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Rosemount Annubar® DP Flowmeters

Models: 3051SFA, 3095MFA, 3051CFA, 2051CFA, 485 and 585

- Energy savings gained through minimal permanent pressure loss
- Innovative T-shaped design that increases accuracy by reducing signal noise
- Integral RTD available for fully compensated mass flow measurement with a single pipe penetration



Rosemount Compact Orifice DP Flowmeters

Models: 3051SFC, 3095MFC, 3051CFC, 2051CFC, 405C and 405P

- Reduce straight pipe requirements to 2D upstream and downstream from any flow disturbance
- Reduce installation costs compared to traditional orifice plates with the direct mount, compact design
- Install between standard raised-face flanges, up to a Class 600 (PN100) rating
- Integral RTD enables fully compensated mass flow measurement with a single pipe penetration



Rosemount Integral Orifice DP Flowmeters

Models: 3051SFP, 3095MFP, 3051CFP, 2051CFP and 1195

- Improves accuracy and repeatability in ½-in., 1-in. and 1 ½-in. line sizes
- Self-centering plate design eliminates installation errors that are magnified in small line sizes
- Precision honed pipe sections to increase measurement accuracy



Rosemount Orifice Plate Primary Element Systems

Models: 1595, 1495 and 1496

- Reduce straight pipe requirements to 2D upstream and downstream with the 1595 Conditioning Plate
- Comprehensive offering of orifice plate configurations and flange unions
- Restriction orifice plates available



Rosemount Vortex Flowmeter Series

Models: 8800D, 8800DR, 8800DD and 8800

- Available with MultiVariable output and temperature compensated mass flow for saturated steam
- Reducer™ Vortex extends measurable flow range, reduces installations costs, and minimizes project risk.
- All-welded, non-clog design eliminates ports and gaskets.
- Advanced filtering and diagnostics provides vibration immunity and in-situ troubleshooting.
- The CriticalProcess™ Vortex increases process availability with the unique isolated sensor design



Rosemount Magnetic Flowmeter Series

Models: 8732, 8712, 8705, 8707, 8711 and 8721

- Rosemount 8712H/8707 High-Signal System - Pulsed DC solutions for the most demanding flow measurement applications
- Remote-mount or Integral-mount design, backlit display, easy to use Local Operator Interface and explosion-proof housing
- Available with HART®, FOUNDATION™ fieldbus, or Profibus-PA, I.S. Outputs, Device Diagnostics and SMART™ Meter Verification to improve reliability and performance



Table Flow-1. Flow Product Selection Chart

Flow Product Selection Chart	Annubar DP Flowmeters	Compact DP Flowmeters	Integral Orifice DP Flowmeters	Orifice Plate Assemblies (Models 1595, 1495/6)	Magnetic Flowmeter Systems	Vortex Flowmeter Assemblies
Applications						
Gas and Steam	●	●	●	●	X	●
Clean Liquid	●	●	●	●	●	●
Dirty Liquid	●	●	●	●	●	●
Viscous Liquid	X	●	●	●	●	●
Slurry	X	X	X	X	●	●
Other Measurement Considerations						
Line Sizes	2" - 96" 50 - 2400 mm	½" - 12" 15 - 300 mm	½" - 1 ½" 15 - 40 mm	2" - 24" 50-600 mm	0.15" - 36" 4 - 900 mm	½" - 12" 15 - 300 mm
Flow Accuracy	Up to 0.8% mass flow rate	Up to 0.75% mass flow rate	Up to 0.9% mass flow rate	Discharge coeff. +/- 0.50%	Up to 0.15% of rate	Up to 0.65% of rate
Flow Turndown	14:1	14:1	14:1	N/A	40:1	35:1
Straight Run Req.	8 D	2-10 D	10 D	2-10 D	0-5 D	10 D
Pressure Loss	Low	Medium	Medium	Medium	None	Medium

- Recommended
- May be suitable
- X Not recommended

Rosemount DP Flowmeters and Primary Elements

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



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DP Flowmeter Selection Guide

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



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

- Up to 0.80% mass flow rate accuracy
- Multivariable capabilities allow for real time fully compensated mass and energy flow
- Advanced diagnostics predict and prevent abnormal process conditions
- Installation ready wireless flow solution
- Ultra for Flow measures %-of-reading performance over 14:1 flow turndown
- 10-year stability, 12-year warranty



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

- Up to 1.65% volumetric flow accuracy at 8:1 turndown
- Available with HART®, FOUNDATION™ fieldbus, and Profibus Protocols
- 5-year stability



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

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

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Rosemount DP Flow

Rosemount Annubar Primary Element Technology

- Energy savings gained through minimal permanent pressure loss
- Innovative T-shape design that increases accuracy to $\pm 0.75\%$ of flow rate
- Variety of sensor materials for optimal compatibility with the process fluid
- Handles applications where conditions exceed the structural limitations of other primary elements
- Symmetrical sensor design allows bi-directional flow measurement



Rosemount Conditioning Orifice Plate Technology

- Reduce straight pipe requirements to two diameters upstream and downstream from any flow disturbance
- Discharge coefficient uncertainty of $\pm 0.5\%$
- Integral thermowell enables fully compensated mass flow with a single pipe penetration
- Reduce installation costs compared to traditional orifice plates with the compact design
- Conditioning orifice plate is based on AGA, ASME and ISO industry standards
- Available in various plate styles providing installation flexibility



Rosemount Integral Orifice Plate Technology

- Improves accuracy and repeatability in $\frac{1}{2}$ -in., 1-in., and 1 $\frac{1}{2}$ -in. line sizes
- Self-centering plate design eliminates installation errors that are magnified in small line sizes
- Precision honed pipe sections allow accuracy of up to $\pm 0.75\%$ of flow rate
- Installation flexibility with numerous process connections
- Integral thermowell enables fully compensated mass flow



Rosemount 3051SF Flowmeter Series



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

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

Additional Information

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Rosemount 3051SFA Annubar Flowmeter

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

Table 1. Rosemount 3051SFA Annubar Flowmeter Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.

The Expanded offering is subject to additional delivery lead time.

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

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Rosemount DP Flow

Table 1. Rosemount 3051SFA Annubar Flowmeter Ordering Information

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

Rosemount DP Flow

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Table 1. Rosemount 3051SFA Annubar Flowmeter Ordering Information

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

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Table 1. Rosemount 3051SFA Annubar Flowmeter Ordering Information

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Isolation Valve for Flo-Tap Models				D	1-7	
Standard						Standard
0 ⁽¹⁾	Not Applicable or Customer Supplied			•	•	★
Expanded						
1	Gate Valve, Carbon Steel			•	•	
2	Gate Valve, Stainless Steel			•	•	
5	Ball Valve, Carbon Steel			•	•	
6	Ball Valve, Stainless Steel			•	•	
Temperature Measurement						
Standard						Standard
T ⁽³⁾	Integral RTD – not available with Flanged model greater than class 600#			•	•	★
0 ⁽⁴⁾	No Temperature Sensor			•	•	★
Expanded						
R ⁽³⁾	Remote Thermowell and RTD			•	•	
Transmitter Connection Platform						
Standard						Standard
3	Direct-mount, Integral 3-valve Manifold– not available with Flanged model greater than class 600			•	•	★
5	Direct -mount, 5-valve Manifold – not available with Flanged model greater than class 600			•	•	★
7	Remote-mount NPT Connections (¹ / ₂ -in. FNPT)			•	•	★
Expanded						
6	Direct-mount, High Temperature 5-valve Manifold – not available with Flanged model greater than class 600			•	•	
8	Remote-mount SW Connections (¹ / ₂ -in.)			•	•	
Differential Pressure Range						
Standard						Standard
1	0 to 25 in H ₂ O (0 to 62,3 mbar)			•	•	★
2	0 to 250 in H ₂ O (0 to 623 mbar)			•	•	★
3	0 to 1000 in H ₂ O (0 to 2,5 bar)			•	•	★
Static Pressure Range						
Standard						Standard
A ⁽⁵⁾	None			•	•	★
D	Absolute 0.5 to 800 psia (0,033 to 55,2 bar)			—	•	★
E ⁽⁶⁾	Absolute 0.5 to 3626 psia (0,033 to 250 bar)			—	•	★
J	Gage -14.2 to 800 psig (-0,979 to 55,2 bar)			—	•	★
K ⁽⁶⁾	Gage -14.2 to 3626 psig (-0,979 to 250 bar)			—	•	★
Transmitter Output						
Standard						Standard
A	4–20 mA with digital signal based on HART protocol			•	•	★
F	FOUNDATION fieldbus protocol (requires PlantWeb housing)			•	—	★
X ⁽⁷⁾	Wireless (Requires wireless options and Wireless Plantweb housing)			•	—	★
Transmitter Housing Style		Material	Conduit Entry Size			
Standard						Standard
00	None (Customer-supplied electrical connection)			•	—	★
1A	PlantWeb Housing		Aluminum ¹ / ₂ -14 NPT	•	•	★
1B	PlantWeb Housing		Aluminum M20 x 1.5	•	•	★
1J	PlantWeb Housing		SST ¹ / ₂ -14 NPT	•	•	★
1K	PlantWeb Housing		SST M20 x 1.5	•	•	★
2A	Junction Box Housing		Aluminum ¹ / ₂ -14 NPT	•	—	★
2B	Junction Box Housing		Aluminum M20 x 1.5	•	—	★
2E	Junction Box housing with output for remote display and interface		Aluminum ¹ / ₂ -14 NPT	•	—	★

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Table 1. Rosemount 3051SFA Annubar Flowmeter Ordering Information

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

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

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

Other Options (Include with selected model number)

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

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Table 1. Rosemount 3051SFA Annubar Flowmeter Ordering Information

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Material Examination		D	1-7	
Expanded				
V2	Radiographic Examination	•	•	
Flow Calibration				
Expanded				
W1	Flow Calibration (Average K)	•	•	
Special Inspection				
Standard				Standard
QC1	Visual and Dimensional Inspection with Certificate	•	•	★
QC7	Inspection and Performance Certificate	•	•	★
Surface Finish				
Standard				Standard
RL	Surface finish for Low Pipe Reynolds Number in Gas and Steam	•	•	★
RH	Surface finish for High Pipe Reynolds Number in Liquid	•	•	★
Material Traceability Certification				
Standard				Standard
Q8 ⁽¹³⁾	Material Traceability Certificate per EN 10204:2004 3.1	•	•	★
Code Conformance				
Expanded				
J2 ⁽¹⁴⁾	ANSI B31.1	•	•	
J3 ⁽¹⁴⁾	ANSI B31.3	•	•	
Material Conformance				
Expanded				
J5 ⁽¹⁵⁾	NACE MR-0175 / ISO 15156	•	•	
Country Certification				
Standard				Standard
J6	European Pressure Directive (PED)	•	•	★
Expanded				
J1	Canadian Registration	•	•	
Installed in Flanged Pipe Spool Section				
Expanded				
H3	150# Flanged Connection with Rosemount Standard Length and Schedule	•	•	
H4	300# Flanged Connection with Rosemount Standard Length and Schedule	•	•	
H5	600# Flanged Connection with Rosemount Standard Length and Schedule	•	•	
Instrument Connections for Remote Mount Option				
Standard				Standard
G2	Needle Valves, Stainless Steel	•	•	★
G6	OS&Y Gate Valve, Stainless Steel	•	•	★
Expanded				
G1	Needle Valves, Carbon Steel	•	•	
G3	Needle Valves, Alloy C-276	•	•	
G5	OS&Y Gate Valve, Carbon Steel	•	•	
G7	OS&Y Gate Valve, Alloy C-276	•	•	
Special Shipment				
Standard				Standard
Y1	Mounting Hardware Shipped Separately	•	•	★
Special Dimensions				
Expanded				
VM	Variable Mounting	•	•	
VT	Variable Tip	•	•	
VS	Variable length Spool Section	•	•	
Transmitter Calibration Certification				
Standard				Standard
Q4	Calibration Certificate for Transmitter	•	•	★

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Table 1. Rosemount 3051SFA Annubar Flowmeter Ordering Information

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

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Rosemount DP Flow

Table 1. Rosemount 3051SFA Annubar Flowmeter Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.

The Expanded offering is subject to additional delivery lead time.

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

(1) Provide the "A" dimension for Flanged (page 115), Flange-Lok (page 114), and Threaded Flo-Tap (page 118) models. Provide the "B" dimension for Flange Flo-Tap models (page 117).

(2) Available in remote mount applications only.

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

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

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

(6) For Measurement Type 1, 2, 5, and 6 with DP range 1, absolute limits are 0.5 to 2000 psi (0.03 to 137.9 bar) and gage limits are -14.2 to 2000 psig (-0.98 to 137.9 bar).

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

(8) Available with output code A only.

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

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

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

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

- (13) Instrument Connections for Remote Mount Options and Isolation Valves for Flo-tap Models are not included in the Material Traceability Certification.*
- (14) Not available with Transmitter Connection Platform 6.*
- (15) Materials of Construction comply with metallurgical requirements within NACE MR0175/ISO 15156 for sour oil field production environments. Environmental limits apply to certain materials. Consult latest standard for details. Selected materials also conform to NACE MR0103 for sour refining environments.*
- (16) Not available with M20 or G ½ conduit entry size.*
- (17) Not available with housing code 7J.*
- (18) Not available with output code X.*
- (19) Not available with output code F, option code DA2, or option code QT.*
- (20) Cable supplied is Belden 3084A, rated for ambient temperatures up to 167°F (75°C).*
- (21) Not available with Housing code 00, 5A, or 7J. External ground screw assembly (option code D4) is included with the T1 option. The T1 option is not needed with FISCO Product Certifications, transient protection is included with the FISCO Product Certification code IA.*
- (22) Includes Hardware Adjustments (option code D1) as standard.*
- (23) Requires Rosemount Engineering Assistant version 5.5.1 to configure.*
- (24) Not available with Output Protocol code F.*
- (25) Not available with Housing code 00, 5A, or 7J. Available with Intrinsically Safe approvals only. For FM Intrinsically Safe, Division 2 (option code I5) or FM FISCO Intrinsically Safe (option code IE), install in accordance with Rosemount drawing 03151-1009 to maintain outdoor rating (NEMA 4X and IP66).*

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Rosemount DP Flow



Rosemount 3051SFC Compact Orifice Flowmeter

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

Table 2. Rosemount 3051SFC Compact Orifice Flowmeter Ordering Information

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

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

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Table 2. Rosemount 3051SFC Compact Orifice Flowmeter Ordering Information

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

Transmitter Connection Platform				D	1-7	
Standard						Standard
3	Direct-mount, 3-valve Integral Manifold, SST			•	•	★
7	Remote-mount, 1/4-in. NPT Connections			•	•	★
Differential Pressure Range						
Standard						Standard
1	0 to 25 inH ₂ O (0 to 62,3 mbar)			•	•	★
2	0 to 250 inH ₂ O (0 to 623 mbar)			•	•	★
3	0 to 1000 inH ₂ O (0 to 2,5 bar)			•	•	★
Static Pressure Range						
Standard						Standard
A ⁽⁵⁾	None			•	•	★
D	Absolute 0.5 to 800 psia (0,033 to 55,2 bar)			—	•	★
E ⁽⁶⁾	Absolute 0.5 to 3626 psia (0,033 to 250 bar)			—	•	★
J	Gage -14.2 to 800 psig (-0,979 to 55,2 bar)			—	•	★
K ⁽⁶⁾	Gage -14.2 to 3626 psig (-0,979 to 250 bar)			—	•	★
Transmitter Output						
Standard						Standard
A	4–20 mA with digital signal based on HART protocol			•	•	★
F	FOUNDATION fieldbus protocol (Requires PlantWeb housing)			•	—	★
X ⁽⁷⁾	Wireless (Requires wireless options and wireless PlantWeb housing)			•	—	★
Transmitter Housing Style			Material	Conduit Entry Size		
Standard						Standard
1A	PlantWeb Housing	Aluminum	1/2-14 NPT	•	•	★
1B	PlantWeb Housing	Aluminum	M20 x 1.5	•	•	★
1J	PlantWeb Housing	SST	1/2-14 NPT	•	•	★
1K	PlantWeb Housing	SST	M20 x 1.5	•	•	★
2A	Junction Box Housing	Aluminum	1/2-14 NPT	•	—	★
2B	Junction Box Housing	Aluminum	M20 x 1.5	•	—	★
2E	Junction Box housing with output for remote display and interface	Aluminum	1/2-14 NPT	•	—	★
2F	Junction Box housing with output for remote display and interface	Aluminum	M20 x 1.5	•	—	★
2J	Junction Box Housing	SST	1/2-14 NPT	•	—	★
2M	Junction Box housing with output for remote display and interface	SST	1/2-14 NPT	•	—	★
5A	Wireless PlantWeb housing	Aluminum	1/2-14 NPT	•	—	★
5J	Wireless PlantWeb housing	SST	1/2-14 NPT	•	—	★
7J ⁽⁷⁾⁽⁸⁾	Quick Connect (A size Mini, 4-pin male termination)			•	—	★
Expanded						
1C	PlantWeb Housing	Aluminum	G1/2	•	•	
1L	PlantWeb Housing	SST	G1/2	•	•	
2C	Junction Box Housing	Aluminum	G1/2	•	—	
2G	Junction Box housing with output for remote display and interface	Aluminum	G1/2	•	—	
Transmitter Performance Class						
Standard						Standard
3051S MultiVariable SuperModule, Measurement Types 1, 2, 5, and 6				•	•	
3	Ultra for Flow: 0.55% flow rate accuracy, 14:1 flow turndown, 10-yr stability. limited 12-yr warranty			•	•	★
5	Classic MV: 0.6% flow rate accuracy, 8:1 flow turndown, 5-yr stability			—	•	★

Table 2. Rosemount 3051SFC Compact Orifice Flowmeter Ordering Information

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

Standard				Standard
3051S Single Variable SuperModule, Measurement Types 3, 4, 7, and D		•	•	
1	Ultra: 0.85% flow rate accuracy, 8:1 flow turndown, 10-yr stability, limited 12-yr warranty	•	—	★
2	Classic: 1.05% flow rate accuracy, 8:1 flow turndown, 5-yr stability	•	—	★
3 ⁽⁹⁾	Ultra for Flow: 0.55% flow rate accuracy, 14:1 flow turndown, 10-yr stability, limited 12-yr warranty	•	•	★

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

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

Other Options (Include with selected model number)

Installation Accessories				
Standard				Standard
A	ANSI Alignment Ring (150#) (Only required for 10-in. (250 mm) and 12-in. (300mm) line sizes)	•	•	★
C	ANSI Alignment Ring (300#) (Only required for 10-in. (250 mm) and 12-in. (300mm) line sizes)	•	•	★
D	ANSI Alignment Ring (600#) (Only required for 10-in. (250 mm) and 12-in. (300mm) line sizes)	•	•	★
G	DIN Alignment Ring (PN 16)	•	•	★
H	DIN Alignment Ring (PN 40)	•	•	★
J	DIN Alignment Ring (PN 100)	•	•	★
Expanded				
B	JIS Alignment Ring (10K)	•	•	
R	JIS Alignment Ring (20K)	•	•	
S	JIS Alignment Ring (40K)	•	•	
Remote Adapters				
Standard				Standard
E	Flange adapters 316 SST (1/2-in. NPT)	•	•	★
High Temperature Applications				
Expanded				
T	Graphite Valve Packing (Tmax = 850 °F)	•	•	
Flow Calibration				
Expanded				
WC	Discharge Coefficient Verification (3 point)	•	•	
WD	Discharge Coefficient Verification (10 point)	•	•	
Pressure Testing				
Expanded				
P1	Hydrostatic Testing with Certificate	•	•	
Special Cleaning				
Expanded				
P2	Cleaning for special with Certificate	•	•	
PA	Cleaning per ASTM G93 Level D (section 11.4)	•	•	
Special Inspection				
Standard				Standard
QC1	Visual and Dimensional Inspection with Certificate	•	•	★
QC7	Inspection and Performance Certificate	•	•	★

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Table 2. Rosemount 3051SFC Compact Orifice Flowmeter Ordering Information

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

Transmitter Calibration Certification				
Standard				Standard
Q4	Calibration Certificate for Transmitter	•	•	★
QP	Calibration Certificate and Tamper Evident Seal	•	•	★
Quality Certification for Safety		D	1-7	
Standard				Standard
QS ⁽¹²⁾⁽¹³⁾	Certificate of FMEDA data	•	—	★
QT ⁽¹²⁾⁽¹³⁾⁽¹⁶⁾	Safety Certified to IEC 61508 with certificate of FMEDA data	•	—	★
Material Traceability Certifications				
Standard				Standard
Q8	Material Traceability Certification per EN 10204:2004 3.1	•	•	★
Code Conformance				
Expanded				
J2	ANSI / ASME B31.1	•	•	
J3	ANSI / ASME B31.3	•	•	
J4	ANSI / ASME B31.8	•	•	
Material Conformance				
Expanded				
J5 ⁽¹⁴⁾	NACE MR-0175-91 / ISO 15156	•	•	
Country Certification				
Expanded				
J1	Canadian Registration	•	•	
Product Certifications				
Standard				Standard
E1	ATEX Flameproof	•	•	★
I1	ATEX Intrinsic Safety	•	•	★
IA	ATEX FISCO Intrinsic Safety; for FOUNDATION fieldbus protocol only	•	—	★
N1	ATEX Type n	•	•	★
ND	ATEX Dust	•	•	★
K1	ATEX Flameproof, Intrinsic Safety, Type n, Dust (combination of E1, I1, N1, and ND)	•	•	★
E4	TIIS Flameproof	•	•	★
E5	FM Explosion-proof, Dust Ignition-proof	•	•	★
I5	FM Intrinsically Safe, Division 2	•	•	★
K5	FM Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E5 and I5)	•	•	★
E6 ⁽¹⁵⁾	CSA Explosion-proof, Dust Ignition-proof, Division 2	•	•	★
I6	CSA Intrinsically Safe	•	•	★
K6 ⁽¹⁵⁾	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E6 and I6)	•	•	★
E7	IECEX Flameproof, Dust Ignition-proof	•	•	★
I7	IECEX Intrinsic Safety	•	•	★
N7	IECEX Type n	•	•	★
K7	IECEX Flameproof, Dust Ignition-proof, Intrinsic Safety, Type n (combination of E7, I7, and N7)	•	•	★
E3	China Flameproof	•	•	★
I3	China Intrinsic Safety	•	•	★
KA ⁽¹⁵⁾	ATEX and CSA Flameproof, Intrinsically Safe, Division 2 (combination of E1, I1, E6, and I6)	•	•	★
KB ⁽¹⁵⁾	FM and CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E5, E6, I5, and I6)	•	•	★
KC	FM and ATEX Explosion-proof, Intrinsically Safe, Division 2 (combination of E5, E1, I5, and I1)	•	•	★
KD ⁽¹⁵⁾	FM, CSA, and ATEX Explosion-proof, Intrinsically Safe (combination of E5, I5, E6, I6, E1, and I1)	•	•	★

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Table 2. Rosemount 3051SFC Compact Orifice Flowmeter Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.

The Expanded offering is subject to additional delivery lead time.

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

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

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

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

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

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- (5) Required for Measurement Type codes 3, 4, 7, and D.
- (6) For Measurement Type 1, 2, 5, and 6 with DP range 1, absolute limits are 0.5 to 2000 psi (0,03 to 137,9 bar) and gage limits are -14.2 to 2000 psig (-0,98 to 137,9 bar).
- (7) Available approvals are FM Intrinsically Safe, Division 2 (option code I5), CSA Intrinsically Safe (option code I6), ATEX Intrinsic Safety (option code I1), and IECEx Intrinsic Safety (option code I7).
- (8) Available with output code A only.
- (9) This option is only available with differential pressure ranges 2 and 3, and silicone fill fluid.
- (10) Long-Life Power Module must be shipped separately, order Part #00753-9220-0001.
- (11) Long-life Power Module must be shipped separately, order Part No. 00753-9220-0001.
- (12) Not available with Output Protocol code F.
- (13) Not available with output code X.
- (14) Materials of Construction comply with metallurgical requirements within NACE MR0175/ISO for sour oil field production environments. Environmental limits apply to certain materials. Consult latest standard for details. Selected materials also conform to NACE MR0103 for sour refining environments.
- (15) Not available with M20 or G ½ conduit entry size.
- (16) Not available with housing code 7J.
- (17) Not available with output code F, option code DA2, or option code QT.
- (18) Cable supplied is Belden 3084A, rated for ambient temperatures up to 167°F (75°C).
- (19) Not available with Housing code 00, 5A, or 7J. External ground screw assembly (option code D4) is included with the T1 option. The T1 option is not needed with FISCO Product Certifications, transient protection is included with the FISCO Product Certification code IA.
- (20) Includes Hardware Adjustments (option code D1) as standard.
- (21) Requires Rosemount Engineering Assistant version 5.5.1 to configure.
- (22) Not available with Housing code 00, 5A, or 7J. Available with Intrinsically Safe approvals only. For FM Intrinsically Safe, Division 2 (option code I5) or FM FISCO Intrinsically Safe (option code IE), install in accordance with Rosemount drawing 03151-1009 to maintain outdoor rating (NEMA 4X and IP66).

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Rosemount DP Flow



Rosemount 3051SFP Integral Orifice Flowmeter

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

Table 3. Rosemount 3051SFP Integral Orifice Flowmeter Ordering Information

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

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

Rosemount DP Flow

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Table 3. Rosemount 3051SFP Integral Orifice Flowmeter Ordering Information

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

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

Table 3. Rosemount 3051SFP Integral Orifice Flowmeter Ordering Information

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

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

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

Update Rate, Operating Frequency and Protocol						
Standard						Standard
WA	User Configurable Update Rate			•	—	★
Operating Frequency and Protocol						
Standard						
3	2.4 GHz DSSS, WirelessHART			•	—	★
Omnidirectional Wireless Antenna						
Standard						
WK ⁽⁷⁾	Long Range, Integral Antenna			•	—	★
SmartPower™						
Standard						
1 ⁽⁸⁾	Power Module Adapter, Intrinsically Safe (Power Module separate)			•	—	★

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Table 3. Rosemount 3051SFP Integral Orifice Flowmeter Ordering Information

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

Other Options (Include with selected model number)

Transmitter / Body Bolt Material		D	1-7	
Expanded				
G	High temperature Option (850 °F (454 °C))	•	•	
Temperature Sensor				
Standard				Standard
T ⁽⁹⁾	Thermowell and RTD	•	•	★
Optional Connection				
Standard				Standard
G1	DIN 19231 Transmitter Connection	•	•	★
Pressure Testing				
Expanded				
P1 ⁽¹⁰⁾	Hydrostatic Testing with Certificate	•	•	
Special Cleaning				
Expanded				
P2	Cleaning for Special Services	•	•	
PA	Cleaning per ASTM G93 Level D (Section 11.4)	•	•	
Material Testing				
Expanded				
V1	Dye Penetrant Exam	•	•	
Material Examination				
Expanded				
V2	Radiographic Examination (available only with Process Connection code W1, W3, and W6)	•	•	
Flow Calibration				
Expanded				
WD ⁽¹¹⁾	Discharge Coefficient Verification	•	•	
WZ ⁽¹¹⁾	Special Calibration	•	•	
Special Inspection				
Standard				Standard
QC1	Visual and Dimensional Inspection with Certificate	•	•	★
QC7	Inspection and Performance Certificate	•	•	★
Material Traceability Certification				
Standard				Standard
Q8	Material certification per EN 10204:2004 3.1	•	•	★
Code Conformance				
Expanded				
J2 ⁽¹²⁾	ANSI / ASME B31.1	•	•	
J3 ⁽¹²⁾	ANSI / ASME B31.3	•	•	
J4 ⁽¹²⁾	ANSI / ASME B31.8	•	•	
Materials Conformance				
Expanded				
J5 ⁽¹³⁾	NACE MR-0175 / ISO 15156	•	•	
Country Certification				
Standard				Standard
J6	European Pressure Directive (PED)	•	•	★
Expanded				
J1	Canadian Registration	•	•	
Transmitter Calibration Certification				
Standard				Standard
Q4	Calibration Certificate for Transmitter	•	•	★
Quality Certification for Safety				
Standard				Standard
QS ⁽¹⁴⁾⁽¹⁵⁾	Certificate of FMEDA data	•	—	★
QT ⁽¹⁴⁾⁽¹⁵⁾⁽¹⁷⁾	Safety-certified to IEC 61508 with Certificate of FMEDA data	•	—	★

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Table 3. Rosemount 3051SFP Integral Orifice Flowmeter Ordering Information

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

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

Rosemount DP Flow

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Table 3. Rosemount 3051SFP Integral Orifice Flowmeter Ordering Information

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

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

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

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

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

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

(5) Only available with output code A.

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

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

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

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

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

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

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

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

(14) Not available with output code X.

(15) Not available with Output Protocol code F.

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

(17) Not available with housing code 7J.

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

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

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

(21) Includes Hardware Adjustments (option code D1) as standard.

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

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

3051SF Series Specifications

3051SF PERFORMANCE SPECIFICATIONS

Performance assumptions include: measured pipe I.D, transmitter is trimmed for optimum flow accuracy, and performance is dependent on application parameters.

Table 4. MultiVariable Flow Performance - Flow Reference Accuracy (Measurement Type 1)⁽¹⁾

3051SFA Annubar Flowmeter			
		Classic MV (8:1 flow turndown)	Ultra for Flow (14:1 flow turndown)
Ranges 2-3		±1.15% of Flow Rate	±0.80% of Flow Rate
3051SFC Compact Orifice Flowmeter - Conditioning Option C			
		Classic MV (8:1 flow turndown)	Ultra for Flow (14:1 flow turndown)
Ranges 2-3	$\beta = 0.4$	±1.10% of Flow Rate	±0.75% of Flow Rate
	$\beta = 0.65$	±1.45% of Flow Rate	±1.15% of Flow Rate
3051SFC Compact Orifice Flowmeter - Orifice Type Option P (2-in. to 12-in. line sizes)			
		Classic MV (8:1 flow turndown)	Ultra for Flow (14:1 flow turndown)
Ranges 2-3	$\beta = 0.4$	±1.30% of Flow Rate	±1.25% of Flow Rate
	$\beta = 0.65$	±1.30% of Flow Rate	±1.25% of Flow Rate
3051SFP Integral Orifice Flowmeter			
		Classic MV (8:1 flow turndown)	Ultra for Flow (14:1 flow turndown)
Ranges 2-3	$\beta < 0.1$	±2.55% of Flow Rate	±2.50% of Flow Rate
	$0.1 < \beta < 0.2$	±1.60% of Flow Rate	±1.35% of Flow Rate
	$0.2 < \beta < 0.6$	±1.25% of Flow Rate	±0.90% of Flow Rate
	$0.6 < \beta < 0.8$	±1.80% of Flow Rate	±1.60% of Flow Rate

(1) Measurement Types 2 - 4 assume that the unmeasured variables are constant. Additional uncertainty will depend on the variation in the unmeasured variables.

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

3051SFA Annubar Flowmeter				
		Classic (8:1 flow turndown)	Ultra (8:1 flow turndown)	Ultra for Flow (14:1 flow turndown)
Ranges 2-3		±1.4% of Flow Rate	±0.95% of Flow Rate	±0.80% of Flow Rate
3051SFC Compact Orifice Flowmeter – Conditioning Option C				
		Classic (8:1 flow turndown)	Ultra (8:1 flow turndown)	Ultra for Flow (14:1 flow turndown)
Ranges 2-3	$\beta = 0.4$	±1.4% of Flow Rate	±0.9% of Flow Rate	±0.75% of Flow Rate
	$\beta = 0.65$	±1.65% of Flow Rate	±1.25% of Flow Rate	±1.15% of Flow Rate
3051SFC Compact Orifice Flowmeter – Orifice Type Option P (2-in. to 12-in. line sizes)				
		Classic (8:1 flow turndown)	Ultra (8:1 flow turndown)	Ultra for Flow (14:1 flow turndown)
Ranges 2-3	$\beta = 0.4$	±1.80% of Flow Rate	±1.45% of Flow Rate	±1.35% of Flow Rate
	$\beta = 0.65$	±1.80% of Flow Rate	±1.45% of Flow Rate	±1.35% of Flow Rate
3051SFP Integral Orifice Flowmeter				
		Classic (8:1 flow turndown)	Ultra (8:1 flow turndown)	Ultra for Flow (14:1 flow turndown)
Ranges 2-3	$\beta < 0.1$	±2.70% of Flow Rate	±2.65% of Flow Rate	±2.60% of Flow Rate
	$0.1 < \beta < 0.2$	±1.80% of Flow Rate	±1.45% of Flow Rate	±1.40% of Flow Rate
	$0.2 < \beta < 0.6$	±1.50% of Flow Rate	±1.05% of Flow Rate	±0.95% of Flow Rate
	$0.6 < \beta < 0.8$	±2.00% of Flow Rate	±1.70% of Flow Rate	±1.60% of Flow Rate

(1) For Measurement Types 5 - 7, refer to the Reference Accuracy specification for the 3051SMV with Measurement Type P.

(2) These flow measurement accuracies assume a constant density, viscosity, and expansibility factor.

Rosemount DP Flow

3051SF Dynamic Performance

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

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

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

Dead Time⁽¹⁾

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

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

Update Rate⁽¹⁾

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

(1) Does not apply to Wireless (output code X). See "Wireless Self-Organizing Networks" on page 30 for wireless update rate.

Mounting Position Effects

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

Vibration Effect

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

For Housing Style codes 1J, 1K, 1L, 2J, and 2M:

Less than $\pm 0.1\%$ of URL when tested per the requirements of IEC60770-1 field with general application or pipeline with low vibration level (10-60 Hz 0.15mm displacement peak amplitude / 60-500 Hz 2g).

Power Supply Effect

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

Electromagnetic Compatibility (EMC)

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

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

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

Transient Protection (Option T1)

Meets IEEE C62.41.2-2002, Location Category B

6 kV crest (0.5 μ s - 100 kHz)

3 kA crest (8 $\times$ 20 microseconds)

6 kV crest (1.2 $\times$ 50 microseconds)

Meets IEEE C37.90.1-2002 Surge Withstand Capability

SWC 2.5 kV crest, 1.0 MHz wave form

3051SF FUNCTIONAL SPECIFICATIONS

Range and Sensor Limits

Flowmeter with Coplanar Sensor Module

Range	DP Sensor (3051SF_3, 4, or 7)	
	Lower (LRL)	Upper (URL)
1	0 inH ₂ O (0 mbar)	25 inH ₂ O (62,3 mbar)
2	0 inH ₂ O (0 bar)	250 inH ₂ O (0,62 bar)
3	0 inH ₂ O (0 bar)	1000 inH ₂ O (2,49 bar)

Flowmeter with MultiVariable Sensor Module

Range	DP Sensor (3051SF1, 2, 5, or 6)	
	Lower (LRL)	Upper (URL)
1	0 inH ₂ O (0 mbar)	25.0 inH ₂ O (62,3 mbar)
2	0 inH ₂ O (0 bar)	250.0 inH ₂ O (0,62 bar)
3	0 inH ₂ O (0 bar)	1000.0 inH ₂ O (2,49 bar)
Range	Static Pressure Sensor (GP/AP)	
	Lower (LRL)	Upper (URL) ⁽¹⁾
3	GP ⁽²⁾ : -14.2 psig (0,98 bar) AP: 0.5 psia (34,5 mbar)	GP: 800 psig (55,16 bar) AP: 800 psia (55,16 bar)
4	GP ⁽²⁾ : -14.2 psig (0,98 bar) AP: 0.5 psia (34,5 mbar)	GP: 3626 psig (250 bar) AP: 3626 psia (250 bar)

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

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

Process Temperature RTD Interface (3051SF_1, 3, 5 or 7)⁽¹⁾

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

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

Rosemount DP Flow

Product Data Sheet

00813-0100-4485, Rev AA

April 2010

Minimum Span Limits

Transmitter with Coplanar Sensor Module (Single Variable)

Range	DP Sensor (3051SF_D, 3, 4 or 7)	
	Ultra & Ultra for Flow	Classic
1	0.5 inH ₂ O (1,24 mbar)	0.5 inH ₂ O (1,24 mbar)
2	1.3 inH ₂ O (3,11 mbar)	2.5 inH ₂ O (6,23 mbar)
3	5.0 inH ₂ O (12,4 mbar)	10.0 inH ₂ O (24,9 mbar)

Transmitter with MultiVariable Sensor Module

Range	DP Sensor (3051SF_1, 2, 5, or 6)	
	Ultra for Flow	Classic MV
1	0.5 inH ₂ O (1,24 mbar)	0.5 inH ₂ O (1,24 mbar)
2	1.3 inH ₂ O (3,11 mbar)	2.5 inH ₂ O (6,23 mbar)
3	5.0 inH ₂ O (12,4 mbar)	10.0 inH ₂ O (24,9 mbar)

Range	Static Pressure Sensor (GP/AP)	
	Ultra for Flow	Classic MV
3	4.0 psi (276 mbar)	8.0 psi (522 mbar)
4	18.13 psi (1,25 bar)	36.26 psi (2,50 bar)

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

Minimum Span = 50 °F (28 °C)

Service

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

Liquid, gas, and steam applications

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

Some fluid types are only supported by certain measurement types

Fluid Compatibility with Pressure and Temperature Compensation

• Available

— Not available

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

4–20 mA/HART

Zero and Span Adjustment

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

Output

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

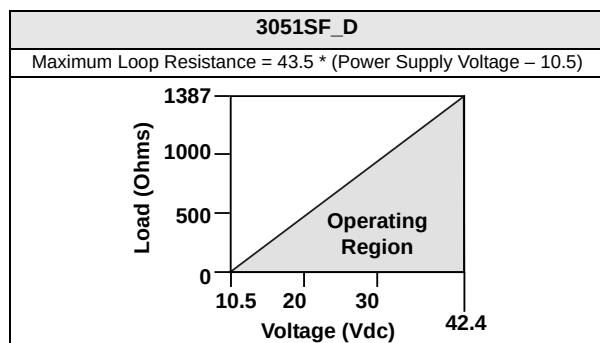
Power Supply

External power supply required.

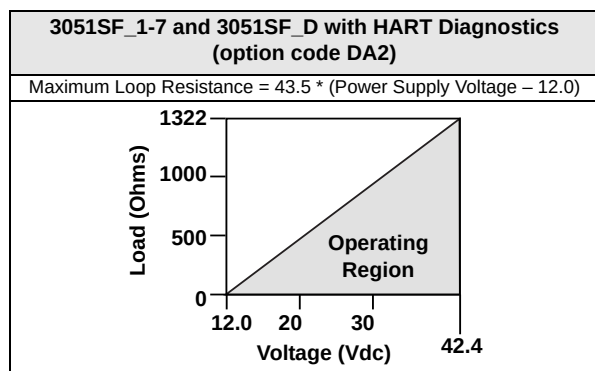
- 3051SF_D: 10.5 to 42.4 Vdc with no load
- 3051SF_D with Advanced HART Diagnostics Suite: 12 to 42.4 Vdc with no load
- 3051SF_1-7: 12 to 42.4 Vdc with no load

Load Limitations

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



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



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

Advanced HART Diagnostics Suite (Option Code DA2)

The 3051SF provides Abnormal Situation Prevention indication for a breakthrough in diagnostic capability. The 3051SF ASP Diagnostics Suite for HART includes Statistical Process Monitoring (SPM), variable logging with time stamp and advanced process alerts. The enhanced EDDL graphic display provides an intuitive and user-friendly interface to better visualize these diagnostics.

The integral SPM technology calculates the mean and standard deviation of the process variable 22 times per second and makes them available to the user. The 3051SF uses these values and highly flexible configuration options for customization to detect many user-defined or application specific abnormal situations (e.g. detecting plugged impulse lines and fluid composition change). Variable logging with time stamp and advanced process alerts capture valuable process and sensor data to enable quick troubleshooting of application and installation issues.

FOUNDATION fieldbus

Power Supply

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

Current Draw

17.5 mA for all configurations (including LCD display option)

FOUNDATION fieldbus Parameters

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

Standard Function Blocks

Resource Block

- Contains hardware, electronics, and diagnostic information.

Transducer Block

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

LCD Block

- Configures the local display.

2 Analog Input Blocks

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

PID Block with Auto-tune

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

Backup Link Active Scheduler (LAS)

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

Software Upgrade in the Field

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

PlantWeb Alerts

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

Advanced Control Function Block Suite (Option Code A01)

Input Selector Block

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

Arithmetic Block

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

Signal Characterizer Block

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

Integrator Block

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

Output Splitter Block

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

Control Selector Block

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

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

Fully Compensated Mass Flow Block (Option Code H01)

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

ASP Diagnostics Suite for FOUNDATION fieldbus (Option Code D01)

The 3051SF ASP Diagnostics Suite for FOUNDATION fieldbus provides Abnormal Situation Prevention indication and enhanced EDDL graphic displays for easy visual analysis.

The integral Statistical Process Monitoring (SPM) technology calculates the mean and standard deviation of the process variable 22 times per second and makes them available to the user. The 3051SF uses these values and highly flexible configuration options for customization to detect many user-defined or application specific abnormal situations (e.g. detecting plugged impulse lines and fluid composition change).

Wireless Self-Organizing Networks

Output

WirelessHART, 2.4 GHz DSSS.

Local Display

The optional five-digit LCD can display user-selectable information such as primary variable in engineering units, percent of range, sensor module temperature, and electronics temperature. Display updates at up to once per minute.

Update Rate

WirelessHART, user selectable 8 sec. to 60 min.

Power Module

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

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

Overpressure Limits

Transmitters withstand the following limits without damage:

Coplanar Sensor Module (Single Variable)

Range	DP ⁽¹⁾
	3051SF_3, 4, 7, or D
1	2000 psi (137,9 bar)
2	3626 psi (250,0 bar)
3	3626 psi (250,0 bar)

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

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

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

Static Pressure Limits

Coplanar Sensor Module

Operates within specifications between static line pressures of:

Range	DP Sensor ⁽¹⁾
	3051SF_3, 4, 7, or D
1	0.5 psia to 2000 psig (0,03 to 137,9 bar)
2	0.5 psia to 3626 psig (0,03 to 150 bar)
3	0.5 psia to 3626 psig (0,03 to 150 bar)

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

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

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

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

Burst Pressure Limits

Coplanar Sensor Module

10000 psig (689,5 bar)

Temperature Limits

Ambient

-40 to 185 °F (-40 to 85 °C)

With LCD display⁽¹⁾: -40 to 175 °F (-40 to 80 °C)

With option code P0: -20 to 185 °F (-29 to 85 °C)

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

Storage

-50 to 185 °F (-46 to 85 °C)

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

With Wireless Output: -40 to 185 °F (-40 to 85 °C)

Process Temperature Limits

For 3051SFA Temperature Limits, see page 91.

For 3051SFC Temperature Limits, see page 103.

For 3051SFP Temperature Limits, see page 111.

At atmospheric pressures and above:

Rosemount DP Flow

Humidity Limits

0–100% relative humidity

Turn-On Time⁽¹⁾

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

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

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

Volumetric Displacement

Less than 0.005 in³ (0,08 cm³)

Damping⁽¹⁾

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

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

Failure Mode Alarm

HART 4-20 mA (output option code A)

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

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

Alarm Configuration

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

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

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

Safety-Certified Transmitter Failure Values⁽¹⁾

Safety accuracy: 2.0%⁽²⁾

Safety response time: 1.5 seconds

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

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

PHYSICAL SPECIFICATIONS

Electrical Connections

$\frac{1}{2}$ –14 NPT, G $\frac{1}{2}$, and M20 × 1.5 conduit. HART interface connections fixed to terminal block for Output code A and X.

Process Connections

Coplanar Sensor Module	
Standard	$\frac{1}{4}$ -18 NPT on 2 1/8-in. centers

Process-Wetted Parts

For 3051SFA wetted parts, see “Annubar Sensor Material” on page 92.

For 3051SFC wetted parts, see “Material of Construction” on page 104.

For 3051SFP wetted parts, see “Material of Construction” on page 111.

Process Isolating Diaphragms

Coplanar Sensor Module
316L SST (UNS S31603), Alloy C-276 (UNS N10276), Alloy 400 (UNS N04400), Tantalum (UNS R05440), Gold-Plated Alloy 400, Gold-plated 316L SST

Drain/Vent Valves

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

Process Flanges and Adapters

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

Non-Wetted Parts

Electronics Housing

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

Paint for Aluminum Housing

Polyurethane

Coplanar Sensor Module Housing

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

Bolts

Plated carbon steel per ASTM A449, Type 1
Austenitic 316 SST per ASTM F593
ASTM A453, Class D, Grade 660 SST
ASTM A193, Grade B7M alloy steel
ASTM A193, Class 2, Grade B8M SST
Alloy K-500

Sensor Module Fill Fluid

Silicone or inert halocarbon

Cover O-rings

Buna-N

Wireless Antenna

PBT/ polycarbonate (PC) integrated omnidirectional antenna

Power Module

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

3051SF Measurement Type 1-7 Certifications

Approved Manufacturing Locations

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

Ordinary Location Certification for FM

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

European Directive Information

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

ATEX Directive (94/9/EC)

Emerson Process Management complies with the ATEX Directive.

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

Models with Differential Pressure Ranges = 2 to 4 inclusive with All other Model 3051SF with Measurement Type 1-7 Pressure Transmitters
 — Sound Engineering Practice
 Transmitter Attachments: Process Flange - Manifold
 — Sound Engineering Practice
 Primary Elements, Flowmeter
 — See appropriate Primary Element QIG

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

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

Hazardous Locations Certifications

North American Certifications

FM Approvals

- E5** Explosion-proof for Class I, Division 1, Groups B, C, and D; dust-ignition proof for Class II and Class III, Division 1, Groups E, F, and G; hazardous locations; enclosure Type 4X, conduit seal not required.
- I5** Intrinsically Safe for use in Class I, Division 1, Groups A, B, C, and D; Class II, Division 1, Groups E, F, and G; Class III, Division 1; Class I, Zone 0 AEx ia IIC when connected in accordance with Rosemount drawing 03151-1206; Non-incendive for Class I, Division 2, Groups A, B, C, and D Enclosure Type 4X
 For entity parameters see control drawing 03151-1206.

Canadian Standards Association (CSA)

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

- E6** Explosion-proof for Class I, Division 1, Groups B, C, and D; Dust-Ignition-Proof for Class II and Class III, Division 1, Groups E, F, and G; suitable for Class I, Division 2, Groups A, B, C, and D, CSA Enclosure Type 4X; conduit seal not required.
- I6** Intrinsically Safe for Class I, Division 1, Groups A, B, C, and D when connected in accordance with Rosemount drawings 03151-1207;
 For entity parameters see control drawing 03151-1207.

European Certifications

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

Input Parameters

Loop / Power	Groups
U _i = 30 V	HART
I _i = 300 mA	HART
P _i = 1.0 W	HART
C _i = 14.8 nF	HART
L _i = 0	HART

Special conditions for safe use (x)

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

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

Special conditions for safe use (x)

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

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

Special conditions for safe use (x)

1. The user must ensure that the maximum rated voltage and current (42.4 volts, 22 milliamperes, DC) are not exceeded. All connections to other apparatus or associated apparatus shall have control over this voltage and current equivalent to a category "ib" circuit according to EN 60079-11.
2. Cable entries must be used which maintain the ingress protection of the enclosure to at least IP66.
3. Unused cable entries must be filled with suitable blanking plugs which maintain the ingress protection of the enclosure to at least IP66.
4. Cable entries and blanking plugs must be suitable for the ambient range of the apparatus and capable of withstanding a 7J impact test.
5. The 3051SF with Measure Type 1-7 must be securely screwed in place to maintain the ingress protection of the enclosure. (The 3051SF with Measure Type 1-7 SuperModule must be properly assembled to the 3051SF with Measure Type 1-7 housing to maintain ingress protection.)

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

Special conditions for safe use (x)

1. Appropriate ex d blanking plugs, cable glands, and wiring needs to be suitable for a temperature of 90 °C.
2. This device contains a thin wall diaphragm. Installation, maintenance and use shall take into account the environmental conditions to which the diaphragm will be subjected. The manufacturer's instructions for maintenance shall be followed in detail to assure safety during its expected lifetime.
3. The 3051SF with Measure Type 1-7 does not comply with the requirements of IEC 60079-1 Clause 5.2, Table 2 for all joints. Contact Emerson Process Management for information on the dimensions of flameproof joints.

Japanese Certifications

E4 TIIS Flameproof
Consult factory for availability
I4 TIIS Intrinsically Safe
Consult factory for availability

China (NEPSI) Certifications

E3 China Flameproof
Ex d II B+H₂T3~T5
I3 China Intrinsic Safety
Ex ia IIC T3/T4

IECEx Certifications

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

Input Parameters

Loop / Power	Groups
U _i = 30 V	HART
I _i = 300 mA	HART
P _i = 1.0 W	HART
C _i = 14.8 nF	HART
L _i = 0	HART

Special conditions for safe use (x)

The 3051SF with Measure Type 1-7 HART 4-20mA is not capable of withstanding the 500V test as defined in clause 6.3.12 of IEC 60079-11. This must be taken into account during installation.

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

Special conditions for safe use (x)

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

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

Special conditions for safe use (x)

1. Appropriate ex d blanking plugs, cable glands, and wiring needs to be suitable for a temperature of 90 °C.
2. This device contains a thin wall diaphragm. Installation, maintenance and use shall take into account the environmental conditions to which the diaphragm will be subjected. The manufacturer's instructions for maintenance shall be followed in detail to assure safety during its expected lifetime.
3. The 3051SF with Measure Type 1-7 does not comply with the requirements of IEC 60079-1 Clause 5.2, Table 2 for all joints. Contact Emerson Process Management for information on the dimensions of flameproof joints.

Combinations of Certifications

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

K1 Combination of E1, I1, N1, and ND
K2 Combination of E2 and I2
K4 Combination of E4 and I4
K5 Combination of E5 and I5
K6 Combination of E6 and I6
K7 Combination of E7, I7, and N7
KA Combination of E1, E6, I1, and I6
KB Combination of E5, E6, I5, and I6
KC Combination of E5, E1, I5 and I1
KD Combination of E5, E6, E1, I5, I6, and I1

3051SF Measurement Type D Certifications

Approved Manufacturing Locations

Rosemount Inc. — Chanhassen, Minnesota USA

Emerson Process Management GmbH & Co. — Wessling, Germany

Emerson Process Management Asia Pacific Private Limited — Singapore

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

Emerson Process Management LTDA — Sorocaba, Brazil

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

Ordinary Location Certification for FM

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

European Directive Information

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

ATEX Directive (94/9/EC)

Emerson Process Management complies with the ATEX Directive.

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

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

Pressure Transmitters — QS Certificate of Assessment - EC No. PED-H-100, Module H Conformity Assessment

All other Model 3051S Pressure Transmitters — Sound Engineering Practice

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

Primary Elements, Flowmeter

— See appropriate Primary Element QIG

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

EN 61326-1:1997 + A1, A2, and A3 – Industrial

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

Emerson Process Management complies with the R&TTE Directive.

HART & FOUNDATION fieldbus Hazardous Locations Certifications

North American Certifications

FM Approvals

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

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

Canadian Standards Association (CSA)

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

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

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

European Certifications

I1/IA ATEX Intrinsic Safety

Certificate No.: BAS01ATEX1303X  II 1G

Ex ia IIC T4 (T_a = -60 °C to 70 °C) -HART/Remote

Display/Quick Connect/HART Diagnostics

Ex ia IIC T4 (T_a = -60 °C to 70 °C) -FOUNDATION fieldbus

Ex ia IIC T4 (T_a = -60 °C to 40 °C) -FISCO

CE 1180

Input Parameters

Loop / Power	Groups
U _i = 30 V	HART / FOUNDATION fieldbus/ Remote Display / Quick Connect / HART Diagnostics
U _i = 17.5 V	FISCO
I _i = 300 mA	HART / FOUNDATION fieldbus/ Remote Display / Quick Connect / HART Diagnostics
I _i = 380 mA	FISCO
P _i = 1.0 W	HART / Remote Display / Quick Connect / HART Diagnostics
P _i = 1.3 W	FOUNDATION fieldbus
P _i = 5.32 W	FISCO
C _i = 30 nF	SuperModule Platform / Quick Connect
C _i = 11.4 nF	HART / HART Diagnostics
C _i = 0	FOUNDATION fieldbus / Remote Display / FISCO
L _i = 0	HART / FOUNDATION fieldbus/ FISCO / Quick Connect / HART Diagnostics
L _i = 60 µH	Remote Display

Special conditions for safe use (x)

- The apparatus, excluding the Types 3051 S-T and 3051 S-C (In-line and Coplanar SuperModule Platforms respectively), is not capable of withstanding the 500V test as defined in Clause 6.4.12 of EN 50020. This must be considered during installation.
- The terminal pins of the Types 3051 S-T and 3051 S-C must be protected to IP20 minimum.

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Rosemount DP Flow

N1 ATEX Type n

Certificate No.: BAS01ATEX3304X  II 3 G

EEx nAnL IIC T4 ($T_a = -40\text{ °C TO } 70\text{ °C}$)

$U_i = 45\text{ Vdc max}$

IP66

CE

Special conditions for safe use (x)

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

ND ATEX Dust

Certificate No.: BAS01ATEX1374X  II 1 D

$T_{105\text{ °C}} (-20\text{ °C} \leq T_{amb} \leq 85\text{ °C})$

$V_{max} = 42.4\text{ volts max}$

$A = 22\text{ mA}$

IP66

CE 1180

Special conditions for safe use (x)

1. The user must ensure that the maximum rated voltage and current (42.4 volts, 22 milliamperes, DC) are not exceeded. All connections to other apparatus or associated apparatus shall have control over this voltage and current equivalent to a category "ib" circuit according to EN 50020.
2. Cable entries must be used which maintain the ingress protection of the enclosure to at least IP66.
3. Unused cable entries must be filled with suitable blanking plugs which maintain the ingress protection of the enclosure to at least IP66.
4. Cable entries and blanking plugs must be suitable for the ambient range of the apparatus and capable of withstanding a 7J impact test.
5. The 3051S must be securely screwed in place to maintain the ingress protection of the enclosure. (The 3051S SuperModule must be properly assembled to the 3051S housing to maintain ingress protection.)

E1 ATEX Flameproof

Certificate No.: KEMA00ATEX2143X  II 1/2 G

Ex d IIC T6 ($-50\text{ °C} \leq T_{amb} \leq 65\text{ °C}$)

Ex d IIC T5 ($-50\text{ °C} \leq T_{amb} \leq 80\text{ °C}$)

$V_{max} = 42.4\text{ V}$

CE 1180

Special conditions for safe use (x)

1. Appropriate ex d blanking plugs, cable glands, and wiring needs to be suitable for a temperature of 90 °C.
2. This device contains a thin wall diaphragm. Installation, maintenance and use shall take into account the environmental conditions to which the diaphragm will be subjected. The manufacturer's instructions for maintenance shall be followed in detail to assure safety during its expected lifetime.
3. The 3051S does not comply with the requirements of EN 60079-1 Clause 5.2, Table 2 for all joints. Contact Emerson Process Management for information on the dimensions of flameproof joints.

Japanese Certifications

E4 TIIS Flameproof

Ex d IIC T6

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

China (NEPSI) Certifications

I3 China Intrinsic Safety

Certificate No. (manufactured in Chanhassen, MN):

GYJ081078

Certificate No. (manufactured in Singapore): GYJ06367

Ex ia IIC T3~T5

Input Parameters

Loop / Power	Groups
$U_i = 30\text{ V}$	HART / FOUNDATION fieldbus/ Remote Display / Quick Connect / HART Diagnostics
$U_i = 17.5\text{ V}$	FISCO
$I_i = 300\text{ mA}$	HART / FOUNDATION fieldbus/ Remote Display / Quick Connect / HART Diagnostics
$I_i = 380\text{ mA}$	FISCO
$P_i = 1.0\text{ W}$	HART / Remote Display / Quick Connect / HART Diagnostics
$P_i = 1.3\text{ W}$	FOUNDATION fieldbus
$P_i = 5.32\text{ W}$	FISCO
$C_i = 30\text{ nF}$	SuperModule Platform / Quick Connect
$C_i = 11.4\text{ nF}$	HART / HART Diagnostics
$C_i = 0$	FOUNDATION fieldbus / Remote Display / FISCO
$L_i = 0$	HART / FOUNDATION fieldbus/ FISCO / Quick Connect / HART Diagnostics
$L_i = 60\text{ }\mu\text{H}$	Remote Display

E3 China Flameproof

Certificate No.: GYJ06366

Ex d IIB+H₂ T3~T5

IECEX Certifications

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

Special conditions for safe use (x)

1. Appropriate ex d blanking plugs, cable glands, and wiring needs to be suitable for a temperature of 90 °C.
2. This device contains a thin wall diaphragm. Installation, maintenance and use shall take into account the environmental conditions to which the diaphragm will be subjected. The manufacturer's instructions for maintenance shall be followed in detail to assure safety during its expected lifetime.
3. The 3051S does not comply with the requirements of IEC 60079-1 Clause 5.2, Table 2 for all joints. Contact Emerson Process Management for information on the dimensions of flameproof joints.

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

Input Parameters

Loop / Power	Groups
U _i = 30 V	HART / FOUNDATION fieldbus/ Remote Display / Quick Connect / HART Diagnostics
U _i = 17.5 V	FISCO
I _i = 300 mA	HART / FOUNDATION fieldbus/ Remote Display / Quick Connect / HART Diagnostics
I _i = 380 mA	FISCO
P _i = 1.0 W	HART / Remote Display / Quick Connect / HART Diagnostics
P _i = 1.3 W	FOUNDATION fieldbus
P _i = 5.32 W	FISCO
C _i = 30 nF	SuperModule Platform / Quick Connect
C _i = 11.4 nF	HART / HART Diagnostics
C _i = 0	FOUNDATION fieldbus / Remote Display / FISCO / Quick Connect / HART Diagnostics
L _i = 0	HART / FOUNDATION fieldbus / FISCO / Quick Connect / HART Diagnostics
L _i = 60 μ H	Remote Display

Special conditions for safe use (x)

1. The Models 3051S HART 4-20mA, 3051S fieldbus, 3051S Profibus and 3051S FISCO are not capable of withstanding the 500V test as defined in clause 6.4.12 of IEC 60079-11. This must be taken into account during installation.
2. The terminal pins of the Types 3051S-T and 3051S-C must be protected to IP20 minimum.

N7 IECEx Type n
Certificate No.: IECExBAS04.0018X
Ex nC IIC T4 (T_a = -40 °C to 70 °C)
U_i = 45 Vdc MAX
IP66

Special conditions for safe use (x)

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

Combinations of Certifications

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

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

3051SF Wireless Certifications

Approved Manufacturing Locations

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

Telecommunication Compliance

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

FCC and IC Approvals

This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions: This device may not cause harmful interference this device and must accept any interference received, including interference that may cause undesired operation.

This device must be installed to ensure a minimum antenna separation distance of 20cm from all persons.

Ordinary Location Certification for FM

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

European Directive Information

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

ATEX Directive (94/9/EC)

Emerson Process Management complies with the ATEX Directive.

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

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

Pressure Transmitters — QS Certificate of Assessment - EC No. PED-H-100, Module H Conformity Assessment

All other Model 3051S Pressure Transmitters — Sound Engineering Practice

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

Primary Elements, Flowmeter

— See appropriate Primary Element QIG

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

EN 61326-1:1997 A1, A2, A3⁽¹⁾

EN 61326-1:2006

EN 61326-2-3:2006

(1) Only applies to "Operating Frequency and Protocol" option code 1.

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

Emerson Process Management complies with the R&TTE Directive.

Hazardous Locations Certifications

North American Certifications

Factory Mutual (FM) Approvals

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

CSA - Canadian Standards Association

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

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

Rosemount DP Flow

European Certifications

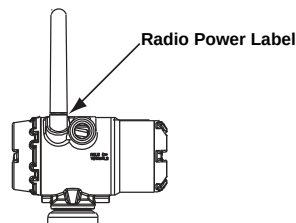
- I1** ATEX Intrinsic Safety
Certificate No.: BAS01ATEX1303X  II 1G
Ex ia IIC T4 (T_a = -60 °C to 70 °C)
IP66
For use with Rosemount SmartPower options
00753-9220-0001 only.
CE 1180

CE ①

Country ⁽¹⁾	Restriction
Bulgaria	General authorization required for outdoor use and public service
France	Outdoor use limited to 10mW e.i.r.p.
Italy	If used outside of own premises, general authorization is required.
Norway	May be restricted in the geographical area within a radius of 20 km from the center of Ny-Alesund.
Romania	Use on a secondary basis. Individual license required.

(1) Only applies to "Operating Frequency and Protocol" option code 1.

Radio Power Label indicates output power configuration of the radio. Devices with this label are configured for output power less than 10 mW e.i.r.p. At time of purchase the customer must specify ultimate country of installation and operation.



IECEX Certifications

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

Rosemount 3051CF Flowmeter Series



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

Additional Information

Specifications: page 56

Certifications: page 60

Dimensional Drawings: page 121

Installation and Flowmeter Orientation: page 151



**Rosemount 3051CFA
Annubar Flowmeter**

Table 6. Rosemount 3051CFA Annubar Flowmeter Ordering Information

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

Model	Product Description	
3051CFA	Annubar Flowmeter	
Measurement Type		
Standard		Standard
D	Differential Pressure	★
Fluid Type		
Standard		Standard
L	Liquid	★
G	Gas	★
S	Steam	★
Line Size		
Standard		Standard
020	2-in. (50 mm)	★
025	2½-in. (63.5 mm)	★
030	3-in. (80 mm)	★
035	3½-in. (89 mm)	★
040	4-in. (100 mm)	★
050	5-in. (125 mm)	★
060	6-in. (150 mm)	★
070	7-in. (175 mm)	★
080	8-in. (200 mm)	★
100	10-in. (250 mm)	★
120	12-in. (300 mm)	★
Expanded		
140	14-in. (350 mm)	
160	16-in. (400 mm)	
180	18-in. (450 mm)	
200	20-in. (500 mm)	
240	24-in. (600 mm)	
300	30-in. (750 mm)	
360	36-in. (900 mm)	
420	42-in. (1066 mm)	
480	48-in. (1210 mm)	
600	60-in. (1520 mm)	

Rosemount DP Flow

Table 6. Rosemount 3051CFA Annubar Flowmeter Ordering Information

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

720	72-in. (1820 mm)	
780	78-in (1950 mm)	
840	84-in. (2100 mm)	
900	90-in. (2250 mm)	
960	96-in (2400 mm)	
Pipe I.D. Range		
Standard		Standard
C	Range C from the Pipe I.D. table	★
D	Range D from the Pipe I.D. table	★
Expanded		
A	Range A from the Pipe I.D. table	
B	Range B from the Pipe I.D. table	
E	Range E from the Pipe I.D. table	
Z	Non-standard Pipe I.D. Range or Line Sizes greater than 12 inches	
Pipe Material / Mounting Assembly Material		
Standard		Standard
C	Carbon steel (A105)	★
S	316 Stainless Steel	★
0 ⁽¹⁾	No Mounting (Customer Supplied)	★
Expanded		
G	Chrome-Moly Grade F-11	
N	Chrome-Moly Grade F-22	
J	Chrome-Moly Grade F-91	
Piping Orientation		
Standard		Standard
H	Horizontal Piping	★
D	Vertical Piping with Downwards Flow	★
U	Vertical Piping with Upwards Flow	★
Annubar Type		
Standard		Standard
P	Pak-Lok	★
F	Flanged with opposite side support	★
Expanded		
L	Flange-Lok	
G	Gear-Drive Flo-Tap	
M	Manual Flo-Tap	
Sensor Material		
Standard		Standard
S	316 Stainless Steel	★
Expanded		
H	Alloy C-276	
Sensor Size		
Standard		Standard
1	Sensor size 1 — Line sizes 2-in. (50 mm) to 8-in. (200 mm)	★
2	Sensor size 2 — Line sizes 6-in. (150 mm) to 96-in. (2400 mm)	★
3	Sensor size 3 — Line sizes greater than 12-in. (300 mm)	★
Mounting Type		
Standard		Standard
T1	Compression or Threaded Connection	★
A1	150# RF ANSI	★
A3	300# RF ANSI	★
A6	600# RF ANSI	★
D1	DN PN16 Flange	★

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Rosemount DP Flow

Table 6. Rosemount 3051CFA Annubar Flowmeter Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.

The Expanded offering is subject to additional delivery lead time.

D3	DN PN40 Flange	★
D6	DN PN100 Flange	★
Expanded		
A9 ⁽²⁾	900# RF ANSI	
AF ⁽²⁾	1500# RF ANSI	
AT ⁽²⁾	2500 # RF ANSI	
R1	150# RTJ Flange	
R3	300# RTJ Flange	
R6	600# RTJ Flange	
R9 ⁽²⁾	900# RTJ Flange	
RF ⁽²⁾	1500# RTJ Flange	
RT ⁽²⁾	2500# RTJ Flange	
Opposite Side Support or Packing Gland		
Standard		Standard
0	No opposite side support or packing gland (Required for Pak-Lok and Flange-Lok models)	★
Opposite Side Support – Required for Flanged Models		
C	NPT Threaded Opposite Support Assembly – Extended Tip	★
D	Welded Opposite Support Assembly – Extended Tip	★
Expanded		
Packing Gland – Required for Flo-Tap Models		
	<i>Packing Gland Material</i>	<i>Rod Material</i>
J	Stainless Steel Packing Gland / Cage Nipple	Carbon Steel
K	Stainless Steel Packing Gland / Cage Nipple	Stainless Steel
L	Stainless Steel Packing Gland / Cage Nipple	Carbon Steel
N	Stainless Steel Packing Gland / Cage Nipple	Stainless Steel
R	Alloy C-276 Packing Gland / Cage Nipple	Stainless Steel
Isolation Valve for Flo-Tap Models		
Standard		Standard
0 ⁽¹⁾	Not Applicable or Customer Supplied	★
Expanded		
1	Gate Valve, Carbon Steel	
2	Gate Valve, Stainless Steel	
5	Ball Valve, Carbon Steel	
6	Ball Valve, Stainless Steel	
7	Ball Valve, Alloy C-276	
Temperature Measurement		
Standard		Standard
T	Integral RTD – not available with Flanged model greater than class 600#	★
0	No Temperature Sensor	★
Expanded		
R	Remote Thermowell and RTD	
Transmitter Connection Platform		
Standard		Standard
3	Direct-mount, Integral 3-valve Manifold– not available with Flanged model greater than class 600	★
5	Direct -mount, 5-valve Manifold – not available with Flanged model greater than class 600	★
7	Remote-mount NPT Connections (¹ / ₂ -in. NPT)	★
Expanded		
6	Direct-mount, high temperature 5-valve Manifold – not available with Flanged model greater than class 600	
8	Remote-mount SW Connections (¹ / ₂ -in.)	
Differential Pressure Range		
Standard		Standard
1	0 to 25 in H ₂ O (0 to 62,3 mbar)	★
2	0 to 250 in H ₂ O (0 to 623 mbar)	★
3	0 to 1000 in H ₂ O (0 to 2,5 bar)	★

Rosemount DP Flow

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Table 6. Rosemount 3051CFA Annubar Flowmeter Ordering Information

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

Transmitter Output			
Standard			Standard
A	4–20 mA with digital signal based on HART Protocol		★
F	FOUNDATION fieldbus Protocol		★
W	Profibus-PA Protocol		★
Expanded			
M ⁽³⁾	Low-Power, 1-5 V dc with Digital Signal Based on HART Protocol		
Transmitter Housing Material ⁽⁴⁾		Conduit Entry Size	
Standard			Standard
A	Aluminum	1/2-14 NPT	★
B	Aluminum	M20 x 1.5	★
J	SST	1/2-14 NPT	★
K	SST	M20 x 1.5	★
Expanded			
D	Aluminum	G1/2	
M	SST	G1/2	
Transmitter Performance Class			
Standard			Standard
1	1.6% flow rate accuracy, 8:1 flow turndown, 5-yr. stability		★

Options (Include with selected model number)

Pressure Testing		
Expanded		
P1 ⁽⁵⁾	Hydrostatic Testing with Certificate	
PX ⁽⁵⁾	Extended Hydrostatic Testing	
Special Cleaning		
Expanded		
P2	Cleaning for Special Services	
PA	Cleaning per ASTM G93 Level D (Section 11.4)	
Material Testing		
Expanded		
V1	Dye Penetrant Exam	
Material Examination		
Expanded		
V2	Radiographic Examination	
Flow Calibration		
Expanded		
W1	Flow Calibration (Average K)	
Special Inspection		
Standard		Standard
QC1	Visual & Dimensional Inspection with Certificate	★
QC7	Inspection & Performance Certificate	★
Surface Finish		
Standard		Standard
RL	Surface finish for Low Pipe Reynolds # in Gas & Steam	★
RH	Surface finish for High Pipe Reynolds # in Liquid	★
Material Traceability Certification		
Standard		Standard
Q8 ⁽⁶⁾	Material Traceability Certification per EN 10474:2004 3.1	★
Code Conformance ⁽⁷⁾		
Expanded		
J2	ANSI/ASME B31.1	
J3	ANSI/ASME B31.3	

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Rosemount DP Flow

Table 6. Rosemount 3051CFA Annubar Flowmeter Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.

The Expanded offering is subject to additional delivery lead time.

Materials Conformance		
Expanded		
J5 ⁽⁸⁾	NACE MR-0175 / ISO 15156	
Country Certification		
Standard		Standard
J6	European Pressure Directive (PED)	★
Expanded		
J1	Canadian Registration	
Installed in Flanged Pipe Spool Section		
Expanded		
H3	150# Flanged Connection with Rosemount Standard Length and Schedule	
H4	300# Flanged Connection with Rosemount Standard Length and Schedule	
H5	600# Flanged Connection with Rosemount Standard Length and Schedule	
Instrument Connections for Remote Mount Options		
Standard		Standard
G2	Needle Valves, Stainless Steel	★
G6	OS&Y Gate Valve, Stainless Steel	★
Expanded		
G1	Needle Valves, Carbon Steel	
G3	Needle Valves, Alloy C-276	
G5	OS&Y Gate Valve, Carbon Steel	
G7	OS&Y Gate Valve, Alloy C-276	
Special Shipment		
Standard		Standard
Y1	Mounting Hardware Shipped Separately	★
Special Dimensions		
Expanded		
VM	Variable Mounting	
VT	Variable Tip	
VS	Variable length Spool Section	
PlantWeb Control Functionality		
Standard		Standard
A01	FOUNDATION fieldbus Advanced Control Function Block Suite	★
PlantWeb Diagnostic Functionality		
Standard		Standard
D01	FOUNDATION fieldbus Diagnostics Suite	★
Product Certifications		
Standard		Standard
C6	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
E5	FM Explosion-proof, Dust Ignition-proof	★
E7	IECEx Flameproof, Dust Ignition-proof	★
E8	ATEX Flameproof, Dust	★
I1	ATEX Intrinsic Safety	★
I5	FM Intrinsically Safe, Division 2	★
IA ⁽⁹⁾	ATEX FISCO Intrinsic Safety; for FOUNDATION fieldbus protocol only	★
K5	FM Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E5 and I5)	★
K6	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E6 and I6)	★
K8	ATEX Flameproof, Intrinsic Safety, Type n, Dust (combination of E8, I1 and N1)	★
KB	FM and CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E5, E6, I5, and I6)	★
KD	FM, CSA, and ATEX Explosion-proof, Intrinsically Safe (combination of E5, I5, E6, I6, E1, and I1)	★
N1	ATEX Type n	★
Alternate Transmitter Material of Construction		
Standard		Standard
L1	Inert Sensor Fill Fluid <i>Note: Silicone fill fluid is standard.</i>	★

Rosemount DP Flow

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Table 6. Rosemount 3051CFA Annubar Flowmeter Ordering Information

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

L2	Graphite-Filled (PTFE) O-ring	★
LA	Inert Sensor Fill Fluid and Graphite-Filled (PTFE) O-ring	★
Digital Display		
Standard		Standard
M5	LCD Display	★
Transmitter Calibration Certification		
Standard		Standard
Q4	Calibration Certificate for Transmitter	★
Quality Certification for Safety		
Standard		Standard
QS ⁽¹¹⁾	Certificate of FMEDA data	★
Transient Protection		
Standard		Standard
T1 ⁽¹⁰⁾	Transient terminal block	★
Manifold for Remote Mount Option		
Standard		Standard
F2	3-Valve Manifold, Stainless Steel	★
F6	5-Valve Manifold, Stainless Steel	★
Expanded		
F1	3-Valve Manifold, Carbon Steel	
F3	3-Valve Manifold, Alloy C-276	
F5	5-Valve Manifold, Carbon Steel	
F7	5-Valve Manifold, Alloy C-276	
Lower Power Output		
Standard		Standard
C2 ⁽¹¹⁾	0.8-3.2 V dc Output with Digital Signal Based on Hart Protocol	★
Alarm Limit		
Standard		Standard
C4 ⁽¹¹⁾⁽¹²⁾	NAMUR Alarm and Saturation Levels, High Alarm	★
CN ⁽¹¹⁾⁽¹²⁾	NAMUR Alarm and Saturation Levels, Low Alarm	★
Ground Screw		
Standard		Standard
V5 ⁽¹³⁾	External Ground Screw Assembly	★
Typical Model Number: 3051CFA D L 060 D C H P S 2 T1 0 0 0 3 2 A A 1		

- (1) Provide the "A" dimension for Flanged (page 123), Flange-Lok (page 122), and Threaded Flo-Tap (page 126) models. Provide the "B" dimension for Flange Flo-Tap models (page 125).
- (2) Available in remote mount applications only.
- (3) Not available with hazardous location certification Option Codes I1, N1, E4, K6, and K8.
- (4) Material specified is cast as follows: CF-8M is the cast version of 316 SST, CF-3M is the cast version of 316L SST. For housing, material is aluminum with polyurethane paint.
- (5) Applies to assembled flowmeter only, mounting not tested.
- (6) Instrument Connections for Remote Mount Options and Isolation Valves for Flo-tap Models are not included in the Material Traceability Certification.
- (7) Not available with Transmitter Connection Platform 6.
- (8) Materials of Construction comply with metallurgical requirements within NACE MR0175/ISO for sour oil field production environments. Environmental limits apply to certain materials. Consult latest standard for details. Selected materials also conform to NACE MR0103 for sour refining environments.
- (9) Only valid with FOUNDATION fieldbus Output Code F.
- (10) Not available with Housing code 00, 5A or 7J. The T1 option is not needed with FISCO Product Certifications, transient protection is included with the FISCO Product Certification code IA.
- (11) Not available with FOUNDATION fieldbus (Output Code F) or Profibus (Output Code W).
- (12) NAMUR-Compliant operation is pre-set at the factory and cannot be changed to standard operation in the field.
- (13) The V5 option is not needed with the T1 option; external ground screw assembly is included with the T1 option.



**Rosemount 3051CFC
Compact Flowmeter**

Table 7. Rosemount 3051CFC Compact Flowmeter Ordering Information

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

Model	Product Description	
3051CFC	Compact Flowmeter	
Measurement Type		
Standard		Standard
D	Differential Pressure	★
Primary Element Technology		
Standard		Standard
C	Conditioning Orifice Plate	★
P	Orifice Type	★
Material Type		
Standard		Standard
S	316 SST	★
Line Size		
Standard		Standard
005 ⁽¹⁾	1/2-in. (15 mm)	★
010 ⁽¹⁾	1-in. (25 mm)	★
015 ⁽¹⁾	1 1/2-in. (40 mm)	★
020	2-in. (50 mm)	★
030	3-in. (80 mm)	★
040	4-in. (100 mm)	★
060	6-in. (150 mm)	★
080	8-in. (200 mm)	★
100	10-in. (250 mm)	★
120	12-in. (300 mm)	★
Primary Element Style		
Standard		Standard
N	Square Edged	★
Primary Element Type		
Standard		Standard
040	0.40 Beta Ratio	★
065 ⁽²⁾	0.65 Beta Ratio	★
Temperature Measurement		
Standard		Standard
0	No Temperature Sensor	★
Expanded		
R	Remote Thermowell and RTD	
Transmitter Connection Platform		
Standard		Standard
3	Direct-mount, Integral 3-valve Manifold	★
7	Remote-mount, 1/4-in. NPT Connections	★
Differential Pressure Range		
Standard		Standard
1	0 to 25 in H ₂ O (0 to 62,3 mbar)	★
2	0 to 250 in H ₂ O (0 to 623 mbar)	★
3	0 to 1000 in H ₂ O (0 to 2,5 bar)	★

Rosemount DP Flow

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Table 7. Rosemount 3051CFC Compact Flowmeter Ordering Information

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

Transmitter Output			
Standard			Standard
A	4–20 mA with digital signal based on HART Protocol		★
F	FOUNDATION fieldbus Protocol		★
W	Profibus-PA Protocol		★
Expanded			
M ⁽³⁾	Low-Power, 1-5 V dc with Digital Signal Based on HART Protocol		
Transmitter Housing Material ⁽⁴⁾		Conduit Entry Size	
Standard			Standard
A	Polyurethane-covered Aluminum	1/2-14 NPT	★
B	Polyurethane-covered Aluminum	M20 x 1.5	★
J	SST	1/2-14 NPT	★
K	SST	M20 x 1.5	★
Expanded			
D	Polyurethane-covered Aluminum	G1/2	
M	SST	G1/2	
Transmitter Performance Class			
Standard			Standard
1	Up to ±1.75% flow rate accuracy, 8:1 flow turndown, 5-year stability		★

Options (Include with selected model number)

Installation Accessories			
Standard			Standard
AB	ANSI Alignment Ring (150#) (Only required for 10-in. (250 mm) and 12-in. (300mm) line sizes)		★
AC	ANSI Alignment Ring (300#) (Only required for 10-in. (250 mm) and 12-in. (300mm) line sizes)		★
AD	ANSI Alignment Ring (600#) (Only required for 10-in. (250 mm) and 12-in. (300mm) line sizes)		★
DG	DIN Alignment Ring (PN16)		★
DH	DIN Alignment Ring (PN40)		★
DJ	DIN Alignment Ring (PN100)		★
Expanded			
JB	JIS Alignment Ring (10K)		
JR	JIS Alignment Ring (20K)		
JS	JIS Alignment Ring (40K)		
Remote Adapters			
Standard			Standard
FE	Flange Adapters 316 SST (1/2-in NPT)		★
High Temperature Application			
Expanded			
HT	Graphite Valve Packing (Tmax = 850 °F)		
Flow Calibration			
Expanded			
WC ⁽⁵⁾	Flow Calibration Certification (3 point)		
WD ⁽⁵⁾	Discharge Coefficient Verification (full 10 point)		
Pressure Testing			
Expanded			
P1	Hydrostatic Testing with Certificate		
Special Cleaning			
Expanded			
P2	Cleaning for Special Services		
PA	Cleaning per ASTM G93 Level D (Section 11.4)		
Special Inspection			
Standard			Standard
QC1	Visual & Dimensional Inspection with Certificate		★
QC7	Inspection and Performance Certificate		★

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Table 7. Rosemount 3051CFC Compact Flowmeter Ordering Information

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

Transmitter Calibration Certification			
Standard			Standard
Q4	Calibration Certificate for Transmitter		★
Quality Certification for Safety			
Standard			Standard
QS ⁽⁶⁾	Prior-use certificate of FMEDA data		★
Material Traceability Certification			
Standard			Standard
Q8	Material Traceability Certification per EN 10204:2004 3.1		★
Code Conformance			
Expanded			
J2	ANSI/ASME B31.1		
J3	ANSI/ASME B31.3		
J4	ANSI/ASME B31.8		
Materials Conformance			
Expanded			
J5 ⁽⁷⁾	NACE MR-0175 / ISO 15156		
Country Certification			
Expanded			
J1	Canadian Registration		
Product Certifications			
Standard			Standard
C6	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2		★
E5	FM Explosion-proof, Dust Ignition-proof		★
E7	IECEX Flameproof, Dust Ignition-proof		★
E8	ATEX Flameproof, Dust		★
I1	ATEX Intrinsic Safety		★
I5	FM Intrinsically Safe, Division 2		★
IA ⁽⁸⁾	ATEX FISCO Intrinsic Safety; for FOUNDATION fieldbus protocol only		★
K5	FM Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E5 and I5)		★
K6	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E6 and I6)		★
K8	ATEX Flameproof, Intrinsic Safety, Type n, Dust (combination of E8, I1 and N1)		★
KB	FM and CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E5, E6, I5, and I6) <i>Note: Only available on Housing Style codes 00, 1A, 1J, 2A, 2J, 2E, or 2M.</i>		★
KD	FM, CSA, and ATEX Explosion-proof, Intrinsically Safe (combination of E5, I5, E6, I6, E1, and I1) <i>Note: Only available on Housing Style codes 00, 1A, 1J, 2A, 2J, 2E, or 2M.</i>		★
N1	ATEX Type n		★
Alternate Transmitter Material of Construction			
Standard			Standard
L1	Inert Sensor Fill Fluid <i>Note: Silicone fill fluid is standard.</i>		★
L2	Graphite-Filled (PTFE) O-ring		★
LA	Inert Sensor Fill Fluid and Graphite-Filled (PTFE) O-ring		★
Digital Display			
Standard			Standard
M5	LCD display		★
Transient Protection			
Standard			Standard
T1 ⁽⁹⁾	Transient terminal block		★
Manifold for Remote Mount Option			
Standard			Standard
F2	3-Valve Manifold, Stainless Steel		★
F6	5-Valve Manifold, Stainless Steel		★

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Table 7. Rosemount 3051CFC Compact Flowmeter Ordering Information

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

PlantWeb Control Functionality		
Standard		Standard
A01	FOUNDATION fieldbus Advanced Control Function Block Suite	★
PlantWeb Diagnostic Functionality		
Standard		Standard
D01	FOUNDATION fieldbus Diagnostic Suite	★
Lower Power Output		
Standard		Standard
C2 ⁽¹⁰⁾	0.8-3.2 V dc Output with Digital Signal Based on Hart Protocol	★
Alarm Limit		
Standard		Standard
C4 ⁽¹⁰⁾⁽¹¹⁾	NAMUR Alarm and Saturation Levels, High Alarm	★
CN ⁽¹⁰⁾⁽¹¹⁾	NAMUR Alarm and Saturation Levels, Low Alarm	★
Ground Screw		
Standard		Standard
V5 ⁽¹²⁾	External Ground Screw Assembly	★
Typical Model Number: 3051CFC D C S 060 N 065 0 3 2 A A 1 WC E5 M5		

(1) Not available for Primary Element Technology C.

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

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

(4) Material specified is cast as follows: CF-8M is the cast version of 316 SST, CF-3M is the cast version of 316L SST. For housing, material is aluminum with polyurethane paint.

(5) Not available with Primary Element Technology P.

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

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

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

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

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

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

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

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Rosemount 3051CFP Integral Orifice Flowmeter

Table 8. Rosemount 3051CFP Integral Orifice Flowmeter Ordering Information

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

Model	Product Description	
3051CFP	Integral Orifice Flowmeter	
Measurement Type		
Standard		Standard
D	Differential Pressure	★
Body Material		
Standard		Standard
S	316 SST	★
Line Size		
Standard		Standard
005	1/2-in. (15 mm)	★
010	1-in. (25 mm)	★
015	1 1/2-in. (40 mm)	★
Process Connection		
Standard		Standard
T1	NPT Female Body (Not Available with Remote Thermowell and RTD)	★
S1 ⁽¹⁾	Socket Weld Body (Not Available with Remote Thermowell and RTD)	★
P1	Pipe Ends: NPT Threaded	★
P2	Pipe ends: Beveled	★
D1	Pipe Ends: Flanged, DIN PN16, slip-on	★
D2	Pipe Ends: Flanged, DIN PN40, slip-on	★
D3	Pipe Ends: Flanged, DIN PN100, slip-on	★
W1	Pipe Ends: Flanged, RF, ANSI Class 150, weld-neck	★
W3	Pipe Ends: Flanged, RF, ANSI Class 300, weld-neck	★
W6	Pipe Ends: Flanged, RF, ANSI Class 600, weld-neck	★
Expanded		
A1	Pipe Ends: Flanged, RF, ANSI Class 150, slip-on	
A3	Pipe Ends: Flanged, RF, ANSI Class 300, slip-on	
A6	Pipe Ends: Flanged, RF, ANSI Class 600, slip-on	
R1	Pipe Ends: Flanged, RTJ, ANSI Class 150, slip-on	
R3	Pipe Ends: Flanged, RTJ, ANSI Class 300, slip-on	
R6	Pipe Ends: Flanged, RTJ, ANSI Class 600, slip-on	
Orifice Plate Material		
Standard		Standard
S	316 SST	★
Expanded		
H	Alloy C-276	
M	Alloy 400	
Bore Size Option		
Standard		Standard
0066	0.066-in. (1.68 mm) for 1/2-in. Pipe	★
0109	0.109-in. (2.77 mm) for 1/2-in. Pipe	★
0160	0.160-in. (4.06 mm) for 1/2-in. Pipe	★
0196	0.196-in. (4.98 mm) for 1/2-in. Pipe	★
0260	0.260-in. (6.60 mm) for 1/2-in. Pipe	★
0340	0.340-in. (8.64 mm) for 1/2-in. Pipe	★
0150	0.150-in. (3.81 mm) for 1-in. Pipe	★

Rosemount DP Flow

Table 8. Rosemount 3051CFP Integral Orifice Flowmeter Ordering Information

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

0250	0.250-in. (6.35 mm) for 1-in. Pipe	★
0345	0.345-in. (8.76 mm) for 1-in. Pipe	★
0500	0.500-in. (12.70 mm) for 1-in. Pipe	★
0630	0.630-in. (16.00 mm) for 1-in. Pipe	★
0800	0.800-in. (20.32 mm) for 1-in. Pipe	★
0295	0.295-in. (7.49 mm) for 1 1/2-in. Pipe	★
0376	0.376-in. (9.55 mm) for 1 1/2-in. Pipe	★
0512	0.512-in. (13.00 mm) for 1 1/2-in. Pipe	★
0748	0.748-in. (19.00 mm) for 1 1/2-in. Pipe	★
1022	1.022-in. (25.96 mm) for 1 1/2-in. Pipe	★
1184	1.184-in. (30.07 mm) for 1 1/2-in. Pipe	★
Expanded		
0010	0.010-in. (0.25 mm) for 1/2-in. Pipe	
0014	0.014-in. (0.36 mm) for 1/2-in. Pipe	
0020	0.020-in. (0.51 mm) for 1/2-in. Pipe	
0034	0.034-in. (0.86 mm) for 1/2-in. Pipe	
Transmitter Connection Platform		
Standard		Standard
D3	Direct-mount, 3-Valve Manifold, SST	★
D5	Direct-mount, 5-Valve Manifold, SST	★
R3	Remote-mount, 3-Valve Manifold, SST	★
R5	Remote-mount, 5-Valve Manifold, SST	★
Expanded		
D4	Direct-mount, 3-Valve Manifold, Alloy C-276	
D6	Direct-mount, 5-Valve Manifold, Alloy C-276	
D7	Direct-mount, High Temperature, 5-Valve Manifold, SST	
R4	Remote-mount, 3-Valve Manifold, Alloy C-276	
R6	Remote-mount, 5-Valve Manifold, Alloy C-276	
Differential Pressure Ranges		
Standard		Standard
1	0 to 25 in H ₂ O (0 to 62,3 mbar)	★
2	0 to 250 in H ₂ O (0 to 623 mbar)	★
3	0 to 1000 in H ₂ O (0 to 2,5 bar)	★
Transmitter Output		
Standard		Standard
A	4–20 mA with digital signal based on HART Protocol	★
F	FOUNDATION fieldbus Protocol	★
W	Profibus-PA Protocol	★
Expanded		
M ⁽²⁾	Low-Power, 1-5 V dc with Digital Signal Based on HART Protocol	
Transmitter Housing Material ⁽³⁾		
Standard		Standard
A	Polyurethane-covered Aluminum	1/2-14 NPT
B	Polyurethane-covered Aluminum	M20 x 1.5
J	SST	1/2-14 NPT
K	SST	M20 x 1.5
Expanded		
D	Polyurethane-covered Aluminum	G ¹ /2
M	SST	G ¹ /2
Transmitter Performance Class		
Standard		Standard
1	up to ±1.75% flow rate accuracy, 8:1 flow turndown, 5-year stability	
		★

Table 8. Rosemount 3051CFP Integral Orifice Flowmeter Ordering Information

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

Options (Include with selected model number)

Transmitter Body / Bolt Material			
Expanded			
GT	High Temperature (850 °F / 454 °C)		
Temperature Sensor			
Expanded			
RT ⁽⁴⁾	Thermowell and RTD		
Optional Connection			
Standard			Standard
G1	DIN 19213 Transmitter Connection		★
Pressure Testing			
Expanded			
P1 ⁽⁵⁾	Hydrostatic Testing with Certificate		
Special Cleaning			
Expanded			
P2	Cleaning for Special Services		
PA	Cleaning per ASTM G93 Level D (Section 11.4)		
Material Testing			
Expanded			
V1	Dye Penetrant Exam		
Material Examination			
Expanded			
V2	Radiographic Examination		
Flow Calibration			
Expanded			
WD ⁽⁶⁾	Discharge Coefficient Verification		
Special Inspection			
Standard			Standard
QC1	Visual & Dimensional Inspection with Certificate		★
QC7	Inspection and Performance Certificate		★
Material Traceability Certification			
Standard			Standard
Q8	Material Traceability Certification per EN 10204:2004 3.1		★
Code Conformance			
Expanded			
J2 ⁽⁷⁾	ANSI/ASME B31.1		
J3 ⁽⁷⁾	ANSI/ASME B31.3		
J4 ⁽⁷⁾	ANSI/ASME B31.8		
Materials Conformance			
Expanded			
J5 ⁽⁸⁾	NACE MR-0175 / ISO 15156		
Country Certification			
Standard			Standard
J6	European Pressure Directive (PED)		★
Expanded			
J1	Canadian Registration		
Transmitter Calibration Certification			
Standard			Standard
Q4	Calibration Certificate for Transmitter		★
Quality Certification for Safety			
Standard			Standard
QS ⁽⁹⁾	Prior-use certificate of FMEDA data		★

Table 8. Rosemount 3051CFP Integral Orifice Flowmeter Ordering Information

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

Product Certifications			
Standard			Standard
C6	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2		★
E5	FM Explosion-proof, Dust Ignition-proof		★
E7	IECEx Flameproof, Dust Ignition-proof		★
E8	ATEX Flameproof, Dust		★
I1	ATEX Intrinsic Safety		★
I5	FM Intrinsically Safe, Division 2		★
IA ⁽¹⁰⁾	ATEX FISCO Intrinsic Safety; for FOUNDATION fieldbus protocol only		★
K5	FM Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E5 and I5)		★
K6	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E6 and I6)		★
K8	ATEX Flameproof, Intrinsic Safety, Type n, Dust (combination of E8, I1 and N1)		★
KB	FM and CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E5, E6, I5, and I6)		★
KD	FM, CSA, and ATEX Explosion-proof, Intrinsically Safe (combination of E5, I5, E6, I6, E1, and I1)		★
N1	ATEX Type n		★
Alternate Transmitter Material of Construction			
Standard			Standard
L1	Inert Sensor Fill Fluid <i>Note: Silicone fill fluid is standard.</i>		★
L2	Graphite-Filled (PTFE) O-ring		★
LA	Inert Sensor Fill Fluid and Graphite-Filled (PTFE) O-ring		★
Digital Display			
Standard			Standard
M5	LCD Display		★
Transient Protection			
Standard			Standard
T1 ⁽¹¹⁾	Transient terminal block		★
PlantWeb Control Functionality			
Standard			Standard
A01	FOUNDATION fieldbus Advanced Control Function Block Suite		★
PlantWeb Diagnostic Functionality			
Standard			Standard
D01	FOUNDATION fieldbus Diagnostic Suite		★
Lower Power Output			
Standard			Standard
C2 ⁽¹²⁾	0.8-3.2 V dc Output with Digital Signal Based on Hart Protocol		★
Alarm Limit			
Standard			Standard
C4 ⁽¹²⁾⁽¹³⁾	NAMUR Alarm and Saturation Levels, High Alarm		★
CN ⁽¹²⁾⁽¹³⁾	NAMUR Alarm and Saturation Levels, Low Alarm		★
Ground Screw			
Standard			Standard
V5 ⁽¹⁴⁾	External Ground Screw Assembly		★
Typical Model Number: 3051CFP D S 010 W1 S 0500 D3 2 A A 1 E5 M5			

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

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

(3) Material specified is cast as follows: CF-8M is the cast version of 316 SST, CF-3M is the cast version of 316L SST. For housing, material is aluminum with polyurethane paint.

