sup>(7)</sup>	INMETRO Intrinsically Safe	★
I3 <sup>(7)</sup>	China Intrinsic Safety	★
I5	FM Intrinsically Safe, Division 2	★
I6	CSA Intrinsically Safe	★
I7 <sup>(7)</sup>	IECEx Intrinsic Safety	★
IA <sup>(7)(12)</sup>	ATEX FISCO Intrinsic Safety; for FOUNDATION Fieldbus Protocol only	★
IE <sup>(7)(12)</sup>	FM FISCO Intrinsically Safe	★
IF <sup>(7)(12)</sup>	CSA FISCO Intrinsically Safe	★
IG <sup>(7)(12)</sup>	IECEx FISCO Intrinsically Safe	★
K1 <sup>(7)</sup>	ATEX Flameproof, Intrinsic Safety, Type n, Dust	★
K5	FM Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E5 and I5)	★
K6	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E6 and I6)	★
K7 <sup>(7)</sup>	IECEx Flameproof, Dust Ignition-proof, Intrinsic Safety, Type n (combination of E7, I7, and N7)	★
KA <sup>(7)</sup>	ATEX and CSA Flameproof, Intrinsically Safe, Division 2	★

**Table 4. Rosemount 2051 CFC 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.

KB	FM and CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E5, E6, I5, and I6)	★
KC <sup>(7)</sup>	FM and ATEX Explosion-proof, Intrinsically Safe, Division 2	★
KD <sup>(7)</sup>	FM, CSA, and ATEX Explosion-proof, Intrinsically Safe (combination of E5, I5, E6, I6, E1, and I1)	★
N1 <sup>(7)</sup>	ATEX Type n	★
N7 <sup>(7)</sup>	IECEX Type n	★
ND <sup>(7)</sup>	ATEX Dust	★
<b>Sensor fill fluid and O-ring options<sup>(7)</sup></b>		
L1 <sup>(13)</sup>	Inert sensor fill fluid	★
L2	Graphite-filled (PTFE) O-ring	★
LA <sup>(13)</sup>	Inert sensor fill fluid and graphite-filled (PTFE) O-ring	★
<b>Display and interface options<sup>(7)</sup></b>		
M <sup>(10)</sup>	LCD display with local operator interface	★
M5	LCD display	★
<b>Transient protection<sup>(7)(13)(14)</sup></b>		
T1	Transient terminal block	★
<b>Manifold for remote mount option<sup>(7)</sup></b>		
F2	3-valve manifold, stainless steel	★
F6	5-valve manifold, stainless steel	★
<b>Alarm limit<sup>(7)(15)</sup></b>		
C4 <sup>(16)</sup>	NAMUR alarm and saturation levels, high alarm	★
CN <sup>(16)</sup>	NAMUR alarm and saturation levels, low alarm	★
CR	Custom alarm and saturation signal levels, high alarm (requires C1 and Configuration Data Sheet)	★
CS	Custom alarm and saturation signal levels, low alarm (requires C1 and Configuration Data Sheet)	★
CT	Low alarm (standard Rosemount alarm and saturation levels)	★
<b>PlantWeb control functionality<sup>(7)(12)</sup></b>		
A01	FOUNDATION Fieldbus advanced control function block suite	★
<b>Hardware adjustments<sup>(7)</sup></b>		
D4 <sup>(15)</sup>	Zero and span hardware adjustments	★
DZ <sup>(17)</sup>	Digital zero trim	★
<b>Ground screw<sup>(7)(13)(18)</sup></b>		
V5	External ground screw assembly	★

**Table 4. Rosemount 2051CFC Compact Flowmeter Ordering Information**

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

<b>HART revision configuration<sup>(7)(15)</sup></b>		
HR5 <sup>(19)</sup>	Configured for HART Revision 5	★
HR7 <sup>(20)</sup>	Configured for HART Revision 7	★
<b>Typical model number: 2051CFC D C S 060 N 065 0 3 2 A A 1 WC E5 M5</b>		

1. Not available for Primary Element Technology C.
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 Rosemount 2051 with Selectable HART can be factory or field configured to HART Revision 7. To order HART Revision 7 factory configured, add option code HR7.
7. Not available with low power output code M.
8. Only available with output code X.
9. Not available with Primary Element Technology P.
10. Not available with FOUNDATION Fieldbus (output code F) or wireless (output code X).
11. 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.
12. Only valid with FOUNDATION Fieldbus output code F.
13. Not available with output code X.
14. Not available with housing code 00, 5A, or 7J. The T1 option is not needed with FISCO Product Certifications, transient protection is included with the FISCO Product Certification code IA.
15. Only available with 4–20 mA HART (output codes A and M).
16. NAMUR-Compliant operation is pre-set at the factory and cannot be changed to standard operation in the field.
17. Only available with HART 4–20 mA (output codes A and M) and wireless (output code X).
18. The V5 option is not needed with the T1 option; external ground screw assembly is included with the T1 option.
19. Configures the HART output to HART Revision 5. The device can be field configured to HART Revision 7 if needed.
20. Configures the HART output to HART Revision 7. The device can be field configured to HART Revision 5 if 14 needed.

## Rosemount 2051CFP Integral Orifice Flowmeter



### Additional information

Specifications: [page 43](#)

Certifications: [page 54](#)

Dimensional Drawings: [page 62](#)

Specification and selection of product materials, options, or components must be made by the purchaser of the equipment. See [page 51](#) for more information on material selection.

**Table 5. Rosemount 2051CFP Integral Orifice Flowmeter Ordering Information**

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

Model	Product description	
2051CFP	Integral Orifice Flowmeter	
<b>Measurement type</b>		
D	Differential pressure	★
<b>Material type</b>		
S	316 SST	★
<b>Line size</b>		
005	1/2-in. (15 mm)	★
010	1-in. (25 mm)	★
015	1 1/2-in. (40 mm)	★
<b>Process connection</b>		
T1	NPT female body (not available with thermowell and RTD)	★
S1 <sup>(1)</sup>	Socket weld body (not available with thermowell and RTD)	★
P1	Pipe ends: NPT threaded	★
P2	Pipe ends: beveled	★
D1	Pipe ends: flanged, DIN PN16, slip-on	★
D2	Pipe ends: flanged, DIN PN40, slip-on	★
D3	Pipe ends: flanged, DIN PN100, slip-on	★
W1	Pipe ends: flanged, RF, ANSI Class 150, weld-neck	★
W3	Pipe ends: flanged, RF, ANSI Class 300, weld-neck	★
W6	Pipe ends: flanged, RF, ANSI Class 600, weld-neck	★
A1	Pipe ends: flanged, RF, ANSI Class 150, slip-on	
A3	Pipe ends: flanged, RF, ANSI Class 300, slip-on	
A6	Pipe ends: flanged, RF, ANSI Class 600, slip-on	
R1	Pipe ends: flanged, RTJ, ANSI Class 150, slip-on	

**Table 5. Rosemount 2051 CFP 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.

R3	Pipe ends: flanged, RTJ, ANSI Class 300, slip-on	
R6	Pipe ends: flanged, RTJ, ANSI Class 600, slip-on	
<b>Orifice plate material</b>		
S	316 SST	★
<b>Bore size option</b>		
0066	0.066-in. (1,68 mm) for 1/2-in. pipe	★
0109	0.109-in. (2,77 mm) for 1/2-in. pipe	★
0160	0.160-in. (4,06 mm) for 1/2-in. pipe	★
0196	0.196-in. (4,98 mm) for 1/2-in. pipe	★
0260	0.260-in. (6,60 mm) for 1/2-in. pipe	★
0340	0.340-in. (8,64 mm) for 1/2-in. pipe	★
0150	0.150-in. (3,81 mm) for 1-in. pipe	★
0250	0.250-in. (6,35 mm) for 1-in. pipe	★
0345	0.345-in. (8,76 mm) for 1-in. pipe	★
0500	0.500-in. (12,70 mm) for 1-in. pipe	★
0630	0.630-in. (16,00 mm) for 1-in. pipe	★
0800	0.800-in. (20,32 mm) for 1-in. pipe	★
0295	0.295-in. (7,49 mm) for 1 1/2-in. pipe	★
0376	0.376-in. (9,55 mm) for 1 1/2-in. pipe	★
0512	0.512-in. (13,00 mm) for 1 1/2-in. pipe	★
0748	0.748-in. (19,00 mm) for 1 1/2-in. pipe	★
1022	1.022-in. (25,96 mm) for 1 1/2-in. pipe	★
1184	1.184-in. (30,07 mm) for 1 1/2-in. pipe	★
0010	0.010-in. (0,25 mm) for 1/2-in. pipe	
0014	0.014-in. (0,36 mm) for 1/2-in. pipe	
0020	0.020-in. (0,51 mm) for 1/2-in. pipe	
0034	0.034-in. (0,86 mm) for 1/2-in. pipe	
<b>Transmitter connection platform</b>		
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	★
<b>Differential pressure ranges</b>		
1	0 to 25 in H <sub>2</sub> O (0 to 62,3 mbar)	★
2	0 to 250 in H <sub>2</sub> O (0 to 623 mbar)	★
3	0 to 1000 in H <sub>2</sub> O (0 to 2,5 bar)	★

**Table 5. Rosemount 2051 CFP Integral Orifice Flowmeter Ordering Information**

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

Transmitter output		
A <sup>(2)</sup>	4–20 mA with digital signal based on HART Protocol	★
F	FOUNDATION Fieldbus Protocol	★
W	PROFIBUS PA Protocol	★
X	Wireless	★
M	Low-Power, 1–5 Vdc with digital signal based on HART Protocol	
Transmitter housing material		Conduit entry size
A	Aluminum	1/2–14 NPT
B	Aluminum	M20 × 1.5
J	SST	1/2–14 NPT
K <sup>(3)</sup>	SST	M20 × 1.5
P <sup>(4)</sup>	Engineered polymer	No conduit entries
D	Aluminum	G1/2
M <sup>(3)</sup>	SST	G1/2
Transmitter performance class		
1	up to ±2.25% flow rate accuracy, 5:1 flow turndown, 2-year stability	★

### Wireless options (requires wireless output code X and engineered polymer housing code P)

Wireless transmit rate, operating frequency and protocol		
WA3	User configurable transmit rate, 2.4 GHz <i>WirelessHART</i>	★
Antenna and SmartPower		
WP5	Internal antenna, compatible with green power module (I.S. power module sold separately)	★

### Options (include with selected model number)

Extended product warranty		
WR3	3-year limited warranty	★
WR5	5-year limited warranty	★
Temperature sensor <sup>(3)(5)</sup>		
RT	Thermowell and RTD	
Optional connection <sup>(3)</sup>		
G1	DIN 19213 transmitter connection	★
Pressure testing <sup>(3)(6)</sup>		
P1	Hydrostatic testing with certificate	

**Table 5. Rosemount 2051 CFP 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.

<b>Special cleaning<sup>(3)</sup></b>		
P2	Cleaning for special services	
PA	Cleaning per ASTM G93 Level D (Section 11.4)	
<b>Material testing<sup>(3)</sup></b>		
V1	Dye penetrant exam	
<b>Material examination<sup>(3)</sup></b>		
V2	Radiographic examination	
<b>Flow calibration<sup>(3)(7)</sup></b>		
WD	Discharge coefficient verification	
<b>Special inspection<sup>(3)</sup></b>		
QC1	Visual and dimensional inspection with certificate	★
QC7	Inspection and performance certificate	★
<b>Material traceability certification<sup>(3)</sup></b>		
Q8	Material traceability certification per EN 10204:2004 3.1	★
<b>Code conformance<sup>(3)(8)</sup></b>		
J2	ANSI/ASME B31.1	
J3	ANSI/ASME B31.3	
J4	ANSI/ASME B31.8	
<b>Materials conformance<sup>(3)(9)</sup></b>		
J5	NACE MR-0175/ISO 15156	
<b>Country certification<sup>(3)</sup></b>		
J6	European Pressure Directive (PED)	★
J1	Canadian registration	
<b>Transmitter calibration certification<sup>(3)</sup></b>		
Q4	Calibration certificate for transmitter	★
<b>Quality certification for safety<sup>(3)</sup></b>		
QS <sup>(10)</sup>	Prior-use certificate of FMEDA data	★
QT <sup>(12)</sup>	Safety certified to IEC 61508 with certificate of FMEDA	★
<b>Product certifications</b>		
E1 <sup>(3)</sup>	ATEX Flameproof	★
E2 <sup>(3)</sup>	INMETRO Flameproof	★
E3 <sup>(3)</sup>	China Flameproof	★
E5	FM Explosion-proof, Dust Ignition-proof	★

**Table 5. Rosemount 2051 CFP 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.

E6	CSA Explosion-proof, Dust Ignition-proof, Division 2	★
E7 <sup>(3)</sup>	IECEX Flameproof	★
I1 <sup>(3)</sup>	ATEX Intrinsic Safety	★
I2 <sup>(3)</sup>	INMETRO Intrinsically Safe	★
I3 <sup>(3)</sup>	China Intrinsic Safety	★
I5	FM Intrinsically Safe, Division 2	★
I6	CSA Intrinsically Safe	★
I7 <sup>(3)</sup>	IECEX Intrinsic Safety	★
IA <sup>(3)(11)</sup>	ATEX FISCO Intrinsic Safety; for FOUNDATION Fieldbus Protocol only	★
IE <sup>(3)(11)</sup>	FM FISCO Intrinsically Safe	★
IF <sup>(3)(11)</sup>	CSA FISCO Intrinsically Safe	★
IG <sup>(3)(11)</sup>	IECEX FISCO Intrinsically Safe	★
K1 <sup>(3)(11)</sup>	ATEX Flameproof, Intrinsic Safety, Type n, Dust	★
K5	FM Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E5 and I5)	★
K6	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E6 and I6)	★
K7 <sup>(3)</sup>	IECEX Flameproof, Dust Ignition-proof, Intrinsic Safety, Type n (combination of E7, I7, and N7)	★
KA <sup>(3)</sup>	ATEX and CSA Flameproof, Intrinsically Safe, Division 2	★
KB	FM and CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E5, E6, I5, and I6)	★
KC <sup>(3)</sup>	FM and ATEX Explosion-proof, Intrinsically Safe, Division 2	★
KD <sup>(3)</sup>	FM, CSA, and ATEX Explosion-proof, Intrinsically Safe (combination of E5, I5, E6, I6, E1, and I1)	★
N1 <sup>(3)</sup>	ATEX Type n	★
N7 <sup>(3)</sup>	IECEX Type n	★
ND <sup>(3)</sup>	ATEX Dust	★
<b>Sensor fill fluid and O-ring options<sup>(3)</sup></b>		
L1 <sup>(12)</sup>	Inert sensor fill fluid	★
L2	Graphite-filled (PTFE) O-ring	★
LA <sup>(12)</sup>	Inert sensor fill fluid and graphite-filled (PTFE) O-ring	★
<b>Display and interface options<sup>(3)</sup></b>		
M4 <sup>(12)</sup>	LCD display with local operator interface	★
M5	LCD display	★
<b>Transient protection<sup>(3)(12)(13)</sup></b>		
T1	Transient terminal block	★
<b>Alarm limit<sup>(3)(14)</sup></b>		
C4 <sup>(15)</sup>	NAMUR alarm and saturation levels, high alarm	★
CN <sup>(15)</sup>	NAMUR alarm and saturation levels, low alarm	★

**Table 5. Rosemount 2051 CFP 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.

CR	Custom alarm and saturation signal levels, high alarm (requires C1 and Configuration Data Sheet)	★
CS	Custom alarm and saturation signal levels, low alarm (requires C1 and Configuration Data Sheet)	★
CT	Low alarm (standard Rosemount alarm and saturation levels)	★
<b>PlantWeb control functionality<sup>(3)(11)</sup></b>		
A01	FOUNDATION Fieldbus advanced control function block suite	★
<b>Hardware adjustments<sup>(3)</sup></b>		
D4 <sup>(14)</sup>	Zero and span hardware adjustments	★
DZ <sup>(16)</sup>	Digital zero trim	★
<b>Ground screw<sup>(3)(12)(17)</sup></b>		
V5	External ground screw assembly	★
<b>HART revision configuration<sup>(3)(14)</sup></b>		
HR5 <sup>(18)</sup>	Configured for HART Revision 5	★
HR7 <sup>(19)</sup>	Configured for HART Revision 7	★
<b>Typical model number: 2051CFP D S 010 W1 S 0500 D3 2 A A 1 E5 M5</b>		

- To improve pipe perpendicularity for gasket sealing, socket diameter is smaller than standard pipe O.D.
- HART Revision 5 is the default HART output. The Rosemount 2051 with Selectable HART can be factory or field configured to HART Revision 7. To order HART Revision 7 factory configured, add option code HR7.
- Not available with low power output code M.
- Only available with output code X.
- Thermowell Material is the same as the body material.
- Does not apply to process connection codes T1 and S1.
- Not available for bore sizes 0010, 0014, 0020, or 0034.
- Not available with DIN process connection codes D1, D2, or D3.
- 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.
- Not available with FOUNDATION Fieldbus (Output Code F) or Wireless (Output Code X).
- Only valid with FOUNDATION Fieldbus output code F.
- Not available with output code X.
- Not available with housing code 00, 5A, or 7J. The T1 option is not needed with FISCO Product Certifications, transient protection is included with the FISCO Product Certification code IA.
- Only available with 4–20 mA HART (output codes A and M).
- NAMUR-Compliant operation is pre-set at the factory and cannot be changed to standard operation in the field.
- Only available with HART 4–20 mA (output codes A and M) and wireless (output code X).
- The V5 option is not needed with the T1 option; external ground screw assembly is included with the T1 option.
- Configures the HART output to HART Revision 5. The device can be field configured to HART Revision 7 if needed.
- Configures the HART output to HART Revision 7. The device can be field configured to HART Revision 5 if needed.