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

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

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

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

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

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

(10) *Only valid with FOUNDATION fieldbus Output Code F.*

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

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

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

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

Rosemount DP Flow

3051CF Specifications

3051CF PERFORMANCE SPECIFICATIONS

Performance assumptions include: measured pipe I.D, transmitter is trimmed for optimum flow accuracy, and performance is dependent on application parameters.

Table 9. Flow Performance - Flow Reference Accuracy

3051CFA Annubar Flowmeter		
Ranges 2-3		±1.60% of Flow Rate at 8:1 flow turndown
3051CFC Compact Orifice Flowmeter – Conditioning Option C		
Ranges 2-3	$\beta = 0.4$	±1.75% of Flow Rate at 8:1 flow turndown
	$\beta = 0.65$	±1.95% of Flow Rate at 8:1 flow turndown
3051CFC Compact Orifice Flowmeter – Orifice Type Option P ⁽¹⁾		
Ranges 2-3	$\beta = 0.4$	±2.00% of Flow Rate at 8:1 flow turndown
	$\beta = 0.65$	±2.00% of Flow Rate at 8:1 flow turndown
3051CFP Integral Orifice Flowmeter		
Ranges 2-3	$\beta < 0.1$	±3.00% of Flow Rate at 8:1 flow turndown
	$0.1 < \beta < 0.2$	±1.95% of Flow Rate at 8:1 flow turndown
	$0.2 < \beta < 0.6$	±1.75% of Flow Rate at 8:1 flow turndown
	$0.6 < \beta < 0.8$	±2.15% of Flow Rate at 8:1 flow turndown

(1) For smaller line sizes, see Rosemount Compact Orifice

3051CF FUNCTIONAL SPECIFICATIONS

Range and Sensor Limits

Table 10. 3051CF Range and Sensor Limits

Range	3051CF Minimum Span	Range and Sensor Limits
1	0.5 inH ₂ O (1,2 mbar)	0 to 25 inH ₂ O (62,3 mbar)
2	2.5 inH ₂ O (6,2 mbar)	0 to 250 inH ₂ O (0,63 bar)
3	10 inH ₂ O (24,9 mbar)	0 to 1000 inH ₂ O (2,49 bar)

Zero and Span Adjustment Requirements (HART and Low Power)

Zero and span values can be set anywhere within the range limits stated in Table 10 and Table 11.

Span must be greater than or equal to the minimum span stated in Table 10 and Table 11.

Service

Liquid, gas, and vapor applications

4–20 mA (Output Code A)

Output

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

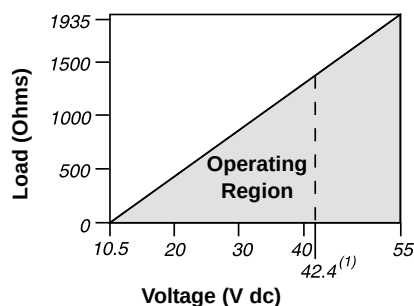
Power Supply

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

Load Limitations

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

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



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

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

Power Supply

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

Current Draw

17.5 mA for all configurations (including LCD display option)

FOUNDATION fieldbus Function Block Execution Times

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

FOUNDATION fieldbus Parameters

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

Standard Function Blocks

Resource Block

Contains hardware, electronics, and diagnostic information.

Transducer Block

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

LCD Block

Configures the local display.

2 Analog Input Blocks

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

PID Block

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

Backup Link Active Scheduler (LAS)

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

Advanced Control Function Block Suite (Option Code A01)

Input Selector Block

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

Arithmetic Block

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

Signal Characterizer Block

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

Integrator Block

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

FOUNDATION fieldbus Diagnostics Suite (Option Code D01)

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

Low Power (Output Code M)

Output

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

Power Consumption

3.0 mA, 18–36 mW

Minimum Load Impedance

100 k Ω (V_{out} wiring)

Indication

Optional 5-digit LCD display

Overpressure Limits

Rosemount 3051CF

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

Static Pressure Limit

Operates within specifications between static line pressures of 0.5 psia and 3626 psig.

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

Burst Pressure Limits

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

Rosemount DP Flow

Failure Mode Alarm

Output Code A

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

Output Code M

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

Output Code F and W

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

Process Temperature Limits

For 3051CFA Temperature Limits, see page 91.

For 3051CFC Temperature Limits, see page 103.

For 3051CFP Temperature Limits, see page 111.

Table 11. 3051CF Process Temperature Limits

3051CF	
Silicone Fill Sensor ⁽¹⁾	–40 to 250 °F (–40 to 121 °C)
Inert Fill Sensor ⁽¹⁾	0 to 185 °F (–18 to 85 °C)

(1) Process temperatures above 185 °F (85 °C) require derating the ambient limits by a 1.5:1 ratio (0.6:1 ratio for the 3051H).

Transmitter Temperature Limits:

Ambient

–40 to 185 °F (–40 to 85 °C)

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

Storage

–50 to 230 °F (–46 to 110 °C)

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

Process

At atmospheric pressures and above. See Table 11

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

Humidity Limits

0–100% relative humidity

Turn-On Time

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

Volumetric Displacement

Less than 0.005 in³ (0,08 cm³)

Damping

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

Long Term Stability

Models	Long Term Stability
3051CF Ranges 2-3	±0.125% of URL for 5 years ±50 °F (28 °C) temperature changes, and up to 1000 psi (6,9 MPa) line pressure.
3051CF Low/Draft Range Range 1	±0.2% of URL for 1 year

Dynamic Performance

	4 - 20 mA (HART protocol) ⁽¹⁾	Fieldbus protocol ⁽³⁾	Typical HART Transmitter Response Time
Total Response Time ($T_d + T_c$) ⁽²⁾ :			
3051CF, Ranges 2-5:	100 ms	152 ms	
Range 1:	255 ms	307 ms	
Dead Time (T_d)	45 ms (nominal)	97 ms	
Update Rate	22 times per second	22 times per second	
(1) Dead time and update rate apply to all models and ranges; analog output only (2) Nominal total response time at 75 °F (24 °C) reference conditions. (3) Transmitter fieldbus output only, segment macro-cycle not included.			

Transmitter Output vs. Time

Pressure Released

100%

36.8%

0%

Time

T_d = Dead Time
 T_c = Time Constant
Response Time = $T_d + T_c$

63.2% of Total Step Change

Vibration Effect

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

3051CF PHYSICAL SPECIFICATIONS

Electrical Connections

$\frac{1}{2}$ –14 NPT, PG 13.5, G $\frac{1}{2}$, and M20 × 1.5 conduit. HART interface connections fixed to terminal block.

Process-Wetted Parts

For 3051CFA wetted parts, see “Annubar Sensor Material” on page 92.

For 3051CFC wetted parts, see “Material of Construction” on page 104.

For 3051CFP wetted parts, see “Material of Construction” on page 111.

Process Isolating Diaphragms

316L SST, Alloy C-276, Alloy 400, Tantalum, Gold-plated Alloy 400, Gold-plate SST

Non-Wetted Parts

Electronics Housing

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

Coplanar Sensor Module Housing

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

Bolts

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

Sensor Module Fill Fluid

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

Paint

Polyurethane

Cover O-rings

Buna-N

3051CF Product Certifications

Approved Manufacturing Locations

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

European Directive Information

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

ATEX Directive (94/9/EC)

All 3051 transmitters comply with the ATEX Directive.

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

3051CF with DP Range 2 and 3
 — QS Certificate of Assessment - EC No. PED-H-100
 Module H Conformity Assessment

All other 3051 Pressure Transmitters

— Sound Engineering Practice

Transmitter Attachments: Process Flange - Manifold

— Sound Engineering Practice

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

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

Ordinary Location Certification for Factory Mutual

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

HART Protocol

Hazardous Locations Certifications

North American Certifications

FM Approvals

- E5** Explosion-Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition-Proof for Class II, Division 1, Groups E, F, and G. Dust-Ignition-Proof for Class III, Division 1. Factory Sealed, Enclosure Type 4X
- I5** Intrinsically Safe for use in Class I, Division 1, Groups A, B, C, and D; Class II, Division 1, Groups E, F, and G; Class III, Division 1 when connected per Rosemount drawing 03031-1019; Non-incendive for Class I, Division 2, Groups A, B, C, and D. Temperature Code: T4 (Ta = 40 °C), T3 (Ta = 85 °C), Enclosure Type 4X
 For input parameters see control drawing 03031-1019.

Canadian Standards Association (CSA)

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

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Rosemount DP Flow

European Certifications

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

Table 12. Input Parameters

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

Special Conditions for Safe Use (X):

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

- N1** ATEX Type n and Dust
Certification No.: BAS 00ATEX3105X  II 3 GD
 $U_i = 55$ Vdc max
Ex nA nL T5 ($-40^\circ C \leq T_{amb} \leq 70$ °C)
Dust rating: Ex tD A22 T80 °C ($-20 \leq T_a \leq 40$ °C) IP66
CE

Special Conditions for Safe Use (X):

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

- E8** ATEX Flame-Proof and Dust
Certification No.: KEMA 00ATEX2013X  II 1/2 GD
Ex d IIC T6 (-50 °C $\leq T_a \leq 65$ °C)
Dust rating Ex tD A20/A21 T90 °C, IP66
CE 1180
 $V_{max} = 55$ V dc

Special Conditions for Safe Use (X):

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

- E7** IECEx Flame-Proof and Dust
Certification No.: IECEx KEM 09.0034X
Ga/Gb Ex d IIC T6 (-50 °C $\leq T_a \leq 65$ °C)
Ex tD A20/A21 T90, IP66

Special Conditions for Safe Use (X):

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

Combinations of Certifications

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

- K5** E5 and I5 combination
KB K5 and C6 combination
KD K5, C6, I1, and E8 combination
K6 C6, I1, and E8 combination
K8 E8 and I1 combination

3051CF FOUNDATION FIELDBUS PROTOCOL

Hazardous Locations Certifications

North American Certifications

FM Approvals

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

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

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

Canadian Standards Association (CSA)

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

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

European Certifications

I1 ATEX Intrinsic Safety and Dust
Certification No.: BAS 98ATEX1355X  II 1 GD
Ex ia IIC T4 (-60 °C ≤ Ta ≤ 60 °C)
Dust Rating: Ex tD A20 T70 °C (-20 °C ≤ Ta ≤ 40 °C) IP66
CE 1180

Table 13. Input Parameters

U _i = 30V
I _i = 300 mA
P _i = 1.3 W
C _i = 0 μF

Special Conditions for Safe Use (X):

The device is not capable of withstanding the 500V insulation test required by Clause 6.8.1 of EN60079-15:2005. This must be taken into account when installing the apparatus.

IA ATEX FISCO Intrinsic Safety
Certification No.: BAS 98ATEX1355X  II 1 G
EEx ia IIC T4 (-60 °C ≤ Ta ≤ 60 °C)
IP66
CE 1180

Table 14. Input Parameters

U _i = 17.5 V
I _i = 380 mA
P _i = 5.32 W
C _i = ≤ 5 μF
L _i = ≤ 10 μH

Special Conditions for Safe Use (X):

The device is not capable of withstanding the 500V insulation test required by Clause 6.8.1 of EN60079-15:2005. This must be taken into account when installing the apparatus.

N1 ATEX Type n and Dust
Certification No.: BAS 98ATEX3356X  II 3 GD
U_i = 40 Vdc max
Ex nA nL IIC T5 (-40 °C ≤ Ta ≤ 70 °C)
Dust rating: Ex tD A22 T80 °C (-20 °C ≤ Ta ≤ 40 °C) IP66

Special Conditions for Safe Use (X):

The device is not capable of withstanding the 500V insulation test required by Clause 6.8.1 of EN60079-15:2005. This must be taken into account when installing the apparatus.

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

Special Conditions for Safe Use (X):

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

E7 IECEx Flame-Proof and Dust
Certification No.: IECEx KEM 09.0034X
Ga/Gb Ex d IIC T6 (-50 °C ≤ Ta ≤ 65 °C)
Ex tD A20/A21 T90, IP66

Special Conditions for Safe Use (X):

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

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Combinations of Certifications

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

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

Rosemount 2051CF Flowmeter Series



Rosemount 2051CF Flowmeters combine the 2051 Pressure transmitter and the latest primary element technology: Annubar Averaging Pitot Tube, Compact Conditioning Orifice Plate and Integral Orifice Plate.

Additional Information

Specifications: page 77

Product Certifications: page 81

Dimensional Drawings: page 129

Installation and Flowmeter Orientation: page 151



Rosemount 2051CFA Annubar Flowmeter

Table 15. Rosemount 2051CFA Annubar Flowmeter Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.

The Expanded offering is subject to additional delivery lead time.

Model	Product Description	
2051CFA	Annubar Flowmeter	
Measurement Type		
Standard		Standard
D	Differential Pressure	★
Fluid Type		
Standard		Standard
L	Liquid	★
G	Gas	★
S	Steam	★
Line Size		
Standard		Standard
020	2-in. (50 mm)	★
025	2½-in. (63.5 mm)	★
030	3-in. (80 mm)	★
035	3½-in. (89 mm)	★
040	4-in. (100 mm)	★
050	5-in. (125 mm)	★
060	6-in. (150 mm)	★
070	7-in. (175 mm)	★
080	8-in. (200 mm)	★
100	10-in. (250 mm)	★
120	12-in. (300 mm)	★
Pipe I.D. Range		
Standard		Standard
C	Range C from the Pipe I.D. table	★
D	Range D from the Pipe I.D. table	★

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Table 15. Rosemount 2051CFA Annubar Flowmeter Ordering Information

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

Expanded		
A	Range A from the Pipe I.D. table	
B	Range B from the Pipe I.D. table	
E	Range E from the Pipe I.D. table	
Z	Non-standard Pipe I.D. Range or Line Sizes greater than 12 inches	
Pipe Material / Mounting Assembly Material		
Standard		Standard
C	Carbon steel (A105)	★
S	316 Stainless Steel	★
0 ⁽¹⁾	No Mounting (Customer Supplied)	
Expanded		
G	Chrome-Moly Grade F-11	
N	Chrome-Moly Grade F-22	
J	Chrome-Moly Grade F-91	
Piping Orientation		
Standard		Standard
H	Horizontal Piping	★
D	Vertical Piping with Downwards Flow	★
U	Vertical Piping with Upwards Flow	★
Annubar Type		
Standard		Standard
P	Pak-Lok	★
F	Flanged with opposite side support	★
Sensor Material		
Standard		Standard
S	316 Stainless Steel	★
Sensor Size		
Standard		Standard
1	Sensor size 1 — Line sizes 2-in. (50 mm) to 8-in. (200 mm)	★
2	Sensor size 2 — Line sizes 6-in. (150 mm) to 96-in. (2400 mm)	★
3	Sensor size 3 — Line sizes greater than 12-in. (300 mm)	★
Mounting Type		
Standard		Standard
T1	Compression or Threaded Connection	★
A1	150# RF ANSI	★
A3	300# RF ANSI	★
A6	600# RF ANSI	★
D1	DN PN16 Flange	★
D3	DN PN40 Flange	★
D6	DN PN100 Flange	★
Expanded		
R1	150# RTJ Flange	
R3	300# RTJ Flange	
R6	600# RTJ Flange	
Opposite Side Support or Packing Gland		
Standard		Standard
0	No opposite side support or packing gland (Required for Pak-Lok and Flange-Lok models)	★
Opposite Side Support – Required for Flanged Models		
C	NPT Threaded Opposite Support Assembly – Extended Tip	★
D	Welded Opposite Support Assembly – Extended Tip	★
Isolation Valve for Flo-Tap Models		
Standard		Standard
0 ⁽¹⁾	Not Applicable or Customer Supplied	★

Rosemount DP Flow

Table 15. Rosemount 2051CFA Annubar Flowmeter Ordering Information

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

Temperature Measurement			
Standard			Standard
T	Integral RTD – not available with Flanged model greater than class 600#		★
0	No Temperature Sensor		★
Expanded			
R	Remote Thermowell and RTD		
Transmitter Connection Platform			
Standard			Standard
3	Direct-mount, Integral 3-valve Manifold– not available with Flanged model greater than class 600		★
5	Direct -mount, 5-valve Manifold – not available with Flanged model greater than class 600		★
7	Remote-mount NPT Connections (¹ / ₂ -in. FNPT)		★
Expanded			
8	Remote-mount SW Connections (¹ / ₂ -in.)		
Differential Pressure Range			
Standard			Standard
1	0 to 25 in H ₂ O (0 to 62,3 mbar)		★
2	0 to 250 in H ₂ O (0 to 623 mbar)		★
3	0 to 1000 in H ₂ O (0 to 2,5 bar)		★
Transmitter Output			
Standard			Standard
A	4–20 mA with digital signal based on HART Protocol		★
F	FOUNDATION fieldbus Protocol		★
Expanded			
M	Low-Power, 1-5 V dc with Digital Signal Based on HART Protocol		
Transmitter Housing Material ⁽²⁾		Conduit Entry Size	
Standard			Standard
A	Polyurethane-covered Aluminum	¹ / ₂ -14 NPT	★
B	Polyurethane-covered Aluminum	M20 x 1.5	★
J	SST	¹ / ₂ -14 NPT	★
K ⁽³⁾	SST	M20 x 1.5	★
Expanded			
D	Polyurethane-covered Aluminum	G ¹ / ₂	
M ⁽³⁾	SST	G ¹ / ₂	
Transmitter Performance Class			
Standard			Standard
1	2.0% flow rate accuracy, 5:1 flow turndown, 2-year stability		★

Options (Include with selected model number)

Pressure Testing		
Expanded		
P1 ⁽⁴⁾	Hydrostatic Testing with Certificate	
PX ⁽⁴⁾	Extended Hydrostatic Testing	
Special Cleaning		
Expanded		
P2	Cleaning for Special Services	
PA	Cleaning per ASTM G93 Level D (Section 11.4)	
Material Testing		
Expanded		
V1	Dye Penetrant Exam	
Material Examination		
Expanded		
V2	Radiographic Examination	

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Rosemount DP Flow

Table 15. Rosemount 2051CFA Annubar Flowmeter Ordering Information

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

Special Inspection		
Standard		Standard
QC1	Visual & Dimensional Inspection with Certificate	★
QC7	Inspection & Performance Certificate	★
Surface Finish		
Standard		Standard
RL	Surface finish for Low Pipe Reynolds # in Gas & Steam	★
RH	Surface finish for High Pipe Reynolds # in Liquid	★
Material Traceability Certification		
Standard		Standard
Q8 ⁽⁵⁾	Material Traceability Certification per EN 10474:2004 3.1	★
Code Conformance		
Expanded		
J2	ANSI/ASME B31.1	
J3	ANSI/ASME B31.3	
Materials Conformance		
Expanded		
J5 ⁽⁶⁾	NACE MR-0175 / ISO 15156	
Country Certification		
Standard		Standard
J6	European Pressure Directive (PED)	★
Expanded		
J1	Canadian Registration	
Instrument Connections for Remote Mount Options		
Standard		Standard
G2	Needle Valves, Stainless Steel	★
G6	OS&Y Gate Valve, Stainless Steel	★
Expanded		
G1	Needle Valves, Carbon Steel	
G3	Needle Valves, Alloy C-276	
G5	OS&Y Gate Valve, Carbon Steel	
G7	OS&Y Gate Valve, Alloy C-276	
Special Shipment		
Standard		Standard
Y1	Mounting Hardware Shipped Separately	★
Product Certifications		
Standard		Standard
E1 ⁽³⁾	ATEX Flameproof	★
E5	FM Explosion-proof, Dust Ignition-proof	★
E6	CSA Explosion-proof, Dust Ignition-proof, Division 2	★
E7	IECEX Flameproof, Dust Ignition-proof	★
I1 ⁽³⁾	ATEX Intrinsic Safety	★
I5	FM Intrinsically Safe, Division 2	★
I6	CSA Intrinsically Safe	★
I7 ⁽³⁾	IECEX Intrinsic Safety	★
IA ⁽⁷⁾	ATEX FISCO Intrinsic Safety; for FOUNDATION fieldbus protocol only	★
IE ⁽⁷⁾	FM FISCO Intrinsically Safe	★
IF ⁽⁷⁾	CSA FISCO Intrinsically Safe	★
IG ⁽⁷⁾	IECEX FISCO Intrinsically Safe	★
K1 ⁽³⁾	ATEX Flameproof, Intrinsic Safety, Type n, Dust	★
K5	FM Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E5 and I5)	★
K6	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E6 and I6)	★
K7 ⁽³⁾	IECEX Flameproof, Dust Ignition-proof, Intrinsic Safety, Type n (combination of E7, I7, and N7)	★
KA ⁽³⁾	ATEX and CSA Flameproof, Intrinsically Safe, Division 2	★
KB	FM and CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E5, E6, I5, and I6)	★
KC ⁽³⁾	FM and ATEX Explosion-proof, Intrinsically Safe, Division 2	★

Rosemount DP Flow

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Table 15. Rosemount 2051CFA Annubar Flowmeter Ordering Information

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

KD ⁽³⁾	FM, CSA, and ATEX Explosion-proof, Intrinsically Safe (combination of E5, I5, E6, I6, E1, and I1)	★
N1 ⁽³⁾	ATEX Type n	★
N7 ⁽³⁾	IECEX Type n	★
ND ⁽³⁾	ATEX Dust	★
Alternate Transmitter Material of Construction		
Standard		Standard
L1	Inert Sensor Fill Fluid	★
L2	Graphite-Filled (PTFE) O-ring	★
LA	Inert Sensor Fill Fluid and Graphite-Filled (PTFE) O-ring	★
Digital Display		
Standard		Standard
M5	PlantWeb LCD display (Requires PlantWeb housing)	★
Transmitter Calibration Certification		
Standard		Standard
Q4	Calibration Certificate for Transmitter	★
Quality Certification for Safety		
Standard		Standard
QS ⁽⁸⁾	Certificate of FMEDA data	★
Transient Protection		
Standard		Standard
T1 ⁽⁹⁾	Transient terminal block	★
Manifold for Remote Mount Option		
Standard		Standard
F2	3-Valve Manifold, Stainless Steel	★
F6	5-Valve Manifold, Stainless Steel	★
Expanded		
F1	3-Valve Manifold, Carbon Steel	
F5	5-Valve Manifold, Carbon Steel	
Hardware Adjustments		
Standard		Standard
D4	Zero and Span Hardware Adjustments	★
Alarm Limit		
Standard		Standard
C4 ⁽⁸⁾⁽¹⁰⁾	NAMUR Alarm and Saturation Levels, High Alarm	★
CN ⁽⁸⁾⁽¹⁰⁾	NAMUR Alarm and Saturation Levels, Low Alarm	★
Ground Screw		
Standard		Standard
V5 ⁽¹¹⁾	External Ground Screw Assembly	★
Typical Model Number: 2051CFA D L 060 D C H P S 2 T1 0 0 0 3 2A A 1A 3		

(1) Provide the "A" dimension for Flanged (page 130) and Pak-Lok (page 129).

(2) Material specified is cast as follows: CF-8M is the cast version of 316 SST, CF-3M is the cast version of 316L SST. For housing, material is aluminum with polyurethane paint.

(3) Not available with Low Power Output Code M.

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

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

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

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

(8) Not available with Output Protocol code F.

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

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

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



**Rosemount 2051CFC
Compact Flowmeter**

Table 16. Rosemount 2051CFC Compact Flowmeter Ordering Information

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

Model	Product Description	
2051CFC	Compact Flowmeter	
Measurement Type		
Standard		Standard
D	Differential Pressure	★
Primary Element Technology		
Standard		Standard
C	Conditioning Orifice Plate	★
P	Orifice Type	★
Material Type		
Standard		Standard
S	316 SST	★
Line Size		
Standard		Standard
005 ⁽¹⁾	1/2-in. (15 mm)	★
010 ⁽¹⁾	1-in. (25 mm)	★
015 ⁽¹⁾	1 1/2-in. (40 mm)	★
020	2-in. (50 mm)	★
030	3-in. (80 mm)	★
040	4-in. (100 mm)	★
060	6-in. (150 mm)	★
080	8-in. (200 mm)	★
100	10-in. (250 mm)	★
120	12-in. (300 mm)	★
Primary Element Style		
Standard		Standard
N	Square Edged	★
Primary Element Type		
Standard		Standard
040	0.40 Beta Ratio	★
065 ⁽²⁾	0.65 Beta Ratio	★
Temperature Measurement		
Standard		Standard
0	No Temperature Sensor	★
Expanded		
R	Remote Thermowell and RTD	
Transmitter Connection Platform		
Standard		Standard
3	Direct-mount, Integral 3-valve Manifold	★
7	Remote-mount, 1/4-in. NPT Connections	★
Differential Pressure Range		
Standard		Standard
1	0 to 25 in H ₂ O (0 to 62,3 mbar)	★
2	0 to 250 in H ₂ O (0 to 623 mbar)	★
3	0 to 1000 in H ₂ O (0 to 2,5 bar)	★

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Table 16. Rosemount 2051CFC Compact Flowmeter Ordering Information

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

Transmitter Output			
Standard			Standard
A	4–20 mA with digital signal based on HART Protocol		★
F	FOUNDATION fieldbus Protocol		★
Expanded			
M	Low-Power, 1-5 V dc with Digital Signal Based on HART Protocol		
Transmitter Housing Material ⁽³⁾		Conduit Entry Size	
Standard			Standard
A	Polyurethane-covered Aluminum	1/2-14 NPT	★
B	Polyurethane-covered Aluminum	M20 x 1.5	★
J	SST	1/2-14 NPT	★
K ⁽⁴⁾	SST	M20 x 1.5	★
Expanded			
D	Polyurethane-covered Aluminum	G1/2	
M ⁽⁴⁾	SST	G1/2	
Transmitter Performance Class			
Standard			Standard
1	up to ±2.25% flow rate accuracy, 5:1 flow turndown, 2-year stability		★

Options (Include with selected model number)

Installation Accessories		
Standard		Standard
AB	ANSI Alignment Ring (150#) (Only required for 10-in. (250 mm) and 12-in. (300mm) line sizes)	★
AC	ANSI Alignment Ring (300#) (Only required for 10-in. (250 mm) and 12-in. (300mm) line sizes)	★
AD	ANSI Alignment Ring (600#) (Only required for 10-in. (250 mm) and 12-in. (300mm) line sizes)	★
DG	DIN Alignment Ring (PN16)	★
DH	DIN Alignment Ring (PN40)	★
DJ	DIN Alignment Ring (PN100)	★
Expanded		
JB	JIS Alignment Ring (10K)	
JR	JIS Alignment Ring (20K)	
JS	JIS Alignment Ring (40K)	
Remote Adapters		
Standard		Standard
FE	Flange Adapters 316 SST (1/2-in NPT)	★
High Temperature Application		
Expanded		
HT	Graphite Valve Packing (Tmax = 850 °F)	
Flow Calibration		
Expanded		
WC	Flow Calibration Certification (3 point)	
WD	Discharge Coefficient Verification (full 10 point)	
Pressure Testing		
Expanded		
P1	Hydrostatic Testing with Certificate	
Special Cleaning		
Expanded		
P2	Cleaning for Special Services	
PA	Cleaning per ASTM G93 Level D (Section 11.4)	
Special Inspection		
Standard		Standard
QC1	Visual & Dimensional Inspection with Certificate	★
QC7	Inspection and Performance Certificate	★

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Table 16. Rosemount 2051CFC Compact Flowmeter Ordering Information

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

Transmitter Calibration Certification		
Standard		Standard
Q4	Calibration Certificate for Transmitter	★
Quality Certification for Safety		
Standard		Standard
QS ⁽⁵⁾	Prior-use certificate of FMEDA data	★
Material Traceability Certification		
Standard		Standard
Q8	Material Traceability Certification per EN 10204:2004 3.1	★
Code Conformance		
Expanded		
J2	ANSI/ASME B31.1	
J3	ANSI/ASME B31.3	
J4	ANSI/ASME B31.8	
Materials Conformance		
Expanded		
J5 ⁽⁶⁾	NACE MR-0175 / ISO 15156	
Country Certification		
Expanded		
J1	Canadian Registration	
Product Certifications		
Standard		Standard
E1 ⁽⁴⁾	ATEX Flameproof	★
E5	FM Explosion-proof, Dust Ignition-proof	★
E6	CSA Explosion-proof, Dust Ignition-proof, Division 2	★
E7 ⁽⁴⁾	IECEx Flameproof, Dust Ignition-proof	★
I1 ⁽⁴⁾	ATEX Intrinsic Safety	★
I5	FM Intrinsically Safe, Division 2	★
I6	CSA Intrinsically Safe	★
I7 ⁽⁴⁾	IECEx Intrinsic Safety	★
IA ⁽⁷⁾	ATEX FISCO Intrinsic Safety; for FOUNDATION fieldbus protocol only	★
IE ⁽⁷⁾	FM FISCO Intrinsically Safe	★
IF ⁽⁷⁾	CSA FISCO Intrinsically Safe	★
IG ⁽⁷⁾	IECEx FISCO Intrinsically Safe	★
K1 ⁽⁴⁾	ATEX Flameproof, Intrinsic Safety, Type n, Dust	★
K5	FM Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E5 and I5)	★
K6	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E6 and I6)	★
K7 ⁽⁴⁾	IECEx Flameproof, Dust Ignition-proof, Intrinsic Safety, Type n (combination of E7, I7, and N7)	★
KA ⁽⁴⁾	ATEX and CSA Flameproof, Intrinsically Safe, Division 2	★
KB	FM and CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E5, E6, I5, and I6)	★
KC ⁽⁴⁾	FM and ATEX Explosion-proof, Intrinsically Safe, Division 2	★
KD ⁽⁴⁾	FM, CSA, and ATEX Explosion-proof, Intrinsically Safe (combination of E5, I5, E6, I6, E1, and I1)	★
N1 ⁽⁴⁾	ATEX Type n	★
N7 ⁽⁴⁾	IECEx Type n	★
ND ⁽⁴⁾	ATEX Dust	★
Alternate Transmitter Material of Construction		
Standard		Standard
L1	Inert Sensor Fill Fluid	★
L2	Graphite-Filled (PTFE) O-ring	★
LA	Inert Sensor Fill Fluid and Graphite-Filled (PTFE) O-ring	★
Digital Display		
Standard		Standard
M5	PlantWeb LCD display (Requires PlantWeb housing)	★

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Table 16. Rosemount 2051CFC Compact Flowmeter Ordering Information

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

Transient Protection		
Standard		Standard
T1 ⁽⁸⁾	Transient terminal block	★
Manifold for Remote Mount Option		
Standard		Standard
F2	3-Valve Manifold, Stainless Steel	★
F6	5-Valve Manifold, Stainless Steel	★
Alarm Limit		
Standard		Standard
C4 ⁽⁹⁾⁽¹⁰⁾	NAMUR Alarm and Saturation Levels, High Alarm	★
CN ⁽⁹⁾⁽¹⁰⁾	NAMUR Alarm and Saturation Levels, Low Alarm	★
Hardware Adjustments		
Standard		Standard
D4	Zero and Span Hardware Adjustments	★
Ground Screw		
Standard		Standard
V5 ⁽¹¹⁾	External Ground Screw Assembly	★
Typical Model Number: 2051CFC D C S 060 N 065 0 3 2 A A 1 WC E5 M5		

(1) Not available for Primary Element Technology C.

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

(3) Material specified is cast as follows: CF-8M is the cast version of 316 SST, CF-3M is the cast version of 316L SST. For housing, material is aluminum with polyurethane paint.

(4) Not available with Low Power Output Code M.

(5) Not available with Output Protocol code F.

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

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

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

(9) Not available with FOUNDATION fieldbus (Output Code F).

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

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

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Rosemount 2051CFP Integral Orifice Flowmeter

Table 17. Rosemount 2051CFP Integral Orifice Flowmeter Ordering Information

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

Model	Product Description	
2051CFP	Integral Orifice Flowmeter	
Measurement Type		
Standard		Standard
D	Differential Pressure	★
Material Type		
Standard		Standard
S	316 SST	★
Line Size		
Standard		Standard
005	1/2-in. (15 mm)	★
010	1-in. (25 mm)	★
015	1 1/2-in. (40 mm)	★
Process Connection		
Standard		Standard
T1	NPT Female Body (Not Available with Remote Thermowell and RTD)	★
S1 ⁽¹⁾	Socket Weld Body (Not Available with Remote Thermowell and RTD)	★
P1	Pipe Ends: NPT Threaded	★
P2	Pipe ends: Beveled	★
D1	Pipe Ends: Flanged, DIN PN16, slip-on	★
D2	Pipe Ends: Flanged, DIN PN40, slip-on	★
D3	Pipe Ends: Flanged, DIN PN100, slip-on	★
W1	Pipe Ends: Flanged, RF, ANSI Class 150, weld-neck	★
W3	Pipe Ends: Flanged, RF, ANSI Class 300, weld-neck	★
W6	Pipe Ends: Flanged, RF, ANSI Class 600, weld-neck	★
Expanded		
A1	Pipe Ends: Flanged, RF, ANSI Class 150, slip-on	
A3	Pipe Ends: Flanged, RF, ANSI Class 300, slip-on	
A6	Pipe Ends: Flanged, RF, ANSI Class 600, slip-on	
R1	Pipe Ends: Flanged, RTJ, ANSI Class 150, slip-on	
R3	Pipe Ends: Flanged, RTJ, ANSI Class 300, slip-on	
R6	Pipe Ends: Flanged, RTJ, ANSI Class 600, slip-on	
Orifice Plate Material		
Standard		Standard
S	316 SST	★
Bore Size Option		
Standard		Standard
0066	0.066-in. (1.68 mm) for 1/2-in. Pipe	★
0109	0.109-in. (2.77 mm) for 1/2-in. Pipe	★
0160	0.160-in. (4.06 mm) for 1/2-in. Pipe	★
0196	0.196-in. (4.98 mm) for 1/2-in. Pipe	★
0260	0.260-in. (6.60 mm) for 1/2-in. Pipe	★
0340	0.340-in. (8.64 mm) for 1/2-in. Pipe	★
0150	0.150-in. (3.81 mm) for 1-in. Pipe	★
0250	0.250-in. (6.35 mm) for 1-in. Pipe	★

Rosemount DP Flow

Table 17. Rosemount 2051CFP Integral Orifice Flowmeter Ordering Information

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

0345	0.345-in. (8.76 mm) for 1-in. Pipe		★
0500	0.500-in. (12.70 mm) for 1-in. Pipe		★
0630	0.630-in. (16.00 mm) for 1-in. Pipe		★
0800	0.800-in. (20.32 mm) for 1-in. Pipe		★
0295	0.295-in. (7.49 mm) for 1 1/2-in. Pipe		★
0376	0.376-in. (9.55 mm) for 1 1/2-in. Pipe		★
0512	0.512-in. (13.00 mm) for 1 1/2-in. Pipe		★
0748	0.748-in. (19.00 mm) for 1 1/2-in. Pipe		★
1022	1.022-in. (25.96 mm) for 1 1/2-in. Pipe		★
1184	1.184-in. (30.07 mm) for 1 1/2-in. Pipe		★
Expanded			
0010	0.010-in. (0.25 mm) for 1/2-in. Pipe		
0014	0.014-in. (0.36 mm) for 1/2-in. Pipe		
0020	0.020-in. (0.51 mm) for 1/2-in. Pipe		
0034	0.034-in. (0.86 mm) for 1/2-in. Pipe		
Transmitter Connection Platform			
Standard			Standard
D3	Direct-mount, 3-Valve Manifold, SST		★
D5	Direct-mount, 5-Valve Manifold, SST		★
R3	Remote-mount, 3-Valve Manifold, SST		★
R5	Remote-mount, 5-Valve Manifold, SST		★
Differential Pressure Ranges			
Standard			Standard
1	0 to 25 in H ₂ O (0 to 62,3 mbar)		★
2	0 to 250 in H ₂ O (0 to 623 mbar)		★
3	0 to 1000 in H ₂ O (0 to 2,5 bar)		★
Transmitter Output			
Standard			Standard
A	4–20 mA with digital signal based on HART protocol		★
F	FOUNDATION fieldbus protocol		★
Expanded			
M	Low-Power, 1-5 V dc with Digital Signal Based on HART Protocol		
Transmitter Housing Material ⁽²⁾		Conduit Entry Size	
Standard			Standard
A	Polyurethane-covered Aluminum	1/2-14 NPT	★
B	Polyurethane-covered Aluminum	M20 x 1.5	★
J	SST	1/2-14 NPT	★
K ⁽³⁾	SST	M20 x 1.5	★
Expanded			
D	Polyurethane-covered Aluminum	G1/2	
M ⁽³⁾	SST	G1/2	
Transmitter Performance Class			
Standard			Standard
1	up to ±2.25% flow rate accuracy, 5:1 flow turndown, 2-year stability		★

Options (Include with selected model number)

Temperature Sensor		
Expanded		
RT ⁽⁴⁾	Thermowell and RTD	
Optional Connection		
Standard		Standard
G1	DIN 19213 Transmitter Connection	★

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Table 17. Rosemount 2051CFP Integral Orifice Flowmeter Ordering Information

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

Pressure Testing		
Expanded		
P1 ⁽⁵⁾	Hydrostatic Testing with Certificate	
Special Cleaning		
Expanded		
P2	Cleaning for Special Services	
PA	Cleaning per ASTM G93 Level D (Section 11.4)	
Material Testing		
Expanded		
V1	Dye Penetrant Exam	
Material Examination		
Expanded		
V2	Radiographic Examination	
Flow Calibration		
Expanded		
WD ⁽⁶⁾	Discharge Coefficient Verification	
Special Inspection		
Standard		Standard
QC1	Visual & Dimensional Inspection with Certificate	★
QC7	Inspection and Performance Certificate	★
Material Traceability Certification		
Standard		Standard
Q8	Material Traceability Certification per EN 10204:2004 3.1	★
Code Conformance		
Expanded		
J2 ⁽⁷⁾	ANSI/ASME B31.1	
J3 ⁽⁷⁾	ANSI/ASME B31.3	
J4 ⁽⁷⁾	ANSI/ASME B31.8	
Materials Conformance		
Expanded		
J5 ⁽⁸⁾	NACE MR-0175 / ISO 15156	
Country Certification		
Standard		Standard
J6	European Pressure Directive (PED)	★
Expanded		
J1	Canadian Registration	
Transmitter Calibration Certification		
Standard		Standard
Q4	Calibration Certificate for Transmitter	★
Quality Certification for Safety		
Standard		Standard
QS ⁽⁹⁾	Prior-use certificate of FMEDA data	★
Product Certifications		
Standard		Standard
E1 ⁽¹⁰⁾	ATEX Flameproof	★
E5	FM Explosion-proof, Dust Ignition-proof	★
E6	CSA Explosion-proof, Dust Ignition-proof, Division 2	★
E7 ⁽¹⁰⁾	IECEx Flameproof, Dust Ignition-proof	★
I1 ⁽¹⁰⁾	ATEX Intrinsic Safety	★
I5	FM Intrinsically Safe, Division 2	★
I6	CSA Intrinsically Safe	★
I7 ⁽¹⁰⁾	IECEx Intrinsic Safety	★
IA ⁽¹¹⁾	ATEX FISCO Intrinsic Safety; for FOUNDATION fieldbus protocol only	★
IE ⁽¹¹⁾	FM FISCO Intrinsically Safe	★
IF ⁽¹¹⁾	CSA FISCO Intrinsically Safe	★

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Table 17. Rosemount 2051CFP Integral Orifice Flowmeter Ordering Information

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

IG ⁽¹¹⁾	IECEX FISCO Intrinsically Safe	★
K1 ⁽¹⁰⁾	ATEX Flameproof, Intrinsic Safety, Type n, Dust	★
K5	FM Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E5 and I5)	★
K6	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E6 and I6)	★
K7 ⁽¹⁰⁾	IECEX Flameproof, Dust Ignition-proof, Intrinsic Safety, Type n (combination of E7, I7, and N7)	★
KA ⁽¹⁰⁾	ATEX and CSA Flameproof, Intrinsically Safe, Division 2	★
KB	FM and CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2 (combination of E5, E6, I5, and I6)	★
KC ⁽¹⁰⁾	FM and ATEX Explosion-proof, Intrinsically Safe, Division 2	★
KD ⁽¹⁰⁾	FM, CSA, and ATEX Explosion-proof, Intrinsically Safe (combination of E5, I5, E6, I6, E1, and I1)	★
N1 ⁽¹⁰⁾	ATEX Type n	★
N7 ⁽¹⁰⁾	IECEX Type n	★
ND ⁽¹⁰⁾	ATEX Dust	★
Alternate Transmitter Material of Construction		
Standard		Standard
L1	Inert Sensor Fill Fluid	★
L2	Graphite-Filled (PTFE) O-ring	★
LA	Inert Sensor Fill Fluid and Graphite-Filled (PTFE) O-ring	★
Digital Display		
Standard		Standard
M5	PlantWeb LCD display (Requires PlantWeb housing)	★
Transient Protection		
Standard		Standard
T1 ⁽¹²⁾	Transient terminal block	★
Alarm Limit		
Standard		Standard
C4 ⁽¹³⁾⁽¹⁴⁾	NAMUR Alarm and Saturation Levels, High Alarm	★
CN ⁽¹³⁾⁽¹⁴⁾	NAMUR Alarm and Saturation Levels, Low Alarm	★
Hardware Adjustments		
Standard		Standard
D4	Zero and Span Hardware Adjustments	★
Ground Screw		
Standard		Standard
V5 ⁽¹⁵⁾	External Ground Screw Assembly	★
Typical Model Number: 2051CFP D S 010 W1 S 0500 D3 2 A A 1 E5 M5		

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

(2) Material specified is cast as follows: CF-8M is the cast version of 316 SST, CF-3M is the cast version of 316L SST. For housing, material is aluminum with polyurethane paint.

(3) Not available with Low Power Output Code M.

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

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

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

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

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

(9) Not available with Output Protocol code F.

(10) Not available with Low Power Output Code M.

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

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

(13) Not available with FOUNDATION fieldbus (Output Code F).

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

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

2051CF Specifications

2051CF PERFORMANCE SPECIFICATIONS

Performance assumptions include: measured pipe I.D, transmitter is trimmed for optimum flow accuracy, and performance is dependent on application parameters.

Table 18. Flow Performance - Flow Reference Accuracy

2051CFA Annubar Flowmeter		
Ranges 2-3		±2.00% of Flow Rate at 5:1 flow turndown
2051CFC Compact Orifice Flowmeter – Conditioning Option C		
Ranges 2-3	$\beta = 0.4$	±2.25% of Flow Rate at 5:1 flow turndown
	$\beta = 0.65$	±2.45% of Flow Rate at 5:1 flow turndown
2051CFC Compact Orifice Flowmeter – Orifice Type Option P ⁽¹⁾		
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
2051CFP Integral Orifice Flowmeter		
Ranges 2-3	$\beta < 0.1$	±3.10% of Flow Rate at 5:1 flow turndown
	$0.1 < \beta < 0.2$	±2.75% of Flow Rate at 5:1 flow turndown
	$0.2 < \beta < 0.6$	±2.25% of Flow Rate at 5:1 flow turndown
	$0.6 < \beta < 0.8$	±3.00% of Flow Rate at 5:1 flow turndown

(1) For smaller line sizes, see Rosemount Compact Orifice

2051CF FUNCTIONAL SPECIFICATIONS

Range and Sensor Limits

Range	2051CF Minimum Span	Range and Sensor Limits
1	0.5 inH ₂ O (1,2 mbar)	0 to 25 inH ₂ O (62,3 mbar)
2	2.5 inH ₂ O (6,2 mbar)	0 to 250 inH ₂ O (0,62 bar)
3	10 inH ₂ O (24,9 mbar)	0 to 1000 inH ₂ O (2,49 bar)

Service

Liquid, gas, and steam applications

Protocols

4–20 mA HART (Output Code A)

Output

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

Power Supply

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

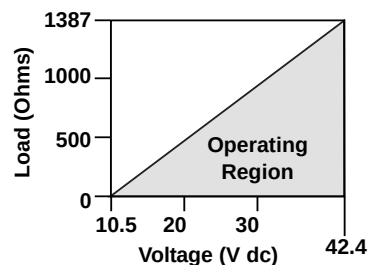
Turn-On Time

Performance within specifications less than 2.0 seconds after power is applied to the transmitter.

Load Limitations

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

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



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

FOUNDATION fieldbus (Output Code F)

Power Supply

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

Current Draw

17.5 mA for all configurations (including LCD display option)

Turn-On Time

Performance within specifications less than 20.0 seconds after power is applied to the transmitter.

FOUNDATION fieldbus Function Block Execution Times

Block	Execution Time
Resource	-
Transducer	-
LCD Block	-
Analog Input 1, 2	30 milliseconds
PID	45 milliseconds

FOUNDATION fieldbus Parameters

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

Standard Function Blocks

Resource Block

- Contains hardware, electronics, and diagnostic information.

Transducer Block

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

LCD Block

- Configures the local display.

2 Analog Input Blocks

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

PID Block

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

Backup Link Active Scheduler (LAS)

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

1-5 Vdc HART Low Power (Output Code M)

Output

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

Power Supply

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

Power Consumption

3.0 mA, 27–84 mW

Output Load

100 k Ω or greater

Turn-On Time

Performance within specifications less than 2.0 seconds after power is applied to the transmitter.

Overpressure Limits

Transmitters withstand the following limits without damage:

2051CF Flowmeters

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

Static Pressure Limit

- Operates within specifications between static line pressures of -14.2 psig (0.034 bar) and 3626 psig (250 bar)
- Range 1: 0.5 psia to 2000 psig (34 mbar and 137,9 bar)

Burst Pressure Limits

2051CF

- 10000 psig (689,5 bar)

Temperature Limits

For 2051CFA Temperature Limits, see page 91.

For 2051CFC Temperature Limits, see page 103.

For 2051CFP Temperature Limits, see page 111.

Transmitter Temperature Limits:

Ambient⁽¹⁾

–40 to 185 °F (–40 to 85 °C)

With LCD display⁽²⁾: –40 to 175 °F (–40 to 80 °C)

Storage⁽¹⁾

–50 to 230 °F (–46 to 110 °C)

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

(1) Limits for silicone fill fluid only.

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

Process Temperature Limits

At atmospheric pressures and above.

Table 19. 2051 Process Temperature Limits

2051C	
Silicone Fill Sensor ⁽¹⁾	–40 to 250 °F (–40 to 121 °C)
Inert Fill Sensor ⁽¹⁾	–40 to 185 °F (–40 to 85 °C)

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

Humidity Limits

0–100% relative humidity

Volumetric Displacement

Less than 0.005 in³ (0,08 cm³)

Damping

Analog output response to a step input change is user-selectable from 0 to 25.6 seconds for one time constant. This software damping is in addition to sensor module response time.

Failure Mode Alarm

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

Standard Operation			
Output Code	Linear Output	Fail High	Fail Low
A	$3.9 \leq I \leq 20.8$	$I \geq 21.75 \text{ mA}$	$I \leq 3.75 \text{ mA}$
M	$0.97 \leq V \leq 5.2$	$V \geq 5.4 \text{ V}$	$V \leq 0.95 \text{ V}$

NAMUR-Compliant Operation			
Output Code	Linear Output	Fail High	Fail Low
A	$3.8 \leq I \leq 20.5$	$I \geq 22.5 \text{ mA}$	$I \leq 3.6 \text{ mA}$

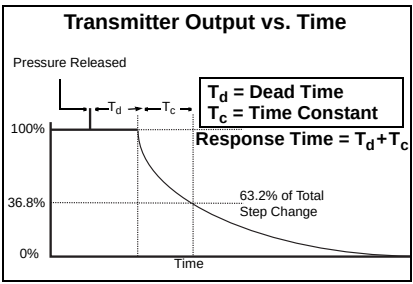
Output Code F

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

Long Term Stability

Models	Standard	Performance Option, P8
2051CF Range 1 (CF) Ranges 2-5	$\pm 0.2\%$ of URL for 1 year, Reference Stability $\pm 0.1\%$ of URL for 2 years, Operating Stability	$\pm 0.125\%$ of URL for 5 years, Operating Stability

Dynamic Performance

	4-20 mA HART ⁽¹⁾ 1-5 Vdc HART Low Power	FOUNDATION fieldbus ⁽³⁾	Typical HART Transmitter Response Time
Total Response Time ($T_d + T_c$)⁽²⁾:			
2051CF, Range 3-5:	115 milliseconds	152 milliseconds	 Transmitter Output vs. Time Pressure Released 100% 36.8% 0% Time T_d = Dead Time T_c = Time Constant Response Time = $T_d + T_c$ 63.2% of Total Step Change
Range 1:	270 milliseconds	307 milliseconds	
Range 2:	130 milliseconds	152 milliseconds	
Dead Time (T_d)	60 milliseconds (nominal)	97 milliseconds	
Update Rate	22 times per second	22 times per second	
(1) Dead time and update rate apply to all models and ranges; analog output only (2) Nominal total response time at 75 °F (24 °C) reference conditions. (3) Transmitter fieldbus output only, segment macro-cycle not included.			

Vibration Effect

Less than $\pm 0.1\%$ 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).

Rosemount DP Flow

2051CF PHYSICAL SPECIFICATIONS

Electrical Connections

$\frac{1}{2}$ –14 NPT, G $\frac{1}{2}$, and M20 × 1.5 conduit.

2051CF Process-Wetted Parts

For 2051CFA wetted parts, see “Annubar Sensor Material” on page 92.

For 2051CFC wetted parts, see “Material of Construction” on page 104.

For 2051CFP wetted parts, see “Material of Construction” on page 111.

Process Isolating Diaphragms

316L SST, Alloy C-276, or Tantalum

Non-Wetted Parts for 2051CF

Electronics Housing

Low-copper aluminum or CF-8M (Cast version of 316 SST).
Enclosure Type 4X, IP 65, IP 66, IP68

Coplanar Sensor Module Housing

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

Bolts

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

Sensor Module Fill Fluid

Silicone oil (D.C. 200) or Fluorocarbon oil (Halocarbon or Fluorinert® FC-43 for 2051T)

Paint

Polyurethane

Cover O-rings

Buna-N

2051CF Product Certifications

Approved Manufacturing Locations

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

European Directive Information

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

ATEX Directive (94/9/EC)

All 2051 transmitters comply with the ATEX Directive.

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

2051CF with DP Range 2 and 3
— QS Certificate of Assessment - EC No. PED-H-100
Module H Conformity Assessment

All other 2051 Pressure Transmitters

— Sound Engineering Practice

Transmitter Attachments: Process Flange - Manifold

— Sound Engineering Practice

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

All 2051 Pressure Transmitters meet all of the requirements of IECEN61326:2006 and NAMUR NE-21.

Ordinary Location Certification for Factory Mutual

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

HART PROTOCOL

Hazardous Locations Certifications

North American Certifications

FM Approvals

- E5** Explosion-Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition-Proof for Class II, Division 1, Groups E, F, and G. Dust-Ignition-Proof for Class III, Division 1. T5 (Ta = 85 °C), Factory Sealed, Enclosure Type 4X
- I5** Intrinsically Safe for use in Class I, Division 1, Groups A, B, C, and D; Class II, Division 1, Groups E, F, and G; Class III, Division 1 when connected per Rosemount drawing 02051-1009; Non-incendive for Class I, Division 2, Groups A, B, C, and D. Temperature Code: T4 (Ta = 40 °C), T3 (Ta = 85 °C), Enclosure Type 4X
For input parameters see control drawing 02051-1009.

Canadian Standards Association (CSA)

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

- E6** Explosion-Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition-Proof for Class II and Class III, Division 1, Groups E, F, and G. Suitable for Class I, Division 2 Groups A, B, C, and D for indoor and outdoor hazardous locations. Enclosure type 4X, factory sealed
- I6** Intrinsically safe approval. Intrinsically safe for Class I, Division 1, Groups A, B, C, and D when connected in accordance with Rosemount drawing 02051-1008. Temperature Code T3C. Dust-Ignition-Proof for Class II and Class III, Division 1, Groups E, F, and G. Suitable for Class I, Division 2 Groups A, B, C, and D hazardous locations. Enclosure type 4X, factory sealed
For input parameters see control drawing 02051-1008.

European Certifications

- I1** ATEX Intrinsic Safety
 Certification No. Baseefa08ATEX0129X  II 1 G
 Ex ia IIC T4 ($-60 \leq T_a \leq +70$ °C)
 IP66 IP68
CE 1180

Table 20. Input Parameters

$U_i = 30V$
$I_i = 200$ mA
$P_i = 1.0W$
$C_i = 0.012$ μF
$L_i = 10$ μH

Table 21. RTD Assembly (2051CFx Option T or R)

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

Special Conditions for Safe Use (X):

When the optional transient protection terminal block is installed, the apparatus is not capable of withstanding the 500V insulation test required by Clause 6.3.12 of EN60079-11. This must be taken into account when installing the apparatus.

- N1** ATEX Type n
 Certification No. Baseefa08ATEX0130X  II 3 G
 Ex nAnL IIC T4 ($-40 \leq T_a \leq +70$ °C)
 $U_i = 42.4$ Vdc max
 IP66
CE

Special Conditions for Safe Use (X):

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

- E1** ATEX Flame-Proof
 Certification No. KEMA 08ATEX0090X  II 1/2 G
 Ex d IIC T6 ($-50 \leq T_a \leq 65$ °C)
 Ex d IIC T5 ($-50 \leq T_a \leq 80$ °C)
 IP66
CE 1180
 $V_{max} = 42.4$ V dc

Special Conditions for Safe Use (X):

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

- ND** ATEX Dust
 Certification No. Baseefa08ATEX0182X  II 1 D
 Dust Rating: II 1 D Ex tD A20 T115 °C (-20 °C $\leq T_a \leq 85$ °C)
 IP66 IP68
 $V_{max} = 42.4$ V dc
 $A = 22$ mA
CE 1180

Special Conditions for Safe Use (X):

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

IECEx Certifications

- I7** IECEx Intrinsic Safety
 Certification No. IECExBAS08.0045X II 1 G
 Ex ia IIC T4 ($-60 \leq T_a \leq +70$ °C)
CE 1180

Table 22. Input Parameters

$U_i = 30V$
$I_i = 200$ mA
$P_i = 1.0W$
$C_i = 0.012$ μF

Table 23. RTD Assembly (2051CFx Option T or R)

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

Special Conditions for Safe Use (X):

When the optional transient protection terminal block is installed, the apparatus is not capable of withstanding the 500V insulation test required by Clause 6.3.12 of IEC60079-11. This must be taken into account when installing the apparatus.

- E7** IECEx Explosion-Proof (Flame-Proof)
 Certification No. IECEx KEM 08.0024X II 1/2 G
 Ex d IIC T6 ($-50 \leq T_a \leq 65$ °C)
 Ex d IIC T5 ($-50 \leq T_a \leq 80$ °C)
CE 1180
 $V_{max} = 42.4$ V dc

Special Conditions for Safe Use (X):

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

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Rosemount DP Flow

N7 IECEx Type n
Certification No. IECExBAS08.0046X II 3 G
Ex nAnL IIC T4 ($-40 \leq T_a \leq +70$ °C)
 $U_i = 42.4$ Vdc max
CE

Special Conditions for Safe Use (X):

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

Combinations of Certifications

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

- K1** E1, I1, N1, and ND combination
- K5** E5 and I5 combination
- K6** I6 and E6 combination
- K7** E7, I7, and N7 combination
- KA** E1, I1, E6, and I6 combination
- KB** E5, I5, E6, and I6 combination
- KC** E1, I1, E5, and I5 combination
- KD** E1, I1, E5, I5, E6, and I6 combination

Rosemount DP Flow

2051CF FOUNDATION FIELDBUS PROTOCOL

Hazardous Locations Certifications

North American Certifications

FM Approvals

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

T5 (Ta = 85 °C), Factory Sealed, Enclosure Type 4X

- I5/IE** Intrinsically Safe for use in Class I, Division 1, Groups A, B, C, and D; Class II, Division 1, Groups E, F, and G; Class III, Division 1 when connected per Rosemount drawing 02051-1009; Non-incendive for Class I, Division 2, Groups A, B, C, and D.

Temperature Code: T4 (Ta = 40 °C), T3 (Ta = 85 °C), Enclosure Type 4X

For input parameters see control drawing 02051-1009.

Canadian Standards Association (CSA)

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

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

- I6/IF** Intrinsically safe approval. Intrinsically safe for Class I, Division 1, Groups A, B, C, and D when connected in accordance with Rosemount drawings 02051-1008. Temperature Code T3C. Dust-Ignition-Proof for Class II and Class III, Division 1, Groups E, F, and G. Suitable for Class I, Division 2 Groups A, B, C, and D hazardous locations. Enclosure type 4X, factory sealed
For input parameters see control drawing 02051-1008.

European Certifications

- I1** ATEX Intrinsic Safety
Certification No. Baseefa08ATEX0129X  II 1 G
Ex ia IIC T4 (T_{amb} = -60 to +60 °C)
IP66
 1180

Table 24. Input Parameters

U _i = 30V
I _i = 300 mA
P _i = 1.3 W
C _i = 0 μF
L _i = 0 uH

Table 25. RTD Assembly (2051CFx Option T or R)

U _i = 5 Vdc
I _i = 500 mA
P _i = 0.63W

Special Conditions for Safe Use (X):

The device is not capable of withstanding the 500V insulation test required by Clause 6.3.12 of EN60079-11. This must be taken into account when installing the apparatus.

- IA** ATEX FISCO Intrinsic Safety
Certification No. Baseefa08ATEX0129X  II 1 G
Ex ia IIC T4 (T_{amb} = -60 to +60 °C)
IP66
 1180

Table 26. Input Parameters

U _i = 17.5 V
I _i = 380 mA
P _i = 5.32 W
C _i = ≤ 5 μF
L _i = ≤ 10 μH

Special Conditions for Safe Use (X):

The device is not capable of withstanding the 500V insulation test required by Clause 6.3.12 of EN60079-11. This must be taken into account when installing the apparatus.

- N1** ATEX Type n
Certification No. Baseefa08ATEX0130X  II 3 G
Ex nAnL IIC T4 (T_{amb} = -40 to +70 °C)
U_i = 32 Vdc max
IP66

Special Conditions for Safe Use (X):

The device is not capable of withstanding the 500V insulation test required by Clause 6.8.1 of EN60079-15. This must be taken into account when installing the apparatus.

E1 ATEX Flame-Proof

Certification No. KEMA 08ATEX0090X  II 1/2 G

Ex d IIC T6 ($T_{amb} = -50$ to 65 °C)

Ex d IIC T5 ($T_{amb} = -50$ to 80 °C)

IP66

CE 1180

$V_{max} = 32$ V dc

Special Conditions for Safe Use (X):

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

ND ATEX Dust

Certification No. Baseefa08ATEX0182X  II 1 D

Dust Rating: II 1 D Ex tD A20 T115 °C (-20 °C $\leq T_a \leq 85$ °C)

IP66 IP68

$V_{max} = 42.4$ V dc

$A = 22$ mA

CE 1180

Special Conditions for Safe Use (X):

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

IECEx Certifications

I7 IECEx Intrinsic Safety

Certification No. IECExBAS08.0045X II 1 G

Ex ia IIC T4 ($T_{amb} = -60$ to $+60$ °C)

IP66

CE 1180

Table 27. Input Parameters

$U_i = 30$ V
$I_i = 300$ mA
$P_i = 1.3$ W
$C_i = 0$ μ F

Table 28. RTD Assembly (2051CFx Option T or R)

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

Special Conditions for Safe Use (X):

The device is not capable of withstanding the 500V insulation test required by Clause 6.3.12 of IEC60079-11. This must be taken into account when installing the apparatus.

E7 IECEx Explosion-Proof (Flame-Proof)

Certification No. IECEx KEM 08.0024X II 1/2 GD

Ex d IIC T6 ($T_{amb} = -50$ to 65 °C)

Ex d IIC T5 ($T_{amb} = -50$ to 80 °C)

IP66

CE 1180

$V_{max} = 32$ V dc

Special Conditions for Safe Use (X):

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

N7 IECEx Type n

Certification No. IECExBAS08.0046X II 3 G

Ex nAnL IIC T4 ($T_{amb} = -40$ to $+70$ °C)

$U_i = 32$ Vdc max

Special Conditions for Safe Use (X):

The device is not capable of withstanding the 500V insulation test required by Clause 6.8.1 of IEC60079-15. This must be taken into account when installing the device.

Combinations of Certifications

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

K1 E1, I1, N1, and ND combination

K5 E5 and I5 combination

K6 I6 and E6 combination

K7 E7, I7, and N7 combination

KA E1, I1, E6, and I6 combination

KB E5, I5, E6, and I6 combination

KC E1, I1, E5, and I5 combination

KD E1, I1, E5, I5, E6, and I6 combination

Rosemount DP Flow

Rosemount 485 Annubar Primary Element



Rosemount 485 Annubar Primary Element utilizes a T-shaped sensor design that offers best in class accuracy and performance.

- Up to 0.75% Flow Rate Accuracy
- Lowest permanent pressure loss
- Available in 2 to 96-in. (50 - 2400 mm) line sizes

Additional Information

Specifications: page 91

Dimensional Drawings: page 134

Installation and Flowmeter Orientation: page 151

Table 29. Rosemount 485 Annubar Primary Ordering Information

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

Model	DP Flow Primary Type	
485	Annubar Primary Element	
Fluid Type		
Standard		Standard
L	Liquid	★
G	Gas	★
S	Steam	★
Line Size		
Standard		Standard
020	2-in. (50 mm)	★
025	2½-in. (63,5 mm)	★
030	3-in. (80 mm)	★
035	3½-in. (89 mm)	★
040	4-in. (100 mm)	★
050	5-in. (125 mm)	★
060	6-in. (150 mm)	★
070	7-in. (175 mm)	★
080	8-in. (200 mm)	★
100	10-in. (250 mm)	★
120	12-in. (300 mm)	★
Expanded		
140	14-in. (350 mm)	
160	16-in. (400 mm)	
180	18-in. (450 mm)	
200	20-in. (500 mm)	
240	24-in. (600 mm)	
300	30-in. (750 mm)	
360	36-in. (900 mm)	
420	42-in. (1066 mm)	
480	48-in. (1210 mm)	
600	60-in. (1520 mm)	
720	72-in. (1820 mm)	
780	78-in. (1950 mm)	
840	84-in. (2100 mm)	
900	90-in. (2250 mm)	
960	96-in. (2400 mm)	

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Rosemount DP Flow

Table 29. Rosemount 485 Annubar Primary Ordering Information

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

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

Rosemount DP Flow

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Table 29. Rosemount 485 Annubar Primary Ordering Information

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

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

Options (Include with selected model number)

Pressure Testing				
Expanded				
P1 ⁽³⁾	Hydrostatic Testing with Certificate			
PX ⁽³⁾	Extended Hydrostatic Testing			

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Table 29. Rosemount 485 Annubar Primary Ordering Information

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

Special Cleaning		
Expanded		
P2	Cleaning for Special Services	
PA	Cleaning per ASTM G93 level D (section 11.4)	
Material Testing		
Expanded		
V1	Dye Penetrant Exam	
Material Examination		
Expanded		
V2	Radiographic Examination	
Flow Calibration		
Expanded		
W1	Flow Calibration (Average K)	
WZ	Special Calibration	
Special Inspection		
Standard		Standard
QC1	Visual and Dimensional Inspection with Certificate	★
QC7	Inspection and Performance Certificate	★
Surface Finish		
Standard		Standard
RL	Surface finish for Low Pipe Reynolds Number in Gas and Steam	★
RH	Surface finish for High Pipe Reynolds Number in Liquid	★
Material Traceability Certification		
Standard		Standard
Q8 ⁽⁴⁾	Material Certificate per EN 10204:2004 3.1	★
Code Conformance		
Expanded		
J2 ⁽⁵⁾	ANSI/ASME B31.1	
J3 ⁽⁵⁾	ANSI/ASME B31.3	
Materials Conformance		
Expanded		
J5 ⁽⁶⁾	NACE MR-0175 / ISO 15156	
Country Certification		
Standard		Standard
J6	European Pressure Directive (PED)	★
Expanded		
J1	Canadian Registration	
Installed in Flanged Pipe Spool Section		
Expanded		
H3	150# Flanged Connection with Rosemount Standard Length and Schedule	
H4	300# Flanged Connection with Rosemount Standard Length and Schedule	
H5	600# Flanged Connection with Rosemount Standard Length and Schedule	
Instrument Connections for Remote Mount Option		
Standard		Standard
G2	Needle Valves, Stainless Steel	★
G6	OS&Y Gate Valve, Stainless Steel	★
Expanded		
G1	Needle Valves, Carbon Steel	
G3	Needle Valves, Alloy C-276	
G5	OS&Y Gate Valve, Carbon Steel	
G7	OS&Y Gate Valve, Alloy C-276	
Special Shipment		
Standard		Standard
Y1	Mounting Hardware Shipped Separately	★

Rosemount DP Flow

Table 29. Rosemount 485 Annubar Primary Ordering Information

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

Attach To		
Expanded		
H1	Attach to Transmitter	
Special Dimensions		
Expanded		
VM	Variable Mounting	
VT	Variable Tip	
VS	Variable length Spool Section	
V9	Special Dimension	
Typical Model Number: 485 L 060 D C H P S 2 T1 0 0 0 3		

- (1) Provide the "A" dimension for Flanged (page 136), Flange-Lok (page 135), and Threaded Flo-Tap models (page 139). Provide the "B" dimension for Flange Flo-Tap models (page 137).
- (2) Available in remote mount applications only.
- (3) Applies to flow element only, mounting hardware not tested.
- (4) Instrument Connections for Remote Mount Options and Isolation Valves for Flo-tap Models are not included in the Material Traceability Certification.
- (5) Not available with Transmitter Connection Platform 6.
- (6) Materials of Construction comply with metallurgical requirements within NACE MR0175/ISO 15156 for sour oil field production environments. Environmental limits apply to certain materials. Consult latest standard for details. Selected materials also conform to NACE MR0103 for sour refining environments.

485 SPECIFICATIONS

485 Performance Specifications

Performance Statement Assumptions

Measured pipe I.D.

Discharge Coefficient Factor

±0.75% of flow rate

Repeatability

±0.1%

Line Sizes

- Sensor Size 1: 2-in. to 8-in. (50 to 200 mm)
- Sensor Size 2: 6-in. to 96-in. (150 to 2400 mm)
- Sensor Size 3: 12-in. to 96-in. (300 to 2400 mm)

NOTE

Some mounting types are not available in larger line sizes.

Table 30. Reynolds Number and Probe Width

Sensor Size	Minimum Rod Reynolds Number (R_d)	Probe Width (d) (inches)
1	6500	0.590-in. (14.99 mm)
2	12500	1.060-in. (26.92 mm)
3	25000	1.935-in. (49.15 mm)

Where

d = Probe width (feet)

v = Velocity of fluid (ft/sec)

ρ = Density of fluid (lbm/ft³)

μ = Viscosity of the fluid (lbm/ft-sec)

$$R_d = \frac{d \times v \times \rho}{\mu}$$

Sizing

Contact an Emerson Process Management representative for assistance. A Configuration Data Sheet is required prior to order for application verification.

Flow Turndown

10:1 or better

Annubar Sensor Surface Finish

The front surface of the Annubar primary is textured for high Reynolds number applications (typically gas and steam). The surface texture creates a more turbulent boundary layer on the front surface of the sensor. The increased turbulence produces a more predictable and repeatable separation of flow at the edge of the sensor. The appropriate surface finish will be determined for each application by the Emerson Process Management sizing program, Instrument Toolkit software.

485 Functional Specifications

Service

- Liquid
- Gas
- Steam

Process Temperature Limits

Direct Mount Transmitter

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

Remote Mount Transmitter

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

Pressure and Temperature Limits⁽¹⁾

Direct Mount Transmitter

- Up to 600# ANSI (1440 psig at 100 °F (99 bar at 38 °C))
- Integral temperature measurement is not available with Flanged mounting type greater than class 600

Remote Mount Transmitter

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

(1) Static pressure selection may effect pressure limitations.

Rosemount DP Flow

485 Physical Specifications

Temperature Measurement

Integral RTD

- 100 Ohm platinum RTD
- 4-wire RTD ($\alpha = 0.00385$)

Remote RTD

- 100 Ohm platinum RTD, spring loaded with $\frac{1}{2}$ -in. NPT nipple and union (078 series with Rosemount 644 housing)

Thermowell

- $\frac{1}{2}$ -in. x $\frac{1}{2}$ -in NPT, 316 Stainless Steel with $\frac{1}{2}$ -in. weld couplet (same as specified pipe material).

Housing Connections

$\frac{1}{2}$ –14 NPT, G $\frac{1}{2}$, and M20 x 1.5 conduit. HART interface connections fixed to terminal block for output code A

Annubar Sensor Material

- 316 Stainless Steel
- Alloy C-276

Mounting Material

- Carbon Steel (A105)
- 316 Stainless Steel
- Chrome-Moly Grade F-11
- Chrome-Moly Grade F-22
- Chrome-Moly Grade F-91

Annubar Type

See "Rosemount 485 Annubar Primary Element" on page 86

Pak-Lok Model (option P)

- Provided with a compression sealing mechanism rated up to 600# ANSI (1440 psig at 100 °F (99 bar at 38 °C))
- –150 to 850 °F (–101 to 454 °C)
- Not available for steam above 600°F (315°C)

Flanged with Opposite Side Support Model (option F)

- Provided with opposite side support, which is the same material as the pipe and requires a second pipe penetration
- Sensor flange is the same material as the Annubar sensor and the mounting flange is the same material as the pipe material
- Flanged mounting hardware: nuts, studs and gaskets (DIN units supplied without nuts, studs and gaskets)
- SST: (–300 to 850 °F (–184 to 454 °C))
- Alloy C-276: (–150 to 1250 °F (–101 to 677 °C))
- Top mounting is recommended for steam above 600 °F (315 °C)

Flange-Lok Model (option L)

- Flange-Lok assembly is supplied in 316 SST material.
- Flange-Lok mounting hardware: nuts, studs and gaskets (DIN units supplied without nuts, studs and gaskets)
- –150 to 850 °F (–101 to 454 °C)
- Not available for steam above 600°F (315°C)

Flo-Tap Models (options G and M)

- Opposite side support is not available
- Threaded connection is not available with Sensor Size 3
- Gear Drive is not available with Sensor Size 1
- Packing gland required
- Packing Gland Material Temperature Limits
 - PTFE: –40 to 400 °F (–40 to 204 °C)
 - Graphite: –150 to 850 °F (–101 to 454 °C)
- Isolation valve included
 - The isolation valve will carry the same pressure rating as the sensor flange and mounting flange specified in the mounting type
 - Isolation vales are not supplied with DIN flanges and must be customer supplied
- For threaded flo-tap models, the isolation valve NPT size is $1\frac{1}{4}$ -in. (Sensor Size 1) and 2-in. (Sensor Size 2).
- Top mounting is recommended for steam above 600 °F (315 °C)

Annubar Type Specification Chart

Option Code	Description	Pak-Lok ⁽¹⁾	Flange-Lok	Flange	Manual and Gear Drive Flo-Tap
T1 ⁽¹⁾	Pak-Lok Body	X			
	Threaded connection				X
A1	150# RF ANSI		X	X	X
A3	300# RF ANSI		X	X	X
A6	600# RF ANSI		X	X	X
A9 ⁽²⁾	900# RF ANSI			X	
AF ⁽²⁾	1500# RF ANSI			X	
AT ⁽²⁾	2500# RF ANSI			X	
D1	DN PN 16		X	X	X
D3	DN PN 40		X	X	X
D6	DN PN 100		X	X	X
R1	150# RTJ Flange		X	X	X
R3	300# RTJ Flange		X	X	X
R6	600# RTJ Flange		X	X	X
R9 ⁽²⁾	900# RTJ Flange			X	
RF ⁽²⁾	1500# RTJ Flange			X	
RT ⁽²⁾	2500# RTJ Flange			X	

(1) Available up to 600# ANSI (1440 psig at 100 °F (99 bar at 38 °C)) rating.

(2) Remote mount only.

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Rosemount DP Flow

Instrument Connections Temperature Ranges

Table 31. Minimum / Maximum Temperature Range

Code	Description	Temperature
G1	Needle Valves, Carbon Steel	–20 to 500 °F (–29 to 260 °C)
G2	Needle Valves, Stainless Steel	–40 to 600 °F (–40 to 316 °C)
G3	Needle Valves, Alloy C-276	–40 to 600 °F (–40 to 316 °C)
G5	OS&Y Gate Valve, Carbon Steel	–20 to 775 °F (–29 to 413 °C)
G6	OS&Y Gate Valve, Stainless Steel	–40 to 850 °F (–40 to 454 °C)
G7	OS&Y Gate Valve, Alloy C-276	–40 to 1250 °F (–40 to 677 °C)

Flowmeter Installed in Flanged Pipe Spool Section (option codes H3, H4, and H5)

- All pipe spool sections are flanged pipe sections
- The flanged pipe spool section is constructed from the same material as the pipe
- Consult the factory for remote temperature measurement and ANSI ratings above 600# and DIN flanges.
- Available in carbon steel (A105) and 316 stainless steel

Table 32. Flanged Pipe Spool Section Schedule

ANSI	Schedule
150# ANSI	40
300# ANSI	40
600# ANSI	80

Table 33. Flange Pipe Spool Section Length

Nominal Pipe Size	Length
2-in. (50 mm)	10.52-in. (267.2 mm)
3-in. (80 mm)	11.37-in. (288.8 mm)
4-in. (100 mm)	12.74-in. (323.6 mm)
6-in. (150 mm)	14.33-in. (364.0 mm)
8-in. (200 mm)	16.58-in. (421.1 mm)

Rosemount 585 Annubar Primary Element



Rosemount 585 Annubar Primary Element utilizes a solid sensor construction that offers capabilities for severe service applications.

- Main Steam Line mounting hardware available
- Symmetrical sensor design allows bi-directional flow measurement
- Available in 4 to 96-in. (50 - 2400 mm) line sizes

Additional Information

Specifications: page 99

Dimensional Drawings: page 140

Installation and Flowmeter Orientation: page 151

Table 34. Rosemount 585 Annubar Ordering Information

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

Model	DP Flow Primary Type	
585	Severe Service Annubar Primary Element	
Application Type		
Standard		Standard
S ⁽¹⁾⁽²⁾	Severe Service Annubar	★
Expanded		
M ⁽³⁾	Main Steam Line Annubar	
Fluid Type		
Standard		Standard
L	Liquid	★
G	Gas	★
S	Steam	★
Annubar Type		
Standard		Standard
F	Flanged with Opposite Side Support	★
Expanded		
L	Main Steam Annubar with Opposite Side Support	
G	Gear-Drive Flo-Tap	
Line Size		
Standard		Standard
040	4-in. (100 mm)	★
050	5-in. (125 mm)	★
060	6-in. (150 mm)	★
080	8-in. (200 mm)	★
100	10-in. (250 mm)	★
120	12-in. (300 mm)	★
Expanded		
140	14-in. (350 mm)	
160	16-in. (400 mm)	
180	18-in. (450 mm)	
200	20-in. (500 mm)	
240	24-in. (600 mm)	
300	30-in. (750 mm)	
360	36-in. (900 mm)	
420	42-in. (1066 mm)	
480	48-in. (1210 mm)	

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Rosemount DP Flow

Table 34. Rosemount 585 Annubar Ordering Information

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

600	60-in. (1520 mm)	
720	72-in. (1820 mm)	
840	84-in. (2100 mm)	
960	96-in. (2400 mm)	
Mounting Assembly Material		
Standard		Standard
C	Carbon Steel (A105)	★
S	316/316L Stainless Steel	★
Expanded		
L	Carbon Steel (A350 LF2)	
G	Chrome-Moly Grade F-11	
N	Chrome-Moly Grade F-22	
J	Chrome-Moly Grade F-91	
0 ⁽⁴⁾	No Mounting (Customer Supplied)	
Piping Orientation		
Standard		Standard
H	Horizontal Piping	★
D	Vertical Piping with Downwards Flow	★
U	Vertical Piping with Upwards Flow	★
Sensor Material		
Standard		Standard
S	316/316L Stainless Steel	★
Expanded		
H ⁽⁵⁾	Alloy C-276	
W ⁽³⁾⁽⁵⁾	Alloy 800H	
K ⁽⁵⁾	PVDF (KYNAR)	
Sensor Size		
Standard		Standard
11	Sensor size 11	★
22 ⁽⁶⁾	Sensor size 22	★
Expanded		
44 ⁽²⁾⁽³⁾	Sensor size 44	
Mounting Type		
Standard		Standard
A	ANSI B16.5 Raised Face Flanges	★
D ⁽⁷⁾	DIN Raised Face Flanges	★
Expanded		
R ⁽⁸⁾	ANSI B16.5 Ring Type Joint Flanges	
0 ⁽³⁾	Main Steam Packing Gland	
Mounting Pressure Class		
Standard		Standard
1	ANSI 150 / DIN PN16	★
3 ⁽⁶⁾	ANSI 300 / DIN PN40	★
6 ⁽⁶⁾	ANSI 600 / DIN PN100	★
Expanded		
N ⁽⁵⁾⁽⁶⁾	ANSI 900	
F ⁽⁵⁾⁽⁶⁾	ANSI 1500	
T ⁽⁵⁾⁽⁶⁾	ANSI 2500	
0 ⁽³⁾⁽⁵⁾⁽⁶⁾	Main Steam Packing Gland	
Opposite Side Support		
Standard		Standard
C ⁽⁹⁾	NPT Threaded Opposite Support Assembly	★
D ⁽³⁾	Welded Opposite Support Assembly	★

Rosemount DP Flow

Table 34. Rosemount 585 Annubar Ordering Information

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

Expanded		
E	Flanged Opposite Support Assembly	
0 ⁽²⁾	No Opposite Side Support Required	
Packing Gland/ Packing		
Standard		Standard
0 ⁽¹⁾	Not Applicable	★
Expanded		
L ⁽²⁾	SS Packing Gland / Graphite Packing	
T ⁽³⁾	Main Steam Packing Gland / Graphite Packing	
Insertion Mechanism		
Standard		Standard
0 ⁽¹⁾⁽³⁾	Not Applicable	★
Expanded		
C	Alloy Steel Insertion Rods / Nuts	
S	Stainless Steel Insertion Rods / Nuts	
Isolation Valve		
Standard		Standard
0 ⁽³⁾⁽¹⁾	Not Applicable or Customer Supplied	★
Expanded		
1	Gate Valve, Carbon Steel	
2	Gate Valve, Stainless Steel	
5	Ball Valve, Carbon Steel	
6	Ball Valve, Stainless Steel	
Temperature Measurement		
Standard		Standard
0	No Temperature Sensor Required	★
Expanded		
R ⁽⁴⁾⁽⁶⁾⁽⁹⁾	Remote RTD (1/2-in. NPT Aluminum Housing) with Thermowell	
S ⁽⁴⁾⁽⁶⁾⁽⁹⁾	Remote RTD (1/2-in. NPT Stainless Housing) with Thermowell	
Transmitter Connection Platform		
Standard		Standard
3 ⁽⁶⁾⁽¹⁰⁾⁽¹¹⁾	Direct-Mount, 3-Valve Manifold	★
Expanded		
4 ⁽⁶⁾⁽¹⁰⁾⁽¹¹⁾	Direct-Mount, Dual 3-Valve Manifolds	
6 ⁽⁶⁾⁽¹⁰⁾⁽¹²⁾	High Temperature Direct-Mount 5-Valve Manifold	
7	Remote-Mount 1/2-in. Threaded Connections	
8 ⁽³⁾	Remote-Mount 1/2-in. Welded Connections	
Mounting Flange Bolting materials		
Standard		Standard
A	193 Gr B7 Studs w/ A194 Gr 2H Nuts	★
0	No Flange Studs/Nuts Supplied	★
Mounting Flange Gasket Materials		
Standard		Standard
1	Spiral Wound, 304SS, Flexible-Graphite Filler	★
0	No Flange Gasket Supplied	★
Expanded		
2	Ring-Joint, ANSI B16.20, Hexagonal, 316L	
3	Spiral Wound, B16.20, 316SS, PTFE Filler	

Table 34. Rosemount 585 Annubar Ordering Information

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

Options (Include with selected model number)

Optional Mounting for Rectangular Ducts		
Expanded		
RD	Annubar Mounting for rectangular ducts	
Pressure Testing		
Expanded		
P1 ⁽¹³⁾	Hydrostatic Testing with Certificate	
PX	Extended Hydrostatic Testing	
Special Cleaning		
Expanded		
PA ⁽⁶⁾⁽¹⁴⁾	Cleaning per ASTM G93 Level D (section 11.4)	
Material Testing		
Expanded		
V1	Dye Penetrant Weld Exam	
Material Examination		
Expanded		
V2	Radiographic Weld Examination	
Flow Calibration		
Expanded		
W1	Flow Calibration (Average K)	
Special Inspection		
Standard		Standard
QC1	Visual & Dimensional Inspection w/ Cert.	
QC7	Inspection & Performance Certificate	
Material Traceability Certification		
Standard		Standard
Q8 ⁽⁵⁾⁽¹⁵⁾	Material Cert. per ISO 10474 3.1 and EN 10204 3.1	
Positive Material Testing		
Expanded		
V4 ⁽¹⁵⁾	Positive Material Identification	
Code Conformance		
Expanded		
J2	ANSI/ASME B31.1	
J3	ANSI/ASME B31.3	
Materials Conformance		
Expanded		
J5 ⁽¹⁶⁾	NACE MR-0175 / ISO 15156	
Country Certification		
Standard		Standard
J6	European Pressure Directive (PED)	
Expanded		
J1	Canadian Registration Certificate	
Instrument Valves for Remote Mount Option		
Standard		Standard
G2	1/2-in. Needle Valves, SS	
G6	1/2-in. OS&Y Gate Valve, SS	
Expanded		
G1	1/2-in. Needle Valves, CS	
G3	1/2-in. Needle Valves, Alloy C-276	
G5	1/2-in. OS&Y Gate Valve, CS	
Instrument Valve Options		
Standard		Standard
DV ⁽¹⁷⁾	Double Instrument Valves (4 valves total)	

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Table 34. Rosemount 585 Annubar Ordering Information

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

Special Shipment		
Standard		Standard
Y1	Mounting Hardware Shipped Separately	★
Assemble Mounting Hardware		
Expanded		
WP ⁽¹⁸⁾	Assemble Weldolet to Packing body	
Special Dimensions		
Expanded		
VM	Variable Mounting	
585 Packing Gland Plug		
Expanded		
TP ⁽¹⁸⁾	Packing Gland Plug for Steam Blow Down	
585 Installation Alignment Bar		
Expanded		
A1 ⁽¹⁸⁾	Installation Alignment Bar	
Typical Model Number: 585 M S L 120 J H W 44 0 0 0 T 0 0 8 0 0		

(1) Required for Annubar Type F.

(2) Required for Annubar Type G.

(3) Required for Annubar Type L.

(4) Not available with Annubar Type L.

(5) Not available with Annubar Type G.

(6) Not available with Sensor Material K.

(7) Mounting Flange Bolting and Gasket option code 0 must be selected.

(8) Mounting Flange Gasket Material option code 2 or 0 must be selected.

(9) Not available with ANSI 2500 Mounting Pressure Class.

(10) Not available with Mounting Pressure Class N, T, or F.

(11) Not available with Sensor Material W.

(12) Not available with Sensor Material H or W.

(13) Applies to flow element only, mounting not tested.

(14) If selected with Annubar Type F, Mounting Flange Gasket Material option code 3 must be selected.

(15) For pressure retaining parts only, isolation and instrument valves are not included.

(16) Materials of Construction comply with metallurgical requirements within NACE MR0175/ISO 15156 for sour oil field production environments. Environmental limits apply to certain materials. Consult latest standard for details. Selected materials also conform to NACE MR0103 for sour refining environments.

(17) Only available if Instrument Valves for Remote Mount Option are selected.

(18) Only available with Annubar Type L.

585 Specifications

585 PERFORMANCE SPECIFICATIONS

Performance Statement Assumptions

Measured pipe I.D.

Discharge Coefficient Factor

±1.50% of flow rate

Repeatability

±0.10%

Line Sizes

- Sensor Size 11: 4-in. to 24-in. (100 to 600 mm)
- Sensor Size 22: 6-in. to 36-in. (150 to 900 mm)
- Sensor Size 44: 10-in. to 96-in. (250 to 2400 mm)

Table 35. Reynolds Number and Probe Width

Sensor Size	Minimum Rod Reynolds Number (R_d)	Probe Width (d) (inches)
11	6500	0.80-in. (20,32 mm)
22	10000	1.20-in. (30,48 mm)
44	25000	2.28-in. (57,91 mm)

Where

$$R_d = \frac{d \times v \times p}{\mu}$$

d = Probe width (feet)

v = Velocity of fluid (ft/sec)

p = Density of fluid (lbm/ft³)

μ = Viscosity of the fluid (lbm/ft-sec)

Sizing

Contact an Emerson Process Management representative for assistance. A Configuration Data Sheet is required prior to order for application verification.

Flow Turndown

10:1 or better

585 FUNCTIONAL SPECIFICATIONS

Service

- Liquid
- Gas
- Steam

Process Temperature Limits

Table 36. Direct Mount Transmitter Connection Platform

Transmitter Connection Platform	Temperature Limit
3-valve manifold (Option code 3)	500 °F (260 °C)
5-valve manifold (Option code 6)	750 °F (398 °C)
Note: Specification is 600 °F (315 °C) in steam service	

Table 37. Remote Mount Transmitter Connection Platform

Sensor Material	Temperature Limit
316 Stainless Steel (Option code S)	850 °F (454 °C)
Alloy C-276 (Option code H)	1250 °F (677 °C)
Alloy 800H (Option code W)	1500 °F (816 °C)
PVDF (KYNAR) (Option code K)	250 °F (121 °C)

Pressure and Temperature Limits

Table 38. Main Steam Line Annubar

Mounting Material	Sensor Material	Max. Pressure @ Temp.	Max. Temp.
Chrome-Moly Grade F-11	Alloy 800H	2317 psig @ 1000 °F (160 bar @ 538 °C)	1100 °F (593 °C)
Chrome-Moly Grade F-22	Alloy 800H	2868 psig @ 1000 °F (198 bar @ 538 °C)	1100 °F (593 °C)
Chrome-Moly Grade F-91	Alloy 800H	3788 psig @ 1100 °F (261 bar @ 593 °C)	1200 °F (649 °C)

Table 39. Severe Service Annubar

Annubar Type	Sensor Material	Max. Flange Rating
Flanged (option code F)	316 SST	2500# ANSI
	Alloy C-276	2500# ANSI
	Alloy 800H	2500# ANSI
	PVDF (KYNAR)	150# ANSI
Flanged Flo-Tap (option code G)	316 SST	600# ANSI

585 PHYSICAL SPECIFICATIONS

Temperature Measurement

Remote RTD

- Series 78 with Rosemount 644 housing 100 Ohm platinum RTD
- Spring loaded with 1/2-in. NPT nipple and union

Thermowell

- 1/2-in. NPT x 3/4-in. socket weld
- 316 Stainless Steel and Alloy C-276 Material
- 2.5-in. insertion length provided

Annubar Sensor Material

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

Mounting Material

- Carbon Steel (A105)
- 316 Stainless Steel
- Carbon Steel (A350 LF2)
- Chrome-Moly Grade F-11
- Chrome-Moly Grade F-22
- Chrome-Moly Grade F-91

Annubar Type

See "585 Dimensional Drawings" on page 140

Flanged with Opposite Side Support Model (option F)

- Provided with opposite side support, which is the same material as the pipe and requires a second pipe penetration
- Sensor flange is the same material as the Annubar sensor and the mounting flange is the same material as the pipe material
- Flanged mounting hardware: nuts, studs and gaskets (DIN units supplied without nuts, studs and gaskets)
- SST: -325 to 850 °F (-198 to 454 °C)
- Alloy C-276: -325 to 1250 °F (-198 to 677 °C)
- PVDF (KYNAR): -40 to 250 °F (-40 to 121 °C)
- Alloy 800H: -325 to 1500 °F (-198 to 816 °C)

Main Steam Annubar with Opposite Side Support (option L)

- Provided with opposite side support, which is the same material as the pipe and requires a second pipe penetration
- Alloy 800H: -325 to 1500 °F (-198 to 816 °C)
- Only available in sensor size 44

Flanged Flo-Tap Models (option G)

- Opposite side support is not available
- Packing Gland Material Temperature Limits
 - Graphite: -40 to 850 °F (-40 to 454 °C)
- Isolation valve option
 - The isolation valve will carry the same pressure rating as the sensor flange and mounting flange specified in the mounting type
- SST: -325 to 850 °F (-198 to 454 °C)
- Maximum allowable insertion pressure: 1440 psig (99 bar)
- Only available in sensor size 44

Annubar Type Specification Chart

Option Code	Mounting Type/ Pressure Class	Flanged	Main Steam	Gear-Drive Flo-Tap
A1	150# RF ANSI	X		X
A3	300# RF ANSI	X		X
A6	600# RF ANSI	X		X
AN ⁽¹⁾	900# RF ANSI	X		
AF ⁽¹⁾	1500# RF ANSI	X		
AT ⁽¹⁾	2500# RF ANSI	X		
D1	DIN PN 16	X		X
D3	DIN PN 40	X		X
D6	DIN PN 100	X		X
R1	150# RTJ Flange	X		X
R3	300# RTJ Flange	X		X
R6	600# RTJ Flange	X		X
RN ⁽¹⁾	900# RTJ Flange	X		
RF ⁽¹⁾	1500# RTJ Flange	X		
RT ⁽¹⁾	2500# RTJ Flange	X		
00 ⁽¹⁾	Main Steam Packing Gland		X	

(1) Remote mount only.

Instrument Connection Temperature Ranges

Table 40. Minimum / Maximum Temperature Range

Code	Description	Temperature
G1	Needle Valves, Carbon Steel	-20 to 550 °F (-29 to 288 °C)
G2	Needle Valves, Stainless Steel	-20 to 1000 °F (-29 to 538 °C)
G3	Needle Valves, Alloy C-276	-20 to 1000 °F (-29 to 538 °C)
G5	OS&Y Gate Valve, Carbon Steel	-20 to 800 °F (-29 to 427 °C)
G6	OS&Y Gate Valve, Stainless Steel	-20 to 850 °F (-29 to 454 °C)

Rosemount 405 Compact Primary Element



Rosemount 405 Compact Primary Element utilizes an easy to install direct mount primary element assembly.

- Available with Conditioning Orifice Plate Technology
- 405P/C orifice primary elements are based on ASME/ISO corner tap design
- Available in 2 to 12-in. (50 - 300 mm) line sizes

Additional Information

Specifications: page 103

Dimensional Drawings: page 143

Installation and Flowmeter Orientation: page 151

Table 41. Rosemount 405 Compact Orifice Primary Element Ordering Information

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

Model	Product Description	
405	Compact Primary Element	
Primary Element Type		
Standard		Standard
C	Conditioning Orifice Plate	★
P	Orifice Plate	★
Material Type		
Standard		Standard
S	316 Stainless Steel (SST)	★
Line Size		
Standard		Standard
005 ⁽¹⁾	1/2-in. (15 mm)	★
010 ⁽¹⁾	1-in. (25 mm)	★
015 ⁽¹⁾	1 1/2-in. (40 mm)	★
020	2-in. (50 mm)	★
030	3-in. (80 mm)	★
040	4-in. (100 mm)	★
060	6-in. (150 mm)	★
080	8-in. (200 mm)	★
100	10-in. (250 mm)	★
120	12-in. (300 mm)	★
Temperature Measurement		
Standard		Standard
N	No Temperature Measurement	★
Primary Element Type		
Standard		Standard
040	0.40 Beta Ratio (β)	★
065 ⁽²⁾	0.65 Beta Ratio (β)	★
Transmitter Connection		
Standard		Standard
D3	Coplanar, Direct mount, 3-valve Integral Manifold, SST	★
R3	Remote-mount, 1/4-in. NPT connections	★
Expanded		★
A3	Traditional, Direct mount, 3-valve Integral Manifold with adapter plate, SST	★

Table 41. Rosemount 405 Compact Orifice Primary Element Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.

The Expanded offering is subject to additional delivery lead time.

Options (Include with selected model number)

Installation Accessories		
Standard		Standard
A	ANSI Alignment Ring (150#) (Only required for 10-in. (250 mm) and 12-in. (300mm) line sizes)	★
C	ANSI Alignment Ring (300#) (Only required for 10-in. (250 mm) and 12-in. (300mm) line sizes)	★
D	ANSI Alignment Ring (600#) (Only required for 10-in. (250 mm) and 12-in. (300mm) line sizes)	★
G	DIN Alignment Ring (PN 16)	★
H	DIN Alignment Ring (PN 40)	★
J	DIN Alignment Ring (PN 100)	★
Expanded		
B	JIS Alignment Ring (10K)	
R	JIS Alignment Ring (20K)	
S	JIS Alignment Ring (40K)	
Remote Adapters		
Standard		Standard
E	Flange adapters 316 SST (1/2-in. NPT)	★
High Temperature Application		
Expanded		
T	Graphite valve packing (Tmax = 850 °F)	
Flow Calibration		
Expanded		
WC	Discharge Coefficient Verification (3 point)	
WD	Discharge Coefficient Verification (10 point)	
Pressure Testing		
Expanded		
P1	Hydrostatic testing with Certificate	
Special Cleaning		
Expanded		
P2	Cleaning for Special Services	
PA	Cleaning per ASTM G93 Level D (section 11.4)	
Special Inspection		
Standard		Standard
QC1	Visual and Dimensional Inspection with certificate	★
QC7	Inspection and performance certificate	★
Material Traceability Certification		
Standard		Standard
Q8	Material Traceability Certification per En 10204:2004 3.1	★
Code Conformance		
Expanded		
J2	ANSI / ASME B31.1	
J3	ANSI / ASME B31.3	
J4	ANSI / ASME B31.8	
Materials Conformance		
Expanded		
J5 ⁽³⁾	NACE MR-0175 / ISO 15156	
Country Certification		
Expanded		
J1	Canadian Registration	
Typical Model Number: 405 C S 040 N 040 D3		

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

(2) For 2-in. (50 mm) line sizes the Beta Ratio is 0.6 for Primary Element Type code C.

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

405 Specifications

405 PERFORMANCE SPECIFICATIONS

Table 42. 405C Conditioning Orifice Technology

Beta Ratio	Cd Uncertainty
$\beta = 0.40$	$\pm 0.50\%$
$\beta = 0.65^{(1)}$	$\pm 1.00\%$

(1) For 0.65 beta and $ReD < 10,000$ add an additional 0.5% to the Discharge Coefficient Uncertainty.

Table 43. 405P Compact Orifice Technology

Beta	Discharge Coefficient Uncertainty
1/2-in. line size	
0.4 0.65	$\pm 2.25\%$
1-in. to 1 1/2-in. line size	
0.4 0.65	$\pm 1.75\%$
2-in. to 12-in. line size	
0.4 0.65	$\pm 1.25\%$

Line Sizes

- 1/2-in. (15 mm) – not available for the 405C
- 1-in. (25 mm) – not available for the 405C
- 1 1/2-in. (40 mm) – not available for the 405C
- 2-in. (50 mm)
- 3-in. (80 mm)
- 4-in. (100 mm)
- 6-in. (150 mm)
- 8-in. (200 mm)
- 10-in. (250 mm)
- 12-in. (300 mm)

Sizing

Contact an Emerson Process Management sales representative assistance. A "Configuration Data Sheet" is required prior to order for application verification.

405 FUNCTIONAL SPECIFICATIONS

Service

- Liquid
- Gas
- Vapor

Process Temperature Limits

Direct Mount Transmitter

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

Remote Mount Transmitter

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

Differential Pressure Limits

Maximum differential pressure (DP) up to 800 inH₂O.

Maximum Working Pressure

- Pressure retention per ANSI B16.5 600# or DIN PN100

Vibration Limits

Qualified per IEC61298-3 (1998) for field with high vibration level or pipeline with high vibration level (10-60Hz 0.21mm displacement peak amplitude / 60 - 2000Hz 3g).

The weight and length of the transmitter assembly shall not exceed 5.8 lbs and 7.75-in.

Assembly to a transmitter

Select option code C11 for the Rosemount 3051S transmitter (or option code S3 for the Rosemount 3051C or 3095MV transmitters) to factory assemble the Rosemount 405 to a Rosemount pressure transmitter. If the 405 and transmitter are not factory assembled, they may be shipped separately. For a consolidated shipment, inform the Emerson Process Management representative when placing the order.

405 PHYSICAL SPECIFICATIONS

Temperature Measurement

Integral RTD⁽¹⁾

- 100 Ohm platinum RTD temperature sensor assembly (316 SST Mineral Insulated Cable) with 1/4-in. NPT connection to wafer side and 1/2-in. NPT connection to transmitter RTD sensor is separated from process fluid by 1/16-in. and is pressure retaining rated for ANSI 600#. Complies with IEC-751 Class B accuracy. Meets Intrinsic Safety certification.

(1) Only available with 3051SFC or 3095MFC Compact Orifice Flowmeter models.

Remote RTD⁽¹⁾

- 100 Ohm platinum with 1/2-in. NPT nipple and union (078 series with Rosemount 644 housing) Model 0078D21N00A025T32Ex Connection Head: 00644-4410-0011
- Standard RTD cable is shielded armored cable, length is 12 ft. (3.66 m)
- Remote RTD material is SST Thermowell
- 1/2-in. x 1/2-in. NPT, 316 SST

(1) Only available with 3051SFC or 3095MFC Compact Orifice Flowmeter models.

Material of Construction

Body/Plate

- 316/316L SST
- 50 micro-inch Ra surface finish

Manifold Head/Valves

- 316 SST

Flange Studs and Nuts

- Customer supplied
- Available as a spare part

Transmitter Connection Studs and Nuts

- Studs— A193 Grade B8M.
- Nuts— A194 Grade 8M.

Gasket and O-rings

- Gaskets are customer supplied.
- Durlon 8500 fiber gaskets are recommended. Consult an Emerson Process Management representative for use with other gaskets.
- Available as a spare part

NOTE

Gaskets and O-rings should be replaced when the 405 is disassembled.

Transmitter Connections

Direct Mount

- Available with 3051SMV, 3051S, 3051, 2051 and 3095 transmitters, ranges 1, 2, and 3.

Remote Mount

- Available with 1/4-in. NPT (standard) or 1/2-in. NPT (option code E) connections

Orifice Type

- Square edged

Orifice Pressure Taps

- Corner

Alignment Rings

Mounts between the following flange configurations:

ASME B16.5 (ANSI)	DIN	JIS
Class 150	PN16 (option code G)	10k (option code B)
Class 300	PN40 (option code H)	20k (option code R)
Class 600	PN100 (option code H)	40k (option code S)

ANSI 150 - 600# alignment ring is included as standard when ordering for up to 8-in. line size. For the 10-in. and 12-in. line size, the alignment ring must be ordered (Installation Accessories).

Typical Orifice Hole Sizes

For 405C, beta is calculated by: $\beta = d_c / \text{Pipe ID}$, where the calculated bore is equal to 2 x typical orifice hole size ($d_c = 2d$). The tables below show the diameter of the typical orifice holes.

Table 44. $\beta = 0.4^{(1)(2)}$

Line Size	405C	405P
1/2-in. (15 mm)	Not Available	0.249 (6.325)
1-in. (25 mm)	Not Available	0.420 (10.668)
1 1/2-in. (40 mm)	Not Available	0.644 (16.358)
2-in. (50 mm)	0.413 (10.490)	0.827 (21.006)
3-in. (80 mm)	0.614 (15.596)	1.227 (31.166)
4-in. (100 mm)	0.805 (20.447)	1.610 (40.894)
6-in. (150 mm)	1.971 (50.063)	3.942 (100.127)
8-in. (200 mm)	2.594 (65.888)	5.188 (131.775)
10-in. (250 mm)	3.257 (82.728)	6.513 (165.43)
12-in. (300 mm)	3.900 (99.060)	7.800 (198.120)

(1) Measurement is in inches (millimeters)

(2) Tolerance = ± 0.002 -in.

Table 45. $\beta = 0.65^{(1)(2)}$

Line Size	405C	405P
1/2-in. (15 mm)	Not Available	0.404 (10.262)
1-in. (25 mm)	Not Available	0.682 (17.323)
1 1/2-in. (40 mm)	Not Available	1.047 (26.594)
2-in. (50 mm)	0.620 (15.748) ⁽³⁾	1.344 (34.138)
3-in. (80 mm)	0.997 (25.324)	1.994 (50.648)
4-in. (100 mm)	1.308 (33.223)	2.617 (66.472)
6-in. (150 mm)	1.213 (30.810)	2.426 (61.620)
8-in. (200 mm)	1.596 (40.538)	3.192 (81.077)
10-in. (250 mm)	2.004 (50.902)	4.008 (101.80)
12-in. (300 mm)	2.400 (60.960)	4.800 (121.92)

(1) Measurement is in inches (millimeters)

(2) Tolerance = ± 0.002 -in.

(3) For 2-in. (50 mm) line size, the Beta (β) = 0.60.

Table 46. 405 Weight (measurement in lb. (kg))

Line Size	Direct Mount (D3)	Remote Mount (R3)
1/2-in. (15 mm)	3.50 (1.73)	7.5 (3.70)
1-in. (25 mm)	4.25 (2.10)	8.25 (4.07)
1 1/2-in. (40 mm)	4.75 (2.34)	8.75 (4.32)
2-in. (50 mm)	5.00 (2.47)	9.00 (4.44)
3-in. (80 mm)	7.00 (3.45)	11.00 (5.43)
4-in. (100 mm)	9.50 (4.69)	13.50 (6.67)
6-in. (150 mm)	13.00 (6.41)	17.00 (8.40)
8-in. (200 mm)	18.25 (9.00)	22.25 (10.99)
10-in. (250 mm)	23.50 (11.59)	27.50 (13.58)
12-in. (300 mm)	29.50 (14.55)	33.50 (16.54)

Rosemount 1595 Conditioning Orifice Plate



Rosemount 1595 Conditioning Orifice combines a flow conditioner with an orifice plate into a highly accurate primary element.

- Requires only 2 diameters of straight pipe run upstream and downstream from a flow disturbance
- Suitable for most gas, liquid, and steam applications
- Available in 2 to 24-in. (50 - 600 mm) line sizes

Additional Information

Specifications: page 107

Dimensional Drawings: page 145

Installation and Flowmeter Orientation: page 151

TABLE 47. Rosemount 1595 Conditioning Orifice Plate Ordering Table

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.

The Expanded offering is subject to additional delivery lead time.

Model	Product Description	
1595	Conditioning Orifice Plate	
Plate Type		
Standard		Standard
P	Paddle, Square Edged	★
U ⁽¹⁾⁽²⁾	Universal, Square Edged	★
Line Size		
Standard		Standard
020	2-in. (50 mm)	★
030	3-in. (76 mm)	★
040	4-in. (100 mm)	★
060	6-in. (150 mm)	★
080	8-in. (200 mm)	★
100	10-in. (250 mm)	★
120	12-in. (300 mm)	★
Expanded		
140	14-in. (350 mm)	
160	16-in. (400 mm)	
180	18-in. (450 mm)	
200	20-in. (500 mm)	
240	24-in. (600 mm)	
Flange Rating		
Standard		Standard
A1	ANSI Class 150 Raised Face (<i>Note: Not compatible with standard ASME B16.36 Orifice Flanges</i>)	★
A3	ANSI Class 300 Raised Face	★
A6	ANSI Class 600 Raised Face	★
A9	ANSI Class 900 Raised Face	★
AF	ANSI Class 1500 Raised Face	★
AT	ANSI Class 2500 Raised Face	★
D1 ⁽¹⁾	DIN PN 10 (only available with Plate Type P)	★
D2 ⁽¹⁾	DIN PN 16 (only available with Plate Type P)	★
D3 ⁽¹⁾	DIN PN 25 (only available with Plate Type P)	★
D4 ⁽¹⁾	DIN PN40 (only available with Plate Type P)	★
D5 ⁽¹⁾	DIN PN 63 (only available with Plate Type P)	★
D6 ⁽¹⁾	DIN PN 100 (only available with Plate Type P)	★
Expanded		
R3 ⁽¹⁾	ANSI Class 300 Ring Joint (only available with Orifice Plate Type code U and requires Plate Holder code PH)	
R6 ⁽¹⁾	ANSI Class 600 Ring Joint (only available with Orifice Plate Type code U and requires Plate Holder code PH)	

Rosemount DP Flow

Product Data Sheet

00813-0100-4485, Rev AA

April 2010

TABLE 47. Rosemount 1595 Conditioning Orifice Plate Ordering Table

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.

The Expanded offering is subject to additional delivery lead time.

R9 ⁽¹⁾	ANSI Class 900 Ring Joint (only available with Orifice Plate Type code U and requires Plate Holder code PH)			
RF ⁽¹⁾	ANSI Class 1500 Ring Joint (only available with Orifice Plate Type code U and requires Plate Holder code PH)			
RT ⁽¹⁾	ANSI Class 2500 Ring Joint (only available with Orifice Plate Type code U and requires Plate Holder code PH)			
Material Type				
Standard				Standard
S	316/316L Stainless Steel			★
Expanded				
M	Alloy 400			
H	Alloy C-276			
Orifice Plate Thickness		Plate Type P	Plate Type U	
Standard				Standard
A	0.125-in.	Line Sizes 2 to 4-in. (50 to 100 mm)	Line size 2 to 6-in. (50 to 150 mm)	★
B	0.250-in.	Line Sizes 6 to 12-in. (150 to 300 mm)	Line size 8 to 12-in. (200 to 300 mm)	★
Expanded				
C	0.375-in.	Line Sizes 14 to 20-in. (350 to 500 mm)	N/A	
D	0.500-in.	Line Size 24-in. (600 mm)	N/A	
Beta Ratio				
Standard				Standard
020	0.20 Beta Ratio			★
040	0.40 Beta Ratio			★
065	0.65 Beta Ratio (0.60 beta ratio for Line Size option 020 only)			★

Options (Include with selected model number)

Flow Calibration		
Standard		Standard
WC	Flow Calibration Certification (3 points)	★
Expanded		
WD	Discharge Coefficient Verification (full 10 points)	
Plate Holder		
Expanded		
PH ⁽¹⁾	Plate Holder for Universal Type Orifice Plate for use with RTJ flange or section	
Special Cleaning		
Expanded		
P2	Cleaning for Special Services	
Special Inspection		
Standard		Standard
QC1	Visual and dimensional Inspection with certification	★
QC7	Inspection and performance certificate	★
Material Traceability Certification		
Standard		Standard
Q8	Material Certification per ISO 10474 3.1-B and EN 10204 3.1	★
Code Conformance		
Expanded		
J5 ⁽³⁾	NACE MR-0175 / ISO 15156	
Country Certification		
Expanded		
J1	Canadian Registration	
Typical Model Number: 1595 P 060 A3 S A 040		

(1) Currently available up to 12-in. (300 mm) line size.

(2) For use with a plate holder device in RTJ type flanges or orifice fittings.

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

1595 Specifications

1595 PERFORMANCE SPECIFICATIONS

Flow Coefficient Uncertainty

Table 48. Discharge Coefficient Uncertainty

Beta Ratio ⁽¹⁾	Cd Uncertainty ⁽²⁾
$\beta = 0.20$	$\pm 0.50\%$
$\beta = 0.40$	$\pm 0.50\%$
$\beta = 0.65$	$\pm 1.00\%$ (applicable for Beta > 0.4)

(1) For 0.65 beta and $ReD < 10,000$ add an additional 0.5% to the Discharge Coefficient Uncertainty.

(2) When using the Calibration Factor (F_c) supplied.

Sizing

Perform a flow calculation using the Instrument Toolkit® software package. Alternatively, contact an Emerson Process Management representative.

Pressure Tap Orientation

Orient the 1595 Conditioning Orifice Plate so that the pressure taps are centered between any 2 (of 4) orifice bore holes. In addition, the pressure taps should be located at 90° to the plane of the last elbow.

The 1595 Conditioning Orifice Plate can be used with the following pressure taps:

- Corner pressure taps - all beta sizes
- Flange pressure taps - all beta sizes
- Radius pressure taps (D and D/2) - 0.4 beta size or smaller

Centering Requirements

The 1595 should be installed so that it is centered in the pipes as recommended by ISO-5167.

1595 FUNCTIONAL SPECIFICATIONS

Service and Flow Range

Liquid, gas or vapor turbulent flow, for pipe Reynold's Numbers greater than 5,000. For pipe Reynold's Numbers less than 10,000 add an additional +0.5% uncertainty to the discharge coefficient uncertainty.

Pipe Sizes

2 to 24-in. (50 to 600 mm). Contact Emerson Process Management for other pipe sizes.

Operating Limits

For line sizes 2-in. (50 mm) to 24-in. (600 mm)

Temperature Range: -320 to 1200 °F (-196 to 649 °C)

- -320 to 800 °F (-196 to 427 °C) and differential pressure up to 800 inH₂O
- 800 to 1200 °F (427 to 649 °C) and differential pressure up to 400 inH₂O

Maximum Working Pressure

- Flange rating per ANSI B16.5 and DIN EN 1092-1.

1595 PHYSICAL SPECIFICATIONS

Material of Construction

Table 49. 1595 Materials of Construction

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

Flange Mounting Hardware

- The 1595 can be used with the Rosemount 1496 Flange Union. See Product Data Sheet 00813-0100-4792 for more information regarding the Rosemount 1496.

Orifice Type

- Paddle, square-edge
- Universal, square-edge

Typical Orifice Hole Sizes

Beta is calculated by: $\beta = d_c / \text{Pipe ID}$, where the calculated bore is equal to 2 x typical orifice hole size ($d_c = 2d$). The table below shows the diameter of each of the four orifice holes.

Table 50. Typical Orifice Hole Sizes

Line Size	Pipe ID	Beta (β) = 0.20 d	Beta (β) = 0.40 d	Beta (β) = 0.65 d
2-in. (50 mm)	2.067-in. (52.502 mm)	0.207 (5.26)	0.413 (10.49)	0.620 (15.75) ⁽¹⁾
3-in. (76 mm)	3.068-in. (77.927 mm)	0.307 (7.80)	0.614 (15.60)	0.997 (25.32)
4-in. (100 mm)	4.026-in. (102.26 mm)	0.403 (10.25)	0.805 (20.45)	1.309 (32.22)
6-in. (150 mm)	6.065-in. (154.051 mm)	0.607 (15.42)	1.213 (30.81)	1.971 (50.06)
8-in. (200 mm)	7.981-in. (202.717 mm)	0.798 (20.27)	1.596 (40.54)	2.594 (65.89)
10-in. (250 mm)	10.02-in. (254.51 mm)	1.002 (25.45)	2.004 (50.90)	3.257 (82.73)
12-in. (300 mm)	12.00-in. (304.80 mm)	1.200 (30.48)	2.400 (60.96)	3.900 (99.06)
14-in. (350 mm)	13.124-in. (333.35 mm)	1.312 (33.32)	2.625 (66.68)	4.265 (108.33)
16-in. (400 mm)	15.000-in. (381.00 mm)	1.500 (38.10)	3.000 (76.20)	4.875 (123.83)
18-in. (450 mm)	16.876-in. (428.65 mm)	1.688 (42.88)	3.375 (85.73)	5.485 (139.32)
20-in. (500 mm)	18.812-in. (477.82 mm)	1.881 (47.78)	3.762 (95.55)	6.114 (155.30)
24-in. (600 mm)	22.624-in. (574.65 mm)	2.262 (57.45)	4.525 (114.94)	7.353 (186.77)

(1) For 2-in. (50.8 mm) line size, the beta (β) is 0.60.

Rosemount DP Flow

Rosemount 1195 Integral Orifice Primary Element



**1195 Integral Orifice
Primary Element**

Rosemount 1195 Integral Orifice Primary Element utilizes a self centering orifice plate design to eliminate installation error.

- Enables highly accurate flow measurement in small line sizes
- Available with a variety of process connections
- Available in 1/2 to 1 1/2-in. (15 - 40 mm) line sizes

Additional Information

Specifications: page 111

Dimensional Drawings: page 149

Installation and Flowmeter Orientation: page 151

Table 51. Rosemount 1195 Integral Orifice Primary Element Ordering Information

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

Model	Product Description	
1195	Integral Orifice Primary Flow Element	
Body Material		
Standard		Standard
S	316 SST	★
Line Size		
Standard		Standard
005	1/2-in. (15 mm)	★
010	1-in. (25 mm)	★
015	1 1/2-in. (40 mm)	★
Process Connection		
Standard		Standard
T1	NPT Female Body (not available with thermowell and RTD)	★
S1 ⁽¹⁾	Socket Weld Body (not available with thermowell and RTD)	★
P1	Pipe Ends: NPT threaded	★
P2	Pipe Ends: Beveled	★
D1	Pipe Ends: Flanged, RF, DIN PN16, slip-on	★
D2	Pipe Ends: Flanged, RF, DIN PN40, slip-on	★
D3	Pipe Ends: Flanged, RF, DIN PN100, slip-on	★
W1	Pipe Ends: Flanged, RF, ANSI Class 150, weld-neck	★
W3	Pipe Ends: Flanged, RF, ANSI Class 300, weld-neck	★
W6	Pipe Ends: Flanged, RF, ANSI Class 600, weld-neck	★
Expanded		
A1	Pipe Ends: Flanged, RF, ANSI Class 150, slip-on	
A3	Pipe Ends: Flanged, RF, ANSI Class 300, slip-on	
A6	Pipe Ends: Flanged, RF, ANSI Class 600, slip-on	
R1	Pipe Ends: Flanged, RTJ, ANSI Class 150, slip-on	
R3	Pipe Ends: Flanged, RTJ, ANSI Class 300, slip-on	
R6	Pipe Ends: Flanged, RTJ, ANSI Class 600, slip-on	
P9	Special Process Connection	
Orifice Plate Material		
Standard		Standard
S	316 SST	★

Product Data Sheet

00813-0100-4485, Rev AA

April 2010

Rosemount DP Flow

Table 51. Rosemount 1195 Integral Orifice Primary Element Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.

The Expanded offering is subject to additional delivery lead time.

Expanded		
H	Alloy C-276	
M	Alloy 400	
Bore Size Option		
Standard		Standard
0066	0.066-in. (1,68 mm) for 1/2-in. pipe	★
0109	0.109-in. (2,77 mm) for 1/2-in. pipe	★
0160	0.160-in. (4,06 mm) for 1/2-in. pipe	★
0196	0.196-in. (4,98 mm) for 1/2-in. pipe	★
0260	0.260-in. (6,60 mm) for 1/2-in. pipe	★
0340	0.340-in. (8,64 mm) for 1/2-in. pipe	★
0150	0.150-in. (3,81 mm) for 1-in. pipe	★
0250	0.250-in. (6,35 mm) for 1-in. pipe	★
0345	0.345-in. (8,76 mm) for 1-in. pipe	★
0500	0.500-in. (12,70 mm) for 1-in. pipe	★
0630	0.630-in. (16,00 mm) for 1-in. pipe	★
0800	0.800-in. (20,32 mm) for 1-in. pipe	★
0295	0.295-in. (7,49 mm) for 1 1/2-in. pipe	★
0376	0.376-in. (9,55 mm) for 1 1/2-in. pipe	★
0512	0.512-in. (13,00 mm) for 1 1/2-in. pipe	★
0748	0.748-in. (19,00 mm) for 1 1/2-in. pipe	★
1022	1.022-in. (25,96 mm) for 1 1/2-in. pipe	★
1184	1.184-in. (30,07 mm) for 1 1/2-in. pipe	★
Expanded		
0010	0.010-in. (0,25 mm) for 1/2-in. pipe	
0014	0.014-in. (0,36 mm) for 1/2-in. pipe	
0020	0.020-in. (0,51 mm) for 1/2-in. pipe	
0034	0.034-in. (0,86 mm) for 1/2-in. pipe	
Transmitter / Body Bolt Material		
Standard		Standard
C	316 SST (1 1/2-in. transmitter studs)	★
Expanded		
G ⁽²⁾	High temperature (850 °F (454 °C))	

Options (Include with selected model number)

Temperature Sensor		
Expanded		
S ⁽³⁾	Thermowell and RTD (SST Temperature Housing)	
T ⁽³⁾	Thermowell and RTD (Aluminum Temperature Housing)	
Assemble to Transmitter		
Expanded		
S4 ⁽⁴⁾	Factory assembly – Attach to transmitter and manifold	
Optional Bore Calculation		
Standard		Standard
BC	Bore Calculation	★
Optional Connection		
Standard		Standard
G1	DIN 19231 Transmitter Connection	★
Adapters for Remote Mounting		
Standard		Standard
G2	1/2–14 NPT Remote Adapters – SST	★
Expanded		
G3	1/2–14 NPT Remote Adapters – Alloy C-276	

Rosemount DP Flow

Table 51. Rosemount 1195 Integral Orifice Primary Element Ordering Information

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

Pressure Testing		
Expanded		
P1 ⁽⁵⁾	Hydrostatic Testing with Certificate	
Special Cleaning		
Expanded		
P2	Cleaning for Special Services	
PA	Cleaning per ASTM G93 Level D (section 11.4)	
Material Testing		
Expanded		
V1	Dye Penetrant Exam	
Material Examination		
Expanded		
V2	Radiographic Examination (available only with Process Connection code W1, W3, and W6)	
Flow Calibration		
Expanded		
WD ⁽⁶⁾	Discharge Coefficient Verification	
WZ ⁽⁶⁾	Special Calibration	
Special Inspection		
Standard		Standard
QC1	Visual and dimensional inspection with certificate	★
QC7	Inspection and performance certificate	★
Material Traceability Certification		
Standard		Standard
Q8	Material certification per EN 10204:2004 3.1	★
Code Conformance		
Expanded		
J2 ⁽⁷⁾	ANSI / ASME B31.1	
J3 ⁽⁷⁾	ANSI / ASME B31.3	
J4 ⁽⁷⁾	ANSI / ASME B31.8	
Materials Conformance		
Expanded		
J5 ⁽⁸⁾	NACE MR-0175 / ISO 15156	
Country Certification		
Standard		Standard
J6	European Pressure Directive (PED)	★
Expanded		
J1	Canadian Registration	
Hardware Adjustments and Ground Screw		
Expanded		
A1	External Ground Screw for Temperature Connection Head	
A2	Cover Clamp and External Ground Screw for Temperature Connection Head	
Typical Model Number: 1195 S 010 A3 S 0150 C		

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

(2) Not available with Assemble to Transmitter code S4.

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

(4) Not available with Process Connection code S1.

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

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

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

(8) Materials of Construction comply with metallurgical requirements within NACE MR0175/ISO 15156 for sour oil field production environments. Environmental limits apply to certain materials. Consult latest standard for details. Selected materials also conform to NACE MR0103 for sour refining environments.

1195 Specifications

1195 PERFORMANCE SPECIFICATIONS

Discharge Coefficient Uncertainty⁽¹⁾

Beta (β) ⁽²⁾	Discharge Coefficient Uncertainty
$\beta < 0.1$	$\pm 2.50\%$
$0.1 < \beta < 0.2$	$\pm 1.25\%$
$0.2 < \beta < 0.6$	$\pm 0.75\%$
$0.6 < \beta < 0.8$	$\pm 1.50\%$

(1) Without associated straight run piping, discharge coefficient uncertainty can add up to 1.5% - 5% additional error. Consult the factory for additional information.

(2) $\beta = \frac{\text{Orifice Plate Bore}}{\text{body I.D.}}$

Line Sizes

- 1/2-in. (15 mm)
- 1-in. (25 mm)
- 1 1/2-in. (40 mm)

Sizing

Contact a Emerson Process Management sales representative for assistance. A "Configuration Data Sheet" is required prior to order for application verification.

1195 FUNCTIONAL SPECIFICATIONS

Service

- Liquid
- Gas
- Steam

Process Temperature Limits

Standard (direct/remote mount):

- -40 to 450 °F (-40 to 232 °C)

Extended (remote mount only with option code T):

- -148 to 850 °F (-100 to 454 °C)

Maximum Working Pressure

- Pressure retention per ANSI B16.5 600# or DIN PN100

Table 52. 1195 Pressure Limits

Line Size	Process Connection Code	Maximum Working Pressure @ 100 °F ⁽¹⁾⁽²⁾
1/2-in. (15 mm)	S1 or P2	3000 psig (207 bar)
	T1 or P1	1500 psig (103 bar)
1-in. (25 mm)	S1 or P2	2000 psig (138 bar)
	T1 or P1	1500 psig (103 bar)
1 1/2-in. (40 mm)	S1 or P2	1500 psig (103 bar)
	T1 or P1	1500 psig (103 bar)
All	Flanged	Meets flange primary pressure rating per ANSI B16.5 (EN-1092-1 for DIN flanges)

(1) For pressure ratings at temperatures less than -20 °F (-29 °C) or above 100 °F (38 °C) consult an Emerson Process Management representative.

(2) Transmitter static pressure range may limit maximum working pressure. Refer to Static Pressure Ranges specification.

1195 PHYSICAL SPECIFICATIONS

Material of Construction

Orifice Plate

- 316/316L SST
- Alloy C-276
- Alloy 400

Body

- 316 SST (CF8M), material per ASTM A351

Pipe Material (If Applicable)

- A312 Gr 316/316L, B622 UNS N10276, Alloy C-276

Flange

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

Body Bolts/Studs

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

Transmitter Connection Studs

- ASTM A193 Gr B8M studs

Gaskets/O-rings

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

Orifice Type

Square edge—orifice bore sizes

- 0.066-in. and larger

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

- 0.034-in.
- 0.020-in.
- 0.014-in.
- 0.010-in.

NOTE

Integral orifice bodies contain corner tapped pressure ports.

Pipe Lengths

Upstream and downstream associated piping sections are available on the 1195. The table below lists the standard overall length (lay length) as a function of end connections and line size.

Transmitter Connections

2 1/8-in. (54 mm) center-to-center. Other transmitter spacing can be accommodated using the optional remote adapters and customer-supplied impulse piping. DIN 19213 connections are available.

Overall Length Dimension	Line Size		
	1/2-in. (15 mm)	1-in. (25 mm)	1 1/2-in. (40 mm)
Beveled/Threaded pipe ends	18.27 (464.1)	28.98 (736.1)	40.35 (1024.9)
RF slip-on, RTJ slip-on, RF-DIN slip on	18.43 (468.2)	29.14 (740.2)	40.51 (1029.0)
RF 150#, weld neck	21.94 (557.2)	33.25 (844.5)	45.12 (1146.0)
RF 300#, weld neck	22.32 (566.9)	33.77 (857.7)	45.60 (1158.2)
RF 600#, weld neck	22.81 (579.4)	34.26 (870.3)	46.23 (1174.3)

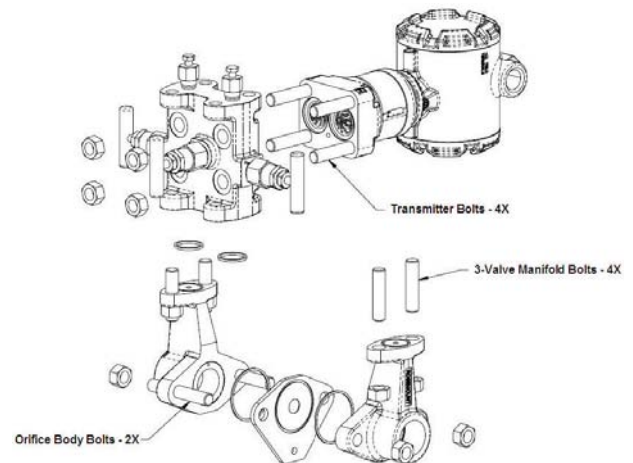
Dimensions are in inches (millimeters).

Torque Values of Standard Bolts

Stud & Nut Torque Specifications ⁽¹⁾	
Manifold/Adapter to 1195 Body	Torque
All Line sizes and gasket types	34-38 lb-ft (44 N-m)
1195 Body to Body ⁽²⁾	
1/2-in. Line size (all gasket types)	60 lb-ft (82 N-m)
1-in. Line size (all gasket types)	60 lb-ft (82 N-m)
1 1/2-in. Line size (PTFE gasket)	60 lb-ft (82 N-m)
1 1/2-in. Line size (X-750 metal gasket)	75 lb-ft (102 N-m)

(1) Studs and nuts should be tightened to specification in two to three steps alternating between sides.

(2) Never reuse gaskets. Always replace gaskets after disassembly to ensure proper seal.



Weight

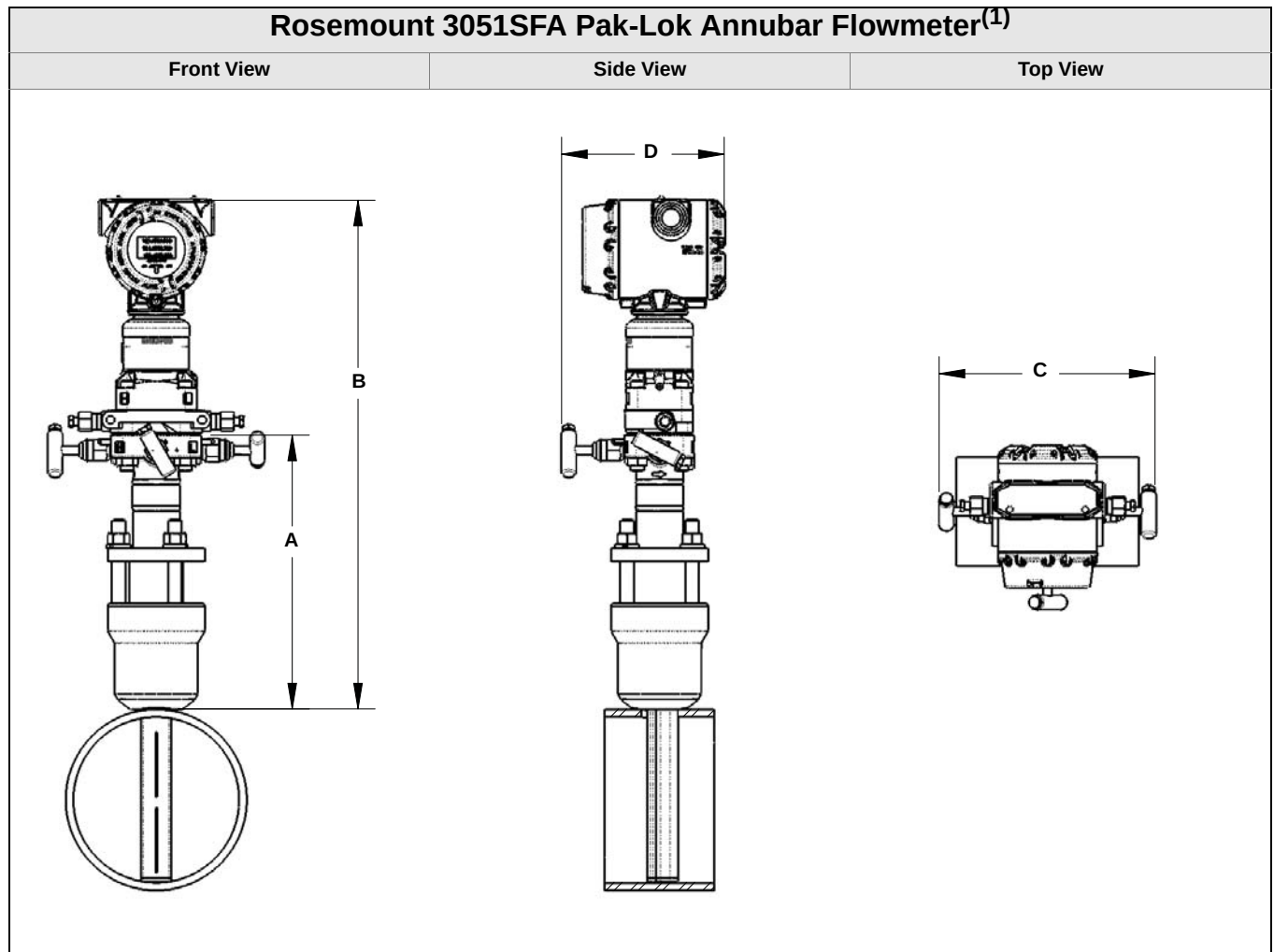
The following weights are approximate

Line Size	1195 Only		With Flanged Piping ⁽¹⁾	
	lb	kg	lb	kg
1/2-in. (15 mm)	4.0	1.8	8	3.6
1-in. (25 mm)	6.0	2.7	12	5.4
1 1/2-in. (40 mm)	8.0	3.6	25	11.3

(1) As supplied with standard lengths, ANSI Class 150 flanges.

Dimensional Drawings

3051SF DIMENSIONAL DRAWINGS

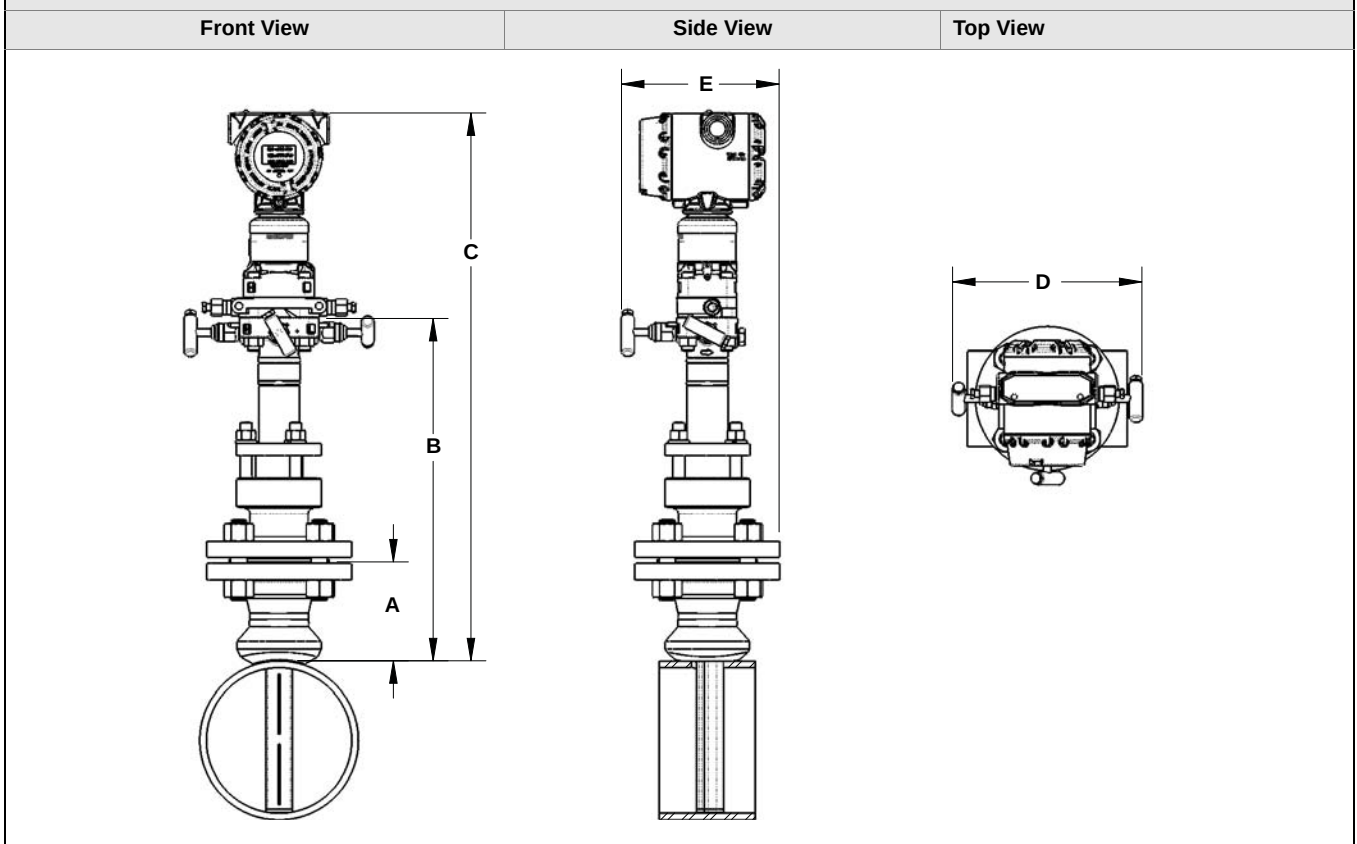


(1) The Pak-Lok Annubar model is rated equivalent to 600# ANSI (1440 psig at 100 °F (99 bar at 38 °C)).

Table 53. Pak-Lok Annubar Flowmeter Dimensional Data

Sensor Size	A (Max)	B (Max)	C (Max)	D (Max)
1	8.50 (215.9)	16.03 (407.2)	9.00 (228.6)	6.90 (175.3)
2	11.00 (279.4)	17.78 (451.6)	9.00 (228.6)	6.90 (175.3)
3	12.00 (304.8)	20.53 (521.5)	9.00 (228.6)	6.90 (175.3)
Dimensions are in inches (millimeters)				

Rosemount 3051SFA Flange-Lok Annubar Flowmeter⁽¹⁾



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

Table 54. Flange-Lok Annubar Flowmeter Dimensional Data

Sensor Size	Flange Size and Rating	A ± 0.125 (3.2)	B ± 0.25 (6.4)	C (Max)	D (Max)	E (Max)
1	1½ – 150#	3.88 (98.6)	12.25 (311.2)	20.78 (527.8)	9.00 (228.6)	6.30 (160.0)
1	1½ – 300#	4.13 (104.9)	12.25 (311.2)	20.78 (527.8)	9.00 (228.6)	6.86 (174.2)
1	1½ – 600#	4.44 (112.8)	12.25 (311.2)	20.78 (527.8)	9.00 (228.6)	6.86 (174.2)
1	DN40/PN16	3.09 (78.5)	12.25 (311.2)	20.78 (527.8)	9.00 (228.6)	6.86 (174.2)
1	DN40/PN40	3.21 (81.5)	12.25 (311.2)	20.78 (527.8)	9.00 (228.6)	6.86 (174.2)
1	DN40/ PN100	3.88 (98.6)	12.25 (311.2)	20.78 (527.8)	9.00 (228.6)	6.86 (174.2)
2	2 – 150#	4.13 (104.9)	14.25 (362.0)	22.78 (578.6)	9.00 (228.6)	6.80 (172.7)
2	2 – 300#	4.38 (111.3)	14.25 (362.0)	22.78 (578.6)	9.00 (228.6)	7.05 (179.1)
2	2 – 600#	4.75 (120.7)	14.25 (362.0)	22.78 (578.6)	9.00 (228.6)	7.05 (179.1)
2	DN50/PN16	3.40 (86.4)	14.25 (362.0)	22.78 (578.6)	9.00 (228.6)	7.05 (179.1)
2	DN50/PN40	3.52 (89.4)	14.25 (362.0)	22.78 (578.6)	9.00 (228.6)	7.05 (179.1)
2	DN50/ PN100	4.30 (109.2)	14.25 (362.0)	22.78 (578.6)	9.00 (228.6)	7.05 (179.1)
3	3 – 150#	4.63 (117.6)	17.50 (444.5)	26.03 (661.2)	9.00 (228.6)	7.55 (191.8)
3	3 – 300#	5.00 (127.0)	17.50 (444.5)	26.03 (661.2)	9.00 (228.6)	7.93 (201.3)
3	3 – 600#	5.38 (136.7)	17.50 (444.5)	26.03 (661.2)	9.00 (228.6)	7.93 (201.3)
3	DN80/PN16	3.85 (97.8)	17.50 (444.5)	26.03 (661.2)	9.00 (228.6)	7.93 (201.3)
3	DN80/PN40	4.16 (105.7)	17.50 (444.5)	26.03 (661.2)	9.00 (228.6)	7.93 (201.3)
3	DN80/ PN100	4.95 (125.7)	17.50 (444.5)	26.03 (661.2)	9.00 (228.6)	7.93 (201.3)
Dimensions are in inches (millimeters)						

Rosemount 3051SFA Flanged with Opposite Side Support Annubar Flowmeter

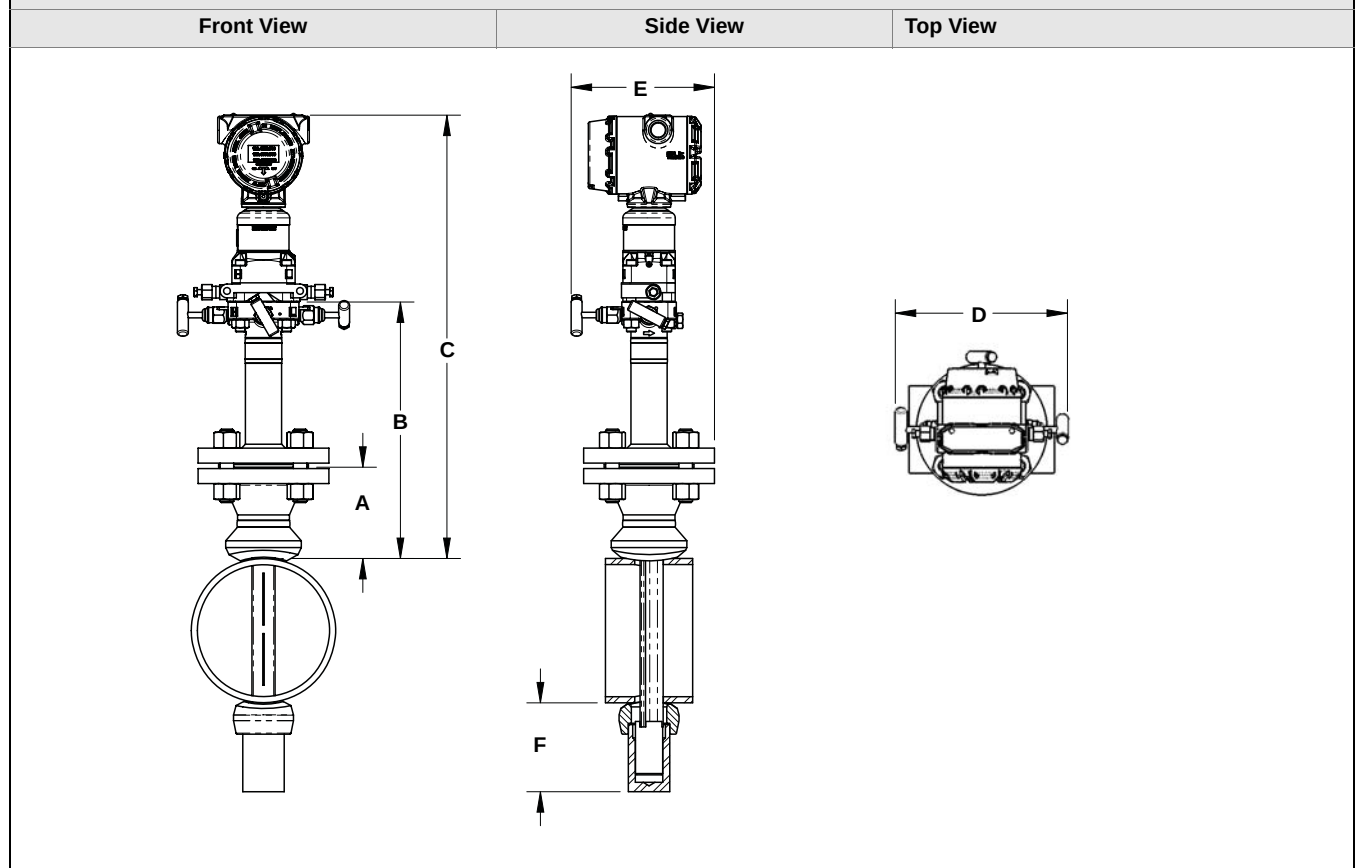


Table 55. Flanged Annubar Flowmeter Dimensional Data

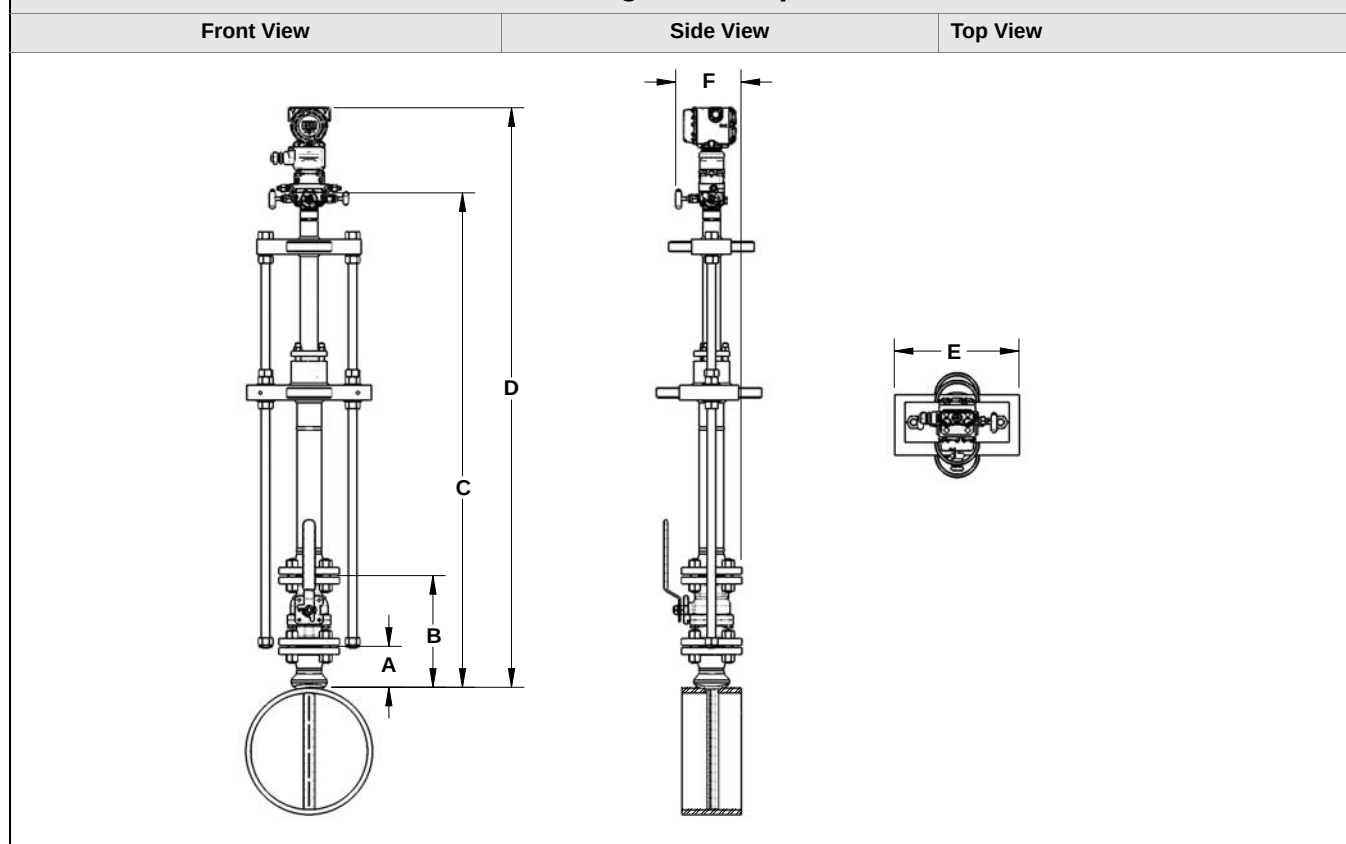
Sensor Size	Flange Size and Rating	A ± 0.125 (3.2)	B ± 0.25 (6.4)	C ± 0.25 (6.4)	D (Max)	E (Max)	F (Max)
1	1½ – 150#	3.88 (98.6)	11.00 (279.4)	19.53 (496.1)	9.00 (228.6)	6.30 (160.0)	3.50 (88.9)
1	1½ – 300#	4.13 (104.9)	11.00 (279.4)	19.53 (496.1)	9.00 (228.6)	6.86 (174.2)	3.50 (88.9)
1	1½ – 600#	4.44 (112.8)	11.00 (279.4)	19.53 (496.1)	9.00 (228.6)	6.86 (174.2)	3.50 (88.9)
1	DN40/PN16	3.09 (78.5)	11.00 (279.4)	19.53 (496.1)	9.00 (228.6)	6.86 (174.2)	3.50 (88.9)
1	DN40/PN40	3.21 (81.5)	11.00 (279.4)	19.53 (496.1)	9.00 (228.6)	6.86 (174.2)	3.50 (88.9)
1	DN40/ PN100	3.88 (98.6)	11.00 (279.4)	19.53 (496.1)	9.00 (228.6)	6.86 (174.2)	3.50 (88.9)
1	1½ – 900#	4.94 (125.5)	9.31 (236.5)	—	—	—	3.50 (88.9)
1	1½ – 1500#	4.94 (125.5)	9.31 (236.5)	—	—	—	3.50 (88.9)
1	1½ – 2500#	6.76 (171.7)	11.63 (295.4)	—	—	—	4.00 (101.6)
2	2 – 150#	4.13 (104.9)	12.00 (304.8)	20.53 (521.5)	9.00 (228.6)	6.80 (172.7)	5.00 (127.0)
2	2 – 300#	4.38 (111.3)	12.00 (304.8)	20.53 (521.5)	9.00 (228.6)	7.05 (179.1)	5.00 (127.0)
2	2 – 600#	4.75 (120.7)	12.00 (304.8)	20.53 (521.5)	9.00 (228.6)	7.05 (179.1)	5.00 (127.0)
2	DN50/PN16	3.40 (86.4)	12.00 (304.8)	20.53 (521.5)	9.00 (228.6)	7.05 (179.1)	5.00 (127.0)
2	DN50/PN40	3.52 (89.4)	12.00 (304.8)	20.53 (521.5)	9.00 (228.6)	7.05 (179.1)	5.00 (127.0)
2	DN50/ PN100	4.30 (109.2)	12.00 (304.8)	20.53 (521.5)	9.00 (228.6)	7.05 (179.1)	5.00 (127.0)
2	2 – 900#	5.88 (149.4)	10.50 (266.7)	—	—	—	5.00 (127.0)
2	2 – 1500#	5.88 (149.4)	10.50 (266.7)	—	—	—	5.00 (127.0)
2	3 – 2500#	9.88 (251.0)	15.63 (397.0)	—	—	—	4.50 (114.3)

Rosemount DP Flow

Table 55. Flanged Annubar Flowmeter Dimensional Data

Sensor Size	Flange Size and Rating	A ± 0.125 (3.2)	B ± 0.25 (6.4)	C ± 0.25 (6.4)	D (Max)	E (Max)	F (Max)
3	3 – 150#	4.63 (117.6)	13.50 (342.9)	22.03 (559.6)	9.00 (228.6)	7.55 (191.8)	4.00 (101.6)
3	3 – 300#	5.00 (127.0)	13.50 (342.9)	22.03 (559.6)	9.00 (228.6)	7.93 (201.3)	4.00 (101.6)
3	3 – 600#	5.38 (136.7)	13.50 (342.9)	22.03 (559.6)	9.00 (228.6)	7.93 (201.3)	4.00 (101.6)
3	DN80/PN16	3.85 (97.8)	13.50 (342.9)	22.03 (559.6)	9.00 (228.6)	7.93 (201.3)	4.00 (101.6)
3	DN80/PN40	4.16 (105.7)	13.50 (342.9)	22.03 (559.6)	9.00 (228.6)	7.93 (201.3)	4.00 (101.6)
3	DN80/ PN100	4.95 (125.7)	13.50 (342.9)	22.03 (559.6)	9.00 (228.6)	7.93 (201.3)	4.00 (101.6)
3	4 – 900#	8.19 (208.0)	13.06 (331.7)	—	—	—	7.00 (177.8)
3	4 – 1500#	8.56 (217.4)	13.81 (350.8)	—	—	—	7.00 (177.8)
3	4 – 2500#	11.19 (284.2)	17.31 (439.7)	—	—	—	7.00 (177.8)
<i>Dimensions are in inches (millimeters)</i>							

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



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

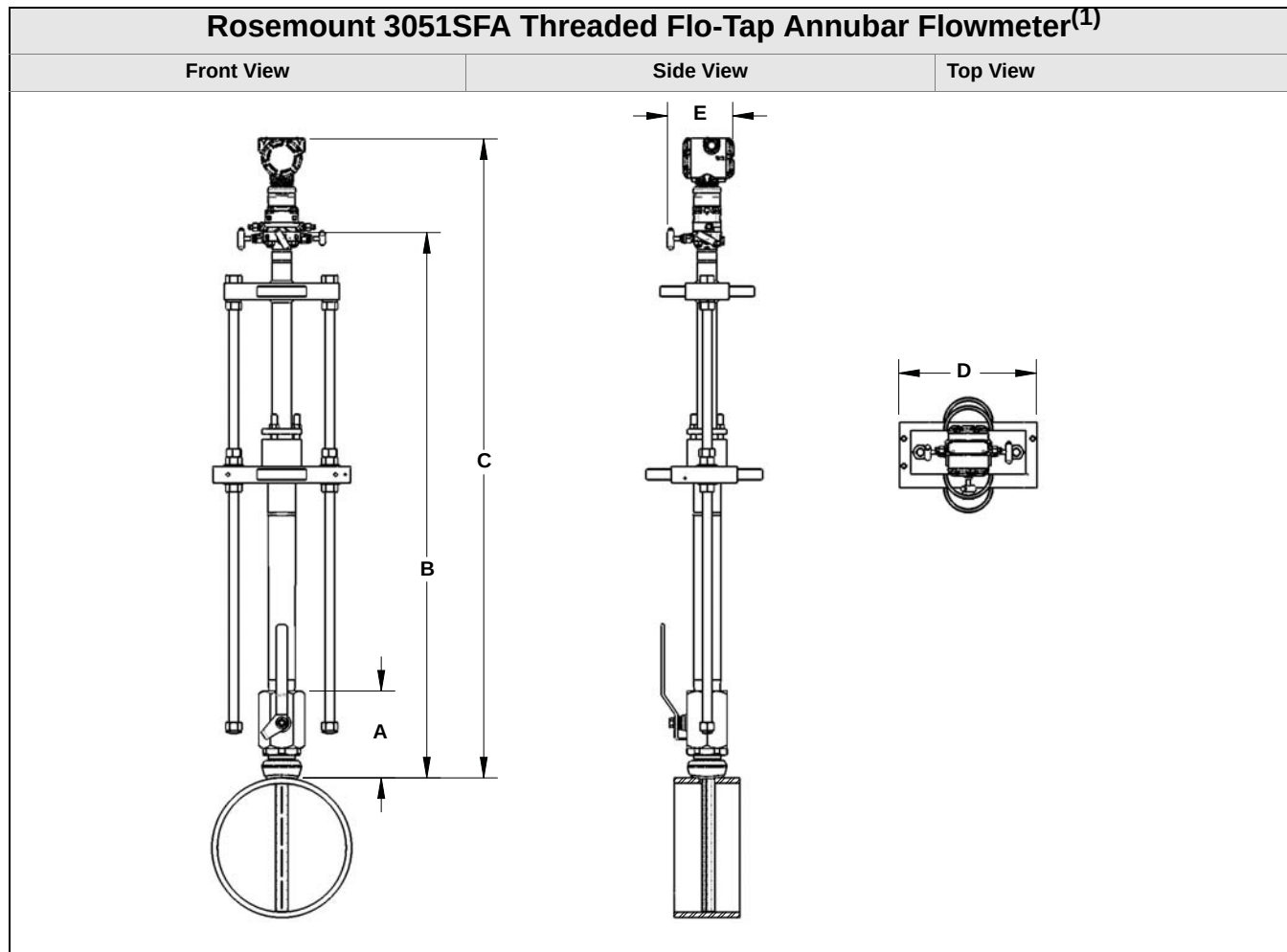
Table 56. Flanged Flo-Tap Annubar Flowmeter Dimensional Data

Sensor Size	Flange Size and Rating	A ± 0.125 (3.2)	B ± 0.25 (6.4)	C ¹ (Max) (Gear Drive)	C ¹ (Max) (Manual)	D (Max)	E (Max)	F (Max)
1	1½ – 150#	3.88 (98.6)	10.50 (266.7)	—	17.77 (451.4)	C + 8.53 (216.7)	10.50 (266.7)	6.30 (160.0)
1	1½ – 300#	4.13 (104.9)	11.75 (298.5)	—	17.77 (451.4)	C + 8.53 (216.7)	10.50 (266.7)	6.86 (174.2)
1	1½ – 600#	4.44 (112.8)	14.06 (357.2)	—	17.77 (451.4)	C + 8.53 (216.7)	10.50 (266.7)	6.86 (174.2)
1	DN40/PN16 ⁽¹⁾	3.09 (78.5)	See Note 1.	—	17.77 (451.4)	C + 8.53 (216.7)	10.50 (266.7)	6.86 (174.2)
1	DN40/PN40 ⁽¹⁾	3.21 (81.5)	See Note 1.	—	17.77 (451.4)	C + 8.53 (216.7)	10.50 (266.7)	6.86 (174.2)
1	DN40/PN100 ⁽¹⁾	3.88 (98.6)	See Note 1.	—	17.77 (451.4)	C + 8.53 (216.7)	10.50 (266.7)	6.86 (174.2)
2	2 – 150#	4.13 (104.9)	11.25 (285.8)	24.44 (620.8)	21.20 (538.5)	C + 8.53 (216.7)	12.56 (319.0)	6.80 (172.7)
2	2 – 300#	4.38 (111.3)	13.00 (330.2)	24.44 (620.8)	21.20 (538.5)	C + 8.53 (216.7)	12.56 (319.0)	7.05 (179.1)
2	2 – 600#	4.75 (120.7)	16.38 (416.0)	24.44 (620.8)	21.20 (538.5)	C + 8.53 (216.7)	12.56 (319.0)	7.05 (179.1)
2	DN50/PN16 ⁽¹⁾	3.40 (86.4)	See Note 1.	24.44 (620.8)	21.20 (538.5)	C + 8.53 (216.7)	12.56 (319.0)	7.05 (179.1)
2	DN50/PN40 ⁽¹⁾	3.52 (89.4)	See Note 1.	24.44 (620.8)	21.20 (538.5)	C + 8.53 (216.7)	12.56 (319.0)	7.05 (179.1)
2	DN50/PN100 ⁽¹⁾	4.30 (109.2)	See Note 1.	24.44 (620.8)	21.20 (538.5)	C + 8.53 (216.7)	12.56 (319.0)	7.05 (179.1)
3	3 – 150#	4.63 (117.6)	12.75 (323.9)	26.37 (669.8)	23.14 (587.8)	C + 8.53 (216.7)	14.13 (358.9)	7.55 (191.8)
3	3 – 300#	5.00 (127.0)	16.25 (412.8)	26.37 (669.8)	23.14 (587.8)	C + 8.53 (216.7)	14.13 (358.9)	7.93 (201.3)
3	3 – 600#	5.38 (136.7)	19.50 (495.3)	26.37 (669.8)	23.14 (587.8)	C + 8.53 (216.7)	14.13 (358.9)	7.93 (201.3)
3	DN80/PN16 ⁽¹⁾	3.85 (97.8)	See Note 1.	26.37 (669.8)	23.14 (587.8)	C + 8.53 (216.7)	14.13 (358.9)	7.93 (201.3)
3	DN80/PN40 ⁽¹⁾	4.16 (105.7)	See Note 1.	26.37 (669.8)	23.14 (587.8)	C + 8.53 (216.7)	14.13 (358.9)	7.93 (201.3)
3	DN80/PN100 ⁽¹⁾	4.95 (125.7)	See Note 1.	26.37 (669.8)	23.14 (587.8)	C + 8.53 (216.7)	14.13 (358.9)	7.93 (201.3)
Dimensions are in inches (millimeters)								

(1) DIN Valves are not offered

Inserted, C Dimension = Pipe I.D. + Wall Thickness + B + C¹

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



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

Table 57. Threaded Flo-Tap Annubar Flowmeter Dimensional Data

Sensor Size	A ± 0.50 (12.7)	B ¹ (Max) (Gear Drive)	B ¹ (Max) (Manual)			E (Max)
				C (Max)	D (Max)	
1	7.51 (190.9)	—	16.96 (430.8)	B + 8.53 (216.7)	10.50 (266.7)	6.90 (175.3)
2	8.17 (207.5)	23.62 (599.9)	20.39 (517.9)	B + 8.53 (216.7)	12.56 (319.0)	6.90 (175.3)
Sensor Size 3 is not available in a Threaded Flo-Tap.						
Dimensions are in inches (millimeters)						

Inserted, B Dimension = Pipe I.D. + Wall Thickness + A + B¹

Retracted, B Dimension = 2 x (Pipe I.D. + Wall Thickness + A) + B¹

Rosemount 3051SFC Compact Orifice Flowmeter			
	Orifice Plate Front View	Orifice Plate Side View	Orifice Plate Top View
Compact Orifice Plate (Primary Element Type code P)			
Conditioning Orifice Plate (Primary Element Type code C)			

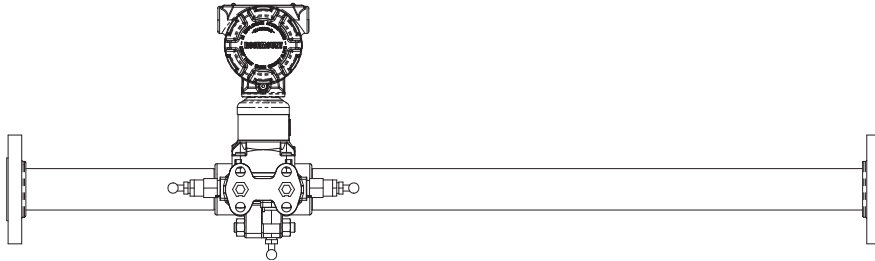
Table 58. Dimensional Drawings⁽¹⁾

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

(1) Measurement in inches (millimeters).

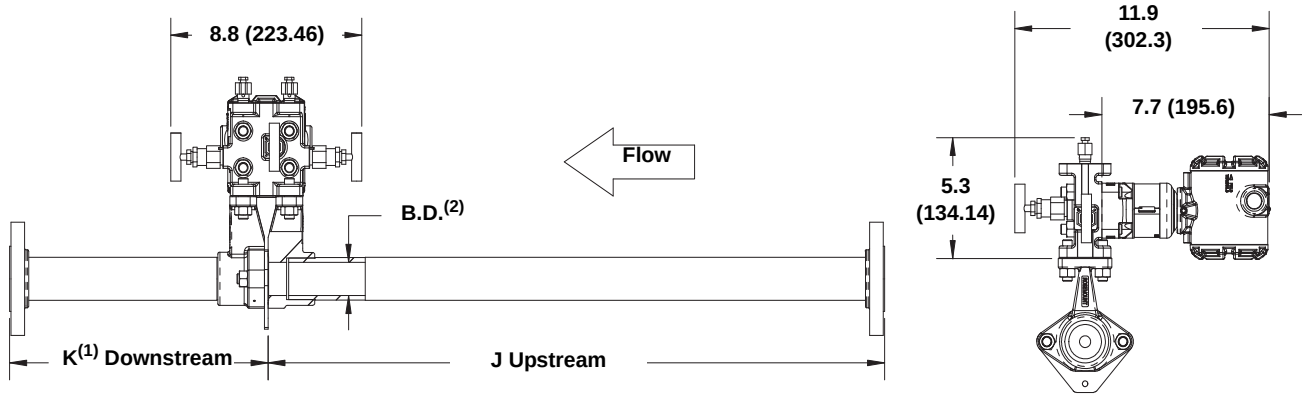
Rosemount 3051SFP Integral Orifice Flowmeter

Front View



Bottom View

Side View



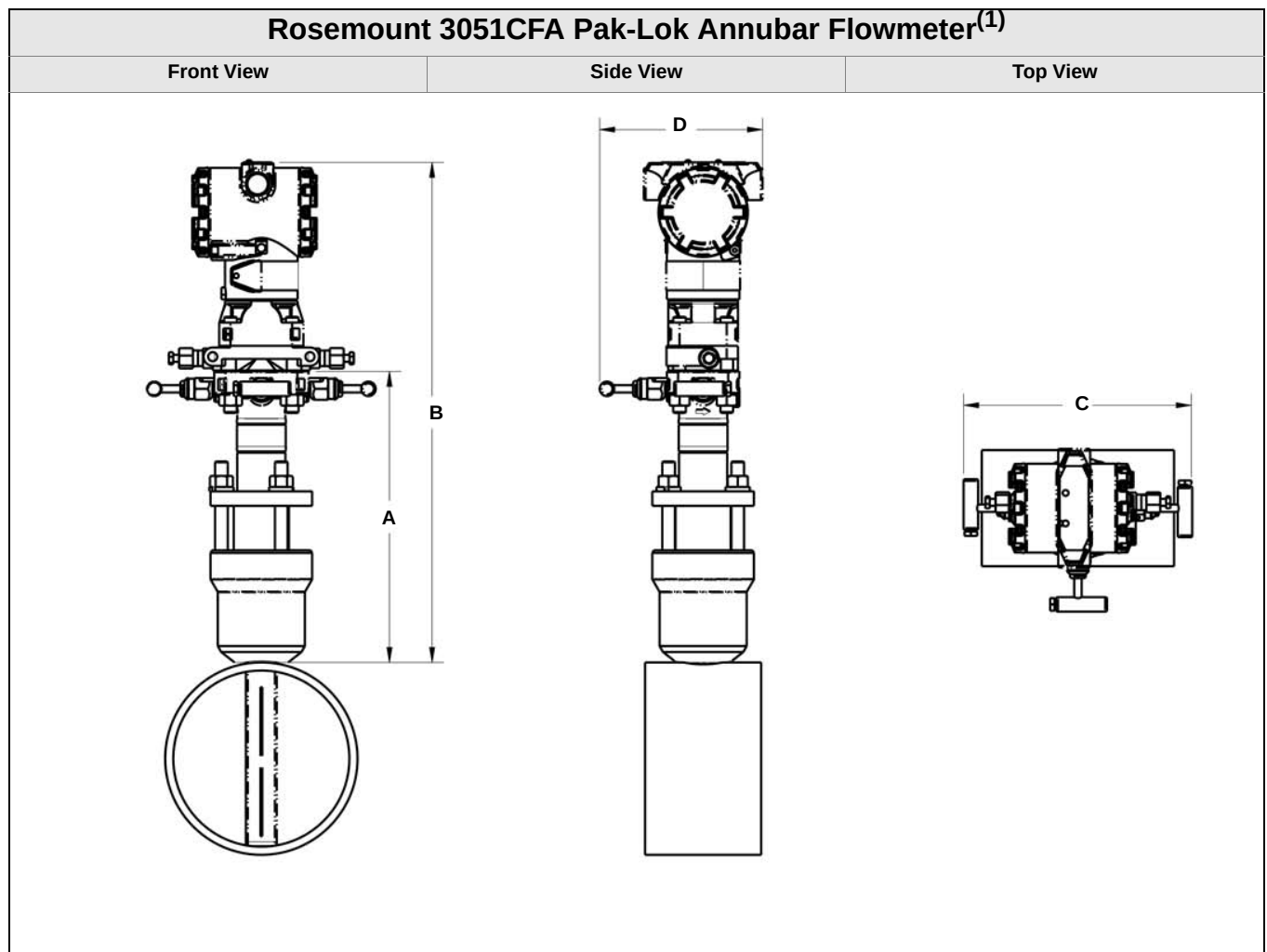
Dimensions are in inches (millimeters).

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

Dimensions are in inches (millimeters).

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

3051CF DIMENSIONAL DRAWINGS



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

Table 59. Pak-Lok Annubar Flowmeter Dimensional Data

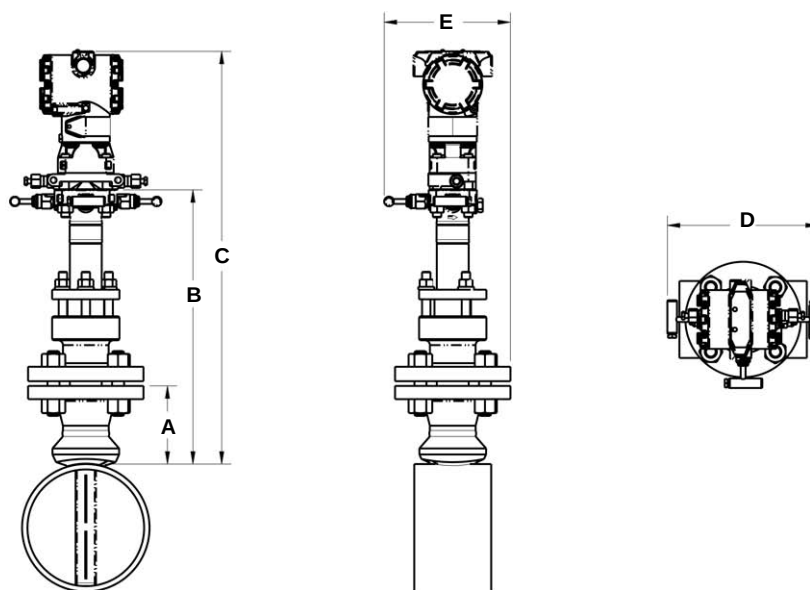
Sensor Size	A (Max)	B (Max)	C (Max)	D (Max)
1	8.50 (215.9)	14.60 (370.8)	9.00 (228.6)	6.00 (152.4)
2	11.0 (279.4)	16.35 (415.3)	9.00 (228.6)	6.00 (152.4)
3	12.00 (304.8)	19.10 (485.1)	9.00 (228.6)	6.00 (152.4)
<i>Dimensions are in inches (millimeters)</i>				

Rosemount 3051CFA Flange-Lok Annubar Flowmeter⁽¹⁾

Front View

Side View

Top View



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

Table 60. Flange-Lok Annubar Flowmeter Dimensional Data

Sensor Size	Flange Size and Rating	A ± 0.125 (3.2)	B ± 0.25 (6.4)	C (Max)	D (Max)	E (Max)
1	1½ – 150#	3.88 (98.6)	12.25 (311.2)	19.35 (491.5)	9.00 (228.6)	6.30 (160.0)
1	1½ – 300#	4.13 (104.9)	12.25 (311.2)	19.35 (491.5)	9.00 (228.6)	6.86 (174.2)
1	1½ – 600#	4.44 (112.8)	12.25 (311.2)	19.35 (491.5)	9.00 (228.6)	6.86 (174.2)
1	DN40/PN16	3.09 (78.5)	12.25 (311.2)	19.35 (491.5)	9.00 (228.6)	6.86 (174.2)
1	DN40/PN40	3.21 (81.5)	12.25 (311.2)	19.35 (491.5)	9.00 (228.6)	6.86 (174.2)
1	DN40/ PN100	3.88 (98.6)	12.25 (311.2)	19.35 (491.5)	9.00 (228.6)	6.86 (174.2)
2	2 – 150#	4.13 (104.9)	14.25 (362.0)	21.35 (542.3)	9.00 (228.6)	6.80 (172.7)
2	2 – 300#	4.38 (111.3)	14.25 (362.0)	21.35 (542.3)	9.00 (228.6)	7.05 (179.1)
2	2 – 600#	4.75 (120.7)	14.25 (362.0)	21.35 (542.3)	9.00 (228.6)	7.05 (179.1)
2	DN50/PN16	3.40 (86.4)	14.25 (362.0)	21.35 (542.3)	9.00 (228.6)	7.05 (179.1)
2	DN50/PN40	3.52 (89.4)	14.25 (362.0)	21.35 (542.3)	9.00 (228.6)	7.05 (179.1)
2	DN50/ PN100	4.30 (109.2)	14.25 (362.0)	21.35 (542.3)	9.00 (228.6)	7.05 (179.1)
3	3 – 150#	4.63 (117.6)	17.50 (444.5)	24.60 (624.8)	9.00 (228.6)	7.55 (191.8)
3	3 – 300#	5.00 (127.0)	17.50 (444.5)	24.60 (624.8)	9.00 (228.6)	7.93 (201.3)
3	3 – 600#	5.38 (136.7)	17.50 (444.5)	24.60 (624.8)	9.00 (228.6)	7.93 (201.3)
3	DN80/PN16	3.85 (97.8)	17.50 (444.5)	24.60 (624.8)	9.00 (228.6)	7.93 (201.3)
3	DN80/PN40	4.16 (105.7)	17.50 (444.5)	24.60 (624.8)	9.00 (228.6)	7.93 (201.3)
3	DN80/ PN100	4.95 (125.7)	17.50 (444.5)	24.60 (624.8)	9.00 (228.6)	7.93 (201.3)

Dimensions are in inches (millimeters)

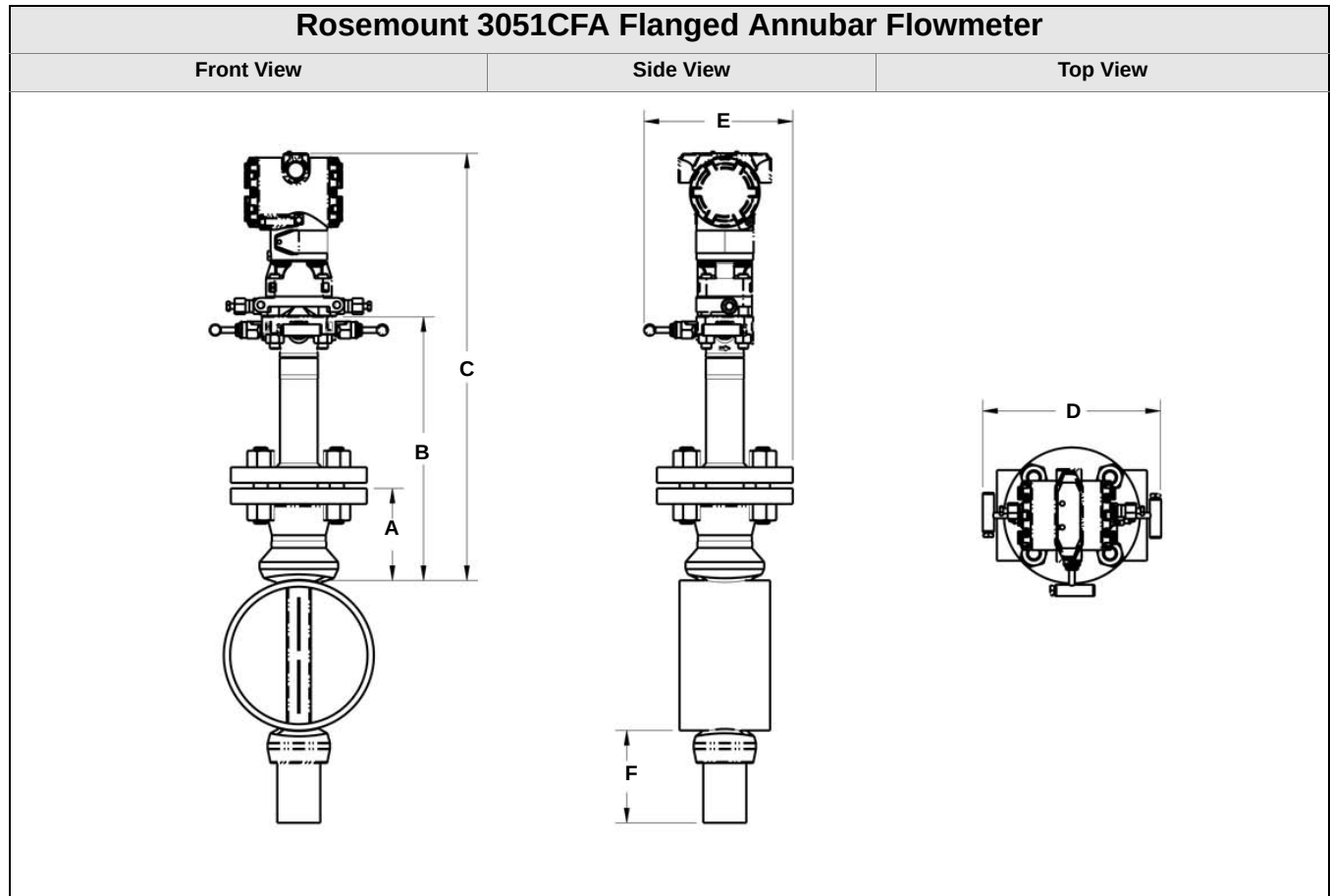


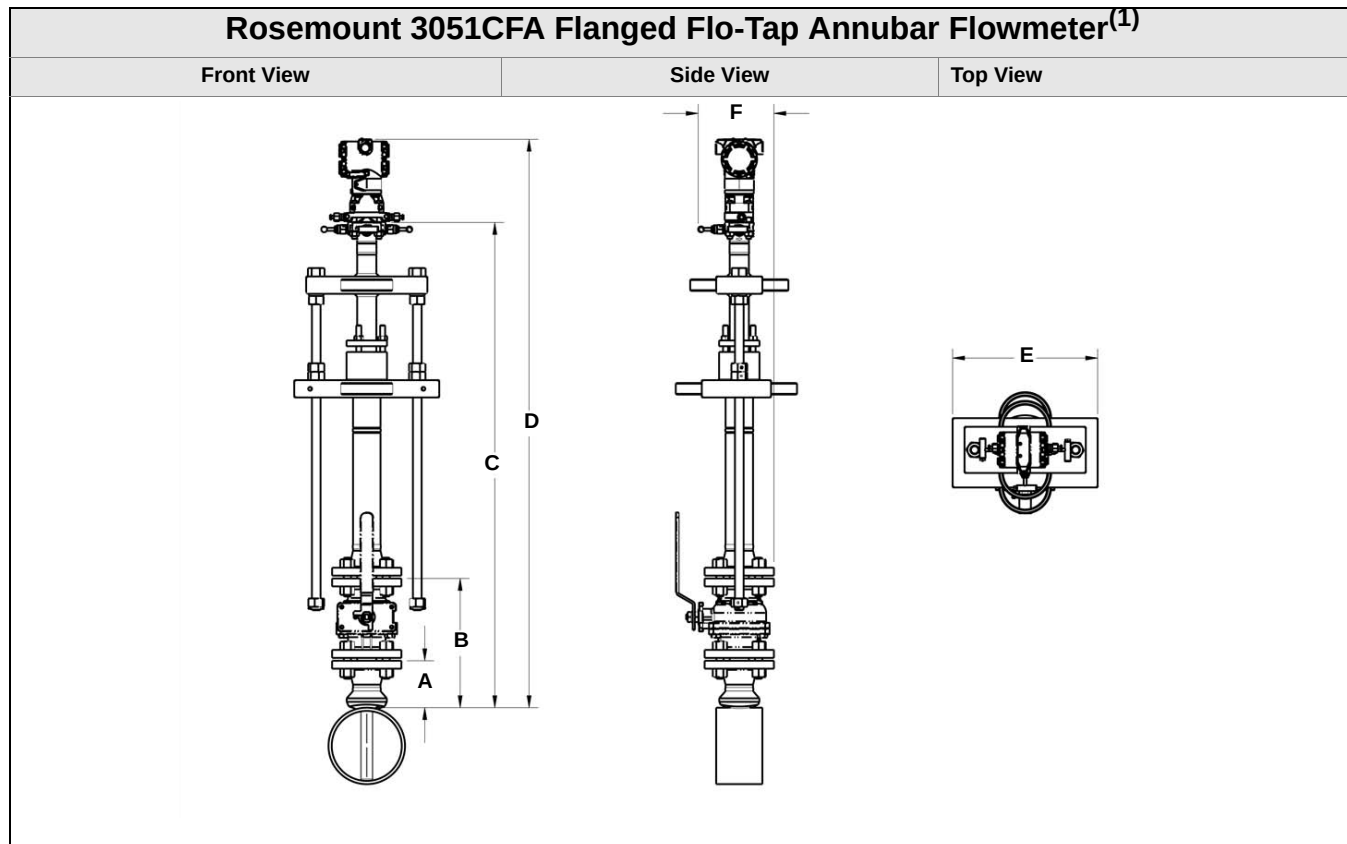
Table 61. Flanged Annubar Flowmeter Dimensional Data

Sensor Size	Flange Size and Rating	A ± 0.125 (3.2)	B ± 0.25 (6.4)	C ± 0.25 (6.4)	D (Max)	E (Max)	F (Max)
1	1½ – 150#	3.88 (98.6)	11.00 (279.4)	18.10 (459.7)	9.00 (228.6)	6.30 (160.0)	3.50 (88.9)
1	1½ – 300#	4.13 (104.9)	11.00 (279.4)	18.10 (459.7)	9.00 (228.6)	6.86 (174.2)	3.50 (88.9)
1	1½ – 600#	4.44 (112.8)	11.00 (279.4)	18.10 (459.7)	9.00(228.6)	6.86 (174.2)	3.50 (88.9)
1	DN40/PN16	3.09 (78.5)	11.00 (279.4)	18.10 (459.7)	9.00 (228.6)	6.86 (174.2)	3.50 (88.9)
1	DN40/PN40	3.21 (81.5)	11.00 (279.4)	18.10 (459.7)	9.00 (228.6)	6.86 (174.2)	3.50 (88.9)
1	DN40/ PN100	3.88 (98.6)	11.00 (279.4)	18.10 (459.7)	9.00(228.6)	6.86 (174.2)	3.50 (88.9)
1	1½ – 900#	4.94 (125.5)	9.31 (236.5)	—	—	—	3.50 (88.9)
1	1½ – 1500#	4.94 (125.5)	9.31 (236.5)	—	—	—	3.50 (88.9)
1	1½ – 2500#	6.76 (171.7)	11.63 (295.4)	—	—	—	4.00 (101.6)
2	2 – 150#	4.13 (104.9)	12.00 (304.8)	19.10 (458.1)	9.00 (228.6)	6.80 (172.7)	5.00 (127.0)
2	2 – 300#	4.38 (111.3)	12.00 (304.8)	19.10 (458.1)	9.00 (228.6)	7.05 (179.1)	5.00 (127.0)
2	2 – 600#	4.75 (120.7)	12.00 (304.8)	19.10 (458.1)	9.00 (228.6)	7.05 (179.1)	5.00 (127.0)
2	DN50/PN16	3.40 (86.4)	12.00 (304.8)	19.10 (458.1)	9.00 (228.6)	7.05 (179.1)	5.00 (127.0)
2	DN50/PN40	3.52 (89.4)	12.00 (304.8)	19.10 (458.1)	9.00 (228.6)	7.05 (179.1)	5.00 (127.0)
2	DN50/ PN100	4.30 (109.3)	12.00 (304.8)	19.10 (458.1)	9.00 (228.6)	7.05 (179.1)	5.00 (127.0)
2	2 – 900#	5.88 (149.4)	10.50 (266.7)	—	—	—	5.00 (127.0)
2	2 – 1500#	5.88 (149.4)	10.50 (266.7)	—	—	—	5.00 (127.0)
2	3 – 2500#	9.88 (251.0)	15.63 (397.0)	—	—	—	4.50 (114.3)

Rosemount DP Flow

Table 61. Flanged Annubar Flowmeter Dimensional Data

Sensor Size	Flange Size and Rating	A ± 0.125 (3.2)	B ± 0.25 (6.4)	C ± 0.25 (6.4)	D (Max)	E (Max)	F (Max)
3	3 – 150#	4.63 (117.6)	13.50 (342.9)	20.60 (523.2)	9.00 (228.6)	7.55 (191.8)	4.00 (101.6)
3	3 – 300#	5.00 (127.0)	13.50 (342.9)	20.60 (523.2)	9.00 (228.6)	7.93 (201.3)	4.00 (101.6)
3	3 – 600#	5.38 (136.7)	13.50 (342.9)	20.60 (523.2)	9.00 (228.6)	7.93 (201.3)	4.00 (101.6)
3	DN80/PN16	3.85 (97.8)	13.50 (342.9)	20.60 (523.2)	9.00 (228.6)	7.93 (201.3)	4.00 (101.6)
3	DN80/PN40	4.16 (105.7)	13.50 (342.9)	20.60 (523.2)	9.00 (228.6)	7.93 (201.3)	4.00 (101.6)
3	DN80/ PN100	4.95 (125.7)	13.50 (342.9)	20.60 (523.2)	9.00 (228.6)	7.93 (201.3)	4.00 (101.6)
3	4 – 900#	8.19 (208.0)	13.06 (331.8)	—	—	—	7.00 (177.8)
3	4 – 1500#	8.56 (217.4)	13.81 (350.8)	—	—	—	7.00 (177.8)
3	4 – 2500#	11.19 (284.2)	17.31 (439.7)	—	—	—	7.00 (177.8)
<i>Dimensions are in inches (millimeters)</i>							



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

Table 62. Flanged Flo-Tap Annubar Flowmeter Dimensional Data

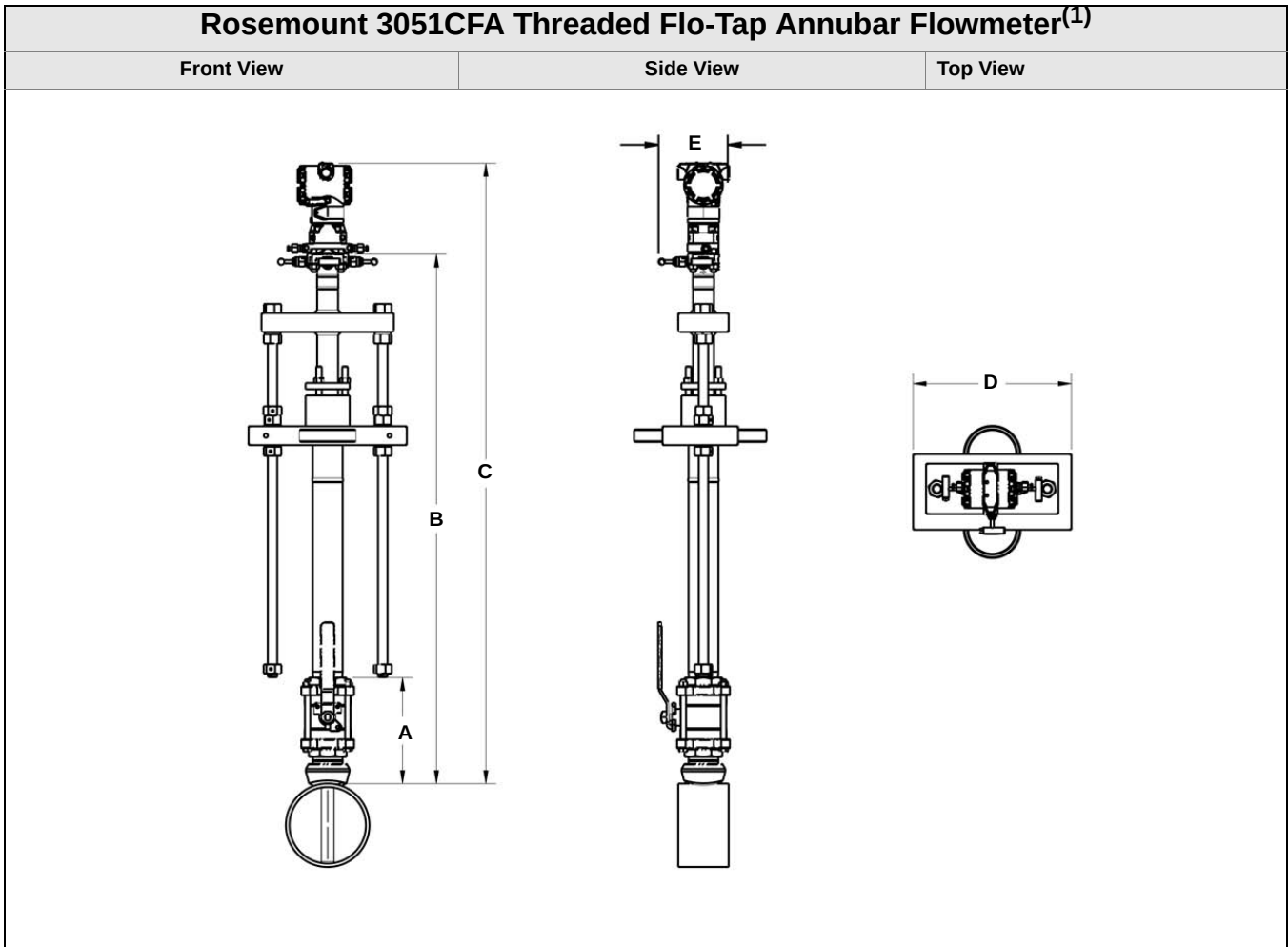
Sensor Size	Flange Size and Rating	A ± 0.125 (3.2)	B ± 0.25 (6.4)	C ¹ (Max) (Gear Drive)	C ¹ (Max) (Manual)	D (Max)	E (Max)	F (Max)
1	1½ – 150#	3.88 (98.6)	10.50 (266.7)	—	17.77 (451.4)	C + 7.10 (180.3)	10.50 (266.7)	6.30 (160.0)
1	1½ – 300#	4.13 (104.9)	11.75 (298.5)	—	17.77 (451.4)	C + 7.10 (180.3)	10.50 (266.7)	6.86 (174.2)
1	1½ – 600#	4.44 (112.8)	14.06 (357.2)	—	17.77 (451.4)	C + 7.10 (180.3)	10.50 (266.7)	6.86 (174.2)
1	DN40/PN16 ⁽¹⁾	3.09 (78.5)	See Note 1.	—	17.77 (451.4)	C + 7.10 (180.3)	10.50 (266.7)	6.86 (174.2)
1	DN40/PN40	3.21 (81.5)	See Note 1.	—	17.77 (451.4)	C + 7.10 (180.3)	10.50 (266.7)	6.86 (174.2)
1	DN40/PN100	3.88 (98.6)	See Note 1.	—	17.77 (451.4)	C + 7.10 (180.3)	10.50 (266.7)	6.86 (174.2)
2	2 – 150#	4.13 (104.9)	11.25 (285.8)	24.44 (620.8)	21.20 (538.5)	C + 7.10 (180.3)	12.56 (319.0)	6.80 (172.7)
2	2 – 300#	4.38 (111.3)	13.00 (330.2)	24.44 (620.8)	21.20 (538.5)	C + 7.10 (180.3)	12.56 (319.0)	7.05 (179.1)
2	2 – 600#	4.75 (120.7)	16.38 (416.0)	24.44 (620.8)	21.20 (538.5)	C + 7.10 (180.3)	12.56 (319.0)	7.05 (179.1)
2	DN50/PN16	3.40 (86.4)	See Note 1.	24.44 (620.8)	21.20 (538.5)	C + 7.10 (180.3)	12.56 (319.0)	7.05 (179.1)
2	DN50/PN40	3.52 (89.4)	See Note 1.	24.44 (620.8)	21.20 (538.5)	C + 7.10 (180.3)	12.56 (319.0)	7.05 (179.1)
2	DN50/PN100	4.30 (109.2)	See Note 1.	24.44 (620.8)	21.20 (538.5)	C + 7.10 (180.3)	12.56 (319.0)	7.05 (179.1)
3	3 – 150#	4.63 (117.6)	12.75 (323.9)	26.37 (669.8)	23.14 (587.8)	C + 7.10 (180.3)	14.13 (358.9)	7.55 (191.8)
3	3 – 300#	5.00 (127.0)	16.25 (412.8)	26.37 (669.8)	23.14 (587.8)	C + 7.10 (180.3)	14.13 (358.9)	7.93 (201.3)
3	3 – 600#	5.38 (136.7)	19.50 (495.3)	26.37 (669.8)	23.14 (587.8)	C + 7.10 (180.3)	14.13 (358.9)	7.93 (201.3)
3	DN80/PN16	3.85 (97.8)	See Note 1.	26.37 (669.8)	23.14 (587.8)	C + 7.10 (180.3)	14.13 (358.9)	7.93 (201.3)
3	DN80/PN40	4.16 (105.7)	See Note 1.	26.37 (669.8)	23.14 (587.8)	C + 7.10 (180.3)	14.13 (358.9)	7.93 (201.3)
3	DN80/PN100	4.95 (125.7)	See Note 1.	26.37 (669.8)	23.14 (587.8)	C + 7.10 (180.3)	14.13 (358.9)	7.93 (201.3)
Dimensions are in inches (millimeters)								

(1) DIN Valves are not offered.