# Rosemount 2051L Liquid Level Transmitter



Rosemount 2051L Liquid Level Transmitter

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

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

### Additional information

Specifications: [page 43](#)

Certifications: [page 54](#)

Dimensional Drawings: [page 62](#)

**Table 6. Rosemount 2051L Liquid Level Transmitter Ordering Information**

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

Model	Transmitter type		
2051L	Liquid Level Transmitter		★
<b>Pressure range</b>			
2	–250 to 250 inH <sub>2</sub> O (–0,6 to 0,6 bar)		★
3	–1000 to 1000 inH <sub>2</sub> O (–2,5 to 2,5 bar)		★
4	–300 to 300 psi (–20,7 to 20,7 bar)		★
<b>Transmitter output</b>			
A <sup>(1)</sup>	4–20 mA with digital signal based on HART Protocol		★
F	FOUNDATION Fieldbus Protocol		★
W	PROFIBUS PA Protocol		★
X	Wireless		★
M	Low-Power, 1–5 V dc with digital signal based on HART Protocol		
<b>Process connection size, diaphragm material (high side)</b>			
	<b>Process connection size</b>	<b>Diaphragm</b>	
G <sup>(2)</sup>	2-in./DN 50	316L SST	★
H <sup>(2)</sup>	2-in./DN 50	Alloy C-276	★
J	2-in./DN 50	Tantalum	★

**Table 6. Rosemount 2051L Liquid Level Transmitter Ordering Information**

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

A <sup>(2)</sup>	3-in./DN 80	316L SST	★
B <sup>(2)</sup>	4-in./DN 100	316L SST	★
C <sup>(2)</sup>	3-in./DN 80	Alloy C-276	★
D <sup>(2)</sup>	4-in./DN 100	Alloy C-276	★
E	3-in./DN 80	Tantalum	★
F	4-in./DN 100	Tantalum	★
<b>Extension length (high side)</b>			
0	None, flush mount		★
2	2-in./50 mm		★
4	4-in./100 mm		★
6	6-in./150 mm		★
<b>Mounting flange size, rating, material (high side)</b>			
	<b>Size</b>	<b>Rating</b>	<b>Material</b>
M	2-in.	ANSI/ASME B16.5 Class 150	CS ★
A	3-in.	ANSI/ASME B16.5 Class 150	CS ★
B	4-in.	ANSI/ASME B16.5 Class 150	CS ★
N	2-in.	ANSI/ASME B16.5 Class 300	CS ★
C	3-in.	ANSI/ASME B16.5 Class 300	CS ★
D	4-in.	ANSI/ASME B16.5 Class 300	CS ★
X <sup>(2)</sup>	2-in.	ANSI/ASME B16.5 Class 150	SST ★
F <sup>(2)</sup>	3-in.	ANSI/ASME B16.5 Class 150	SST ★
G <sup>(2)</sup>	4-in.	ANSI/ASME B16.5 Class 150	SST ★
Y <sup>(2)</sup>	Displayed	ANSI/ASME B16.5 Class 300	SST ★
H <sup>(2)</sup>	3-in.	ANSI/ASME B16.5 Class 300	SST ★
J <sup>(2)</sup>	4-in.	ANSI/ASME B16.5 Class 300	SST ★
Q	DN50	PN 10-40 per EN 1092-1	CS ★
R	DN80	PN 40 per EN 1092-1	CS ★
K <sup>(2)</sup>	DN50	PN 10-40 per EN 1092-1	SST ★
T <sup>(2)</sup>	DN80	PN 40 per EN 1092-1	SST ★
<b>Seal fill fluid (high side)</b>		<b>Specific gravity at 77 °F (25 °C)</b>	<b>Temperature limits (ambient temperature of 70 °F [21 °C])</b>
A	SYLTherm™ XLT	0.85	-102 to 293 °F (-75 to 145 °C) ★
C	Silicone 704	1.07	32 to 401 °F (0 to 205 °C) ★
D	Silicone 200	0.93	-49 to 401 °F (-45 to 205 °C) ★
F	Silicone 200 for vacuum applications limits: For use in vacuum applications below 14.7 psia (1 bar-a), refer to vapor pressure curves in Rosemount DP Level Fill Fluid Specification <a href="#">Technical Note</a> .		

**Table 6. Rosemount 2051L Liquid Level Transmitter Ordering Information**

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

H	Inert (halocarbon)	1.85	5 to 401 °F (–15 to 205 °C)	★
G	Glycerin and water	1.13	–49 to 320 °F (–45 to 160 °C)	★
L	Silicone 704 for Vacuum Applications Limits: For use in vacuum applications below 14.7 psia (1 bar-a), refer to vapor pressure curves in Rosemount DP Level Fill Fluid Specification <a href="#">Technical Note</a> .			
N	Neobee® M-20	0.92	5 to 401 °F (–15 to 205 °C)	★
P	Propylene glycol and water	1.02	5 to 203 °F (–15 to 95 °C)	★
<b>Sensor module configuration, flange adapter (low side)</b>				
	<b>Configuration</b>	<b>Flange adapter</b>		
1	Gage	SST		★
2	Differential	SST		★
3 <sup>(3)</sup>	Tuned-System with remote seal	None		★
<b>Sensor module diaphragm material, sensor fill fluid (low side)</b>				
	<b>Diaphragm material</b>	<b>Sensor fill fluid</b>		
1	316L SST	Silicone		★
2	Alloy C-276 (SST valve seat)	Silicone		★
7	Alloy C-276 (Alloy C-276 valve seat)	Silicone		★
A <sup>(4)</sup>	316L SST	Inert (halocarbon)		★
B <sup>(2)(4)</sup>	Alloy C-276 (SST valve seat)	Inert (halocarbon)		★
G <sup>(4)</sup>	Alloy C-276 (Alloy C-276 valve seat)	Inert (halocarbon)		★
<b>O-ring</b>				
A	Glass-filled PTFE			★
<b>Housing material</b>		<b>Conduit entry size</b>		
A	Aluminum	1/2–14 NPT		★
B	Aluminum	M20 × 1.5		★
J	SST	1/2–14 NPT		★
K <sup>(5)</sup>	SST	M20 × 1.5		★
P <sup>(6)</sup>	Engineered polymer	No conduit entries		★
D	Aluminum	G1/2		
M <sup>(5)</sup>	SST	G1/2		

**Wireless options** (requires wireless output code X and engineered polymer housing code P)

<b>Wireless transmit rate, operating frequency and protocol</b>				
WA3	User configurable transmit rate, 2.4 GHz WirelessHART			★
<b>Antenna and SmartPower</b>				
WP5	Internal antenna, compatible with green power module (I.S. power module sold separately)			★

**Table 6. Rosemount 2051L Liquid Level Transmitter Ordering Information**

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

**Options** (include with selected model number)

<b>Extended product warranty</b>		
WR3	3-year limited warranty	★
WR5	5-year limited warranty	★
<b>PlantWeb control functionality<sup>(7)</sup></b>		
A01	FOUNDATION Fieldbus advanced control function block suite	★
<b>Seal assemblies<sup>(8)</sup></b>		
S1	Assemble to one Rosemount 1199 Seal (requires 1199M)	★
<b>Product certifications</b>		
E1 <sup>(5)</sup>	ATEX Flameproof	★
E2 <sup>(5)</sup>	INMETRO Flameproof	★
E3 <sup>(5)</sup>	China Flameproof	★
E4	TIIS Flameproof	★
E5	FM Explosion-proof, Dust Ignition-proof	★
E6	CSA Explosion-proof, Dust Ignition-proof, Division 2	★
E7 <sup>(5)</sup>	IECEX Flameproof	★
EW <sup>(5)</sup>	India (CCOE) Flameproof Approval	★
I1 <sup>(5)</sup>	ATEX Intrinsic Safety	★
I2 <sup>(5)</sup>	INMETRO Intrinsically Safe	★
I3 <sup>(5)</sup>	China Intrinsic Safety	★
I4 <sup>(5)(6)</sup>	TIIS Intrinsic Safety	★
I5	FM Intrinsically Safe, Division 2	★
I6	CSA Intrinsically Safe	★
I7 <sup>(5)</sup>	IECEX Intrinsic Safety	★
IA <sup>(7)</sup>	ATEX FISCO Intrinsic Safety	★
IE <sup>(7)</sup>	FM FISCO Intrinsically Safe	★
IF <sup>(7)</sup>	CSA FISCO Intrinsically Safe	★
IG <sup>(7)</sup>	IECEX FISCO Intrinsically Safe	★
IW <sup>(5)</sup>	India (CCOE) Intrinsically Safety Approval	★
K1 <sup>(5)</sup>	ATEX Flameproof, Intrinsic Safety, Type n, Dust	★
K2	INMETRO Flameproof and Intrinsic Safety	★
K5	FM Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
K6	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
K7 <sup>(5)</sup>	IECEX Flameproof, Intrinsic Safety, Type n and Dust	★
KA <sup>(5)</sup>	ATEX and CSA Flameproof, Intrinsically Safe, Division 2	★

**Table 6. Rosemount 2051L Liquid Level Transmitter Ordering Information**

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

KB	FM and CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
KC <sup>(5)</sup>	FM and ATEX Explosion-proof, Intrinsically Safe, Division 2	★
KD <sup>(5)</sup>	FM, CSA, and ATEX Explosion-proof, Intrinsically Safe	★
N1 <sup>(5)</sup>	ATEX Type n	★
N7 <sup>(5)</sup>	IECEx Type n	★
ND <sup>(5)</sup>	ATEX Dust	★
EM	Technical Regulations Customs Union (EAC) Flameproof	★
IM	Technical Regulations Customs Union (EAC) Intrinsic Safety	★
KM	Technical Regulations Customs Union (EAC) Flameproof and Intrinsic Safety	★
<b>Shipboard approvals<sup>(4)</sup></b>		
SBS	American Bureau of Shipping (ABS) type approval	★
SBV	Bureau Veritas (BV) type approval	★
SDN	Det Norske Veritas (DNV) type approval	★
SLL	Lloyds Register (LR) type approval	★
<b>Display and interface options</b>		
M4 <sup>(9)</sup>	LCD display with local operator interface	★
M5	LCD display	★
<b>Hardware adjustments</b>		
D4 <sup>(10)</sup>	Zero and span configuration buttons	★
DZ <sup>(11)</sup>	Digital zero trim	★
<b>Flange adapters<sup>(12)</sup></b>		
DF	1/2–14 NPT flange adapters	★
<b>Conduit plug<sup>(4)(13)</sup></b>		
DO	316 SST conduit plug	★
<b>Ground screw<sup>(4)(14)</sup></b>		
V5	External ground screw assembly	★
<b>Transient protection<sup>(4)(15)</sup></b>		
T1	Transient terminal block	★
<b>Software configuration<sup>(11)</sup></b>		
C1	Custom software configuration (requires completed Configuration Data Sheet)	★
<b>Alarm limit<sup>(10)</sup></b>		
C4 <sup>(16)</sup>	NAMUR alarm and saturation levels, high alarm	★
CN <sup>(16)</sup>	NAMUR alarm and saturation levels, low alarm	★
CR	Custom alarm and saturation signal levels, high alarm (requires C1 and Configuration Data Sheet)	★

**Table 6. Rosemount 2051L Liquid Level Transmitter Ordering Information**

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

CS	Custom alarm and saturation signal levels, low alarm (requires C1 and Configuration Data Sheet)			★
CT	Low alarm (standard Rosemount alarm and saturation levels)			★
<b>Calibration certification</b>				
Q4	Calibration certificate			★
QG	Calibration certificate and GOST verification certificate			★
GP	Calibration certificate and tamper evident seal			★
<b>Material traceability certification</b>				
Q8	Material traceability certification per EN 10204 3.1			★
<b>Quality certification for safety<sup>(17)</sup></b>				
QS	Prior-use certificate of FMEDA data			★
QT	Safety certified to IEC 61508 with certificate of FMEDA			★
<b>Toolkit total system performance reports</b>				
QZ	Remote seal system performance calculation report			★
<b>Conduit electrical connector<sup>(4)</sup></b>				
GE	M12, 4-pin, male connector (eurofast)			★
GM	A size mini, 4-pin, male connector (minifast)			★
<b>NACE certificate<sup>(18)</sup></b>				
Q15	Certificate of compliance to NACE MR0175/ISO 15156 for wetted materials			★
Q25	Certificate of compliance to NACE MR0103 for wetted materials			★
<b>Lower housing flushing connection options</b>				
	<b>Ring material</b>	<b>Number</b>	<b>Size (NPT)</b>	
F1	316 SST	1	1/4–18 NPT	★
F2	316 SST	2	1/4–18 NPT	★
F3 <sup>(19)</sup>	Alloy C-276	1	1/4–18 NPT	★
F4 <sup>(19)</sup>	Alloy C-276	2	1/4–18 NPT	★
F7	316 SST	1	1/2–14 NPT	★
F8	316 SST	2	1/2–14 NPT	★
F9	Alloy C-276	1	1/2–14 NPT	★
F0	Alloy C-276	2	1/2–14 NPT	★
<b>Typical model number:</b>	<b>2051L 2 A A0 X D 21 A A B4 M5 F1</b>			

- HART Revision 5 is the default HART output. The Rosemount 2051 with Selectable HART can be factory or field configured to HART Revision 7. To order HART Revision 7 factory configured, add option code HR7.
- Materials of Construction comply with metallurgical requirements highlighted within NACE MR0175/ISO 15156 for sour oil field production environments. Environmental limits apply to certain materials. Consult latest standard for details. Selected materials also conform to NACE MR0103 for sour refining environments. Order with Q15 or Q25 to receive a NACE certificate.

3. Requires option code S1.
4. Not available with output code X.
5. Not available with low power output code M.
6. Only available with output code X.
7. Only valid with FOUNDATION Fieldbus output code F.
8. "Assemble-to" items are specified separately and require a completed model number.
9. Not valid with FOUNDATION Fieldbus output code F and wireless output code X.
10. Only available with 4–20 mA HART (output codes A and M).
11. Only available with HART 4–20 mA output (output codes A) and wireless output (output code X).
12. Not available with remote mount seal assembly option S1.
13. Transmitter is shipped with 316 SST conduit plug (uninstalled) in place of standard carbon steel conduit plug.
14. The V5 option is not needed with the T1 option; external ground screw assembly is included with the T1 option.
15. The T1 option is not needed with FISCO Product Certifications; transient protection is included in the FISCO product certification codes IA, IE, IF, and IG.
16. NAMUR-Compliant operation is pre-set at the factory.
17. Only available with HART 4–20 mA output (output code A).
18. NACE Compliant wetted materials are identified by [Footnote 2](#).
19. Not available with option codes A0, B0, and G0.

# Specifications

## Performance specifications

This product data sheet covers HART, Wireless, FOUNDATION Fieldbus, and PROFIBUS PA Protocols unless specified.

### Conformance to specification ( $\pm 3\sigma$ [sigma])

Technology leadership, advanced manufacturing techniques, and statistical process control ensure specification conformance to at least  $\pm 3\sigma$ .

### Reference accuracy

Stated reference accuracy equations include terminal based linearity, hysteresis, and repeatability. For Wireless, FOUNDATION Fieldbus, and PROFIBUS PA devices, use calibrated range in place of span.

Models	Standard	High performance option, P8	
<b>Rosemount 2051C</b>			
Range 1	$\pm 0.10\%$ of span For spans less than 15:1, accuracy = $\pm \left( 0.025 + 0.005 \left[ \frac{URL}{Span} \right] \right) \% \text{ of span}$	N/A	N/A
Ranges 2–4	$\pm 0.065\%$ of span For spans less than 10:1, accuracy = $\pm \left( 0.025 + 0.005 \left[ \frac{URL}{Span} \right] \right) \% \text{ of span}$	Ranges 2–4	High accuracy option, P8 $\pm 0.05\%$ of span For spans less than 10:1 <sup>(1)</sup> , accuracy = $\pm \left( 0.015 + 0.005 \left[ \frac{URL}{Span} \right] \right) \% \text{ of span}$
Range 5	$\pm 0.075\%$ of span For spans less than 10:1, accuracy = $\pm \left( 0.025 + 0.005 \left[ \frac{URL}{Span} \right] \right) \% \text{ of span}$	Range 5	High performance option, P8 $\pm 0.065\%$ of span For spans less than 10:1, accuracy = $\pm \left( 0.015 + 0.005 \left[ \frac{URL}{Span} \right] \right) \% \text{ of span}$
<b>Rosemount 2051T</b>			
Ranges 1–4	$\pm 0.065\%$ of span For spans less than 10:1, accuracy = $\pm \left( 0.0075 \left[ \frac{URL}{Span} \right] \right) \% \text{ of span}$	Ranges 1–4	High accuracy option, P8 $\pm 0.05\%$ of span For spans less than 10:1 <sup>(1)</sup> , accuracy = $\pm \left( 0.0075 \left[ \frac{URL}{Span} \right] \right) \% \text{ of span}$
Range 5	$\pm 0.075\%$ of span For spans less than 10:1, accuracy = $\pm \left( 0.0075 \left[ \frac{URL}{Span} \right] \right) \% \text{ of span}$	N/A	N/A
<b>Rosemount 2051L</b>			
Ranges 2–4	$\pm 0.075\%$ of span For spans less than 10:1, accuracy = $\pm \left( 0.025 + 0.005 \left[ \frac{URL}{Span} \right] \right) \% \text{ of span}$	N/A	N/A

1. For protocol code F, accuracy specification is for spans less than 7:1. Not available with output code W.

**Flow performance**

**Flow reference accuracy**

Rosemount 2051CFA Annubar Flowmeter		
Ranges 2-3		±2.00% of flow rate at 5:1 flow turndown
Rosemount 2051CFC_A Compact Annubar Flowmeter — Annubar option A		
Ranges 2-3	Standard	±2.60% of flow rate at 5:1 flow turndown
	Calibrated	±2.30% of flow rate at 5:1 flow turndown
Rosemount 2051CFC Compact Orifice Flowmeter — conditioning option C		
Ranges 2-3	$\beta = 0.4$	±2.25% of flow rate at 5:1 flow turndown
	$\beta = 0.65$	±2.45% of flow rate at 5:1 flow turndown
Rosemount 2051CFC Compact Orifice Flowmeter — orifice type option P <sup>(1)</sup>		
Ranges 2-3	$\beta = 0.4$	±2.50% of flow rate at 5:1 flow turndown
	$\beta = 0.65$	±2.50% of flow rate at 5:1 flow turndown

Rosemount 2051CFP Integral Orifice Flowmeter		
Ranges 2-3	Bore < 0.1	±3.10% of flow rate at 5:1 flow turndown
	0.1 < Bore < 0.2	±2.75% of flow rate at 5:1 flow turndown
	0.2 < Bore < 0.6	±2.25% of flow rate at 5:1 flow turndown
	0.6 < Bore < 0.8	±3.00% of flow rate at 5:1 flow turndown

1. For smaller line sizes, see Rosemount Compact Orifice.

**Long-term stability**

±50 °F (28 °C) temperature changes and up to 1000 psi (6,9 MPa) line pressure.

Models	Standard	High performance option, P8
Rosemount 2051C		
Range 1 (CD)	±0.2% of URL for 1 year	±0.125% of URL for 5 years
Ranges 2-5	±0.1% of URL for 3 years	
Rosemount 2051T		
Ranges 1-5	±0.1% of URL for 3 years	±0.125% of URL for 5 years

**Dynamic performance**

	4-20 mA HART <sup>(1)</sup> 1-5 Vdc HART Low Power	FOUNDATION Fieldbus and PROFIBUS PA Protocols <sup>(2)</sup>	Typical HART transmitter response time
<b>Total response time (<math>T_d + T_c</math>)<sup>(3)</sup>:</b>			<p>Transmitter Output vs. Time</p> <p>Pressure released</p> <p>100% 36.8% 0%</p> <p>Time</p> <p><math>T_d</math> = Dead time <math>T_c</math> = Time constant Response time = <math>T_d + T_c</math></p> <p>63.2% of total step change</p>
Rosemount 2051C			
Range 3-5:	115 ms	152 ms	
Range 1:	270 ms	307 ms	
Range 2:	130 ms	152 ms	
2051T:	100 ms	152 ms	
2051L:	See Instrument Toolkit™	See Instrument Toolkit	
<b>Dead time (<math>T_d</math>)</b>	60 ms (nominal)	97 ms	
<b>Update rate<sup>(4)</sup></b>	22 times per second	22 times per second	

1. Dead time and update rate apply to all models and ranges; analog output only.
2. Transducer block response time, Analog Input block execution time not included.
3. Nominal total response time at 75 °F (24 °C) reference conditions.
4. Does not apply to wireless (output code X). See “Wireless (output code X)” on page 48 for wireless update rate.

**Line pressure effect per 1000 psi (6,9 MPa)**

For line pressures above 2000 psi (13,7 MPa) and Ranges 4–5, see Rosemount 2051 [Reference Manual](#) for HART, Rosemount 2051 [Reference Manual](#) for WirelessHART, Rosemount 2051 [Reference Manual](#) for FOUNDATION Fieldbus, and Rosemount 2051 [Reference Manual](#) PROFIBUS PA.

Models	Line pressure effect	
<b>Rosemount 2051CD, 2051CF</b>	<b>Zero Error<sup>(1)</sup></b>	<b>Span Error</b>
Range 1	±0.25% of URL/ 1000 psi (68,9 bar)	±0.4% of reading/ 1,000 psi (68,9 bar)
Ranges 2–3	±0.05% of URL/ 1000 psi (68,9 bar) for line pressures from 0 to 2000 psi (0 to 13,7 MPa)	±0.1% of reading/ 1,000 psi (68,9 bar)

1. Can be calibrated out at line pressure.

**Ambient temperature effect per 50 °F (28 °C)**

Models	Ambient temperature effect
<b>Rosemount 2051C, 2051CF</b>	
Ranges 2–5	±(0.025% URL + 0.125% span) from 1:1 to 5:1 ±(0.05% URL + 0.25% span) from 5:1 to 100:1
Range 1	±(0.1% URL + 0.25% span) from 1:1 to 30:1
<b>Rosemount 2051T</b>	
Range 2–4	±(0.05% URL + 0.25% span) from 1:1 to 30:1 ±(0.07% URL + 0.25% span) from 30:1 to 100:1
Range 1	±(0.05% URL + 0.25% span) from 1:1 to 10:1 ±(0.10% URL + 0.25% span) from 10:1 to 100:1
Range 5	±(0.1% URL + 0.15% span)
<b>Rosemount 2051L</b>	See Instrument Toolkit

**Mounting position effects**

Models	Mounting position effects
Rosemount 2051C	Zero shifts up to ±1.25 inH <sub>2</sub> O (3,1 mbar), which can be calibrated out. No span effect.
Rosemount 2051T	Zero shifts up to ±2.5 inH <sub>2</sub> O (6,2 mbar), which can be calibrated out. No span effect.
Rosemount 2051L	With liquid level diaphragm in vertical plane, zero shift of up to 1 inH <sub>2</sub> O (2,49 mbar). With diaphragm in horizontal plane, zero shift of up to 5 inH <sub>2</sub> O (12,43 mbar) plus extension length on extended units. Zero shifts can be calibrated out. No span effect.

**Vibration effect**

Less than ±0.1% of URL when tested per the requirements of IEC60770-1 field or pipeline with high vibration level (10–60 Hz 0.21mm displacement peak amplitude/60–2000 Hz 3g).

**Power supply effect**

Less than ±0.005% of calibrated span per volt.

**Electromagnetic compatibility (EMC)**

Meets all industrial environment requirements of EN61326 and NAMUR NE-21<sup>(1)</sup>. Maximum deviation < 1% span during EMC disturbance<sup>(2)</sup>.

- NAMUR NE-21 does not apply to Low-Power (Transmitter output option code M) and Wireless (Transmitter output code X).
- During surge event device may exceed maximum EMC deviation limit or reset; however, device will self-recover and return to normal operation within specified start-up time.

**Transient protection (option code T1)**

Meets IEEE C62.41, category location B

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

## Functional specifications

### Range and sensor limits

**Table 7. Range and Sensor Limits for Rosemount 2051CD, 2051CF, 2051CG, 2051L models**

Range	Minimum span	Upper (URL)	Lower (LRL)			
			Rosemount 2051C differential, 2051CF flowmeters	Rosemount 2051C gage <sup>(1)</sup>	Rosemount 2051L differential	Rosemount 2051L gage <sup>(1)</sup>
1	0.5 inH <sub>2</sub> O (1,2 mbar)	25 inH <sub>2</sub> O (62,3 mbar)	-25 inH <sub>2</sub> O (-62,1 mbar)	-25 inH <sub>2</sub> O (-62,1 mbar)	N/A	N/A
2	2.5 inH <sub>2</sub> O (6,2 mbar)	250 inH <sub>2</sub> O (0,62 bar)	-250 inH <sub>2</sub> O (-0,62 bar)	-250 inH <sub>2</sub> O (-0,62 bar)	-250 inH <sub>2</sub> O (-0,62 bar)	-250 inH <sub>2</sub> O (-0,62 bar)
3	10 inH <sub>2</sub> O (24,9 mbar)	1000 inH <sub>2</sub> O (2,49 bar)	-1000 inH <sub>2</sub> O (-2,49 bar)	-393 inH <sub>2</sub> O (-979 mbar)	-1000 inH <sub>2</sub> O (-2,49 bar)	-393 inH <sub>2</sub> O (-979 mbar)
4	3 psi (0,207 bar)	300 psi (20,7 bar)	-300 psi (-20,7 bar)	-14.2 psig (-979 mbar)	-300 psi (-20,7 bar)	-14.2 psig (-979 mbar)
5	20 psi (1,38 bar)	2000 psi (137,9 bar)	-2000 psi (-137,9 bar)	-14.2 psig (-979 mbar)	N/A	N/A

1. Assumes atmospheric pressure of 14.7 psig.

**Table 8. Range and Sensor Limits for Rosemount 2051T model**

Range	Minimum span	Upper (URL)	Lower (LRL)(Abs)	Lower <sup>(1)</sup> (LRL)(Gage)
1	0.3 psi (20,7 mbar)	30 psi (2,07 bar)	0 psia (0 bar)	-14.7 psig (-1,01 bar)
2	1.5 psi (0,103 bar)	150 psi (10,3 bar)	0 psia (0 bar)	-14.7 psig (-1,01 bar)
3	8 psi (0,55 bar)	800 psi (55,2 bar)	0 psia (0 bar)	-14.7 psig (-1,01 bar)
4	40 psi (2,76 bar)	4000 psi (275,8 bar)	0 psia (0 bar)	-14.7 psig (-1,01 bar)
5	2,000 psi (137,9 bar)	10,000 psi (689,5 bar)	0 psia (0 bar)	-14.7 psig (-1,01 bar)

1. Assumes atmospheric pressure of 14.7 psig.

### Service

Liquid, gas, and vapor applications

### Protocols

#### 4–20 mA HART (output code A)

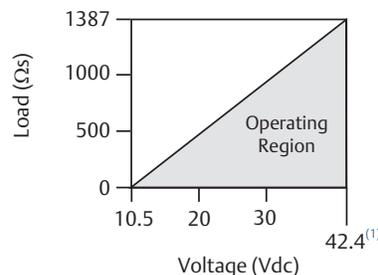
#### Power supply

External power supply required. Standard transmitter operates on 10.5 to 42.4 Vdc with no load.

### Load limitations

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

$$\text{Max. Loop Resistance} = 43.5 (\text{Power Supply Voltage} - 10.5)$$



Communication requires a minimum loop resistance of 250 ohms.

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

**Indication**

Optional two line LOI/LCD display

**Zero and span adjustment requirements**

Zero and span values can be set anywhere within the range limits stated in [Table 7](#) and [Table 8](#).

Span must be greater than or equal to the minimum span stated in [Table 7](#) and [Table 8](#).

**Output**

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

**Rosemount 2051**

Digital communications based on HART Revision 5 Protocol.

**Rosemount2051 with Selectable HART**

The Rosemount 2051 with Selectable HART comes with Selectable HART Revisions. Digital communications based on HART Revision 5 (default) or Revision 7 (option code HR7) Protocol can be selected. The HART revision can be switched in the field using any HART based configuration tool or the optional LOI.

**LOI**

The LOI utilizes a two-button menu with internal and external configuration buttons. Internal buttons are always configured for LOI. External buttons can be configured for either LOI, (option code M4), analog zero and span (option code D4) or digital zero trim (option code DZ). See Rosemount 2051 with Selectable HART [Reference Manual](#) for LOI configuration menu.

**FOUNDATION Fieldbus (output code F)****Power supply**

External power supply required; transmitters operate on 9.0 to 32.0 Vdc transmitter terminal voltage for non-I.S. applications, 9.0 to 30 Vdc for entity model intrinsically safe applications and 9.0 to 17.5 Vdc for FISCO intrinsically safe applications.

**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	N/A
Transducer	N/A
LCD display block	N/A
Analog input 1, 2	20 milliseconds
PID	25 milliseconds
Arithmetic	20 milliseconds
Input selection	20 milliseconds
Signal characterizer	20 milliseconds
Integrator	20 milliseconds
Output splitter	20 milliseconds
Control selector	20 milliseconds

**FOUNDATION Fieldbus parameters**

Schedule entries	7 (max.)
Links	25 (max.)
Virtual communications relationships (VCR)	20 (max.)

**Standard function blocks****Resource block**

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

**Sensor transducer block**

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

**LCD display transducer block**

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

**Analog input block**

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

**Note**

The channel, Set XD\_Scale, Set L\_Type, and sometimes Set Out\_Scale are typically configured by instrument personnel. Other AI block parameters, block links, and schedule are typically configured by the control systems configuration engineer.

**Input selector block**

The input selector (ISEL) function block can be used to select the first good, Hot Backup™, maximum, minimum, or average of as many as eight input values and place it at the output. The block supports signal status propagation.

**Integrator block**

The integrator (INT) function block integrates one or two variables over time. The block compares the integrated or accumulated value to pre-trip and trip limits and generates discrete output signals when the limits are reached. The Integrator Block is used as a totalizer. This block will accept up to two inputs, has six options how to totalize the inputs, and two trip outputs.