Note: Customer Supplied.

Inserted, C Dimension = Pipe I.D. + Wall Thickness + B + C¹

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



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

Table 63. Threaded Flo-Tap Annubar Flowmeter Dimensional Data

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

Inserted, B Dimension = Pipe I.D. + Wall Thickness + A + B¹

Retracted, B Dimension = 2 x (Pipe I.D. + Wall Thickness + A) + B¹

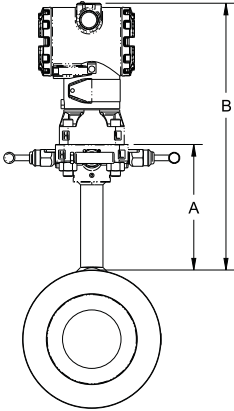
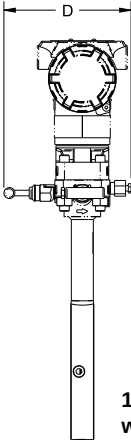
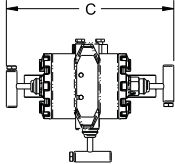
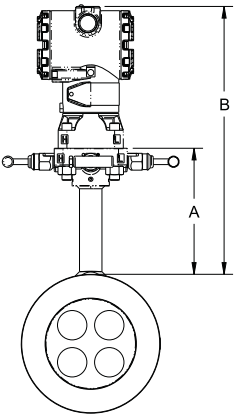
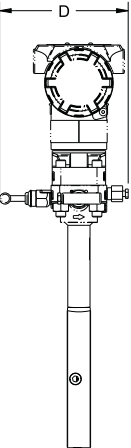
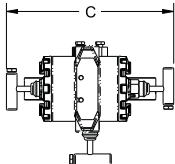
Rosemount 3051CFC Compact Orifice Flowmeter			
	Orifice Plate Side View	Orifice Plate Front View	Orifice Plate Top View
Compact Orifice Plate (Primary Element Type code P)		 1.13-in. (28.7 mm) wafer thickness	
Conditioning Orifice Plate (Primary Element Type code C)			

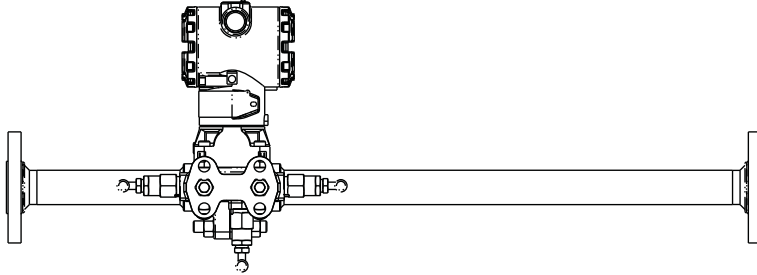
Table 64. Dimensional Drawings⁽¹⁾

Primary ⁽¹⁾ Element Type	A	B	Transmitter Height	C	D
Type P and C	5.62 (143)	Transmitter Height + A	6.27 (159)	7.75 (197) - closed 8.25 (210) - open	6.00 (152) - closed 6.25 (159) - open

(1) Measurement in inches (millimeters).

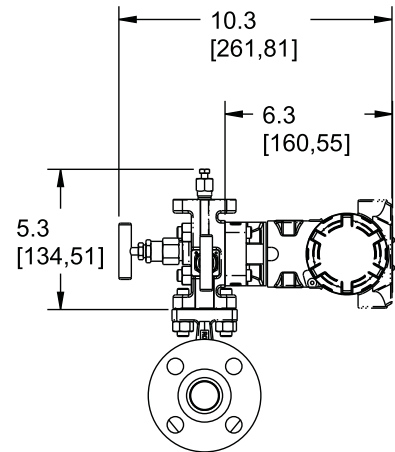
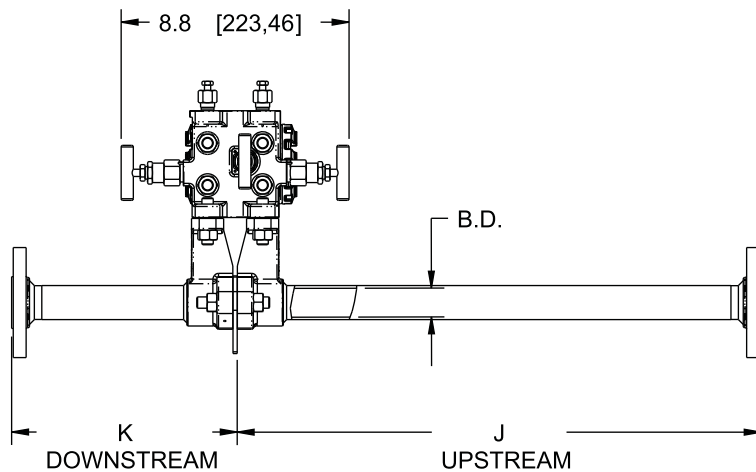
Rosemount 3051CFP Integral Orifice Flowmeter

Side View



Bottom View

Front View



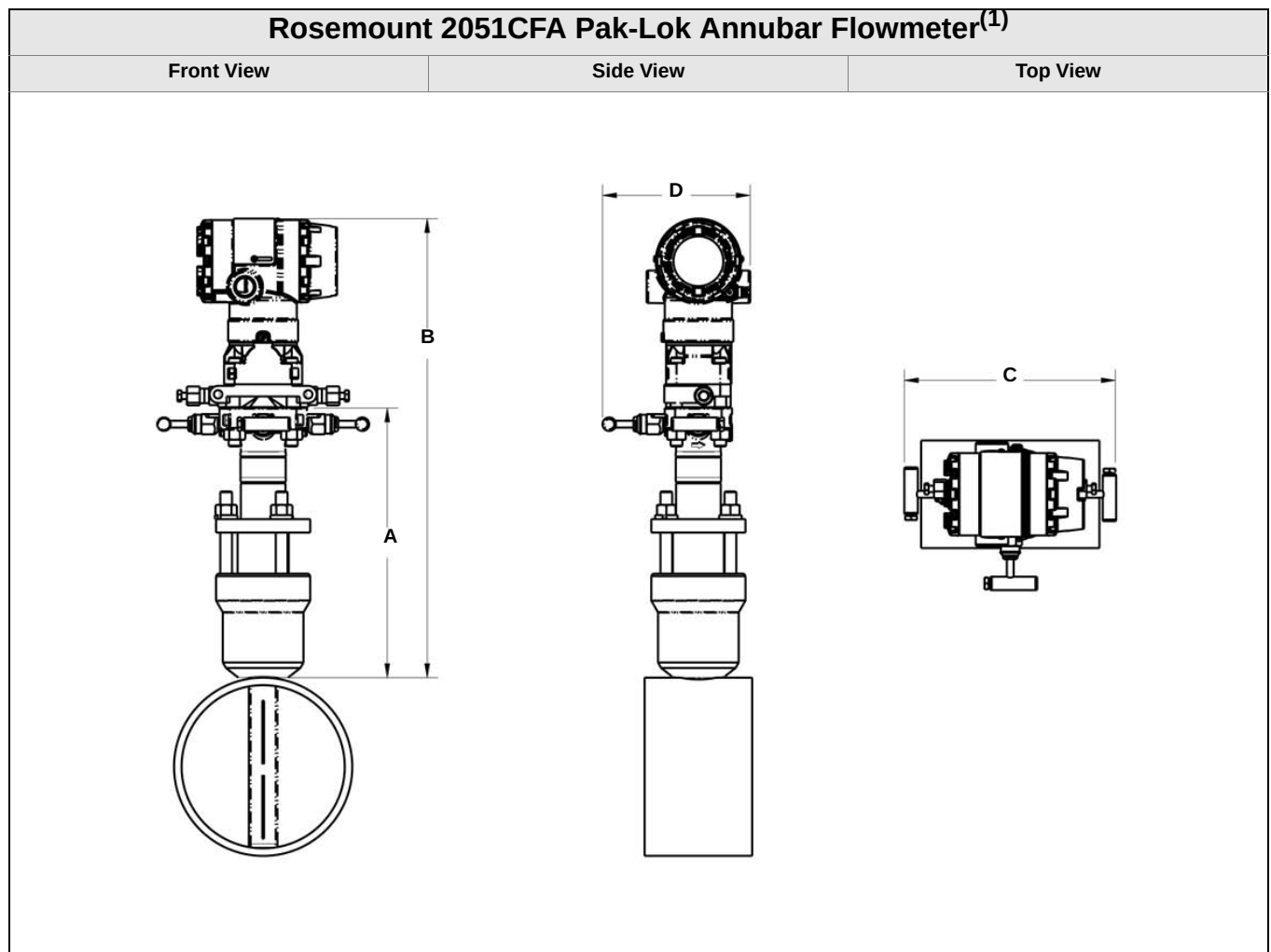
Dimensions are in inches (millimeters).

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

Dimensions are in inches (millimeters).

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

2051CF DIMENSIONAL DRAWINGS



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

Table 65. 2051CFA Pak-Lok Annubar Flowmeter Dimensional Data

Sensor Size	A (Max)	B (Max)	C (Max)	D (Max)
1	8.50 (215.9)	14.55 (369.6)	9.00 (228.6)	6.00 (152.4)
2	11.00 (279.4)	16.30 (414.0)	9.00 (228.6)	6.00 (152.4)
3	12.00 (304.8)	19.05 (483.9)	9.00 (228.6)	6.00 (152.4)
Dimensions are in inches (millimeters)				

Rosemount 2051CFA Flanged with Opposite Side Support Annubar Flowmeter

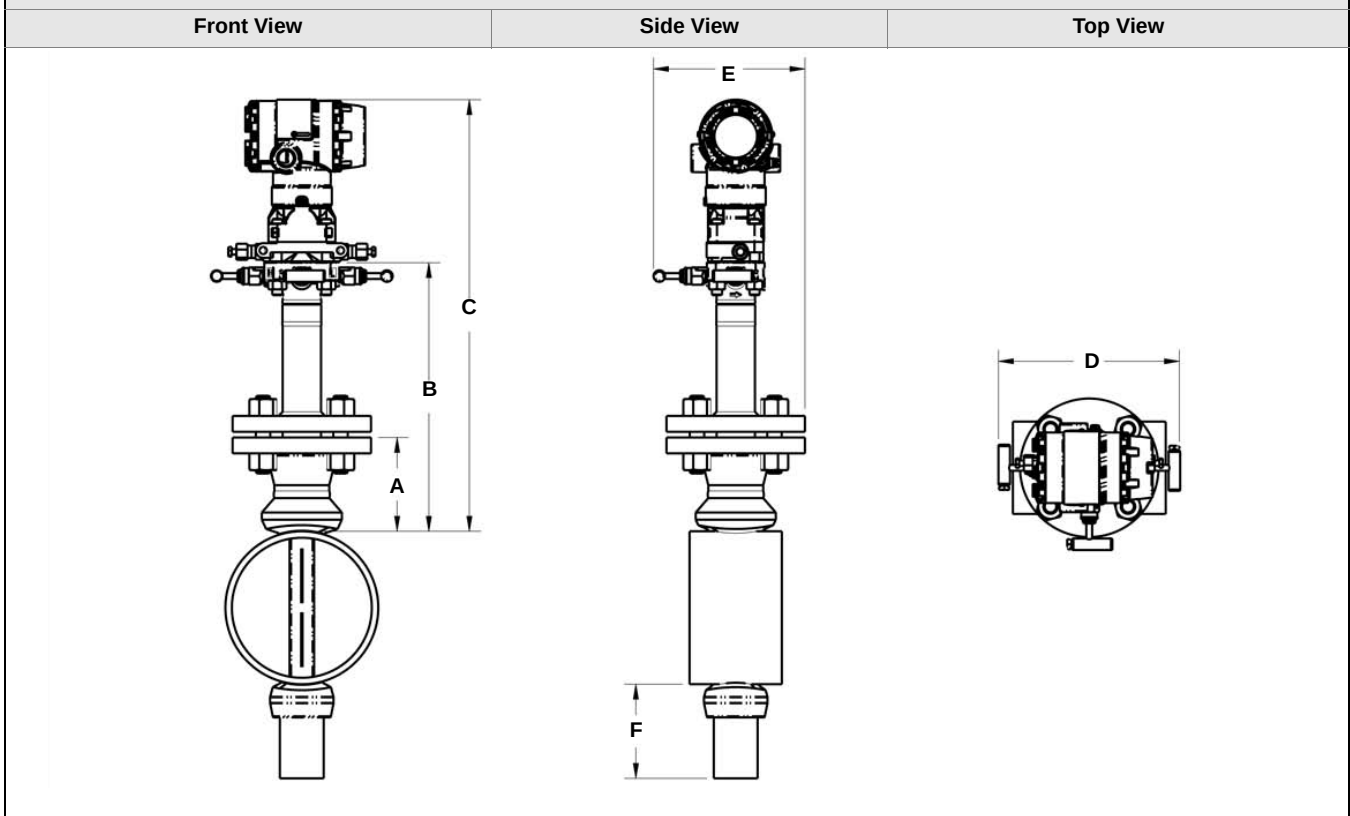


Table 66. Flanged Annubar Flowmeter Dimensional Data

Sensor Size	Flange Size and Rating	A ± 0.125 (3.2)	B ± 0.25 (6.4)	C ± 0.25 (6.4)	D (Max)	E (Max)	F (Max)
1	1½ – 150#	3.88 (98.6)	11.00 (279.4)	18.03 (458.0)	9.00 (228.6)	6.30 (160.0)	3.50 (88.9)
1	1½ – 300#	4.13 (104.9)	11.00 (279.4)	18.03 (458.0)	9.00 (228.6)	6.86 (174.2)	3.50 (88.9)
1	1½ – 600#	4.44 (112.8)	11.00 (279.4)	18.03 (458.0)	9.00 (228.6)	6.86 (174.2)	3.50 (88.9)
1	DN40/PN16	3.09 (78.5)	11.00 (279.4)	18.03 (458.0)	9.00 (228.6)	6.30 (160.0)	3.50 (88.9)
1	DN40/PN40	3.21 (81.5)	11.00 (279.4)	18.03 (458.0)	9.00 (228.6)	6.86 (174.2)	3.50 (88.9)
1	DN40/ PN100	3.88 (98.6)	11.00 (279.4)	18.03 (458.0)	9.00 (228.6)	6.86 (174.2)	3.50 (88.9)
1	1½ – 900#	4.94 (125.5)	9.31 (236.5)	-	-	-	3.50 (88.9)
1	1½ – 1500#	4.94 (125.5)	9.31 (236.5)	-	-	-	3.50 (88.9)
1	1½ – 2500#	6.76 (171.7)	11.63 (295.4)	-	-	-	4.00 (101.6)
2	2 – 150#	4.13 (104.9)	12.00 (304.8)	19.03 (483.4)	9.00 (228.6)	6.30 (160.0)	5.00 (127.0)
2	2 – 300#	4.38 (111.3)	12.00 (304.8)	19.03 (483.4)	9.00 (228.6)	6.86 (174.2)	5.00 (127.0)
2	2 – 600#	4.75 (120.7)	12.00 (304.8)	19.03 (483.4)	9.00 (228.6)	6.86 (174.2)	5.00 (127.0)
2	DN50/PN16	3.40 (86.4)	12.00 (304.8)	19.03 (483.4)	9.00 (228.6)	6.30 (160.0)	5.00 (127.0)
2	DN50/PN40	3.52 (89.4)	12.00 (304.8)	19.03 (483.4)	9.00 (228.6)	6.86 (174.2)	5.00 (127.0)
2	DN50/ PN100	4.30 (109.2)	12.00 (304.8)	19.03 (483.4)	9.00 (228.6)	6.86 (174.2)	5.00 (127.0)
2	2 – 900#	5.88 (149.4)	10.50 (266.7)	-	-	-	5.00 (127.0)
2	2 – 1500#	5.88 (149.4)	10.50 (266.7)	-	-	-	5.00 (127.0)
2	2 – 2500#	9.88 (251.0)	15.63 (397.0)	-	-	-	4.50 (114.3)

Table 66. Flanged Annubar Flowmeter Dimensional Data

Sensor Size	Flange Size and Rating	A ± 0.125 (3.2)	B ± 0.25 (6.4)	C ± 0.25 (6.4)	D (Max)	E (Max)	F (Max)
3	3 – 150#	4.63 (117.6)	13.50 (342.9)	20.53 (521.5)	9.00 (228.6)	6.30 (160.0)	4.00 (101.6)
3	3 – 300#	5.00 (127.0)	13.50 (342.9)	20.53 (521.5)	9.00 (228.6)	6.86 (174.2)	4.00 (101.6)
3	3 – 600#	5.38 (136.7)	13.50 (342.9)	20.53 (521.5)	9.00 (228.6)	6.86 (174.2)	4.00 (101.6)
3	DN80/PN16	3.85 (97.8)	13.50 (342.9)	20.53 (521.5)	9.00 (228.6)	6.30 (160.0)	4.00 (101.6)
3	DN80/PN40	4.16 (105.7)	13.50 (342.9)	20.53 (521.5)	9.00 (228.6)	6.86 (174.2)	4.00 (101.6)
3	DN80/ PN100	4.95 (125.7)	13.50 (342.9)	20.53 (521.5)	9.00 (228.6)	6.86 (174.2)	4.00 (101.6)
3	3 – 900#	8.19 (208.0)	13.06 (331.7)	-	-	-	7.00 (177.8)
3	3 – 1500#	8.56 (217.4)	13.81 (350.8)	-	-	-	7.00 (177.8)
3	3 – 2500#	11.19 (284.2)	17.31 (439.7)	-	-	-	7.00 (177.8)

Dimensions are in inches (millimeters)

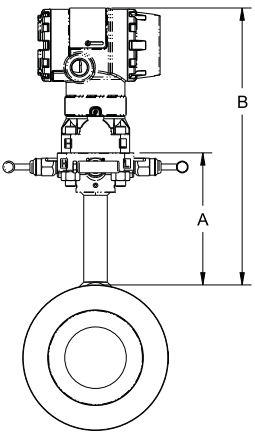
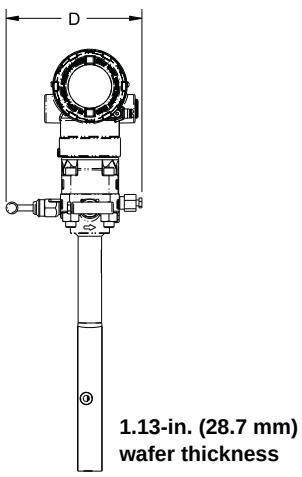
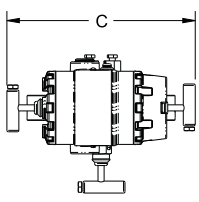
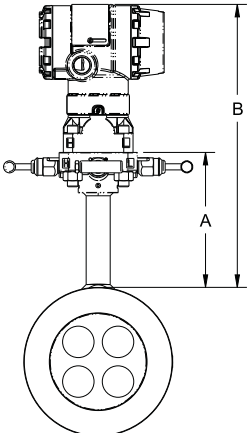
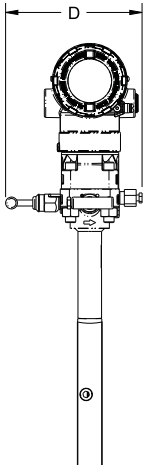
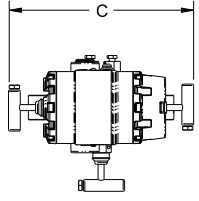
Rosemount 2051CFC Compact Orifice Flowmeter			
	Orifice Plate Side View	Orifice Plate Front View	Orifice Plate Top View
Compact Orifice Plate (Primary Element Type code P)		 1.13-in. (28.7 mm) wafer thickness	
Conditioning Orifice Plate (Primary Element Type code C)			

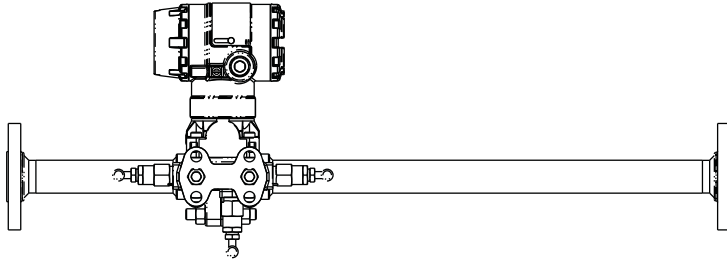
Table 67. 2051CFC Dimensional Drawings⁽¹⁾

Primary ⁽¹⁾ Element Type	A	B	Transmitter Height	C	D
Type P and C	5.62 (143)	Transmitter Height + A	6.2 (157)	7.75 (197) - closed 8.25 (210) - open	6.00 (152) - closed 6.25 (159) - open

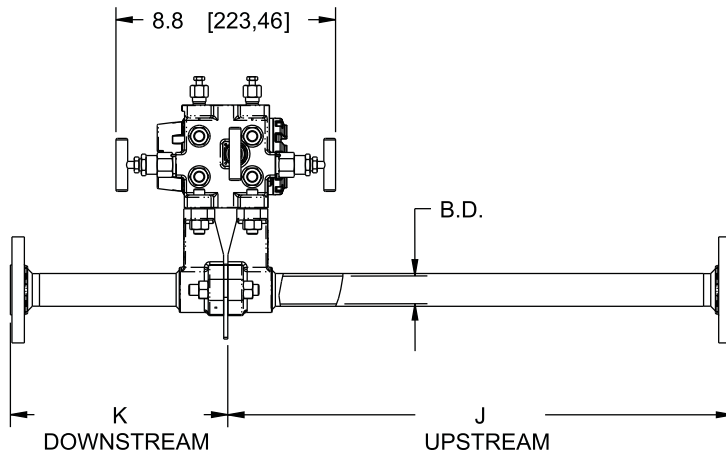
⁽¹⁾ Measurement in inches (millimeters).

Rosemount 2051CFP Integral Orifice Flowmeter

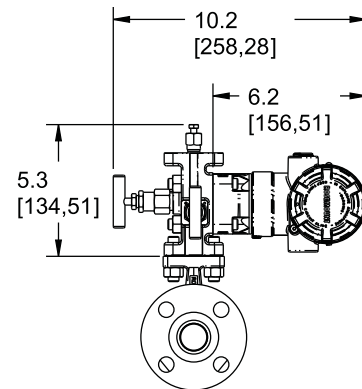
Side View



Bottom View



Front View



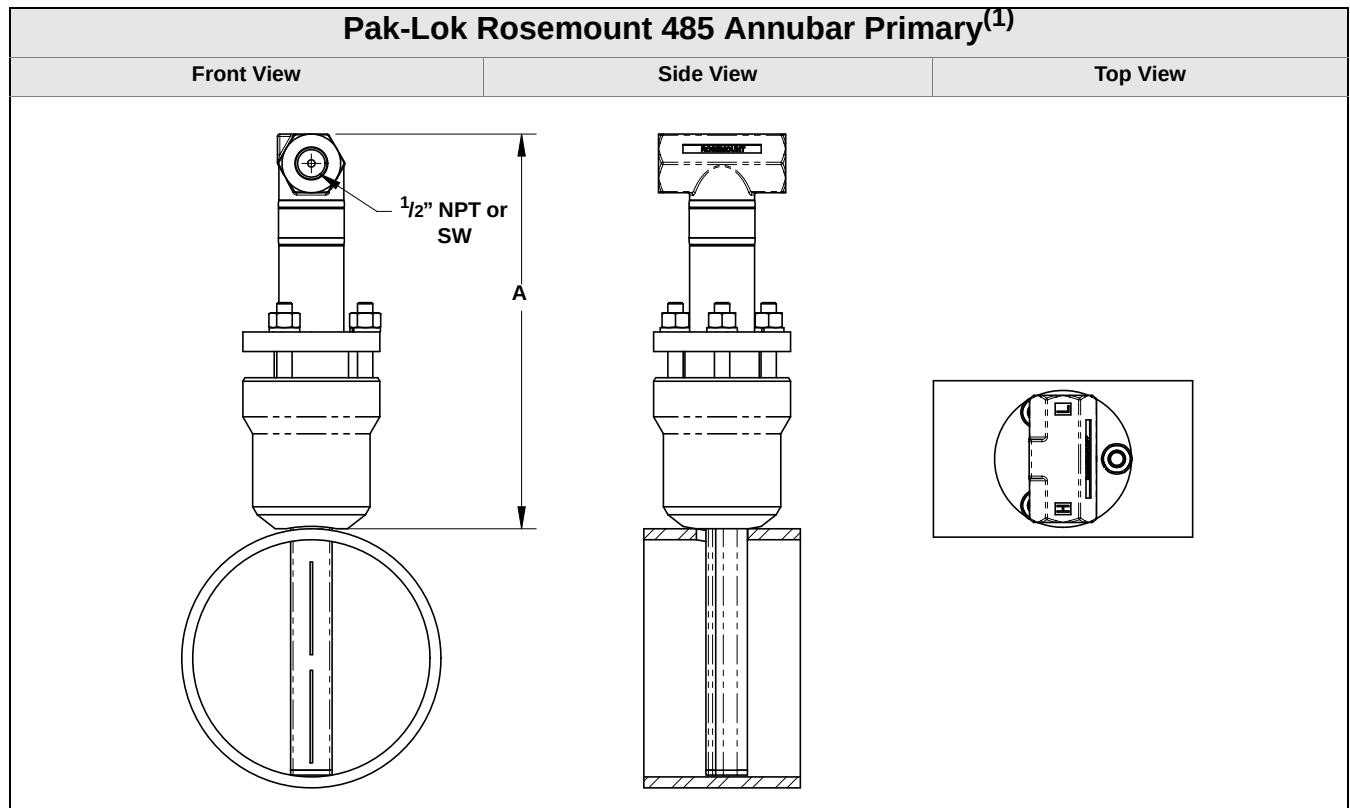
Dimensions are in inches (millimeters).

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

Dimensions are in inches (millimeters).

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

485 DIMENSIONAL DRAWINGS

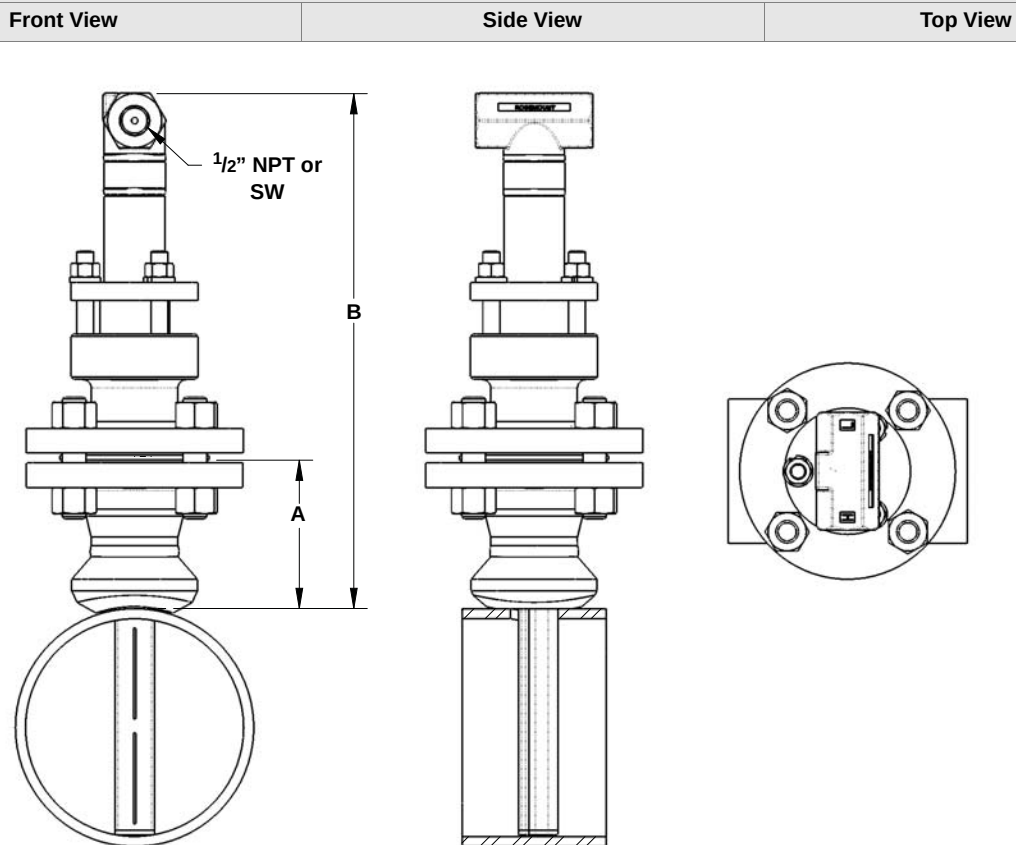


(1) The Pak-Lok Annubar model is available up to 600# ANSI (1440 psig at 100 °F (99 bar at 38 °C)).

Table 68. Pak-Lok Rosemount 485 Annubar Primary Dimensional Data

Sensor Size	A (Max)
1	8.50 (215.9)
2	11.00 (279.4)
3	12.00 (304.8)
Dimensions are in inches (millimeters)	

Flange-Lok Rosemount 485 Annubar Primary⁽¹⁾



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

Table 69. Flange-Lok 485 Annubar Primary Dimensional Data

Sensor Size	Flange Size and Rating	A ± 0.125 (3.2)	B ± 0.25 (6.4)
1	1½ – 150#	3.88 (98.6)	12.25 (311.2)
1	1½ – 300#	4.13 (104.9)	12.25 (311.2)
1	1½ – 600#	4.44 (112.8)	12.25 (311.2)
1	DN40/PN16	3.09 (78.5)	12.25 (311.2)
1	DN40/PN40	3.21 (81.5)	12.25 (311.2)
1	DN40/PN100	3.88 (98.6)	12.25 (311.2)
2	2 – 150#	4.13 (104.9)	14.25 (362.0)
2	2 – 300#	4.38 (111.3)	14.25 (362.0)
2	2 – 600#	4.75 (120.7)	14.25 (362.0)
2	DN50/PN16	3.40 (86.4)	14.25 (362.0)
2	DN50/PN40	3.52 (89.4)	14.25 (362.0)
2	DN50/ PN100	4.30 (109.2)	14.25 (362.0)
3	3 – 150#	4.63 (117.6)	17.50 (444.5)
3	3 – 300#	5.00 (127.0)	17.50 (444.5)
3	3 – 600#	5.38 (136.7)	17.50 (444.5)
3	DN80/PN16	3.85 (97.8)	17.50 (444.5)
3	DN80/PN40	4.16 (105.7)	17.50 (444.5)
3	DN80/ PN100	4.95 (125.7)	17.50 (444.5)

Dimensions are in inches (millimeters)

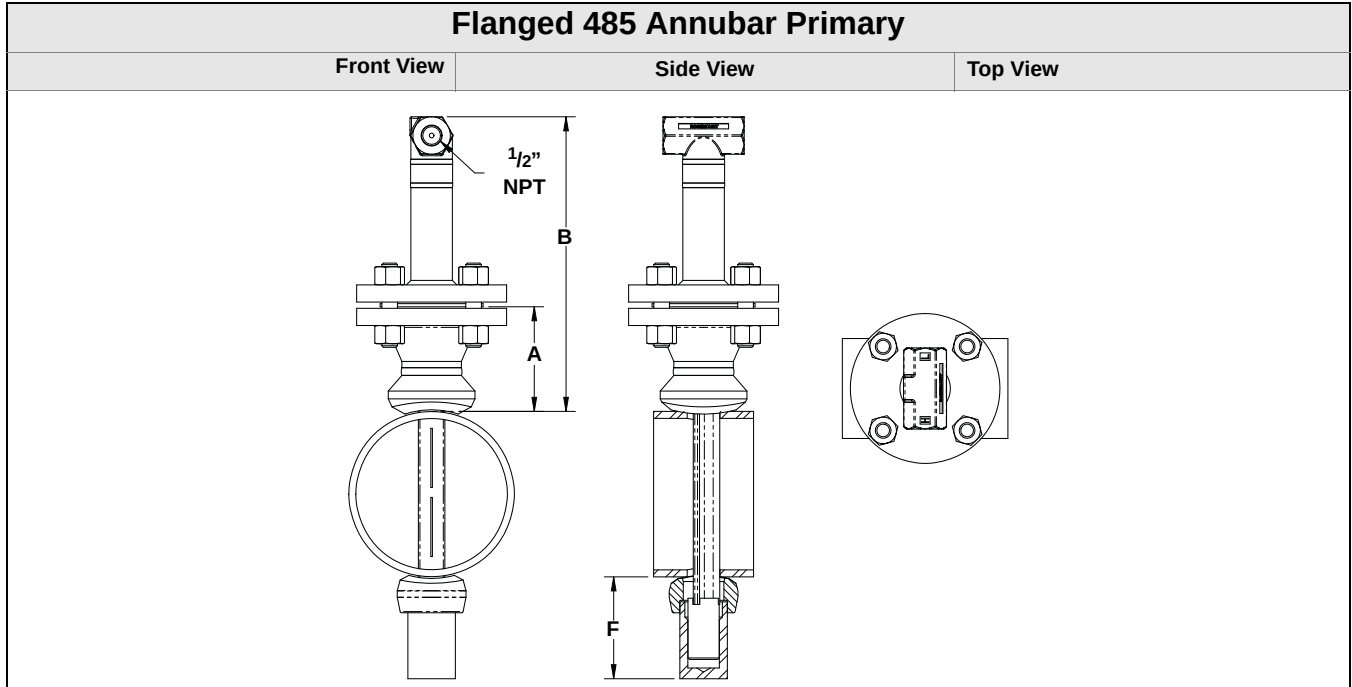


Table 70. Flanged Annubar Flowmeter Dimensional Data

Sensor Size	Flange Size and Rating	A ± 0.125 (3.2)	B ± 0.25 (6.4)	F (Max)
1	1 ¹ / ₂ – 150#	3.88 (98.6)	11.00 (279.4)	3.50 (88.9)
1	1 ¹ / ₂ – 300#	4.13 (104.9)	11.00 (279.4)	3.50 (88.9)
1	1 ¹ / ₂ – 600#	4.44 (112.8)	11.00 (279.4)	3.50 (88.9)
1	DN40/PN16	3.09 (78.5)	11.00 (279.4)	3.50 (88.9)
1	DN40/PN40	3.21 (81.5)	11.00 (279.4)	3.50 (88.9)
1	DN40/ PN100	3.88 (98.6)	11.00 (279.4)	3.50 (88.9)
1	1 ¹ / ₂ – 900#	4.94 (125.5)	9.31 (236.5)	3.50 (88.9)
1	1 ¹ / ₂ – 1500#	4.94 (125.5)	9.31 (236.5)	3.50 (88.9)
1	1 ¹ / ₂ – 2500#	6.76 (171.7)	11.63 (295.4)	4.00 (101.6)
2	2 – 150#	4.13 (104.9)	12.00 (304.8)	5.00 (127.0)
2	2 – 300#	4.38 (111.3)	12.00 (304.8)	5.00 (127.0)
2	2 – 600#	4.75 (120.7)	12.00 (304.8)	5.00 (127.0)
2	DN50/PN16	3.40 (86.4)	12.00 (304.8)	5.00 (127.0)
2	DN50/PN40	3.52 (89.4)	12.00 (304.8)	5.00 (127.0)
2	DN50/ PN100	4.30 (109.2)	12.00 (304.8)	5.00 (127.0)
2	2 – 900#	5.88 (149.4)	10.50 (266.7)	5.00 (127.0)
2	2 – 1500#	5.88 (149.4)	10.50 (266.7)	5.00 (127.0)
2	3 – 2500#	9.88 (251.0)	15.63 (397.0)	4.50 (114.3)
3	3 – 150#	4.63 (117.6)	13.50 (342.9)	4.00 (101.6)
3	3 – 300#	5.00 (127.0)	13.50 (342.9)	4.00 (101.6)
3	3 – 600#	5.38 (136.7)	13.50 (342.9)	4.00 (101.6)
3	DN80/PN16	3.85 (97.8)	13.50 (342.9)	4.00 (101.6)
3	DN80/PN40	4.16 (105.7)	13.50 (342.9)	4.00 (101.6)
3	DN80/ PN100	4.95 (125.7)	13.50 (342.9)	4.00 (101.6)
3	4 – 900#	8.19 (208.0)	13.06 (331.7)	7.00 (177.8)
3	4 – 1500#	8.56 (217.4)	13.81 (350.8)	7.00 (177.8)
3	4 – 2500#	11.19 (284.2)	17.31 (439.7)	7.00 (177.8)

Dimensions are in inches (millimeters)

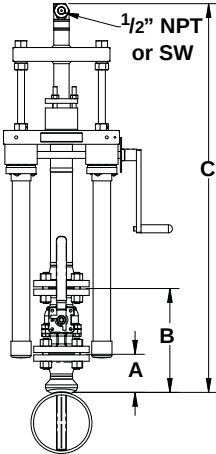
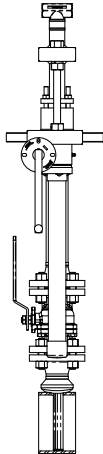
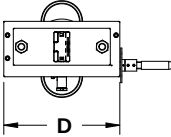
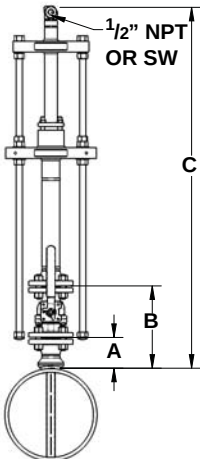
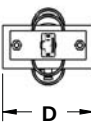
Flanged Flo-Tap 485 Annubar Primary			
	Front View	Side View	Top View
Gear Drive			
	Front View	Side View	Top View
Manual			

Table 71. Flanged Flo-Tap 485 Annubar Primary Dimensional Data

Sensor Size	Flange Size and Rating	A ± 0.125 (3.2)	B ± 0.25 (6.4)	C ¹ (Max) (Gear Drive)	C ¹ (Max) (Manual)	D (Max)
1	1½ – 150#	3.88 (98.6)	10.50 (266.7)	—	17.77 (451.4)	10.50 (266.7)
1	1½ – 300#	4.13 (104.9)	11.75 (298.5)	—	17.77 (451.4)	10.50 (266.7)
1	1½ – 600#	4.44 (112.8)	14.06 (357.2)	—	17.77 (451.4)	10.50 (266.7)
1	DN40/PN16	3.09 (78.5)	See Note ⁽¹⁾	—	17.77 (451.4)	10.50 (266.7)
1	DN40/PN40	3.21 (81.5)	See Note ⁽¹⁾	—	17.77 (451.4)	10.50 (266.7)
1	DN40/PN100	3.88 (98.6)	See Note ⁽¹⁾	—	17.77 (451.4)	10.50 (266.7)
2	2 – 150#	4.13 (104.9)	11.25 (285.8)	24.44 (620.8)	21.20 (538.5)	12.56 (319.0)
2	2 – 300#	4.38 (111.3)	13.00 (330.2)	24.44 (620.8)	21.20 (538.5)	12.56 (319.0)
2	2 – 600#	4.75 (120.7)	16.38 (416.0)	24.44 (620.8)	21.20 (538.5)	12.56 (319.0)
2	DN50/PN16	3.40 (86.4)	See Note ⁽¹⁾	24.44 (620.8)	21.20 (538.5)	12.56 (319.0)
2	DN50/PN40	3.52 (89.4)	See Note ⁽¹⁾	24.44 (620.8)	21.20 (538.5)	12.56 (319.0)
2	DN50/PN100	4.30 (109.2)	See Note ⁽¹⁾	24.44 (620.8)	21.20 (538.5)	12.56 (319.0)

Table 71. Flanged Flo-Tap 485 Annubar Primary Dimensional Data

Sensor Size	Flange Size and Rating	A ± 0.125 (3.2)	B ± 0.25 (6.4)	C ¹ (Max) (Gear Drive)	C ¹ (Max) (Manual)	D (Max)
3	3 – 150#	4.63 (117.6)	12.75 (323.9)	26.37 (669.8)	23.14 (587.8)	14.13 (358.9)
3	3 – 300#	5.00 (127.0)	16.25 (412.8)	26.37 (669.8)	23.14 (587.8)	14.13 (358.9)
3	3 – 600#	5.38 (136.7)	19.50 (495.4)	26.37 (669.8)	23.14 (587.8)	14.13 (358.9)
3	DN80/PN16	3.85 (97.8)	See Note ⁽¹⁾	26.37 (669.8)	23.14 (587.8)	14.13 (358.9)
3	DN80/PN40	4.16 (105.7)	See Note ⁽¹⁾	26.37 (669.8)	23.14 (587.8)	14.13 (358.9)
3	DN80/PN100	4.95 (125.7)	See Note ⁽¹⁾	26.37 (669.8)	23.14 (587.8)	14.13 (358.9)
Use the appropriate formula to determine C value: <i>Inserted formula:</i> Pipe I.D. + Wall Thickness + Value B + C ¹ (use the Manual Drive or Gear drive values for C ¹) <i>Retracted formula:</i> [2 x (Pipe I.D. + Wall Thickness + Value B)] + C ¹ (use the Manual Drive or Gear drive values for C ¹)						
<i>Dimensions are in inches (millimeters)</i>						

(1) DIN Valves are not offered.

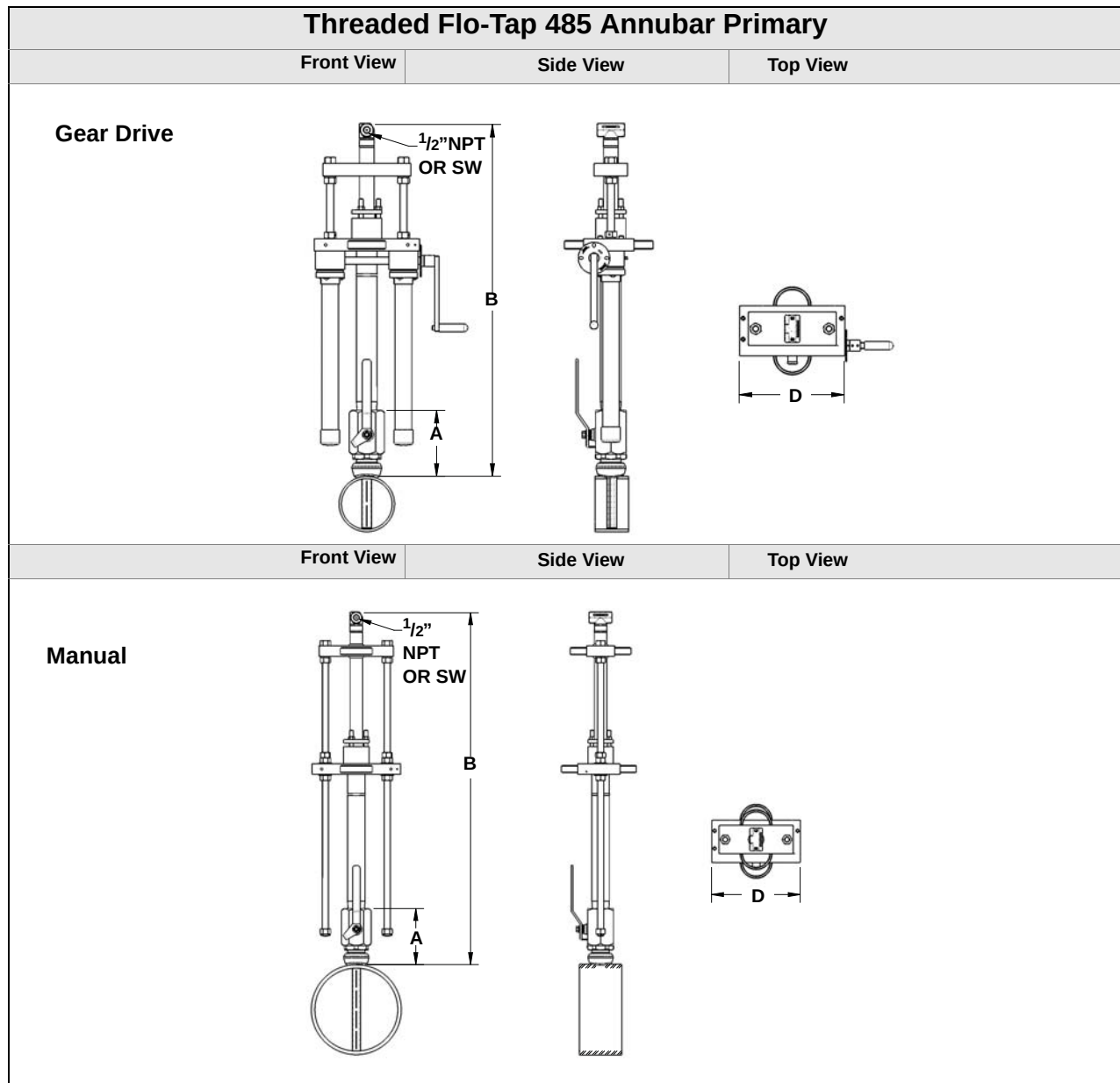


Table 72. Threaded Flo-Tap 485 Annubar Primary Dimensional Data

Sensor Size	A ± 0.50 (12.7)	B ¹ (Max) (Gear Drive)	B ¹ (Max) (Manual)	D (Max)
1	7.51 (190.9)	—	16.96 (430.8)	10.50 (266.7)
2	8.17 (207.5)	23.62 (599.9)	20.39 (517.9)	12.56 (319.0)

Sensor Size 3 is not available in a Threaded Flo-Tap.

Inserted, B Dimension = Pipe I.D. + Wall Thickness + A + B¹
 Retracted, B Dimension = 2 x (Pipe I.D. + Wall Thickness + A) + B¹

585 DIMENSIONAL DRAWINGS

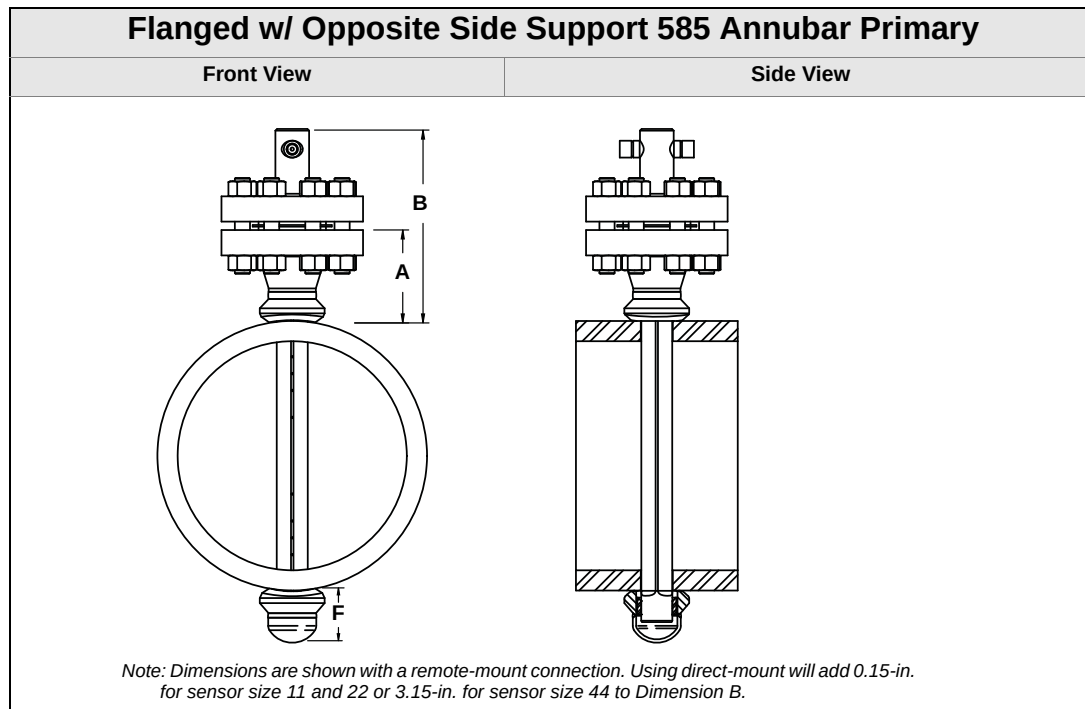


Table 73. Flanged w/ Opposite Side Support Dimensional Data

Sensor Size	Flange Size and Rating	A ± 0.125 (3.2)	B ± 0.25 (6.4)	F (Max)
11	1½-in. – 150#	3.88 (98.6)	9.70 (246.4)	3.10 (78.7)
11	1½-in. – 300#	4.13 (104.9)	10.07 (255.8)	3.10 (78.7)
11	1½-in. – 600#	4.44 (112.8)	10.70 (271.8)	3.10 (78.7)
11	DIN40/PN16	3.21 (81.5)	9.05 (229.9)	3.10 (78.7)
11	DIN40/PN40	3.21 (81.5)	9.05 (229.9)	3.10 (78.7)
11	DIN40/ PN100	3.88 (98.6)	10.03 (254.8)	3.10 (78.7)
11	1½-in. – 900#	4.94 (125.5)	11.57 (293.9)	3.60 (91.4)
11	1½-in. – 1500#	4.94 (125.5)	11.57 (293.9)	3.60 (91.4)
11	1½-in. – 2500#	6.75 (171.5)	13.88 (352.6)	3.60 (91.4)
22	2-in. – 150#	4.13 (104.9)	10.01 (254.3)	4.50 (114.3)
22	2-in. – 300#	4.38 (111.3)	10.38 (263.7)	4.50 (114.3)
22	2-in. – 600#	4.75 (120.7)	11.13 (282.7)	4.50 (114.3)
22	DIN50/PN16	3.40 (86.4)	9.24 (234.7)	4.50 (114.3)
22	DIN50/PN40	3.52 (89.4)	9.44 (239.8)	4.50 (114.3)
22	DIN50/ PN100	4.30 (109.2)	10.53 (267.5)	4.50 (114.3)
22	2-in. – 900#	5.88 (149.4)	12.76 (324.1)	4.50 (114.3)
22	2-in. – 1500#	5.88 (149.4)	12.76 (324.1)	4.50 (114.3)
22	3-in. – 2500#	9.88 (250.1)	17.88 (454.2)	4.50 (114.3)
44	3-in. – 150#	4.63 (117.6)	10.69 (271.5)	3.90 (99.1)
44	3-in. – 300#	5.00 (127.0)	11.26 (286.6)	3.90 (99.1)
44	3-in. – 600#	5.38 (136.7)	12.00 (304.8)	3.90 (99.1)
44	DIN80/PN16	3.85 (97.8)	9.77 (248.2)	3.90 (99.1)
44	DIN80/PN40	4.16 (105.7)	10.23 (259.8)	3.90 (99.1)
44	DIN80/ PN100	4.95 (125.7)	11.34 (288.8)	3.90 (99.1)
44	4-in. – 900#	8.19 (208.8)	15.32 (389.1)	6.40 (162.6)
44	4-in. – 1500#	8.56 (217.4)	16.07 (408.2)	6.40 (162.6)
44	4-in. – 2500#	11.19 (284.2)	19.57 (497.1)	6.40 (162.6)

Dimensions are in inches (millimeters)

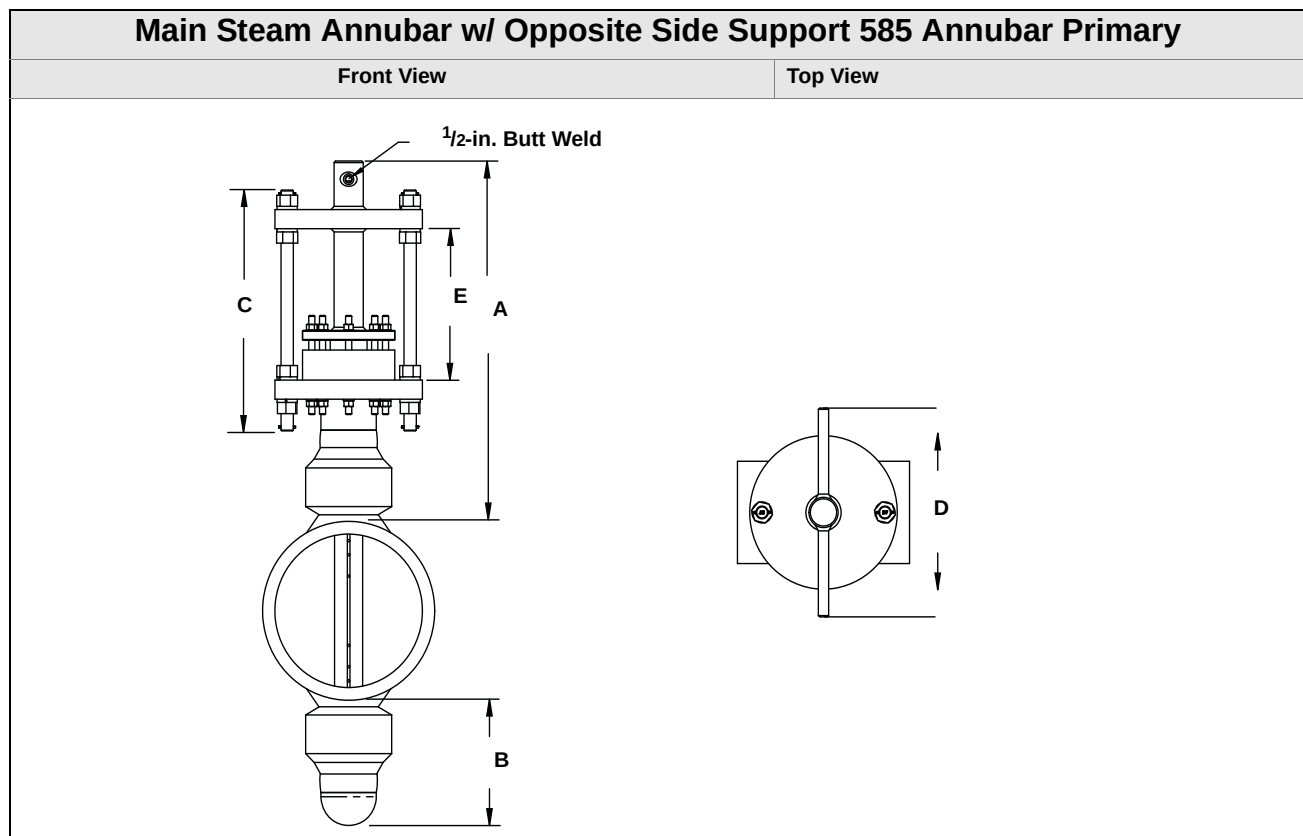


Table 74. Main Steam Annubar w/ Opposite Side Support Dimensional Data

Sensor Size	A (Max)	B	C	D	E
44	29.67 (753.6)	10.0 (254)	19.0 (483)	16.33 (414.0)	11.0 (279)
<i>Dimensions are in inches (millimeters)</i>					

NOTE

Locking rods are always located 90° from the instrument connections. For horizontal installations, the instrument connections will be parallel to the pipe. For vertical installations, the instrument connections will be perpendicular to the pipe.

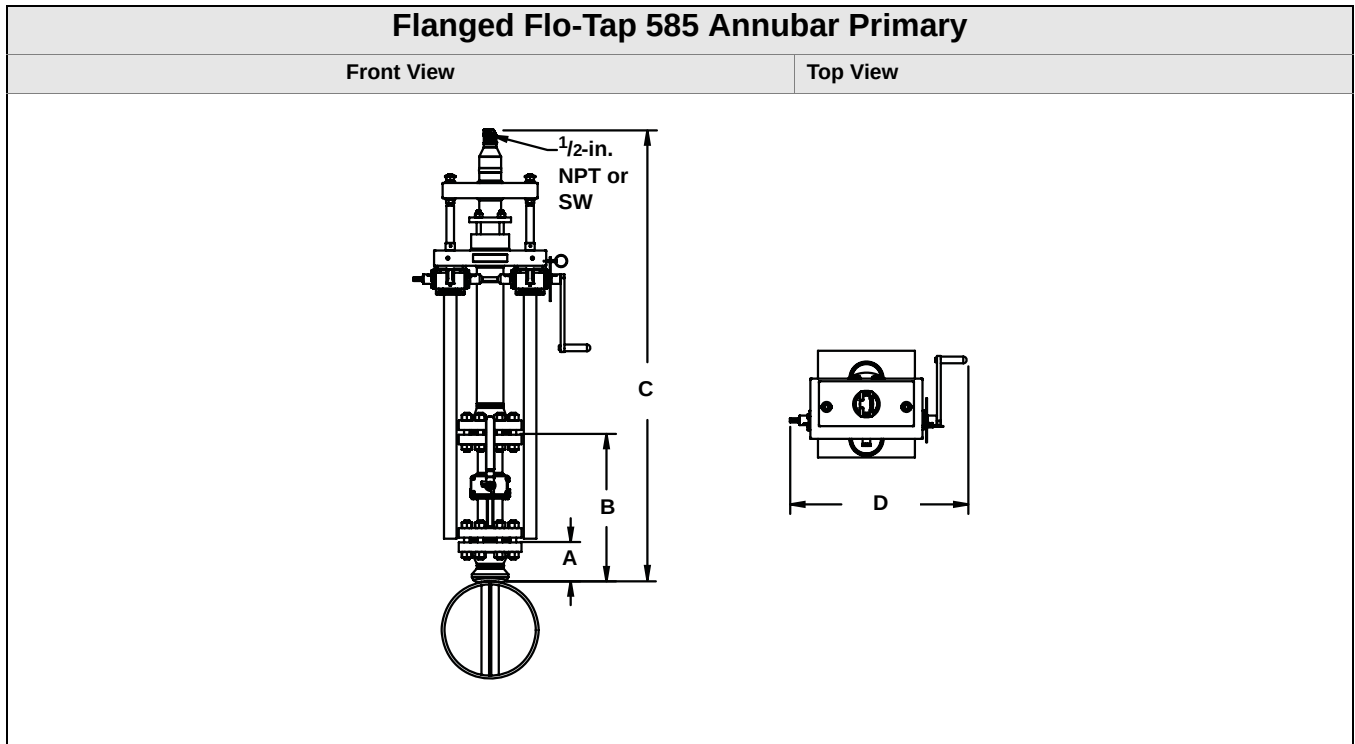
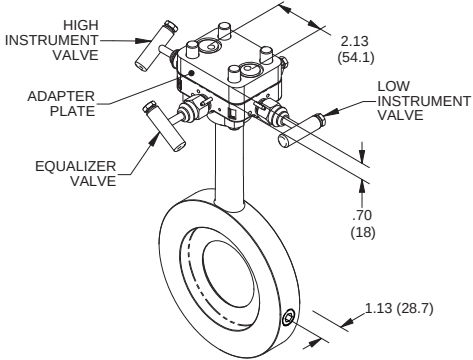
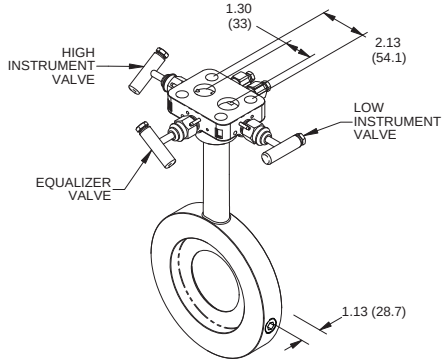
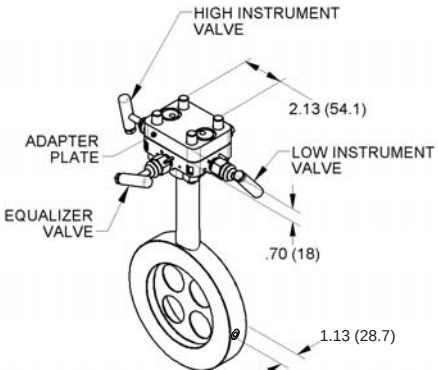
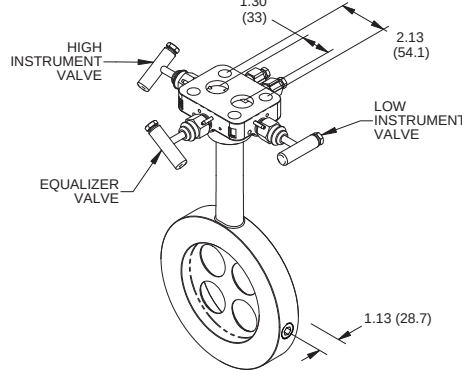


Table 75. Flanged Flo-Tap 585 Annubar Primary Dimensional Data

Sensor Size	Flange Size and Rating	A ± 0.125 (3.2)	B ± 0.25 (6.4)	C ¹ (Max) (Gear Drive)	D (Max)
44	3 – 150#	4.63 (117,6)	12.75 (323,9)	25.58 (649.7)	23.3 (591,8)
44	3 – 300#	5.00 (127,0)	16.25 (412,8)	25.58 (649.7)	23.3 (591,8)
44	3 – 600#	5.38 (136,7)	19.50 (495,4)	25.58 (649.7)	23.3 (591,8)
Use the appropriate formula to determine C value: <i>Inserted formula:</i> Pipe I.D. + Wall Thickness + Value B + C ¹ (use the Gear drive values for C ¹) <i>Retracted formula:</i> [2 x (Pipe I.D. + Wall Thickness + Value B)] + C ¹ (use the Gear drive values for C ¹) <i>Dimensions are in inches (millimeters)</i>					

405 DIMENSIONAL DRAWINGS

Rosemount 405 Compact Orifice Plate (Direct Mount)		
	Front View (transmitter connection A3)	Front View (transmitter connection D3)
Compact Orifice Plate (Primary Element Type code P)		
Conditioning Orifice Plate (Primary Element Type code C)		

NOTE
Transmitter connection code A3 is to be used with a traditional style transmitter. This is a stainless steel adapter plate for allowing the direct mount of traditional style transmitters.

Rosemount 405 Compact Orifice Plate (Remote Mount Transmitter)		
	Adapter Plate (R3)	Flange Adapter (R3 with option E)
Compact Orifice Plate (Primary Element Type code P)		
Conditioning Orifice Plate (Primary Element Type code C)		

1595 DIMENSIONAL DRAWINGS

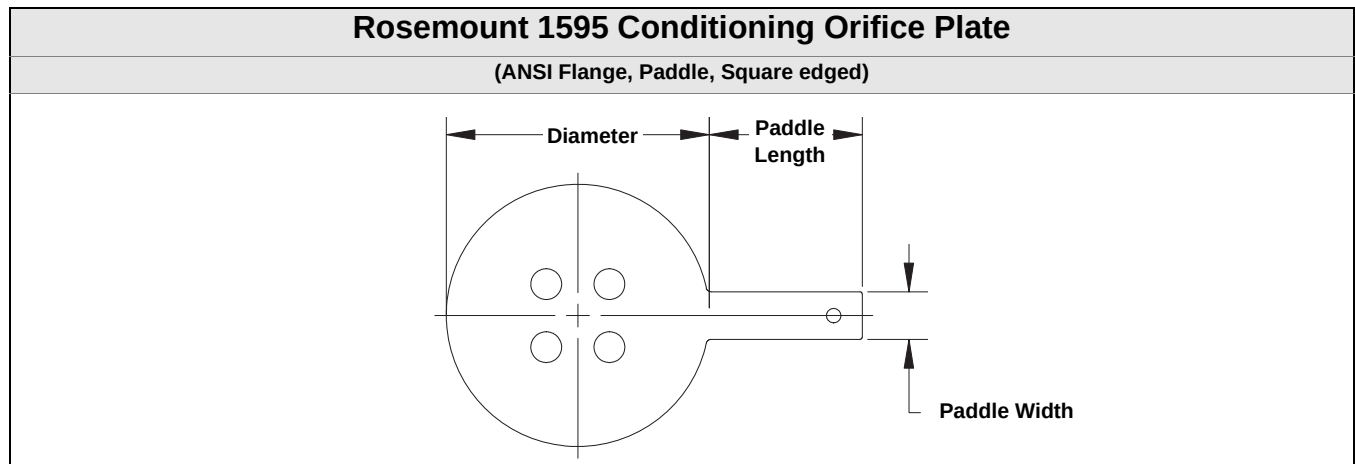


Table 76. Paddle Type Orifice Plate Dimensions in inches (millimeters)

Line Size	Diameter for Paddle Type						Paddle Length	Paddle Width
	150#	300#	600#	900#	1500#	2500#		
2-in. (50 mm)	4.125 (104.78)	4.375 (111.13)	4.375 (111.13)	5.625 (142.875)	5.625 (142.875)	5.750 (146.050)	4.0 (101.6)	1.0 (25.4)
3-in. (76 mm)	5.375 (136.53)	5.875 (149.23)	5.875 (149.23)	6.625 (168.275)	6.875 (174.625)	7.750 (196.85)	4.0 (101.6)	1.0 (25.4)
4-in. (100 mm)	6.875 (174.63)	7.125 (180.98)	7.625 (193.68)	8.125 (206.35)	8.250 (209.550)	9.250 (234.95)	4.0 (101.6)	1.0 (25.4)
6-in. (150 mm)	8.750 (222.25)	9.875 (250.83)	10.500 (266.7)	11.375 (288.925)	11.125 (282.575)	12.500 (317.50)	4.0 (101.6)	1.0 (25.4)
8-in. (200 mm)	11.000 (279.4)	12.125 (307.98)	12.625 (320.675)	14.125 (358.775)	13.875 (352.425)	15.250 (387.350)	6.0 (152.4)	1.5 (38.1)
10-in. (250 mm)	13.375 (339.73)	14.250 (361.95)	15.750 (400.05)	17.125 (434.975)	17.125 (434.975)	18.750 (476.25)	6.0 (152.4)	1.5 (38.1)
12-in. (300 mm)	16.125 (409.58)	16.625 (422.26)	18.000 (457.2)	19.625 (498.475)	20.500 (520.7)	21.625 (549.275)	6.0 (152.4)	1.5 (38.1)
14-in. (350 mm)	17.750 (450.85)	19.125 (485.78)	19.375 (492.125)				6.0 (152.4)	1.5 (38.1)
16-in. (400 mm)	20.250 (514.35)	21.250 (539.75)	22.250 (565.15)				6.0 (152.4)	1.5 (38.1)
18-in. (450 mm)	21.500 (546.1)	23.375 (593.725)	24.000 (609.6)				6.0 (152.4)	1.5 (38.1)
20-in. (500 mm)	23.750 (603.25)	25.625 (650.875)	26.750 (679.45)				6.0 (152.4)	1.5 (38.1)
24-in. (600 mm)	28.125 (714.375)	30.375 (771.525)	31.000 (787.4)				6.0 (152.4)	1.5 (38.1)

NOTE: Consult factory for availability of line sizes and flange ratings not shown in the above table.

Rosemount DP Flow

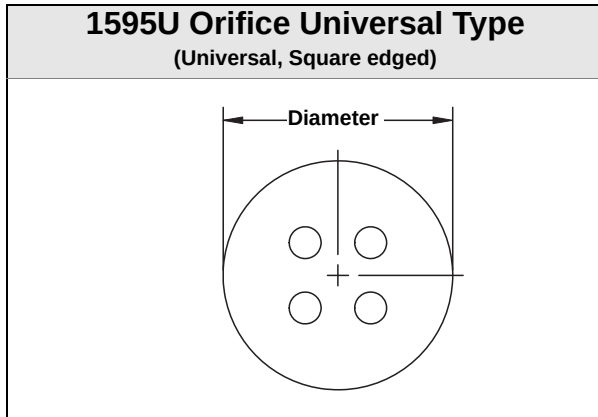


Table 77. A.P.I Ring No.'s and Rating

Line Size	Diameter for Universal Type	A.P.I Ring No.	Rating (lbs.)
2-in. (50 mm)	2.437-in. (61.8998 mm)	R-23	300-600
		R-24	900-1500
		R-26	2500
3-in. (76 mm)	3.437-in. (87.2998 mm)	R-31	300-600 & 900
		R-32	2500
		R-35	1500
4-in. (100 mm)	4.406-in. (111.912 mm)	R-37	300-600 & 900
		R-38	2500
		R-39	1500
6-in. (150 mm)	6.437-in. (163.5 mm)	R-45	300-600 & 900
		R-46	1500
		R-47	2500
8-in. (200 mm)	8.437-in. (214.3 mm)	R-49	300-600 & 900
		R-50	1500
		R-51	2500
10-in. (250 mm)	10.687-in. (271.45 mm)	R-53	300-600 & 900
		R-54	1500
		R-55	2500
12-in. (300 mm)	12.593-in. (319.862 mm)	R-57	300-600 & 900
		R-58	1500
		R-59	2500

NOTE

Refer to Table 76 for line size and pressure rating availability.

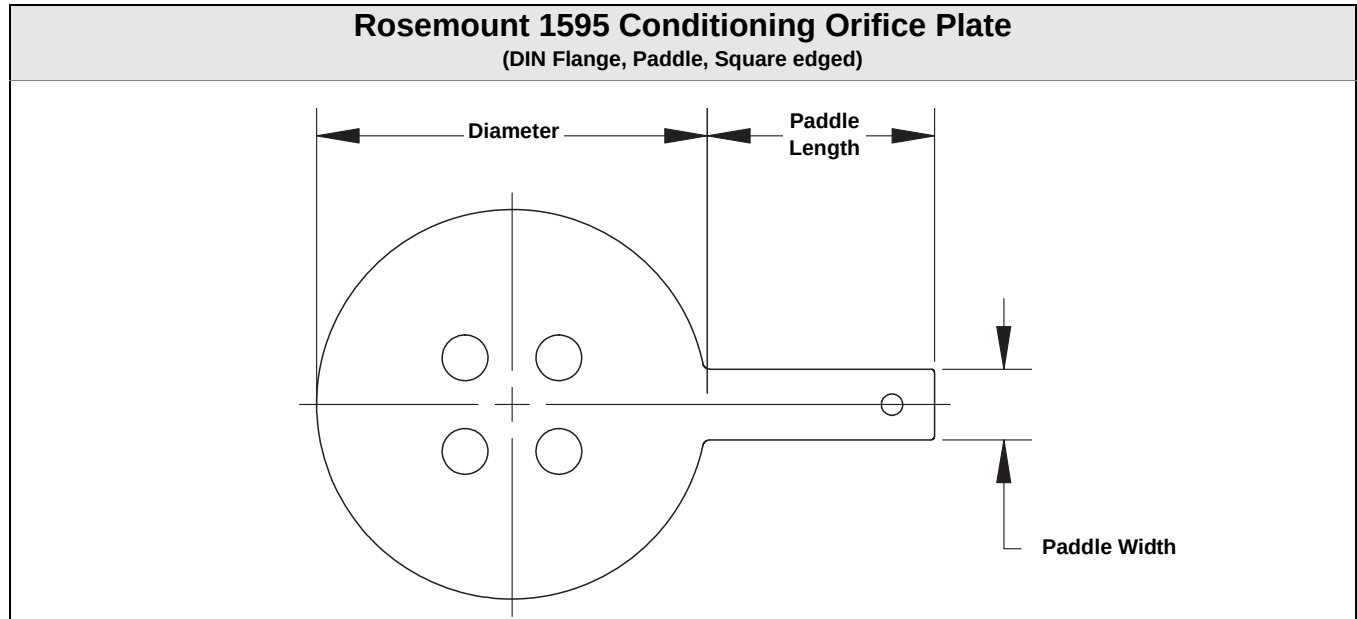


Table 78. 1595 Conditioning Orifice Plate Dimensions in millimeters (inches)

Line Size	Diameter (max) – by flange rating						Paddle Length	Paddle Width
	PN 10	PN 16	PN 25	PN 40	PN 63/64	PN 100		
DN 50 (2-in.)	107 (4.21)	107 (4.21)	107 (4.21)	107 (4.21)	113 (4.45)	119 (4.69)	101.6 (4.0)	25.4 (1.0)
DN 80 (3-in.)	142 (5.60)	142 (5.60)	142 (5.60)	142 (5.60)	148 (5.82)	154 (6.06)	101.6 (4.0)	25.4 (1.0)
DN 100 (4-in.)	162 (6.38)	162 (6.38)	168 (6.61)	168 (6.61)	174 (6.85)	180 (7.09)	101.6 (4.0)	25.4 (1.0)
DN 150 (6-in.)	218 (8.58)	218 (8.58)	224 (8.82)	224 (8.82)	247 (9.72)	257 (10.12)	101.6 (4.0)	25.4 (1.0)
DN 200 (8-in.)	273 (10.74)	273 (10.74)	284 (11.18)	290 (11.42)	309 (12.17)	324 (12.76)	152.4 (6.0)	38.1 (1.5)
DN 250 (10-in.)	328 (12.91)	329 (12.95)	340 (13.39)	352 (13.86)	364 (14.33)	391 (15.39)	152.4 (6.0)	38.1 (1.5)
DN 300 (12-in.)	378 (14.88)	384 (15.12)	400 (15.75)	417 (16.42)	424 (16.69)	458 (18.03)	152.4 (6.0)	38.1 (1.5)

NOTE: Consult factory for availability of line sizes and flange ratings not shown in the above table.

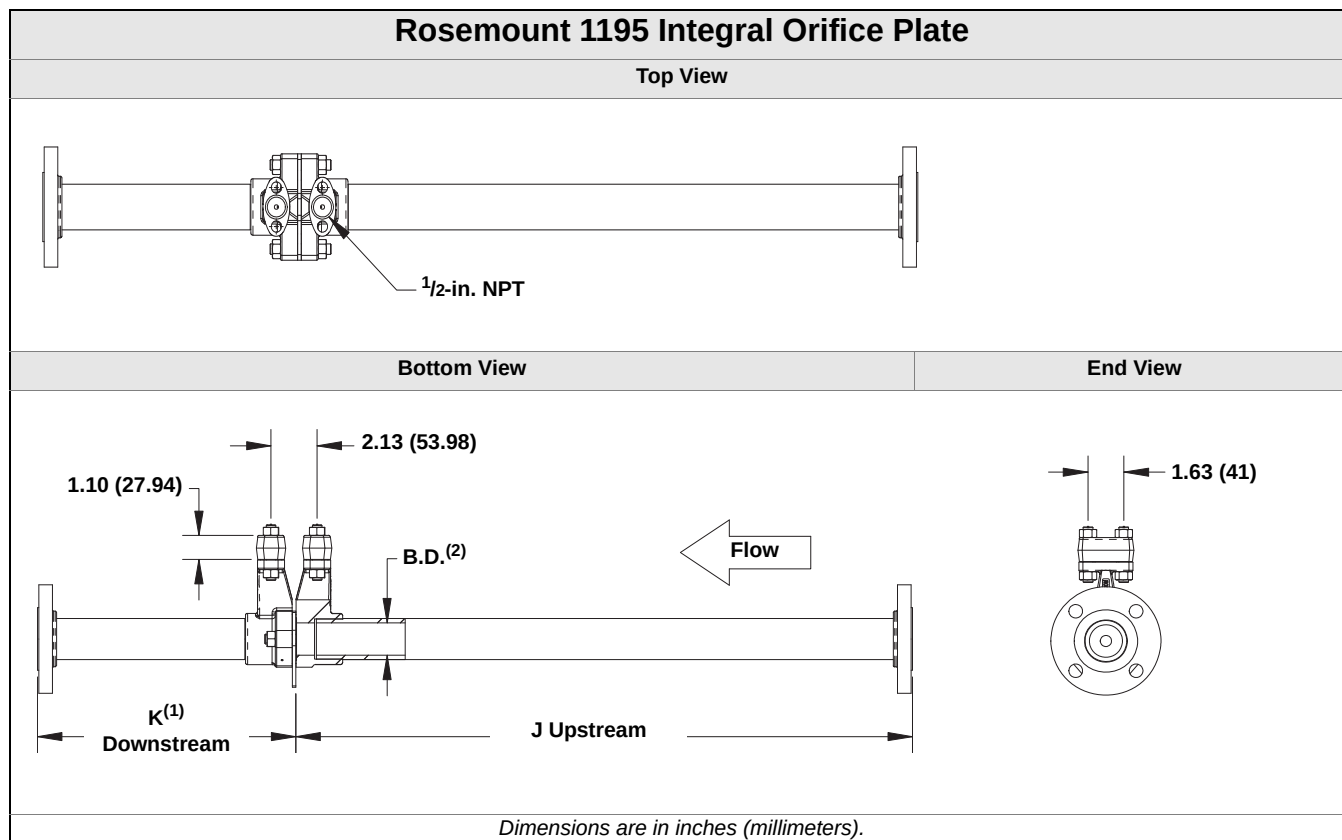
Rosemount DP Flow

Table 79. Available Beta Ratio (β)

The table below shows the available Beta Ratio (β) for line size vs. pipe schedule

Line Size	Pipe Schedule	Beta (β) Available	Line Size	Pipe Schedule	Beta (β) Available
2	≤ 80	0.20, 0.40, 0.60	14	≤ 80	0.20, 0.40, 0.65
2	160	0.20	14	100	0.20, 0.40
3	≤ 80	0.20, 0.40, 0.65	14	120	0.20, 0.40
3	160	0.20, 0.40	14	140	0.20, 0.40
3	XXS	0.20	14	160	0.20, 0.40
4	≤ 80	0.20, 0.40, 0.65	14	XXS	0.20, 0.40
4	120	0.20, 0.40	16	≤ 80	0.20, 0.40, 0.65
4	160	0.20, 0.40	16	100	0.20, 0.40
4	XXS	0.20	16	120	0.20, 0.40
6	≤ 80	0.20, 0.40, 0.65	16	140	0.20, 0.40
6	120	0.20, 0.40	16	160	0.20, 0.40
6	160	0.20, 0.40	16	XXS	0.20, 0.40
6	XXS	0.20	18	≤ 80	0.20, 0.40, 0.65
8	≤ 80	0.20, 0.40, 0.65	18	100	0.20, 0.40, 0.65
8	100	0.20, 0.40, 0.65	18	120	0.20, 0.40
8	120	0.20, 0.40	18	140	0.20, 0.40
8	140	0.20, 0.40	18	160	0.20, 0.40
8	160	0.20, 0.40	18	XXS	0.20, 0.40
8	XXS	0.20, 0.40	20	≤ 80	0.20, 0.40, 0.65
10	≤ 80	0.20, 0.40, 0.65	20	100	0.20, 0.40, 0.65
10	100	0.20, 0.40, 0.65	20	120	0.20, 0.40
10	120	0.20, 0.40	20	140	0.20, 0.40
10	140	0.20, 0.40	20	160	0.20, 0.40
10	160	0.20, 0.40	20	XXS	0.20, 0.40
10	XXS	0.20, 0.40	24	≤ 80	0.20, 0.40, 0.65
12	≤ 80	0.20, 0.40, 0.65	24	100	0.20, 0.40
12	100	0.20, 0.40	24	120	0.20, 0.40
12	120	0.20, 0.40	24	140	0.20, 0.40
12	140	0.20, 0.40	24	160	0.20, 0.40
12	160	0.20, 0.40	24	XXS	0.20, 0.40
12	XXS	0.20, 0.40			

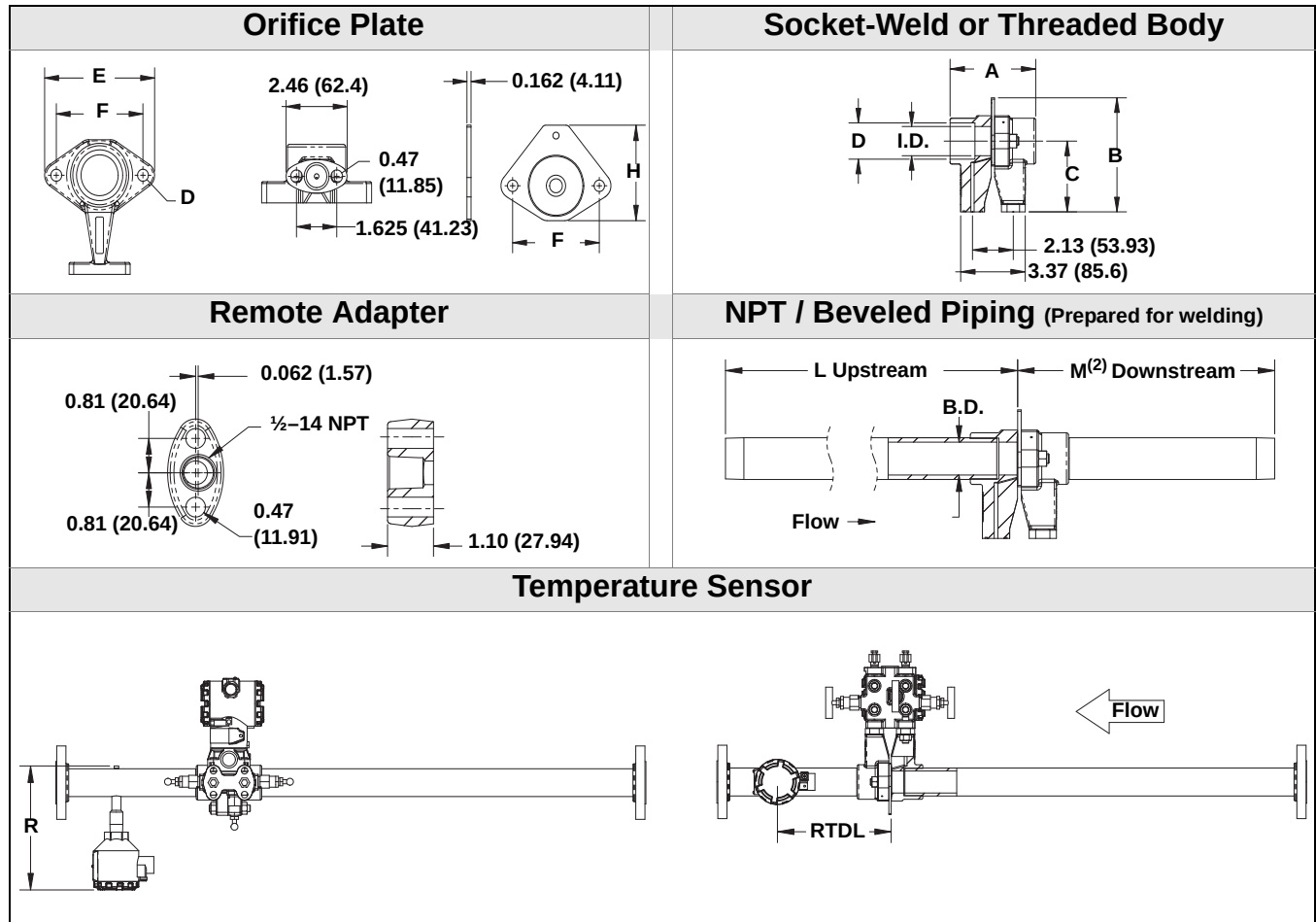
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Dimension	Line Size		
	1/2-in. (15 mm)	1-in. (25 mm)	1 1/2-in. (40 mm)
J (Beveled/Threaded pipe ends)	12.54 (318.4)	20.24 (514.0)	28.44 (722.4)
J (RF slip-on, RTJ slip-on, RF-DIN slip-on)	12.62 (320.4)	20.32 (516.0)	28.52 (724.4)
J (RF 150#, weld-neck)	14.37 (364.9)	22.37 (568.1)	30.82 (782.9)
J (RF 300#, weld-neck)	14.56 (369.8)	22.63 (574.7)	31.06 (789.0)
J (RF 600#, weld-neck)	14.81 (376.0)	22.88 (581.0)	31.38 (797.1)
K ((RF slip-on, RTJ slip-on, RF-DIN slip-on) ⁽¹⁾	5.82 (147.8)	8.83 (224.2)	11.99 (304.6)
K (RF 150#, weld-neck)	7.57 (192.3)	10.88 (276.3)	14.29 (363.1)
K (RF 300#, weld-neck)	7.76 (197.1)	11.14 (282.9)	14.53 (369.2)
K (RF 600#, weld-neck)	8.01 (203.4)	11.39 (289.2)	14.85 (377.2)
B.D.(Bore Diameter) ⁽²⁾	0.664 (16.86)	1.097 (27.86)	1.567 (39.80)
<i>Dimensions are in inches (millimeters).</i>			

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

(2) B.D. is diameter of the precision bored portion of the upstream and downstream piping.



Dimension	Line Size					
	1/2-in. (12.7 mm)		1-in. (25.4 mm)		1 1/2-in. (38.1 mm)	
A	3.4-in.	86 mm	3.8-in.	97 mm	4.5-in.	114 mm
B	4.7-in.	119.4 mm	5.2-in.	132 mm	5.9-in.	149.9 mm
C	3.0-in.	76 mm	3.3-in.	84 mm	3.7-in.	94 mm
D ⁽¹⁾	0.805-in.	20.45 mm	1.280-in.	32.51 mm	1.865-in.	47.37 mm
E	3.6-in.	91 mm	3.9-in.	99 mm	4.4-in.	112 mm
F	2.6-in.	66 mm	3.0-in.	76 mm	3.5-in.	89 mm
H	2.5-in.	64 mm	3.0-in.	76 mm	3.5-in.	89 mm
L	12.54-in.	318.4 mm	20.24-in.	514 mm	28.44-in.	722.4 mm
M	5.74-in.	145.7 mm	8.75-in.	222.2mm	11.91-in.	302.6 mm
R	7.4-in.	187.96 mm	7.8-in.	198.12 mm	8.4-in.	213.36 mm
RTDL	3.11-in.	78.9 mm	5.25-in.	133.4 mm	7.50-in.	190.5 mm
B.D. (Bore Diameter) ⁽²⁾	0.664-in.	16.87 mm	1.097-in.	27.86 mm	1.567-in.	39.80 mm
I.D. (Inside Diameter)	0.622-in.	15.80 mm	1.049-in.	26.64 mm	1.500-in.	38.10 mm

(1) To improve pipe perpendicularity for gasket sealing, socket diameter "D" is smaller than standard pipe O.D. Pipe O.D. must be machined smaller than socket diameter "D" to ensure proper fit.

(2) B.D is diameter of the precision bored portion of the upstream and downstream piping.

Installation and Flowmeter Orientation

Table 80. Annubar Straight Run Requirements⁽¹⁾

		Annubar Products			
		3051SFA, 3051CFA, 2051CFA, 485, 585 ⁽²⁾			
		Without Straightening Vanes ⁽³⁾		With Straightening Vanes ⁽⁴⁾	
		In Plane	Out Plane	From Disturbance	From Straightening Vane
Upstream (inlet) side					
	Reducer	12	12	8	4
	Expander	18	18	8	4
	Single Elbow (90°) or tee	8	10	8	4
	Two Elbows in plane	11	16	8	4
	Two Elbow out of plane	23	28	8	4
	Butterfly Valve (75-100% open)	30	30	8	4
	Ball / Gate Valve full open	8	10	8	4
Downstream (outlet) side		4	4	4	4

(1) Consult an Emerson Process Management representative if a disturbance is not listed or if multiple disturbances are present.

(2) Consult the factory for instructions regarding use in square or rectangular ducts.

(3) In Plane means the Annubar is in the same plane as the elbow. Out of Plane means the bar is perpendicular to the plane of the upstream elbow. Refer to Figure 1 on page 152.

(4) Use straightening vane to reduce the required straight run length.

Table 81. Conditioning Orifice Plate and Compact Orifice Plate Straight Run Requirements⁽¹⁾

		Conditioning Orifice Plate Products		Compact Orifice Plate Products	
		3051SFC_C, 3051CFDC, 2051CFDC, 1595, 405C ⁽²⁾		3051SFC_P, 3051CFCDP, 2051CFCDP, 405P ⁽³⁾⁽⁴⁾	
		0.4 Beta	0.65 Beta	0.4 Beta	0.65 Beta
Upstream (inlet) side					
	Reducer	2	2	5	12
	Expander	6	8	12	28
	Single Elbow (90°) or tee	2	2	16	44
	Two Elbows in plane	2	2	10	44
	Two Elbow out of plane	2	2	50	60
	Butterfly Valve (75-100% open)	2	5	16 ⁽⁵⁾	44 ⁽⁵⁾
	Ball / Gate Valve full open	2	2	12	18
Downstream (outlet) side		2	2	6	7

(1) Consult an Emerson Process Management representative if a disturbance is not listed or if multiple disturbances are present.

(2) For any Beta greater than 0.40, use beta 0.65 recommended lengths. For any Beta ratio less than or equal to 0.40, use beta 0.4 recommended lengths.

(3) Recommended lengths represented in pipe diameters per ISO 5167.

(4) Refer to ISO 5167 for recommended lengths when using flow straighteners.

(5) Recommended lengths not per ISO 5167. Butterfly valves are not listed in the ISO specification.

Table 82. Integral Orifice Plate Straight Run Requirements⁽¹⁾⁽²⁾

		3051SFP, 3051CFP, 2051CFP, 1195 ⁽¹⁾⁽²⁾											
		<0.20 Beta		0.40 Beta		0.50 Beta		0.60 Beta		0.67 Beta		0.75 Beta	
Upstream (inlet) side		A ⁽³⁾	B ⁽⁴⁾	A	B	A	B	A	B	A	B	A	B
	Reducer	5	-	5	-	8	5	9	5	12	6	13	8
	Expander	6	-	12	8	20	9	26	11	28	14	36	18
	Single Elbow (90°) or tee	6	3	16	3	22	9	42	13	44	20	44	20
	Two Elbows in plane	10	-	10	-	18	10	30	18	44	18	44	18
	Two Elbow out of plane	34	17	50	25	75	34	65	18	60	18	75	18
	Butterfly Valve	12	6	12	6	12	6	14	7	18	9	24	12
	Gate Valve full open	12	6	12	6	12	6	14	7	18	9	24	12
Downstream (outlet) side		4	2	6	3	6	3	7	3.5	7	3.5	8	4

(1) Recommended lengths are guidelines based on ISO 5167.

(2) Straight run represents distance from the face of the orifice plate to the disturbance.

(3) Straight run represents distance from the face of the orifice plate to the disturbance.

(4) Recommended lengths represented in pipe diameters corresponding to an additional +0.5% discharge coefficient uncertainty.

3051SFA, 3051CFA, 2051CFA, 485 Drill Hole Size According to Sensor Size

Sensor Size	Diameter
1	3/4-in. (19 mm)
2	1 ⁵ /16-in. (34 mm)
3	2 ¹ /2-in. (64 mm)

585 Drill Hole Size According to Sensor Size

Sensor Size	Hole Diameter	
11	7/8-in. (23 mm)	+ 1/32-in. (0,80 mm) - 0.00
22	1 ⁵ /16-in. (34 mm)	+ 1/16-in. (1,59 mm) - 0.00
44	2 ¹ /2-in. (64 mm)	+ 1/16-in. (1,59 mm) - 0.00

Orifice Plate Pipe Orientation

Pipe orientation for both 3051SFC, 3051CFC, 2051CFC, 405C, 405P, 3051SFP, 3051CFP, 2051CFP AND 1195.

Orientation/ Flow Direction	Process ⁽¹⁾		
	Gas	Liquid	Steam
Horizontal	D/R	D/R	D/R
Vertical Up	R	D/R	R
Vertical Down	D/R	NR	NR

(1) D = Direct mount acceptable (recommended)

R = Remote mount acceptable

NR = Not recommended

Compact Flowmeter Pipe Centering

Improper centering of any orifice type device can cause an error of up to ±5% in small line sizes. A centering mechanism (centering ring) independent of flange rating comes standard with the 405 Compact Flowmeter Series.

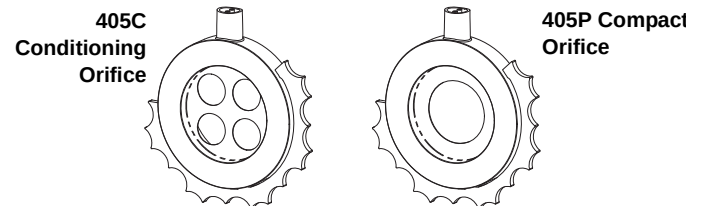
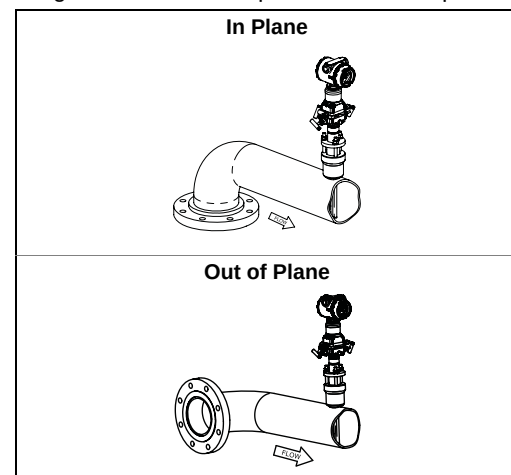


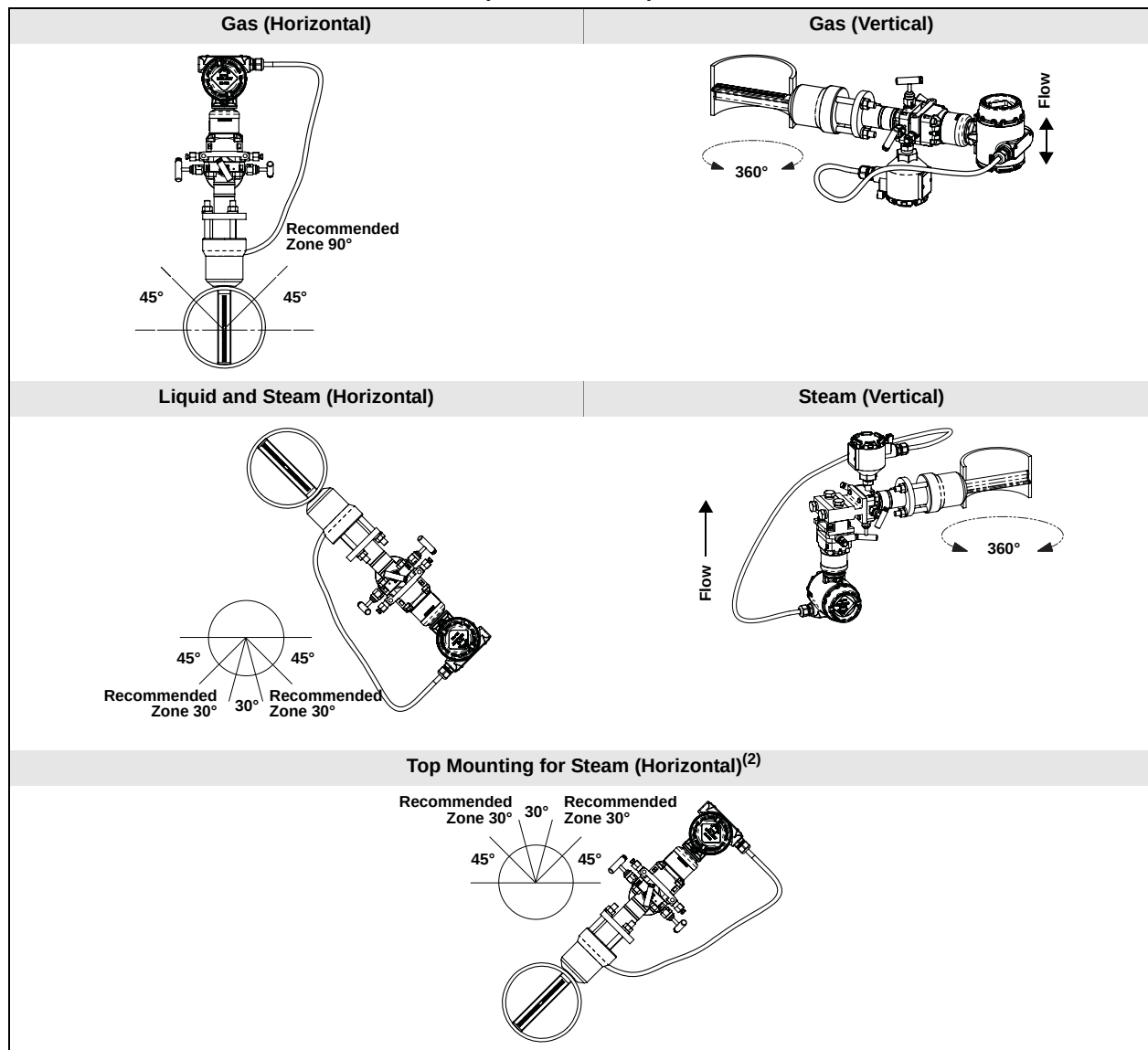
Figure 1. Annubar In plane and Out of plane



Annubar Flowmeter Orientation

For 3051SFA, 3051CFA, 2051CFA, 485, 585

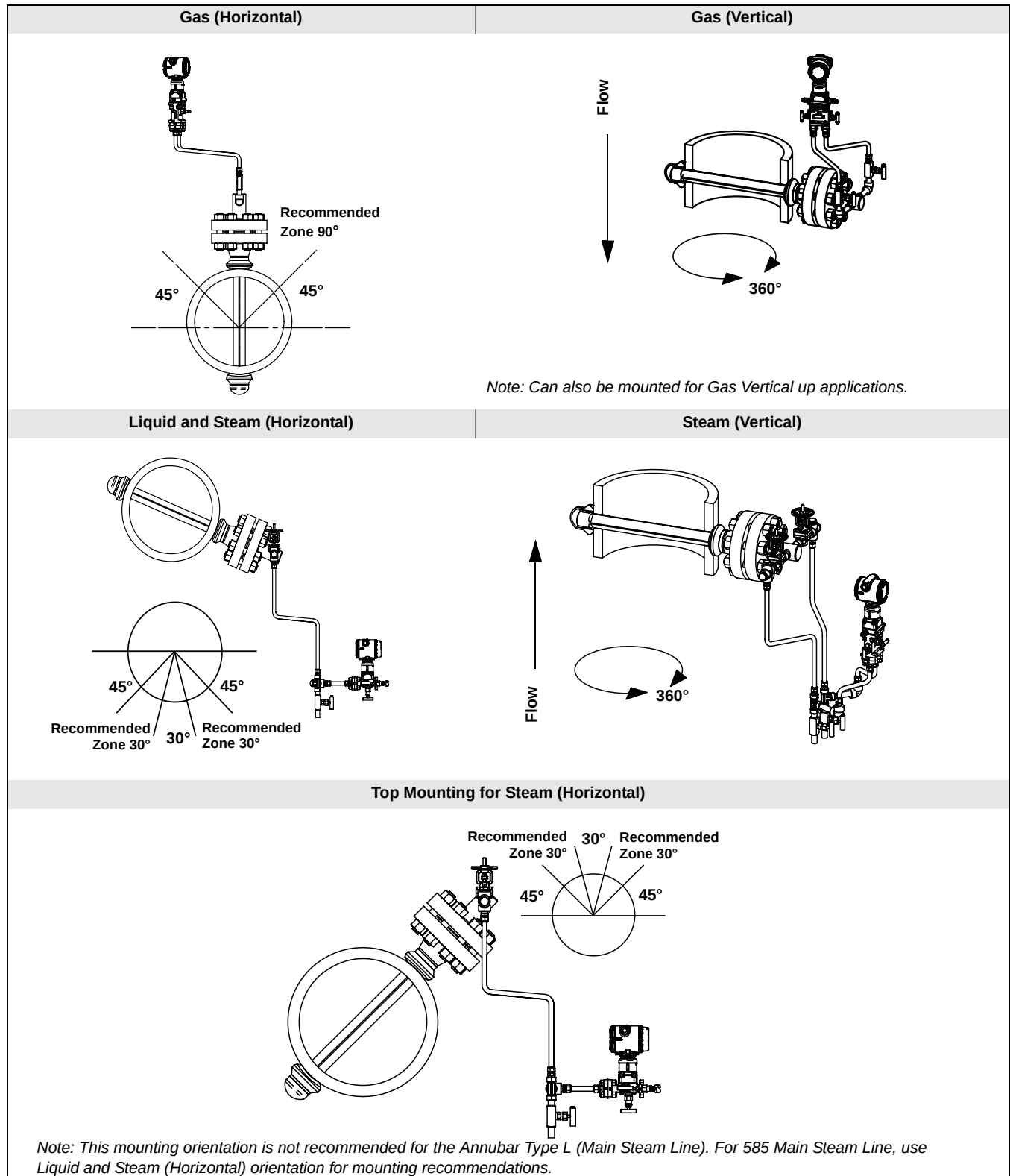
Annubar Direct Mount Flowmeter Orientation (Recommended)⁽¹⁾



(1) The flowmeter orientation recommendations may vary for the Manual and Gear-Drive Flo-Tap Annubar Types.

(2) Note: This mounting orientation is not recommended for the 585 Annubar Type L (Main Stream Line). For 585 Main Steam Line, use Liquid and Steam (Horizontal) orientation for mounting recommendations.

Annubar Remount Mount Flowmeter Orientation (Recommended)⁽¹⁾

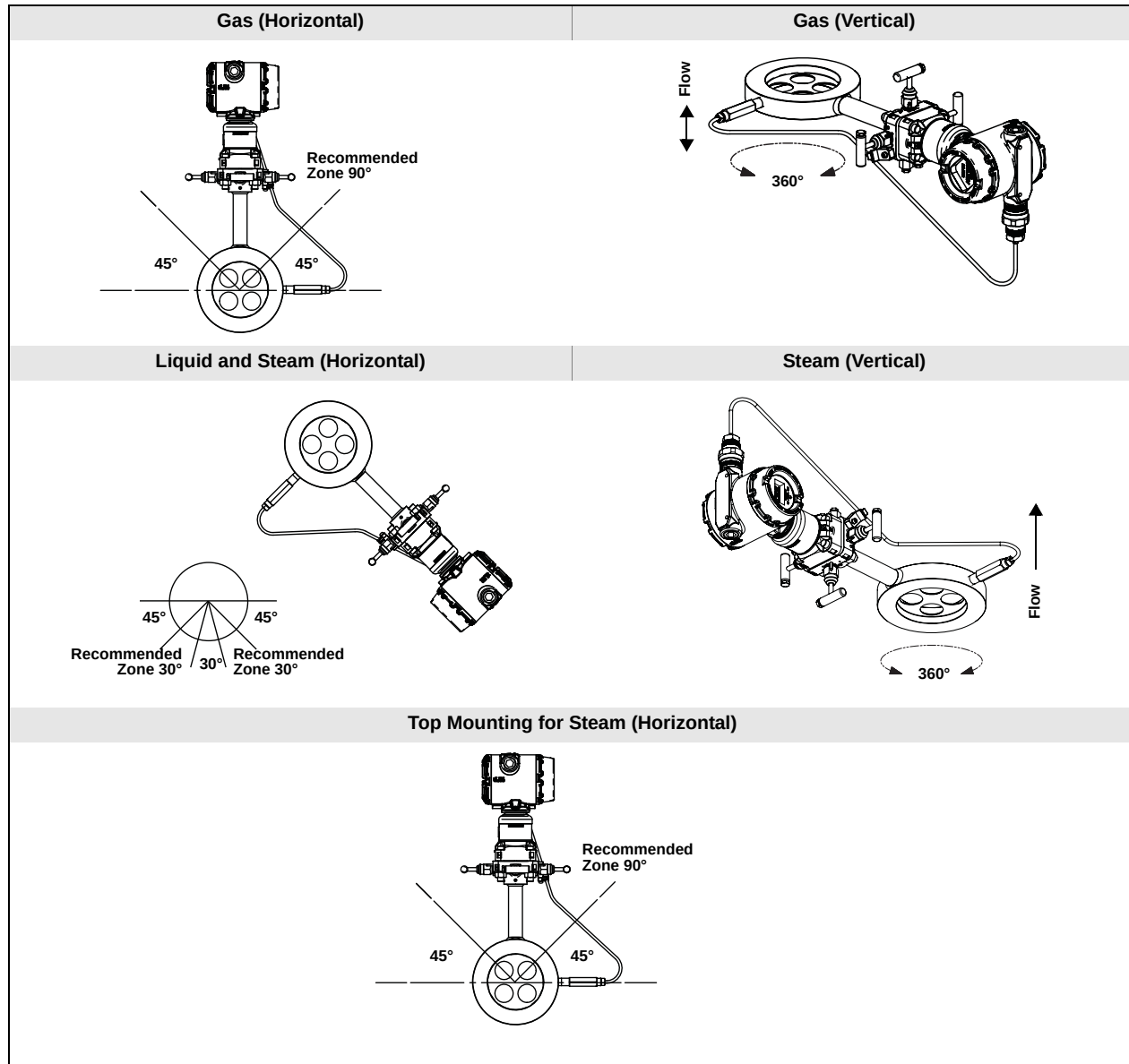


(1) The flowmeter orientation recommendations may vary for the Gear-Drive Flo-Tap Annubar Type.

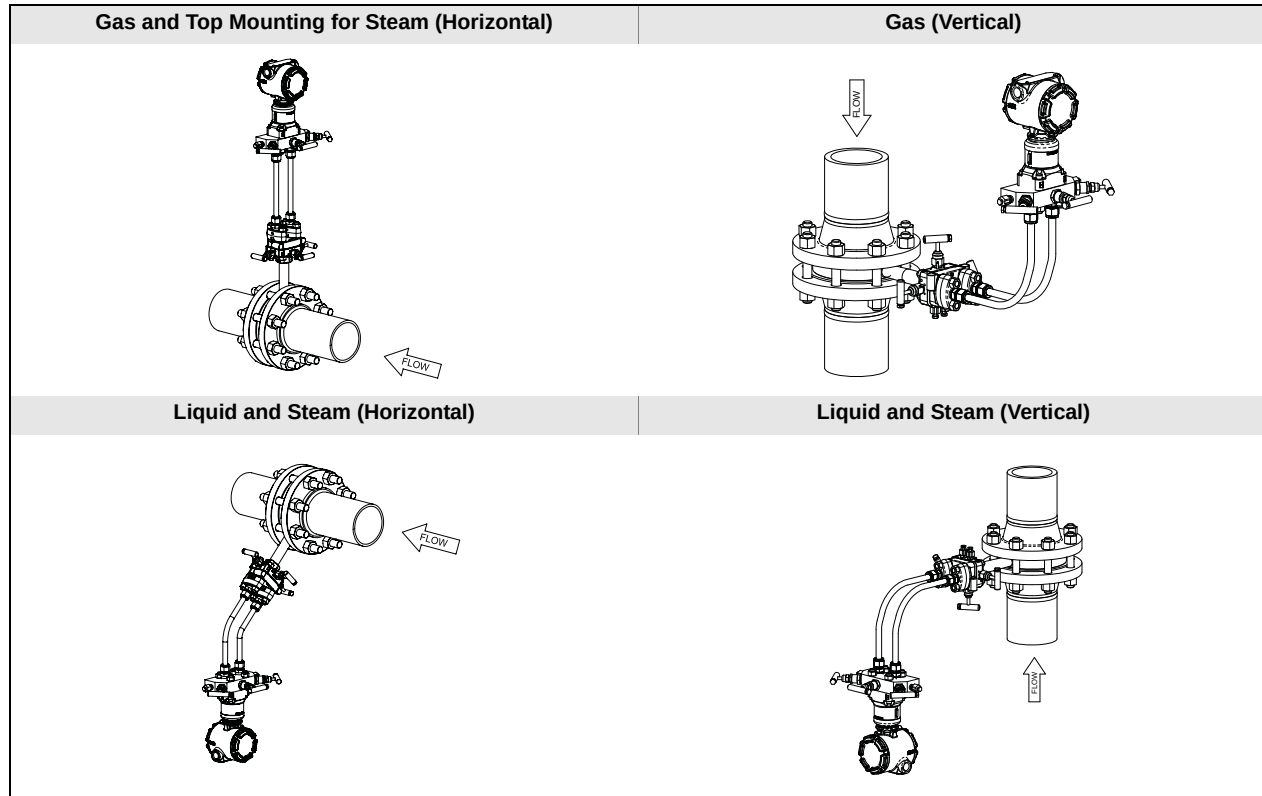
405 Flowmeter Orientation

For 3051SFC, 3051CFC, 2051CFC, 405C, 405P

405 Direct Mount Flowmeter Orientation (Recommended)



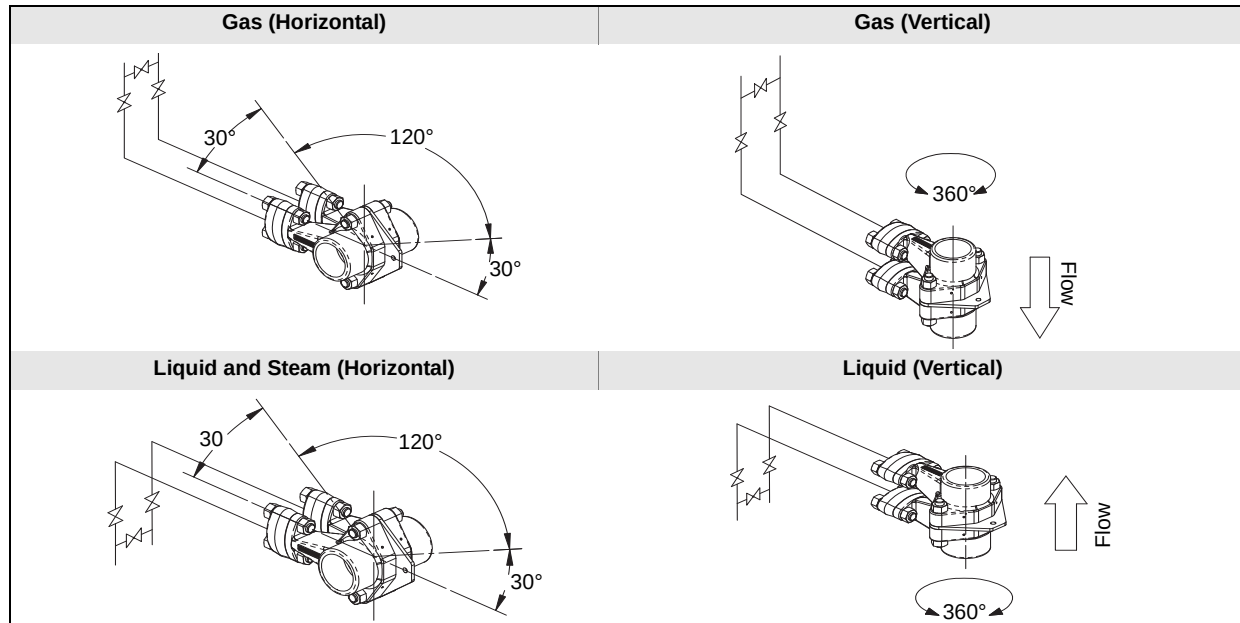
405 Remote Mount Flowmeter Orientation (Recommended)



1195 Integral Orifice Flowmeter Orientation

For 3051SFP, 3051CFP, 2051CFP, 1195

1195 Flowmeter Orientation (Recommended)



Product Data Sheet

00813-0100-4485, Rev AA

April 2010

Rosemount DP Flow

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Rosemount 1495 Orifice Plate

Rosemount 1496 Orifice Flange Union

- *Comprehensive offering*
- *Easy to use, prove, and troubleshoot*
- *The Rosemount 1495 Orifice Plate is compliant to ISO 5167, AGA Report No. 3 / API 14.3.2 and ASME MFC-3M, making the 1495 ideal for custody transfer applications*
- *Suitable for most gas, liquid, and steam applications*
- *Rosemount 1495 Restriction Orifice Plates now available*



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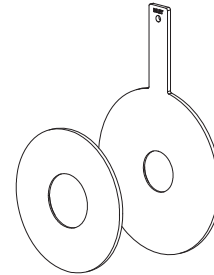
Rosemount 1495 and 1496

The Rosemount 1495 and 1496

Rosemount 1495 Orifice Plate

- The most common primary element in the world with established manufacturing and installation standards
- Reliable technology measurement due to known historical flow data
- Easy to use, prove, and troubleshoot
- Compliant to ISO 5167, AGA Report No. 3 / API 14.3.2, and ASME MFC-3M, ensuring a precise flow measurement.
- Ideal for custody transfer applications
- Additional bore types available per ISO TR 15377 as well as an unbeveled bore option for Restriction Orifice applications
- Suitable for most gas, liquid, and steam as well as high temperature and pressure applications
- Meets AGA, ASME, ISO, and API standards, ensuring precision flow measurement
- Available for DIN 19206 Part 1

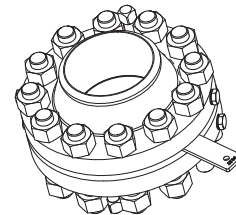
FIGURE 1. 1495 Orifice Plate



Rosemount 1496 Orifice Flange Union

- Cost effective flow measurement
- No on-site flange tap drilling required
- All hardware for complete assembly provided: studs, nuts, jack screws, gaskets, and pipe plugs
- Meets high pressure and temperatures requirement up to ANSI Class 2500#
- Meets ASME B16.36
- Flange unions available per DIN 19214 Part 1

FIGURE 2. 1496 Orifice Flange Union



Shown with 1495 Orifice Plate (ordered separately).

Rosemount DP Flow Solutions

Rosemount Annubar® DP Flowmeters

Models: 3051SFA, 3095MFA, 3051CFA, 2051CFA, 485 and 585

- Energy savings gained through minimal permanent pressure loss
- Innovative T-shaped design that increases accuracy by reducing signal noise
- Integral RTD available for fully compensated mass flow measurement with a single pipe penetration

Rosemount Compact Orifice DP Flowmeters

Models: 3051SFC, 3095MFC, 3051CFC, 2051CFC, 405C and 405P

- Reduce straight pipe requirements to 2D upstream and downstream from any flow disturbance
- Reduce installation costs compared to traditional orifice plates with the direct mount, compact design
- Install between standard raised-face flanges, up to a Class 600 (PN100) rating
- Integral RTD enables fully compensated mass flow measurement with a single pipe penetration

Rosemount Integral Orifice DP Flowmeters

Models: 3051SFP, 3095MFP, 3051CFP, 2051CFP and 1195

- Improves accuracy and repeatability in ½-in., 1-in. and 1 ½-in. line sizes
- Self-centering plate design eliminates installation errors that are magnified in small line sizes
- Precision honed pipe sections to increase measurement accuracy

Rosemount Orifice Plate Primary Element Systems

Models: 1595, 1495 and 1496

- Reduce straight pipe requirements to 2D upstream and downstream with the 1595 Conditioning Plate
- Comprehensive offering of orifice plate configurations and flange unions
- Restriction orifice plates available

Ordering Information

ROSEMOUNT 1495 CONFIGURATION

Standard configuration is with a square-edged concentric bore in both paddle and universal type plates. Also available with a spiral finish. Final inspection reports illustrating plate thickness, concentricity, outside dimensions, inside dimensions, roundness, and flatness are available.

- Bore calculations are available if the Configuration Data Sheet (CDS) is completed and Option BC is selected.

1495 ORDERING INFORMATION

TABLE 1. Rosemount 1495 Orifice Plate Ordering Information

★ The Standard offering 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	
1495	Orifice Plate Primary	
Orifice Plate Type		
Standard		Standard
PC	Paddle, Concentric	★
PG	Paddle, Concentric, Spiral finish	★
UC	Universal, Concentric	★
Line Size		
Standard		Standard
020	2 inches (DN50)	★
025	2 1/2 inches (DN65)	★
030	3 inches (DN80)	★
040	4 inches (DN100)	★
060	6 inches (DN150)	★
080	8 inches (DN200)	★
100	10 inches (DN250)	★
120	12 inches (DN300)	★
140	14 inches (DN350)	★
160	16 inches (DN400)	★
180	18 inches (DN450)	★
200	20 inches (DN500)	★
240	24 inches (DN600)	★
Flange Rating		
Standard		Standard
A1	Flange ANSI Class 150 Raised Face	★
A3	ANSI Class 300 Raised Face	★
A6	ANSI Class 600 Raised Face	★
A9	ANSI Class 900 Raised Face	★
AF	ANSI Class 1500 Raised Face	★
AT ⁽¹⁾	ANSI Class 2500 Raised Face	★
D1	DIN PN10	★
D2	DIN PN16	★
D3	DIN PN25	★
D4	DIN PN40	★
D5	DIN PN63 ⁽²⁾	★
D6	DIN PN100	★

Rosemount 1495 and 1496

TABLE 1. Rosemount 1495 Orifice Plate Ordering Information

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

Expanded		
R3	Flange ANSI Class 300 Ring Joint	
R6	Flange ANSI Class 600 Ring Joint	
R9	Flange ANSI Class 900 Ring Joint	
RF	Flange ANSI Class 1500 Ring Joint	
RT	Flange ANSI Class 2500 Ring Joint	
Orifice Plate Material Type		
Standard		Standard
S	316/316L Stainless Steel	★
T	DIN 1.4571 (316Ti Stainless Steel)	★
L	304/304L Stainless Steel	★
Expanded		
H	Alloy C-276	
M	Alloy 400	
Plate Thickness		
Standard		Standard
A	0.125-in. (3.2 mm) – default for line size 2 to 6-in. (50 to 150 mm)	★
B	0.250-in. (6.35 mm) – default for line size 8 to 14-in. (200 to 350 mm)	★
C	0.375 in. (9.53 mm) - default for line size 16 to 20-in. (400 to 500 mm)	★
D	0.500-in. (12.7 mm) – default for line size 24-in. (600 mm)	★
E ⁽³⁾	Plate Thickness per DIN 19206	★
Bore		
Standard		Standard
XXXXX	Bore (XXXXX = XX.XXX)	★

Options (Include with selected model number)

Bore Calculation		
Standard		Standard
BC	Bore Calculation	★
Drain / Vent Hole		
Standard		Standard
DV ⁽⁴⁾	Drain / Vent Hole	★
Plate Holder		
Standard		Standard
PH ⁽⁵⁾	Plate Holder for RTJ Flanges	★
Alternate Bore Type		
Standard		Standard
TC	Conical Entrance Bore	★
TE ⁽⁴⁾	Eccentric Bore	★
TS ⁽⁴⁾	Segmental Bore	★
TQ	Quadrant Edged Bore	★
RO ⁽⁶⁾	Restriction Orifice Plate	★
Alternate Pipe Schedule		
Standard		Standard
FA ⁽⁷⁾	Schedule 5S	★
FB ⁽⁷⁾	Schedule 10	★
FC ⁽⁷⁾	Schedule 10S	★
FD ⁽⁷⁾	Schedule 20	★
FE ⁽⁷⁾	Schedule 30	★

TABLE 1. Rosemount 1495 Orifice Plate Ordering Information

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

FF ⁽⁷⁾	Schedule 40	★
FG ⁽⁷⁾	Schedule 40S	★
FH ⁽⁷⁾	Schedule Standard (STD)	★
FI ⁽⁷⁾	Schedule 60	★
FJ ⁽⁷⁾	Schedule 80	★
FK ⁽⁷⁾	Schedule 80S	★
FL ⁽⁷⁾	Schedule Extra Strong (XS)	★
FM ⁽⁷⁾	Schedule 100	★
FN ⁽⁷⁾	Schedule 120	★
FP ⁽⁷⁾	Schedule 140	★
FQ ⁽⁷⁾	Schedule 160	★
FR ⁽⁷⁾	Schedule Double Extra Strong (XXS)	★
Special Cleaning		
Expanded		
P2	Cleaning for special processes	
Special Inspection		
Standard		Standard
QC1	Visual and dimensional inspection with certificate	★
QC7	Inspection and performance certificate	★
Material Traceability Certification		
Standard		Standard
Q8	Material certificate per ISO 10474 3.1.B and EN 10204 3.1.B	★
Code Conformance		
Expanded		
J5 ⁽⁸⁾	NACE MR-0175 / ISO 15156	
Country Certification		
Expanded		
J1	Canadian Registration	
Typical Model Number: 1495 PC 040 A3 S A 02125		

(1) Available in line sizes from 2-12 inches.

(2) Previously PN64.

(3) Standard Plate Thickness:
DN50 - 65 = 3 mm
DN80 - 450 = 4 mm
DN500 - 600 = 6 mm

(4) This option requires pipe I.D. to be specified. Please select alternate pipe schedule option or specify on order.

(5) Integral Plate Holder (material matches plate material) for line sizes to 3-in., requires minimum 1/4-in plate thickness. Screw Type Plate Holder in 304SS for line sizes 4-in. and larger.

(6) A standard beveled orifice plate is provided with the "RO" option code.

(7) These options should only be selected if options DV, TE, or TS are selected. These options are not available with flange rating D1-D6.

(8) Materials of Construction comply with metallurgical requirements highlighted within NACE MR0175/ISO 15156 for sour oil field production environments. Environmental limits apply to certain materials. Consult latest standard for details. Selected materials also conform to NACE MR0103 for sour refining environments.

Rosemount 1495 and 1496

ROSEMOUNT 1496 CONFIGURATION

Standard flange styles are raised face (RF) weld neck, RF slip-on, or RF threaded for paddle type orifice plates, and ring type joint (RTJ) weld neck for universal type plates with plate holders. All flange unions are supplied with studs, nuts, jackscrews, gaskets, and pipe plugs. Table 5 lists standard pipe schedules.

- Meets ASME B16.36
- Meets DIN 19214 part 1
- Threaded tap connection provided 180-degrees apart

The following options are available.

- Socket weld tap connections
- High temperature flange gaskets for temperatures greater than 500 °F (260 °F)
- Stainless Steel flange bolting per ASTM A193 Grade B8M/A194 Grade 8M

1496 ORDERING INFORMATION

TABLE 2. Rosemount 1496 Orifice Flange Union Ordering Table

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.

The Expanded offering is subject to additional delivery lead time.

Model	Product Description	
1496	Orifice Flange Union	
Flange Union Type		
Standard		Standard
WN	Raised Face, Weld Neck	★
TH	Raised Face, Threaded	★
SO	Raised Face, Slip-On	★
DN	Raised Face, Weld Neck, DIN 19214 Part 1	★
Expanded		
RJ	Ring Joint, Weld Neck	
Line Size		
Standard		Standard
020	2 inches (DN50)	★
025	2½-inches (DN65)	★
030	3 inches (DN80)	★
040	4 inches (DN100)	★
060	6 inches (DN150)	★
080	8 inches (DN200)	★
100	10 inches (DN250)	★
120	12 inches (DN300)	★
140	14 inches (DN350)	★
160	16 inches (DN400)	★
180	18 inches (DN450)	★
200	20 inches (DN500)	★
240	24 inches (DN600)	★
Flange Rating		
Standard		Standard
A3	ANSI Class 300	★
A6	ANSI Class 600	★
A9	ANSI Class 900	★
AF	ANSI Class 1500	★
AT ⁽¹⁾	ANSI Class 2500	★
D1	DIN PN10	★
D2	DIN PN16	★
D3	DIN PN25	★
D4	DIN PN40	★
D5	DIN PN63 ⁽²⁾	★
D6	DIN PN100	★

Product Data Sheet

00813-0100-4792, Rev KA

April 2010

Rosemount 1495 and 1496

TABLE 2. Rosemount 1496 Orifice Flange Union Ordering Table

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.

The Expanded offering is subject to additional delivery lead time.

Expanded		
R3	Ring-Type Joint (RTJ) Class 300	
R6	Ring-Type Joint (RTJ) Class 600	
R9	Ring-Type Joint (RTJ) Class 900	
RF	Ring-Type Joint (RTJ) Class 1500	
RT	Ring-Type Joint (RTJ) Class 2500	
Flange Union Material Type		
Standard		Standard
C	Carbon Steel	★
S	316/316L Stainless Steel	★
T	DIN 1.4571 (316Ti Stainless Steel)	★
L	304/304L Stainless Steel	★
Expanded		
H	Alloy C-276	
M	Alloy 400	

Options (Include with selected model number)

Alternate Pipe Schedule / Wall Thickness ⁽³⁾		
Standard		Standard
FA ⁽⁴⁾	Schedule 5S	★
FB ⁽⁴⁾	Schedule 10	★
FC ⁽⁴⁾	Schedule 10S	★
FD ⁽⁴⁾	Schedule 20	★
FE ⁽⁴⁾	Schedule 30	★
FF ⁽⁴⁾	Schedule 40	★
FG ⁽⁴⁾	Schedule 40S	★
FH ⁽⁴⁾	Schedule Standard (STD)	★
FI ⁽⁴⁾	Schedule 60	★
FJ ⁽⁴⁾	Schedule 80	★
FK ⁽⁴⁾	Schedule 80S	★
FL ⁽⁴⁾	Schedule Extra Strong (XS)	★
FM ⁽⁴⁾	Schedule 100	★
FN ⁽⁴⁾	Schedule 120	★
FP ⁽⁴⁾	Schedule 140	★
FQ ⁽⁴⁾	Schedule 160	★
FR ⁽⁴⁾	Schedule Double Extra Strong (XXS)	★
High Temperature Gaskets		
Standard		Standard
G1 ⁽⁵⁾	High Temperature Gaskets (spiral wound gaskets)	★
Alternate Bolting Material		
Standard		Standard
SS ⁽⁶⁾	316SS Studs/Nuts	★
Alternate Pressure Tap Type		
Standard		Standard
ST	Socketweld Pressure Taps (not available with Flange Union Type code DN)	★
Special Cleaning		
Expanded		
P2	Cleaned for Special Processes	

Rosemount 1495 and 1496

TABLE 2. Rosemount 1496 Orifice Flange Union Ordering Table

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.

The Expanded offering is subject to additional delivery lead time.

Special Inspection		
Standard		Standard
QC1	Visual and dimensional inspection with certificate	★
Material Traceability Certification		
Standard		Standard
Q8	Material certificate per ISO 10474 3.1.B and EN 10204 3.1.B	★
Code Conformance		
Expanded		
J5 ⁽⁷⁾	Materials conforming to NACE MR01-75	
Country Certification		
Standard		Standard
J1	Canadian Registration Number	★
Expanded		
J6	Conformance to European Pressure Equipment Directive (PED) 97/23/EC	
Typical Model Number: 1496 WN 040 A3 S		

(1) Available in line sizes from 2-12 inches.

(2) Previously PN64.

(3) Default pipe schedules are listed in Table 5 on page 10 for the 1496 Orifice Flange Unions.

(4) These options are not available with flange type DN. These options should only be selected if the required pipe schedule is different from the default pipe schedule, as shown in Table 5 on page 10. Standard wall thickness for DIN weldneck flanges is per ISO EN 1092-1 (2002). Consult the factory if a different wall thickness is required.

(5) Not available with Flange Union Type code RJ.

(6) Stainless steel bolting (ASTM A193 GR B8M Class 2) is classified as "low strength bolting" by the various ASME B31 piping codes and may not be suitable for all applications requiring code conformance.

(7) 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.

Specifications

FUNCTIONAL SPECIFICATIONS

Service and Flow Range

Liquid, gas or vapor turbulent flow, for pipe Reynold's Numbers greater than the following⁽¹⁾:

AGA-3: 4,000

ASME MFC-3M⁽²⁾: 5,000 and $170\beta^2 D$ (whichever is higher)

ISO-5167⁽²⁾: 5,000 and $170\beta^2 D$ (whichever is higher)

(1) For flange tap applications.

(2) D = pipe I.D. in mm.

Orifice Plate Operating Limitations

Temperature Limit:

Based on flange rating per ANSI B16.5.

TABLE 3.

ANSI Flange Rating	Applicability	Gasket Description	Temperature Rating
300#	Default	Durlon 8500, Compressed Sheet Gasket	-100°F to 700°F
	If "P2" option	Durlon 9000, Compressed Sheet Gasket	-350°F to 520°F
	If "G1" option	Flexitallic CGI, Spiral Wound Gasket with Thermiculite 735 Filler	-350°F to 1000°F
600#, 900#, 1500#, 2500#	Default	Flexitallic CGI, Spiral Wound Gasket with Thermiculite 735 Filler	-350°F to 1000°F
	If "P2" option	Flexitallic CGI, Spiral Wound Gasket with PTFE Filler	-300°F to 500°F
	If "G1" option	Flexitallic CGI, Spiral Wound Gasket with Thermiculite 735 Filler	-350°F to 1000°F

Maximum Working Pressure:

Based on flange rating per ANSI B16.5.

Service and Flow Range

Liquid, gas or vapor turbulent flow, for pipe Reynold's Numbers within ISO 5167, AGA Report No. 3/ API 14.3.2, and ASME MFC-3M specifications.

Pipe Sizes

2-in. to 24-in. (50 mm to 600 mm). Contact Emerson Process Management for pipe sizes less than 2-in. (50 mm) or greater than 24-in. (600 mm).

•

Operating Limits

1495 Temperature Range:

- -320 to 1200 °F (-196 to 649 °C)

1496 Temperature Range:

TABLE 4.

1496 Material	Temperature Rating
Carbon Steel (ASTM A105)	-20°F to 1000°F
316/316L Stainless Steel (ASTM A182)	-325°F to 1000°F
304/304L Stainless Steel (ASTM A182)	-425°F to 1000°F
Alloy C-276 (ASTM B462 UNS N10276)	-325°F to 1250°F
Alloy 400 (ASTM B564 UNS N04400)	-325°F to 900°F
Carbon Steel (A350-LF2)	-50°F to 1000°F
DIN 1.4571 (316Ti Stainless Steel)	-325°F to 1000°F
Alloy C4 (ASTM B574 UNS N06455)	-325°F to 800°F

Rosemount 1495 and 1496

PHYSICAL SPECIFICATIONS

Standard Pipe Schedules

TABLE 5. Default Pipe Schedules for 1496 Orifice Flange Unions ⁽¹⁾⁽²⁾

Nominal Pipe Size ⁽³⁾	ANSI 300# (WN, TH, SO)	ANSI 600# (WN, RJ)	ANSI 900# (WN, RJ)	ANSI 1500# (WN, RJ)	ANSI 2500# (WN, RJ)
2 (51)	Standard	Standard	XS	XS	160
2½- (64)	Standard	Standard	XS	XS	
3 (76)	Standard	Standard	XS		
4 (102)	Standard	Standard	XS		
6 (152)	Standard	Standard	XS		
8 (203)	Standard	Standard			
10 (254)	Standard	XS			
12 (305)	Standard	XS			
14 (356)	Standard				
16 (406)	Standard				
18 (457)	Standard				
20 (508)	Standard				
24 (610)	XS				

(1) If no default schedule provided - customer must specify pipe schedule.

(2) Standard wall thickness for DIN weldneck flanges is per ISO EN 1092-1 (2002). Consult factory if different wall thickness is required.

(3) Size in inches (millimeters).

NOTE

It is strongly encouraged to use the ordering codes to specify desired pipe schedule.

TABLE 6. Dimensions of Pipe Inner Diameter⁽¹⁾

Nominal Pipe Size	Schedule					
	5S	10	10S	20	30	40
2 (51)	2.245 (57.02)	2.157 (54.79)	2.157 (54.79)	—	—	2.067 (52.501)
2½- (64)	2.709 (68.81)	2.635 (66.93)	2.635 (66.93)	—	—	2.469 (62.71)
3 (76)	2.224 (56.49)	3.26 (82.80)	3.26 (82.80)	—	—	3.068 (77.93)
4 (102)	4.334 (110.08)	4.26 (108.20)	4.26 (108.20)	—	—	4.026 (102.26)
6 (152)	6.407 (162.74)	6.357 (161.47)	6.357 (161.47)	—	—	6.065 (154.05)
8 (203)	8.407 (213.54)	8.329 (211.56)	8.329 (211.56)	8.125 (206.38)	8.071 (205)	7.981 (202.72)
10 (254)	10.482 (266.24)	10.42 (264.67)	10.42 (264.67)	10.25 (260.35)	10.136 (257.45)	10.20 (254.51)
12 (305)	12.438 (315.93)	12.39 (314.71)	12.39 (314.71)	12.25 (311.15)	12.09 (307.09)	11.938 (303.23)
14 (356)	—	13.5 (342.90)	13.624 (346.05)	13.376 (339.75)	13.25 (336.55)	13.124 (333.35)
16 (406)	—	15.5 (393.70)	15.624 (396.85)	15.376 (390.55)	15.25 (387.35)	15.0 (381.0)
18 (457)	—	17.5 (444.50)	17.624 (447.65)	17.376 (441.35)	17.126 (435.00)	16.976 (431.19)
20 (508)	—	19.5 (495.30)	19.564 (496.93)	19.25 (488.95)	19.0 (482.60)	18.814 (477.88)
24 (610)	—	23.5 (596.90)	23.5 (596.90)	23.25 (590.55)	22.876 (581.05)	22.626 (574.70)
Nominal Pipe Size	Schedule					
	40S	Standard	60	80	80S	XS
2 (51)	2.067 (52.501)	2.067 (52.50)	—	1.939 (49.25)	1.939 (49.25)	1.939 (49.25)
2½- (64)	2.469 (62.71)	2.469 (62.71)	—	2.323 (59.0)	2.323 (59.0)	2.323 (59.0)
3 (76)	3.068 (77.93)	3.068 (77.93)	—	2.90 (73.66)	2.90 (73.66)	2.90 (73.66)
4 (102)	4.026 (102.26)	4.026 (102.26)	—	3.826 (97.18)	3.826 (97.18)	3.826 (97.18)
6 (152)	6.065 (154.05)	6.065 (154.05)	—	5.761 (146.33)	5.761 (146.33)	5.761 (146.33)
8 (203)	7.981 (202.72)	7.981 (202.72)	7.813 (198.45)	7.625 (193.68)	7.625 (193.68)	7.625 (193.68)
10 (254)	10.02 (254.51)	10.20 (259.08)	9.75 (247.65)	9.564 (242.94)	9.75 (247.65)	9.75 (247.65)
12 (305)	12.0 (304.8)	12.00 (304.80)	11.626 (41.30)	11.376 (288.95)	11.75 (298.45)	11.75 (298.45)
14 (356)	—	13.250 (336.55)	12.814 (325.48)	12.50 (317.50)	—	13.0 (330.20)
16 (406)	—	15.250 (387.35)	14.688 (373.08)	14.314 (363.58)	—	15.0 (381.0)
18 (457)	—	17.250 (438.15)	16.5 (419.10)	16.126 (409.60)	—	17.0 (425.0)
20 (508)	—	19.252 (488.95)	18.376 (466.75)	17.938 (455.63)	—	19.0 (482.60)
24 (610)	—	23.250 (590.55)	22.064 (560.43)	21.564 (547.73)	—	23.0 (584.20)
Nominal Pipe Size	Schedule					
	100	120	140	160	XXS	
2 (51)	—	—	—	1.689 (42.9)	1.503 (38.18)	
2½- (64)	—	—	—	2.125 (53.98)	1.771 (44.98)	
3 (76)	—	—	—	2.624 (66.65)	2.30 (58.42)	
4 (102)	—	3.624 (92.005)	—	3.438 (87.33)	3.152 (80.06)	
6 (152)	—	5.501 (139.73)	—	5.189 (131.80)	4.897 (124.38)	
8 (203)	7.437 (188.90)	7.189 (157.15)	7.001 (177.83)	6.813 (173.05)	6.875 (174.63)	
10 (254)	9.314 (236.58)	9.064 (230.23)	8.75 (222.25)	8.50 (215.90)	—	
12 (305)	11.064 (281.03)	10.75 (273.05)	10.5 (266.70)	10.126 (257.20)	—	
14 (356)	12.126 (308.00)	11.814 (300.08)	11.5 (37.50)	11.188 (284.18)	—	
16 (406)	13.938 (354.03)	13.564 (344.53)	13.124 (333.35)	12.814 (325.48)	—	
18 (457)	15.688 (398.27)	15.25 (387.35)	14.876 (377.85)	14.438 (366.73)	—	
20 (508)	17.44 (443.98)	17.0 (431.80)	16.5 (410.10)	16.064 (408.03)	—	
24 (610)	20.938 (531.83)	20.376 (517.55)	19.876 (504.85)	19.314 (490.58)	—	

(1) Measurement is in inches (millimeters).

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Materials of Construction

1495 Orifice Plate

304/304L or 316/316L Stainless Steel ASTM A240; DIN 1.4571 (316Ti SST)⁽¹⁾; Alloy C-276 ASTM B575; or Alloy 400 ASTM B127.

(1) May not be available in all world areas.

Orifice Bore Sizes

Standard bore sizes are in $\frac{1}{8}$ -in. (3.2 mm) increments from $\frac{1}{2}$ -in. (12.7 mm) to 4-in. (101.6 mm) and in $\frac{1}{4}$ -in. (6.3 mm) increments from 4 $\frac{1}{4}$ to 6-in. (107.95 mm to 152.4 mm).

If required, Emerson Process Management can determine the orifice bore. Basic flow data is required at the time of order, see Calculation Data Sheet.

Bore tolerances are within AGA and ASME specifications.

Available options allow the user to have the Rosemount 1495 sized for specific operating conditions. The "1495PC Paddle Type Orifice Plate" on page 15 specifies the physical parameters of the orifice from a detailed sizing calculation.

1496 Flange Unions

Orifice Flanges (ANSI B16.36): Carbon Steel ASTM A105 / A350; Stainless Steel ASTM A182; Alloy C-276 ASTM B564/575; or Alloy 400 ASTM B564/127; DIN 1.4571 (316Ti SST)⁽¹⁾; DIN 1.0460 (carbon steel)⁽¹⁾.

(1) May not be available in all world areas.

Flange Mounting Hardware

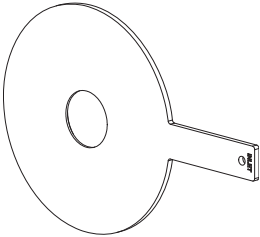
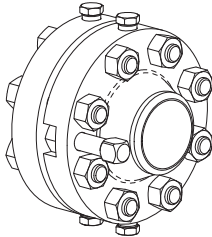
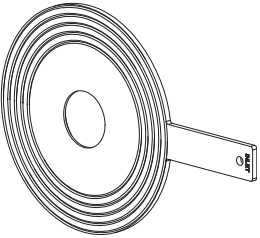
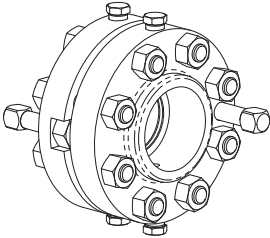
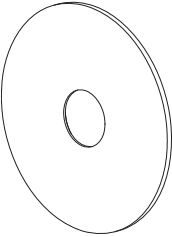
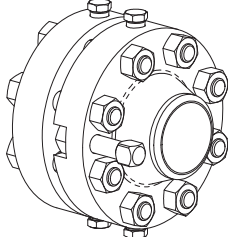
- Studs: Carbon Steel ASTM A193 Grade B7M
- Nuts: Carbon Steel ASTM A194 Gr 2H
- Gaskets: Non-asbestos ring type, Durlon® 8500 Green, Klingersil C4400, or equivalent
- Pipe Plugs: Match flange material

Pressure Taps

Pressure tap connections are $\frac{1}{2}$ -in. (12.7 mm) NPT and 180° apart as standard. The tap hole diameter is $\frac{1}{4}$ -in. (6.35 mm) for 2-in. (51 mm) and 2 $\frac{1}{2}$ -in. (63.5 mm) size, $\frac{3}{8}$ -in. (9.6 mm) for 3-in. (76.2 mm) size, and $\frac{1}{2}$ -in. (12.7 mm) for 4-in. (101.6 mm) and larger sizes.

Sizing and How to Order

When making a selection, move from left to right, selecting an option in Column 1 and/or Column 2.

	Column 1	Column 2
	Orifice Paddle Type	Flange Union
Paddle Type	1495 PC Paddle, square edged, concentric 	1496 WN Raised Face (RF) Weld Neck (for use with paddle type orifice plates) 
	1495 PG Paddle, square edged, concentric, spiral finish 	1496 SO / TH Raised Face (RF) Slip On / Threaded (for use with paddle type orifice plates) 
	Orifice Universal Type	Flange Union
Universal Type	1495 UC Universal, square edged, concentric 	1496 RJ Ring Type Joint (RTJ) Weld Neck (for use with universal orifice plates with plate holder) 

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	Column 1	Column 2
	Orifice Plate	Flange Union
	Choose Flange Rating: ANSI Class 300#, 600#, 900#, 1500#, or 2500# DIN flange ratings: PN10, PN16, PN25, PN40, PN63, PN100	ANSI Class 300#, 600#, 900#, 1500#, or 2500# DIN flange ratings: PN10, PN16, PN25, PN40, PN63, PN100
	Material: - SST 316/316L ASTM A240 - SST 304/304L ASTM A240 - SST 316Ti DIN 1.4571 - Alloy C-276 ASTM B575 - Alloy 400 ASTM B564	- CS ASTM A105 or ASTM A350 LF2 - SST 316/316L ASTM A182 - SST 304/304L ASTM A182 - SST 316Ti DIN 1.4571 - Alloy C-276 ASTM B564 - Alloy 400 ASTM B564
	Choose Line Size: 2 to 24-in. (50 to 600 mm) - Contact Emerson Process Management for lines less than 2-in. (51 mm)	2 to 24-in. (50 to 600 mm) - Contact Emerson Process Management for lines less than 2-in. (51 mm)
	Choose Plate Thickness: - Default is 0.125-in. (3.2 mm) for 2 to 6-in (50 to 150 mm) line size - Default is 0.250-in. (6.35 mm) for 8 to 14-in (200 to 350 mm) line size - Default is 0.375-in. (9.53) for 16 to 20-in. (400 to 500 mm) - Default is 0.500-in. (12.7 mm) for 24-in (600 mm) line size	Choose Flange Union Type: - Raised Face Weldneck (1496WN) - Raised Face Threaded (1496TH) - Raised Face Slip-On (1496SO) - RTJ weldneck (1496RJ) - Raised Face DIN Weldneck (1496DN)
	Choose Bore Diameter: Refer to Instrument Toolkit™ for orifice plate sizing. Or, Emerson Process Management will calculate the bore diameter by specifying option code BC in the 1495 ordering table. Include all of the flowing conditions and pipe information for the application on the CDS. See the "Calculation Data Sheet" for a detailed sizing calculation.	

Dimensional Drawings

1495 DIMENSIONAL DRAWINGS

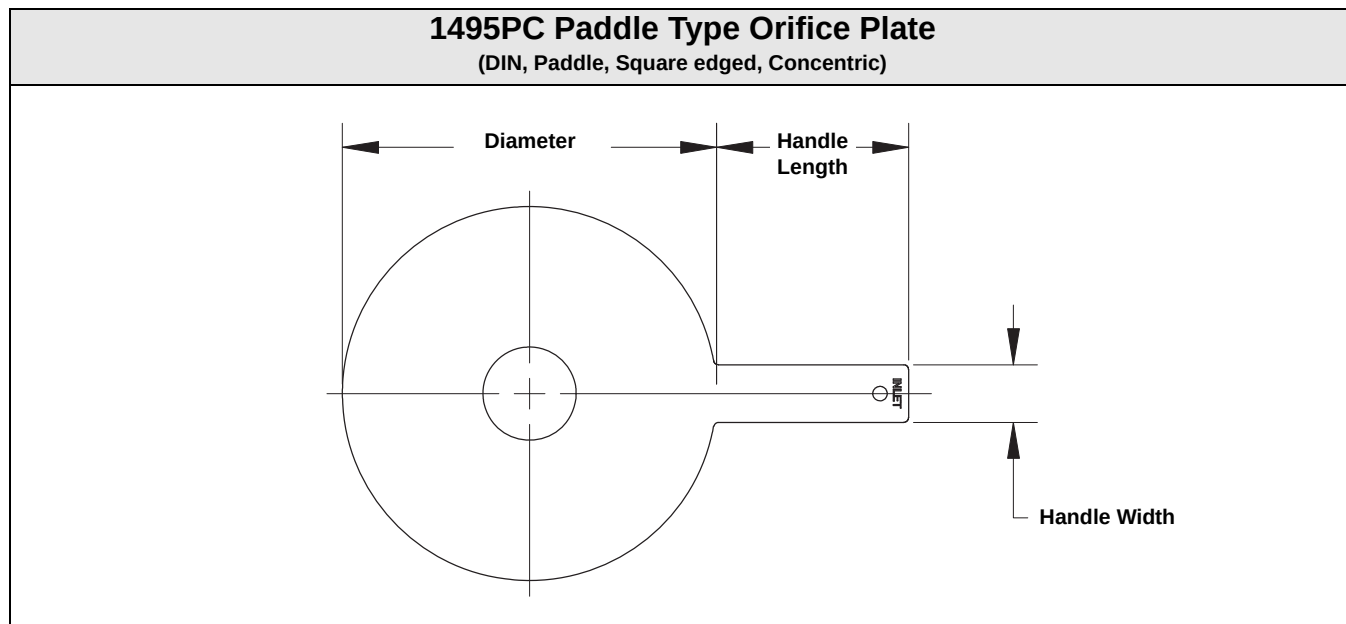


TABLE 7. 1495 Orifice Plate Dimensions⁽¹⁾

DN	Diameter (max) – by flange rating						Handle Width	Handle Length
	PN 10	PN 16	PN 25	PN 40	PN 63/64	PN 100		
DN 50	4.21 (107)	4.21 (107)	4.21 (107)	4.21 (107)	4.45 (113)	4.69 (119)	1.5 (40)	6.3 (160)
DN 65	5 (127)	5 (127)	5 (127)	5 (127)	5.43 (138)	5.67 (144)	1.5 (40)	6.3 (160)
DN 80	5.6 (142)	5.6 (142)	5.6 (142)	5.6 (142)	5.82 (148)	6.06 (154)	1.5 (40)	6.3 (160)
DN 100	6.38 (162)	6.38 (162)	6.61 (168)	6.61 (168)	6.85 (174)	7.09 (180)	1.5 (40)	6.3 (160)
DN 125	7.56 (192)	7.56 (192)	7.64 (194)	7.63 (194)	8.27 (210)	8.54 (217)	1.5 (40)	6.3 (160)
DN 150	8.58 (218)	8.58 (218)	8.82 (224)	8.82 (224)	9.72 (247)	10.12 (257)	1.5 (40)	6.3 (160)
DN 200	10.74 (273)	10.74 (273)	11.18 (284)	11.42 (290)	12.17 (309)	12.76 (324)	1.5 (40)	6.3 (160)
DN 250	12.91 (328)	12.95 (329)	13.39 (340)	13.86 (352)	14.33 (364)	15.39 (391)	1.5 (40)	6.3 (160)
DN 300	14.88 (378)	15.11 (384)	15.75 (400)	16.42 (417)	16.69 (424)	18.03 (458)	1.5 (40)	6.3 (160)
DN 350	17.24 (438)	17.48 (444)	17.99 (457)	18.66 (474)	19.13 (486)	20.16 (512)	1.5 (40)	6.3 (160)
DN 400	19.25 (489)	19.49 (495)	20.24 (514)	21.49 (546)	21.38 (543)	22.52 (572)	1.5 (40)	6.3 (160)
DN 450	21.22 (539)	21.85 (555)	22.24 (565)	22.48 (571)	Not Applicable	Not Applicable	1.5 (40)	6.3 (160)
DN 500	23.39 (594)	24.29 (617)	24.57 (624)	24.72 (628)	25.87 (657)	27.72 (704)	1.5 (40)	8.0 (200)
DN 600	27.36 (695)	28.9 (734)	28.78 (731)	29.41 (747)	30.08 (764)	32.01 (813)	1.5 (40)	8.0 (200)

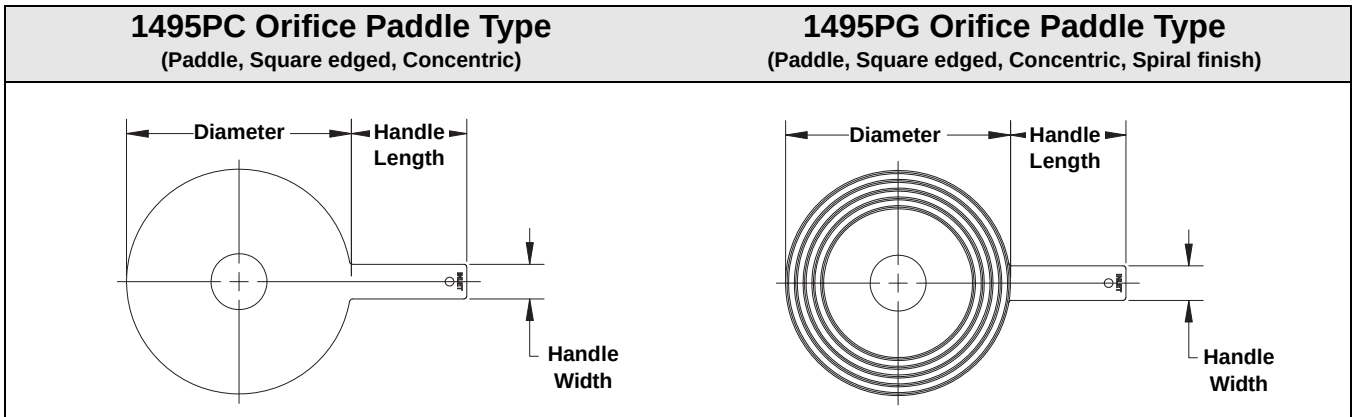
⁽¹⁾ Measurement is in inches (millimeters)

Rosemount 1495 and 1496

Product Data Sheet

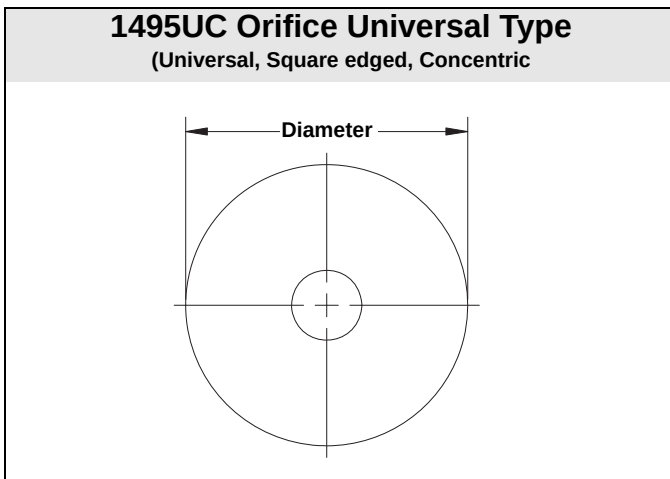
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Line Size	Diameter for Paddle Type ⁽¹⁾						Handle Length	Handle Width
	150#	300#	600#	900#	1500#	2500#		
2-in.	4.125 (104.78)	4.375 (111.13)	4.375 (111.13)	5.625 (142.875)	5.625 (142.875)	5.750 (146.05)	4.0 (101.6)	1.00 (25.4)
2½-in.	4.875 (123.82)	5.125 (130.18)	5.125 (130.18)	6.500 (165.1)	6.500 (165.1)	6.625 (168.275)	4.0 (101.6)	1.00 (25.4)
3-in.	5.375 (136.53)	5.875 (149.23)	5.875 (149.23)	6.625 (168.275)	6.875 (174.625)	7.750 (196.85)	4.0 (101.6)	1.00 (25.4)
4-in.	6.875 (174.63)	7.125 (180.98)	7.625 (193.675)	8.125 (206.375)	8.250 (209.55)	9.250 (234.95)	4.0 (101.6)	1.00 (25.4)
6-in.	8.750 (222.25)	9.875 (250.83)	10.500 (266.7)	11.375 (288.925)	11.125 (282.575)	12.500 (317.5)	4.0 (101.6)	1.00 (25.4)
8-in.	11.000 (279.4)	12.125 (307.98)	12.625 (320.675)	14.125 (358.775)	13.875 (352.425)	15.250 (387.35)	6.0 (127)	1.5 (38.1)
10-in.	13.375 (339.73)	14.250 (361.95)	15.750 (400.05)	17.125 (434.975)	17.125 (434.975)	18.750 (476.25)	6.0 (152.4)	1.5 (38.1)
12-in.	16.125 (409.58)	16.625 (422.26)	18.000 (457.2)	19.625 (498.475)	20.500 (520.7)	21.625 (549.275)	6.0 (152.4)	1.5 (38.1)
14-in.	17.750 (450.85)	19.125 (485.78)	19.375 (339.725)	20.500 (520.7)	22.750 (577.85)	—	6.0 (152.4)	1.5 (38.1)
16-in.	20.250 (514.35)	21.250 (539.75)	22.250 (565.15)	22.625 (574.675)	25.250 (641.35)	—	6.0 (152.4)	1.5 (38.1)
18-in.	21.500 (546.1)	23.375 (593.725)	24.000 (609.6)	25.000 (635.00)	27.625 (701.675)	—	6.0 (152.4)	1.5 (38.1)
20-in.	23.750 (603.25)	25.625 (650.875)	26.750 (679.45)	27.375 (695.325)	29.625 (752.475)	—	6.0 (152.4)	1.5 (38.1)
24-in.	28.125 (714.375)	30.375 (771.525)	31.000 (787.4)	32.875 (835.025)	35.500 (901.7)	—	6.0 (152.4)	1.5 (38.1)

(1) Measurement is in inches (millimeters)

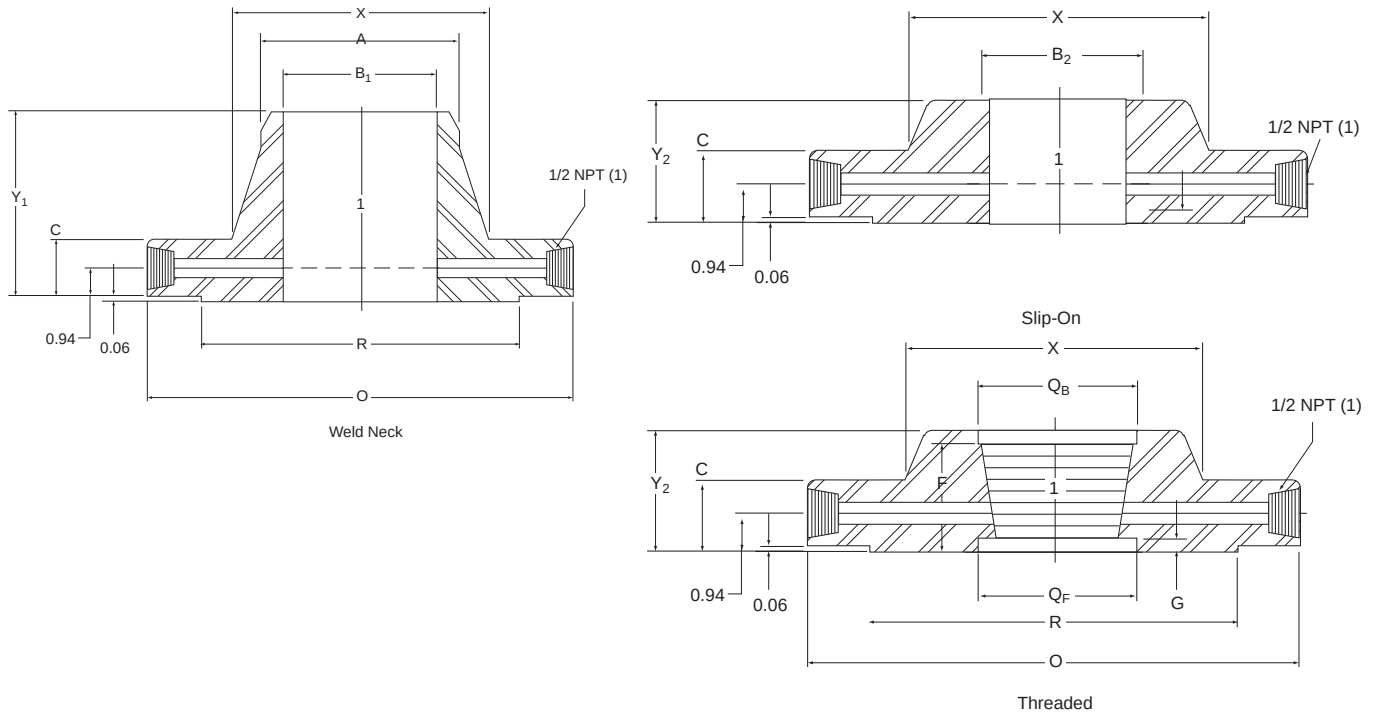


(1) Measurement is in inches (millimeters)

Line Size	Diameter for Universal Type ⁽¹⁾
2-in.	2.437 (61.8998)
2½-in.	2.812 (71.4248)
3-in.	3.437 (87.2998)
4-in.	4.406 (111.912)
6-in.	6.437 (163.5)
8-in.	8.437 (214.3)
10-in.	10.687 (271.45)
12-in.	12.593 (319.862)
14-in.	14.000 (355.6)
16-in.	16.000 (406.4)
18-in.	18.000 (457.2)
20-in.	20.000 (508)
24-in.	24.000 (609.6)

1496 DIMENSIONAL DRAWINGS

FIGURE 3. Class 300



ASME B16.36-1996

TABLE 8. Class 300 Orifice Flanges, Welding Neck, Slip-On, and Threaded⁽¹⁾⁽²⁾

Nominal Pipe Size	Outside Diameter of Raised Face R	Outside Diameter of Flange O	Thickness of Flange, Min. C	Length Through Hub		Diameter of Hub X	Hub Diameter Beginning of Chamfer (W.N.) A	Diameter of Counter-bore		Counter-bore Depth (From Face)		Bore	
				Slip-On and Threaded Y ₂	Weld Neck Y ₁			Back Q _B	Face Q _F	F	G	Slip-On B ₂	Weld Neck B ₁
1	2.00	4.88	1.50	1.88	3.25	2.12	1.32	1.41	1.30	1.44	0.75	1.36	See Note ⁽⁵⁾
1½	2.88	6.12	1.50	1.88	3.38	2.75	1.90	1.99	1.89	1.47	0.72	1.95	
2	3.62	6.50	1.50	1.94	3.38	3.31	2.38	2.50	2.36	1.50	0.69	2.44	
2½	4.12	7.50	1.50	2.00	3.50	3.94	2.88	3.00	2.84	1.75	0.56	2.94	
3	5.00	8.25	1.50	2.06	3.50	4.62	3.50	3.63	3.46	1.81	0.56	3.57	
4	6.19	10.00	1.50	2.12	3.62	5.75	4.50	4.63	4.45	1.88	0.56	4.57	
6	8.50	12.50	1.50	2.12	3.94	8.12	6.63	6.75	6.57	1.88	0.31	6.72	
8	10.62	15.00	1.62	2.44	4.38	10.25	8.63	8.75	8.55	2.19	0.44	8.72	
10	12.75	17.50	1.88	2.62	4.62	12.62	10.75	See Note ⁽⁶⁾ .				10.88	
12	15.00	20.50	2.00	2.88	5.12	14.75	12.75					12.88	
14	16.25	23.00	2.12	3.00	5.62	16.75	14.00					14.14	
16	18.50	25.50	2.25	3.25	5.75	19.00	16.00					16.16	
18	21.00	28.00	2.38	3.50	6.25	21.00	18.00					18.18	
20	23.00	30.50	2.50	3.75	6.38	23.12	20.00					20.20	
24	27.25	36.00	2.75	4.19	6.62	27.62	24.00					24.25	

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Nominal Pipe Size (1)(2)	Diameter of Pressure Connection TT	Drilling Template				Bolt Length (3)(4)	
		Bolt Circle	Number of Holes	Diameter of Holes	Diameter of Bolts	Machine Bolts	Stud Bolts
1	$\frac{1}{4}$	3.50	4	0.69	$\frac{5}{8}$	4.50	5.00
1 $\frac{1}{2}$	$\frac{1}{4}$	4.50	4	0.81	$\frac{3}{4}$	4.75	5.25
2	$\frac{1}{4}$	5.00	8	0.69	$\frac{5}{8}$	4.50	5.00
2 $\frac{1}{2}$	$\frac{1}{4}$	5.88	8	0.81	$\frac{3}{4}$	4.75	5.25
3	$\frac{3}{8}$	6.62	8	0.81	$\frac{3}{4}$	4.75	5.25
4	$\frac{1}{2}$	7.88	8	0.81	$\frac{3}{4}$	4.75	5.25
6	$\frac{1}{2}$	10.62	12	0.88	$\frac{3}{4}$	4.75	5.25
8	$\frac{1}{2}$	13.00	12	1.00	$\frac{7}{8}$	5.00	5.75
10	$\frac{1}{2}$	15.25	16	1.12	1	5.75	6.50
12	$\frac{1}{2}$	17.75	16	1.25	1 $\frac{1}{8}$	6.25	7.00
14	$\frac{1}{2}$	20.25	20	1.25	1 $\frac{1}{8}$	6.50	7.25
16	$\frac{1}{2}$	22.50	20	1.38	1 $\frac{1}{4}$	7.00	7.75
18	$\frac{1}{2}$	24.75	24	1.38	1 $\frac{1}{4}$	7.25	8.00
20	$\frac{1}{2}$	27.00	24	1.38	1 $\frac{1}{4}$	7.50	8.50
24	$\frac{1}{2}$	32.00	24	1.62	1 $\frac{1}{2}$	8.25	9.50

- (1) Weld neck flanges NPS 3 and smaller are identical to Class 600 flanges and may be so marked.
(2) All other dimensions are in accordance with ASME B16.5.
(3) Bolt lengths include allowance for orifice and gasket thickness of 0.25 in. for NPS 1-12 and 0.38 in. for NPS 14-24.
(4) In conformance with ASME B16.5, stud bolt lengths do not include point heights.
(5) Threaded flanges are furnished in NPS 1-8 only.
(6) Bore diameter of weld neck flanges is to be specified by the purchaser.

FIGURE 4. Class 600

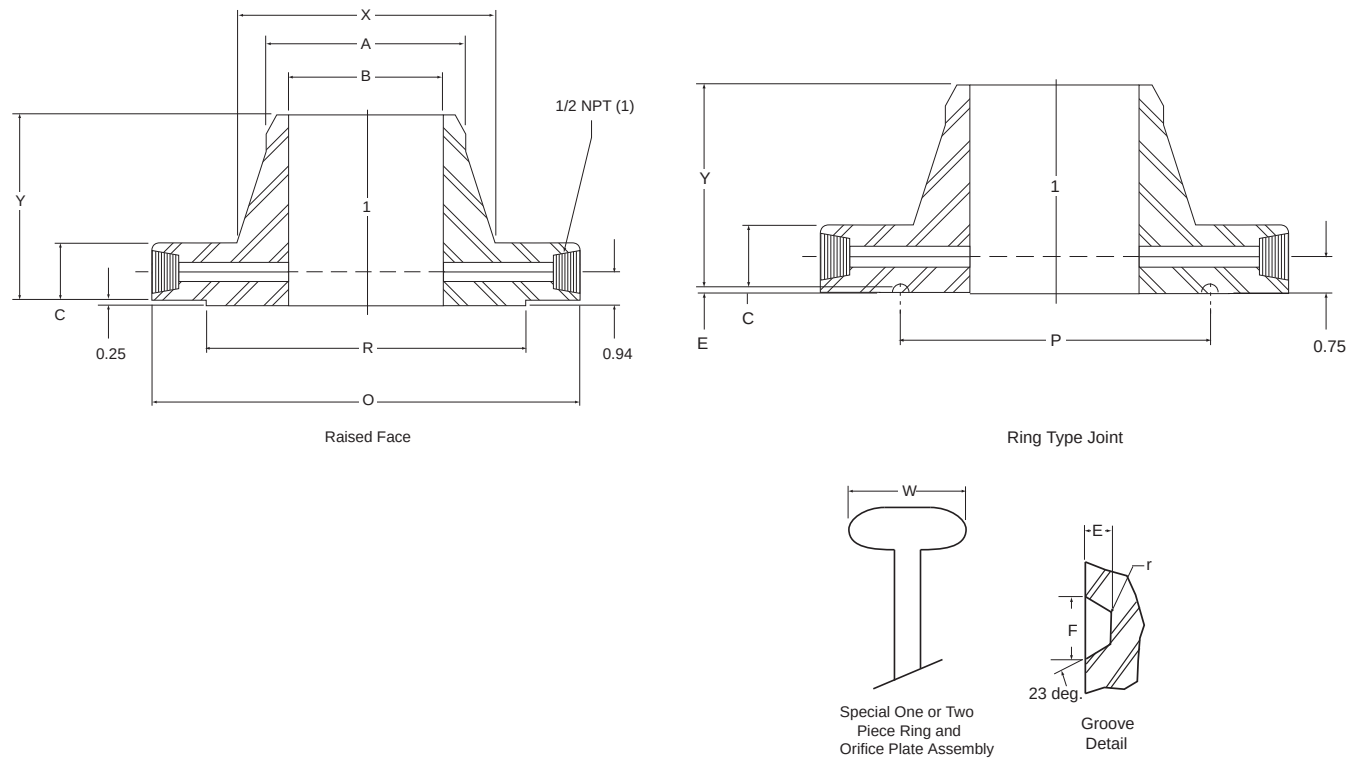


TABLE 9. Class 600 Orifice Flanges, Welding Neck⁽¹⁾⁽²⁾

Nominal Pipe Size	Outside Diameter of Raised Face R	Outside Diameter of Flange O	Thickness of Flange, Min. C	Length Through Hub Y	Height of Raised Face H	Ring Type Joint						Diameter of Hub X	Hub Diameter Beginning of Chamfer A
						Groove Number	Pitch Diameter P	Groove Depth E	Groove Width F	Radius at Bottom r_{max}	Special Oval Ring Height W		
1	2.00	4.88	1.44	3.19	0.06	R16	2.000	0.250	0.344	0.03	1.00	2.12	1.32
1½	2.88	6.12	1.44	3.32	0.06	R20	2.688	0.250	0.344	0.03	1.00	2.75	1.90
2	3.62	6.50	1.44	3.32	0.06	R23	3.250	0.312	0.469	0.03	1.06	3.31	2.38
2½	4.12	7.50	1.44	3.44	0.06	R26	4.000	0.312	0.469	0.03	1.06	3.94	2.88
3	5.00	8.25	1.44	3.44	0.06	R31	4.875	0.312	0.469	0.03	1.06	4.62	3.50
4	6.19	10.75	1.50	4.00	0.25	R37	5.875	0.312	0.469	0.03	1.06	6.00	4.50
6	8.50	14.00	1.88	4.62	0.25	R45	8.312	0.312	0.469	0.03	1.06	8.75	6.63
8	10.62	16.50	2.19	5.25	0.25	R49	10.625	0.312	0.469	0.03	1.06	10.75	8.63
10	12.75	20.00	2.50	6.00	0.25	R53	12.750	0.312	0.469	0.03	1.06	13.50	10.75
12	15.00	22.00	2.62	6.12	0.25	R57	15.000	0.312	0.469	0.03	1.06	15.75	12.75
14	16.25	23.75	2.75	6.50	0.25	R61	16.500	0.312	0.469	0.03	1.06	17.00	14.00
16	18.50	27.00	3.00	7.00	0.25	R65	18.500	0.312	0.469	0.03	1.19	19.50	16.00
18	21.00	29.25	3.25	7.25	0.25	R69	21.000	0.312	0.469	0.03	1.19	21.50	18.00
20	23.00	32.00	3.50	7.50	0.25	R73	23.000	0.375	0.531	0.06	1.25	24.00	20.00
24	27.25	37.00	4.00	8.00	0.25	R77	27.250	0.438	0.656	0.06	1.44	28.25	24.00

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(1)(2) Nominal Pipe Size	Bore B	Diameter of Pressure Conn- ection TT	Drilling Template				Diameter of Bolts	Length of Stud Bolts ⁽³⁾⁽⁴⁾					
			Bolt Circle	Number of Holes	Diameter of Holes			Raised Face	Ring Joint	Raised Face	Ring Joint		
1	See Note ⁽⁵⁾ .	¹ / ₄	3.50	4	0.69	0.75	⁵ / ₈	5.00	5.50				
1 ¹ / ₂		¹ / ₄	4.50	4	0.81	0.88	³ / ₄	5.25	5.50				
2		¹ / ₄	5.00	8	0.69	0.75	⁵ / ₈	5.00	5.50				
2 ¹ / ₂		¹ / ₄	5.88	8	0.81	0.88	³ / ₄	5.25	5.75				
3		³ / ₈	6.62	8	0.81	0.88	³ / ₄	5.25	5.75				
4		¹ / ₂	8.50	8	1.00	1.00	⁷ / ₈	6.00	6.50				
6		¹ / ₂	11.50	12	1.12	1.12	1	7.00	7.50				
8		¹ / ₂	13.75	12	1.25	1.25	1 ¹ / ₈	7.75	8.25				
10		¹ / ₂	17.00	16	1.38	1.38	1 ¹ / ₄	8.75	9.25				
12		¹ / ₂	19.25	20	1.38	1.38	1 ¹ / ₄	9.00	9.50				
14		¹ / ₂	20.75	20	1.50	1.50	1 ³ / ₈	9.50	10.00				
16		¹ / ₂	23.75	20	1.62	1.62	1 ¹ / ₂	10.25	10.75				
18		¹ / ₂	25.75	20	1.75	1.75	1 ⁵ / ₈	11.00	11.50				
20		¹ / ₂	28.50	24	1.75	1.75	1 ⁵ / ₈	11.75	12.50				
24		¹ / ₂	33.00	24	2.00	2.00	1 ⁷ / ₈	13.25	13.75				

(1) Weld neck flanges NPS 3 and smaller are identical to Class 300 flanges except for bolting and may be used for such service.

(2) All other dimensions are in accordance with ASME B16.5.

(3) Bolt lengths for raised face flanges include allowance for orifice and gasket thickness of 0.25 in. for NPS 1-12 and 0.38 in. for NPS 14-24. Bolt lengths for ring type joint flanges include allowance of 0.62 in. for NPS 1-10, 0.75 in. for NPS 12-18, and 0.88 in. for NPS 20.

(4) In conformance with ASME B16.5, stud bolt lengths do not include point heights.

(5) Bore is to be specified by the purchaser.

FIGURE 5. Class 900

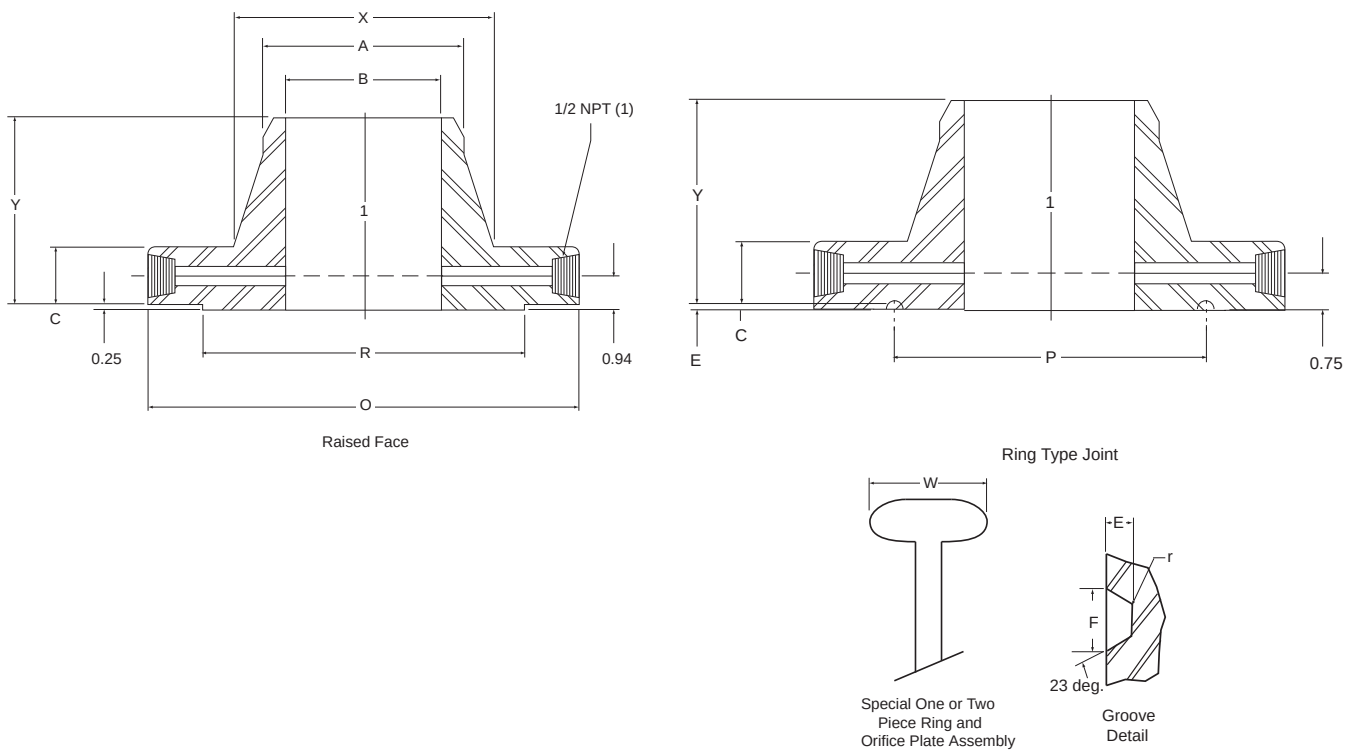


TABLE 10. Class 900 Orifice Flanges, Welding Neck⁽¹⁾

Nominal Pipe Size	Out- side Diameter of Raised Face R	Out- side Diameter of Flange O	Thickness of Flange, Min. C	Length Through Hub Y	Ring Type Joint						Diameter of Hub X	Hub Diameter Beginning of Chamfer A
					Groove Number	Pitch Diameter P	Groove Depth E	Groove Width F	Radius at Bottom r _{max}	Special Oval Ring Height W		
1	For Nominal Pipe Size (NPS) 2½ and smaller, use Class 1500.											
1½												
2												
2½												
3	5.00	9.50	1.50	4.00	R31	4.875	0.312	0.469	0.03	1.06	5.00	3.50
4	6.19	11.50	1.75	4.50	R37	5.875	0.312	0.469	0.03	1.06	6.25	4.50
6	8.50	15.00	2.19	5.50	R45	8.312	0.312	0.469	0.03	1.06	9.25	6.63
8	10.62	18.50	2.50	6.38	R49	10.625	0.312	0.469	0.03	1.06	11.75	8.63
10	12.75	21.50	2.75	7.25	R53	12.750	0.312	0.469	0.03	1.06	14.50	10.75
12	15.00	24.00	3.12	7.88	R57	15.000	0.312	0.469	0.03	1.06	16.50	12.75
14	16.25	25.25	3.38	8.38	R62	16.500	0.438	0.656	0.06	1.31	17.75	14.00
16	18.50	27.75	3.50	8.50	R66	18.500	0.438	0.656	0.06	1.44	20.00	16.00
18	21.00	31.00	4.00	9.00	R70	21.000	0.500	0.781	0.06	1.56	22.25	18.00
20	23.00	33.75	4.25	9.75	R74	23.000	0.500	0.781	0.06	1.56	24.50	20.00
24	27.25	41.00	5.50	11.50	R78	27.250	0.625	1.062	0.09	1.88	29.50	24.00

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(1) Nominal Pipe Size	Bore B	Diameter of Pressure Connection TT	Drilling Template				Length of Stud Bolts ⁽²⁾⁽³⁾			
			Diameter of Bolt Circle	Number of Holes	Diameter of Holes	Diameter of Bolts	Raised Face	Ring Joint		
1	For Nominal Pipe Size (NPS) 2½ and smaller, use Class 1500.									
1½										
2										
2½										
3	See Note ⁽⁴⁾ .	¾	7.50	8	7.50	7/8	6.00	6.50		
4		½	9.25	8	9.25	1 1/8	7.00	7.50		
6		½	12.50	12	12.50	1 1/8	7.75	8.25		
8		½	15.50	12	15.50	1 3/8	9.00	9.50		
10		½	18.50	16	18.50	1 3/8	9.50	10.00		
12		½	21.00	20	21.00	1 3/8	10.25	10.75		
14		½	22.00	20	22.00	1½	11.00	11.50		
16		½	24.25	20	24.25	1 5/8	11.50	12.00		
18		½	27.00	20	27.00	1 7/8	13.00	13.75		
20		½	29.50	20	29.50	2	14.00	14.75		
24		½	35.50	20	35.50	2½	17.50	18.50		

(1) All other dimensions are in accordance with ASME B16.5.

(2) In conformance with ASME B16.5, stud bolt lengths do not include point heights.

(3) Bolt lengths for raised face flanges include allowance for orifice and gasket thickness of 0.25 in. for NPS 3-12 and 0.38 in. for NPS 14-24. Bolt lengths for ring type joint flanges include allowance of 0.62 in. for NPS 3-10 and 0.75 in. for NPS 12.

(4) Bore is to be specified by the purchaser.

FIGURE 6. Class 1500

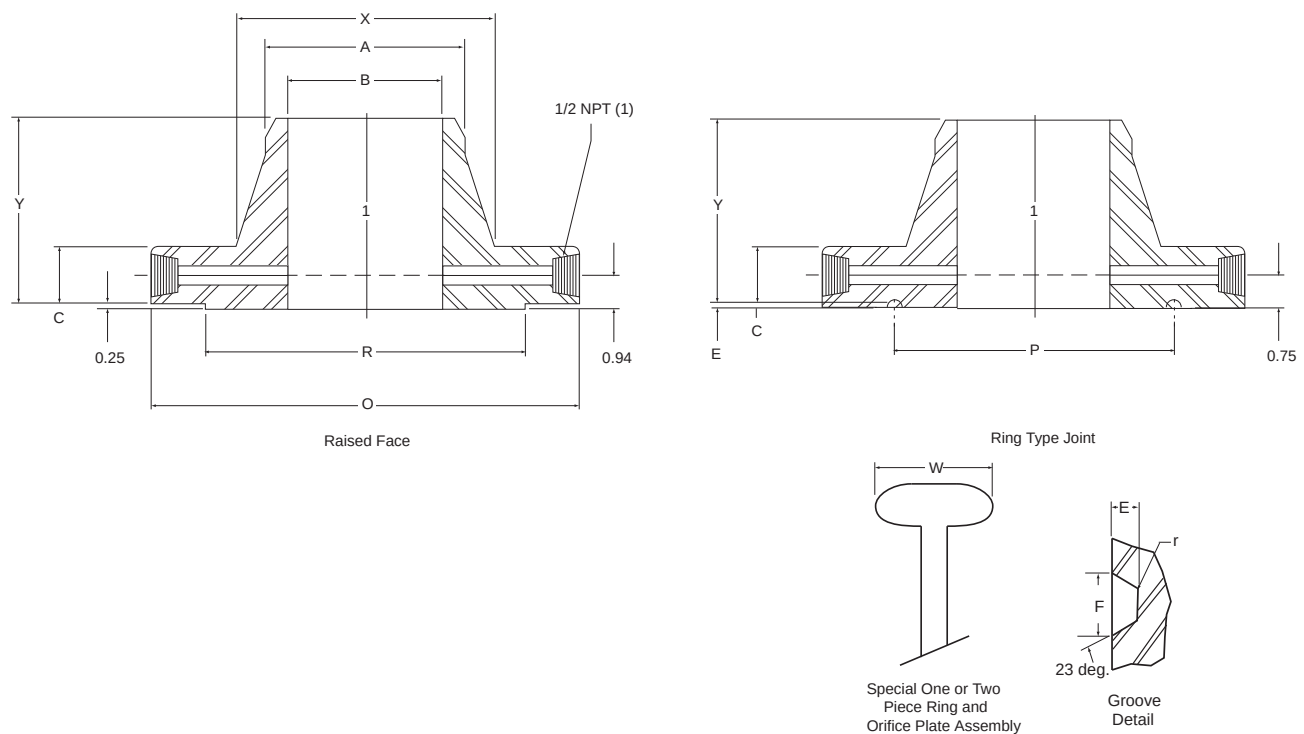


TABLE 11. Class 1500 Orifice Flanges, Welding Neck⁽¹⁾

Nominal Pipe Size	Out-side Diameter of Raised Face R	Out-side Diameter of Flange O	Thickness of Flange, Min. C	Length Through Hub Y	Ring Type Joint						Diameter of Hub X	Hub Diameter Beginning of Chamfer A
					Groove Number	Pitch Diameter P	Groove Depth E	Groove Width F	Radius at Bottom r_{max}	Special Oval Ring Height W		
1	2.00	5.88	1.50	3.25	R16	2.000	0.250	0.344	0.03	1.00	2.06	1.32
1½	2.88	7.00	1.50	3.50	R20	2.688	0.250	0.344	0.03	1.00	2.75	1.90
2	3.62	8.50	1.50	4.00	R24	3.750	0.312	0.469	0.03	1.06	4.12	2.38
2½	4.12	9.62	1.62	4.12	R27	4.250	0.312	0.469	0.03	1.06	4.88	2.88
3	5.00	10.50	1.88	4.62	R35	5.375	0.312	0.469	0.03	1.06	5.25	3.50
4	6.19	12.25	2.12	4.88	R39	6.375	0.312	0.469	0.03	1.06	6.38	4.50
6	8.50	15.50	3.25	6.75	R46	8.312	0.375	0.531	0.06	1.12	9.00	6.63
8	10.62	19.00	3.62	8.38	R50	10.625	0.438	0.656	0.06	1.31	11.50	8.63
10	12.75	23.00	4.25	10.00	R54	12.750	0.438	0.656	0.06	1.31	14.50	10.75
12	15.00	26.50	4.88	11.12	R58	15.000	0.562	0.806	0.06	1.56	17.75	12.75
14	16.25	29.50	5.25	11.75	R63	16.500	0.625	1.062	0.09	1.75	19.50	14.00
16	18.50	32.50	5.75	12.25	R67	18.500	0.688	1.188	0.09	2.00	21.75	16.00
18	21.00	36.00	6.38	12.88	R71	21.000	0.688	1.188	0.09	2.00	23.50	18.00
20	23.00	38.75	7.00	14.00	R75	23.000	0.688	1.312	0.09	2.12	25.25	20.00
24	27.25	46.00	8.00	16.00	R79	27.250	0.812	1.438	0.09	2.31	30.00	24.00

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(1) Nominal Pipe Size	Bore B	Diameter of Pressure Conn- ection TT	Drilling Template				Length of Stud Bolts ⁽²⁾⁽³⁾			
			Diameter of Bolt Circle	Number of Holes	Diameter of Holes	Diameter of Bolts	Raised Face	Ring Joint		
1	See Note (4).	¹ / ₄	4.00	4	1.00	⁷ / ₈	6.00	6.25		
¹ / ₂		¹ / ₄	4.88	4	1.12	1	6.25	6.50		
2		¹ / ₄	6.50	8	1.00	⁷ / ₈	6.00	6.50		
2 ¹ / ₂		¹ / ₄	7.50	8	1.12	1	6.50	7.00		
3		³ / ₈	8.00	8	1.25	1 ¹ / ₈	7.25	7.25		
4		¹ / ₂	9.50	8	1.38	1 ¹ / ₄	8.00	8.50		
6		¹ / ₂	12.50	12	1.50	1 ³ / ₈	10.50	11.00		
8		¹ / ₂	15.50	12	1.75	1 ⁵ / ₈	11.75	12.25		
10		¹ / ₂	19.00	12	2.00	1 ⁷ / ₈	13.50	14.00		
12		¹ / ₂	22.50	16	2.12	2	15.00	15.75		
14		¹ / ₂	25.00	16	2.38	2 ¹ / ₄	16.25	17.52		
16		¹ / ₂	27.75	16	2.62	2 ¹ / ₂	17.75	19.00		
18		¹ / ₂	30.50	16	2.88	2 ³ / ₄	19.75	21.00		
20		¹ / ₂	32.75	16	3.12	3	21.50	22.50		
24		¹ / ₂	39.00	16	3.62	3 ¹ / ₂	24.50	26.00		

(1) All other dimensions are in accordance with ASME B16.5.