**Arithmetic block**

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

**Signal characterizer block**

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

**PID block**

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

**Control selector block**

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

**Output splitter block**

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

**Backup link active scheduler (LAS)**

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

**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 for non-I.S. applications, 9.0 to 30 Vdc for entity model intrinsically safe applications and 9.0 to 17.5 Vdc for FISCO intrinsically safe applications.

**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

**LOI**

Optional external configuration buttons

**Wireless (output code X)****Output**

IEC 62591 (*WirelessHART*), 2.4 GHz DSSS

**Wireless radio (internal antenna, WP5 option)**

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

**Local display**

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

**Digital zero trim**

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

**Update rate**

User selectable 1 second to 60 minutes

**Wireless sensor module for in-line transmitters**

The Rosemount 2051 Wireless Transmitter requires the engineered polymer housing to be selected. The standard sensor module will come with aluminum material. If stainless steel is required, the option WSM must be selected.

**Power module**

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

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

**HART 1–5 Vdc Low Power (output code M)**

**Output**

Three-wire 1–5 Vdc output, user-selectable for linear or square root output. Digital process variable superimposed on voltage signal, available to any host conforming to the HART Protocol.

**Rosemount 2051**

Digital communications based on HART Revision 5 Protocol.

**Rosemount 2051 with Selectable HART**

The Rosemount 2051 with Selectable HART comes with Selectable HART Revisions. Digital communications based on HART Revision 5 (default) or Revision 7 (option code HR7) Protocol can be selected. The HART revision can be switched in the field using any HART based configuration tool or the optional LOI.

**LOI**

The LOI utilizes a two-button menu with internal and external configuration buttons. Internal buttons are always configured for LOI. External buttons can be configured for either LOI, (option code M4), analog zero and span (option code D4) or digital zero trim (option code DZ). See Rosemount 2051 with Selectable HART [Reference Manual](#) for LOI configuration menu.

**Power supply**

External power supply required. Standard transmitter operates on 9 to 28 Vdc with no load.

**Power consumption**

3.0 mA, 27–84 mW

**Output load**

100 kΩ or greater (meter input impedance)

**Turn-on time**

Performance within specifications less than two seconds after power is applied to the transmitter.

**Overpressure limits**

Transmitters withstand the following limits without damage:

**Rosemount 2051C, 2051CF**

- Ranges 2–5: 3,626 psig (250 bar)  
4,500 psig (310,3 bar) for option code P9
- Range 1: 2,000 psig (137,9 bar)

**Rosemount 2051T**

- Range 1: 750 psi (51,7 bar)
- Range 2: 1,500 psi (103,4 bar)
- Range 3: 1,600 psi (110,3 bar)
- Range 4: 6,000 psi (413,7 bar)
- Range 5: 15,000 psi (1034,2 bar)

**Rosemount 2051L**

Limit is flange rating or sensor rating, whichever is lower (See [Table 9](#)).

**Table 9. Rosemount 2051L Flange Rating**

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

**Table 9. Rosemount 2051L Flange Rating**

Standard	Type	CS rating	SST rating
DIN	PN 10–40	40 bar	40 bar
DIN	PN 10/16	16 bar	16 bar
At 248 °F (120 °C), the rating decreases with increasing temperature, per DIN 2401.			

**Static pressure limit**

**Rosemount 2051CD, 2051CF**

- Operates within specifications between static line pressures of –14.2 psig (0,034 bar) and 3626 psig (250 bar)
- For Option Code P9, 4500 psig (310,3 bar)
- Range 1: 0.5 psia to 2000 psig (34 mbar and 137,9 bar)

**Burst pressure limits**

**Rosemount 2051C, 2051CF coplanar or traditional process flange**

10,000 psig (689.5 bar)

**Rosemount 2051T in-line**

- Ranges 1–4: 11000 psi (758,4 bar)
- Range 5: 26000 psi (1792,6 bar)

**Temperature limits**

**Ambient**

–40 to 185 °F (–40 to 85 °C)

With LCD display<sup>(1)(2)</sup>: –40 to 175 °F (–40 to 80 °C)

**Storage<sup>(1)</sup>**

–50 to 230 °F (–46 to 110 °C)

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

With Wireless output: –40 °F to 185 °F (–40 °C to 85 °C)

- Rosemount 2051 LCD display may not be readable and LCD display updates may be slower at temperatures below –22 °F (–30 °C).
- Wireless LCD display may not be readable and LCD display updates will be slower at temperatures below –4 °F (–20 °C).

**Process**

At atmospheric pressures and above. See [Table 10](#).

**Table 10. Process Temperature Limits**

Rosemount 2051C, 2051CF	
Silicone fill sensor <sup>(1)</sup>	
with coplanar flange	–40 to 250 °F (–40 to 121 °C) <sup>(2)</sup>
with traditional flange	–40 to 300 °F (–40 to 149 °C) <sup>(2)(3)</sup>
with level flange	–40 to 300 °F (–40 to 149 °C) <sup>(2)</sup>
with Rosemount 305 Integral Manifold	–40 to 300 °F (–40 to 149 °C) <sup>(2)</sup>
Inert fill sensor <sup>(1)</sup>	–40 to 185 °F (–40 to 85 °C) <sup>(3)</sup>
Rosemount 2051T (process fill fluid)	
Silicone fill sensor <sup>(1)</sup>	–40 to 250 °F (–40 to 121 °C) <sup>(2)</sup>
Inert fill sensor <sup>(1)</sup>	–22 to 250 °F (–30 to 121 °C) <sup>(2)</sup>
Rosemount 2051L low side temperature limits	
Silicone fill sensor <sup>(1)</sup>	–40 to 250 °F (–40 to 121 °C) <sup>(2)</sup>
Inert fill Sensor <sup>(1)</sup>	–40 to 185 °F (–40 to 85 °C) <sup>(2)</sup>
Rosemount 2051L high side temperature limits (process fill fluid)	
SYLTHERM XLT	–102 to 293 °F (–75 to 145 °C)
Silicone 704	32 to 401 °F (0 to 205 °C)
Silicone 200	–49 to 401 °F (–45 to 205 °C)
Inert	–49 to 320 °F (–45 to 160 °C)
Glycerin and water	5 to 203 °F (–15 to 95 °C)
Neobee M-20	5 to 401 °F (–15 to 205 °C)
Propylene glycol and water	5 to 203 °F (–15 to 95 °C)

- Process temperatures above 185 °F (85 °C) require derating the ambient limits by a 1.5:1 ratio.
- 220 °F (104 °C) limit in vacuum service; 130 °F (54 °C) for pressures below 0.5 psia.
- 160 °F (71 °C) limit in vacuum service.

## Humidity limits

0–100% relative humidity

## Volumetric displacement

Less than 0.005 in<sup>3</sup> (0,08 cm<sup>3</sup>)

## Damping

### 4–20 mA HART

#### Rosemount 2051 with selectable HART

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

#### Rosemount 2051

Analog output response to a step input change is user-selectable from 0.4 to 60 seconds for one time constant. This software damping is in addition to sensor module response time.

### FOUNDATION Fieldbus

Transducer block: User configurable

AI block: User configurable

### PROFIBUS PA

AI block only: User configurable

## Failure mode alarm

### HART 4–20 mA (output code A)

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:

**Table 11. Standard Operation**

Output code	Linear output	Fail high	Fail low
A	$3.9 \leq I \leq 20.8$	$I \geq 21.75 \text{ mA}$	$I \leq 3.75 \text{ mA}$
M	$0.97 \leq V \leq 5.2$	$V \geq 5.4 \text{ V}$	$V \leq 0.95 \text{ V}$

**Table 12. NAMUR-Compliant Operation**

Output code	Linear output	Fail high	Fail low
A	$3.8 \leq I \leq 20.5$	$I \geq 22.5 \text{ mA}$	$I \leq 3.6 \text{ mA}$

### Output code F and X

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

## Physical specifications

### Material selection

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

### Electrical connections

1/2–14 NPT, G1/2, and M20 × 1.5 conduit

### Process connections

#### Rosemount 2051C

- 1/4–18 NPT on 2 1/8-in. centers
- 1/2–14 NPT and RC 1/2 on 2-in. (50,8 mm), 2 1/8-in. (54,0 mm), or 2 1/4-in. (57,2 mm) centers (process adapters)

#### Rosemount 2051T

- 1/2–14 NPT female
- G1/2 A DIN 16288 male (available in SST for Range 1–4 transmitters only)
- Autoclave type F-250-C (pressure relieved 9/16–18 gland thread; 1/4 O.D. high pressure tube 60° cone; available in SST for Range 5 transmitters only)

#### Rosemount 2051L

- High pressure side: 2-in. (50,8 mm), 3-in. (72 mm), or 4-in. (102 mm), ASME B 16.5 (ANSI) Class 150 or 300 flange; 50, 80, or 100 mm, DIN 2501 PN 40 or 10/16 flange
- Low pressure side: 1/4–18 NPT on flange, 1/2–14 NPT on process adapter

**Rosemount 2051CF**

- For Rosemount 2051CFA wetted parts, see Rosemount DP Flowmeters and Primary Elements [Product Data Sheet](#) in the 485 section
- For Rosemount 2051CFC wetted parts, see Rosemount DP Flowmeters and Primary Elements [Product Data Sheet](#) in the 405 section
- For Rosemount 2051CFP wetted parts, see Rosemount DP Flowmeters and Primary Elements [Product Data Sheet](#) in the 1195 section

**Rosemount 2051C process wetted parts**

**Drain/vent valves**

316 SST or Alloy C-276

**Process flanges and adapters**

Plated carbon steel, SST CF-8M (cast version of 316 SST, material per ASTM-A743), or CW2M (cast version of Alloy C)

**Wetted O-rings**

Glass-filled PTFE or graphite-filled PTFE

**Process isolating diaphragms**

316L SST, Alloy C-276, or Tantalum

**Rosemount 2051T process wetted parts**

**Process connections**

316L SST or Alloy C-276

**Process Isolating diaphragms**

316L SST or Alloy C-276

**Rosemount 2051L Process wetted parts**

**Flanged process connection (transmitter high side)**

**Process diaphragms, including process gasket surface**

316L SST, Alloy C-276, or Tantalum

**Extension**

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

**Mounting flange**

Zinc-cobalt plated CS or SST

**Reference process connection (transmitter low side)**

**Isolating diaphragms**

316L SST or Alloy C-276

**Reference flange and adapter**

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

**Non-wetted parts for Rosemount 2051C/T/L**

**Electronics housing**

Low-copper aluminum or CF-8M (cast version of 316 SST) Enclosures meet NEMA® Type 4X, IP66, and IP68 when properly installed.

Housing material code P: PBT/PC with NEMA 4X and IP66/67/68

**Paint for aluminum housing**

Polyurethane

**Coplanar sensor module housing**

CF-3M (cast version of 316L SST)

**Bolts**

ASTM A449, Type 1 (zinc-cobalt plated carbon steel)

ASTM F593G, Condition CW1 (Austenitic 316 SST)

ASTM A193, Grade B7M (zinc plated alloy steel)

Alloy K-500

**Sensor module fill fluid**

Silicone or inert halocarbon

In-line series uses Fluorinert® FC-43

**Process fill fluid (2051L only)**

SYL THERM XLT, Silicone 704, Silicone 200, inert, glycerin and water, Neobee M-20, or propylene glycol and water

**Cover O-rings**

Buna-N

Silicone (for wireless option code X)

**Power module**

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

**Shipping weights**

**Table 13. Transmitter Weights without Options<sup>(1)</sup>**

Transmitter	Standard lb (kg)	Wireless lb (kg)
Rosemount 2051C	4.9 (2.2)	3.9 (1,8)
Rosemount 2051L	See <a href="#">Table 14</a>	See <a href="#">Table 14</a>
Rosemount 2051T	3.1 (1.4)	1.9 (0,86)

1. Transmitter weights include the sensor module and housing only (aluminum for standard 2051 and polymer for wireless).

**Table 14. Rosemount 2051L Weights without Options**

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

**Table 15. Transmitter Options Weights**

Code	Option	Add lb (kg)
J, K, L, M	Stainless steel housing	3.9 (1,8)
M5	LCD display for aluminum housing	0.5 (0,2)
M5	LCD display for wireless output	0.1 (0,04)
B4	SST mounting bracket for coplanar flange	1.0 (0,5)
B1, B2, B3	Mounting bracket for traditional flange	2.3 (1,0)
B7, B8, B9	Mounting bracket for traditional flange	2.3 (1,0)
BA, BC	SST bracket for traditional flange	2.3 (1,0)
H2	Traditional flange	2.6 (1,2)
H3	Traditional flange	3.0 (1,4)
H4	Traditional flange	3.0 (1,4)
H7	Traditional Flange	2.7 (1,2)
FC	Level flange—3-in., Class 150	12.7 (5,8)
FD	Level flange—3-in., Class 300	15.9 (7,2)
FA	Level flange—2-in., Class 150	8.0 (3,6)
FB	Level flange—2-in., Class 300	8.4 (3,3)
FP	DIN Level flange, SST, DN 50, PN 40	7.8 (3,5)
FQ	DIN Level flange, SST, DN 80, PN 40	12.7 (5,8)
WSM	SST sensor module	1.0 (0,45)
	Power module (701PGNKF)	0.4 (0,18)

# Product Certifications

## Rosemount 2051

Rev 1.3

### European Directive Information

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

### Ordinary Location Certification

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

### North America

- E5** USA Explosionproof (XP) and Dust-Ignitionproof (DIP)  
Certificate: 3032938  
Standards: FM Class 3600 – 2011, FM Class 3615 – 2006, FM Class 3616 – 2011, FM Class 3810 – 2005, ANSI/NEMA 250 – 2008, ANSI/IEC 60529 2004  
Markings: XP CL I, DIV 1, GP B, C, D; DIP CL II, DIV 1, GP E, F, G; CL III; T5(-50 °C ≤ T<sub>a</sub> ≤ +85 °C); Factory Sealed; Type 4X
- I5** USA Intrinsic Safety (IS) and Nonincendive (NI)  
Certificate: 3033457  
Standards: FM Class 3600 – 2011, FM Class 3610 – 2010, FM Class 3611 – 2004, FM Class 3810 – 2005, ANSI/NEMA 250 – 2008  
Markings: IS CL I, DIV 1, GP A, B, C, D; CL II, DIV 1, GP E, F, G; Class III; DIV 1 when connected per Rosemount drawing 02051-1009; Class I, Zone 0; AEx ia IIC T4; NI CL 1, DIV 2, GP A, B, C, D; T4(-50 °C ≤ T<sub>a</sub> ≤ +70 °C); Type 4X
- IE** USA FISCO  
Certificate: 3033457  
Standards: FM Class 3600 – 2011, FM Class 3610 – 2010, FM Class 3611 – 2004, FM Class 3810 – 2005  
Markings: IS CL I, DIV 1, GP A, B, C, D when connected per Rosemount drawing 02051-1009 (-50 °C ≤ T<sub>a</sub> ≤ +60 °C); Type 4X

- E6** Canada Explosion-Proof, Dust Ignition Proof  
Certificate: 2041384  
Standards: CAN/CSA C22.2 No. 0-10, CSA Std C22.2 No. 25-1966, CSA Std C22.2 No. 30-M1986, CAN/CSA-C22.2 No. 94-M91, CSA Std C22.2 No.142-M1987, CAN/CSA-C22.2 No.157-92, CSA Std C22.2 No. 213-M1987, CAN/CSA-E60079-0:07, CAN/CSA-E60079-1:07, CAN/CSA-E60079-11-02, CAN/CSA-C22.2 No.60529:05, ANSI/ISA-12.27.01–2003  
Markings: Explosion-Proof for Class I, Divisions 1, Groups B, C, and D. Dust-Ignition Proof for Class II and Class III, Division 1, Groups E, F, and G. Suitable for Class I, Division 2; Groups A, B, C, and D for indoor and outdoor hazardous locations. Class I Zone 1 Ex d IIC T5. Enclosure type 4X, factory sealed. Single Seal
- I6** Canada Intrinsic Safety  
Certificate: 2041384  
Standards: CSA Std. C22.2 No. 142 - M1987, CSA Std.C22.2 No. 213 - M1987, CSA Std. C22.2 No.157 - 92, CSA Std. C22.2 No. 213 - M1987, ANSI/ISA 12.27.01 – 2003, CAN/CSA-E60079-0:07, CAN/CSA-E60079-11:02  
Markings: Intrinsically safe for Class I, Division 1, Groups A,B, C, and D when connected in accordance with Rosemount drawing 02051-1008. Ex ia IIC T3C. Single Seal. Enclosure Type 4X

**Europe**

- E1** ATEX Flameproof  
 Certificate: KEMA 08ATEX0090X  
 Standards: EN60079-0:2006, EN60079-1:2007, EN60079-26:2007  
 Markings: Ⓢ II 1/2 G Ex d IIC T6 IP66 (−50 °C ≤ T<sub>a</sub> ≤ 65 °C);  
 Ⓢ II 1/2 G Ex d IIC T5 IP66 (−50 °C ≤ T<sub>a</sub> ≤ 80 °C)

**Special Conditions for Safe Use (X):**

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

- I1** ATEX Intrinsic Safety  
 Certificate: Baseefa08ATEX0129X  
 Standards: EN60079-0:2012, EN60079-11:2012  
 Markings: Ⓢ II 1 G Ex ia IIC T4 Ga (−60 °C ≤ T<sub>a</sub> ≤ +70 °C)

**Table 16. Input Parameters**

Parameter	HART	Fieldbus/PROFIBUS
Voltage U <sub>i</sub>	30 V	30 V
Current I <sub>i</sub>	200 mA	300 mA
Power P <sub>i</sub>	1.0 W	1.3 W
Capacitance C <sub>i</sub>	0.012 μF	0 μF
Inductance L <sub>i</sub>	0 mH	0 mH

**Special Condition for Safe Use (X):**

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

- IA** ATEX FISCO  
 Certificate: Baseefa08ATEX0129X  
 Standards: EN60079-0:2012, EN60079-11:2012  
 Markings: Ⓢ II 1 G Ex ia IIC T4 Ga (−60 °C ≤ T<sub>a</sub> ≤ +60 °C)

**Table 17. Input Parameters**

Parameter	FISCO
Voltage U <sub>i</sub>	17.5 V
Current I <sub>i</sub>	380 mA
Power P <sub>i</sub>	5.32 W
Capacitance C <sub>i</sub>	0 μF
Inductance L <sub>i</sub>	0 mH

**Special Conditions for Safe Use (X):**

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

- N1** ATEX Type n  
 Certificate: Baseefa08ATEX0130X  
 Standards: EN60079-0:2012, EN60079-15:2010  
 Markings: Ⓢ II 3G Ex nA IIC T4 Gc (−40 °C ≤ T<sub>a</sub> ≤ +70 °C)

**Special Condition for Safe Use (X):**

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

- ND** ATEX Dust  
 Certificate: Baseefa08ATEX0182X  
 Standards: EN60079-0:2012, EN60079-31:2009  
 Markings: Ⓢ II 1 D Ex ta IIIC T95 °C T<sub>500</sub> 105 °C Da (−20 °C ≤ T<sub>a</sub> ≤ +85 °C)

**Special Condition for Safe Use (X):**

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

**International**

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

**Table 18. Process Temperature**

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

**Special Conditions for Safe Use (X):**

1. The device contains a thin wall diaphragm. Installation, maintenance and use shall take into account the environmental conditions to which the diaphragm will be subjected. The manufacturer’s instructions for maintenance shall be followed in detail to assure safety during its expected lifetime.
  2. The Ex d blanking elements, cable glands, and wiring shall be suitable for a temperature of 90 °C.
  3. In case of repair, contact the manufacturer for information on the dimensions of the flameproof joints.
- I7** IECEx Intrinsic Safety  
 Certificate: IECExBAS08.0045X  
 Standards: IEC60079-0:2011, IEC60079-11:2011  
 Markings: Ex ia IIC T4 Ga (-60 °C ≤ T<sub>a</sub> ≤ +70 °C)

**Table 19. Input Parameters**

Parameter	HART	Fieldbus/PROFIBUS
Voltage U <sub>i</sub>	30 V	30 V
Current I <sub>i</sub>	200 mA	300 mA
Power P <sub>i</sub>	1.0 W	1.3 W
Capacitance C <sub>i</sub>	0.012 μF	0 μF
Inductance L <sub>i</sub>	0 mH	0 mH

**Special Condition for Safe Use (X):**

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

- IG** IECEx FISCO  
 Certificate: IECExBAS08.0045X  
 Standards: IEC60079-0:2011, IEC60079-11:2011  
 Markings: Ex ia IIC T4 Ga (-60 °C ≤ T<sub>a</sub> ≤ +60 °C)

**Table 20. Input Parameters**

Parameter	FISCO
Voltage U <sub>i</sub>	17.5 V
Current I <sub>i</sub>	380 mA
Power P <sub>i</sub>	5.32 W
Capacitance C <sub>i</sub>	0 μF
Inductance L <sub>i</sub>	0 mH

**Special Condition for Safe Use (X):**

1. If the equipment is fitted with an optional 90 V transient suppressor, it is incapable of withstanding the 500 V isolation from earth test and this must be taken into account during installation.
  2. The enclosure may be made of aluminum alloy and given a protective polyurethane paint finish; however care should be taken to protect it from impact and abrasion when located in Zone 0.
- N7** IECEx Type n  
 Certificate: IECExBAS08.0046X  
 Standards: IEC60079-0:2011, IEC60079-15:2010  
 Markings: Ex nA IIC T4 Gc (-40 °C ≤ T<sub>a</sub> ≤ +70 °C)

**Special Condition for Safe Use (X):**

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

**Brazil**

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

**Special Condition for Safe Use (X):**

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

- I2** INMETRO Intrinsic Safety  
 Certificate: UL-BR 14.0759X  
 Standards: ABNT NBR IEC 60079-0:2008 + Errata 1:2011;  
 ABNT NBR IEC 60079-11:2009  
 Markings: Ex ia IIC T4 Ga (-60 °C ≤ T<sub>a</sub> ≤ +70 °C)

**Table 21. Input Parameters**

Parameter	HART	Fieldbus/PROFIBUS
Voltage U <sub>i</sub>	30 V	30 V
Current I <sub>i</sub>	200 mA	300 mA
Power P <sub>i</sub>	1 W	1.3 W
Capacitance C <sub>i</sub>	0.012 μF	0 μF
Inductance L <sub>i</sub>	0 mH	0 mH

**Special Conditions for Safe Use (X):**

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

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

**Table 22. Input Parameters**

Parameter	FISCO
Voltage U <sub>i</sub>	17.5 V
Current I <sub>i</sub>	380 mA
Power P <sub>i</sub>	5.32 W
Capacitance C <sub>i</sub>	0 μF
Inductance L <sub>i</sub>	0 mH

**Special Condition for Safe Use (X):**

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

**China**

- E3** China Flameproof  
 Certificate: GYJ13.1386X; GYJ5.1366X [Flowmeters]  
 Standards: GB3836.1-2010, GB3836.2-2010,  
 GB3836.20-2010-2010  
 Markings: Pressure Transmitter: Ex d IIC Gb,  
 T6(-50 °C ≤ T<sub>a</sub> ≤ +65 °C),  
 T5(-50 °C ≤ T<sub>a</sub> ≤ +80 °C)  
 Flowmeter: Ex d IIC Ga/Gb,  
 T6(-50 °C ≤ T<sub>a</sub> ≤ +65 °C),  
 T5(-50 °C ≤ T<sub>a</sub> ≤ +80 °C)

**Special Conditions for Safe Use (X):**

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

T <sub>a</sub>	Temperature class
-50 °C ≤ T <sub>a</sub> ≤ +80 °C	T5
-50 °C ≤ T <sub>a</sub> ≤ +65 °C	T6

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

- I3** China Intrinsic Safety  
 Certificate: GYJ12.1295X; GYJ15.1365X [Flowmeters]  
 Standards: GB3836.1-2010, GB3836.4-2010,  
 GB3836.20-2010  
 Markings: Ex ia IIC T4 Ga (-60 °C ≤ T<sub>a</sub> ≤ +70 °C)

**Special Conditions for Safe Use (X):**

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

Model	T code	Temperature range
HART, Fieldbus, PROFIBUS, and Low Power	T4	-60 °C ≤ T <sub>a</sub> ≤ +70 °C

3. Intrinsically safe parameters:

Parameter	HART	Fieldbus/ PROFIBUS	FISCO
Voltage U <sub>i</sub>	30 V	30 V	17.5 V
Current I <sub>i</sub>	200 mA	300 mA	380 mA
Power P <sub>i</sub>	1 W	1.3 W	5.32 W
Capacitance C <sub>i</sub>	0.012 μF	0 μF	0 nF
Inductance L <sub>i</sub>	0 mH	0 mH	0 μF

Note 1: FISCO parameters comply with the requirements for FISCO field devices in GB3836.19-2010.

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

4. The product should be used with Ex-certified associated apparatus to establish explosion protection system that can be used in explosive gas atmospheres. Wiring and terminals should comply with the instruction manual of the product and associated apparatus.
5. The cables between this product and associated apparatus should be shielded cables (the cables must have insulated shield). The shielded cable has to be grounded reliably in a non-hazardous area.

6. End users are not permitted to change any internal components, and needs to settle the problem in conjunction with the manufacturer to avoid damage to the product.
7. During installation, use and maintenance of this product, observe the following standards: GB3836.13-2013, GB3836.15-2000, GB3836.16-2006, GB3836.18-2010, GB50257-2014.

**Japan**

- E4** Japan Flameproof  
 Certificate: TC20598, TC20599, TC20602, TC20603 [HART]; TC20600, TC20601, TC20604, TC20605 [Fieldbus]  
 Markings: Ex d IIC T5

**Technical Regulations Customs Union (EAC)**

- EM** EAC Flameproof  
 Certificate: RU C-US.GB05.B.01199  
 Markings: Ga/Gb Ex d IIC T5/T6 X, T5(-50 °C ≤ T<sub>a</sub> ≤ +80 °C), T6(-50 °C ≤ T<sub>a</sub> ≤ +65 °C)

**Special Condition for Safe Use (X):**

1. See certificate for special conditions.

- IM** EAC Intrinsically Safe  
 Certificate: RU C-US.GB05.B.01199  
 Markings: 0Ex ia IIC T4 Ga X (-60 °C ≤ T<sub>a</sub> ≤ +70 °C)

**Special Condition for Safe Use (X):**

1. See certificate for special conditions.

**Combinations**

- K1** Combination of E1, I1, N1, and ND  
**K2** Combination of E2 and I2  
**K5** Combination of E5 and I5  
**K6** Combination of E6 and I6  
**K7** Combination of E7, I7, N7 and IECEx Dust

IECEx Type n  
 Certificate: IECExBAS08.0058X  
 Standards: IEC60079-0:2011, IEC60079-15:2010  
 Markings: Ex nA IIIC T95 °C T<sub>500</sub> 105 °C Da (-20 °C ≤ T<sub>a</sub> ≤ +85 °C)

**Special Condition for Safe Use (X):**

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

- KA** Combination of E1, I1, and K6  
**KB** Combination of K5 and K6  
**KC** Combination of E1, I1, and K5  
**KD** Combination of K1, K5, and K6  
**KM** Combination of EM and IM

**Additional Certifications****SBS** American Bureau of Shipping (ABS) Type Approval

Certificate: 09-HS446883B-3-PDA

Intended Use: Marine and Offshore Applications  
Measurement of either Gauge or Absolute  
Pressure for Liquid, Gas, and VaporABS Rules: 2013 Steel Vessels Rules 1-1-4/7.7,  
1-1-Appendix 3, 4-8-3/1.7, 4-8-3/13.1**SBV** Bureau Veritas (BV) Type Approval

Certificate: 23157/B0 BV

BV Rules: Bureau Veritas Rules for the Classification of  
Steel ShipsApplication: Class notations: AUT-UMS, AUT-CCS,  
AUT-PORT and AUT-IMS; Pressure transmitter  
type 2051 cannot be installed on diesel  
engines.**SDN** Det Norske Veritas (DNV) Type Approval

Certificate: TAA00004F

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

Application:

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

**SLL** Lloyds Register (LR) Type Approval

Certificate: 11/60002

Application: Environmental categories ENV1, ENV2, ENV3,  
and ENV5

## Rosemount 2051 Wireless

Rev 1.1

### European Directive Information

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

### Telecommunication compliance

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

### FCC and IC

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

### Ordinary Location Certification from FM Approvals

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

### Installing in North America

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

### USA

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

#### Special Conditions for Safe Use (X):

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

### Canada

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

**Europe**

- I1** ATEX Intrinsic Safety  
 Certificate: Baseefa12ATEX0228X  
 Standards: EN 60079-0:2012, EN 60079-11:2012  
 Markings:  II 1 G Ex ia IIC T4 Ga,  
 T4(-40 °C ≤ T<sub>a</sub> ≤ +70 °C) IP66/IP68

**Special Conditions for Safe Use (X):**

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

**International**

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

**Special Conditions for Safe Use (X):**

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

**Brazil**

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

**Special Condition for Safe Use (X):**

1. See certificate for special conditions.

**China**

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

**Special Condition for Safe Use (X):**

1. See certificate for special conditions.

**EAC - Belarus, Kazakhstan, Russia**

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

**Special Condition for Safe Use (X):**

1. See certificate for special conditions.

**Korea**

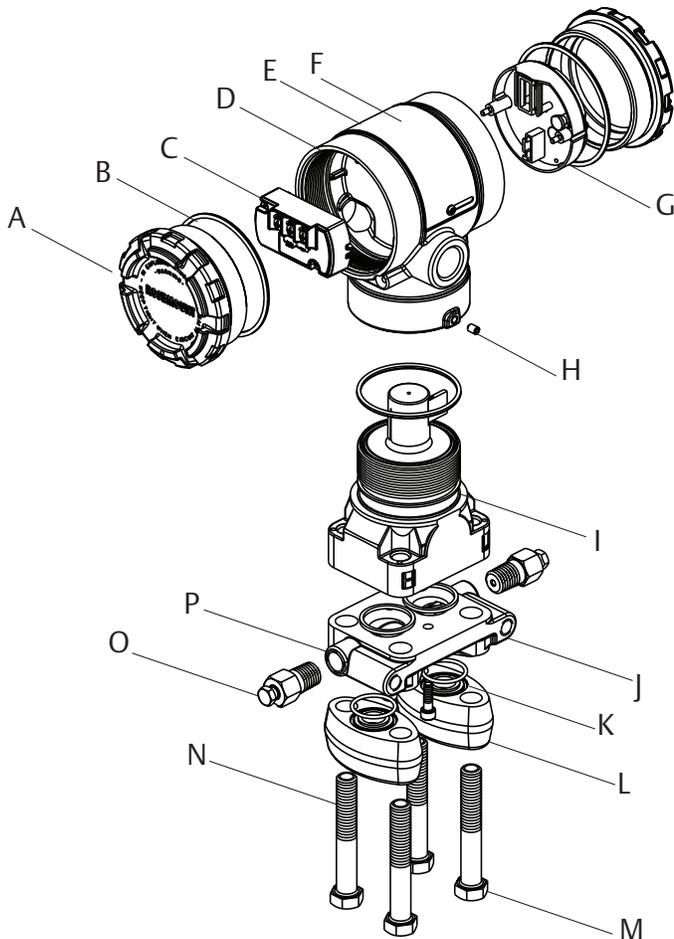
- IP** Korea Intrinsic Safety  
 Certificate: 13-KB4BO-0295X  
 Markings: Ex ia IIC T4 (-40 °C ≤ T<sub>a</sub> ≤ +70 °C)

**Special Condition for Safe Use (X):**

1. See certificate for special conditions.

## Dimensional drawings

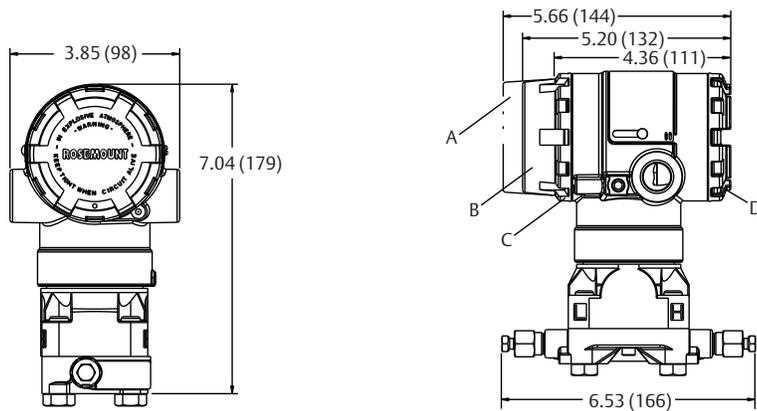
Figure 1. Rosemount 2051C Exploded View



- |  |  |
|--|--|
| A. Cover   | I. Sensor module                                   |
| B. Cover O-ring  | J. Process O-ring                                  |
| C. Terminal block  | K. Flange adapter O-ring                           |
| D. Electronics housing   | L. Flange alignment screw (not pressure retaining) |
| E. Local configuration buttons <sup>(1)</sup>  | M. Flange bolts                                    |
| F. Nameplate   | N. Flange adapters                                 |
| G. Electronics board   | O. Drain/vent valve                                |
| H. Housing rotation set screw<br>(180° maximum housing rotation without further disassembly) | P. Coplanar flange                                 |

1. Span and zero adjustment buttons are optional with 4–20 mA and 1–5 Vdc HART Protocol. LOI buttons are optional for PROFIBUS PA Protocol. Local configuration buttons are not available with FOUNDATION Fieldbus.