(2) Bolt lengths for raised face flanges include allowance for orifice and gasket thickness of 0.25 in. for NPS 1-12 and 0.38 in. for NPS 14-24. Bolt lengths for ring type joint flanges include allowance of 0.62 in. for NPS 1-10, 0.75 in. for NPS 12-18, and 0.88 in. for NPS 20.

(3) In conformance with ASME B16.5, stud bolt lengths do not include point heights.

(4) Bore is to be specified by the purchaser.

FIGURE 7. Class 2500

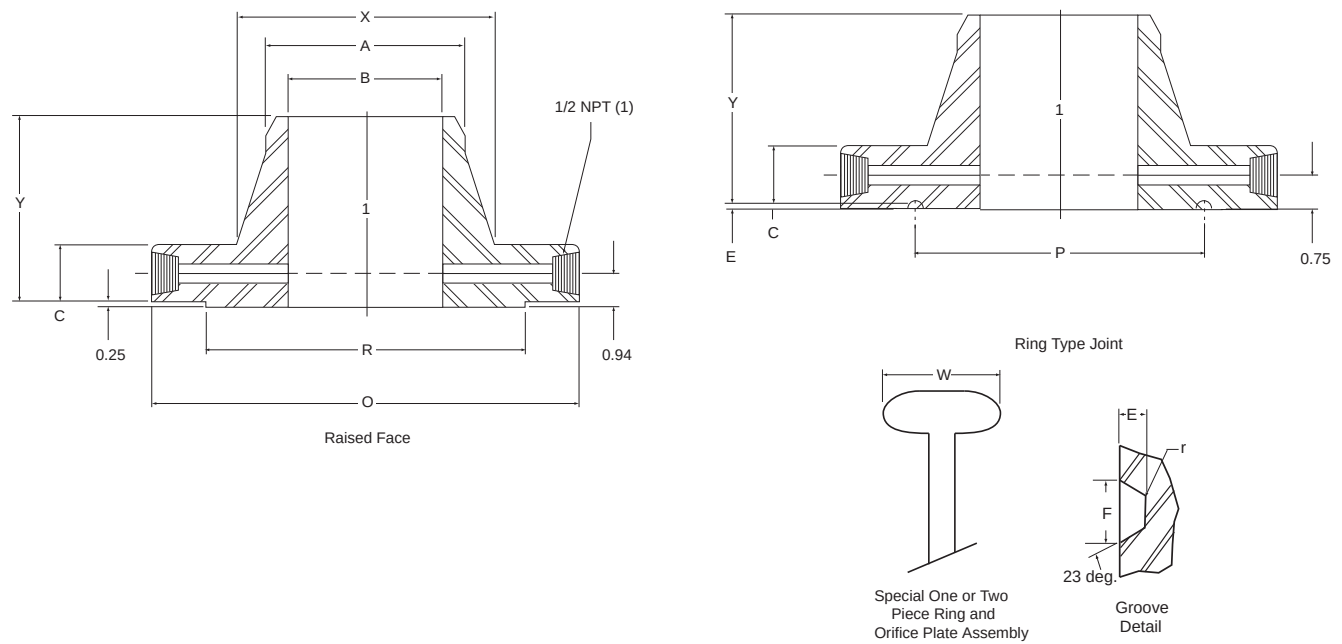


TABLE 12. Class 2500 Orifice Flanges, Welding Neck⁽¹⁾

Nominal Pipe Size	Out-side Diameter of Raised Face R	Out-side Diameter of Flange O	Thickness of Flange, Min. C	Length Through Hub Y	Ring Type Joint						Diam-eter of Hub X	Hub Diameter Beginning of Chamfer A
					Groove Number	Pitch Diameter P	Groove Depth E	Groove Width F	Radius at Bottom r_{max}	Special Oval Ring Height W		
1	2.00	6.25	1.50	3.62	R18	2.375	0.250	0.344	0.03	1.00	2.25	1.32
1.5	2.88	8.00	1.75	4.38	R23	3.250	0.312	0.469	0.03	1.06	3.12	1.90
2	3.62	9.25	2.00	5.00	R26	4.000	0.312	0.469	0.03	1.06	3.75	2.38
2.5	4.12	10.50	2.25	5.62	R28	4.375	0.375	0.531	0.06	1.19	4.50	2.88
3	5.00	12.00	2.62	6.62	R32	5.000	0.375	0.531	0.06	1.19	5.25	3.50
4	6.19	14.00	3.00	7.35	R38	6.188	0.438	0.656	0.06	1.31	6.50	4.50
6	8.50	19.00	4.25	10.75	R47	9.000	0.500	0.781	0.06	1.31	6.50	4.50
8	10.62	21.75	5.00	12.50	R51	11.000	0.562	0.906	0.06	1.56	12.00	8.63
10	12.75	26.50	6.50	16.50	R55	13.500	0.688	1.188	0.09	1.88	14.75	10.75
12	15.00	30.00	7.25	18.25	R60	16.000	0.688	1.312	0.09	2.00	17.38	12.75

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(1) Nominal Pipe Size	Bore B	Diameter of Pressure Conn- ection TT	Drilling Template				Length of Stud Bolts ⁽²⁾⁽³⁾			
			Diameter of Bolt Circle	Number of Holes	Diameter of Holes	Diameter of Bolts	Raised Face	Ring Joint		
1	See Note (4).	¹ / ₄	4.25	4	1.00	⁷ / ₈	6.00	6.25		
1.5		¹ / ₄	5.75	4	1.25	¹ / ₈	7.00	7.50		
2		¹ / ₄	6.75	8	1.12	1	7.25	7.75		
2.5		¹ / ₄	7.75	8	1.25	¹ / ₈	8.00	8.50		
3		³ / ₈	9.00	8	1.38	¹ / ₄	9.00	9.50		
4		¹ / ₂	10.75	8	1.62	¹ / ₂	10.25	10.75		
6		¹ / ₂	14.50	8	2.12	2	13.75	14.50		
8		¹ / ₂	17.25	12	2.12	2	15.25	16.00		
10		¹ / ₂	21.25	12	2.62	² / ₂	19.25	20.25		
12		¹ / ₂	24.38	12	2.88	² / ₄	21.25	22.50		

(1) All other dimensions are in accordance with ASME B16.5.

(2) Bolt lengths for raised face flanges include allowance for orifice and gasket thickness of 0.25 in. for NPS 1-12 and 0.38 in. for NPS 14-24. Bolt lengths for ring type joint flanges include allowance of 0.62 in. for NPS 1-10, 0.75 in. for NPS 12-18, and 0.88 in. for NPS 20.

(3) In conformance with ASME B16.5, stud bolt lengths do not include point heights.

(4) Bore is to be specified by the purchaser.

Calculation Data Sheet

This Calculation Data Sheet can be provided. The detailed sizing calculation may be done through the "Configuration Data Sheet".

ROSEMOUNT INC. 1495 ORIFICE PLATE CALCULATION DATA SHEET					
GENERAL DATA					
Customer:	Customer Name				
Project:	2010 Official Calculations				
S. O. No:	Sales Order Number				
P. O. No:	Customer P.O Number				
Calc. Date:	04/26/2010				
Model No:	1495PC080A3SA04625BC				
Tag No:	Tag Number				
PRODUCT DESCRIPTION					
Plate Type:	Square-edge	Tap Type:	Flange tapping		
Plate Material:	316 SST	Tap Location:	Upstream		
Drain/Vent Diameter:	None	Line Size:	8-inch		
Process Connection		Pipe Schedule:	40		
		Pipe Material:	Carbon Steel		
INPUT DATA					
Fluid Type:	Steam				
Fluid Description:					
Pipe I.D.	7.981	inch			
Pressure	60	psig	Base Pressure	14.6960001	psia
Temperature at Flow:	307.33	F	Base Temperature	59	F
Absolute Viscosity:	0.014093	cP			
Isentropic Exponent	1.317455				
Compressibility at Flow			Base Compressibility		
Density at Flow:	0.171328	lb/ft ³	Base Density		lb/ft ³
Flow Rates					
	Minimum:	6000	lb/hr		
	Normal:	8000	lb/hr		
	Maximum:	10000	lb/hr		
	Full Scale:	10000	lb/hr		
CALCULATED DATA (Calculation performed at normal conditions. DP in H ₂ O at 68 °F)					
Orifice Bore Size:	4.000	inch	Bore Reynolds Number (Normal):	894278.832	
DP at Min. Flow:	16.379	in H ₂ O at 68 °F	Pipe Reynolds Number (Normal):	448514.484	
DP at Normal Flow:	29.117	in H ₂ O at 68 °F	Gas Expansion Factor:	0.99538888	
DP at Max. Flow:	45.496	in H ₂ O at 68 °F	Permanent Pressure Loss:		
URV (DP at Full Scale):	45.496	in H ₂ O at 68 °F	at Normal Flow:	21.2294996	in H ₂ O at 68 °F
Drain/Vent Corr. Factor:	1		at Max Flow:	33.1710931	in H ₂ O at 68 °F
Beta:	0.50119		Velocity at Max. Flow:	46.6687791	ft/sec
Discharge Coefficient	0.60366		Minimum Accurate Flow:	2111.34891	lb/hr
Notes					
Calculation by VLB					
This report is provided according to the terms and conditions of the instrument Toolkit End-Use Customer License agreement. Version: 3.159 (Build 159) Printed on: 04/26/10 12:00					

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Rosemount 8800D Series Vortex Flowmeter

HART® AND FOUNDATION™ FIELD BUS PROTOCOLS

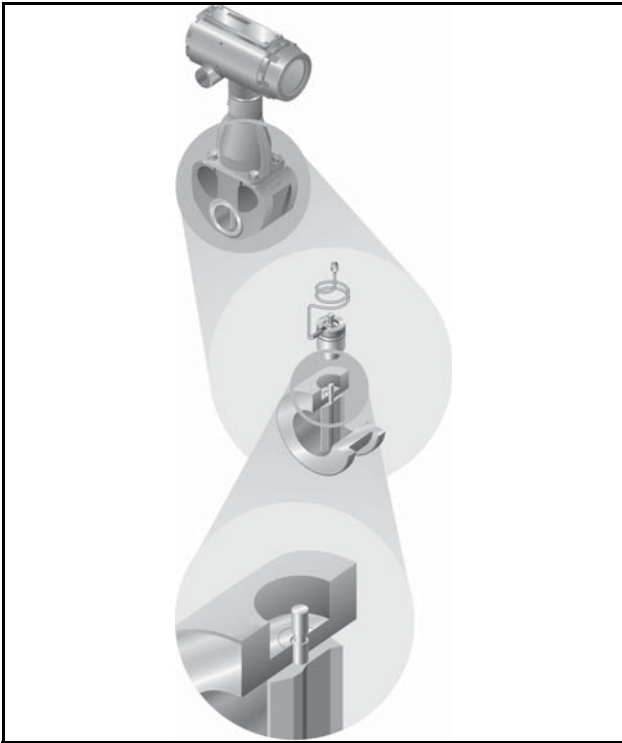
- Available with optional MultiVariable output and temperature compensated mass flow for saturated steam.
- Available in wafer, flanged, dual, reducer and high pressure designs.
- Available in Reducer™ Vortex which extends the measurable flow range, reduces installation costs, and minimizes project risk.
- All-welded, non-clog design eliminates ports and gaskets.
- Adaptive Digital Signal Processing (ADSP) provides vibration immunity and the ability to optimize the measurable flow range.
- With the unique isolated sensor design, the CriticalProcess™ Vortex allows for replacement without breaking the process seal.
- Simplified troubleshooting through device diagnostics and meter verification.



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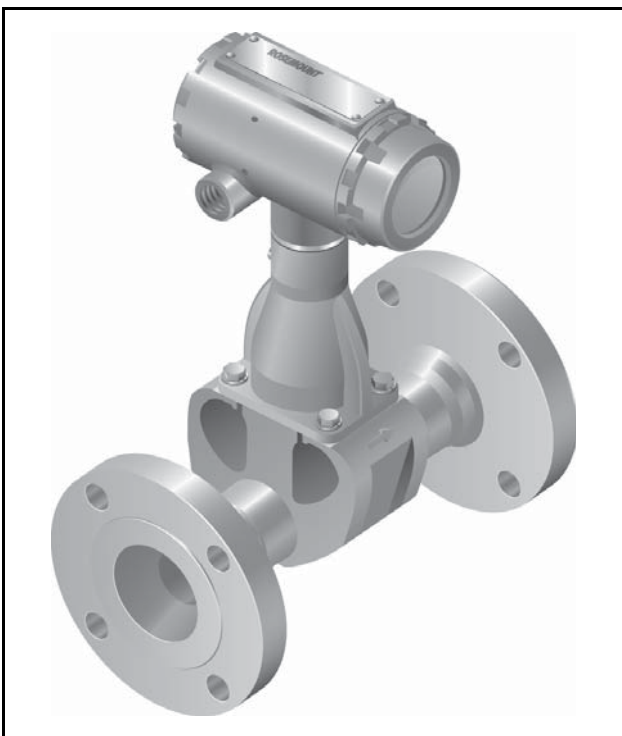
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THE ROSEMOUNT 8800D DELIVERS RELIABILITY



- **Rosemount Reliability** - The 8800D Vortex eliminates impulse lines, ports, and gaskets to improve reliability.
- **Non-clog Design** - Unique gasket-free construction which has no ports that can clog.
- **Vibration Immunity** - Mass Balancing of the sensor system, and Adaptive Digital Signal Processing (ADSP) provide Vibration immunity.
- **Replaceable Sensor** - The sensor is isolated from the process and can be replaced without breaking the process seals. All line sizes use the same sensor design allowing a single spare to serve every meter. The CriticalProcess Vortex enhances the ability to replace the sensor without shutting down the process.
- **Simplified Troubleshooting** - Device Diagnostics enable field verification of Meter Electronics and Sensor with no process shutdown.

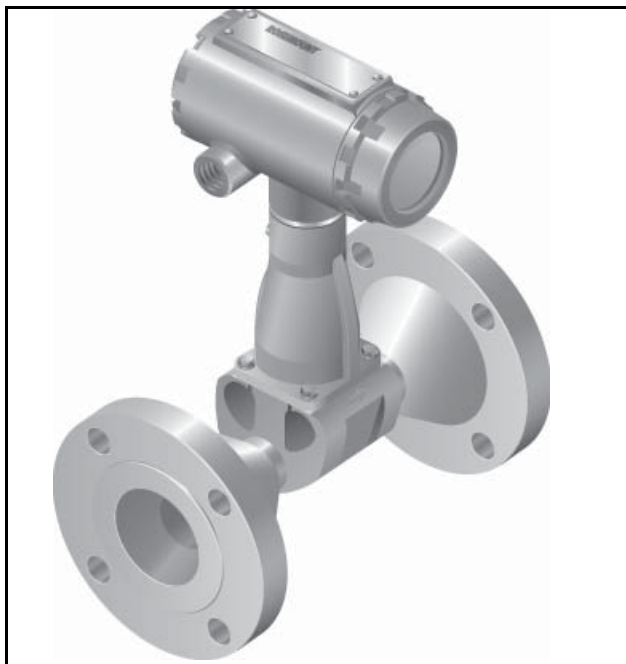
THE ROSEMOUNT 8800D OFFERING



- The 8800D is available in wafer style meter bodies for 1/2 through 8-in. line sizes, and ASME B16.5 (ANSI), DIN, or JIS flanged style meter bodies for 1/2 through 12-in. line sizes.
- Alignment rings, provided with each wafer-style flowmeter, ensure that the meter body is properly centered with the adjacent piping.
- The wafer, flanged, and weld end style meter bodies are available in 316 stainless steel and nickel alloy materials of construction.
- Available up to ASME class 1500 for 1 through 8-in. (25 mm through 200 mm) and ASME class 900 for 1/2-in. (15 mm) through 8-in. (200 mm).
- Available with FOUNDATION fieldbus functionality which includes Device Diagnostics and PlantWeb Alerts.

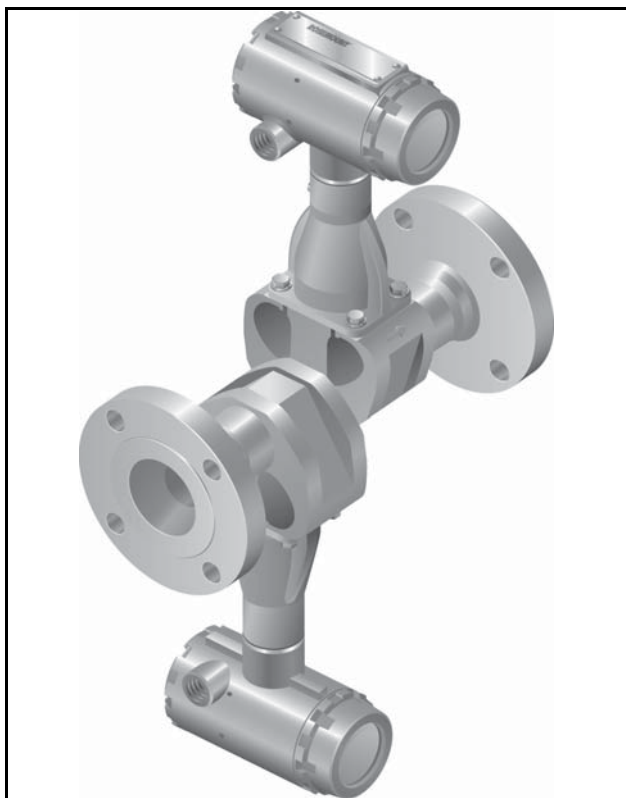


THE ROSEMOUNT 8800DR REDUCER VORTEX EXTENDS THE MEASURABLE FLOW RANGE AT A REDUCED COST



- **Rosemount Reliability** - Designed with same electronics, sensor, and meter body as the 8800D.
- **Reduced Cost** - Eliminates field assembly and welding of separate reducers and piping reducing installed cost by as much as 50%.
- **Extended Measurable Flow** - Low-end flow range is doubled with the Rosemount 8800DR Reducer Vortex.
- **Reduced Project Risk** - Reducer Vortex and the Standard Vortex have the same face-to-face dimension. As a result either meter can be used without affecting pipe layout.
- Available as flanged meter for 1 through 12-in. stainless steel and nickel alloy materials of construction.
- Available with FOUNDATION fieldbus functionality.

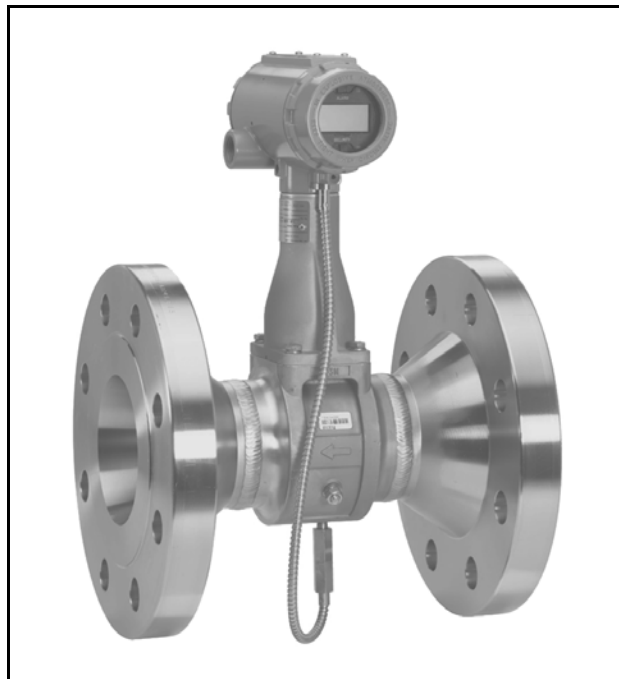
THE DUAL-SENSOR VORTEX FLOWMETER



- **Safety Integrated Systems (SIS)** - Ideal solution where redundant flow signals are required.
- **Rosemount Reliability** - Designed with same electronics, sensor, and meter body as the 8800D.
- **Redundant Flow Measurement** - Dual Vortex meter is constructed of two complete vortex meters: sensor, electronics, and shedder bar⁽¹⁾. The meters are welded together and flow calibrated to provide an accurate single flowmeter with two independent flow measurements.
- Available as flanged meter for 1/2 through 12-in. stainless steel and nickel alloy materials of construction.

(1) All 6-in. (150 mm) through 12-in. (300 mm) dual style vortex meters have a single shedder bar.

8800D MULTIVARIABLE VORTEX REDUCES INSTALLATION COSTS, SIMPLIFIES INSTALLATION, AND IMPROVES PERFORMANCE IN SATURATED STEAM



- MultiVariable Vortex Design**
 Incorporates temperature sensor into the vortex meter using the shedder bar as a thermowell, which keeps the vortex and temperature sensors isolated from process for easy verification and replacement.
- Temperature Compensated Capability for Saturated Steam**
 Calculates density from measured process temperature and uses the calculated density to provide a temperature compensated mass flow.
- Increased performance in Saturated Steam**
 Performance in saturated steam is improved due to the fact that the electronics will be compensating for changes in the process temperature.
- Reduces Installed Costs**
 MultiVariable Vortex eliminates the need for an external thermowell and temperature sensor.
- Output Options**
 Can map independent variables to analog output, pulse output, or HART burst variables.
- Available with Flow Computer for additional functionality**
 Integrate the MultiVariable Vortex with a pressure transmitter for full pressure and temperature compensation of superheated steam and various gases.
- Remote Mount Electronics**
 Also available with remote mounted electronics up to 75 ft. (23 m).

When you integrate the MultiVariable Vortex with a Rosemount Flow Computer, you get:

- Remote Communications
- Heat Calculations
- Remote Totalization
- Peak Demand Calculation
- Datalogging Capabilities

Please see Product Data Sheet 00813-0100-4005 for more information on the Rosemount Flow Computer.



ROSEMOUNT 8800D VORTEX FLOWMETER WITH FOUNDATION FIELDBUS

The software for the 8800D Flowmeter with FOUNDATION fieldbus permits remote testing and configuration using any FOUNDATION fieldbus-compliant host, such as the DeltaV system from Emerson Process Management.

Transducer Block

The transducer block calculates flow from sensor frequency. The calculation includes information about damping, shedding frequency, K-factor, process fluid, pipe ID, and diagnostics.

Resource Block

The resource block contains physical transmitter information, including available memory, manufacturer identification, device type, software tag, and unique identification.

Backup Link Active Scheduler (LAS)

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

The host or other configuration tool is used to download the schedule for the application to the link master device. In the absence of a primary link master, the transmitter will claim the LAS and provide permanent control for the H1 segment.

Diagnostics

The transmitter automatically performs continuous self-diagnostics. The user can perform on-line testing of the transmitter digital signal. Advanced simulation diagnostics are available. This enables remote verification of the electronics via a flow signal generator built into the electronics. The sensor strength value can be used to view the process flow signal and provide information regarding filter settings.

FOUNDATION Fieldbus Function Blocks

Analog Input

The AI function block processes the measurement and makes it available to other function blocks. The AI function block also allows filtering, alarming, and engineering unit changes.

The 8800D Flowmeter with FOUNDATION fieldbus comes standard with three AI function blocks (1 block for flow, 1 block for signal strength, and one block for future use with the MTA option).

Proportional/Integral/Derivative

The optional PID function block provides a sophisticated implementation of the universal PID algorithm. The PID function block features input for feed forward control, alarms on the process variable, and control deviation. The PID type (series or Instrument Society of America [ISA]) is user-selectable on the derivative filter.

Integrator

The standard integrator block is available for totalization of flow.

Setup

Basic setup requires connecting the transmitter to a fieldbus network or Field Communicator. The FOUNDATION fieldbus-compliant host will automatically establish communication with the device.

The Rosemount 8800D Flowmeter can be easily configured using the DeltaV system. User-configurable parameters include: tag, scaling and units, process fluid type, damping, fixed process density, pipe inside diameter (ID)⁽¹⁾, and fixed process temperature⁽¹⁾.

Tagging information can be entered into the transmitter to allow identification and a physical description. 32-character tags are provided for identification of the transmitter and each function block.

(1) Process temperature and pipe ID have known effects on the K-factor. The 8800D software automatically accounts for these effects by compensating the K-factor.

Specifications

The following specifications are for the Rosemount 8800D, Rosemount 8800DR, and Rosemount 8800DD, except where noted.

FUNCTIONAL SPECIFICATIONS

Process Fluids

Liquid, gas, and steam applications. Fluids must be homogeneous and single-phase.

Line Sizes

Wafer

1/2, 1, 1 1/2, 2, 3, 4, 6, and 8 inches
(DN 15, 25, 40, 50, 80, 100, 150, and 200)

Flanged and Dual-Sensor Style

1/2, 1, 1 1/2, 2, 3, 4, 6, 8, 10, and 12 inches
(DN 15, 25, 40, 50, 80, 100, 150, 200, 250, and 300)

Reducer

1, 1 1/2, 2, 3, 4, 6, 8, 10, and 12 inches
(DN 25, 40, 50, 80, 100, 150, 200, 250, and 300)

Pipe Schedules

Process piping Schedules 10, 40, 80, and 160.

NOTE

The appropriate bore diameter of the process piping must be entered using the Field Communicator or AMS Device Manager. Meters will be shipped from the factory at the Schedule 40 default value unless otherwise specified.

Measurable Flow Rates

Capable of processing signals from flow applications which meet the sizing requirements below.

To determine the appropriate flowmeter size for an application, process conditions must be within the Reynolds number and velocity limitations for the desired line size provided in Table 1, Table 2, and Table 3.

NOTE

Consult your local sales representative to obtain a computer sizing program that describes in greater detail how to specify the correct flowmeter size for an application.

The Reynolds number equation shown below combines the effects of density (ρ), viscosity (μ_{cp}), pipe inside diameter (D), and flow velocity (V).

$$R_D = \frac{VD\rho}{\mu_{cp}}$$

Table 1. Minimum Measurable Meter Reynolds Numbers

Meter Sizes (Inches / DN)	Reynolds Number Limitations
1/2 through 4/15 through 100	5000 minimum
6 through 12/150 through 300	

Table 2. Minimum Measurable Meter Velocities⁽¹⁾

	Feet per Second	Meters per Second
Liquids ⁽²⁾	$\sqrt{36/\rho}$	$\sqrt{54/\rho}$
Gases ⁽²⁾	$\sqrt{36/\rho}$	$\sqrt{54/\rho}$
The ρ is the process fluid density at flowing conditions in lb/ft ³ for ft/s and kg/m ³ for m/s		

(1) Velocities are referenced to schedule 40 pipe.

(2) This minimum measurable meter velocity is based on default filter settings.

Table 3. Maximum Measurable Meter Velocities⁽¹⁾
(Use the smaller of the two values)

	Feet per Second	Meters per Second
Liquids	$\sqrt{90,000/\rho}$ or 25	$\sqrt{134,000/\rho}$ or 7.6
Gases ⁽²⁾	$\sqrt{90,000/\rho}$ or 250	$\sqrt{134,000/\rho}$ or 76
The ρ is the process fluid density at flowing conditions in lb/ft ³ for ft/s and kg/m ³ for m/s		

(1) Velocities are referenced to schedule 40 pipe.

(2) Accuracy limitations for gas and steam for Dual-style meters (1/2-in. to 4-in.): max velocity of 100 ft/s (30.5 m/s).

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Process Temperature Limits

Standard

–40 to 450 °F (–40 to 232 °C)

Extended

–330 to 800 °F (–200 to 427 °C)

MultiVariable (MTA option)

–40 to 800 °F (–40 to 427 °C)

- Use above 450 °F (232 °C) requires Extended Sensor

Output Signals

4–20 mA Digital HART Signal

Superimposed on 4–20 mA signal

Optional Scalable Pulse Output

0 to 10000 Hz; transistor switch closure with adjustable scaling via HART communications; capable of switching up to 30 Vdc, 120 mA maximum

Digital FOUNDATION fieldbus signal

Completely digital output with FOUNDATION fieldbus communication (ITK 5.1 compliant).

Analog Output Adjustment

Engineering units and lower and upper range values are user-selected. Output is automatically scaled to provide 4 mA at the selected lower range value, 20 mA at the selected upper range value. No frequency input is required to adjust the range values.

Scalable Frequency Adjustment

The scalable pulse output can be set to a specific velocity, volume, or mass (i.e. 1 pulse = 1 lb). The scalable pulse output can also be scaled to a specific rate of volume, mass, or velocity (i.e. 100 Hz = 500 lb/hr).

Ambient Temperature Limits

Operating

–58 to 185 °F (–50 to 85 °C)

–4 to 185 °F (–20 to 85 °C) for flowmeters with local indicator

Storage

–58 to 250 °F (–50 to 121 °C)

–50 to 185 °F (–46 to 85 °C) for flowmeters with local indicator

Pressure Limits

Flange Style Meter

Rated for ASME B16.5 (ANSI) Class 150, 300, 600, 900, and 1500, DIN PN 10, 16, 25, 40, 64, 100, and 160, and JIS 10K, 20K, and 40K

Reducer Style Meter

Rated for ASME B16.5 (ANSI) Class 150, 300, 600, and 900, DIN PN 10, 16, 25, 40, 64, 100, and 160.

Dual Sensor Style Meter

Rated for ASME B16.5 (ANSI) Class 150, 300, 600, 900, and 1500, DIN PN 10, 16, 25, 40, 64, 100, and 160, and JIS 10K, 20K, and 40K

Wafer Style Meter

Rated for ASME B16.5 (ANSI) Class 150, 300, and 600, DIN PN 10, 16, 25, 40, 64, and 100, and JIS 10K, 20K, and 40K

NOTE:

All Wafer Style Meters are pressure rated and labeled at 1500 PSI / 10.34 MPa at 100 °F / 38 °C regardless of Alignment Ring Size code ordered.

Weld-End Style Meter

W1 Welds to Schedule 10 mating pipe
Max Working Pressure 720 psig (4.96 MPa-g)

W4 Welds to Schedule 40 mating pipe
Max Working Pressure 1440 psig (9.93 MPa-g)

W8 Welds to Schedule 80 mating pipe
Max Working Pressure 2160 psig (14.9 MPa-g)

W9 Welds to Schedule 160 mating pipe
Max Working Pressure 3600 psig (24.8 MPa-g)

NOTE:

1-in. (25 mm), and 1.5-in. (40 mm) weld to Schedule 80 mating pipe

Power Supply

HART Analog

External power supply required. Flowmeter operates on 10.8 to 42 Vdc terminal voltage (with 250-ohm minimum load required for HART communications, 16.8 Vdc power supply is required)

FOUNDATION fieldbus

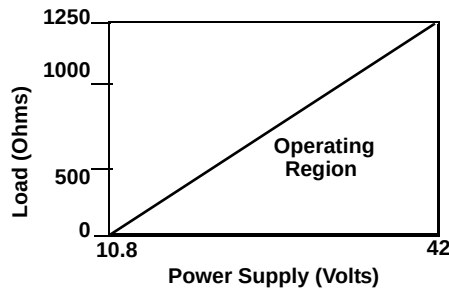
External power supply required. Flowmeter operates on 9 to 32 Vdc, 18 mA maximum.

Power Consumption

One watt maximum

Load Limitations (HART Analog)

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



$$R_{\max} = 41.7(V_{\text{ps}} - 10.8)$$

V_{ps} = Power Supply Voltage (Volts)

$R_{\max}$ = Maximum Loop Resistance (Ohms)

NOTE

HART Communication requires a minimum loop resistance of 250 ohms.

Optional LCD Indicator

The optional LCD indicator is capable of displaying:

- Primary Variable
- Velocity Flow
- Volumetric Flow
- Mass Flow
- Percent of Range
- Analog Output (if applicable)
- Totalizer (Output Code "D" and "P" Only)
- Shedding Frequency
- Pulse Output Frequency (if applicable)
- Electronics Temperature (Output Code "D" and "P" Only)
- Process Temperature (MTA Option Only)
- Calculated Process Density (MTA Option Only)

If more than one item is selected, the display will scroll through all items selected.

Enclosure Rating

FM Type 4X; CSA Type 4X; IP66

Permanent Pressure Loss

The approximate permanent pressure loss (PPL) from the Rosemount 8800D flowmeter is calculated for each application in the Vortex sizing software available from your local Rosemount representative. The PPL is determined using the equation:

$$PPL = \frac{A \times \rho_f \times Q^2}{D^4}$$

where:

PPL = Permanent Pressure loss (psi or kPa)

Where:

ρ_f = Density at operating conditions (lb/ft³ or kg/m³)

Q = Actual volumetric flow rate (Gas = ft³/min or m³/hr; Liquid = gal/min or l/min)

D = Flowmeter bore diameter (in. or mm)

A = Constant depending on meter style, fluid type and flow units. Determined per following table:

Table 4. Determining the PPL

Meter Style	English Units		SI Units	
	A_{Liquid}	A_{Gas}	A_{Liquid}	A_{Gas}
8800DF/W	3.4×10^{-5}	1.9×10^{-3}	0.425	118
8800DR	3.91×10^{-5}	2.19×10^{-3}	0.489	136
8800DD ⁽¹⁾	6.12×10^{-5}	3.42×10^{-3}	0.765	212

(1) For all 6-in. thru 12-in. line sizes A is the same for 8800DD and 8800DF

Minimum Upstream Pressure (Liquids)

Flow metering conditions that would allow cavitation, the release of vapor from a liquid, should be avoided. This flow condition can be avoided by remaining within the proper flow range of the meter and by following appropriate system design.

For some liquid applications, incorporation of a back pressure valve should be considered. To prevent cavitation, the minimum upstream pressure should be:

$$P = 2.9 \times \Delta P + 1.3 \times p_v \text{ or } P = 2.9 \times \Delta P + p_v + 0.5 \text{ psia} \\ (3.45 \text{ kPa}) \text{ (use the smaller of the two results)}$$

P = Line pressure five pipe diameters downstream of the meter (psia or kPa abs)

ΔP = Pressure loss across the meter (psi or kPa)

p_v = Liquid vapor pressure at operating conditions (psia or kPa abs)

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Failure Mode Alarm

HART Analog

If self-diagnostics detect a gross flowmeter failure, the analog signal will be driven to the values below:

Low	3.75
High	22.6
NAMUR Low	3.60
NAMUR High	22.6

High or low alarm signal is user-selectable through the fail mode alarm jumper on the electronics. NAMUR-compliant alarm limits are available through the C4 or CN Option. Alarm type is field configurable also.

FOUNDATION fieldbus

The AI block allows the user to configure the alarm to HI-HI, HI, LO, or LO-LO with a variety of priority levels.

Saturation Output Values

When the operating flow is outside the range points, the analog output continues to track the operating flow until reaching the saturation value listed below; the output does not exceed the listed saturation value regardless of the operating flow. The NAMUR-Compliant Saturation Values are available through the C4 or CN option. Saturation type is field configurable.

Low	3.9
High	20.8
NAMUR Low	3.8
NAMUR High	20.5

Damping

Flow Damping adjustable between 0.2 and 255 seconds.

Process Temperature Damping adjustable between 0.4 and 32.0 seconds (MTA Option Only).

Response Time

Three vortex shedding cycles or 300 ms, whichever is greater, maximum required to reach 63.2% of actual input with the minimum damping (0.2 seconds).

Turn-on Time

HART Analog

Less than four (4) seconds plus the response time to rated accuracy from power up (less than 7 seconds with the MTA Option).

FOUNDATION fieldbus

Performance within specifications no greater than 10.0 seconds after power is applied.

Transient Protection

The optional transient terminal block prevents damage to the flowmeter from transients induced by lightning, welding, heavy electrical equipment, or switch gears. The transient protection electronics are located in the terminal block.

The transient terminal block meets the following specifications:
ASME B16.5 (ANSI)/IEEE C62.41 - 1980
(IEEE 587) Categories A, B
3 kA crest ($8 \times 20 \mu\text{s}$)
6 kV crest ($1.2 \times 50 \mu\text{s}$)
6 kV/0.5 kA (0.5 μs , 100 kHz, ring wave)

Security Lockout

When the security lockout jumper is enabled, the electronics will not allow you to modify parameters that affect flowmeter output.

Output Testing

Current Source

Flowmeter may be commanded to set the current to a specified value between 4 and 20 mA.

Frequency Source

Flowmeter may be commanded to set the frequency to a specified value between 0 and 10000 Hz.

Low Flow Cutoff

Adjustable over entire flow range. Below selected value, output is driven to 4 mA and zero pulse output frequency.

Humidity Limits

Operates in 0–95% relative humidity under noncondensing conditions (tested to IEC 60770, Section 6.2.11).

Overrange Capability

HART Analog

Analog signal output continues to 105 percent of span, then remains constant with increasing flow. The digital and pulse outputs will continue to indicate flow up to the upper sensor limit of the flowmeter and a maximum pulse output frequency of 10400 Hz.

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FOUNDATION fieldbus

For liquid process fluid type, the transducer block digital output will continue to a nominal value of 25 ft/s. After that, the status associated with the transducer block output will go to UNCERTAIN. Above a nominal value of 30 ft/s, the status will go to BAD.

For gas/steam service, the transducer block digital output will continue to a nominal value of 220 ft/s for 0.5 and 1.0-in. line sizes and a nominal value of 250 ft/s for 1.5–12-in. line sizes. After that, the status associated with the transducer block output will go to UNCERTAIN. Above a nominal value of 300 ft/s for all line sizes, the status will go to BAD.

Flow Calibration

Meter bodies are flow-calibrated and assigned a unique calibration factor (K-factor) at the factory. The calibration factor is entered into the electronics, enabling interchangeability of electronics and/or sensors without calculations or compromise in accuracy of the calibrated meter body.

Status (FOUNDATION fieldbus only)

If self-diagnostics detect a transmitter failure, the status of the measurement will inform the control system. Status may also set the PID output to a safe value.

Schedule Entries (FOUNDATION fieldbus only)

Six (6)

Links (FOUNDATION fieldbus only)

Twelve (12)

Virtual Communications Relationships (VCRs) (FOUNDATION fieldbus only)

Two (2) predefined (F6, F7)

Four (4) configured (see Table 5)

Table 5. Block Information

Block	Base Index	Execution Time (Milliseconds)
Resource (RB)	300	—
Transducer (TB)	400	—
Analog Input (AI)	1,000	20
Proportional/ Integral/Derivative (PID)	10,000	30
Integrator (INT)	12,000	20

Typical Flow Ranges

Table 6 - Table 12 show typical flow ranges for some common process fluids with default filter settings. Consult your local sales representative to obtain a computer sizing program that describes in greater detail the flow range for an application.

Table 6. Typical pipe velocity ranges for 8800D and 8800DR⁽¹⁾

Process Line Size (Inches/ DN)	Vortex Meter ⁽²⁾	Liquid Velocity Ranges		Gas Velocity Ranges	
		(ft/s)	(m/s)	(ft/s)	(m/s)
0.5/ 15	8800DF005	0.70 to 25.0	0.21 to 7.6	6.50 to 250.0	1.98 to 76.2
1/ 25	8800DF010	0.70 to 25.0	0.21 to 7.6	6.50 to 250.0	1.98 to 76.2
	8800DR010	0.25 to 8.8	0.08 to 2.7	2.29 to 87.9	0.70 to 26.8
1.5/ 40	8800DF015	0.70 to 25.0	0.21 to 7.6	6.50 to 250.0	1.98 to 76.2
	8800DR015	0.30 to 10.6	0.09 to 3.2	2.76 to 106.1	0.84 to 32.3
2/ 50	8800DF020	0.70 to 25.0	0.21 to 7.6	6.50 to 250.0	1.98 to 76.2
	8800DR020	0.42 to 15.2	0.13 to 4.6	3.94 to 151.7	1.20 to 46.2
3/ 80	8800DF030	0.70 to 25.0	0.21 to 7.6	6.50 to 250.0	1.98 to 76.2
	8800DR030	0.32 to 11.3	0.10 to 3.5	2.95 to 113.5	0.90 to 34.6
4/ 100	8800DF040	0.70 to 25.0	0.21 to 7.6	6.50 to 250.0	1.98 to 76.2
	8800DR040	0.41 to 14.5	0.12 to 4.4	3.77 to 145.2	1.15 to 44.3
6/ 150	8800DF060	0.70 to 25.0	0.21 to 7.6	6.50 to 250.0	1.98 to 76.2
	8800DR060	0.31 to 11.0	0.09 to 3.4	2.86 to 110.2	0.87 to 33.6
8/ 200	8800DF080	0.70 to 25.0	0.21 to 7.6	6.50 to 250.0	1.98 to 76.2
	8800DR080	0.40 to 14.4	0.12 to 4.4	3.75 to 144.4	1.14 to 44.0
10/ 250	8800DF100	0.90 to 25.0	0.27 to 7.6	6.50 to 250.0	1.98 to 76.2
	8800DR100	0.44 to 15.9	0.13 to 4.8	4.12 to 158.6	1.26 to 48.3
12/ 300	8800DF120	1.10 to 25.0	0.34 to 7.6	6.50 to 250.0	1.98 to 76.2
	8800DR120	0.63 to 17.6	0.19 to 5.4	4.58 to 176.1	1.40 to 53.7

(1) Table 6 is a reference of pipe velocities that can be measured for the standard Rosemount 8800D and the reducer Rosemount 8800DR Vortex Meters. It does not consider density limitations, as described in tables 2 and 3. Velocities are referenced in schedule 40 pipe.

(2) Velocity range of the Rosemount 8800DW is the same as Rosemount 8800DF.

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Table 7. Water Flow Rate Limits for the Rosemount 8800D and 8800DR⁽¹⁾

Process Line Size (Inches/ DN)	Vortex Meter ⁽²⁾	Minimum and Maximum Measurable Water Flow Rates*	
		Gallons/Minute	Cubic Meters/Hour
0.5/ 15	8800DF005	1.76 to 23.7	0.40 to 5.4
1/ 25	8800DF010	2.96 to 67.3	0.67 to 15.3
	8800DR010	1.76 to 23.7	0.40 to 5.4
1.5/ 40	8800DF015	4.83 to 158	1.10 to 35.9
	8800DR015	2.96 to 67.3	0.67 to 15.3
2/ 50	8800DF020	7.96 to 261	1.81 to 59.4
	8800DR020	4.83 to 158.0	1.10 to 35.9
3/ 80	8800DF030	17.5 to 576	4.00 to 130
	8800DR030	7.96 to 261.0	1.81 to 59.3
4/ 100	8800DF040	30.2 to 992	6.86 to 225
	8800DR040	17.5 to 576	4.00 to 130
6/ 150	8800DF060	68.5 to 2251	15.6 to 511
	8800DR060	30.2 to 992	6.86 to 225
8/ 200	8800DF080	119 to 3898	27.0 to 885
	8800DR080	68.5 to 2251	15.6 to 511
10/ 250	8800DF100	231 to 6144	52.2 to 1395
	8800DR100	119 to 3898	27.0 to 885
12/ 300	8800DF120	391 to 8813	88.8 to 2002
	8800DR120	231 to 6144	52.2 to 1395
*Conditions: 77 °F (25 °C) and 14.7 psia (1.01 bar absolute)			

(1) Table 7 is a reference of flow rates that can be measured for the standard Rosemount 8800D and the reducer 8800DR Vortex Meters. It does not consider density limitations, as described in tables 2 and 3.

(2) Velocity range of the 8800DW is the same as 8800DF.

Table 8. Air Flow Rate Limits at 59 °F (15 °C)

Process Pressure	Flow Rate Limits	Minimum and Maximum Air Flow Rates for line sizes 1/2-in./DN 15 through 1-in./DN 25							
		1/2-in./DN 15				1-in./DN 25			
		Rosemount 8800D		Rosemount 8800DR		Rosemount 8800D		Rosemount 8800DR	
		ACFM	ACMH	ACFM	ACMH	ACFM	ACMH	ACFM	ACMH
0 psig (0 bar G)	max	27.9	47.3	Not	Not	79.2	134	27.9	47.3
	min	3.86	6.56	Available	Available	7.81	13.3	3.86	6.56
50 psig (3,45 bar G)	max	27.9	47.3	Not	Not	79.2	134	27.9	47.3
	min	1.31	2.22	Available	Available	3.72	6.32	1.31	2.22
100 psig (6,89 bar G)	max	27.9	47.3	Not	Not	79.2	134	27.9	47.3
	min	0.98	1.66	Available	Available	2.80	4.75	0.98	1.66
150 psig (10,3 bar G)	max	27.9	47.3	Not	Not	79.2	134	27.9	47.3
	min	0.82	1.41	Available	Available	2.34	3.98	0.82	1.41
200 psig (13,8 bar G)	max	27.9	47.3	Not	Not	79.2	134	27.9	47.3
	min	0.82	1.41	Available	Available	2.34	3.98	0.82	1.41
300 psig (20,7 bar G)	max	27.9	47.3	Not	Not	79.2	134	27.9	47.3
	min	0.82	1.41	Available	Available	2.34	3.98	0.82	1.41
400 psig (27,6 bar G)	max	25.7	43.9	Not	Not	73.0	124	25.7	43.9
	min	0.82	1.41	Available	Available	2.34	3.98	0.82	1.41
500 psig (34,5 bar G)	max	23.0	39.4	Not	Not	66.0	112	23.0	39.4
	min	0.82	1.41	Available	Available	2.34	3.98	0.82	1.41

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Table 9. Air Flow Rate Limits at 59 °F (15 °C)

Process Pressure	Flow Rate Limits	Minimum and Maximum Air Flow Rates for line sizes 1½-in./DN 40 through 2-in./DN 50							
		1½-in./DN 40				2-in./DN 50			
		Rosemount 8800D		Rosemount 8800DR		Rosemount 8800D		Rosemount 8800DR	
		ACFM	ACMH	ACFM	ACMH	ACFM	ACMH	ACFM	ACMH
0 psig (0 bar G)	max	212	360	79.2	134	349	593	212	360
	min	18.4	31.2	7.81	13.3	30.3	51.5	18.4	31.2
50 psig (3,45 bar G)	max	212	360	79.2	134	349	593	212	360
	min	8.76	14.9	3.72	6.32	14.5	24.6	8.76	14.9
100 psig (6,89 bar G)	max	212	360	79.2	134	349	593	212	360
	min	6.58	11.2	2.80	4.75	10.8	18.3	6.58	11.2
150 psig (10,3 bar G)	max	212	360	79.2	134	349	593	212	360
	min	5.51	9.36	2.34	3.98	9.09	15.4	5.51	9.36
200 psig (13,8 bar G)	max	212	360	79.2	134	349	593	212	360
	min	5.51	9.36	2.34	3.98	9.09	15.4	5.51	9.36
300 psig (20,7 bar G)	max	198	337	79.2	134	326	554	198	337
	min	5.51	9.36	2.34	3.98	9.09	15.4	5.51	9.36
400 psig (27,6 bar G)	max	172	293	73.0	124	284	483	172	293
	min	5.51	9.36	2.34	3.98	9.09	15.4	5.51	9.36
500 psig (34,5 bar G)	max	154	262	66.0	112	254	432	154	262
	min	5.51	9.36	2.34	3.98	9.09	15.4	5.51	9.36

Table 10. Air Flow Rate Limits at 59 °F (15 °C)

Process Pressure	Flow Rate Limits	Minimum and Maximum Air Flow Rates for line sizes 3-in./DN 80 through 4-in./DN 100							
		3-in./DN 80				4-in./DN 100			
		Rosemount 8800D		Rosemount 8800DR		Rosemount 8800D		Rosemount 8800DR	
		ACFM	ACMH	ACFM	ACMH	ACFM	ACMH	ACFM	ACMH
0 psig (0 bar G)	max	770	1308	349	593	1326	2253	770	1308
	min	66.8	114	30.3	51.5	115	195	66.8	114
50 psig (3,45 bar G)	max	770	1308	349	593	1326	2253	770	1308
	min	31.8	54.1	14.5	24.6	54.8	93.2	31.8	54.1
100 psig (6,89 bar G)	max	770	1308	349	593	1326	2253	770	1308
	min	23.9	40.6	10.8	18.3	41.1	69.8	23.9	40.6
150 psig (10,3 bar G)	max	770	1308	349	593	1326	2253	770	1308
	min	20.0	34.0	9.09	15.4	34.5	58.6	20.0	34.0
200 psig (13,8 bar G)	max	770	1308	349	593	1326	2253	770	1308
	min	20.0	34.0	9.09	15.4	34.5	58.6	20.0	34.0
300 psig (20,7 bar G)	max	718	1220	326	554	1237	2102	718	1220
	min	20.0	34.0	9.09	15.4	34.5	58.6	20.0	34.0
400 psig (27,6 bar G)	max	625	1062	284	483	1076	1828	625	1062
	min	20.0	34.0	9.09	15.4	34.5	58.6	20.0	34.0
500 psig (34,5 bar G)	max	560	951	254	432	964	1638	560	951
	min	20.0	34.0	9.09	15.4	34.5	58.6	20.0	34.0

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Table 11. Air Flow Rate Limits at 59 °F (15 °C)

Process Pressure	Flow Rate Limits	Minimum and Maximum Air Flow Rates for line sizes 6-in./DN 150 through 8-in./DN 200							
		6-in./DN 150				8-in./DN 200			
		Rosemount 8800D		Rosemount 8800DR		Rosemount 8800D		Rosemount 8800DR	
		ACFM	ACMH	ACFM	ACMH	ACFM	ACMH	ACFM	ACMH
0 psig (0 bar G)	max	3009	5112	1326	2253	5211	8853	3009	5112
	min	261	443	115	195	452	768	261	443
50 psig (3,45 bar G)	max	3009	5112	1326	2253	5211	8853	3009	5112
	min	124	211	54.8	93.2	215	365	124	211
100 psig (6,89 bar G)	max	3009	5112	1326	2253	5211	8853	3009	5112
	min	93.3	159	41.1	69.8	162	276	93.3	159
150 psig (10,3 bar G)	max	3009	5112	1326	2253	5211	8853	3009	5112
	min	78.2	133	34.5	58.6	135	229	78.2	133
200 psig (13,8 bar G)	max	3009	5112	1326	2253	5211	8853	3009	5112
	min	78.2	133	34.5	58.6	135	229	78.2	133
300 psig (20,7 bar G)	max	2807	4769	1237	2102	4862	8260	2807	4769
	min	78.2	133	34.5	58.6	135	229	78.2	133
400 psig (27,6 bar G)	max	2442	4149	1076	1828	4228	7183	2442	4149
	min	78.2	133	34.5	58.6	136	229	78.2	133
500 psig (34,5 bar G)	max	2188	3717	964	1638	3789	6437	2188	3717
	min	78.2	133	34.5	58.6	136	229	78.2	133

Table 12. Air Flow Rate Limits at 59 °F (15 °C)

Process Pressure	Flow Rate Limits	Minimum and Maximum Air Flow Rates for line sizes 10-in./DN 250 through 12-in./DN 300							
		10-in./DN 250				12-in./DN 300			
		Rosemount 8800D		Rosemount 8800DR		Rosemount 8800D		Rosemount 8800DR	
		ACFM	ACMH	ACFM	ACMH	ACFM	ACMH	ACFM	ACMH
0 psig (0 bar G)	max	8214	13956	5211	8853	11781	20016	8214	13956
	min	712.9	1211	452	768	1022	1736	712.9	1211
50 psig (3,45 bar G)	max	8214	13956	5211	8853	11781	20016	8214	13956
	min	339.5	577	215	365	486.9	827	339.5	577
100 psig (6,89 bar G)	max	8214	13956	5211	8853	11781	20016	8214	13956
	min	254.7	433	162	276	365.4	621	254.7	433
150 psig (10,3 bar G)	max	8214	13956	5211	8853	11781	20016	8214	13956
	min	213.6	363	135	229	306.3	520	213.6	363
200 psig (13,8 bar G)	max	8214	13956	5211	8853	11781	20016	8214	13956
	min	213.6	363	135	229	306.3	520	213.6	363
300 psig (20,7 bar G)	max	7664	13021	4862	8260	10992	18675	7664	13021
	min	213.6	363	135	229	306.3	520	213.6	363
400 psig (27,6 bar G)	max	6664	11322	4228	7183	9559	16241	6664	11322
	min	213.6	363	136	229	306.3	520	213.6	363
500 psig (34,5 bar G)	max	5972	10146	3789	6437	8565	14552	5972	10146
	min	213.6	363	136	229	306.3	520	213.6	363

NOTES

The Rosemount 8800D measures the volumetric flow under operating conditions (i.e. the actual volume at the operating pressure and temperature—acfm or acmh), as shown above. However, gas volumes are strongly dependent on pressure and temperature. Therefore, gas quantities are typically stated in standard or normal conditions (e.g. SCFM or NCMH). (Standard conditions are typically 59 °F and 14.7 psia. Normal conditions are typically 0 °C and 1 bar abs.)

The flow rate limits in standard conditions are found using the equations below:

Standard Flow Rate = Actual Flow Rate X Density Ratio

Density Ratio = Density at Actual (Operating) Conditions / Density at Standard Conditions

Table 13. Saturated Steam Flow Rate Limits (Assumes Steam Quality is 100%)

Process Pressure	Flow Rate Limits	Minimum and Maximum Saturated Steam Flow Rates for line sizes 1½-in./DN 15 through 1-in./DN 25							
		½-in./DN 15				1-in./DN 25			
		Rosemount 8800D		Rosemount 8800DR		Rosemount 8800D		Rosemount 8800DR	
		lb/hr	kg/hr	lb/hr	kg/hr	lb/hr	kg/hr	lb/hr	kg/hr
15 psig (1,03 bar G)	max	120	54.6	Not Available	Not Available	342	155	120	54.6
	min	12.8	5.81	Available	Available	34.8	15.8	12.8	5.81
25 psig (1,72 bar G)	max	158	71.7	Not Available	Not Available	449	203	158	71.7
	min	14.0	6.35	Available	Available	39.9	18.1	14.0	6.35
50 psig (3,45 bar G)	max	250	113	Not Available	Not Available	711	322	250	113
	min	17.6	8.00	Available	Available	50.1	22.7	17.6	8.00
100 psig (6,89 bar G)	max	429	194	Not Available	Not Available	1221	554	429	194
	min	23.1	10.5	Available	Available	65.7	29.8	23.1	10.5
150 psig (10,3 bar G)	max	606	275	Not Available	Not Available	1724	782	606	275
	min	27.4	12.5	Available	Available	78.1	35.4	27.4	12.5
200 psig (13,8 bar G)	max	782	354	Not Available	Not Available	2225	1009	782	354
	min	31.2	14.1	Available	Available	88.7	40.2	31.2	14.1
300 psig (20,7 bar G)	max	1135	515	Not Available	Not Available	3229	1464	1135	515
	min	37.6	17.0	Available	Available	107	48.5	37.6	17.0
400 psig (27,6 bar G)	max	1492	676	Not Available	Not Available	4244	1925	1492	676
	min	44.1	20.0	Available	Available	125	56.7	44.1	20.0
500 psig (34,5 bar G)	max	1855	841	Not Available	Not Available	5277	2393	1855	841
	min	54.8	24.9	Available	Available	156	70.7	54.8	24.9

Table 14. Saturated Steam Flow Rate Limits (Assumes Steam Quality is 100%)

Process Pressure	Flow Rate Limits	Minimum and Maximum Saturated Steam Flow Rates for line sizes 1½-in./DN 40 through 2-in./DN 50							
		1½-in./DN 40				2-in./DN 50			
		Rosemount 8800D		Rosemount 8800DR		Rosemount 8800D		Rosemount 8800DR	
		lb/hr	kg/hr	lb/hr	kg/hr	lb/hr	kg/hr	lb/hr	kg/hr
15 psig (1,03 bar G)	max	917	416	342	155	1511	685	917	416
	min	82.0	37.2	34.8	15.8	135	61.2	82.0	37.2
25 psig (1,72 bar G)	max	1204	546	449	203	1983	899	1204	546
	min	93.9	42.6	39.9	18.1	155	70.2	93.9	42.6
50 psig (3,45 bar G)	max	1904	864	711	322	3138	1423	1904	864
	min	118	53.4	50.1	22.7	195	88.3	118	53.4
100 psig (6,89 bar G)	max	3270	1483	1221	554	5389	2444	3270	1483
	min	155	70.1	65.7	29.8	255	116	155	70.1
150 psig (10,3 bar G)	max	4616	2094	1724	782	7609	3451	4616	2094
	min	184	83.2	78.1	35.4	303	137	184	83.2
200 psig (13,8 bar G)	max	5956	2702	2225	1009	9818	4453	5956	2702
	min	209	94.5	88.7	40.2	344	156	209	94.5
300 psig (20,7 bar G)	max	8644	3921	3229	1464	14248	6463	8644	3921
	min	252	114	107	48.5	415	189	252	114
400 psig (27,6 bar G)	max	11362	5154	4244	1925	18727	8494	11362	5154
	min	295	134	125	56.7	487	221	295	134
500 psig (34,5 bar G)	max	14126	6407	5277	2393	23284	10561	14126	6407
	min	367	167	156	70.7	605	274	367	167

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Table 15. Saturated Steam Flow Rate Limits (Assumes Steam Quality is 100%)

Process Pressure	Flow Rate Limits	Minimum and Maximum Saturated Steam Flow Rates for line sizes 3-in./DN 80 through 4-in./DN 100							
		3-in./DN 80				4-in./DN 100			
		Rosemount 8800D		Rosemount 8800DR		Rosemount 8800D		Rosemount 8800DR	
		lb/hr	kg/hr	lb/hr	kg/hr	lb/hr	kg/hr	lb/hr	kg/hr
15 psig (1,03 bar G)	max min	3330 298	1510 135	1511 135	685 61.2	5734 513	2601 233	3330 298	1510 135
25 psig (1,72 bar G)	max min	4370 341	1982 155	1983 155	899 70.2	7526 587	3414 267	4370 341	1982 155
50 psig (3,45 bar G)	max min	6914 429	3136 195	3138 195	1423 88.3	11905 739	5400 335	6914 429	3136 195
100 psig (6,89 bar G)	max min	11874 562	5386 255	5389 255	2444 116	20448 968	9275 439	11874 562	5386 255
150 psig (10,3 bar G)	max min	16763 668	7603 303	7609 303	3451 137	28866 1150	13093 522	16763 668	7603 303
200 psig (13,8 bar G)	max min	21630 759	9811 344	9818 344	4453 156	37247 1307	16895 593	21630 759	9811 344
300 psig (20,7 bar G)	max min	31389 914	14237 415	14248 415	6463 189	54052 1574	24517 714	31389 914	14237 415
400 psig (27,6 bar G)	max min	41258 1073	18714 487	18727 487	8494 221	71047 1847	32226 838	41258 1073	18714 487
500 psig (34,5 bar G)	max min	51297 1334	23267 605	23284 605	10561 274	88334 2297	40068 1042	51297 1334	23267 605

Table 16. Saturated Steam Flow Rate Limits (Assumes Steam Quality is 100%)

Process Pressure	Flow Rate Limits	Minimum and Maximum Saturated Steam Flow Rates for line sizes 6-in./DN 150 through 8-in./DN 200							
		6-in./DN 150				8-in./DN 200			
		Rosemount 8800D		Rosemount 8800DR		Rosemount 8800D		Rosemount 8800DR	
		lb/hr	kg/hr	lb/hr	kg/hr	lb/hr	kg/hr	lb/hr	kg/hr
15 psig (1,03 bar G)	max min	13013 1163	5903 528	5734 513	2601 233	22534 2015	10221 914	13013 1163	5903 528
25 psig (1,72 bar G)	max min	17080 1333	7747 605	7526 587	3414 267	29575 2308	13415 1047	17080 1333	7747 605
50 psig (3,45 bar G)	max min	27019 1676	12255 760	11905 739	5400 335	46787 2903	21222 1317	27019 1676	12255 760
100 psig (6,89 bar G)	max min	46405 2197	21049 996	20448 968	9275 439	80356 3804	36449 1725	46405 2197	21049 996
150 psig (10,3 bar G)	max min	65611 2610	29761 1184	28866 1150	13093 522	113440 4520	51455 2050	65611 2610	29761 1184
200 psig (13,8 bar G)	max min	84530 2965	38342 1345	37247 1307	16895 593	146375 5134	66395 2329	84530 2965	38342 1345
300 psig (20,7 bar G)	max min	122666 3572	55640 1620	54052 1574	24517 714	212411 6185	96348 2805	122666 3572	55640 1620
400 psig (27,6 bar G)	max min	161236 4192	73135 1901	71047 1847	32226 838	279200 7259	126643 3293	161236 4192	73135 1901
500 psig (34,5 bar G)	max min	200468 5212	90931 2364	88334 2297	40068 1042	347134 9025	157457 4094	200468 5212	90931 2364

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Table 17. Saturated Steam Flow Rate Limits (Assumes Steam Quality is 100%)

Process Pressure	Flow Rate Limits	Minimum and Maximum Saturated Steam Flow Rates for line sizes 10-in./DN 250 through 12-in./DN 300							
		10-in./DN 250				12-in./DN 300			
		Rosemount 8800D		Rosemount 8800DR		Rosemount 8800D		Rosemount 8800DR	
		lb/hr	kg/hr	lb/hr	kg/hr	lb/hr	kg/hr	lb/hr	kg/hr
15 psig (1,03 bar G)	max	35519	16111	22534	10221	50994	23130	35519	16111
	min	3175	1440	2015	914	4554	2066	3175	1440
25 psig (1,72 bar G)	max	46618	21146	29575	13415	66862	30328	46618	21146
	min	4570	2073	2308	1047	5218	2367	4570	2073
50 psig (3,45 bar G)	max	73748	33452	46787	21222	105774	47978	73748	33452
	min	4575	2075	2903	1317	6562	2976	4575	2075
100 psig (6,89 bar G)	max	126660	57452	80356	36449	181663	82401	126660	57452
	min	5996	2720	3804	1725	8600	3901	5996	2720
150 psig (10,3 bar G)	max	178808	81106	113440	51455	256457	116327	178808	81106
	min	7125	3232	4520	2050	10218	4635	7125	3232
200 psig (13,8 bar G)	max	230722	104654	146375	66395	330915	150101	230722	104654
	min	8092	3670	5134	2329	11607	5265	8092	3670
300 psig (20,7 bar G)	max	334810	151867	212411	96348	480203	217816	334810	151867
	min	9749	4422	6185	2805	13983	6343	9749	4422
400 psig (27,6 bar G)	max	440085	199619	279200	126643	631195	286305	440085	199619
	min	11442	5190	7259	3293	16411	7444	11442	5190
500 psig (34,5 bar G)	max	547165	248190	347134	157457	784775	355968	547165	248190
	min	14226	6453	9025	4094	20404	9255	14226	6453

PERFORMANCE SPECIFICATIONS

The following performance specifications are for all Rosemount models except where noted. Digital performance specifications applicable to both Digital HART and FOUNDATION fieldbus output.

Flow Accuracy

Includes linearity, hysteresis, and repeatability.

Liquids - for Reynolds Numbers over 20000

Digital and Pulse Output

±0.65% of rate

Note: The accuracy for the 8800DR, line sizes 6 to 12-in. (150 to 300mm), is ±1.0% of rate.

Analog Output

Same as pulse output plus an additional 0.025% of span

Gas and Steam - for Reynolds Numbers over 15,000

Digital and Pulse Output

±1.0% of rate

Note: The accuracy for the 8800DR, line sizes 6 to 12-in. (150 to 300mm), is ±1.35% of rate.

Analog Output

Same as pulse output plus an additional 0.025% of span

Accuracy limitations for gas and steam:

For ½ and 1-in. (DN 15 and DN 25): max velocity of 220 ft/s (67.06 m/s)

For ½ to 4-in. (DN 15 to DN 200) Dual-style meters: max velocity of 100 ft/s (30.5 m/s)

NOTE

As the meter Reynolds Numbers decreases below the stated limit to 10,000 the accuracy error band will increase linearly to +/-2.0%. For Reynolds Numbers down to 5,000 the accuracy error band will increase linearly from +/-2.0% to +/-6.0%.

Process Temperature Accuracy

2.2 °F (1.2 °C) or 0.4% of reading (in °C), whichever is greater.

NOTE

For remote mount installations, add ±0.018 °F/ft. (±0.03 °C/m) of uncertainty to the temperature measurement.

Mass Flow Accuracy for Temperature Compensated Mass Flow

Digital and Pulse Output

± 2.0% of rate (Nominal)

Nominal conditions include temperature variation in saturation and superheat at 150 psig (10 bar-g) and above.

For pressure below 150 psig (10 bar-g), add 0.08% of uncertainty for every 15 psi (1 bar) below 150 psig (10 bar-g).

Analog Output

Same as pulse output plus an additional 0.025% of span

Repeatability

± 0.1% of actual flow rate

Stability

± 0.1% of rate over one year

Process Temperature Effect

Automatic K-factor correction with user-entered process temperature.

Table 18 indicates the percent change in K-factor per 100 °F (55.5 °C) in process temperature from reference temperature of 77 °F (25 °C).

Table 18. Process Temperature Effect

Material	Percent Change in K-Factor per 100 °F (55.5 °C)
316L @ < 77 °F (25 °C)	+ 0.23
316L @ > 77 °F (25 °C)	- 0.27
Nickel Alloy C < 77 °F (25 °C)	+ 0.22
Nickel Alloy C > 77 °F (25 °C)	- 0.22

Ambient Temperature Effect

Digital and Pulse Outputs

No effect

Analog Output

±0.1% of span from -58 to 185 °F (-50 to 85 °C)

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Vibration Effect

An output with no process flow may be detected if sufficiently high vibration is present.

The meter design will minimize this effect, and the factory settings for signal processing are selected to eliminate these errors for most applications.

If an output error at zero flow is still detected, it can be eliminated by adjusting the low flow cutoff, trigger level, or low-pass filter.

As the process begins to flow through the meter, most vibration effects are quickly overcome by the flow signal.

Vibration Specifications

Integral Aluminum Housings, Remote Aluminum Housings, and Remote SST Housings

At or near the minimum liquid flow rate in a normal pipe mounted installation, the maximum vibration should be 0.087-in. (2,21 mm) double amplitude displacement or 1 g acceleration, whichever is smaller. At or near the minimum gas flow rate in a normal pipe mounted installation, the maximum vibration should be 0.043-in. (1,09 mm) double amplitude displacement or $\frac{1}{2}$ g acceleration, whichever is smaller.

Integral SST Housing

At or near the minimum liquid flow rate in a normal pipe mounted installation, the maximum vibration should be 0.044-in. (1,11 mm) double amplitude displacement or $\frac{1}{3}$ g acceleration, whichever is smaller. At or near the minimum gas flow rate in a normal pipe mounted installation, the maximum vibration should be 0.022-in. (0,55 mm) double amplitude displacement or $\frac{1}{6}$ g acceleration, whichever is smaller.

Mounting Position Effect

Meter will meet accuracy specifications when mounted in horizontal, vertical, or inclined pipelines. Best practice for mounting in a horizontal pipe is to orient the shedder bar in the horizontal plane. This will prevent solids in liquid applications and liquid in gas/steam applications from disrupting the shedding frequency.

EMI/RFI Effect

Meets EMC requirements to EU Directive 2004/108/EC.

HART Analog

Output error less than $\pm 0.025\%$ of span with twisted pair from 80-1000 MHz for radiated field strength of 10 V/m. Tested per EN61326.

FOUNDATION fieldbus and Digital HART

No effect on the values that are being given if using HART digital signal or FOUNDATION fieldbus. Tested per EN61326.

Magnetic-Field Interference

HART Analog

Output error less than $\pm 0.025\%$ of span at 30 A/m (rms).

FOUNDATION fieldbus

No effect on digital output accuracy at 30 A/m (rms). Tested per EN 61326.

Series Mode Noise Rejection

HART Analog

Output error less than $\pm 0.025\%$ of span at 1 V rms, 60 Hz.

FOUNDATION fieldbus

No effect on digital output accuracy at 1 V rms, 60 Hz.

Common Mode Noise Rejection

HART Analog

Output error less than $\pm 0.025\%$ of span at 30 V rms, 60 Hz.

FOUNDATION fieldbus

No effect on digital output accuracy at 250 V rms, 60 Hz.

Power Supply Effect

HART Analog

Less than 0.005% of span per volt

FOUNDATION fieldbus

No effect on accuracy.

PHYSICAL SPECIFICATIONS

NACE Compliance

Materials of Construction meet NACE material recommendations per MR0175/ISO15156 for use in H₂S containing environments in oil field production. Materials of construction also meet NACE recommendations per MR0103-2003 for corrosive petroleum refining environments. MR0103 compliance requires Q25 option in model code.

NOTE:

Certificate of compliance for MR0175/ISO15156 requires Q15 as a separate line item.

Electrical Connections

1/2 –14 NPT, PG 13.5, or M20 × 1.5 conduit threads; screw terminals provided for 4–20 mA and pulse output connections; communicator connections permanently fixed to terminal block.

Non-Wetted Materials

Housing

Low-copper aluminum (FM Type 4X, CSA Type 4X, IP66)

Optional SST housing

Paint

Polyurethane

Cover O-rings

Buna-N

Flanges

316/316L lap joint

Temperature Sensor (MTA Option)

Type-N Thermocouple

Process-Wetted Materials

Meter Body

316L wrought stainless and CF-3M cast stainless or N06022 wrought Nickel Alloy and CW2M cast Nickel Alloy. Other material grades available. Consult factory for other materials of construction.

Flanges

316/316L stainless steel

Nickel Alloy N06022 Weld Neck

Collars

Nickel Alloy N06022

316/316L Stainless Steel

Surface Finish of Flanges and Collars

Standard: To the requirements of the applicable flange standard.

Smooth: 63 to 125 μ inches

(1.6 to 3.1 μ meters) Ra roughness

Process Connections

Mounts between the following flange configurations:

ASME B16.5 (ANSI): Class 150, 300, 600, 900, 1500

DIN: PN 10, 16, 25, 40, 64, 100, 160

JIS: 10K, 20K, and 40K

Weld-end: Schedule 10, Schedule 40, Schedule 80, Schedule 160

Mounting

Integral (Standard)

Electronics are mounted on meter body.

Remote (Optional)

Electronics may be mounted remote from the meter body. Interconnecting coaxial cable available in nonadjustable 10, 20, and 30 ft (3,0, 6,1, and 9,1 m) lengths. Consult factory for non-standard lengths up to 75 ft (22,9 m).

Remote mounting hardware includes a pipe mount bracket with one u-bolt.

Product Data Sheet

00813-0100-4004, Rev HA

April 2010

Rosemount 8800D

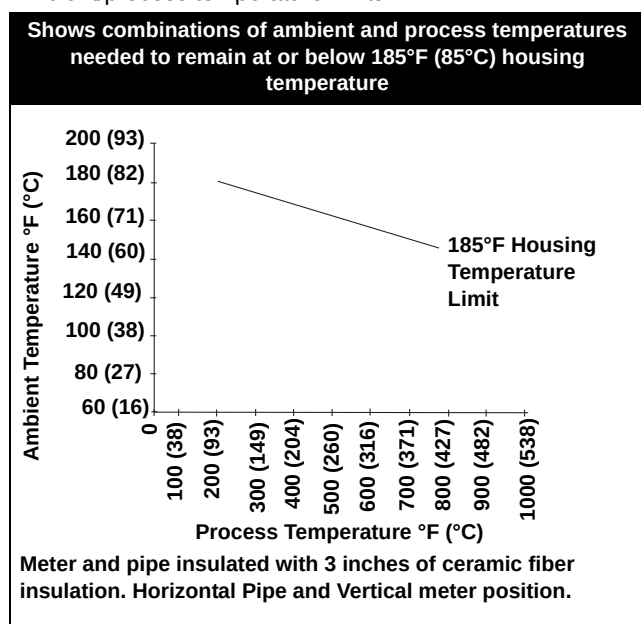
Temperature Limitations for Integral Mounting

The maximum process temperature for integral mount electronics is dependent on the ambient temperature where the meter is installed. The electronics must not exceed 185°F (85°C). The following is for reference, please note that the pipe was insulated with 3 inches of ceramic fiber insulator.

Flow Calibration Information

Flowmeter calibration and configuration information is provided with every flowmeter. For a certified copy of flow calibration data, Option Q4 must be ordered in the model number.

Figure 1. Rosemount 8800 Vortex Flowmeter
Ambient/process temperature limits



Pipe Length Requirements

The vortex meter may be installed with a minimum of ten diameters (D) of straight pipe length upstream and five diameters (D) of straight pipe length downstream.

Rated Accuracy is based on the number of pipe diameter from an upstream disturbance. No K-factor correction is required if the meter is installed with 35 D upstream and 10 D downstream. The value of the K-factor may shift up to 0.5% when the upstream straight pipe length is between 10D and 35D. Please see Technical Data Sheet (00816-0100-3250) on Installation Effects for optional K-factor corrections. This effect can be corrected in the electronics.

Tagging

The flowmeter will be tagged at no charge, according to customer requirements. All tags are stainless steel. The standard tag is permanently attached to the flowmeter. Character height is 1/16-in. (1,6 mm). A wired-on tag is available on request. Wire on tags can contain five lines with up to 28 characters per line.

Product Certifications

Approved Manufacturing Locations

Rosemount Inc. — Eden Prairie, Minnesota, USA

Emerson Process Management BV - Ede, The Netherlands

Emerson Process Management Flow Technologies Company, Ltd

- Nanjing, Jiangsu Province, P.R. China

EUROPEAN DIRECTIVE INFORMATION

The CE Declaration of Conformity for all applicable European directives for this product can be found on our website at www.rosemount.com. A hard copy may be obtained by contacting our local sales office.

ATEX Directive

Rosemount Inc. complies with the ATEX Directive.

Flameproof enclosure EEx d protection type in accordance with EN50018

- Transmitters with Flameproof enclosure type protection shall only be opened when power is removed.
- Closing of entries in the device must be carried out using the appropriate EEx d metal cable gland or metal blanking plug.
- Do not exceed the energy level, which is stated on the approval label.



Type n protection type in accordance with EN60079-15



Closing of entries in the device must be carried out using the appropriate EExe or EExn metal cable gland and metal blanking plug or any appropriate ATEX approved cable gland and blanking plug with IP66 rating certified by an EU approved certification body.

EUROPEAN PRESSURE EQUIPMENT DIRECTIVE (PED)

Rosemount 8800 Vortex Flowmeter Line Size 40 mm to 300 mm

Certificate Number PED-H-100

CE 0575

Module H Conformity Assessment

Mandatory CE-marking for flowmeters in accordance with Article 15 of the PED can be found on the flowtube body.

Flowmeter categories I – IV, use module H for conformity assessment procedures.

Rosemount 8800 Vortex Flowmeter Line Size 15 mm and 25 mm

Sound Engineering Practice

Flowmeters that are SEP are outside the scope of PED and cannot be marked for compliance with PED.

HAZARDOUS LOCATION CERTIFICATIONS

Rosemount 8800D with HART Protocol

North American Certifications

Factory Mutual (FM)

- E5** Explosion-proof for Class I, Division 1, Groups B, C, and D; Dust Ignition-proof for Class II/III, Division 1, Groups E, F, and G; Temp Code T6 (-50°C ≤ Ta ≤ 70°C) Factory Sealed Enclosure Type 4X.
- I5** Intrinsically safe for use in Class I, II, III Division 1, Groups A, B, C, D, E, F, G; Class I, Zone 0, AEx ia IIC T4 Non-incendive for Class I, Division 2, Groups A, B, C, and D. NIFW (Non-incendive Field Wiring) when installed per Rosemount Drawing 08800-0112 T4 (-50°C to 70°C) Enclosure Type 4X.
- K5** E5 and I5 Combination

Canadian Standards Association (CSA)

- E6** Dust Ignition-proof for Class II and Class III, Division 1, Groups E, F, and G; Class I, Zone 1, Ex d[ia] IIC CSA 06.1674267 T6 (-50°C to 70°C) Factory Sealed Single Seal. Enclosure Type 4X.
- I6** Intrinsically safe for use in Class I, II, III Division 1, Groups A, B, C, D, E, F, G; Non-incendive for Class I, Division 2, Groups A, B, C and D T4 (-50°C to 70°C) Single Seal. Enclosure Type 4X.
- K6** E6 and I6 Combination

Combination Certifications

- KB** E5, I5, E6, and I6 Combination

European Certifications

ATEX Intrinsic Safety

- I1** Certification No. Baseefa05ATEX0084X
ATEX Marking  II 1 G
EEx ia IIC T5 ($-60^{\circ}\text{C} \leq T_a \leq 40^{\circ}\text{C}$)
EEx ia IIC T4 ($-60^{\circ}\text{C} \leq T_a \leq 70^{\circ}\text{C}$)
Input Parameters:
 $U_i = 30 \text{ Vdc}$
 $I_i^{(1)} = 185 \text{ mA}$
 $P_i^{(1)} = 1.0 \text{ W}$
 $C_i = 0 \text{ }\mu\text{F}$
 $L_i = 0.97 \text{ mH}$
CE 0575

SPECIAL CONDITIONS

When fitted with 90V transient suppressors (T1 Option), the equipment is not capable of passing the 500V isolation test. This must be taken into account upon installation.

ATEX Type N Certification

- N1** Certification No. Baseefa05ATEX0085X
ATEX Marking  II 3 G
EEx nAnL II T5 ($-40^{\circ}\text{C} \leq T_a \leq 70^{\circ}\text{C}$)
Input Parameters:
 $U_i = 42 \text{ V dc Max}$
 $C_i = 0 \text{ }\mu\text{F}$
 $L_i = 0.97 \text{ mH}$

SPECIAL CONDITIONS

When fitted with 90V transient suppressors (T1 Option), the equipment is not capable of passing the 500V isolation test. This must be taken into account upon installation.

ATEX Flameproof Certification

- E1** Certification No. KEMA99ATEX3852X
ATEX Marking Remote Mount:
Transmitter:  II 2(1) G
EEx d [ia] IIC T6 ($-50^{\circ}\text{C} \leq T_a \leq 70^{\circ}\text{C}$)
Meter Body:  II 1 G
EEx ia IIC T6 ($-50^{\circ}\text{C} \leq T_a \leq 70^{\circ}\text{C}$)
ATEX Marking Integral Mount:  II 1/2 G
EEx d [ia] IIC T6 ($-50^{\circ}\text{C} \leq T_a \leq 70^{\circ}\text{C}$)
CE 0575
 $V = 42 \text{ Vdc Max}$
 $U_m = 250\text{V}$

SPECIAL CONDITIONS

When the equipment is installed, precautions must be taken to ensure, taking into account the effect of the fluid temperature, that the ambient temperature of the electrical parts of the equipment is comprised between -50°C and 70°C .

The remote mounted sensor may only be connected to the transmitter with the associated cable, supplied by the manufacturer.

ATEX Dust Certification

- ND** Certification No. Baseefa05ATEX0086
ATEX Marking  Ex tD A20 IP66 T90°C
($-20^{\circ}\text{C} \leq T_a \leq 70^{\circ}\text{C}$)
 $U_i = 42 \text{ Vdc}$
CE 0575
K1 E1, I1, N1 and ND Combination

(1) Total for transmitter

International IECEx Certifications

Intrinsic Safety

- I7** Certification No. IECEx BAS05.0028X
Ex ia IIC T5 ($-60^{\circ}\text{C} \leq T_a \leq 40^{\circ}\text{C}$)
Ex ia IIC T4 ($-60^{\circ}\text{C} \leq T_a \leq 70^{\circ}\text{C}$)
Input Parameters:
 $U_i = 30\text{ Vdc}$
 $I_i = 185\text{ mA}$
 $P_i = 1.0\text{ W}$
 $C_i = 0\text{ }\mu\text{F}$
 $L_i = 0.97\text{ mH}$

SPECIAL CONDITIONS

When fitted with 90V transient suppressors (T1 Option), the equipment is not capable of passing the 500V isolation test. This must be taken into account upon installation.

Type N Certification

- N7** Certification No. IECEx BAS05.0029X
Ex nC IIC T5 ($-40^{\circ}\text{C} \leq T_a \leq 70^{\circ}\text{C}$)
 $U_i = 42\text{ V dc}$

SPECIAL CONDITIONS

When fitted with 90V transient suppressors (T1 Option), the equipment is not capable of passing the 500V isolation test. This must be taken into account upon installation.

Flameproof Certification

- E7** Certification No. IECEx KEM05.0017X
Marking Remote Mount:
Transmitter: Ex d [ia] IIC T6 ($-50^{\circ}\text{C} \leq T_a \leq 70^{\circ}\text{C}$)
Meter Body: Ex ia IIC T6 ($-50^{\circ}\text{C} \leq T_a \leq 70^{\circ}\text{C}$)
Marking Integral Mount: Ex d [ia] IIC T6
($-50^{\circ}\text{C} \leq T_a \leq 70^{\circ}\text{C}$)
 $V = 42\text{ Vdc Max}$
 $U_m = 250\text{V}$

SPECIAL CONDITIONS

When the equipment is installed, particular precautions must be taken to ensure, taking into account the effect of the process fluid temperature, that the ambient temperature of the electrical parts of the equipment is comprised between -50°C and 70°C .

The remote mounted sensor shall only be connected to the transmitter with the associated cable, supplied by the manufacturer.

- K7** E7, I7, and N7 Combination

Chinese Certifications (NEPSI)

Flameproof Certification

- E3** Certification No. GYJ071327X
Ex d [ia] IIC T6 (-50°C to 70°C)

Intrinsic Safety

- I3** Certification No. GYJ071171X
Ex ia IIC T4/T5
T4: (-60°C to 70°C)
T5: (-60°C to 40°C)
Input Parameters:
 $U_i = 30\text{ Vdc}$
 $I_i = 185\text{ mA}$
 $P_i = 1.0\text{ W}$
 $C_i = 0\text{ }\mu\text{F}$
 $L_i = 0.97\text{ mH}$

Type N Certification

- N3** Certification No. GYJ071193X
Ex nAnL IIC T5 (-40°C to 70°C)
42 Vdc Max
K3 E3, I3, and N3 Combination

Japanese Certifications (TIIS)

Flameproof Certification

- E4** Transmitter - Ex d [ia] T6
Remote Sensor - Ex ia IIC T6

Certificate	Description
TC17816	8800D with display, without MTA option
TC17817	8800D without display, without MTA option
TC17905	8800D with display, with MTA option
TC17906	8800D without display, with MTA option

Rosemount 8800D With FOUNDATION™ Fieldbus Protocol

North American Certifications

Factory Mutual (FM) Approvals

- E5** Explosion-proof for Class I, Division 1, Groups B, C, and D.
Dust Ignition-proof for Class II/III, Division 1, Groups E, F, and G.
Temperature Code T6 ($-50^{\circ}\text{C} \leq T_a \leq 70^{\circ}\text{C}$)
Factory Sealed
Enclosure Type 4X
- I5** Intrinsically safe for use in Class I, II, III Division 1, Groups A, B, C, D, E, F, G;
Class I, Zone 0, AEx ia IIC T4
Non-incendive for Class I, Division 2, Groups A, B, C, and D.
NIFW (Non-incendive Field Wiring) when installed per Rosemount Drawing 08800-0112
T4 (-50°C to 60°C)
Enclosure Type 4X.
- IE** FISCO/FNICO for Class I, Division 1, Groups A, B, C, and D.
Class II/III, Division 1, Groups E, F, and G.
T4 (-50°C to 60°C)
when installed per Rosemount control drawing 08800-0116.
- K5** E5 and I5 combination

Canadian Standards Association (CSA) Approvals

Single Seal

- E6** Dust Ignition-proof for Class II and Class III, Division 1, Groups E, F, and G;
Class I, Zone 1, Ex d[ia] IIC CSA 06.1674267
T6 (-50°C to 70°C)
Factory Sealed
Single Seal.
Enclosure Type 4X.
- I6** Intrinsically safe for use in Class I, II, III Division 1, Groups A, B, C, D, E, F, G;
Non-incendive for Class I, Division 2, Groups A, B, C and D
T4 (-50°C to 60°C)
Single Seal.
Enclosure Type 4X.
- IF** FISCO/FNICO for Class I, Division 1, Groups A, B, C, and D;
T4 (-50°C to 60°C)
When installed per Rosemount drawing 08800-0112
Enclosure Type 4X
- K6** E6 and I6 combination.

Combination Certifications

- KB** E5, I5, E6, and I6 Combination

European Certifications

ATEX Intrinsic Safety Certification

- I1** Certification No. Baseefa05ATEX0084X
ATEX Marking  II 1 G
EEx ia IIC T4 ($-60^{\circ}\text{C} \leq T_a \leq 60^{\circ}\text{C}$)
CE 0575
Input Parameters:
 $U_i = 30 \text{ Vdc}$
 $I_i = 300 \text{ mA}$
 $P_i = 1.3 \text{ W}$
 $C_i = 0 \mu\text{F}$
 $L_i = 20 \mu\text{H}$

SPECIAL CONDITIONS FOR SAFE USE (X)

When fitted with 90V transient suppressors (T1 Option), the equipment is not capable of passing the 500V isolation test. This must be taken into account upon installation.

ATEX FISCO/FNICO

- IA** Certification No. Baseefa05ATEX0084X
ATEX Marking  II 1 G
EEx ia IIC T4 ($-60^{\circ}\text{C} \leq T_a \leq 60^{\circ}\text{C}$)
CE 0575
Input Parameters:
 $U_i = 17.5 \text{ Vdc}$
 $I_i = 380 \text{ mA}$
 $P_i = 5.32 \text{ W}$
 $C_i = 0 \mu\text{F}$
 $L_i < 10 \mu\text{H}$

SPECIAL CONDITIONS FOR SAFE USE (X)

When fitted with 90V transient suppressors (T1 Option), the equipment is not capable of passing the 500V isolation test. This must be taken into account upon installation.

ATEX Type N Certification

- N1** Certification No. Baseefa05ATEX0085X
ATEX Marking  II 3 G
EEx nAnL IIC T5 ($-40^{\circ}\text{C} \leq T_a \leq 70^{\circ}\text{C}$)
Input Parameters:
 $U_i = 32 \text{ Vdc MAX}$
 $C_i = 0 \mu\text{F}$
 $L_i = 20 \mu\text{H}$

SPECIAL CONDITIONS FOR SAFE USE (X)

When fitted with 90V transient suppressors (T1 Option), the equipment is not capable of passing the 500V isolation test. This must be taken into account upon installation.

ATEX Flameproof Certifications

- E1** Certification No. KEMA 99ATEX3852X
ATEX Marking Remote Mount:
Transmitter:  II 2(1) G
EEx d [ia] IIC T6 (-50°C ≤ Ta ≤ 70°C)
Meter Body:  II 1 G
EEx ia IIC T6 (-50°C ≤ Ta ≤ 70°C)
ATEX Marking Integral Mount:  II 1/2 G
EEx d [ia] IIC T6 (-50°C ≤ Ta ≤ 70°C)
CE 0575
V = 42 Vdc Max
Um = 250V

SPECIAL CONDITIONS

When the equipment is installed, particular precautions must be taken to ensure, taking into account the effect of the process fluid temperature, that the ambient temperature of the electrical parts of the equipment is comprised between -50°C and 70°C.

The remote mounted sensor shall only be connected to the transmitter with the associated cable, supplied by the manufacturer.

ATEX Dust Certification

- ND** Certification No. Baseefa05ATEX0086
ATEX Marking  II 1 D T90°C (-20°C ≤ Ta ≤ 70°C)
Ui = 42 Vdc
CE 0575
K1 E1, I1, N1 and ND Combination

International IECEx Certifications

Intrinsic Safety

- I7** Certification No. IECEx BAS 05.0028X
Ex ia IIC T4 (-60°C ≤ Ta ≤ 60°C)
Input Parameters:
Ui = 30 Vdc
Ii = 300 mA
Pi = 1.3 W
Ci = 0 μF
Li = 20 μH

SPECIAL CONDITIONS

When fitted with 90V transient suppressors (T1 Option), the equipment is not capable of passing the 500V isolation test. This must be taken into account upon installation.

FISCO/FNICO

- IG** Certification No. IECEx BAS 05.0028X
Ex ia IIC T4 (-60°C ≤ Ta ≤ 60°C)
Input Parameters:
Ui = 17.5 Vdc
Ii = 380 mA
Pi = 5.32 W
Ci = 0 μF
Li < 10 μH

Type N Certification

- N7** Certification No. IECEx BAS 05.0029X
Ex nC IIC T5 (-40°C ≤ Ta ≤ 70°C)
Ui = 32 Vdc Max

Flameproof Certification

- E7** Certification No. IECEx KEM 05.0017X
Marking Remote Mount:
Transmitter: Ex d [ia] IIC T6 (-50°C ≤ Ta ≤ 70°C)
Meter Body: Ex ia IIC T6 (-50°C ≤ Ta ≤ 70°C)
Marking Integral Mount: Ex d [ia] IIC T6
(-50°C ≤ Ta ≤ 70°C)
V = 32 Vdc Max
Um = 250V

SPECIAL CONDITIONS

When the equipment is installed, particular precautions must be taken to ensure, taking into account the effect of the process fluid temperature, that the ambient temperature of the electrical parts of the equipment is comprised between -50°C and 70°C.

The remote mounted sensor shall only be connected to the transmitter with the associated cable, supplied by the manufacturer.

- K7** E7, I7, and N7 Combination

Chinese Certifications (NEPSI)

Flameproof Certification

E3 Certification No. GYJ071327X
Ex d [ia] IIC T6 (-50°C to 70°C)

Intrinsic Safety

I3 Certification No. GYJ071171X
Ex ia IIC T6 (-60°C to 60°C)

Input Parameters:

$$U_i = 30 \text{ Vdc}$$

$$I_i = 300 \text{ mA}$$

$$P_i = 1.3 \text{ W}$$

$$C_i = 0 \text{ }\mu\text{F}$$

$$L_i = 20 \text{ }\mu\text{H}$$

FISCO/FNICO

IH For FISCO:

Certification No. GYJ071171X
Ex ia IIC T4 (-60°C to 60°C)

Input Parameters:

$$U_i = 17.5 \text{ Vdc}$$

$$I_i = 380 \text{ mA}$$

$$P_i = 5.32 \text{ W}$$

$$C_i = 0 \text{ }\mu\text{F}$$

$$L_i < 10 \text{ }\mu\text{H}$$

For FNICO:

Certification No. GYJ071193X
Ex nAnL IIC T5 (-40°C to 70°C)
17.5 Vdc Max

Type N Certification

N3 Certification No. GYJ071193X
Ex nAnL IIC T5 (-40°C to 70°C)

32 Vdc Max

K3 E3, I3, and N3 Combination

Japanese Certifications (TIIS)

Flameproof Certification

E4 TIIS Flameproof

Transmitter - Ex d [ia] T6

Remote Sensor - Ex ia IIC T6

Certificate Description

TC17816 8800D with display, without MTA option

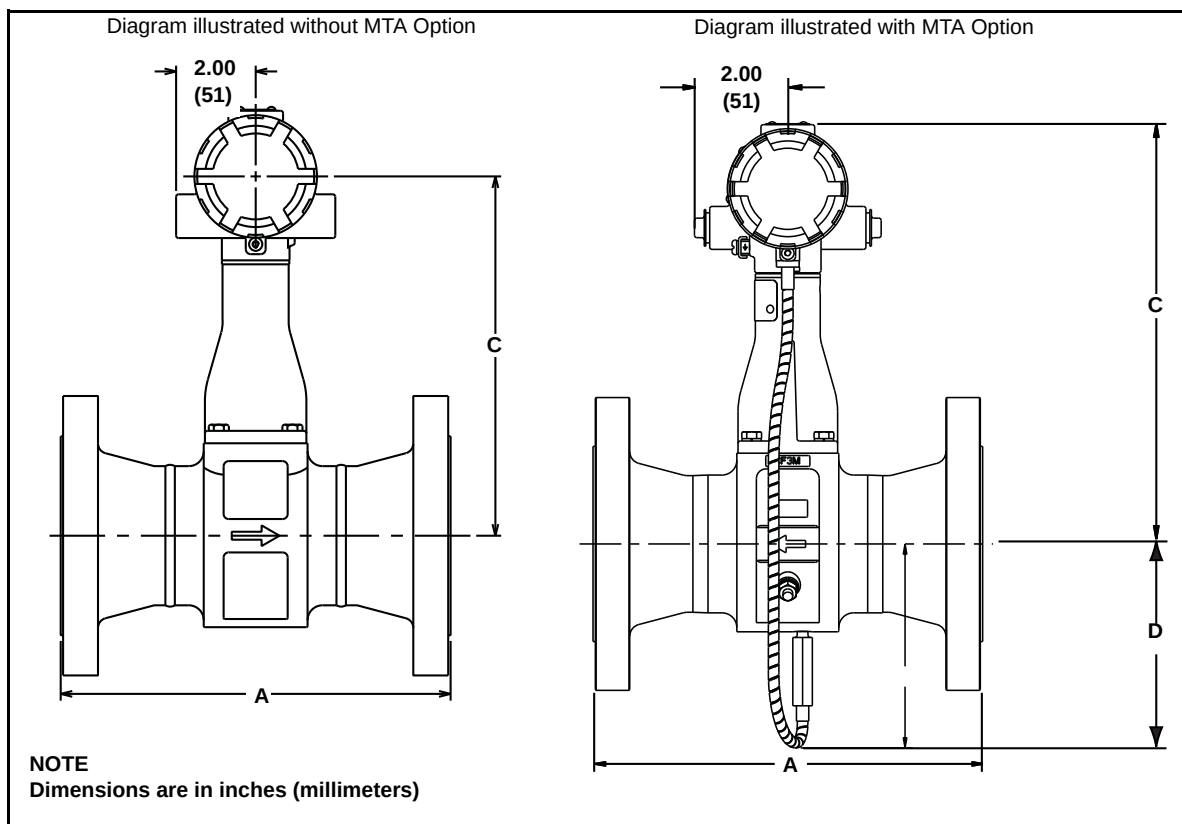
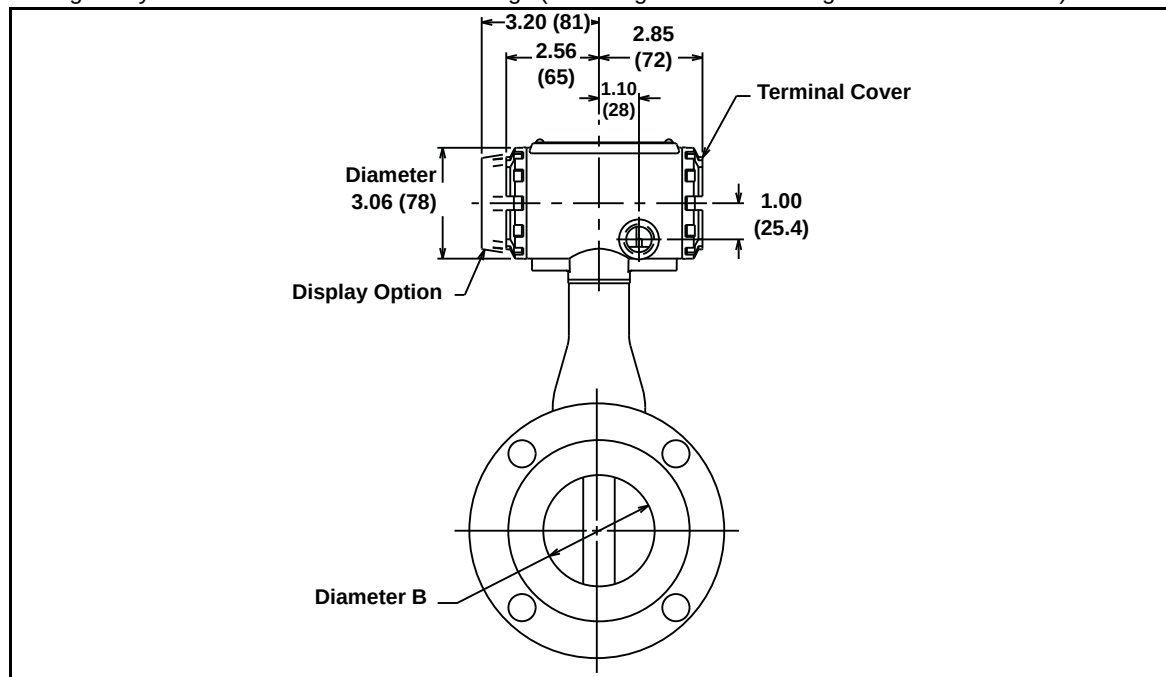
TC17817 8800D without display, without MTA option

TC17905 8800D with display, with MTA option

TC17906 8800D without display, with MTA option

Dimensional Drawings

Figure 2. Flanged-Style Flowmeter Dimensional Drawings ($\frac{1}{2}$ -through 12-in./15 through 300 mm Line Sizes)



Product Data Sheet

00813-0100-4004, Rev HA

April 2010

Rosemount 8800D

Table 19. Flanged-Style Flowmeter (¹/₂-through 2-in./15 through 50 mm Line Sizes)

Nominal Size in. (mm)	Flange Rating	Face-to-face A in. (mm)	A-ANSI RTJ in. (mm)	Diameter B in. (mm)	C in. (mm)	D in. (mm)	Weight ⁽¹⁾ lb (kg)
¹ / ₂ (15)	Class 150	6.8 (173)	–	0.54 (13,7)	7.6 (193)	–	9.1 (4,1)
	Class 300	7.2 (183)	7.6 (193)	0.54 (13,7)	7.6 (193)	–	10.4 (4,7)
	Class 600	7.7 (196)	7.6 (193)	0.54 (13,7)	7.6 (193)	–	10.8 (4,9)
	Class 900	8.3 (211)	8.3 (211)	0.54 (13,7)	7.6 (193)	–	15.6 (7,1)
	PN 16/40	6.1 (155)	–	0.54 (13,7)	7.6 (193)	–	10.4 (4,7)
	PN 100	6.6 (168)	–	0.54 (13,7)	7.6 (193)	–	12.4 (5,6)
	PN 160	6.6 (168)	–	0.54 (13,7)	7.6 (193)	–	12.4 (5,6)
	JIS 10K/20K	6.3 (160)	–	0.54 (13,7)	7.6 (193)	–	10.2 (4,6)
	JIS 40K	7.3 (185)	–	0.54 (13,7)	7.6 (193)	–	13.7 (6,2)
1 (25)	Class 150	7.5 (191)	8.0 (203)	0.95 (24,1)	7.7 (196)	–	12.3 (5,6)
	Class 300	8.0 (203)	8.5 (216)	0.95 (24,1)	7.7 (196)	–	15.0 (6,8)
	Class 600	8.5 (216)	8.5 (216)	0.95 (24,1)	7.7 (196)	–	15.8 (7,2)
	Class 900	9.4 (239)	9.4 (239)	0.95 (24,1)	7.7 (196)	–	24.4 (11,1)
	Class 1500	9.4 (239)	9.4 (239)	0.95 (24,1)	7.7 (196)	–	24.4 (11,1)
	PN 16/40	6.2 (157)	–	0.95 (24,1)	7.7 (196)	–	13.6 (6,2)
	PN 100	7.7 (195)	–	0.95 (24,1)	7.7 (196)	–	19.6 (8,9)
	PN 160	7.7 (195)	–	0.95 (24,1)	7.7 (196)	–	19.6 (8,9)
	PN 250	7.8 (198)	–	0.95 (24,1)	7.7 (196)	–	23.7 (10,7)
	JIS 10K/20K	6.5 (165)	–	0.95 (24,1)	7.7 (196)	–	14.0 (6,3)
1 ¹ / ₂ (40)	Class 150	8.2 (208)	8.7 (221)	1.49 (37,8)	8.1 (206)	–	17.6 (8,0)
	Class 300	8.7 (221)	9.2 (234)	1.49 (37,8)	8.1 (206)	–	23.0 (10,5)
	Class 600	9.3 (236)	9.3 (236)	1.49 (37,8)	8.1 (206)	–	25.5 (11,6)
	Class 900	10.3 (262)	10.3 (262)	1.49 (37,8)	8.1 (206)	–	36.6 (16,6)
	Class 1500	10.3 (262)	10.3 (262)	1.49 (37,8)	8.1 (206)	–	36.6 (16,6)
	PN 16/40	6.9 (175)	–	1.49 (37,8)	8.1 (206)	–	19.4 (8,8)
	PN 100	8.2 (208)	–	1.49 (37,8)	8.1 (206)	–	28.0 (12,7)
	PN 160	8.4 (213)	–	1.49 (37,8)	8.1 (206)	–	29.5 (13,4)
	PN 250	9.6 (244)	–	1.49 (37,8)	8.1 (206)	–	39.2 (17,8)
	JIS 10K/20K	7.3 (185)	–	1.49 (37,8)	8.1 (206)	–	18.6 (8,4)
2 (50)	Class 150	9.2 (234)	9.7 (246)	1.92 (48,8)	8.5 (216)	4.7 (119)	22.0 (10,1)
	Class 300	9.7 (246)	10.4 (264)	1.92 (48,8)	8.5 (216)	4.7 (119)	26.1 (11,8)
	Class 600	10.5 (267)	10.7 (271)	1.92 (48,8)	8.5 (216)	4.7 (119)	29.8 (13,5)
	Class 900	12.7 (323)	12.9 (328)	1.92 (48,8)	8.5 (216)	4.7 (119)	59.5 (27,0)
	Class 1500	12.7 (323)	12.9 (328)	1.67 (42,4)	8.5 (216)	4.7 (119)	61.9 (28,1)
	PN 16/40	8.0 (203)	–	1.92 (48,8)	8.5 (216)	4.7 (119)	23.2 (10,5)
	PN 64	9.1 (231)	–	1.92 (48,8)	8.5 (216)	4.7 (119)	30.8 (13,9)
	PN 100	9.6 (244)	–	1.92 (48,8)	8.5 (216)	4.7 (119)	36.5 (16,6)
	PN 160	10.2 (259)	–	1.92 (48,8)	8.5 (216)	4.7 (119)	38.8 (17,6)
	PN 250	10.9 (277)	–	1.67 (42,4)	8.5 (216)	4.7 (119)	47.4 (21,5)
	JIS 10K	7.7 (195)	–	1.92 (48,8)	8.5 (216)	4.7 (119)	19.5 (8,8)
	JIS 20K	8.2 (208)	–	1.92 (48,8)	8.5 (216)	4.7 (119)	20.4 (9,3)
	JIS 40K	9.8 (249)	–	1.92 (48,8)	8.5 (216)	4.7 (119)	28.5 (12,9)

(1) Add 0.2 lb (0,1 kg) for display option.

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Table 20. Flanged-Style Flowmeter (3-through 6-in./80 through 150 mm Line Sizes) (Refer to previous drawing)

Nominal Size in. (mm)	Flange Rating	Face-to-face A in. (mm)	A ANSI RTJ in. (mm)	Diameter B in. (mm)	C in. (mm)	D in. (mm)	Weight ⁽¹⁾ lb (kg)
3 (80)	Class 150	9.9 (251)	10.4 (264)	2.87 (72,9)	9.1 (231)	5.3 (135)	37.2 (16,9)
	Class 300	10.6 (269)	11.2 (284)	2.87 (72,9)	9.1 (231)	5.3 (135)	46.5 (21,1)
	Class 600	11.4 (290)	11.5 (292)	2.87 (72,9)	9.1 (231)	5.3 (135)	52.6 (23,8)
	Class 900	12.9 (328)	13.0 (330)	2.87 (72,9)	9.1 (231)	5.3 (135)	76.1 (34,5)
	Class 1500	14.1 (358)	14.2 (361)	2.66 (67,6)	9.1 (231)	5.3 (135)	108.9 (49,4)
	PN 16/40	8.9 (226)	—	2.87 (72,9)	9.1 (231)	5.3 (135)	36.6 (16,6)
	PN 64	10.0 (254)	—	2.87 (72,9)	9.1 (231)	5.3 (135)	45.3 (20,6)
	PN 100	10.5 (267)	—	2.87 (72,9)	9.1 (231)	5.3 (135)	54.7 (24,8)
	PN 160	11.1 (282)	—	2.87 (72,9)	9.1 (231)	5.3 (135)	59.6 (27,0)
	PN 250	12.4 (315)	—	2.60 (66,0)	9.1 (231)	5.3 (135)	90.1 (40,9)
	JIS 10K	7.9 (200)	—	2.87 (72,9)	9.1 (231)	5.3 (135)	28.0 (12,7)
	JIS 20K	9.3 (235)	—	2.87 (72,9)	9.1 (231)	5.3 (135)	35.4 (16,1)
	JIS 40K	11.0 (280)	—	2.87 (72,9)	9.1 (231)	5.3 (135)	50.3 (22,8)
4 (100)	Class 150	10.3 (262)	10.8 (274)	3.79 (96,3)	9.6 (244)	5.9 (150)	51.3 (23,3)
	Class 300	11.0 (279)	11.6 (295)	3.79 (96,3)	9.6 (244)	5.9 (150)	71.5 (32,4)
	Class 600	12.8 (325)	12.9 (328)	3.79 (96,3)	9.6 (244)	5.9 (150)	97.5 (44,2)
	Class 900	13.8 (351)	13.9 (353)	3.79 (96,3)	9.6 (244)	5.9 (150)	120.8 (54,8)
	Class 1500	14.5 (368)	14.6 (371)	3.40 (86,4)	9.6 (244)	5.9 (150)	162.6 (73,8)
	PN 16	8.4 (213)	—	3.79 (96,3)	9.6 (244)	5.9 (150)	40.4 (18,2)
	PN 40	9.4 (239)	—	3.79 (96,3)	9.6 (244)	5.9 (150)	49.5 (22,4)
	PN 64	10.4 (264)	—	3.79 (96,3)	9.6 (244)	5.9 (150)	62.5 (28,3)
	PN 100	11.3 (287)	—	3.79 (96,3)	9.6 (244)	5.9 (150)	78.9 (35,8)
	PN 160	12.1 (307)	—	3.79 (96,3)	9.6 (244)	5.9 (150)	86.2 (39,1)
	PN 250	13.7 (348)	—	3.40 (86,4)	9.6 (244)	5.9 (150)	143.4 (65,0)
	JIS 10K	8.7 (220)	—	3.79 (96,3)	9.6 (244)	5.9 (150)	37.5 (17,0)
	JIS 20K	8.7 (220)	—	3.79 (96,3)	9.6 (244)	5.9 (150)	45.4 (20,6)
	JIS 40K	11.8 (300)	—	3.79 (96,3)	9.6 (244)	5.9 (150)	75.8 (34,4)
6 (150)	Class 150	11.6 (295)	12.1 (307)	5.7 (144,8)	10.8 (274)	7.4 (188)	81 (37)
	Class 300	12.3 (315)	13.0 (330)	5.7 (144,8)	10.8 (274)	7.4 (188)	120 (55)
	Class 600	14.3 (363)	14.5 (368)	5.7 (144,8)	10.8 (274)	7.4 (188)	187 (85)
	Class 900	16.1 (409)	16.2 (411)	5.14 (130,6)	10.8 (274)	7.4 (188)	277.9 (126,0)
	Class 1500	18.6 (472)	18.8 (478)	5.14 (130,6)	10.8 (274)	7.4 (188)	375.8 (170,4)
	PN 16	8.9 (226)	—	5.7 (144,8)	10.8 (274)	7.4 (188)	66 (30)
	PN 40	10.5 (267)	—	5.7 (144,8)	10.8 (274)	7.4 (188)	86 (39)
	PN 64	12.1 (307)	—	5.7 (144,8)	10.8 (274)	7.4 (188)	130 (59)
	PN 100	13.6 (345)	—	5.7 (144,8)	10.8 (274)	7.4 (188)	160 (73)
	PN 160	14.7 (373)	—	5.14 (130,6)	10.8 (274)	7.4 (188)	202.2 (91,7)
	PN 250	17.2 (437)	—	5.14 (130,6)	10.8 (274)	7.4 (188)	312 (141,6)
	JIS 10K	10.6 (270)	—	5.7 (144,8)	10.8 (274)	7.4 (188)	70 (32)
	JIS 20K	10.6 (270)	—	5.7 (144,8)	10.8 (274)	7.4 (188)	88 (40)
	JIS 40K	14.2 (360)	—	5.7 (144,8)	10.8 (274)	7.4 (188)	166 (75)

(1) Add 0.2 lb (0,1 kg) for display option.

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Table 21. Flanged-Style Flowmeter (8-through 12-in./200 through 300 mm Line Sizes) (Refer to previous drawing)

Nominal Size in. (mm)	Flange Rating	Face-to-face A in. (mm)	A ANSI RTJ in. (mm)	Diameter B in. (mm)	C in. (mm)	D in. (mm)	Weight ⁽¹⁾ lb (kg)
8 (200)	Class 150	13.5 (343)	14.0 (356)	7.55 (191,8)	11.7 (297)	8.3 (211)	141.6 (64,2)
	Class 300	14.3 (363)	14.9 (378)	7.55 (191,8)	11.7 (297)	8.3 (211)	198.7 (90,1)
	Class 600	16.5 (419)	16.7 (424)	7.55 (191,8)	11.7 (297)	8.3 (211)	298.6 (135,2)
	Class 900	18.8 (478)	18.9 (480)	6.62 (168,1)	11.7 (297)	8.3 (211)	479.2 (217,4)
	Class 1500	22.8 (579)	23.2 (589)	6.62 (168,1)	11.7 (297)	8.3 (211)	652.4 (259,9)
	PN 10	10.4 (264)	—	7.55 (191,8)	11.7 (297)	8.3 (211)	110.5 (50,1)
	PN 16	10.4 (264)	—	7.55 (191,8)	11.7 (297)	8.3 (211)	109.4 (49,6)
	PN 25	11.8 (300)	—	7.55 (191,8)	11.7 (297)	8.3 (211)	137.7 (62,5)
	PN 40	12.5 (318)	—	7.55 (191,8)	11.7 (297)	8.3 (211)	156.5 (71,0)
	PN 64	14.2 (361)	—	7.55 (191,8)	11.7 (297)	8.3 (211)	217.1 (98,5)
	PN 100	15.8 (401)	—	7.55 (191,8)	11.7 (297)	8.3 (211)	282.7 (128,2)
	PN 160	16.6 (422)	—	6.62 (168,1)	11.7 (297)	8.3 (211)	346.6 (157,2)
	PN250	20.5 (521)	—	6.62 (168,1)	11.7 (297)	8.3 (211)	570.5 (258,8)
	JIS 10K	12.2 (310)	—	7.55 (191,8)	11.7 (297)	8.3 (211)	110.1 (49,9)
	JIS 20K	12.2 (310)	—	7.55 (191,8)	11.7 (297)	8.3 (211)	134.5 (61,0)
	JIS 40K	16.5 (419)	—	7.55 (191,8)	11.7 (297)	8.3 (211)	255.7 (116,0)
10 (250)	Class 150	14.5 (368)	15.0 (381)	9.56 (242,8)	12.8 (325)	9.3 (236)	197.7 (89,7)
	Class 300	15.8 (401)	16.4 (417)	9.56 (242,8)	12.8 (325)	9.3 (236)	286.2 (129,8)
	Class 600	19.0 (483)	19.2 (488)	9.56 (242,8)	12.8 (325)	9.3 (236)	477.9 (216,9)
	PN 10	11.9 (302)	—	9.56 (242,8)	12.8 (325)	9.3 (236)	157.1 (71,3)
	PN 16	12.0 (307)	—	9.56 (242,8)	12.8 (325)	9.3 (236)	161.9 (73,5)
	PN 25	13.5 (343)	—	9.56 (242,8)	12.8 (325)	9.3 (236)	198.6 (90,1)
	PN 40	14.8 (376)	—	9.56 (242,8)	12.8 (325)	9.3 (236)	246.8 (111,9)
	PN 64	16.4 (417)	—	9.56 (242,8)	12.8 (325)	9.3 (236)	308.2 (139,8)
	PN 100	18.9 (480)	—	9.56 (242,8)	12.8 (325)	9.3 (236)	445.2 (201,9)
	JIS 10K	14.5 (368)	—	9.56 (242,8)	12.8 (325)	9.3 (236)	174.5 (79,1)
	JIS 20K	14.5 (368)	—	9.56 (242,8)	12.8 (325)	9.3 (236)	221.8 (100,6)
	JIS 40K	18.1 (460)	—	9.56 (242,8)	12.8 (325)	9.3 (236)	378.5 (171,7)
12 (300)	Class 150	16.8 (427)	17.3 (439)	11.38 (289,0)	13.7 (348)	10.1 (256)	297.5 (134,9)
	Class 300	18.0 (457)	18.6 (472)	11.38 (289,0)	13.7 (348)	10.1 (256)	415.7 (188,6)
	Class 600	20.5 (521)	20.6 (523)	11.38 (289,0)	13.7 (348)	10.1 (256)	595.4 (270,1)
	PN 10	13.1 (333)	—	11.38 (289,0)	13.7 (348)	10.1 (256)	204.1 (92,6)
	PN 16	13.9 (353)	—	11.38 (289,0)	13.7 (348)	10.1 (256)	224.6 (101,9)
	PN 25	15.0 (381)	—	11.38 (289,0)	13.7 (348)	10.1 (256)	269.4 (122,2)
	PN 40	16.8 (427)	—	11.38 (289,0)	13.7 (348)	10.1 (256)	347.9 (157,8)
	PN 64	18.8 (478)	—	11.38 (289,0)	13.7 (348)	10.1 (256)	431.2 (195,6)
	PN 100	21.2 (538)	—	11.38 (289,0)	13.7 (348)	10.1 (256)	644.1 (292,2)
	JIS 10K	15.7 (399)	—	11.38 (289,0)	13.7 (348)	10.1 (256)	222.9 (101,1)
	JIS 20K	15.7 (399)	—	11.38 (289,0)	13.7 (348)	10.1 (256)	284.2 (128,9)
	JIS 40K	19.6 (498)	—	11.38 (289,0)	13.7 (348)	10.1 (256)	493.8 (224,0)

(1) Add 0.2 lb (0,1 kg) for display option.

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Figure 3. Rosemount 8800DR Reducer Flowmeter Dimensional Drawings (1-through 12-in./25 through 300 mm Line Sizes)

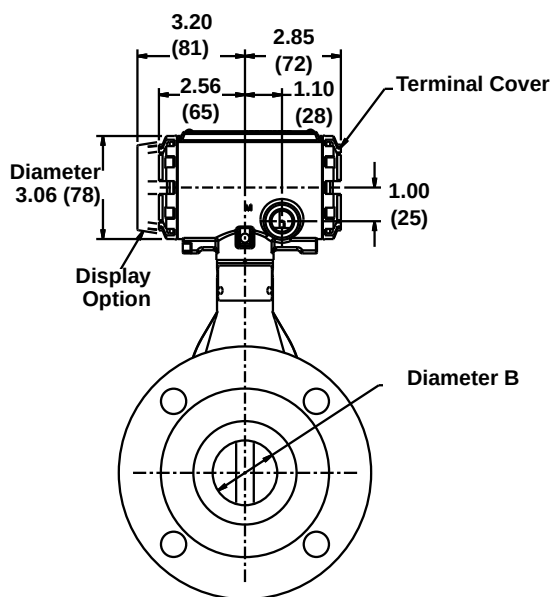


Diagram illustrated without MTA Option

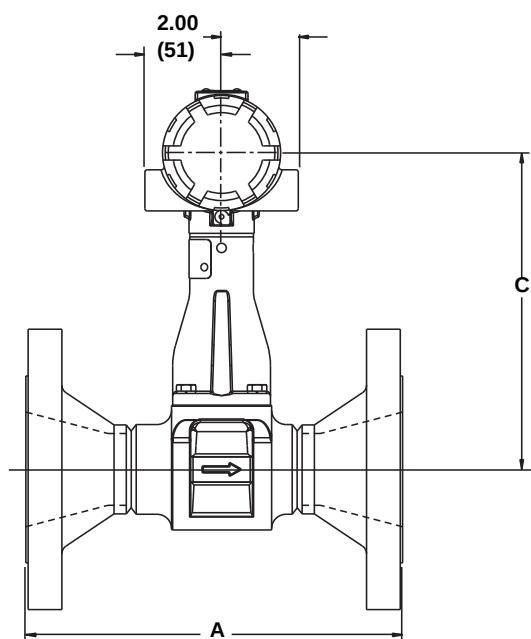
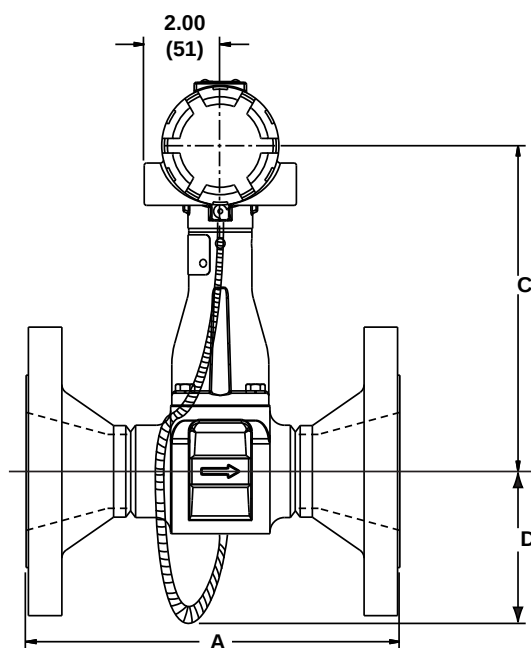


Diagram illustrated with MTA Option



NOTE

Dimensions are in inches (millimeters)

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TABLE 22. Reducer Flowmeter (1-through 3-in./25 through 80 mm Line Sizes)

Nominal Size in. (mm)	Flange Rating	Face-to-face A in. (mm)	A-ANSI RTJ in. (mm)	Diameter B in. (mm)	C in. (mm)	D in. (mm)	Weight ⁽¹⁾ lb (kg)
1 (25)	Class 150	7.5 (191)	8.0 (203)	0.54 (13,7)	7.6 (193)	–	11.6 (5,2)
	Class 300	8.0 (203)	8.5 (216)	0.54 (13,7)	7.6 (193)	–	14.2 (6,4)
	Class 600	8.5 (216)	8.5 (216)	0.54 (13,7)	7.6 (193)	–	15.1 (6,9)
	Class 900	9.4 (239)	9.4 (239)	0.54 (13,7)	7.6 (193)	–	20.7 (9,4)
	PN 16/40	6.2 (157)	–	0.54 (13,7)	7.6 (193)	–	12.6 (5,7)
	PN 100	7.7 (195)	–	0.54 (13,7)	7.6 (193)	–	18.4 (8,4)
1 ½ (40)	Class 150	8.2 (208)	8.7 (221)	0.95 (24,1)	7.7 (196)	–	15.8 (7,20)
	Class 300	8.7 (221)	9.2 (234)	0.95 (24,1)	7.7 (196)	–	21.2 (9,6)
	Class 600	9.3 (236)	9.3 (236)	0.95 (24,1)	7.7 (196)	–	23.8 (10,8)
	Class 900	10.3 (262)	10.3 (262)	0.95 (24,1)	7.7 (196)	–	35.0 (15,9)
	PN 16/40	6.9 (175)	–	0.95 (24,1)	7.7 (196)	–	17.5 (7,9)
	PN 100	8.2 (208)	–	0.95 (24,1)	7.7 (196)	–	26.2 (11,9)
2 (50)	PN 160	8.4 (213)	–	0.95 (24,1)	7.7 (196)	–	27.7 (12,6)
	Class 150	9.2 (236)	9.7 (249)	1.49 (37,8)	8.1 (206)	4.7 (119)	22.6 (10,3)
	Class 300	9.7 (249)	10.4 (264)	1.49 (37,8)	8.1 (206)	4.7 (119)	26.8 (12,1)
	Class 600	10.5 (267)	10.6 (269)	1.49 (37,8)	8.1 (206)	4.7 (119)	30.6 (13,9)
	Class 900	12.7 (323)	12.9 (328)	1.49 (37,8)	8.1 (206)	4.7 (119)	60.8 (27,6)
	PN 16/40	8.0 (203)	–	1.49 (37,8)	8.1 (206)	4.7 (119)	23.5 (10,7)
3 (80)	PN 64	9.1 (231)	–	1.49 (37,8)	8.1 (206)	4.7 (119)	31.3 (14,2)
	PN 100	9.6 (244)	–	1.49 (37,8)	8.1 (206)	4.7 (119)	37.2 (16,9)
	PN 160	10.2 (259)	–	1.49 (37,8)	8.1 (206)	4.7 (119)	39.6 (18,0)
	Class 150	9.9 (251)	10.4 (264)	1.92 (48,8)	8.5 (216)	5.3 (134)	33.2 (15,0)
	Class 300	10.6 (269)	11.2 (284)	1.92 (48,8)	8.5 (216)	5.3 (134)	42.7 (19,4)
	Class 600	11.4 (290)	11.5 (292)	1.92 (48,8)	8.5 (216)	5.3 (134)	49.5 (22,4)
	Class 900	12.9 (328)	13.0 (330)	1.92 (48,8)	8.5 (216)	5.3 (134)	73.3 (33,2)
	PN 16/40	8.9 (226)	–	1.92 (48,8)	8.5 (216)	5.3 (134)	33.3 (15,1)
	PN 64	10.0 (254)	–	1.92 (48,8)	8.5 (216)	5.3 (134)	42.4 (19,3)
	PN 100	10.5 (267)	–	1.92 (48,8)	8.5 (216)	5.3 (134)	52.2 (23,7)
	PN 160	11.1 (282)	–	1.92 (48,8)	8.5 (216)	5.3 (134)	57.9 (26,3)

(1) Add 0.2 lb (0,1 kg) for display option.

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TABLE 23. Reducer Flowmeter (4-through 12-in./100 through 300mm Line Sizes) (Refer to previous drawing)

Nominal Size in. (mm)	Flange Rating	Face-to-face A in. (mm)	A ANSI RTJ in. (mm)	Diameter B in. (mm)	C in. (mm)	D in. (mm)	Weight ⁽¹⁾ lb (kg)
4 (100)	Class 150	10.3 (262)	10.8 (274)	2.87 (72,9)	9.1 (231)	5.9 (149)	46.3 (21,0)
	Class 300	11.0 (279)	11.6 (295)	2.87 (72,9)	9.1 (231)	5.9 (149)	67.0 (30,4)
	Class 600	12.8 (325)	12.9 (328)	2.87 (72,9)	9.1 (231)	5.9 (149)	94.3 (42,8)
	Class 900	13.8 (351)	13.9 (353)	2.87 (72,9)	9.1 (231)	5.9 (149)	118.0 (53,5)
	PN 16	8.4 (213)	—	2.87 (72,9)	9.1 (231)	5.9 (149)	36.4 (16,5)
	PN 40	9.4 (239)	—	2.87 (72,9)	9.1 (231)	5.9 (149)	45.9 (20,8)
	PN 64	10.4 (264)	—	2.87 (72,9)	9.1 (231)	5.9 (149)	59.7 (27,1)
	PN 100	11.3 (287)	—	2.87 (72,9)	9.1 (231)	5.9 (149)	76.7 (34,8)
6 (150)	PN 160	12.1 (307)	—	2.87 (72,9)	9.1 (231)	—	84.7 (38,4)
	Class 150	11.6 (295)	12.1 (307)	3.79 (96,3)	9.6 (244)	7.4 (187)	70.3 (31,9)
	Class 300	12.3 (312)	13.0 (330)	3.79 (96,3)	9.6 (244)	7.4 (187)	113.1 (51,3)
	Class 600	14.3 (363)	14.4 (366)	3.79 (96,3)	9.6 (244)	7.4 (187)	185.1 (84,0)
	Class 900	16.1 (409)	16.2 (411)	3.79 (96,3)	9.6 (244)	7.4 (187)	246.3 (111,7)
	PN 16	8.9 (226)	—	3.79 (96,3)	9.6 (244)	7.4 (187)	59.2 (26,9)
	PN 40	10.5 (267)	—	3.79 (96,3)	9.6 (244)	7.4 (187)	81.9 (37,2)
	PN 64	12.1 (307)	—	3.79 (96,3)	9.6 (244)	7.4 (187)	125.4 (56,9)
8 (200)	PN 100	13.6 (345)	—	3.79 (96,3)	9.6 (244)	7.4 (187)	162.3 (73,6)
	PN 160	14.7 (373)	—	3.79 (96,3)	9.6 (244)	7.4 (187)	187.9 (85,2)
	Class 150	13.5 (343)	14.0 (356)	5.70 (144,8)	10.8 (274)	8.3 (210)	124 (56)
	Class 300	14.3 (363)	14.9 (378)	5.70 (144,8)	10.8 (274)	8.3 (210)	186 (84)
	Class 600	16.5 (419)	16.7 (424)	5.70 (144,8)	10.8 (274)	8.3 (210)	295 (134)
	PN 10	10.4 (264)	—	5.70 (144,8)	10.8 (274)	8.3 (210)	91 (41)
	PN 16	10.4 (264)	—	5.70 (144,8)	10.8 (274)	8.3 (210)	91 (41)
	PN 25	11.8 (300)	—	5.70 (144,8)	10.8 (274)	8.3 (210)	124 (56)
10 (250)	PN 40	12.5 (318)	—	5.70 (144,8)	10.8 (274)	8.3 (210)	145 (66)
	PN 64	14.2 (361)	—	5.70 (144,8)	10.8 (274)	8.3 (210)	211 (96)
	PN 100	15.8 (401)	—	5.70 (144,8)	10.8 (274)	8.3 (210)	283 (128)
	Class 150	14.5 (368)	15.0 (381)	7.55 (191,8)	11.7 (297)	9.3 (236)	182.4 (82,8)
	Class 300	15.8 (401)	16.4 (417)	7.55 (191,8)	11.7 (297)	9.3 (236)	281.7 (127,8)
	Class 600	19.0 (483)	19.2 (488)	7.55 (191,8)	11.7 (297)	9.3 (236)	489.9 (222,2)
	PN 10	11.9 (302)	—	7.55 (191,8)	11.7 (297)	9.3 (236)	138.6 (62,9)
	PN 16	12.0 (305)	—	7.55 (191,8)	11.7 (297)	9.3 (236)	148.6 (67,4)
12 (300)	PN 25	13.5 (343)	—	7.55 (191,8)	11.7 (297)	9.3 (236)	191.0 (86,6)
	PN 40	14.8 (376)	—	7.55 (191,8)	11.7 (297)	9.3 (236)	245.8 (111,5)
	PN 64	16.4 (417)	—	7.55 (191,8)	11.7 (297)	9.3 (236)	314.1 (142,5)
	PN 100	18.9 (480)	—	7.55 (191,8)	11.7 (297)	9.3 (236)	463.5 (210,2)
	Class 150	16.8 (427)	17.3 (439)	9.56 (242,8)	12.8 (325)	10.1 (256)	282.0 (127,9)
	Class 300	18.0 (457)	18.6 (472)	9.56 (242,8)	12.8 (325)	10.1 (256)	412.2 (187,0)
	Class 600	20.5 (521)	20.6 (523)	9.56 (242,8)	12.8 (325)	10.1 (256)	609.9 (276,6)
	PN 10	13.1 (333)	—	9.56 (242,8)	12.8 (325)	10.1 (256)	188.3 (85,4)
12 (300)	PN 16	13.9 (353)	—	9.56 (242,8)	12.8 (325)	10.1 (256)	211.8 (96,1)
	PN 25	15.0 (381)	—	9.56 (242,8)	12.8 (325)	10.1 (256)	262.4 (119,1)
	PN 40	16.8 (427)	—	9.56 (242,8)	12.8 (325)	10.1 (256)	349.9 (158,7)
	PN 64	18.8 (478)	—	9.56 (242,8)	12.8 (325)	10.1 (256)	444.2 (201,5)
	PN 100	21.2 (538)	—	9.56 (242,8)	12.8 (325)	10.1 (256)	672.1 (304,8)

(1) Add 0.2 lb (0,1 kg) for display option.

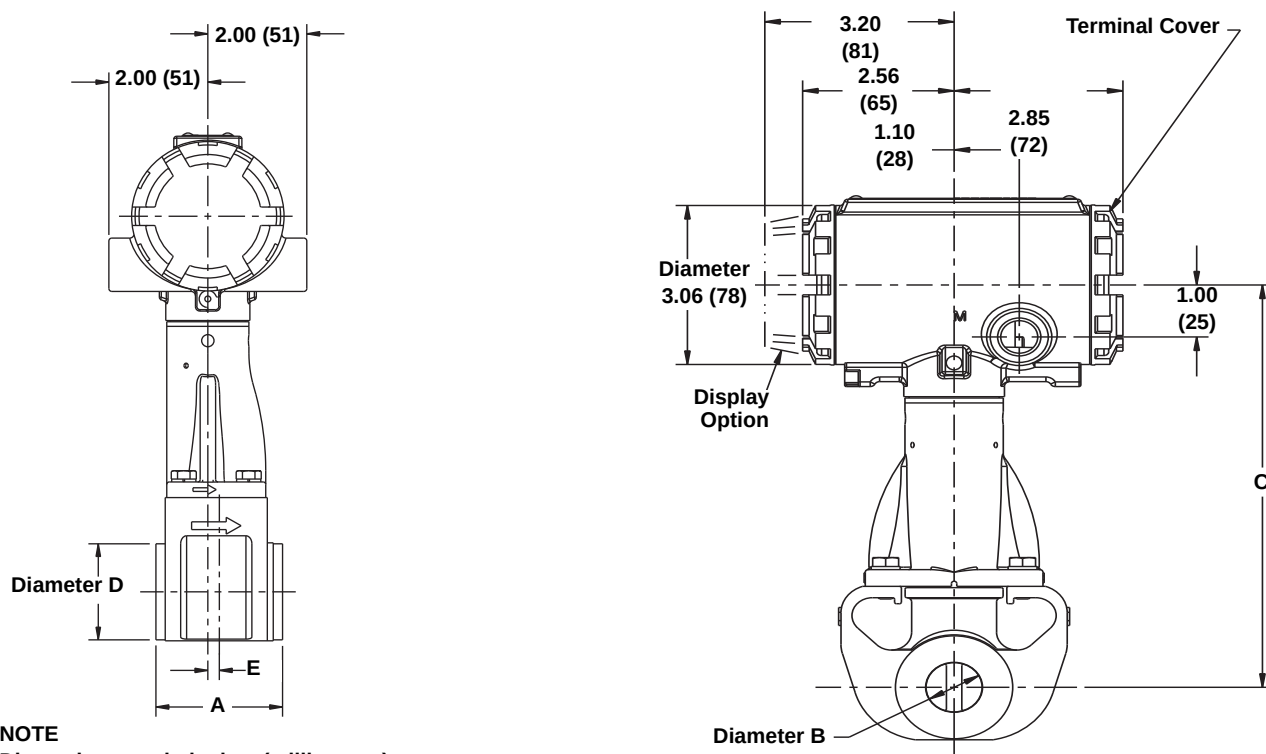
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Figure 4. Wafer-Style Dimensional Drawings ($\frac{1}{2}$ -through 8-in./15 through 200 mm Line Sizes)



NOTE

Dimensions are in inches (millimeters)

Electronics housing may be rotated in 90 degree increments

Table 24. Rosemount 8800D Wafer-Style Meter

Nominal Size in. (mm)	Face-to-face A in. (mm)	Diameter B in. (mm)	C in. (mm)	Diameter D in. (mm)	E in. (mm)	Weight lb (kg) ⁽¹⁾
$\frac{1}{2}$ (15)	2.56 (65)	0.52 (13,2)	7.63 (194)	1.38 (35,1)	0.17 (4,3)	6.8 (3,1)
1 (25)	2.56 (65)	0.95 (24,1)	7.74 (197)	1.98 (50,3)	0.23 (5,9)	7.4 (3,4)
1½ (40)	2.56 (65)	1.49 (37,8)	8.14 (206)	2.87 (72,9)	0.18 (4,5)	10.0 (6,2)
2 (50)	2.56 (65)	1.92 (48,8)	8.85 (224,8)	3.86 (98)	0.12 (3)	10.6 (4,8)
3 (80)	2.56 (65)	2.87 (72,9)	9.62 (244,4)	5.00 (127)	0.25 (6,4)	13.6 (6,2)
4 (100)	3.42 (87)	3.79 (96,3)	10.48 (266,2)	6.20 (157,5)	0.44 (11,2)	21.4 (9,7)
6 (150)	5.00 (127)	5.70 (144,8)	10.29 (261)	8.50 (216)	0.30 (7,6)	36 (16,3)
8 (200)	6.60 (168)	7.55 (192)	11.22 (285)	10.62 (270)	0.70 (17,8)	62 (28)

(1) Add 0.2 lb (0,1 kg) for display option.

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Figure 5. Vortex Dual-Sensor Style Flowmeter Dimensional Drawings ($\frac{1}{2}$ -in. (15 mm) through 4-in. (100 mm) line sizes)

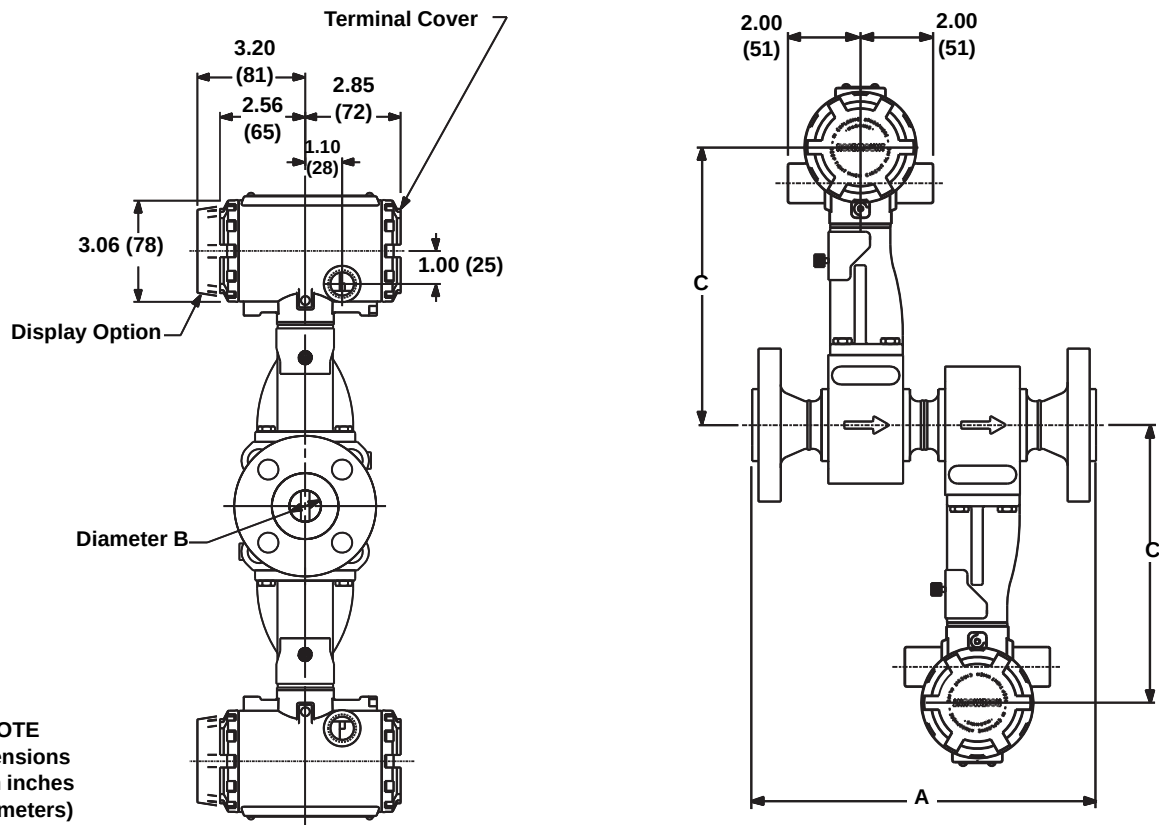
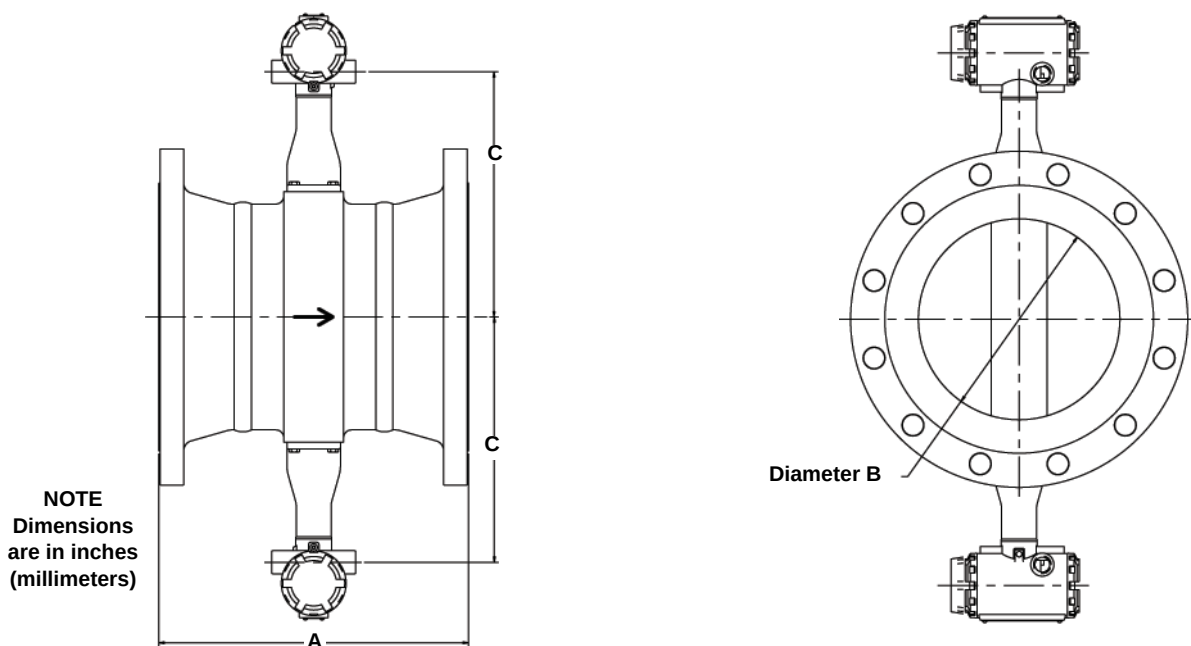


Figure 6. Vortex Dual-Sensor Style Flowmeter Dimensional Drawings (6-in. (150 mm) through 12-in. (300 mm) line sizes)



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Table 25. Vortex Dual-Sensor Style Flowmeter ($\frac{1}{2}$ -through 3-in./15 through 80 mm Line Sizes)

Nominal Size in. (mm)	Flange Rating	Face-to-face A in. (mm)	A ANSI RTJ in. (mm)	Diameter B in. (mm)	C in. (mm)	Weight lb (kg) ⁽¹⁾
$\frac{1}{2}$ (15)	Class 150	11.9 (302)	—	0.54 (13,7)	7.6 (193)	16.2 (7,4)
	Class 300	12.3 (312)	12.7 (323)	0.54 (13,7)	7.6 (193)	17.4 (7,9)
	Class 600	12.8 (325)	12.7 (323)	0.54 (13,7)	7.6 (193)	17.9 (8,1)
	Class 900	13.4 (340)	13.4 (340)	0.54 (13,7)	7.6 (193)	22.7 (10,3)
	PN 16/40	11.2 (284)	—	0.54 (13,7)	7.6 (193)	17.4 (7,9)
	PN 100	11.7 (297)	—	0.54 (13,7)	7.6 (193)	19.4 (8,8)
	PN 160	11.7 (297)	—	0.54 (13,7)	7.6 (193)	19.4 (8,8)
	JIS 10K/20K	11.4 (290)	—	0.54 (13,7)	7.6 (193)	17.3 (7,8)
	JIS 40K	12.4 (315)	—	0.54 (13,7)	7.6 (193)	20.8 (9,4)
1 (25)	Class 150	15.0 (381)	15.6 (396)	0.95 (24,1)	7.7 (196)	20.7 (9,4)
	Class 300	15.6 (396)	16.1 (409)	0.95 (24,1)	7.7 (196)	23.3 (10,6)
	Class 600	16.1 (409)	16.1 (409)	0.95 (24,1)	7.7 (196)	24.2 (11,0)
	Class 900	16.9 (429)	16.9 (429)	0.95 (24,1)	7.7 (196)	32.8 (14,9)
	Class 1500	16.9 (429)	16.9 (429)	0.95 (24,1)	7.7 (196)	32.8 (14,9)
	PN 16/40	13.8 (351)	—	0.95 (24,1)	7.7 (196)	21.9 (9,9)
	PN 100	15.3 (389)	—	0.95 (24,1)	7.7 (196)	28.0 (12,7)
	PN 160	15.3 (389)	—	0.95 (24,1)	7.7 (196)	28.0 (12,7)
	PN 250	15.4 (391)	—	0.95 (24,1)	7.7 (196)	32.0 (14,5)
	JIS 10K/20K	14.0 (356)	—	0.95 (24,1)	7.7 (196)	22.3 (10,1)
	JIS 40K	15.4 (391)	—	0.95 (24,1)	7.7 (196)	26.0 (11,8)
1 $\frac{1}{2}$ (40)	Class 150	11.3 (287)	11.8 (300)	1.49 (37,8)	8.1 (206)	27.0 (12,2)
	Class 300	11.8 (300)	12.3 (312)	1.49 (37,8)	8.1 (206)	32.4 (14,7)
	Class 600	12.4 (315)	12.4 (315)	1.49 (37,8)	8.1 (206)	34.8 (15,8)
	Class 900	13.4 (340)	13.4 (340)	1.49 (37,8)	8.1 (206)	45.9 (20,8)
	Class 1500	13.4 (340)	13.4 (340)	1.49 (37,8)	8.1 (206)	45.9 (20,8)
	PN 16/40	9.9 (251)	—	1.49 (37,8)	8.1 (206)	28.7 (13,0)
	PN 100	11.3 (287)	—	1.49 (37,8)	8.1 (206)	37.4 (16,9)
	PN 160	11.4 (290)	—	1.49 (37,8)	8.1 (206)	38.8 (17,6)
	PN 250	12.7 (323)	—	1.49 (37,8)	8.1 (206)	48.5 (22,0)
	JIS 10K/20K	10.3 (262)	—	1.49 (37,8)	8.1 (206)	27.9 (12,7)
	JIS 40K	11.5 (292)	—	1.49 (37,8)	8.1 (206)	34.9 (15,8)
2 (50)	Class 150	13.0 (330)	13.5 (343)	1.92 (48,8)	8.5 (216)	31.9 (14,5)
	Class 300	13.5 (343)	14.0 (356)	1.92 (48,8)	8.5 (216)	35.7 (16,2)
	Class 600	14.3 (363)	14.3 (363)	1.92 (48,8)	8.5 (216)	39.4 (17,9)
	Class 900	16.5 (419)	16.7 (424)	1.92 (48,8)	8.5 (216)	69.1 (31,4)
	Class 1500	15.6 (396)	15.7 (399)	1.67 (42,4)	8.5 (216)	72.4 (32,9)
	PN 16/40	11.8 (300)	—	1.92 (48,8)	8.5 (216)	32.8 (14,9)
	PN 64	12.9 (328)	—	1.92 (48,8)	8.5 (216)	40.4 (18,3)
	PN 100	13.4 (340)	—	1.92 (48,8)	8.5 (216)	46.2 (20,9)
	PN 160	13.9 (353)	—	1.92 (48,8)	8.5 (216)	48.4 (21,9)
	PN 250	13.8 (351)	—	1.92 (48,8)	8.5 (216)	57.1 (25,9)
	JIS 10K	11.5 (292)	—	1.92 (48,8)	8.5 (216)	29.1 (13,2)
	JIS 20K	12.0 (305)	—	1.92 (48,8)	8.5 (216)	30.0 (13,6)
	JIS 40K	13.6 (345)	—	1.92 (48,8)	8.5 (216)	38.1 (17,3)
3 (80)	Class 150	14.3 (363)	14.8 (376)	2.87 (72,9)	9.1 (231)	50.6 (23,0)
	Class 300	15.0 (381)	15.7 (399)	2.87 (72,9)	9.1 (231)	59.9 (27,2)
	Class 600	15.8 (401)	15.9 (404)	2.87 (72,9)	9.1 (231)	65.9 (29,9)
	Class 900	17.3 (439)	17.4 (442)	2.87 (72,9)	9.1 (231)	88.4 (40,8)
	Class 1500	18.5 (470)	18.7 (475)	2.60 (66,0)	9.1 (232)	123.8 (56,2)
	PN 16/40	13.4 (340)	—	2.87 (72,9)	9.1 (231)	50.0 (22,7)
	PN 64	14.5 (368)	—	2.87 (72,9)	9.1 (231)	58.7 (26,6)
	PN 100	14.9 (378)	—	2.87 (72,9)	9.1 (231)	68.0 (30,9)
	PN 160	15.6 (396)	—	2.87 (72,9)	9.1 (231)	73.4 (33,3)
	PN 250	16.8 (427)	—	2.60 (66,0)	9.1 (231)	103 (46,9)
	JIS 10K	12.3 (312)	—	2.87 (72,9)	9.1 (231)	41.4 (18,8)
	JIS 20K	13.7 (348)	—	2.87 (72,9)	9.1 (231)	48.8 (22,1)
	JIS 40K	15.5 (394)	—	2.87 (72,9)	9.1 (231)	63.7 (28,9)

(1) Add 0.4 lb (0,2 kg) for display option.

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Table 26. Vortex Dual-Sensor Style Flowmeter (4- through 12-in./100 through 300 mm Line Sizes)

Nominal Size in. (mm)	Flange Rating	Face-to-face A in. (mm)	A ANSI RTJ in. (mm)	Diameter B in. (mm)	C in. (mm)	Weight lb (kg) ⁽¹⁾
4 (100)	Class 150	15.2 (386)	15.7 (399)	3.79 (96,3)	9.6 (244)	69.7 (31,6)
	Class 300	16.0 (406)	16.6 (422)	3.79 (96,3)	9.6 (244)	88.9 (40,8)
	Class 600	17.7 (450)	17.9 (455)	3.79 (96,3)	9.6 (244)	116 (52,5)
	Class 900	18.7 (475)	18.9 (480)	3.79 (96,3)	9.6 (244)	139 (63,1)
	Class 1500	20.0 (509)	20.2 (512)	3.40 (86,4)	9.6 (244)	184 (83,3)
	PN 16	13.3 (338)	—	3.79 (96,3)	9.6 (244)	58.7 (26,6)
	PN 40	14.4 (366)	—	3.79 (96,3)	9.6 (244)	67.8 (30,8)
	PN 64	15.4 (391)	—	3.79 (96,3)	9.6 (244)	80.8 (36,7)
	PN 100	16.3 (414)	—	3.79 (96,3)	9.6 (244)	97.2 (44,1)
	PN 160	17.1 (434)	—	3.79 (96,3)	9.6 (244)	104 (47,4)
	PN 250	19.2 (488)	—	3.40 (86,4)	9.6 (244)	162 (73,4)
	JIS 10K	13.6 (345)	—	3.79 (96,3)	9.6 (244)	55.8 (25,3)
	JIS 20K	13.6 (345)	—	3.79 (96,3)	9.6 (244)	63.8 (28,9)
	JIS 40K	16.8 (427)	—	3.79 (96,3)	9.6 (244)	94.2 (42,7)
6 (150)	Class 150	11.6 (295)	12.1 (307)	5.7 (144,8)	10.8 (274)	85 (39)
	Class 300	12.3 (312)	13.0 (330)	5.7 (144,8)	10.8 (274)	124 (57)
	Class 600	14.3 (363)	14.4 (366)	5.7 (144,8)	10.8 (274)	191 (87)
	Class 900	16.1 (409)	16.2 (411)	5.14 (130,6)	10.8 (274)	282 (128)
	Class 1500	18.6 (472)	18.8 (478)	5.14 (130,6)	10.8 (274)	380 (173)
	PN 16	8.9 (226)	—	5.7 (144,8)	10.8 (274)	70 (32)
	PN 40	10.5 (267)	—	5.7 (144,8)	10.8 (274)	90 (41)
	PN 64	12.1 (307)	—	5.7 (144,8)	10.8 (274)	134 (61)
	PN 100	13.6 (345)	—	5.7 (144,8)	10.8 (274)	164 (75)
	PN 160	14.7 (373)	—	5.14 (130,6)	10.8 (274)	207 (94)
	PN 250	17.2 (437)	—	5.14 (130,6)	10.8 (274)	316 (144)
	JIS 10K	10.6 (269)	—	5.7 (144,8)	10.8 (274)	74 (34)
	JIS 20K	10.6 (269)	—	5.7 (144,8)	10.8 (274)	92 (42)
	JIS 40K	14.2 (361)	—	5.7 (144,8)	10.8 (274)	170 (77)
8 (200)	Class 150	13.5 (343)	14.0 (356)	7.55 (191,8)	11.7 (297)	146 (66)
	Class 300	14.3 (363)	14.9 (378)	7.55 (191,8)	11.7 (297)	203 (92)
	Class 600	16.5 (419)	16.7 (424)	7.55 (191,8)	11.7 (297)	303 (138)
	Class 900	18.8 (478)	18.9 (480)	6.62 (168,1)	11.7 (297)	484 (220)
	Class 1500	22.8 (579)	23.2 (589)	6.62 (168,1)	11.7 (297)	657 (299)
	PN 10	10.4 (264)	—	7.55 (191,8)	11.7 (297)	115 (52)
	PN 16	10.4 (264)	—	7.55 (191,8)	11.7 (297)	114 (52)
	PN 25	11.8 (300)	—	7.55 (191,8)	11.7 (297)	142 (65)
	PN 40	12.5 (318)	—	7.55 (191,8)	11.7 (297)	161 (73)
	PN 64	14.2 (361)	—	7.55 (191,8)	11.7 (297)	221 (101)
	PN 100	15.8 (401)	—	7.55 (191,8)	11.7 (297)	287 (130)
	PN 160	16.6 (422)	—	6.62 (168,1)	11.7 (297)	351 (160)
	PN 250	20.5 (521)	—	6.62 (168,1)	11.7 (297)	575 (261)
	JIS 10K	12.2 (310)	—	7.55 (191,8)	11.7 (297)	114 (52)
	JIS 20K	12.2 (310)	—	7.55 (191,8)	11.7 (297)	139 (63)
	JIS 40K	16.5 (419)	—	7.55 (191,8)	11.7 (297)	260 (118)

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Table 26. Vortex Dual-Sensor Style Flowmeter (4- through 12-in./100 through 300 mm Line Sizes)

10 (250)	Class 150	14.5 (368)	15.0 (381)	9.56 (243)	12.8 (325)	202 (91,6)
	Class 300	15.8 (401)	16.4 (417)	9.56 (243)	12.8 (325)	290 (132)
	Class 600	19.0 (483)	19.2 (488)	9.56 (243)	12.8 (325)	482 (219)
	PN 10	11.9 (302)	—	9.56 (243)	12.8 (325)	161 (73,2)
	PN 16	12.0 (305)	—	9.56 (243)	12.8 (325)	166 (75,4)
	PN 25	13.5 (343)	—	9.56 (243)	12.8 (325)	203 (92,0)
	PN 40	14.8 (376)	—	9.56 (243)	12.8 (325)	251 (11,4)
	PN 64	16.4 (417)	—	9.56 (243)	12.8 (325)	312 (142)
	PN 100	18.9 (480)	—	9.56 (243)	12.8 (325)	450 (204)
	JIS 10K	14.5 (368)	—	9.56 (243)	12.8 (325)	179 (81,4)
	JIS 20K	14.5 (368)	—	9.56 (243)	12.8 (325)	226 (103)
	JIS 40K	18.1 (460)	—	9.56 (243)	12.8 (325)	383 (174)
12 (300)	Class 150	16.8 (427)	17.3 (439)	11.38 (289)	13.7 (348)	302 (137)
	Class 300	18.0 (457)	18.6 (472)	11.38 (289)	13.7 (348)	420 (191)
	Class 600	20.5 (521)	20.6 (523)	11.38 (289)	13.7 (348)	600 (272)
	PN 10	13.1 (333)	—	11.38 (289)	13.7 (348)	208 (94,5)
	PN 16	13.9 (353)	—	11.38 (289)	13.7 (348)	229 (104)
	PN 25	15.0 (381)	—	11.38 (289)	13.7 (348)	274 (124)
	PN 40	16.8 (427)	—	11.38 (289)	13.7 (348)	352 (160)
	PN 64	18.8 (478)	—	11.38 (289)	13.7 (348)	435 (198)
	PN 100	21.2 (538)	—	11.38 (289)	13.7 (348)	648 (294)
	JIS 10K	15.7 (399)	—	11.38 (289)	13.7 (348)	227 (103)
	JIS 20K	15.7 (399)	—	11.38 (289)	13.7 (348)	288 (131)
	JIS 40K	19.6 (498)	—	11.38 (289)	13.7 (348)	498 (226)

(1) Add 0.4 Lb (0,2 kg) for display option.

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Figure 7. Vortex weld-end style flowmeter dimensional drawings ($\frac{1}{2}$ - 4-in. (15 - 100 mm) line sizes)

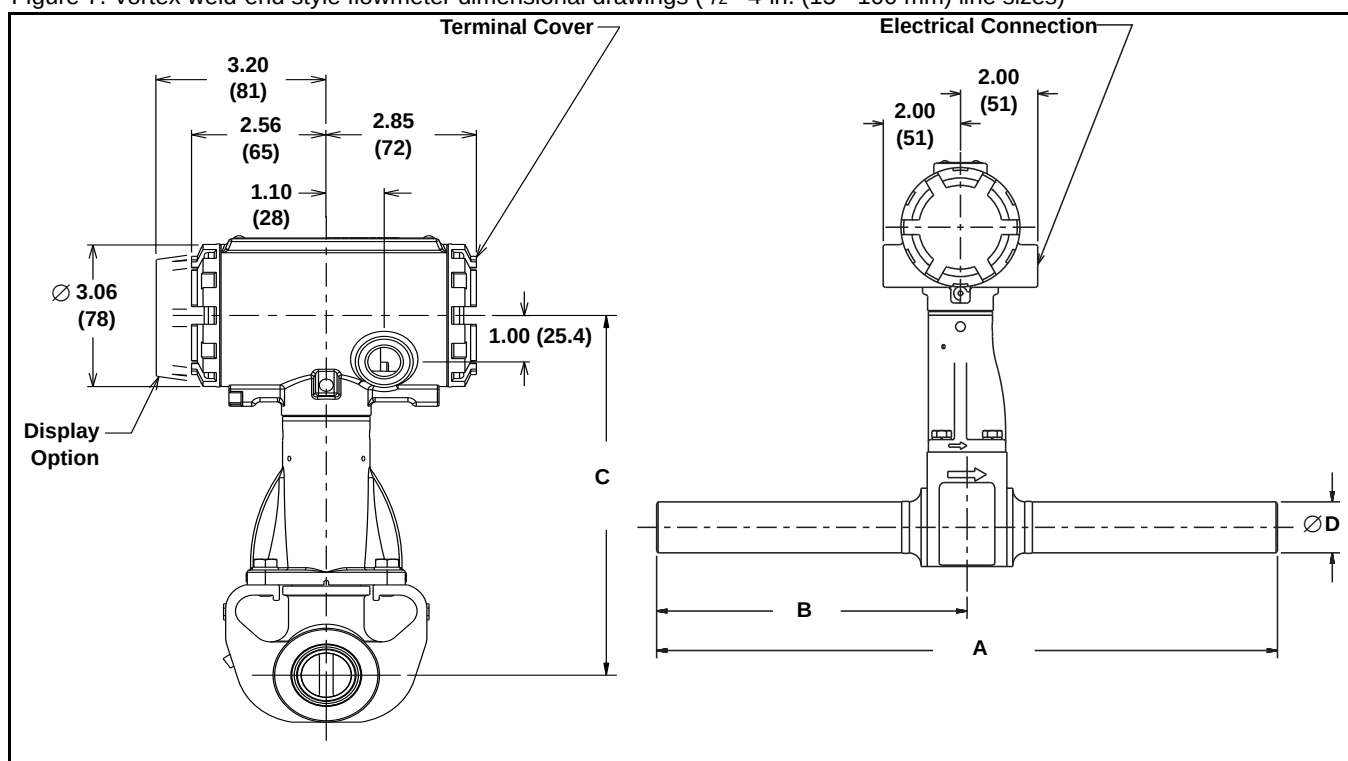


Table 27. Vortex weld-end style flowmeter ($\frac{1}{2}$ - 4-in. (15 - 100 mm) line sizes)

Nominal Size in. (mm)	A in. (mm)	B in. (mm)	C $\pm$ 0.20 in. (5.1 mm)	Diameter D $\pm$ 0.031 in. (0.79 mm)
0.5	16.0 (406)	8.0 (203)	7.63 (194)	.840 (21.34)
1	16.0 (406)	8.0 (203)	7.74 (197)	1.315 (33.40)
1.5	16.0 (406)	8.0 (203)	8.14 (207)	1.900 (48.26)
2	16.0 (406)	8.0 (203)	8.49 (216)	2.375 (60.33)
3	16.0 (406)	8.0 (203)	9.05 (230)	3.500 (88.90)
4	16.0 (406)	8.0 (203)	9.60 (244)	4.500 (114.30)

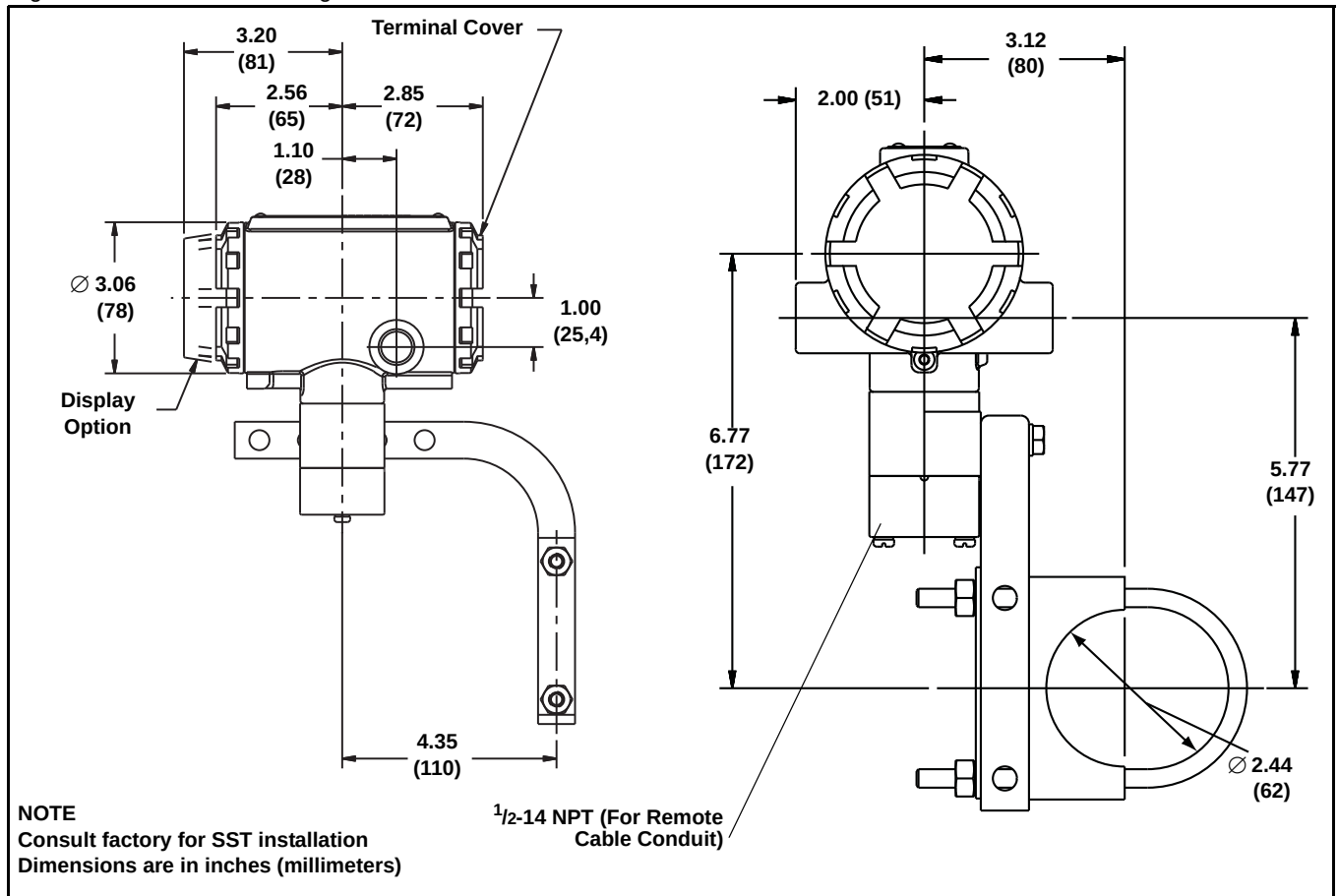
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Figure 8. Dimensional Drawings for Remote Mount Transmitters



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Figure 9. Dimensional Drawings for Remote Mount Wafer-Style Flowmeters ($\frac{1}{2}$ -through 8-in./15 through 200 mm Line Sizes)

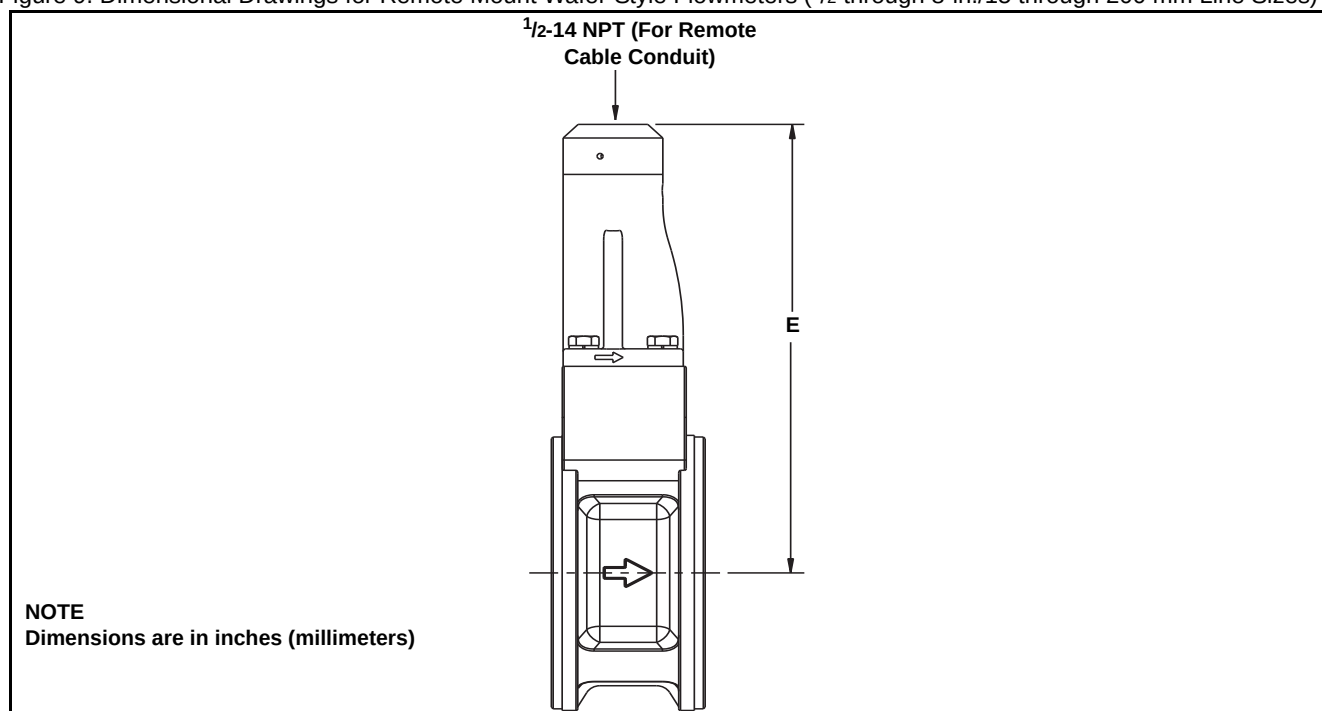


Table 28. Rosemount 8800D Wafer-Style Meter

Nominal Size in. (mm)	E Wafer Style in. (mm)
$\frac{1}{2}$ (15)	6.4 (163)
1 (25)	6.5 (165)
$1\frac{1}{2}$ (40)	6.9 (175)
2 (50)	7.6 (193)
3 (80)	8.3 (211)
4 (100)	9.2 (234)
6 (150)	9.5 (241)
8 (200)	10.4 (264)

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Figure 10. Dimensional Drawings for Flanged-and Dual Sensor Flanged-Style Remote Mount Flowmeters
($\frac{1}{2}$ -through 12-in./15 through 300 mm Line Sizes)

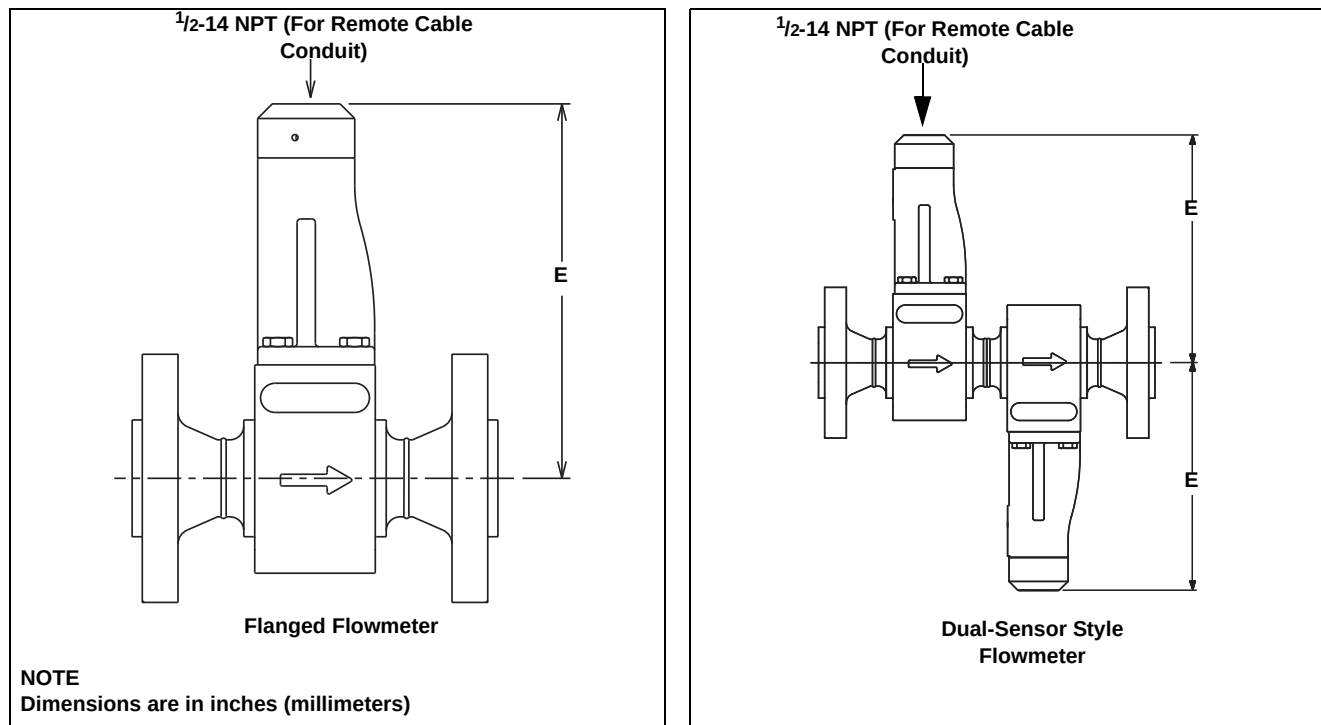


Table 29. Remote Mount, Flanged-and Dual Sensor Flowmeter Dimensions

Nominal Size in. (mm)	E Flange Style in. (mm)
$\frac{1}{2}$ (15)	6.4 (162)
1 (25)	6.5 (165)
$1\frac{1}{2}$ (40)	6.8 (173)
2 (50)	7.2 (183)
3 (80)	7.8 (198)
4 (100)	8.3 (211)
6 (150)	9.5 (241)
8 (200)	10.4 (264)
10 (250)	11.4 (290)
12 (300)	12.3 (313)

Rosemount 8800D

Ordering Information

Table 30. Rosemount 8800D Vortex Flowmeter

★ The Standard offering 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	
8800D	Vortex Flowmeter	
Meter Style		
Standard		Standard
F	Flanged style	★
W	Wafer style	★
R	Reducer Style (Flanged style only)	★
Expanded		
D	Dual-sensor style (Flanged style only)	
Line Size		
Standard		Standard
005	1/2-in. (15 mm) (Not available for Rosemount 8800DR)	★
010	1-in. (25 mm)	★
015	1 1/2-in. (40 mm)	★
020	2-in. (50 mm)	★
030	3-in. (80 mm)	★
040	4-in. (100 mm)	★
Expanded		
060	6-in. (150 mm)	
080	8-in. (200 mm)	
100	10-in. (250mm)	
120	12-in. (300mm)	
Wetted Materials		
Standard		Standard
S	316 wrought stainless and CF-3M cast stainless <i>Note: Material of construction is 316/316L</i>	★
Expanded		
H	UNS N06022 wrought Nickel Alloy; CW2M cast Nickel Alloy <i>Note: See Table 31 on page 49</i>	
	Other wetted materials are available. Consult factory for details.	
Flange or Alignment Ring Size		
Standard		Standard
A1	ASME B16.5 (ANSI) RF Class 150	★
A3	ASME B16.5 (ANSI) RF Class 300	★
D1	DIN PN 16 (PN 10/16 for wafer-style) 2526-Type D	★
D3	DIN PN 40 (PN 25/40 for wafer-style) 2526-Type D	★
Expanded		
A6	ASME B16.5 (ANSI) RF Class 600	
A7 ⁽¹⁾	ASME B16.5 (ANSI) RF Class 900	
A8 ⁽²⁾	ASME B16.5 (ANSI) RF Class 1500	
B1	ASME B16.5 (ANSI) RTJ Class 150 for flange-style only	
B3	ASME B16.5 (ANSI) RTJ Class 300 for flange-style only	
B6	ASME B16.5 (ANSI) RTJ Class 600 for flange-style only	
B7 ⁽¹⁾	ASME B16.5 (ANSI) RTJ Class 900 for flange-style only	
B8 ⁽²⁾	ASME B16.5 (ANSI) RTJ Class 1500 for flange-style only	
C1	ASME B16.5 (ANSI) RF Class 150, smooth finish	
C3	ASME B16.5 (ANSI) RF Class 300, smooth finish	
C6	ASME B16.5 (ANSI) RF Class 600, smooth finish	
C7 ⁽¹⁾	ASME B16.5 (ANSI) RF Class 900, smooth finish	
C8	ASME B16.5 (ANSI) RF Class 1500, smooth finish	

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Rosemount 8800D

Table 30. Rosemount 8800D Vortex Flowmeter

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.

The Expanded offering is subject to additional delivery lead time.

D0	DIN PN 10 2526-Type D	
D2	DIN PN 25 2526-Type D	
D4	DIN PN 64 2526-Type D	
D6	DIN PN 100 2526-Type D	
D7 ⁽¹⁾	DIN PN 160 2526-Type D	
D8	DIN PN 250 2526-Type D	
G0	DIN PN 10 2512-Type N for flange-style only	
G1	DIN PN 16 2512-Type N for flange-style only	
G2	DIN PN 25 2512-Type N for flange-style only	
G3	DIN PN 40 2512-Type N for flange-style only	
G4	DIN PN 64 2512-Type N for flange-style only	
G6	DIN PN 100 2512-Type N for flange-style only	
G7 ⁽¹⁾	DIN PN 160 2512-Type N for flange-style only	
G8	DIN PN 250 2512-Type N for flange-style only	
H0	DIN PN 10 2526-Type E	
H1	DIN PN 16 (PN 10/16 for wafer-style) 2526-Type E	
H2	DIN PN 25 2526-Type E	
H3	DIN PN 40 (PN 25/40 for wafer-style) 2526-Type E	
H4	DIN PN 64 2526-Type E	
H6	DIN PN 100 2526-Type E	
H7 ⁽¹⁾	DIN PN 160 2526-Type E	
H8	DIN PN 250 2526-Type E	
J1	JIS 10K	
J2	JIS 20K	
J4	JIS 40K	
W1 ⁽³⁾	Weld End, Schedule 10S	
W4 ⁽³⁾	Weld End, Schedule 40S	
W8 ⁽³⁾	Weld End, Schedule 80S	
W9 ⁽³⁾	Weld End, Schedule 160S	
Sensor Process Temperature Range		
Standard		Standard
N	Standard: -40 to 450°F (-40 to 232°C)	★
E	Extended: -330 to 800°F (-200 to 427°C)	★
Conduit Entry		
Standard		Standard
1	1/2 -14 NPT – Aluminum Housing	★
2	M20 × 1.5 – Aluminum Housing	★
4	G ¹ / ₂ (One Conduit Entry) – Aluminum Housing	★
5	G ¹ / ₂ (Two Conduit Entries) – Aluminum Housing	★
Expanded		
6 ⁽⁴⁾	1/2 - 14 NPT - SST Housing	
7 ⁽⁴⁾	M20 x 1.5 - SST Housing	
Outputs		
Standard		Standard
D	4-20 mA digital electronics (HART protocol)	★
P	4-20 mA digital electronics (HART protocol) with scaled pulse	★
F ⁽⁵⁾	FOUNDATION fieldbus digital signal	★
Calibration		
Standard		Standard
1	Flow calibration	★

Rosemount 8800D

Table 30. Rosemount 8800D Vortex Flowmeter

★ The Standard offering 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

MultiVariable Options		
Expanded		
MTA ⁽⁶⁾	MultiVariable output with Integral Temperature Sensor	
Hazardous Locations Certifications		
Standard		Standard
E5	FM Explosion-proof, Dust Ignition-proof	★
I5	FM Intrinsically Safe, Non-incendive	★
IE	FM FISCO Intrinsically Safe ⁽⁷⁾	★
K5	FM Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Non-incendive	★
E6	CSA Explosion-proof, Dust Ignition-proof	★
I6	CSA Intrinsically Safe, Non-incendive	★
IF	CSA FISCO Intrinsically Safe ⁽⁷⁾	★
K6	CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Non-incendive	★
KB	FM and CSA Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Non-incendive	★
E1	ATEX Flameproof	★
I1	ATEX Intrinsic Safety	★
N1	ATEX Type n	★
ND	ATEX Dust	★
IA	ATEX FISCO Intrinsic Safety ⁽⁷⁾	★
K1	ATEX Flameproof, Intrinsic Safety, Type n, Dust	★
E7	IECEx Flameproof	★
I7	IECEx Intrinsic Safety	★
N7	IECEx Type n	★
IG	IECEx FISCO Intrinsic Safety ⁽⁷⁾	★
K7	IECEx Flameproof, Intrinsic Safety, Type n	★
E3	China Flameproof	★
I3	China Intrinsic Safety	★
N3	China Type n	★
IH	China FISCO/FNICO Intrinsic Safety ⁽⁷⁾	★
K3	China Flameproof, Intrinsic Safety, Type n	★
E4 ⁽⁸⁾	TIIS Flameproof	★
E2	INMETRO Flameproof	★
I2	INMETRO Intrinsic Safety	★
IB	INMETRO FISCO Intrinsic Safety	★
Plantweb Control Functionality		
Standard		Standard
A01	Basic Control: One Proportional/Integral/Derivative (PID) Function Block	★
Conduit Electrical Connector		
Expanded		
GE ⁽⁹⁾	M12, 4-pin, Male Connector (<i>eurofast</i> [®])	
GM ⁽⁹⁾	A size Mini, 4-pin, Male Connector (<i>minifast</i> [®])	
GN	ATEX Flameproof A size, Mini 4-pin male connector (minifast)	
Other Options		
Standard		Standard
C4 ⁽¹⁰⁾	NAMUR alarm and saturation values, high alarm	★
CN ⁽¹⁰⁾	NAMUR alarm and saturation values, low alarm	★
V5 ⁽¹¹⁾	External ground screw assembly	★
T1	Transient protection terminal block	★
P2	Cleaning for special services	★

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Rosemount 8800D

Table 30. Rosemount 8800D Vortex Flowmeter

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.

The Expanded offering is subject to additional delivery lead time.

M5	LCD indicator	★
R10	Remote electronics with 10 ft (3,0 m) cable	★
R20	Remote electronics with 20 ft (6,1 m) cable	★
R30	Remote electronics with 30 ft (9,1 m) cable	★
R50	Remote electronics with 50 ft (15,2 m) cable	★
Expanded		
RXX ⁽¹²⁾	Remote electronics with customer-specified cable length (up to 75 ft (23 m) maximum)	
CPA ⁽¹³⁾	CriticalProcess Online Sensor	
Certification Options		
Standard		Standard
Q4	Calibration data sheet per ISO 10474 3.1B and EN 10204 3.1	★
Q8	Material traceability certification per ISO 10474 3.1B and EN 10204 3.1	★
QP	Calibration certification and tamper evident seal	★
Q25	NACE MR0103 Certificate of Compliance	★
Q66	Certificate for Procedure Qualification Records	★
Q67	Certificate for Welder Performance Qualification Records	★
Q68	Certification for Welding Procedure Specifications	★
Q69 ⁽¹⁴⁾	Inspection certificate weld examination (wafer) per ISO 10474 3.1B and EN 10204 3.1	★
Q70	Inspection certificate weld examination (flanged) per ISO 10474 3.1B and EN 10204 3.1	★
Q71	Inspection certification weld examination (flanged) per ISO 10474 3.1B (includes x-rays) and EN 10204 3.1	★
Q79	Certification for Combo PQR/WPQ/WPS	★
Expanded		
QKH	KHK Documentation Package	
Quick Installation Guide (QIG) Language Options (Default is English)		
Standard		Standard
YA	Danish QIG	★
YB	Hungarian QIG	★
YC	Czech QIG	★
YD	Dutch QIG	★
YF	French QIG	★
YG	German QIG	★
YH	Finnish QIG	★
YI	Italian QIG	★
YJ	Japanese QIG	★
YM	Chinese (Mandarin) QIG	★
YN	Norwegian QIG	★
YL	Polish QIG	★
YP	Portuguese QIG	★
YR	Russian QIG	★
YS	Spanish QIG	★
YW	Swedish QIG	★
Typical Model Number: 8800D F 020 S A1 N 1 D 1 M5		

(1) Available on flanged and dual style meters from 1/2" - 8" (15-200 mm) and Reducer style meters from 1" - 6" (25-150 mm).

(2) Only available for stainless steel flange and dual style meters from 1" - 8" (25-200 mm). Consult factory for other materials.

(3) W1, W4, W8, and W9 are only available with Meter Style F from 1/2-in. (15 mm) to 4-in. (100 mm) in SST.

(4) No TIIS approval

(5) Includes five Analog Input (AI) function blocks, 1 PID function block, 1 Integrator (INT) function block, 1 Arithmetic (ARITH) function block and Backup Link Active Scheduler.

(6) Available in Stainless Steel meter body only. Available with Rosemount 8800DF from 1 1/2-in (40 mm) through 12-in. (300 mm). Available with 8800DR from 2-in (50 mm) through 12-in (300 mm). Not available with 8800DW or 8800DD. Not available with flange codes A7, A8, B7, B8, C7, C8, D7, D8, G7, G8, H7, H8.

- (7) *Fieldbus Intrinsic Safe Concept available with output code F (FOUNDATION fieldbus digital signal).*
- (8) *TIIS Flameproof Approval requires G¹/2 conduit entry.*
- (9) *Not available with certain hazardous location certifications. Contact a Rosemount representative for details.*
- (10) *NAMUR compliant operation and the alarm latch options are pre-set at the factory and can be changed to standard operation in the field.*
- (11) *V5 only available with no approval, it is standard with the other approvals.*
- (12) *XX is a customer specified length in feet.*
- (13) *The CPA option is not available on wafer, ¹/₂-in. flange, or 1-in. reducer units. In addition it is not available on 1" flanged and 1.5" reducer JIS 10K, DIN PN40, or DIN PN16.*
- (14) *Q69 available for all Nickel Alloy wafers and stainless steel wafers in line sizes ¹/₂-in. (15 mm), 6-in. (150 mm), and 8-in. (200 mm).*

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Rosemount 8800D

Table 31. Method of Construction for the 8800DF in Nickel Alloy.

Line Size	A1	A3	A6	A7	D1	D3	D4	D6	D7
½ (15)	C	C	C	W	W	W	NA	W	W
1 (25)	C	C	C	W	W	W	NA	W	W
1½ (40)	C	C	C	W	W	W	NA	W	W
2 (50)	C	C	C	W	C	C	W	W	W
3 (80)	C	C	C	W	C	C	W	W	W
4 (100)	C	C	C	W	C	C	W	W	W
6 (150)	C	C	C	CF	W	W	W	W	CF
8 (200)	C	C	C	CF	W	W	W	W	CF
10 (250)	W	W	W	NA	W	W	W	W	NA
12 (300)	W	W	W	NA	W	W	W	W	NA
C = Nickel Alloy collar and 316 SST lap flange. If weld neck flange is required, V0022 can be ordered.									
W = Nickel Alloy weld neck flange.									
CF = Consult Factory									
NA = Not Available									
All 8800DR Reducer Vortex Meters with Nickel Alloy materials of construction use weld neck flanges.									
Flange codes other than those listed in Table 29 all use weld neck flanges.									

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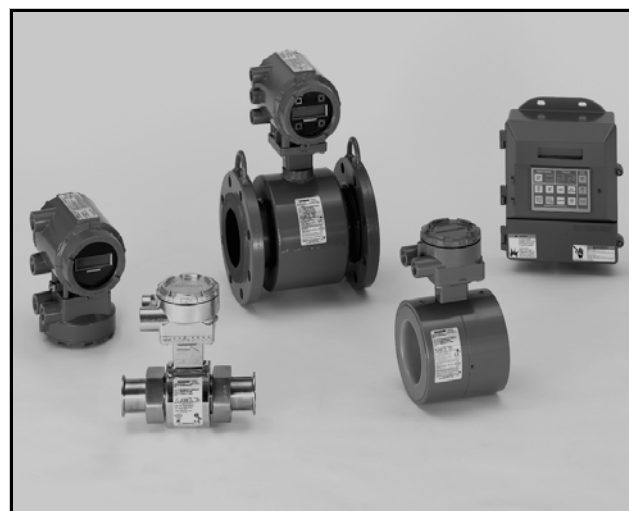
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Rosemount 8700 Series Magnetic Flowmeter Systems

- Industry leading performance with standard reference accuracy of 0.25% of rate with an optional High Accuracy of 0.15% of rate.
- Rosemount 8732 Transmitter - Integral-mount design, backlit display, and explosion-proof housing. Available with HART[®], FOUNDATION[™] fieldbus, or Profibus PA, I.S. Outputs, Device Diagnostics, and SMART[™] Meter Verification to improve reliability and performance
- Rosemount 8712 HART Transmitter - available with Device Diagnostics including SMART Meter Verification to improve reliability and performance. Quick setup with easy-to-use local operator interface
- Rosemount 8712H/8707 High-Signal System - Pulsed DC solutions for the most demanding flow measurement applications
- Rosemount 8705 Flanged sensor - Fully welded sensor for maximum protection (standard ISO lay length)
- Rosemount 8711 Wafer sensor - Economical, compact, and lightweight sensor, provided with alignment rings for easy installation
- Rosemount 8721 Hygienic sensor - Specifically designed for food, beverage, and life sciences applications



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Product Selection Guide

Several sensor types, liner types, electrode materials, electrode types, grounding options, and transmitters are available for the Rosemount 8700 Series Magnetic Flowmeter System to ensure compatibility with virtually any application and installation. See Table 18 for information on liner types, Table 19 for information on electrode materials and electrode types, Table 20 and Table 21 for grounding options and installation, and Table 1 for transmitter selection. Other material options not mentioned here are available. Contact your local sales representative for alternative material selection. For further guidance on selecting materials, refer to the Magnetic Flowmeter Material Selection Guide located on Rosemount.com (Technical Data Sheet Number 00816-0100-3033). For more information regarding product offering and ordering information, refer to “Ordering Information” on page 6 in this product data sheet.