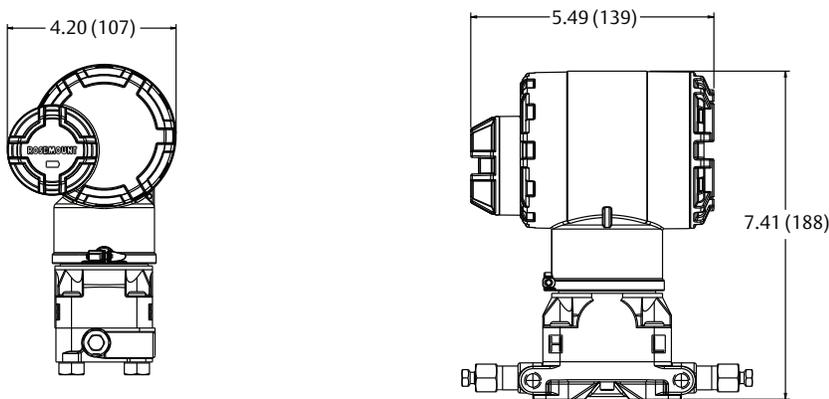
**Figure 2. Rosemount 2051C Coplanar Flange**



A. Fieldbus display cover  
 B. HART display cover  
 Dimensions are in inches (millimeters).

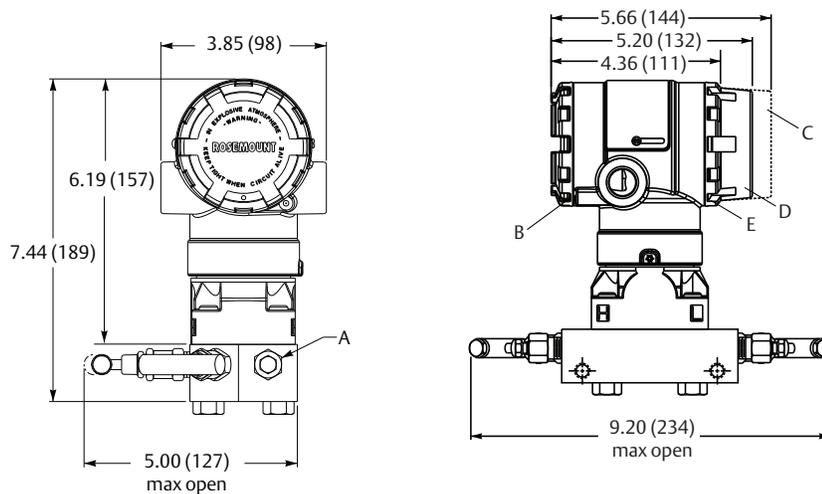
C. Transmitter circuitry  
 D. Terminal connections

**Figure 3. Rosemount 2051 Wireless Housing with Coplanar Platform**



Dimensions are in inches (millimeters).

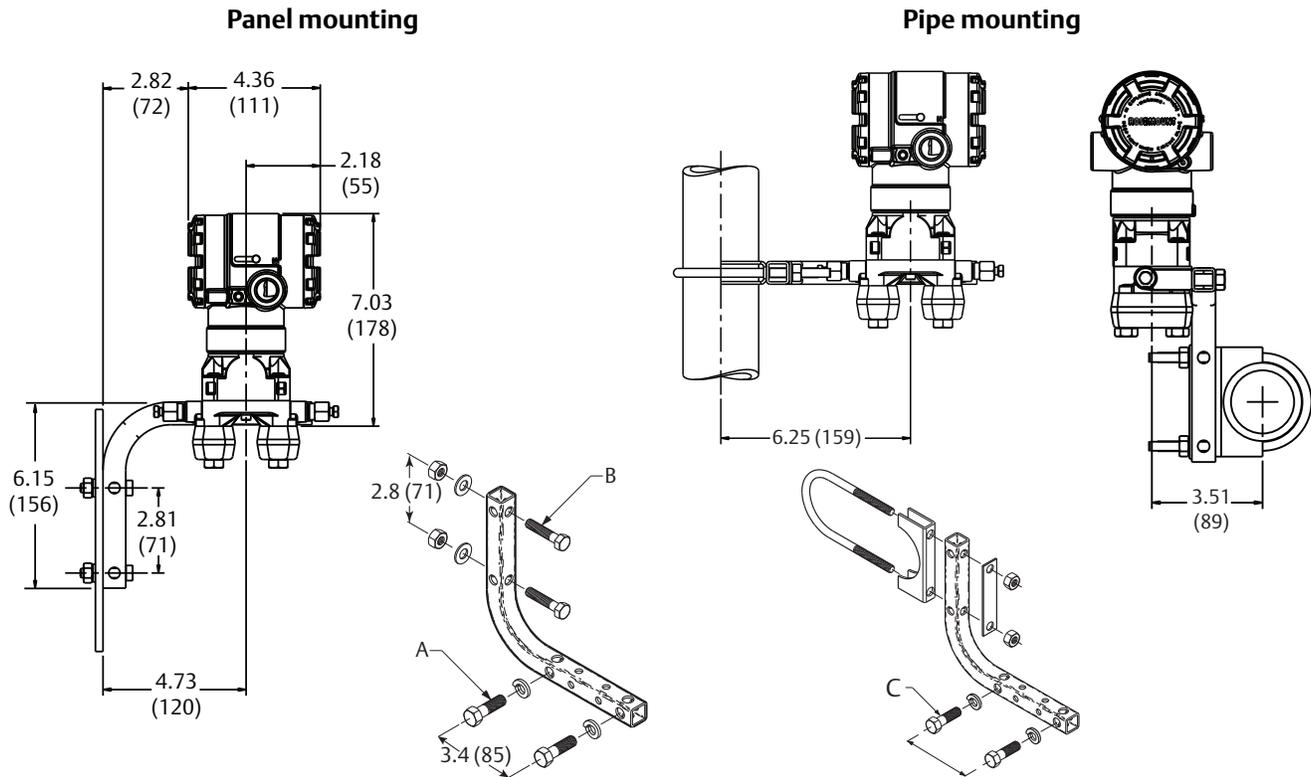
**Figure 4. Rosemount 2051C Coplanar with Rosemount 305 Three-Valve Coplanar Integral Manifold**



A. Drain/Vent valve  
 B. Terminal connections  
 C. Fieldbus display cover  
 Dimensions are in inches (millimeters).

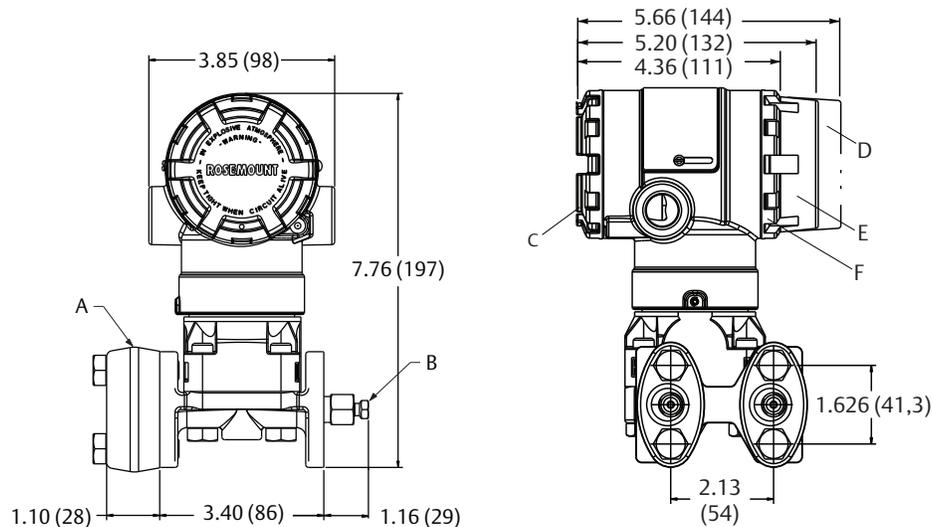
D. HART display cover  
 E. Transmitter circuitry

Figure 5. Coplanar Flange Mounting Configurations with Optional Bracket (B4) for 2-in. Pipe or Panel Mounting



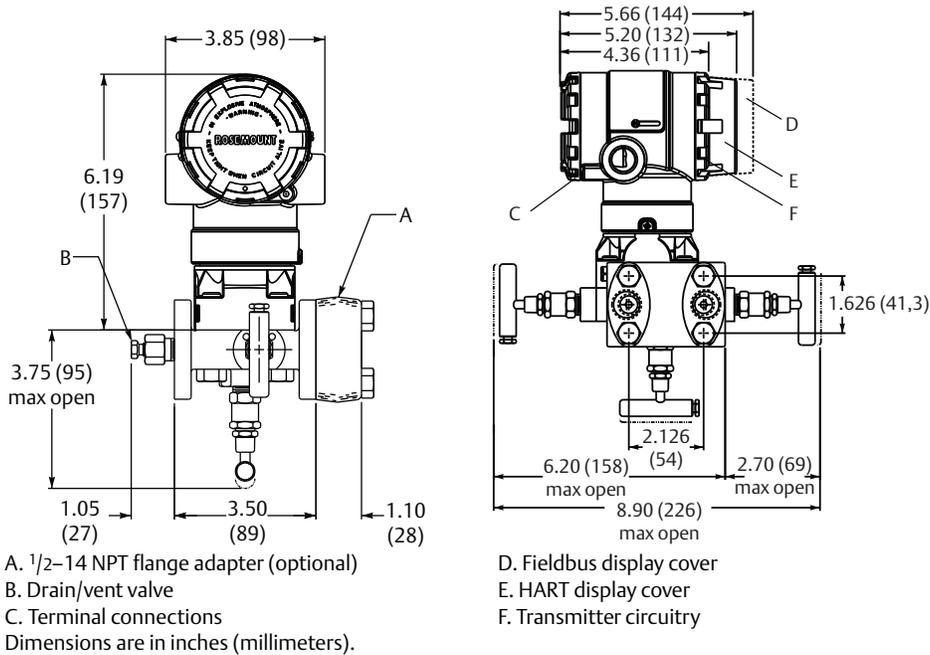
- A. 3/8-16 × 1 1/4 bolts for mounting to transmitter
  - B. 5/16 × 1 1/2 bolts for panel mounting (not supplied)
  - C. 2-in. U-bolt for pipe mounting
- Dimensions are in inches (millimeters).

Figure 6. Rosemount 2051C Coplanar with Traditional Flange

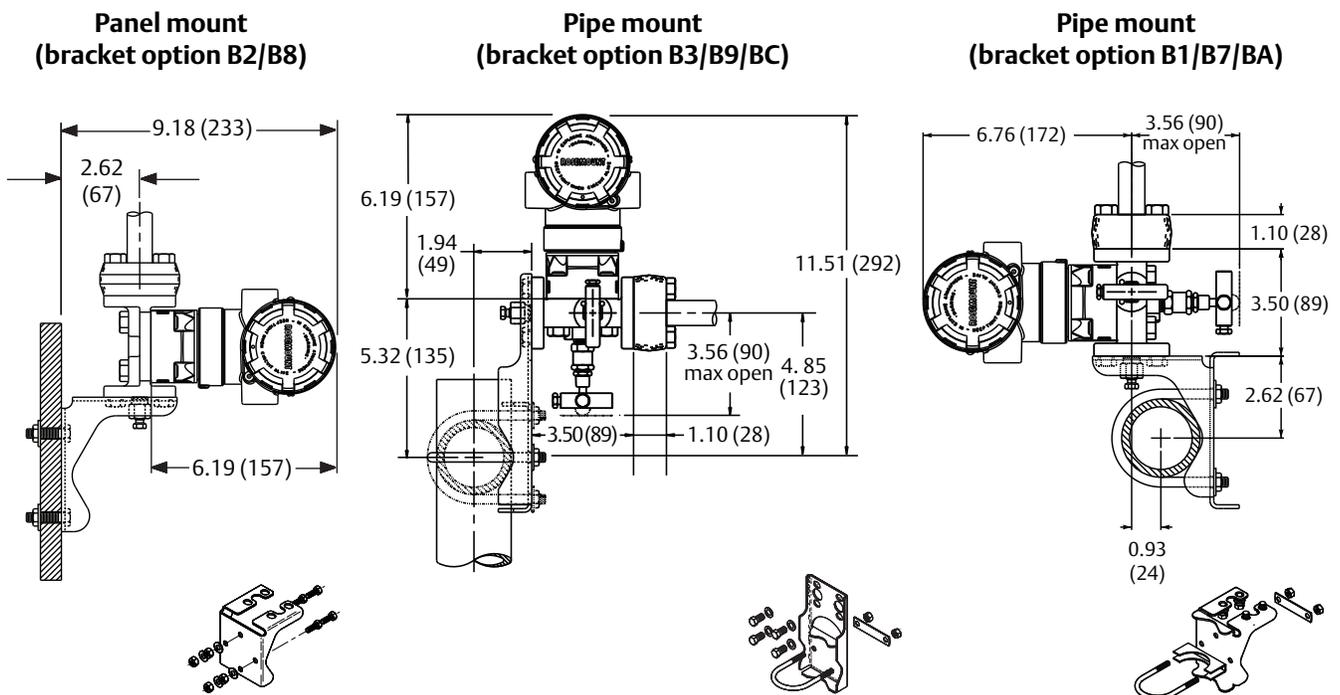


- A. 1/2-14 NPT flange adapter (optional)
  - B. Drain/vent valve
  - C. Terminal connections
  - D. Fieldbus display cover
  - E. HART display cover
  - F. Transmitter circuitry
- Dimensions are in inches (millimeters).

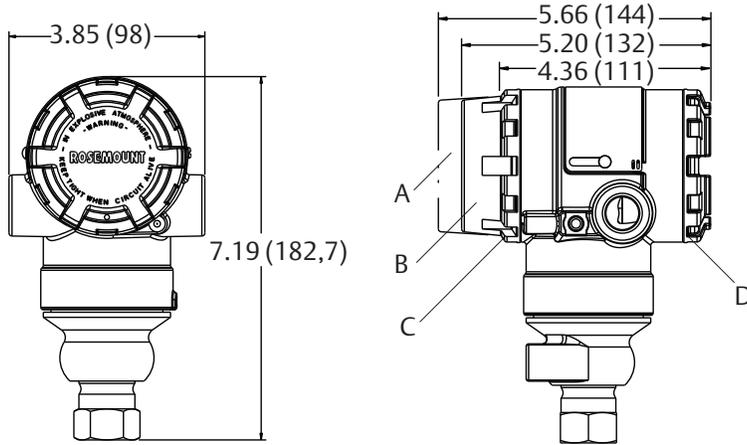
**Figure 7. Rosemount 2051C Coplanar with Rosemount 305 Three-Valve Traditional Integral Manifold**



**Figure 8. Traditional Flange Mounting Configurations with Optional Brackets for 2-in. Pipe or Panel Mounting**



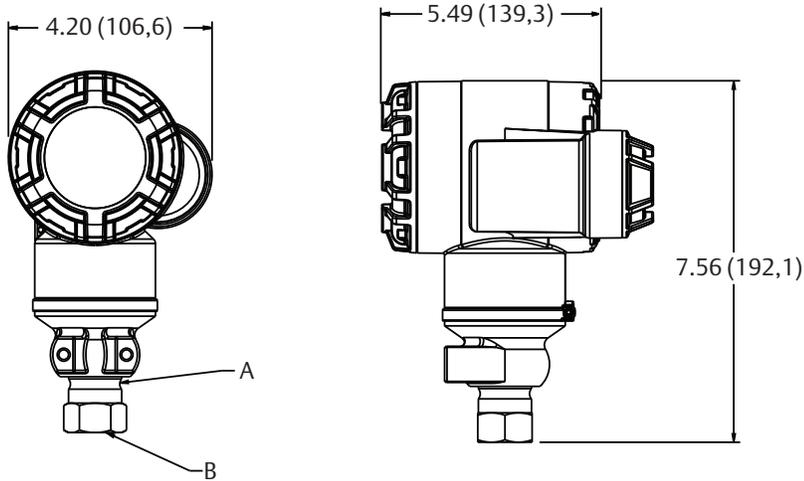
**Figure 9. Rosemount 2051T**



- A. Fieldbus display cover
- B. HART display cover
- C. Transmitter circuitry
- D. Terminal connections

Dimensions are in inches (millimeters).

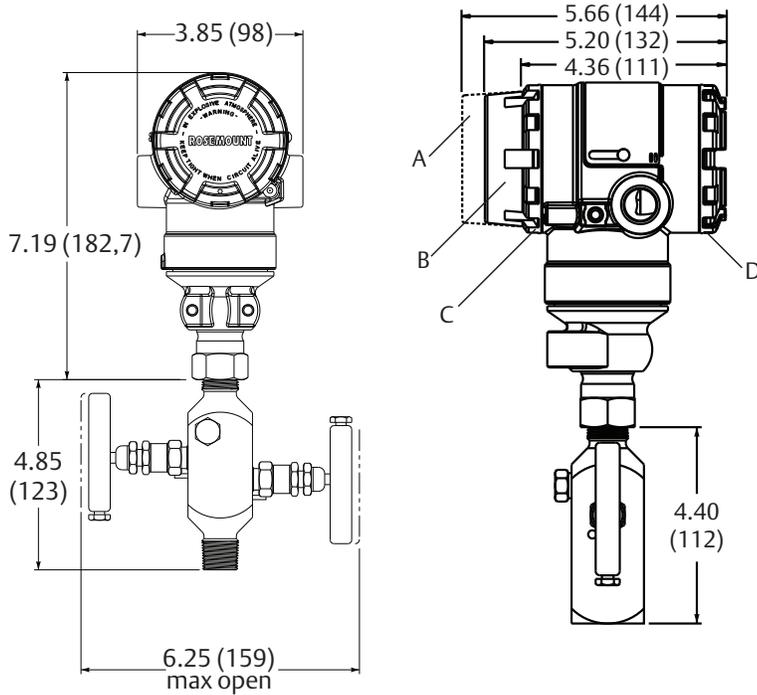
**Figure 10. Rosemount 2051 Wireless Housing with In-line Platform**



- A. U-Bolt bracket
- B. 1/2-14 NPT female or G1/2A DIN 16288 make process connection

Dimensions are in inches (millimeters).

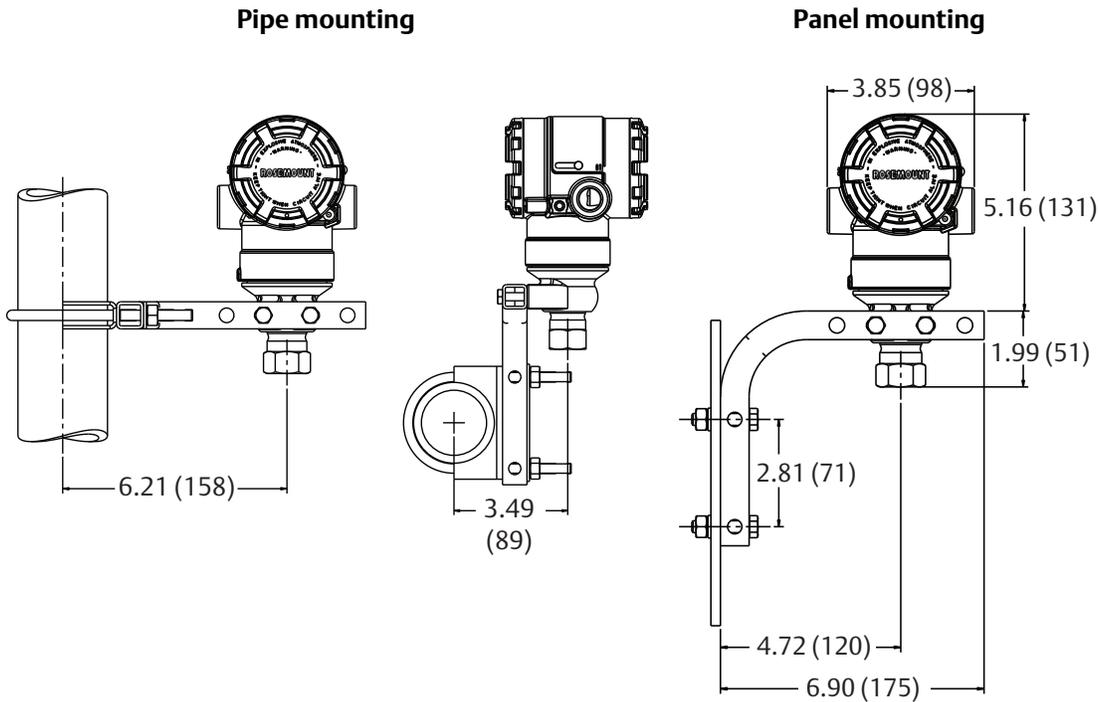
**Figure 11. Rosemount 2051T with Rosemount 306 Two-Valve Integral Manifold**



- A. Fieldbus display cover
- B. HART display cover
- C. Transmitter circuitry
- D. Terminal connections

Dimensions are in inches (millimeters).

**Figure 12. Rosemount 2051T Typical Mounting Configurations with Optional Mounting Bracket**



Dimensions are in inches (millimeters).

Figure 13. Rosemount 2051CFA Pak-Lok Annubar Flowmeter<sup>(1)</sup>

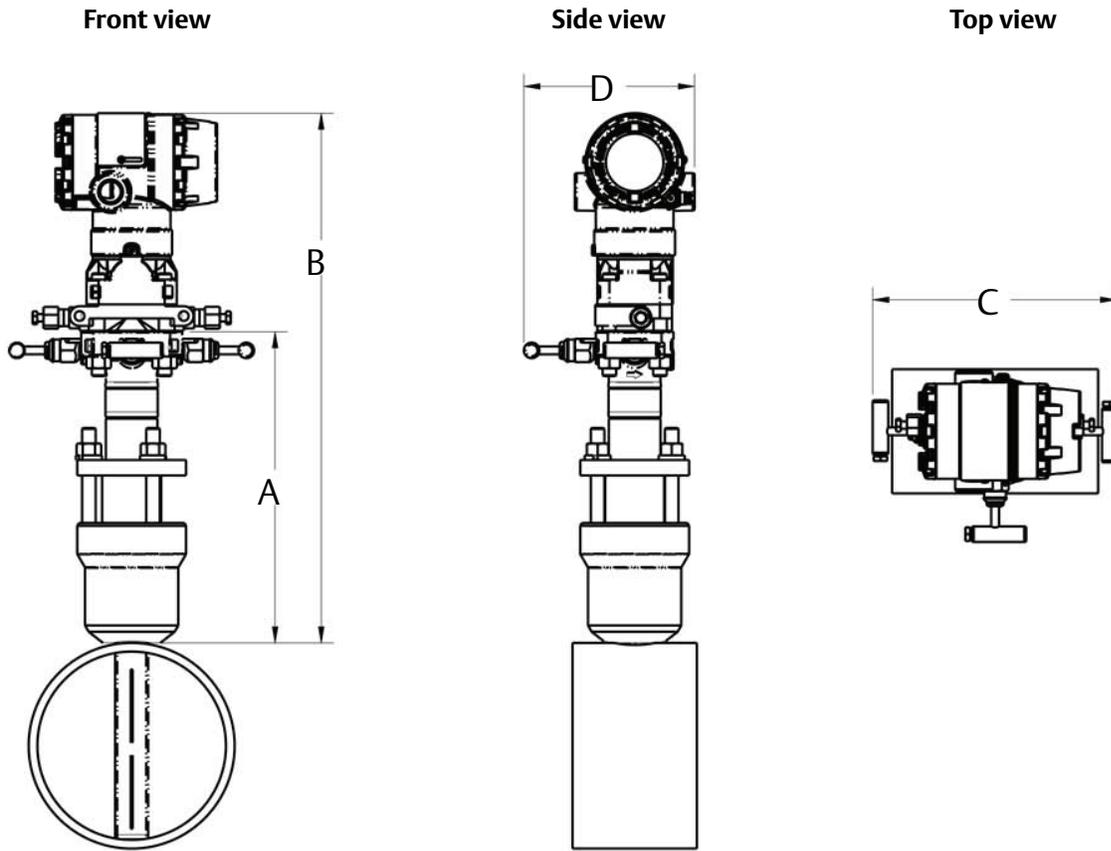


Table 23. Rosemount 2051CFA Pak-Lok Annubar Flowmeter Dimensional Data

Sensor size	A (max)	B (max)	C (max)	D (max)
1	8.50 (215.9)	14.55 (369.6)	9.00 (228.6)	6.00 (152.4)
2	11.00 (279.4)	16.30 (414.0)	9.00 (228.6)	6.00 (152.4)
3	12.00 (304.8)	19.05 (483.9)	9.00 (228.6)	6.00 (152.4)

Dimensions are in inches (millimeters).

1. The Pak-Lok Annubar model is available up to Class 600 ANSI (1,440 psig at 100 °F [99 bar at 38 °C]).

Figure 14. Rosemount 2051CFC Compact Orifice Flowmeter

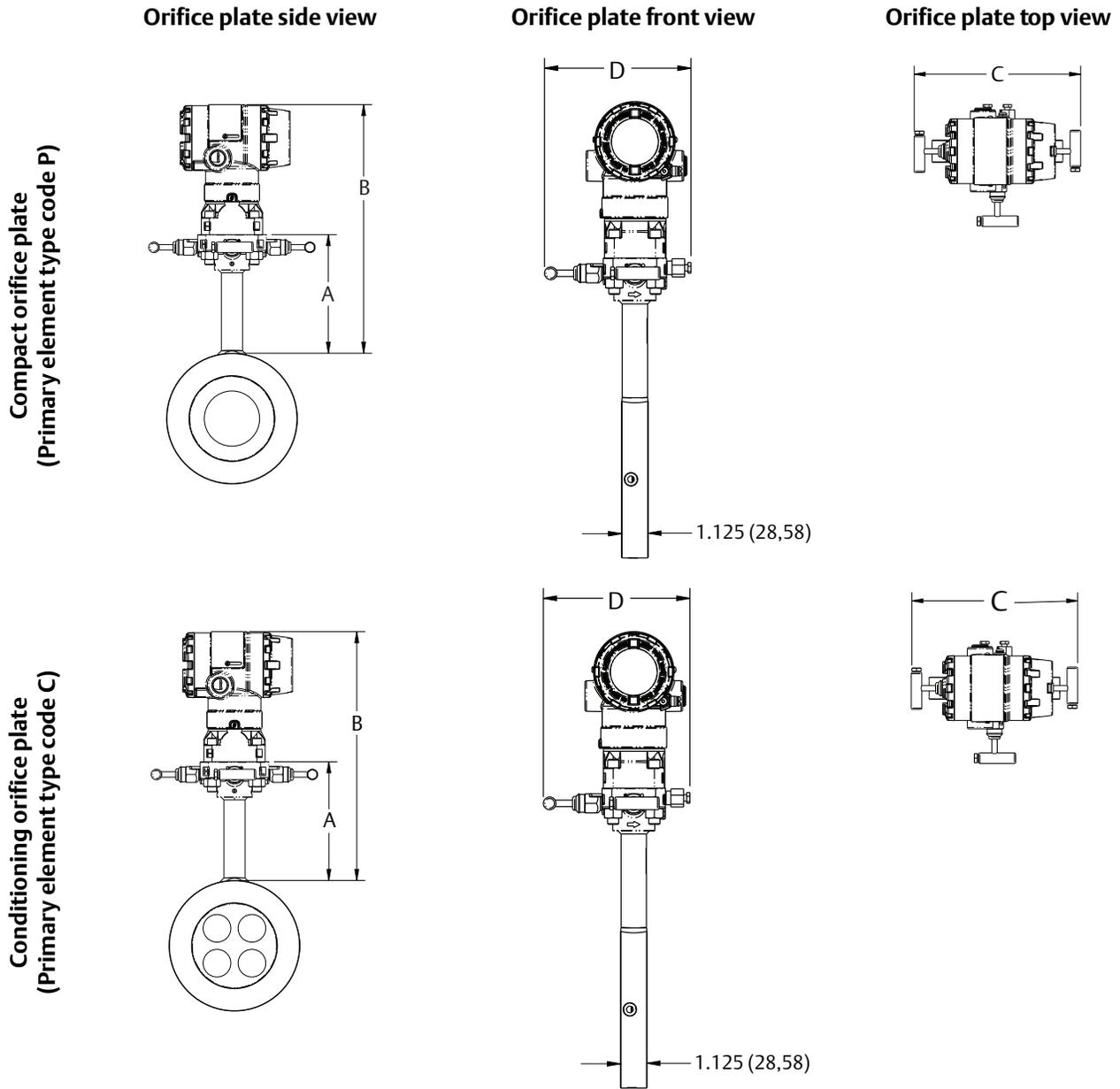
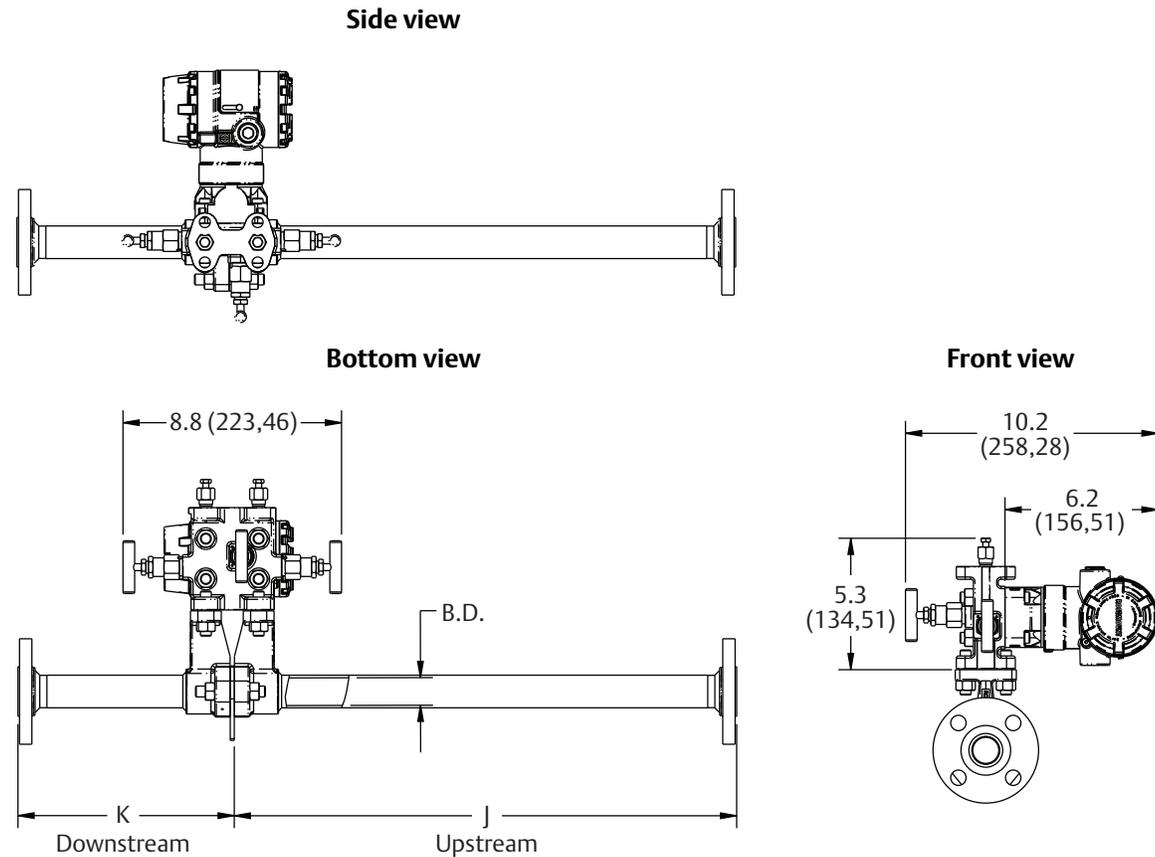


Table 24. Rosemount 2051CFC Dimensional Data

Primary element type	A	B	Transmitter height	C	D
Type P and C	5.62 (143)	Transmitter Height + A	6.27 (159)	7.75 (197) - closed 8.25 (210) - open	6.00 (152) - closed 6.25 (159) - open

Dimensions are in inches (millimeters).

Figure 15. Rosemount 2051CFP Integral Orifice Flowmeter



Dimensions are in inches (millimeters).

Table 25. Rosemount 2051CFP Dimensional Data

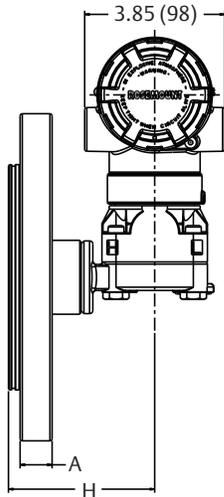
Dimension	Line size		
	1/2-in. (15 mm)	1-in. (25 mm)	1 1/2-in. (40 mm)
J (beveled/threaded pipe ends)	12.54 (318,4)	20.24 (514,0)	28.44 (722,4)
J (RF slip-on, RTJ slip-on, RF-DIN slip on)	12.62 (320,4)	20.32 (516,0)	28.52 (724,4)
J (RF Class 150, weld neck)	14.37 (364,9)	22.37 (568,1)	30.82 (782,9)
J (RF Class 300, weld neck)	14.56 (369,8)	22.63 (574,7)	31.06 (789,0)
J (RF Class 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) <sup>(1)</sup>	5.82 (147,8)	8.83 (224,2)	11.99 (304,6)
K (RF Class 150, weld neck)	7.57 (192,3)	10.88 (276,3)	14.29 (363,1)
K (RF Class 300, weld neck)	7.76 (197,1)	11.14 (282,9)	14.53 (369,2)
K (RF Class 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).

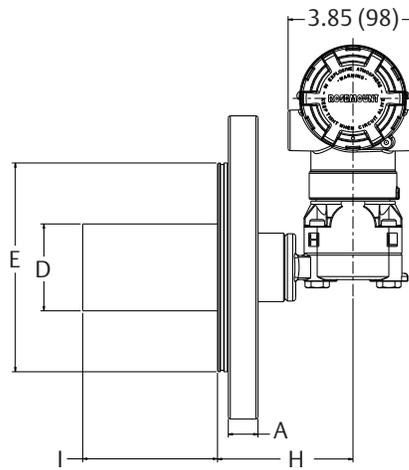
1. Downstream length shown here includes plate thickness of 0.162-in. (4.11 mm).

Figure 16. Rosemount 2051L Liquid Level

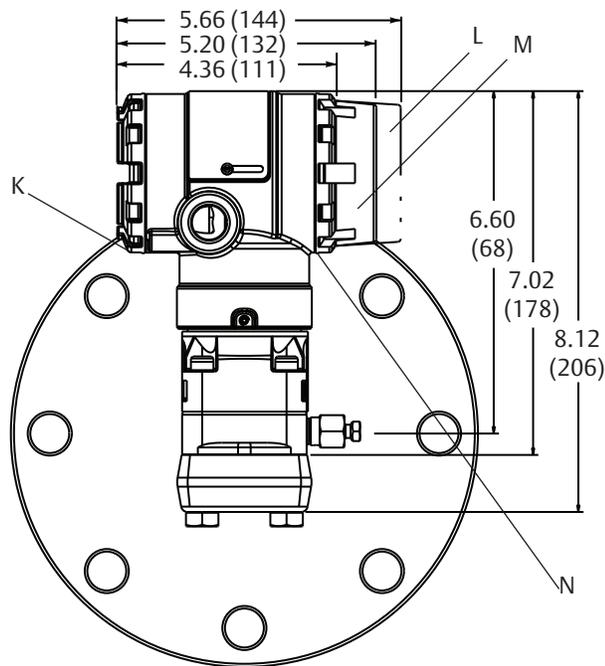
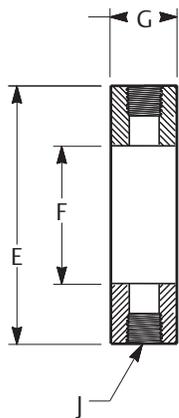
**2-in. flange configuration  
(flush mount only)**



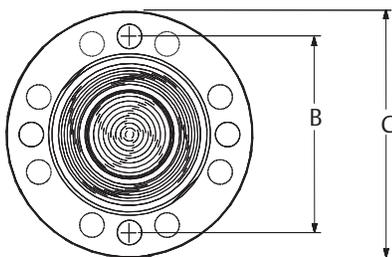
**3- and 4-in. flange configuration**



**Optional flushing connection ring  
(lower housing)**



**Diaphragm assembly and  
mounting flange**



A–H. Refer to [Table 26](#)  
 I. 2-in., 4-in., or 6-in. extension  
 (50.8, 101.6, 152.4)  
 J. Flushing connection  
 Dimensions are in inches (millimeters).

K. Terminal connections  
 L. Fieldbus display cover  
 M. HART display cover  
 N. Transmitter circuitry

Table 26. 2051L Dimensional Specifications

Class <sup>(1)</sup>	Pipe size	Flange thickness A	Bolt circle diameter B	Outside diameter C	No. of bolts	Bolt hole diameter	Extension diameter <sup>(1)</sup> D	O.D. gasket surface E
ASME B16.5 (ANSI) 150	2 (51)	0.69 (18)	4.75 (121)	6.0 (152)	4	0.75 (19)	N/A	3.6 (92)
	3 (76)	0.88 (22)	6.0 (152)	7.5 (191)	4	0.75 (19)	2.58 (66)	5.0 (127)
	4 (102)	0.88 (22)	7.5 (191)	9.0 (229)	8	0.75 (19)	3.5 (89)	6.2 (158)
ASME B16.5 (ANSI) 300	2 (51)	0.82 (21)	5.0 (127)	6.5 (165)	8	0.75 (19)	N/A	3.6 (92)
	3 (76)	1.06 (27)	6.62 (168)	8.25 (210)	8	0.88 (22)	2.58 (66)	5.0 (127)
	4 (102)	1.19 (30)	7.88 (200)	10.0 (254)	8	0.88 (22)	3.5 (89)	6.2 (158)
DIN 2501 PN 10–40	DN 50	20 mm	125 mm	165 mm	4	18 mm	N/A	4.0 (102)
DIN 2501 PN 25/40	DN 80	24 mm	160 mm	200 mm	8	18 mm	66 mm	5.4 (138)
	DN 100	24 mm	190 mm	235 mm	8	22 mm	89 mm	6.2 (158)

Dimensions are in inches (millimeters).

Class <sup>(1)</sup>	Pipe size	Process side F	Lower housing G		H
			1/4 NPT	1/2 NPT	
ASME B16.5 (ANSI) 150	2 (51)	2.12 (54)	0.97 (25)	1.31 (33)	5.65 (143)
	3 (76)	3.6 (91)	0.97 (25)	1.31 (33)	5.65 (143)
	4 (102)	3.6 (91)	0.97 (25)	1.31 (33)	5.65 (143)
ASME B16.5 (ANSI) 300	2 (51)	2.12 (54)	0.97 (25)	1.31 (33)	5.65 (143)
	3 (76)	3.6 (91)	0.97 (25)	1.31 (33)	5.65 (143)
	4 (102)	3.6 (91)	0.97 (25)	1.31 (33)	5.65 (143)
DIN 2501 PN 10–40	DN 50	2.4 (61)	0.97 (25)	1.31 (33)	5.65 (143)
DIN 2501 PN 25/40	DN 80	3.6 (91)	0.97 (25)	1.31 (33)	5.65 (143)
	DN 100	3.6 (91)	0.97 (25)	1.31 (33)	5.65 (143)

Dimensions are in inches (millimeters).

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

# Options

## Standard configuration

Unless otherwise specified, transmitter is shipped as follows:

Engineering units	inH <sub>2</sub> O (Ranges 1, 2, and 3)
Differential/Gage	psi (Ranges 4–5)
2051TA	psi (all ranges)
4 mA (1 Vdc) <sup>(1)</sup>	0 (engineering units)
20 mA (5 Vdc) <sup>(1)</sup> :	Upper range limit
Output:	Linear
Flange type	Specified model code option
Flange material	Specified model code option
O-ring material	Specified model code option
Drain/vent:	Specified model code option
LCD display	Installed or none
Alarm <sup>(1)</sup>	High
Software tag	(Blank)

1. Not applicable to FOUNDATION Fieldbus, PROFIBUS PA, or Wireless.

## Custom configuration<sup>(1)</sup>

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

- Output information
- Transmitter information
- LCD display configuration
- Hardware selectable information
- Signal selection
- Wireless information
- Scaled variable
- and more

Refer to the Rosemount 2051 [Configuration Data Sheet](#) and the Rosemount 2051 Wireless [Configuration Data Sheet](#).

1. Not applicable to FOUNDATION Fieldbus or PROFIBUS PA Protocols.

## Tagging (3 options available)

Standard SST hardware tag is permanently affixed on transmitter. Tag character height is 0.125-in. (3,18 mm), 84 characters maximum.

Tag may be wired to the transmitter nameplate upon request, 85 characters maximum.

Tag may be stored in transmitter memory. Character limit is dependent on Protocol.

- HART Revision 5: 8 characters
- HART Revision 7 and Wireless: 32 characters
- FOUNDATION Fieldbus: 32 characters
- PROFIBUS PA: 32 characters

## Commissioning tag<sup>(1)</sup>

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

1. Only applicable to FOUNDATION Fieldbus.

## Optional Rosemount 304, 305, or 306 Integral manifolds

Factory assembled to Rosemount 2051C and Rosemount 2051T transmitters. Refer to the Rosemount Manifolds [Product Data Sheet](#) for additional information.

## Other seals

Refer to the Rosemount DP Level Transmitters and 1199 Seal Systems [Product Data Sheet](#) for additional information.

## Output information

Output range points must be the same unit of measure.

Available units of measure include:

Pressure		
atm	mmH <sub>2</sub> O @ 4 °C <sup>(1)</sup>	ftH <sub>2</sub> O @ 4 °C <sup>(1)</sup>
mbar	ftH <sub>2</sub> O	psi
bar	inH <sub>2</sub> O @ 60 °F <sup>(1)</sup>	torr
inH <sub>2</sub> O	Psf <sup>(1)</sup>	cmH <sub>2</sub> O @ 4 °C <sup>(1)</sup>
inHg	g/cm <sup>2</sup>	cmHg @ 0 °C <sup>(1)</sup>
hPa <sup>(1)</sup>	kg/cm <sup>2</sup>	ftH <sub>2</sub> O @ 60 °F <sup>(1)</sup>
mHg @ 0 °C <sup>(1)</sup>	Pa	mH <sub>2</sub> O @ 4 °C <sup>(1)</sup>
inH <sub>2</sub> O @ 4 °C <sup>(1)</sup>	kPa	mHg @ 0 °C <sup>(1)</sup>
mmH <sub>2</sub> O	MPa <sup>(1)(2)</sup>	hPa <sup>(1)</sup>
mmHg	kg/m <sup>2(1)</sup>	
Flow <sup>(2)(3)</sup>		
bbbl	kg	cm <sup>3</sup>
ft <sup>3</sup>	lb	m <sup>3</sup>
gal	L	ton
Level <sup>(3)</sup>		
%	ft	cm
in	mm	

1. Available with enhanced 2051 and wireless.
2. Available on PROFIBUS PA.
3. All flow units are available per second, minute, hour or day.

## Display and interface options

### M4 Digital display with LOI

- Available for 4–20 mA HART, 4–20 mA HART Low Power, and PROFIBUS PA

### M5 Digital display

- 2-line, 5-digit LCD display for 4–20 mA HART
- 2-line, 5-digit LCD display for 1–5 Vdc HART Low Power
- 2-line, 8-digit LCD display for FOUNDATION Fieldbus and PROFIBUS PA
- 3-line, 7-digit LCD display for wireless
- Direct reading of digital data for higher accuracy
- Displays user-defined flow, level, volume, or pressure units
- Displays diagnostic messages for local troubleshooting
- 90-degree rotation capability for easy viewing

## Configuration buttons<sup>(1)</sup>

Rosemount 2051 requires option **D4** (analog zero and span), **DZ** (digital trim), **M4** (LOI) for local configuration buttons.

## Transient protection

### T1 Integral transient protection terminal block

Meets IEEE C62.41, category location B

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

## Bolts for flanges and adapters

Standard material is plated carbon steel per ASTM A449, type 1

### L4 Austenitic 316 stainless steel bolts

### L5 ASTM A 193, Grade B7M bolts

### L6 Alloy K-500 bolts

### L8 ASTM A 193 Class 2, Grade B8M bolts

## Conduit plug

### DO 316 SST conduit plug

Single 316 SST conduit plug replaces carbon steel plug

## Rosemount 2051C coplanar flange and 2051T bracket option

### B4 Bracket for 2-in. pipe or panel mounting

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

## Rosemount 2051C traditional flange bracket options

- B1** Bracket for 2-in. pipe mounting
  - For use with the traditional flange option
  - Bracket for mounting on 2-in. pipe
  - Carbon steel construction with carbon steel bolts
  - Coated with polyurethane paint
- B2** Bracket for panel mounting
  - For use with the traditional flange option
  - Bracket for mounting transmitter on wall or panel
  - Carbon steel construction with carbon steel bolts
  - Coated with polyurethane paint
- B3** Flat bracket for 2-in. pipe mounting
  - For use with the traditional flange option
  - Bracket for vertical mounting of transmitter on 2-in. pipe
  - Carbon steel construction with carbon steel bolts
  - Coated with polyurethane paint
- B7** B1 bracket with SST bolts
  - Same bracket as the B1 option with Series 300 stainless steel bolts
- B8** B2 bracket with SST bolts
  - Same bracket as the B2 option with Series 300 stainless steel bolts
- B9** B3 bracket with SST bolts
  - Same bracket as the B3 option with Series 300 stainless steel bolts
- BA** Stainless steel B1 bracket with SST bolts
  - B1 bracket in stainless steel with Series 300 stainless steel bolts
- BC** Stainless steel B3 bracket with SST bolts
  - B3 bracket in stainless steel with Series 300 stainless steel bolts

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