Table 1. Transmitter Selection

Transmitter	General Characteristics
8732E 	• Ideal for integral mount transmitter installations • HART / Analog, FOUNDATION fieldbus, or Profibus PA fieldbus output available • Advanced Diagnostics available • Optical Switch LOI • Optional DI/DO available (HART only)
8712E 	• Remote mount transmitter • Easy to use LOI with dedicated configuration buttons • Advanced Diagnostics available
8712H 	• Remote mount transmitter • High-Signal Pulsed DC for use with the High-Signal 8707 Sensor • Ideal for noisy applications - mining/pulp stock/other slurries • 115 V AC power only • Not CE Marked

Table 2. Sensor Selection

Sensor	General Characteristics
8705 	• Standard Process Sensor • Flanged Process Connections • Welded, sealed coil housing • 1/2-in. (15mm) to 36-in. (900mm) • Pulse DC Technology • Standard, grounding, and bulletnose electrodes available
8707 	• High Signal Sensor • Flanged Process System Sensor • Welded, sealed coil housing • 3-in. (80mm) to 36-in. (900mm) • High current pulsed DC technology ideal for high noise applications • Standard, grounding, and bulletnose electrodes available
8711 	• Wafer (flangeless) design • Economical, compact, and lightweight alternative to flanged sensors • 0.15-in. (4mm) to 8-in. (200mm) • Pulsed DC technology • Standard, grounding, and bulletnose electrodes available
8721 	• Hygienic sensor • Designed for food, beverage, and pharmaceutical applications • 3-A and EHEDG certified • 1/2-in. (15mm) to 4-in. (100mm) • Pulsed DC technology • Variety of industry standard process connections • Suitable for CIP/SIP

Rosemount Magmeter Diagnostics Power PlantWeb



Rosemount Mag Diagnostics Power PlantWeb to Reduce Cost & Improve Output by Enabling New Practices

Rosemount Magmeters provide device diagnostics that powers PlantWeb and informs the user of abnormal situations throughout the life of the meter - from Installation to Maintenance and Meter Verification. With Rosemount Magmeter diagnostics enabled, users can change their practices to improve plant availability and throughput, and reduce costs through simplified installation, maintenance and troubleshooting.

Diagnostics	Mag User Practice	8732E	8712E	8712H
Basic				
Empty Pipe	Process Management	•	•	•
Electronics Temperature	Maintenance	•	•	
Coil Fault	Maintenance	•	•	•
Transmitter Faults	Maintenance	•	•	•
Reverse Flow	Process Management	•	•	•
Advanced (Suite 1)		DA1 / D01	DA1	N/A
High Process Noise	Process Management	•	•	
Grounding/Wiring Fault	Installation	•	•	
Electrode Coating	Maintenance	April 2010		
Advanced (Suite 2)		DA2 / D01	DA2	N/A
SMART Meter Verification	Meter Verification	•	•	
4-20 mA Loop Verification	Maintenance	•		

OPTIONS FOR ACCESSING DIAGNOSTICS

Rosemount Magmeter Diagnostics can be accessed through the Local Operator Interface (LOI)⁽¹⁾, the 475 Field Communicator, and AMS™ Suite: Intelligent Device Manager.

Access diagnostics through the LOI for quicker installation, maintenance, and meter verification⁽¹⁾

Rosemount Magmeter Diagnostics are available through the LOI to make maintenance of every magmeter easier.

Access diagnostics through AMS Intelligent Device Manager for the ultimate value

The value of the diagnostics increases significantly when AMS is used. Now the user gets a simplified screen flow and procedures for how to respond to the diagnostic messages.

(1) A Local Operator Interface (LOI) is not available on FOUNDATION fieldbus transmitters.

Magnetic Flowmeter Sizing

Flowmeter Sizing

Because of its effect on flow velocity, sensor size is an important consideration. It may be necessary to select a magnetic flowmeter that is larger or smaller than the adjacent piping to ensure the fluid velocity is in the specified measuring range of the sensor. Suggested guidelines and examples for sizing normal velocities in different applications are listed in Table 3, Table 4, and Table 5. Operation outside these guidelines may also give acceptable performance.

Table 3. Sizing Guidelines

Application	Velocity Range (ft/s)	Velocity Range (m/s)
Normal Service	0–39	0–12
Preferred Service	2–20	0.6–6.1
Abrasive Slurries	3–10	0.9–3.1
Non-Abrasive Slurries	5–15	1.5–4.6

To convert flow rate to velocity, use the appropriate factor listed in Table 4 and the following equation:

$$\text{Velocity} = \frac{\text{Flow Rate}}{\text{Factor}}$$

Example: SI Units

Magnetometer Size: 100 mm (**factor from Table 4 = 492.0**)

Normal Flow Rate: 800 L/min

$$\text{Velocity} = \frac{800 \text{ (L/min)}}{492.0}$$

$$\text{Velocity} = 1.7 \text{ m/s}$$

Example: English Units

Magnetometer Size: 4 in. (**factor from Table 4 = 39.679**)

Normal Flow Rate: 300 GPM

$$\text{Velocity} = \frac{300 \text{ (gpm)}}{39.679}$$

$$\text{Velocity} = 7.56 \text{ ft/s}$$

Table 4. Line Size vs. Conversion Factor

Nominal Line Size Inches (mm)	Gallons Per Minute Factor	Liters Per Minute Factor
0.15 (4)	0.055	0.683
0.30 (8)	0.220	2.732
½ (15)	0.947	11.745
1 (25)	2.693	33.407
1½ (40)	6.345	78.69
2 (50)	10.459	129.7
2 ½ (65)	14.922	185.0
3 (80)	23.042	285.7
4 (100)	39.679	492.0
6 (150)	90.048	1,116
8 (200)	155.94	1,933
10 (250)	245.78	3,048
12 (300)	352.51	4,371
14 (350)	421.70	5,229
16 (400)	550.80	6,830
18 (450)	697.19	8,645
20 (500)	866.51	10,745
24 (600)	1,253.2	15,541
30 (750)	2,006.0	24,877
36 (900)	2,935.0	36,398

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Rosemount 8700 Series

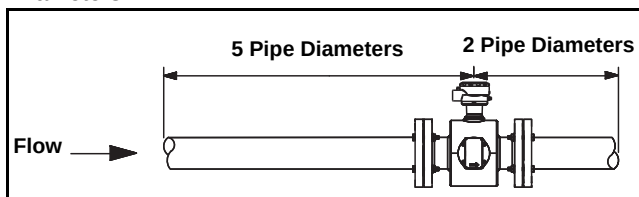
Table 5. Line Size vs. Velocity/Rate

Nominal Line Size in Inches (mm)	Minimum/Maximum Flow Rate							
	Gallons per Minute				Liters per Minute			
	at 0.04 ft/s (Low-flow Cutoff)	at 1 ft/s (Min Range Setting)	at 3 ft/s	at 39 ft/s (Max Range Setting)	at 0.012 m/s (Low-flow Cutoff)	at 0.3 m/s (Min Range Setting)	at 1 m/s	at 12 m/s (Max Range Setting)
.15 (4)	0.002	0.055	0.16	2.14	0.01	0.21	0.68	8.16
.30 (8)	0.009	0.220	0.66	8.58	0.03	0.83	2.73	32.76
1/2 (15)	0.038	0.947	2.84	36.93	0.14	3.58	11.74	140.88
1 (25)	0.108	2.694	8.08	105.07	0.41	10.18	33.40	424.80
1 1/2 (40)	0.254	6.345	19.03	247.46	0.96	23.98	78.69	944.28
2 (50)	0.418	10.459	31.37	407.90	1.58	39.54	129.7	1,556
2 1/2 (65)	0.597	14.922	44.77	582.0	2.22	55.51	185.0	2,220
3 (80)	0.922	23.042	69.12	898.64	3.49	87.10	285.7	3,428
4 (100)	1.588	39.667	119.0	1547.0	6.00	138.6	492.0	5,904
6 (150)	3.600	90.048	270.1	3511.8	13.61	340.3	1,116	13,400
8 (200)	6.240	155.94	467.7	6081.7	23.59	589.4	1,933	23,204
10 (250)	9.840	245.78	737.3	9585.4	37.20	929.0	3,048	36,576
12 (300)	14.200	352.51	1,059	13,747	53.68	1,332	4,371	52,548
14 (350)	16.800	421.70	1,265	16,446	63.50	1,594	5,230	62,755
16 (400)	22.000	550.80	1,652	21,481	83.16	2,082	6,830	81,964
18 (450)	27.800	697.19	2,091	27,190	105.0	2,635	8,646	103,750
20 (500)	34.600	866.51	2,599	33,793	130.7	3,275	10,740	128,948
24 (600)	50.200	1,253.2	3,759	48,874	189.7	4,737	15,540	186,496
30 (750)	80.200	2,006.0	6,018	78,234	303.1	7,582	24,880	298,527
36 (900)	117.40	2,935.0	8,805	114,465	443.7	11,094	36,390	436,779

Upstream/Downstream Piping Length

To ensure specification accuracy over widely varying process conditions, install the sensor with a minimum of five straight pipe diameters upstream and two straight pipe diameters downstream from the electrode plane. See Figure 1. This procedure should adequately allow for disturbances created by elbows, valves, and reducers.

Figure 1. Upstream and Downstream Straight Pipe Diameters



Installations with reduced straight runs from 0 to five pipe diameters are possible. In reduced straight pipe run installations, performance may shift. Reported flow rates will still be highly repeatable.

Sensor Grounding

A reliable ground path is required between the sensor and the process fluid. Optional grounding rings, grounding electrodes, and lining protectors are available with 8700 Series sensors to ensure proper grounding. See Table 6 and Table 21.

Ordering Information



Rosemount 8732E

The Rosemount 8732E transmitter has multiple diagnostic suites available. Best in class performance coupled with advanced diagnostics provides unparalleled process management capabilities. With an optional backlit 2 line by 16 character display/local operator interface, the transmitter can be configured by optical switches to simplify adjustments in hazardous environments without removing the cover.



Rosemount 8712E

The remote mount 8712 transmitter brings diagnostics to any HART/ 4-20mA system that can change how magmeters are installed, maintained, and verified. The Rosemount 8712 also features an easy-to-use 2 line by 16 character operator interface, with quick access to all diagnostic information, and instant access to basic configuration setup through dedicated keys.

Table 6. Rosemount 8732E/8712E Ordering Information

★ The Standard offering 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	8732E	8712E	
8732E	Magnetic Flowmeter Transmitter	•		
8712E	Remote Mount Transmitter		•	
Transmitter Style				
Standard				Standard
S	Standard	•	•	★
Transmitter Mount				
Standard				Standard
T	Integral Mount	•		★
R	Remote Mount for 2 in. pipe or panel (includes CS mounting bolts and 304 SST bracket)	•	•	★
Transmitter Power Supply				
Standard				Standard
1	AC Power Supply (90 to 250 V AC, 50-60Hz)	•	•	★
2	DC Power Supply (12 to 42 V DC)	•	•	★
Outputs				
Standard				Standard
A	4-20 mA Digital Electronics (HART Protocol)	•	•	★
B	4-20 mA Digital Electronics (HART Protocol) with Intrinsically Safe Output ⁽¹⁾	•		★
F	FOUNDATION fieldbus digital electronics with FISCO Intrinsically Safe Output	•		★
P	Profibus PA fieldbus digital electronics with FISCO Intrinsically Safe Output	•		★

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Rosemount 8700 Series

Table 6. Rosemount 8732E/8712E Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.

The Expanded offering is subject to additional delivery lead time.

		8732E	8712E	
Expanded				
G	FOUNDATION fieldbus digital electronics (Available with approval code NA only)	•		
U	Profibus PA fieldbus digital electronics (Available with approval code NA only)	•		
Conduit Entry				
8732E - 2 Conduits / 8712E - 4 Conduits				
Standard				Standard
1	1/2 - 14 NPT	•	•	★
Expanded				
2	CM20 ⁽²⁾	•	•	
3	PG 13.5 ⁽²⁾	•	•	
3 Conduits				
Standard				Standard
4	1/2 - 14 NPT	•		★
Expanded				
5	CM20 ⁽²⁾	•		
6	PG 13.5 ⁽²⁾	•		
Safety Approvals⁽³⁾				
Standard				Standard
NA	CE Marking, no hazardous location approval	•	•	★
FM & CSA				
Standard				Standard
N0	FM Class 1 Div 2 for non-flammable: CSA Class 1 Div 2	•	•	★
N5	FM Class 1 Div 2 for flammable fluids	•	•	★
E5	FM Class 1 Div 1, explosion-proof	•		★
ATEX				
Standard				Standard
ED	ATEX flameproof Ex de IIB T6, and ATEX Dust Approval; Ex de [ia] IIB T6 with IS Output	•		★
ND	ATEX Dust Ex tD A20 IP66 T100 °C	•		★
Expanded				
E1	ATEX flameproof Ex de IIC T6, and ATEX Dust Approval; Ex de [ia] IIC T6 with IS Output	•		
N1	ATEX Type Ex nA nL IIC T4 or Ex nA nL [ia] IIC T4	•	•	
IECEX				
Standard				Standard
EF	IECEX flameproof Ex de IIB T6 Gb and IECEX Dust Approval; Ex de [ia IIC Ga] IIB T6 Gb with IS Output	•		★
NF	Ex tD A20 IP66 T100 °C or Ex tD A20 IP66 T100 °C [Ex ia Ga] IIC	•		★
Expanded				
E7	IECEX flameproof Ex de IIC T6 Gb and IECEX Dust Approval; Exde [ia Ga] IIC T6 Gb with IS Output	•		
N7	Ex nA nL IIC T4 and IECEX Dust; Ex nA nL [ia] IIC T4 with FISCO/FNICO outputs	•	•	
NEPSI and CMC (China)				
Standard				Standard
EP	NEPSI flameproof Ex de IIB T6; Ex de [ia] IIB T6 with IS output	•		★
Expanded				
E3	NEPSI flameproof Ex de IIC T6; Ex de [ia] IIC T6 with IS output	•		
InMetro (Brazil)				
Standard				Standard
EB	InMetro flameproof BR-Ex de IIB T6; BR- Ex de [ia] IIB T6 with IS outputs	•		★
Expanded				
E2	InMetro flameproof BR-Ex de IIC T6; BR- Ex de [ia] IIC T6 with IS outputs	•		

Rosemount 8700 Series

Table 6. Rosemount 8732E/8712E Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.

The Expanded offering is subject to additional delivery lead time.

GOST (Russia)		8732E	8712E	
Standard				Standard
EM	GOST flameproof EX de IIB T6; Ex de [ia] IIB T6 with IS outputs	•		★
Expanded				
E8	GOST flameproof Ex de IIC T6; Ex de [ia] IIC T6 with IS outputs	•		
KOSHA (Korea)				
Standard				Standard
EK	KOSHA flameproof EX de IIB T6; Ex de [ia] IIB T6 with IS outputs	•		★
Expanded				
E9	KOSHA flameproof Ex de IIC T6; Ex de [ia] IIC T6 with IS outputs	•		

Options (Include with selected model number)

PlantWeb Product/Process Diagnostics				
Standard				Standard
DA1 ⁽⁴⁾	Magmeter HART Diagnostic Suite 1: High Process Noise Detection, Ground/Wiring Fault Detection, and Coated Electrode Detection	•	•	★
DA2	Magmeter HART Diagnostic Suite 2: SMART Meter Verification	•	•	★
D01	Magmeter digital fieldbus Diagnostic Suite 1: High Process Noise and Ground/Wiring Fault Detection	•		★
D02	Magmeter digital fieldbus Diagnostic Suite 2: SMART Meter Verification	•		★
Discrete Input/Discrete Output				
Standard				Standard
AX	DI/DO, see page 31 for more details ⁽⁵⁾⁽⁶⁾	•	•	★
Other Options				
Standard				Standard
M4	Local Operator Interface (HART and Profibus PA only)	•	•	★
M5	Local Display (HART and FOUNDATION fieldbus only)	•		★
Expanded				
C1	Custom Configuration (CDS Required)	•	•	
D1	High Accuracy Calibration (0.15% of rate for matched sensor and transmitter) ⁽⁷⁾	•	•	
DT	Heavy Duty Tagging	•	•	
B6	316L Stainless Steel 4-bolt Kit for 2-in. Remote Pipe Mount	•	•	
GE	M12, 4-Pin, Male Connector (Eurofast)	•	•	
GM	A Size Mini, 4-Pin, Male Connector (Minifast)	•	•	
GT	A Size, Spade Terminal Mini, 5-pin, Male Connector (Minifast)	•	•	
Q4	Inspection certificate; calibration data, ISO10474 3.1B	•	•	
QIG Language		8732E	8712E	
Expanded				
YA	Danish	•	•	
YB	Hungarian	•	•	
YC	Czech	•	•	
YD	Dutch	•	•	
YE	Bulgarian	•	•	
YF	French	•	•	
YG	German	•	•	
YH	Finnish	•	•	
YI	Italian	•	•	
YJ	Japanese	•	•	
YL	Polish	•	•	
YM	Mandarin	•	•	

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Table 6. Rosemount 8732E/8712E Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.

The Expanded offering is subject to additional delivery lead time.

YN	Norwegian	•	•	
YP	Portuguese	•	•	
YS	Spanish	•	•	
YR	Russian	•	•	
YW	Swedish	•	•	
Typical Model Number: 8732E S T 1 A 1 N0 DA1 DA2 M4				

(1) I.S. Output must be externally powered

(2) Adapters are used for this conduit entry type

(3) All product, ordered with or without Safety approvals, is compliant with local CE Marking and C-tick requirements unless specifically noted as a special

(4) Coated electrode detection is only available on the 8732E (April 2010).

(5) Not available with intrinsically safe outputs (output option B)

(6) Not available on the 8732E with conduit entry codes 1, 2 or 3

(7) D1 Option Code must be ordered with sensor and transmitter

Rosemount 8700 Series

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Rosemount 8712H High-Signal Magmeter System⁽¹⁾

The 8707 High-Signal Sensor, used in conjunction with the 8712H High-Signal Transmitter, forms the Rosemount High-Signal Magnetic Flowmeter System. This system provides stable flow measurement in the most difficult high-noise applications while maintaining the benefits of DC technology. The increased signal strength of the high-signal system is made possible through a combination of sensor coil design that incorporates the most advanced materials and an extremely efficient and innovative coil drive circuit. The increased signal strength of the Rosemount high-signal system, coupled with advanced signal processing and superior filtering techniques, provide the solution to demanding flow measurement applications.

Table 7. Rosemount 8712H Ordering Information

★ The Standard offering 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	
8712H	High-Signal Magnetic Flowmeter Transmitter (For use with 8707 High-Signal Sensor only.)	
Transmitter Style		
Standard		Standard
R	Remote (2-in. pipe or surface mounting)	★
Power Supply Voltage		
Standard		Standard
12	115 V ac, 50–60 Hz	★
Product Certifications		
Standard		Standard
N0	Factory Mutual (FM) Class I, Division 2 Approval for nonflammable fluids; Canadian Standards Association (CSA) Class I, Division 2 Approval	★
N5	Factory Mutual (FM) Class I, Division 2 Approval for flammable fluids	★
NA	No Approval	★

Options (Include with selected model number)

Standard		Standard
M4	Local Operator Interface (LOI)	★
Expanded		
B6	Stainless Steel 4-bolt Kit for 2-in. Pipe Mount	
C1	Custom Configuration (Completed CDS required with order)	
D1	High Accuracy Calibration [0.25% of rate from 3 to 30 ft/s (0.9 to 10 m/s)] matched sensor and transmitter system ⁽¹⁾	
J1	CM20 Conduit Adapters	
J2	PG 13.5 Conduit Adapters	
Quick Installation Guide (QIG) Language Options (Default is English)		
Expanded		
YA	Danish	
YB	Hungarian	
YC	Czech	
YD	Dutch	
YE	Bulgarian	
YF	French	
YG	German	
YH	Finnish	

(1) The high-signal magmeter system is not currently available with CE mark.

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Rosemount 8700 Series

Table 7. Rosemount 8712H Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.

The Expanded offering is subject to additional delivery lead time.

YI	Italian	
YJ	Japanese	
YL	Polish	
YM	Mandarin	
YN	Norwegian	
YP	Portuguese	
YS	Spanish	
YR	Russian	
YW	Swedish	
Typical Model Number: 8712H R 12 N 0 M 4		

(1) D1 Option Code must be selected for both sensor and transmitter.

Rosemount 8700 Series



Rosemount Flanged Sensors

All flanged sensors are fabricated from stainless and carbon steel and welded to provide a hermetic seal that protects against moisture and other contaminants. Sizes range from 1/2 in. (15 mm) to 36 in. (900 mm). The sealed housing ensures maximum sensor reliability by protecting all internal components and wiring from the most hostile environments.



Rosemount 8707/8712H High-Signal Magmeter System

The 8707 High-Signal Sensor, used in conjunction with the 8712H High-Signal Transmitter, forms the Rosemount High-Signal Magnetic Flowmeter System. This system provides stable flow measurement in the most difficult high-noise applications while maintaining the benefits of DC technology. The increased signal strength of the high-signal system is made possible through a combination of sensor coil design that incorporates the most advanced materials and an extremely efficient and innovative coil drive circuit. The increased signal strength of the Rosemount high-signal system, coupled with advanced signal processing and superior filtering techniques, provide the solution to demanding flow measurement applications.

Table 8. Rosemount Flanged Sensor Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.

The Expanded offering is subject to additional delivery lead time.

Code	Product Description ⁽¹⁾	
8705	Magnetic Flowmeter Sensor	
8707	High-Signal Magnetic Flowmeter Sensor	
Lining Material		
Standard		Standard
T	PTFE ⁽²⁾	★
P	Polyurethane ⁽³⁾	★
Expanded		
A	PFA ⁽⁴⁾	
F	ETFE ⁽⁵⁾	
N	Neoprene ⁽³⁾	
L	Linatex ⁽³⁾	
Electrode Material		
Standard		Standard
S	316L Stainless Steel	★
H	Nickel Alloy 276 (UNS N10276)	★
T	Tantalum	★
P	80% Platinum - 20% Iridium	★
Expanded		
N	Titanium	

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Rosemount 8700 Series

Table 8. Rosemount Flanged Sensor Ordering Information

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

Electrode Type		Electrode Material (From Above)					
		Code S	Code H	Code T	Code P	Code N	
Standard							Standard
A	2 Electrodes - Standard	•	•	•	•	•	★
E	3rd Grounding Electrode	•	•	•	•	•	★
Expanded							
B	2 Electrodes - Bullet Nose	•	•				
F	3rd Grounding Electrode Bullet Nose	•	•				
Line Size ⁽⁶⁾		Lining Material (From Above)					
		Code A	Code T	Code F	Code P	Code N and L	
005	1/2-in. (15 mm) (8705 only)	•	•	•	NA	NA	
010	1-in. (25 mm) (8705 only)	•	•	•	•	•	
015	1 1/2-in. (40 mm) (8705 only)	•	•	•	•	•	
020	2-in. (50 mm) (8705 only)	•	•	•	•	•	
030	3-in. (80 mm)	•	•	•	•	•	
040	4-in. (100 mm)	•	•	•	•	•	
060	6-in. (150 mm)	•	•	•	•	•	
080	8-in. (200 mm)	•	•	•	•	•	
100	10-in. (250 mm)	•	•	•	•	•	
120	12-in. (300 mm)	•	•	•	•	•	
140	14-in. (350 mm)	•	•	•	•	•	
160	16-in. (400 mm)	NA	•	•	•	•	
180	18-in. (450 mm)	NA	•	NA	•	•	
200	20-in. (500 mm)	NA	•	NA	•	•	
240	24-in. (600 mm)	NA	•	NA	•	•	
300	30-in. (750 mm)	NA	•	NA	•	•	
360	36-in. (900 mm)	NA	•	NA	•	•	
Flange Material and Type⁽⁶⁾							
C	Carbon Steel Raised Face Slip-On						
S	Stainless Steel (304/304L) Raised Face Slip-On						
P	Stainless Steel (316/316L) Raised Face Slip-On						
J ⁽⁷⁾	Carbon Steel Ring Type Joint (RTJ) Weld Neck						
K ⁽⁷⁾	Stainless Steel (304/304L) Ring Type Joint (RTJ) Weld Neck						

Rosemount 8700 Series

Table 8. Rosemount Flanged Sensor Ordering Information

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

Flange Type and Rating ⁽⁶⁾		Availability		
1	ASME B16.5 ANSI Class 150 (30 and 36 in. AWWA C207 Class D Flat Face)	Refer to Table 9 on page 17 for carbon steel flange material availability	Refer to Table 10 on page 17 for stainless steel flange material availability	
2	MSS SP44 Class 150 (30 and 36 in. line sizes only)			
3	ASME B16.5 (ANSI) Class 300/MSS-SP44 Class 300 (30-in only)			
6	ASME B16.5 (ANSI) Class 600 (Maximum Pressure: 1000 psig) ⁽⁸⁾			
7	ASME B16.5 (ANSI) Class 600 ⁽⁹⁾			
9	ASME B16.5 (ANSI) Class 900 ⁽⁹⁾⁽¹⁰⁾			
M	ASME B16.5 (ANSI) Class 1500 ⁽¹¹⁾			
N	ASME B16.5 (ANSI) Class 2500 ⁽¹¹⁾			
D	EN 1092-1 (DIN) PN 10	Refer to Table 11 on page 18 for flange material availability		
E	EN 1092-1 (DIN) PN 16			
F	EN 1092-1 (DIN) PN 25			
H	EN 1092-1 (DIN) PN 40			
K	AS2129 Table D ⁽¹²⁾			
L	AS2129 Table E ⁽¹²⁾			
P	JIS B 2220, nominal pressure 10K ⁽¹³⁾	Refer to Table 12 on page 18 for flange material availability		
R	JIS B 2220, nominal pressure 20K ⁽¹³⁾			
Electrode Housing Configuration				
Standard				Standard
W0	Sealed, Welded Housing ⁽¹⁴⁾			★
Expanded				
W1	Sealed, Welded Housing with Pressure Relief			
W3	Sealed, Welded Housing with Separate Electrode Compartments ⁽¹⁵⁾			
Hazardous Area Approvals		8705	8707	
Standard				Standard
NA	No Hazardous Area Approval		•	★
FM & CSA				
Standard				Standard
N0	FM Class 1 Div 2 for Non-Flammable fluids; CSA Class 1 Div 2		•	★
N5	FM Class 1 Div 2 for Flammable fluids		•	★
Expanded				
E5 ⁽¹⁶⁾	FM Class 1 Div 1, Explosion Proof		•	
ATEX				
Standard				Standard
N1	ATEX EEx nA [L] IIC Type n Approval		•	★
Expanded				
E1	ATEX EEx e ia IIC T3..T6, Increased Safety Approval (with I.S. electrodes), integral mount with 8732E only		•	
KD	ATEX EEx e ia IIC T3..T6, Increased Safety Approval (with I.S. electrodes)		•	
ND	ATEX Dust Approval		•	
NEPSI				
Expanded				
E3	NEPSI Ex e ia IIC T3..T6, Increased Safety Approval (with I.S. electrodes), integral mount with 8732E only		•	
EP	NEPSI Ex e ia IIC T3..T6, Increased Safety Approval (with I.S. electrodes)		•	

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Table 8. Rosemount Flanged Sensor Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.

The Expanded offering is subject to additional delivery lead time.

KOSHA		8705	8707	
Expanded				
E9	KOSHA Ex e ia IIC T3..T6, Increased Safety Approval (with I.S. electrodes), integral mount with 8732E only	•		
EK	KOSHA Ex e ia IIC T3..T6, Increased Safety Approval (with I.S. electrodes)	•		
INMETRO				
Expanded				
E2	InMetro BR-Ex e ia IIC T3..T6, Increased Safety Approval (with I.S. electrodes), integral mount with 8732E only	•		
EB	InMetro BR-Ex e ia IIC T3..T6, Increased Safety Approval (with I.S. electrodes)	•		
GOST				
E8	GOST Ex e ia IIC T3..T6, Increased Safety Approval (with I.S. electrodes), integral mount with 8732E only	•		
EM	GOST Ex e ia IIC T3..T6, Increased Safety Approval (with I.S. electrodes)	•		

Options (Include with selected model number)

Certifications				
Expanded				
CR ⁽¹⁷⁾	Canadian Registration Number (CRN) certification	•	•	
PD	Pressure Equipment Directive Certification (PED, per 97/23/EC)	•	•	
DW	NSF Drinking Water Certification ⁽¹⁸⁾	•	•	
Optional Grounding Rings⁽¹⁹⁾				
Standard				Standard
G1	(2) 316L SST Ground Rings	•	•	★
G2	(2) Nickel Alloy 276 (UNS N10276) Ground Rings ⁽²⁰⁾	•	•	★
G5	(1) 316L SST Ground Rings	•	•	★
G6	(1) Nickel Alloy 276 (UNS N10276) Ground Rings ⁽²⁰⁾	•	•	★
Expanded				
G3	(2) Titanium Ground Rings ⁽²⁰⁾	•	•	
G4	(2) Tantalum Ground Rings ⁽²¹⁾	•	•	
G7	(1) Titanium Ground Rings ⁽²⁰⁾	•	•	
G8	(1) Tantalum Ground Rings ⁽²¹⁾	•	•	
Optional Lining Protectors⁽¹⁹⁾				
Standard				Standard
L1	(2) 316L SST Lining Protectors	•	•	★
L2	(2) Nickel Alloy 276 (UNS N10276) Lining Protectors ⁽²⁰⁾	•	•	★
Expanded				
L3	(2) Titanium Lining Protectors ⁽²⁰⁾	•	•	
H1	Lay-length matching 8701 using spool piece ⁽²⁰⁾	•	•	
H2	Lay-length matching 8701 ⁽²²⁾	•	•	
H5	Lay-length matching Foxboro 2800 using spool piece ⁽²³⁾	•	•	
H7	Lay-length ABB CopaX and MagX using spool piece ⁽²⁰⁾	•	•	
Other Options				
Standard				Standard
B3	Integral Mount with 8732	•		★
Expanded				
D1	High Accuracy Calibration (0.15% of rate for matched sensor and E-Series transmitter) ⁽²⁴⁾ (0.25% of rate for matched 8707 and 8712H)	•	•	
DT	Heavy Duty Tagging	•	•	
J1	CM 20 Conduit Adapter	•	•	
J2	PG 13.5 Conduit Adapter	•	•	
SC	304 SST Junction Box, fully welded to housing	•	•	

Rosemount 8700 Series

Table 8. Rosemount Flanged Sensor Ordering Information

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

		8705	8707	
TA	High Temperature Permeable Fluid Option (Contains vent holes provided for permeable fluids such as nitric acid, hydrofluoric acid, or sodium hydroxide at high temperatures)	•	•	
Q4	Calibration Certificate per ISO 10474 3.1B	•	•	
Q8	Material Traceability 3.1B	•	•	
Q9	Material Traceability Electrode only 3.1B	•	•	
Q66	Welding Procedure Qualification Record Documentation	•	•	
Q67	Welding Performance Qualification Record Documentation	•	•	
Q70	Weld Examination Inspection Certificate, ISO 10474 3.1B	•	•	
Typical Model Number: 8705 T SA 040 C1 W0 N0				

- (1) The high-signal magmeter system is not currently available with CE mark.
- (2) Available in 1/2 in. to 36 in. line sizes ANSI 150, ANSI 300, and DIN Flanges. Available in 1 in. to 10 in. ANSI 600 Derated only.
- (3) Available in 1 in. to 24 in. line sizes ANSI 150, ANSI 300, and DIN Flanges. Available in 30 and 36 in. AWWA Class 125 and ANSI 150. Available in 1 in. to 24 in. ANSI 600 full rated. Available in 1 to 12 in. ANSI 900, ANSI 1500, and ANSI 2500.
- (4) Available in 1/2 in. to 12 in. line sizes ANSI 150, ANSI 300, and DIN Flanges. Available in 14 in. ANSI 150 only. Not available with electrode housing code W3.
- (5) Available in 1/2 in. to 14 in. line sizes ANSI 150, ANSI 300, and DIN Flanges. Available in 16 in. ANSI 150 only. Available in 1 to 10 in. ANSI 600 Derated only.
- (6) Refer to Table 9, Table 10, and Table 11 on page 17 and page 18 for Standard vs. Expanded offering.
- (7) Available in ANSI 1500 and ANSI 2500 only.
- (8) Electrode type options limited to two measurement electrodes or two measurement electrodes + third grounding electrode.
- (9) Electrode type options limited to two measurement electrodes only.
- (10) Lining protectors not available.
- (11) Available with liner options P, N or L line size limited to 1.5 in. to 12 in. for ANSI 1500 and 2 in. to 12 in. for ANSI 2500, available with two measurement electrodes only, not available with ground rings or lining protectors.
- (12) Liner material options limited to T, P, or F; cannot be ordered with ground rings, lining protectors, or H (x) options.
- (13) Available with liner option T only, line size 1/2-in. to 8-in. only, not available with grounding rings or lining protectors.
- (14) Available with ANSI 150, ANSI 300, and DIN flanges.
- (15) Available in 3-in. and larger meters for the 8705. Available in 8-in. and larger meters for 8707.
- (16) Available in sensor line sizes 0.5 through 8 in. (15 through 200 mm).
- (17) CRN Approval covers Alberta and Ontario as a standard. Consult the Factory for availability of other Provinces.
- (18) Only available with PTFE or Polyurethane Liner Material with 316L SST Electrode Material.
- (19) Grounding Rings and Lining Protectors provide the same fluid grounding function. Lining Protectors available for PTFE and ETFE only.
- (20) Available in sensor line sizes 0.5 through 12 in. (15 through 300 mm).
- (21) Available in sensor line sizes 0.5 through 8 in. (15 through 200 mm).
- (22) Available in sensor line sizes 0.5 through 16 in. (15 through 400 mm).
- (23) Available in sensor line sizes 3 through 18 in. (80 through 450 mm).
- (24) D1 Option Code must be ordered with sensor and transmitter.

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Table 9. Carbon Steel ASME B16.5 (ANSI) Flange Rating Availability⁽¹⁾

Line Size Code	Line Size Inches (mm)	Class 150 (C1)	MSS-SP44 Class 150 (C2)	Class 300 (C3)	Class 600 (C6)	Class 600 (C7)	Class 900 (C9)	Class 1500 (JM)	Class 2500 (JN)
005	0.5 (15)	★	NA	★	•	NA	NA	NA	NA
010	1 (25)	★	NA	★	•	•	•	NA	NA
015	1.5 (40)	★	NA	★	•	•	•	•	•
020	2 (50)	★	NA	★	•	•	•	•	•
030	3 (80)	★	NA	★	•	•	•	•	•
040	4 (100)	★	NA	★	•	•	•	•	•
060	6 (150)	★	NA	★	•	•	•	•	•
080	8 (200)	★	NA	★	•	•	•	•	•
100	10 (250)	★	NA	★	•	•	•	•	•
120	12 (300)	★	NA	★	CF	•	•	•	•
140	14 (350)	•	NA	•	CF	•	NA	NA	NA
160	16 (400)	•	NA	•	CF	•	NA	NA	NA
180	18 (450)	•	NA	•	CF	•	NA	NA	NA
200	20 (500)	•	NA	•	CF	•	NA	NA	NA
240	24 (600)	•	NA	•	CF	•	NA	NA	NA
300 ⁽²⁾	30 (750)	•	•	•	NA	NA	NA	NA	NA
360 ⁽³⁾	36 (900)	•	•	NA	NA	NA	NA	NA	NA

(1) Stars (★) represent a Standard offering while dots represent an Expanded offering.

(2) MSS-SP44 Class 300 Flanges for option C3

(3) AWWA C207 Class D Flat Face Flange for option C1 only

Table 10. Stainless Steel ASME B16.5 (ANSI) Flange Rating Availability⁽¹⁾

Line Size Code	Line Size Inches (mm)	Class 150 (S1)	MSS-SP44 Class 150 (S2)	Class 300 (S3)	Class 600 (S6)	Class 600 (S7)	Class 900 (S9)	Class 1500 (KM)	Class 2500 (KN)	Class 150 (P1)	MSS-SP44 Class 150 (P2)	Class 300 (P3)
005	0.5 (15)	★	NA	•	•	NA	NA	NA	NA	•	NA	•
010	1 (25)	★	NA	•	•	•	•	NA	NA	•	NA	•
015	1.5 (40)	★	NA	•	•	•	•	•	•	•	NA	•
020	2 (50)	★	NA	•	•	•	•	•	•	•	NA	•
030	3 (80)	★	NA	•	•	•	•	•	•	•	NA	•
040	4 (100)	★	NA	•	•	•	•	•	•	•	NA	•
060	6 (150)	★	NA	•	•	•	•	•	•	•	NA	•
080	8 (200)	★	NA	•	•	•	•	•	•	•	NA	•
100	10 (250)	★	NA	•	•	•	•	•	•	•	NA	•
120	12 (300)	★	NA	•	CF	•	•	•	•	•	NA	•
140	14 (350)	•	NA	•	CF	•	NA	NA	NA	•	NA	•
160	16 (400)	•	NA	•	CF	•	NA	NA	NA	•	NA	•
180	18 (450)	•	NA	•	CF	•	NA	NA	NA	•	NA	•
200	20 (500)	•	NA	•	CF	•	NA	NA	NA	•	NA	•
240	24 (600)	•	NA	•	CF	•	NA	NA	NA	•	NA	•
300 ⁽²⁾	30 (750)	•	•	•	NA	NA	NA	NA	NA	•	•	•
360 ⁽³⁾	36 (900)	•	•	NA	NA	NA	NA	NA	NA	•	•	NA

(1) Stars (★) represent a Standard offering while dots represent an Expanded offering.

(2) MSS-SP44 Class 300 Flanges for option S3 or P3

(3) AWWA C207 Class D Flat Face Flange for option S1 or P1 Only

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Table 11. EN 1092-1 (DIN) Flange Rating Availability⁽¹⁾

Line Size Code	Line Size Inches (mm)	Carbon Steel PN 10 (CD)	Carbon Steel PN 16 (CE)	Carbon Steel t PN 25 (CF)	Carbon Steel PN 40 (CH)	Carbon Steel Table D (CK)	Carbon Steel Table E (CL)	Stainless Steel PN 10 (SD)	Stainless Steel PN 16 (SE)	Stainless Steel PN 25 (SF)	Stainless Steel PN 40 (SH)
005	0.5 (15)	NA	NA	NA	★	•	•	NA	NA	NA	★
010	1 (25)	NA	NA	NA	★	•	•	NA	NA	NA	★
015	1.5 (40)	NA	NA	NA	★	•	•	NA	NA	NA	★
020	2 (50)	NA	NA	NA	★	•	•	NA	NA	NA	★
030	3 (80)	NA	NA	NA	★	•	•	NA	NA	NA	★
040	4 (100)	NA	★	NA	★	•	•	NA	★	NA	★
060	6 (150)	NA	★	NA	★	•	•	NA	★	NA	★
080	8 (200)	★	★	•	★	•	•	•	★	•	★
100	10 (250)	★	★	•	•	•	•	•	•	•	•
120	12 (300)	★	★	•	•	•	•	•	•	•	•
140	14 (350)	•	•	•	•	•	•	•	CF	CF	CF
160	16 (400)	•	•	•	•	•	•	•	CF	CF	CF
180	18 (450)	•	•	•	•	•	•	•	CF	CF	CF
200	20 (500)	•	•	•	•	•	•	•	CF	CF	CF
240	24 (600)	•	•	•	•	•	CF	•	CF	CF	CF

(1) Stars (★) represent a Standard offering while dots represent an Expanded offering.

Table 12. JIS 2220 B Flange Rating Availability

Line Size Code	Line Size Inches (mm)	Carbon Steel 10 K (CP)	Carbon Steel 20 K (CR)	304 SST 10 K (SP)	304 SST 20 K (SR)
005	0.5 (15)	•	•	•	•
010	1 (25)	•	•	•	•
015	1.5 (40)	•	•	•	•
020	2 (50)	•	•	•	•
030	3 (80)	•	•	•	•
040	4 (100)	•	•	•	•
060	6 (150)	•	•	•	•
080	8 (200)	•	•	•	•

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Rosemount 8711 Wafer Sensors

The flangeless design of the 8711 wafer sensor makes it an economical, compact, and lightweight alternative to flanged magnetic flowmeters. Alignment rings provided with every 8711, center the sensor in the process line and makes installation easier.

Table 13. Rosemount 8711 Ordering Information

★ The Standard offering 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	
8711	Magnetic Flowmeter Wafer Sensor	
Lining Material		
Standard		Standard
T	ETFE ⁽¹⁾	★
Expanded		
A	PFA ⁽²⁾	
S	PTFE ⁽³⁾	
Electrode Material		
Standard		Standard
S	316L Stainless Steel	★
H	Nickel Alloy 276 (UNS N10276)	★
T	Tantalum	★
P	80% Platinum - 20% Iridium	★
Expanded		
N	Titanium	
Electrode Type		
Standard		Standard
A	2 Electrodes - Standard	★
E	3rd Grounding Electrode - Standard	★
Expanded		
B	2 Electrodes - Bullet Nose ⁽⁴⁾	
F	3rd Grounding Electrode Bullet Nose ⁽⁴⁾	
Line Size		
Standard		Standard
005	½ in. (15 mm)	★
010	1in. (25 mm)	★
015	1½ in. (40mm)	★
020	2 in. (50mm)	★
030	3 in. (80 mm)	★
040	4 in. (100 mm)	★
060	6 in. (150 mm)	★
080	8 in. (200 mm)	★
Expanded		
15F	0.15 in. (4 mm)	
30F	0.3 in. (8 mm)	

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Table 13. Rosemount 8711 Ordering Information

★ The Standard offering 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 Mounting Configuration		
Standard		Standard
R	Remote	★
U	Integral, mounted to Rosemount 8732E Transmitter	★
Mounting Kit		
Expanded Kit: Includes two alignment rings (where applicable), threaded SST studs, and nuts		
Standard		Standard
1	ASME B16.5 (ANSI) Class 150	★
2	EN 1092-1 (DIN) PN 10/16 ⁽⁵⁾	★
3	ASME B16.5 (ANSI) Class 300	★
4	EN 1092-1 (DIN) PN 25/40 ⁽⁶⁾	★
Standard Kit: Includes two alignment rings (where applicable)		
Standard		Standard
5	ASME B16.5 (ANSI) Class 150	★
6	EN 1092-1 (DIN) PN 10/16 ⁽⁵⁾	★
7	ASME B16.5 (ANSI) Class 300	★
8	EN 1092-1 (DIN) PN 25/40 ⁽⁶⁾	★
Hazardous Area Approval		
Standard		Standard
NA	No Hazardous Area Approval Required	★
FM & CSA		
Standard		Standard
N0	FM Class 1 Div 2 for Non-Flammable fluids; CSA Class 1 Div 2	★
N5	FM Class 1 Div 2 for Flammable fluids	★
E5	FM Class 1 Div 1, Explosion Proof	★
ATEX		
Expanded		
E1	ATEX EEx e ia IIC T3... T6, Increased Safety Approval (with I.S. electrodes), integral mount with 8732E only	
KD	ATEX EEx e ia IIC T3... T6, Increased Safety Approval (with I.S. electrodes)	
N1	ATEX EEx nA [L] IIC Type n Approval	
ND	ATEX Dust Approval	
NEPSI		
Expanded		
E3	NEPSI Ex e ia IIC T3... T6, Increased Safety Approval (with I.S. electrodes), integral mount with 8732E only	
EP	NEPSI Ex e ia IIC T3... T6, Increased Safety Approval (with I.S. electrodes)	
KOSHA		
Expanded		
E9	KOSHA Ex e ia IIC T3... T6, Increased Safety Approval (with I.S. electrodes), integral mount with 8732E only	
EK	KOSHA Ex e ia IIC T3... T6, Increased Safety Approval (with I.S. electrodes)	
InMetro		
Expanded		
E2	InMetro BR-Ex e ia IIC T3... T6, Increased Safety Approval (with I.S. electrodes), integral mount with 8732E only	
EB	InMetro BR-Ex e ia IIC T3... T6, Increased Safety Approval (with I.S. electrodes)	
GOST		
Expanded		
E8	GOST Ex e ia IIC T3... T6, Increased Safety Approval (with I.S. electrodes), integral mount with 8732E only	
EM	GOST Ex e ia IIC T3... T6, Increased Safety Approval (with I.S. electrodes)	

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Table 13. Rosemount 8711 Ordering Information

★ The Standard offering 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)

Certifications		
Expanded		
PD	Pressure Equipment Directive Certification (PED, per 97/23/EC)	
DW	NSF Drinking Water Certification ⁽⁷⁾	
Optional Grounding Rings		
Standard		Standard
G1	(2) 316L SST Ground Rings	★
G5	Single 316L SST Ground Ring	★
Expanded		
G2	(2) Nickel Alloy 276 (UNS N10276) Ground Rings	
G3	(2) Titanium Ground Rings	
G4	(2) Tantalum Ground Rings	
G6	Single Nickel Alloy 276 (UNS N10276) Ground Ring	
G7	Single Titanium Ground Ring	
G8	Single Tantalum Ground Ring	
Other Options		
Expanded		
D1	High Accuracy Calibration (0.15% of rate for matched sensor and transmitter) ⁽⁸⁾	
DT	Heavy Duty Tagging	
Q4	Calibration Certificate per ISO 10474 3.1B	
Q8	Material Traceability 3.1B	
Q9	Material Traceability Electrode only 3.1B	
Q66	Welding Procedure Qualification Record Documentation ⁽⁹⁾	
Q67	Welding Performance Qualification Record Documentation ⁽⁹⁾	
Q70	Weld Examination Inspection Certificate, ISO 10474 3.1B ⁽⁹⁾	
Typical Model Number: 8711 TSA 020 R 5 N0		

(1) Not available with 0.15 and 0.30 in. (4 and 8 mm) line sizes

(2) Available with 0.15 and 0.30 in. (4 and 8 mm) line sizes only

(3) Not available with 0.15 and 0.30 in. (4 and 8 mm) line sizes

(4) Bullet nose electrodes are available in 1.5 in. to 8 in. meters (40 mm to 200 mm)

(5) 8 in. (200 mm) has a PN 10 mounting kit only

(6) 8 in. (200 mm) has a PN 25 mounting kit only

(7) Only available with PTFE Liner Material with 316L SST Electrode Material

(8) D1 Option Code must be ordered with sensor and transmitter

(9) 6 and 8 in. (150 and 200 mm) line sizes only

Rosemount 8700 Series



Rosemount 8721 Hygienic Sensors

The 8721 hygienic sensor is specifically designed for the demanding applications in food, beverage, and life sciences. The robust, all-welded, full diameter sensor is constructed of FDA approved materials and is authorized to display the 3-A Symbol (Authorization #1222) is certified by EHEDG (#C03-5229) and is approved for use in FDA Grade A milk meter based timing loops (M-b 350). Sizes range from 1/2" (15mm) to 4" (100mm) and are available in a variety of industry standard process connections.

Table 14. Rosemount 8721 Ordering Information

★ The Standard offering 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	
8721	Hygienic Magnetic Flowmeter Sensor	
Lining Material		
Standard		Standard
A	PFA	★
Electrode Material		
Standard		Standard
S	316L SST (standard)	★
Expanded		
H	Nickel Alloy 276 (UNS N10276)	
P	80% Platinum-20% Iridium	
Electrode Construction		
Standard		Standard
A	Standard measurement electrodes	★
Line Sizes		
Standard		Standard
005	15 mm (1/2 in.)	★
010	25 mm (1 in.)	★
015	40 mm (1 1/2 in.)	★
020	50 mm (2.0 in.)	★
025	65 mm (2 1/2 in.)	★
030	80 mm (3.0 in.)	★
040	100 mm (4.0 in.)	★
Transmitter Mounting Configuration		
Standard		Standard
R	Remote, for use with 8712, or remote version of 8732 transmitter	★
U	Integral, mounted to 8732 transmitter	★
X	Sensor only (does not include terminal junction box)	★
Process Connection Type		
Standard		Standard
A	Tri-Clamp ⁽¹⁾	★
B	IDF Sanitary screw type ⁽²⁾	★
Expanded		
C	ANSI Weld Nipple ⁽²⁾	
D	DIN 11851 (Imperial)	
E	DIN 11851 (Metric)	
F	DIN 11864-1 form A	

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Table 14. Rosemount 8721 Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.

The Expanded offering is subject to additional delivery lead time.

G	DIN 11864-2 form A	
H	SMS Connection	
J	Cherry-Burrell I-Line	
K	DIN 11850 Weld Nipple	
Process Gasket Material		
Standard		Standard
1	Silicone gasket seal	★
2	EPDM	★
Expanded		
4	Viton	
8	EPDM Compression - limiting ⁽³⁾	
9	Viton Compression - limiting ⁽³⁾	
X	No gasket (User supplied; only applicable with Process Connection B)	
Product Certifications		
Standard		Standard
NA	CE Marking; 3A; EHEDG Type EL ⁽³⁾ ; no hazardous location approvals	★
N0	Factory Mutual (FM) Ordinary Location; CSA; CE Marking; 3-A; EHEDG Type EL ⁽³⁾	★

Options (Include with selected model number)

Expanded		
AH	Electropolished process connection surface finish < 15µinch Ra (0.38µm Ra)	
D1	High Accuracy Calibration [0.25% of rate from 3-30 ft/s (0.9-10 m/s)] matched sensor and transmitter system	
D3	High Velocity Meter Verification. Calibration verified at 1, 3, 10 and 20 ft/sec (0.3, 1, 3, and 6 m/s)	
HD	DanFoss Lay Length	
HP	Process Data PD340 (Alfa-Laval PD340) 250mm lay length and Tri-Clamp process connections	
J1	CM20 Conduit Adapter (Applies to Transmitter Mount Option "R" only)	
J2	PG13.5 Conduit Adapter (Applies to Transmitter Mount Option "R" only)	
Q4	Calibration Certificate per ISO 10474 3.1B	
Q8	Material Traceability Certificate per ISO 10474 3.1B (product contact surfaces)	
SJ	304 Stainless Steel terminal junction box (Remote configuration only)	
Typical Model Number: 8721 A S A 020 U A 1 N0		

(1) Tri-Clamp specification per BPE-2002

(2) IDF Specification per BS4825 Part 4

(3) EHEDG Document 8 requires mechanical compression limiting, provided by Compression - limiting gaskets for line sizes 1- 4 in. only.



Rosemount 8714D

The Rosemount 8714D Calibration Standard attaches to an 8712D, 8712E, or 8732 transmitter's sensor connections to ensure traceability to NIST standards and long-term accuracy of the flowmeter system. The 8714D is not compatible with the 8712H High-Signal transmitter

Table 15. Rosemount 8714D Ordering Information

Model	Description
8714DQ4	Reference Calibration Standard

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Tagging

The sensor and transmitter will be tagged, at no charge, in accordance with customer requirements.

Transmitter tag character height is 0.125 in. (3.18 mm). Sensor tag: 40 character maximum.

Transmitter tag: see Configuration Data Sheet for character maximum.

Ordering Procedure

To order, select the desired sensor and/or transmitter by specifying model codes from the ordering table.

For remote transmitter applications, note the cable specification requirements.

Sensors and transmitters must be selected from Product Data Sheet 00813-0100-4727.

Standard Configuration

Unless the Configuration Data Sheet is completed, the transmitter will be shipped as follows:

Engineering Units:	ft/sec
4 mA (1 V DC):	0
20 mA (5 V DC):	30
Sensor Size:	3-in.
Empty Pipe:	Off
Sensor Calibration Number:	1000005010000000

Integrally Mounted Rosemount 8732E Transmitters are factory configured with the attached sensor size and appropriate calibration number.

Cable Requirements for Remote Transmitters

Description	Length	P/N
Signal Cable (20 AWG) Belden 8762, Alpha 2411 equivalent	ft m	08712-0061-0001 08712-0061-2003
Coil Drive Cable (14 AWG) Belden 8720, Alpha 2442 equivalent	ft m	08712-0060-0001 08712-0060-2003
Combination Signal and Coil Drive Cable (18 AWG) ⁽¹⁾	ft m	08712-0752-0001 08712-0752-2003

(1) Combination signal and coil drive cable is not recommended for high-signal magmeter system. For remote mount installations, combination signal and coil drive cable should be limited to less than 330 ft (100 m).

Remote transmitter installations require equal lengths of signal and coil drive cables. Integrally mounted transmitters are factory wired and do not require interconnecting cables.

Lengths from 5 to 1,000 ft. (1.5 to 300 m) may be specified, and will be shipped with the sensor. Cable longer than 100 ft. (30 m) is not recommended for high-signal systems.

Custom Configuration (Option Code C1)

If Option Code C1 is ordered, the Configuration Data Sheet (CDS) must be submitted at the time of order.

Rosemount 8700 Series Product Specifications Overview

Listed below are tables that outline some of the basic performance, physical, and functional specifications of the Rosemount 8700 Series Magnetic Flowmeter products. Table 16 provides an overview of the Rosemount 8700 Series Transmitter products. Table 17 provides an overview of the Rosemount 8700 Series Sensor products.

Table 16. Rosemount 8700 Series Transmitter Specifications

	Model	Base Accuracy ⁽¹⁾	Mounting	Power Supply	User Interface	Communication Protocol	Diagnostics	Sensor Compatibility	Page for Detailed Specifications	Page for Ordering Information
	8732E	0.25% Standard 0.15% High Accuracy Option	Integral or Remote	Global AC or DC	4 Optical Switch LOI	HART	Basic plus DA1 and DA2 Suite	All Rosemount plus other manufacturers	page 29	page 6
						Profibus PA fieldbus	Basic plus D01 and D02 Suite			
					Display Only	FOUNDATION fieldbus				
	8712E	0.25% Standard 0.15% High Accuracy Option	Remote	Global AC or DC	Dedicated 15 Button LOI	HART	Basic plus Optional DA1 and DA2 Suite	All Rosemount plus other manufacturers	page 37	page 6
	8712H	0.5% Standard 0.25% High Accuracy Option	Remote	115 V AC	Dedicated 15 Button LOI	HART	Basic	8707 Only	page 37	page 10

(1) For complete accuracy specifications, please refer to the transmitter detailed specifications.

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Table 17. Rosemount 8700 Series Sensor Specifications

	Model	Style	Base Accuracy ⁽¹⁾	Line Sizes	Coil Drive Power	Design Features	Page for Detailed Specifications	Page for Ordering Information
	8705	Flanged	0.25% Standard 0.15% High Accuracy Option	0.5 to 36 in. (15 to 900 mm)	Pulsed DC	Standard Process Design	page 40	page 12
	8707	High-Signal (Flanged)	0.5% Standard 0.25% High Accuracy Option	3 to 36 in. (15 to 900 mm)	High-Signal Pulsed DC	Superior signal stability for Noisy Applications	page 40	page 12
	8711	Wafer	0.25% Standard 0.15% High Accuracy Option	0.15 to 8 in. (4 to 200 mm)	Pulsed DC	Compact, Light Weight	page 44	page 19
	8721	Hygienic	0.5% Standard 0.25% High Accuracy Option	0.5 to 4 in. (15 to 100 mm)	Pulsed DC	3-A and EHEDG CIP/SIP	page 46	page 22

(1) For complete accuracy specifications, please refer to the sensor detailed specifications.

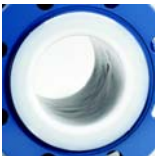
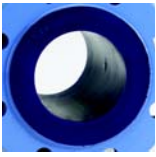
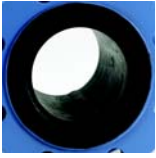
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Table 18. Lining Material Selection

Liner Material	General Characteristics
PFA 	• Best chemical resistance • Better abrasion resistance than PTFE • Best high temperature capabilities • -20 to 350°F (-29 to 177°C)
PTFE 	• Highly chemical resistant • Excellent high temperature capabilities • -20 to 350°F (-29 to 177°C)
ETFE 	• Excellent chemical resistance • Better abrasion resistance than PTFE • -20 to 300°F (-29 to 149°C)
Polyurethane 	• Excellent abrasion resistance for slurries with small and medium particles • Limited chemical resistance • 0 to 140°F (-18 to 60°C) • Typically applied in clean water
Neoprene 	• Very good abrasion resistance for small and medium particles • Better chemical resistance than polyurethane • 0 to 176°F (-18 to 80°C) • Typically applied in water with chemicals, and sea water
Linatex Rubber 	• Very good abrasion resistance for large particles • Limited chemical resistance especially in acids • Softer material than polyurethane and neoprene • 0 to 158°F (-18 to 70°C) • Typically applied in mining slurries

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Table 19. Electrode Selection

Electrode Material	General Characteristics
316L Stainless Steel	• Good corrosion resistance
	• Good abrasion resistance
	• Not recommended for sulfuric or hydrochloric acids
Nickel Alloy 276 (UNS N10276)	• Better corrosion resistance
	• High strength
	• Good in slurry applications
	• Effective in oxidizing fluids
Tantalum	• Excellent corrosion resistance
	• Not recommended for hydrofluoric acid, fluorosilic acid, or sodium hydroxide
80% Platinum 20% Iridium	• Best chemical resistance
	• Expensive material
	• not recommended for aquaregia
Titanium	• Better chemical resistance
	• Better abrasion resistance
	• Good for sea water applications
	• Not recommended for hydrofluoric or sulfuric acid
Electrode Type	General Characteristics
Standard Measurement	• Lowest cost
	• Good for most applications
Standard Measurement + Grounding (Also see Table 20 and Table 21 for grounding options and installation)	• Low cost grounding option especially for large line sizes
	• Minimum conductivity of 100 microsiemens/cm
	• Not recommended for electrolysis or galvanic corrosion applications
Bulb-nose	• Slightly more expensive
	• Best option for coating processes

Table 20. Grounding Options

Grounding Options	General Characteristics
No Grounding Options (grounding straps)	• Acceptable for conductive unlined pipe
	• Grounding straps provided at no cost
Grounding Electrodes	• Same material as measurement electrodes
	• Sufficient grounding option when process fluid conductivity is greater than 100 microsiemens/cm
	• Not recommended in electrolysis applications, galvanic corrosion applications, or applications where the electrodes may coat.
Grounding Rings	• Low conductivity process fluids
	• Cathodic or electrolysis applications that may have stray currents in or around the process
	• Variety of materials for process fluid compatibility
Lining Protectors	• Protect upstream edge of sensor from abrasive fluids
	• Permanently installed on sensor
	• Protect liner material from over torquing of flange bolts
	• Provide ground path and eliminate need for grounding rings or grounding electrode

Table 21. Grounding Installation

Type of Pipe	Grounding Options No Grounding Option (Straps Only)	Grounding Rings	Grounding Electrode	Lining Protectors
Conductive Unlined Pipe	Acceptable	Not Required	Not Required	Acceptable (Not Required)
Conductive Lined Pipe	Not Acceptable	Acceptable	Acceptable	Acceptable
Non-Conductive Pipe	Not Acceptable	Acceptable	Acceptable	Acceptable

Rosemount E-Series Transmitter Specifications



Functional Specifications

Sensor Compatibility

Compatible with Rosemount 8705, 8711, 8721, and 570TM sensors. Compatible with Rosemount 8707 sensor with D2 Dual calibration option. Compatible with AC and DC powered sensors of other manufacturers.

Sensor Coil Resistance

350 Ω maximum

Transmitter Coil Drive Current

500 mA

Flow Rate Range

Capable of processing signals from fluids that are traveling between 0.04 and 39 ft/s (0.01 to 12 m/s) for both forward and reverse flow in all sensor sizes. Full scale continuously adjustable between -39 and 39 ft/s (-12 to 12 m/s).

Conductivity Limits

Process liquid must have a conductivity of 5 microsiemens/cm (5 micromhos/cm) or greater. Excludes the effect of interconnecting cable length in remote mount transmitter installations.

Power Supply

90 -250 V AC, 50–60 Hz or 12-42 V DC

AC Power Supply Requirements

Units powered by 90-250 V AC have the following power requirements.

Figure 2. AC Current Requirements

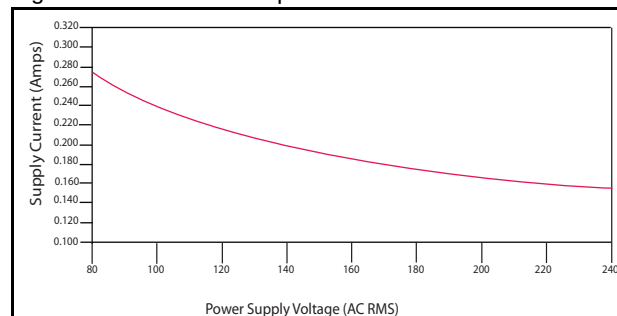
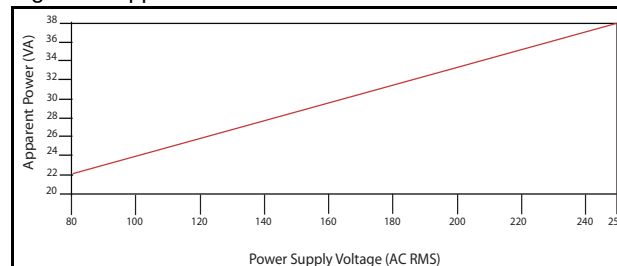


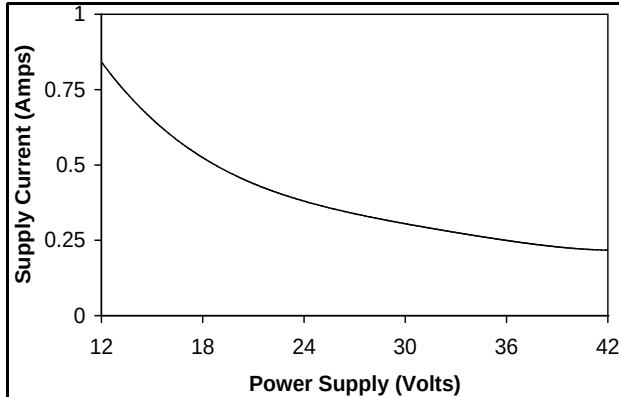
Figure 3. Apparent Power



DC Supply Current Requirements

Units powered by 12-42 V DC power supply may draw up to 1 amp of current steady state.

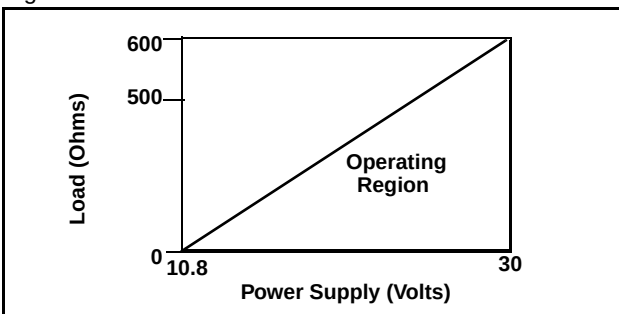
Figure 4. DC Current Requirements



DC Load Limitations (Analog Output)

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

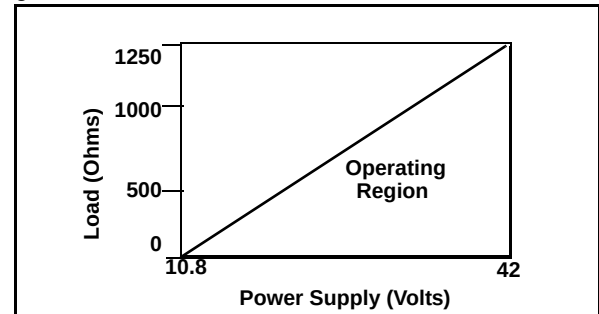
Figure 5. 8732E DC Load Limitations



$$R_{\max} = 31.25 (V_{\text{ps}} - 10.8)$$

V_{ps} = Power Supply Voltage (Volts)
 $R_{\max}$ = Maximum Loop Resistance (Ohms)

Figure 6. 8712E DC Load Limitations



$$R_{\max} = 41.7 (V_{\text{ps}} - 10.8)$$

V_{ps} = Power Supply Voltage (Volts)
 $R_{\max}$ = Maximum Loop Resistance (Ohms)

NOTE

HART Communication requires a minimum loop resistance of 250 ohms.

Power Consumption

10 watts maximum

Switch-on current

AC: Maximum 26 A (< 5 ms) at 250 V AC

DC: Maximum 30 A (< 5 ms) at 42 V DC

8732E Ambient Temperature Limits

Operating

–58 to 165 °F (–50 to 74 °C) without local operator interface

13 to 149 °F (–25 to 65 °C) with local operator interface

Storage

–40 to 185 °F (–40 to 85 °C)

–22 to 176 °F (–30 to 80 °C) with local operator interface

8732E Humidity Limits

0–100% RH to 150 °F (65 °C)

8712E Ambient Temperature Limits

Operating

–20 to 140 °F (–29 to 60 °C) with local operator interface

–40 to 165 °F (–40 to 74 °C) without local operator interface

Storage

–40 to 176 °F (–40 to 80 °C)

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Rosemount 8700 Series

8712E Humidity Limits

0-100% RH to 120 °F (49 °C), decreases linearly to 10% RH at 130 °F (54 °C)

Enclosure Rating

Type 4X, IEC 60529, IP66 (transmitter)

Transient Protection Rating

The 8732E has built in transient protection that conforms to EN 61000-4-4 for burst currents and 61000-4-5 for surge currents. For CE testing the transmitter is compliant with IEC 61185-2.2000 Class 3 which is up to 2 kV and up to 2 kA protection.

Turn-on Time

5 minutes to rated accuracy from power up; 5 seconds from power interruption

Start-up Time

50 ms from zero flow

Low Flow Cutoff

Adjustable between 0.01 and 38.37 ft/s (0.003 and 11.7 m/s). Below selected value, output is driven to the zero flow rate signal level.

Overrange Capability

Signal output will remain linear until 110% of upper range value or 44 ft/s (13 m/s). The signal output will remain constant above these values. Out of range message displayed on LOI and the HART Communicator.

Damping

Adjustable between 0 and 256 seconds

E-Series Advanced Diagnostics Capabilities

Basic

- Self test
- Transmitter faults
- Analog output test
- Pulse output test
- Tunable empty pipe
- Reverse flow
- Coil circuit fault
- Electronics temperature

Process Diagnostics (DA1/D01)

- Ground/wiring fault
- High process noise
- Coated Electrode Detection⁽¹⁾

SMART Meter Verification (DA2/D02)

Smart Meter Verification
4-20 mA loop verification⁽¹⁾

Output Signals

8732E HART / Pulse Specifications

Analog Output Adjustment⁽²⁾

4–20 mA, switch-selectable as internally or externally powered 10 to 30 V DC; 0 to 600 Ω load.

Engineering units—lower and upper range values are user-selectable.

Output automatically scaled to provide 4 mA at lower range value and 20 mA at upper range value. Full scale continuously adjustable between -39 and 39 ft/s (-12 to 12 m/sec), 1 ft/s (0.3 m/s) minimum span.

HART Communications, digital flow signal, superimposed on 4–20 mA signal, available for control system interface. 250 Ω required for HART communications.

Scalable Frequency Adjustment⁽²⁾

0-10,000 Hz, switch-selectable as internally or externally powered 10 to 30 V DC, transistor switch closure up to 5.75 w. Pulse value can be set to equal desired volume in selected engineering units. Pulse width adjustable from 0.5 to 100 m/s. Local operator interface automatically calculates and displays maximum allowable output frequency.

8712E HART / Pulse Specifications

Analog Output Adjustment⁽³⁾

4–20 mA, switch-selectable as internally or externally powered 5 to 24 V DC; 0 to 1000 Ω load.

Engineering units—lower and upper range values are user-selectable.

Output automatically scaled to provide 4 mA at lower range value and 20 mA at upper range value. Full scale continuously adjustable between -39 and 39 ft/s (-12 to 12 m/sec), 1 ft/s (0.3 m/s) minimum span.

(1) Only available on the 8732E with HART outputs

(2) For transmitters with intrinsically safe outputs, power must be supplied externally.

(3) For transmitters with intrinsically safe outputs, power must be supplied externally.

Rosemount 8700 Series

HART Communications, digital flow signal, superimposed on 4–20 mA signal, available for control system interface. 250 Ω required for HART communications.

Scalable Frequency Adjustment⁽²⁾

0-10,000 Hz, externally powered 5 to 24 V DC, transistor switch closure up to 2 W for frequencies up to 4,000 Hz and 5 V DC at 0.1 W at maximum frequency of 10,000 Hz. Pulse value can be set to equal desired volume in selected engineering units. Pulse width adjustable from 1.5 to 500 msec, below 1.5 msec pulse width automatically switches to 50% duty cycle. Local operator interface automatically calculates and displays maximum allowable output frequency.

Optional Digital Output Function (AX option)

Externally powered at 5 to 24 V DC, transistor switch closure up to 3 W to indicate either:

Reverse Flow:

Activates switch closure output when reverse flow is detected. The reverse flow rate is displayed.

Zero Flow:

Activates switch closure output when flow goes to 0 ft/s.

Empty Pipe⁽¹⁾:

Activates switch closure output when an empty pipe condition is detected.

Transmitter Faults⁽¹⁾:

Activates switch closure output when a transmitter fault is detected.

Flow Limits (2)⁽¹⁾:

Activates switch closure output when the transmitter measures a flow rate that meets the conditions established for this alert. There are two independent flow limit alerts that can be configured as discrete outputs.

Totalizer Limit⁽¹⁾:

Activates switch closure output when the transmitter measures a total flow that meets the conditions established for this alert.

Diagnostic Status⁽¹⁾:

Activates switch closure output when the transmitter detects a condition that meets the configured criteria of this output.

Optional Digital Input Function (AX option)

Externally powered at 5 to 24 V DC, transistor switch closure up to 3 W to indicate either:

Net Total Reset:

Resets the net totalizer value to zero.

Positive Zero Return (PZR):

Forces outputs of the transmitter to zero flow. Activated by applying a contact closure.

Output Testing

Analog Output Test

Transmitter may be commanded to supply a specified current between 3.5 and 23 mA.

Pulse Output Test

Transmitter may be commanded to supply a specified frequency between 1 and 10,000 Hz.

Security Lockout

Security lockout switch on the electronics board can be set to deactivate all LOI and HART-based communicator functions to protect configuration variables from unwanted or accidental change.

8732 LOI Lockout

All optical switches on the display can be locked locally from the display layout configuration screen by holding the upper right optical switch for 10 seconds. The display can be reactivated holding the same switch for 10 seconds.

(1) Available on the 8732E HART in April 2010.

FOUNDATION fieldbus Digital Output Specifications

Output Signal

Manchester-encoded digital signal that conforms to IEC 1158-2 and ISA 50.02

Schedule Entries

Seven (7)

Links

Twenty (20)

Virtual Communications Relationships (VCRs)

One (1) predefined (F6, F7) Nineteen (19) configurable (see Table 1)

Block	Execution Time (Milliseconds)
Resource (RB)	—
Transducer (TB)	—
Analog Input (AI)	10
Proportional/Integral/Derivative (PID)	10
Integrator (INT)	10
Arithmetic (AR)	10

FOUNDATION Fieldbus Function Blocks

Transducer Block

The transducer block calculates flow from the measured induced voltage. The calculation includes information related to the calibration number, line size, and diagnostics.

Resource Block

The resource block contains physical transmitter information, including available memory, manufacturer identification, device type, software tag, and unique identification.

Backup Link Active Scheduler (LAS)

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

The host or other configuration tool is used to download the schedule for the application to the link master device. In the absence of a primary link master, the transmitter will claim the LAS and provide permanent control for the H1 segment.

Diagnostics

The transmitter automatically performs continuous self-diagnostics. The user can perform on-line testing of the transmitter digital signal. Advanced simulation diagnostics are available. This enables remote verification of the electronics via a flow signal generator built into the electronics. The sensor strength value can be used to view the process flow signal and provide information regarding filter settings.

Analog Input

The AI function block processes the measurement and makes it available to other function blocks. The AI function block also allows filtering, alarming, and engineering unit changes.

The 8732E Transmitter with FOUNDATION fieldbus comes standard with one AI function block for flow.

Arithmetic Block

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

Proportional/Integral/Derivative

The optional PID function block provides a sophisticated implementation of the universal PID algorithm. The PID function block features input for feed forward control, alarms on the process variable, and control deviation. The PID type (series or Instrument Society of America [ISA]) is user-selectable on the derivative filter.

Integrator

The standard integrator block is available for totalization of flow.

Reverse Flow

Detects and reports reverse flow

Software Lockout

A write-lock switch and software lockout are provided in the resource function block.

Totalizer

Non-volatile totalizer for net, gross, forward and reverse totals.

Rosemount 8700 Series

Profibus PA fieldbus Digital Output Specifications

Output Signal

Manchester-encoded digital signal that conforms to IEC 1158-2 and ISA 50.02.

Profile Version

3.01

Identification Number

Generic: 0x9740

Manufacturer Specific: 0x0C15

Profibus PA Function Blocks

Resource Block

The Resource Block contains physical transmitter information, including available memory, manufacturer identification, device type, software tag, and unique identification.

Transducer Block

The transducer block calculates flow from the measured induced voltage and provides the PV Variable input to the AI Block. The calculation includes information related to the calibration number, line size, and diagnostics.

Diagnostics

The transmitter automatically performs continuous self-diagnostics. The user can perform on-line testing of the transmitter digital signal. In addition advanced diagnostic capabilities are also available to give better insight to meter performance and process information.

Analog Input Block

The AI function block processes the measurement and makes it available to the Host system. The AI function block also allows filtering, alarming, and engineering unit changes. The 8732E Transmitter with Profibus PA digital fieldbus comes standard with one AI function block flow.

Totalizer Block (3 blocks)

The Totalizer function block allows for totalization of the flow signal. The 8732E Transmitter with Profibus PA digital fieldbus comes with 3 independent totalizer blocks. Each totalized value can be displayed on the Local Operator Interface of the device in addition to the Primary Variable. The non-volatile totalizers can be configured to measure gross, net, forward, and reverse totals.

Sensor Compensation

Rosemount sensors are flow-calibrated and assigned a calibration factor at the factory. The calibration factor is entered into the transmitter, enabling interchangeability of sensors without calculations or a compromise in standard accuracy.

8732E transmitters and other manufacturers' sensors can be calibrated at known process conditions or at the Rosemount NIST-Traceable Flow Facility. Transmitters calibrated on site require a two-step procedure to match a known flow rate. This procedure can be found in the Operations Manual:

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Rosemount 8700 Series

Performance Specifications

(System specifications are given using the frequency output and with the unit at reference conditions.)

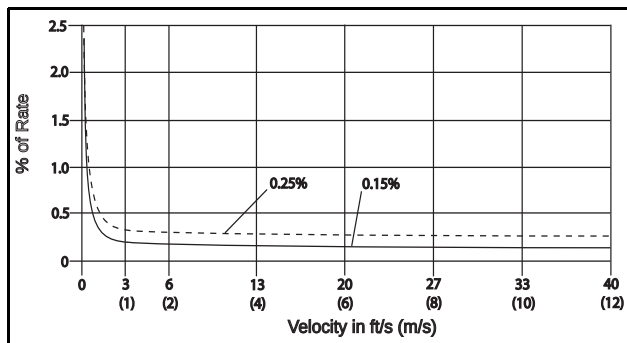
Accuracy

Includes the combined effects of linearity, hysteresis, repeatability, and calibration uncertainty.

Rosemount E Series with 8705/8707 Sensor:

Standard system accuracy is $\pm 0.25\%$ of rate ± 1.0 mm/sec from 0.04 to 6 ft/s (0.01 to 2 m/s); above 6 ft/s (2 m/s), the system has an accuracy of $\pm 0.25\%$ of rate ± 1.5 mm/sec.

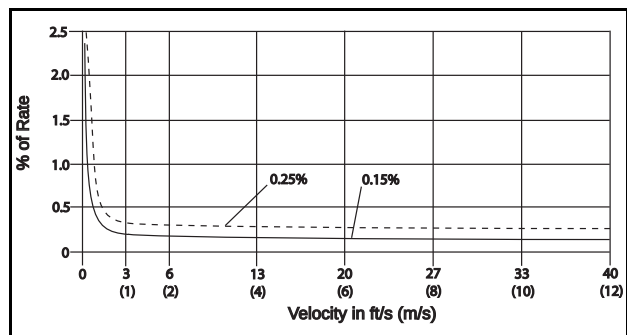
Optional high accuracy is $\pm 0.15\%$ of rate ± 1.0 mm/sec from 0.04 to 13 ft/s (0.01 to 4 m/s); above 13 ft/s (4 m/s), the system has an accuracy of $\pm 0.18\%$ of rate.⁽¹⁾



Rosemount E-Series with 8711 Sensor:

Standard system accuracy is $\pm 0.25\%$ of rate ± 2.0 mm/sec from 0.04 to 39 ft/s (0.01 to 12 m/s).

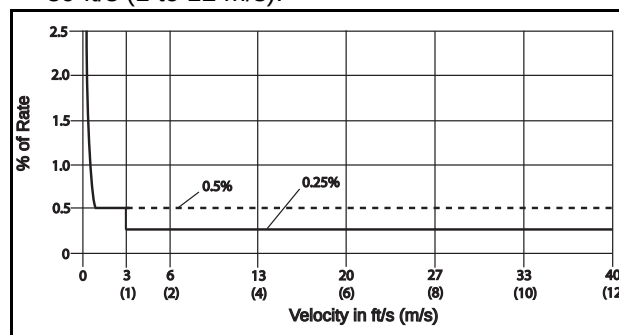
Optional high accuracy is $\pm 0.15\%$ of rate ± 1.0 mm/sec from 0.04 to 13 ft/s (0.01 to 4 m/s); above 13 ft/s (4 m/s), the system has an accuracy of $\pm 0.18\%$ of rate.



Rosemount E-Series with 8721 Sensor:

Standard system accuracy is $\pm 0.5\%$ of rate from 1 to 39 ft/s (0.3 to 12 m/s); between 0.04 and 1.0 ft/s (0.01 and 0.3 m/s), the system has an accuracy of ± 0.005 ft/s (0.0015 m/s).

Optional high accuracy is $\pm 0.25\%$ of rate from 3 to 39 ft/s (1 to 12 m/s).



Rosemount E-Series with Legacy 8705/8707 Sensors:

Standard system accuracy is $\pm 0.5\%$ of rate from 1 to 39 ft/s (0.3 to 12 m/s); between 0.04 and 1.0 ft/s (0.01 and 0.3 m/s), the system has an accuracy of ± 0.005 ft/s (0.0015 m/s).

Rosemount E-Series with Legacy 8711 Sensors:

Standard system accuracy is $\pm 0.5\%$ of rate from 3 to 39 ft/s (1 to 12 m/s); between 0.04 and 3.0 ft/s (0.01 and 1 m/s), the system has an accuracy of ± 0.015 ft/s (0.005 m/s).

Rosemount E-Series with Other Manufacturers' Sensors:

When calibrated in the Rosemount Flow Facility, system accuracies as good as 0.5% of rate can be attained.

There is no accuracy specification for other manufacturers' sensors calibrated in the process line.

Analog Output Effect

Analog output has the same accuracy as frequency output plus an additional $\pm 4\mu\text{A}$.

Vibration Effect

IEC 60770-1

(1) For Sensor sizes greater than 12 in. (300 mm) the high accuracy is $\pm 0.25\%$ of rate from 3 to 39 ft/sec (1 to 12 m/sec).

Rosemount 8700 Series

Repeatability

±0.1% of reading

Response Time (Analog Output)

50 ms maximum response time to step change in input

Stability

±0.1% of rate over six months

Ambient Temperature Effect

±0.25% change over operating temperature range

EMC Compliance

EN61326-1: 2006 (Industrial) electromagnetic compatibility (EMC) for process and laboratory apparatus.

8732E Physical Specifications

Materials of Construction

Housing

Low copper aluminum, Type 4X and IEC 60529 IP66

Paint

Polyurethane

Cover Gasket

Rubber

Electrical Connections

Two 1/2–14 NPT connections provided on the transmitter housing (optional third connection available). PG13.5 and CM20 adapters are available. Screw terminals provided for all connections. Power wiring connected to transmitter only. Integrally mounted transmitters are factory wired to the sensor.

Transmitter Weight

Approximately 7 pounds (3.2 kg). Add 1 pound (0.5 kg) for Option Code M4/M5.

8712E Physical Specifications

Materials of Construction

Housing

Low-copper aluminum, Type 4X and IEC 60529 IP66

Paint

Polyurethane

Cover Gasket

Rubber

Electrical Connections

Four 1/2–14 NPT connections provided on the base of the transmitter. Screw terminals provided for all of the connections. Power wiring connected to the transmitter only. Remote mounted transmitters require only a single conduit connection to the sensor.

Line Power Fuses

90–250 V ac systems

2 amp, Quick-acting Bussman AGCI or equivalent

12–42 V DC systems

3 amp, Quick-acting Bussman AGCI or equivalent

Transmitter Weight

Transmitter approximately 9 lb (4 kg). Add 1 lb (0.5 kg) for local operator interface.



Rosemount 8712H Transmitter Specifications

Functional Specifications

Sensor Compatibility

Compatible with 8707 High-Signal sensor only.

Sensor Coil Resistance

12 Ω maximum

Transmitter Coil Drive Current

5 A

Flow Rate Range

Capable of processing signals from fluids that are traveling between 0.04 and 30 ft/s (0.01 to 10 m/s) for both forward and reverse flow in all sensor sizes. Full scale continuously adjustable between -30 and 30 ft/s (-10 to 10 m/s).

Conductivity Limits

Process liquid must have a conductivity of 50 microsiemens/cm (50 micromhos/cm). Excludes the effect of interconnecting cable length in remote mount transmitter installations.

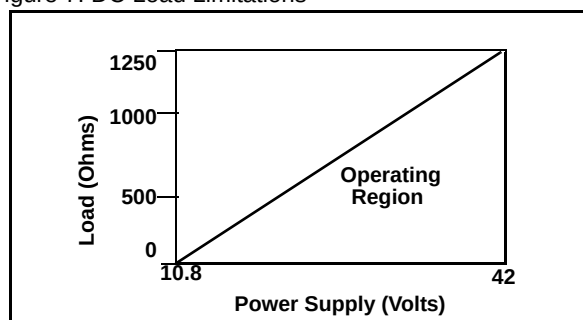
Power Supply

115 V AC, 50–60 Hz

DC Load Limitations (Analog Output)

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

Figure 7. DC Load Limitations



$$\begin{aligned} R_{\max} &= 41.7(V_{ps} - 10.8) \\ V_{ps} &= \text{Power Supply Voltage (Volts)} \\ R_{\max} &= \text{Maximum Loop Resistance (Ohms)} \end{aligned}$$

NOTE

HART Communication requires a minimum loop resistance of 250 ohms.

Power Consumption

300 watts maximum

Ambient Temperature Limits

Operating

-20 to 130 °F (-29 to 54 °C) with or without local operator interface

Storage

-40 to 176 °F (-40 to 80 °C)

Humidity Limits

0–100% RH at 120 °F (49 °C), decreases linearly to 10% RH at 130 °F (54 °C)

Enclosure Ratings

Type 4X, IP66

Rosemount 8700 Series

Output Signals

Analog Output Adjustment

4–20 mA, switch-selectable as internally or externally powered 5 to 24 V DC; 0 to 1000 Ω load.

Engineering units—lower and upper range values are user-selectable.

Output automatically scaled to provide 4 mA at lower range value and 20 mA at upper range value.

Full scale continuously adjustable between -30 and 30 ft/s (-10 to 10 m/sec), 1 ft/s (0.3 m/s) minimum span.

HART Communications, digital flow signal, superimposed on 4–20 mA signal, available for control system interface. 250 Ω required for HART communications.

Scalable Frequency Adjustment

0-1000 Hz, externally powered at 5 to 24 V DC, transistor switch closure up to 5.75 W. Pulse value can be set to equal desired volume in selected engineering units. Pulse width adjustable from 0.5 to 100 m/s. Local operator interface automatically calculates and displays maximum allowable output frequency.

Auxiliary Output Function

Externally powered at 5 to 24 V DC, transistor switch closure up to 3 W to indicate either:

Reverse Flow:

Activates switch closure output when reverse flow is detected. The reverse flow rate is displayed.

Zero Flow:

Activates switch closure output when flow goes to 0 ft/s.

Positive Zero Return (PZR)⁽¹⁾

Forces outputs of the transmitter to the zero flow rate signal level. Activated by applying a contact closure.

Security Lockout

Security lockout jumper on the electronics board can be set to deactivate all LOI and HART-based communicator functions to protect configuration variables from unwanted or accidental change.

Output Testing

Analog Output Test

Transmitter may be commanded to supply a specified current between 3.75 and 23.25 mA

Pulse Output Test

Transmitter may be commanded to supply a specified frequency between 1 and 1000 Hz

Turn-on Time

30 minutes to rated accuracy from power up, 5 seconds from power interruption

Start-up Time

0.2 seconds from zero flow

Low Flow Cutoff

Adjustable between 0.01 and 38.37 ft/s (0.003 and 11.7 m/s). Below selected value, output is driven to the zero flow rate signal level.

Overrange Capability

Signal output will remain linear until 110% of upper range value. The signal output will remain constant above these values. Out of range message displayed on LOI and the HART Communicator.

Damping

Adjustable between 0.2 and 256 seconds

Sensor Compensation

Rosemount sensors are flow-calibrated and assigned a calibration factor at the factory. The calibration factor is entered into the transmitter, enabling interchangeability of sensors without calculations or a compromise in accuracy.

(1) PZR is internally powered on the 8712H transmitter.

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Rosemount 8700 Series

Performance Specifications

(System specifications are given using the frequency output and with the unit at referenced conditions.)

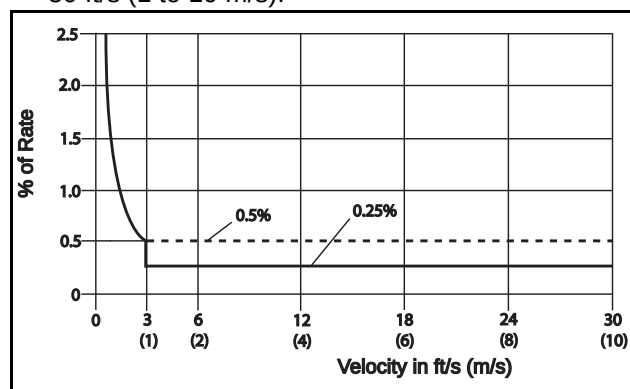
Accuracy

Includes the combined effects of linearity, hysteresis, repeatability, and calibration uncertainty.

Rosemount High Signal Flowmeter System

System accuracy is $\pm 0.5\%$ of rate from 3 to 30 ft/s (1 to 10 m/s); between 0.04 and 3.0 ft/s (0.01 and 0.3 m/s), the system has an accuracy of ± 0.015 ft/s (0.005 m/s).

Optional high accuracy is $\pm 0.25\%$ of rate from 3 to 30 ft/s (1 to 10 m/s).



Analog Output Effect

Analog output has the same accuracy as frequency output plus an additional 0.1% of span.

Vibration Effect

$\pm 0.1\%$ of span per SAMA PMC 31.1, Level 2

Repeatability

$\pm 0.1\%$ of reading

Response Time

0.2 seconds maximum response to step change in input

Stability

$\pm 0.1\%$ of rate over six months

Ambient Temperature Effect

$\pm 1\%$ per 100 °F (37.8 °C)

EMC Compliance

EN61326-1: 2006 (Industrial) electromagnetic compatibility (EMC) for process and laboratory apparatus.

Physical Specifications

Materials of Construction

Housing

Low-copper aluminum, Type 4X and IEC 60529 IP66

Paint

Polyurethane

Cover Gasket

Rubber

Electrical Connections

Four $\frac{1}{2}$ -14 NPT connections provided on the base of the transmitter. Screw terminals provided for all of the connections. Power wiring connected to the transmitter only. Remote mounted transmitters require only a single conduit connection to the sensor.

Line Power Fuses

115 V ac systems

5 amp, Quick-acting Bussman AGCI or equivalent.

Transmitter Weight

Transmitter approximately 9 lb (4 kg). Add 1 lb (0.5 kg) for local operator interface.

Rosemount 8700 Series



Rosemount Flanged Sensor Specifications

Functional Specifications

Service

Conductive liquids and slurries

Line Sizes

1/2–36 in. (15–900 mm) for Rosemount 8705

3–36 in. (80–600 mm) for Rosemount 8707

Interchangeability

Rosemount 8705 Sensors are interchangeable with 8732, and 8712E Transmitters. Rosemount 8707 High-Signal Sensors are interchangeable with 8732, 8712E, and 8712H High-Signal Transmitters. System accuracy is maintained regardless of line size or optional features. Each sensor nameplate has a sixteen-digit calibration number that can be entered into a transmitter through the Local Operator Interface (LOI) or the HART Communicator. In a FOUNDATION fieldbus environment, the 8732E can be configured using the DeltaV™ fieldbus configuration tool or another FOUNDATION fieldbus configuration device. No further calibration is necessary.

Upper Range Limit

39 ft/s (12 m/s)

Process Temperature Limits

PTFE Lining

–20 to 350 °F (–29 to 177 °C)

ETFE Lining

–20 to 300 °F (–29 to 149 °C)

PFA Lining

–20 to 350 °F (–29 to 177 °C)

Polyurethane Lining

0 to 140 °F (–18 to 60 °C)

Neoprene Lining

0 to 176 °F (–18 to 80 °C)

Linatex Lining

0 to 158 °F (–18 to 70 °C)

Ambient Temperature Limits

–30 to 150 °F (–34 to 65 °C)

Pressure Limits

See Table 22 and Table 24

Vacuum Limits

PTFE Lining

Full vacuum to 350 °F (177 °C) through 4-in. (100 mm) line sizes. Consult factory for vacuum applications with line sizes of 6 inches (150 mm) or larger.

All Other Standard Sensor Lining Materials

Full vacuum to maximum material temperature limits for all available line sizes.

Submergence Protection⁽¹⁾

IP68. Continuous submergence to 30 ft. (10 m). Requires conduit entries of the sensor remote junction box be properly sealed to prevent water ingress. This requires the user to install sealed IP68 approved cable glands, conduit connections, or conduit plugs. For more details on proper installation techniques for an IP68 / submersible application, reference Rosemount Technical Document 00840-0100-4750 available on www.Rosemount.com.

(1) Available for Rosemount 8705 Sensors only.

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Rosemount 8700 Series

Conductivity Limits

Process liquid must have a conductivity of 5 microsiemens/cm (5 micromhos/cm) or greater for 8705. Process liquid must have a conductivity of 50 microsiemens/cm (50 micromhos/cm) for 8707 when used with 8712H, 5 microsiemens/cm when used with other transmitters. Excludes the effect of interconnecting cable length in remote mount transmitter installations.

Table 22. Temperature vs. Pressure Limits⁽¹⁾

Sensor Temperature vs. Pressure Limits for ASME B16.5 Class Flanges (¹ / ₂ - to 36-in. line sizes) ⁽²⁾					
Flange Material	Flange Rating	Pressure			
		@ -20 to 100 °F (-29 to 38 °C)	@ 200 °F (93 °C)	@ 300 °F (149 °C)	@ 350 °F (177 °C)
Carbon Steel	Class 150	285 psi	260 psi	230 psi	215 psi
	Class 300	740 psi	675 psi	655 psi	645 psi
	Class 600 ⁽³⁾	1000 psi	800 psi	700 psi	650 psi
	Class 600 ⁽⁴⁾	1480 psi	1350 psi	1315 psi	1292 psi
	Class 900	2220 psi	2025 psi	1970 psi	1935 psi
	Class 1500	3705 psi	3375 psi	3280 psi	3225 psi
304 Stainless Steel	Class 2500	6170 psi	5625 psi	5470 psi	5375 psi
	Class 150	275 psi	235 psi	205 psi	190 psi
	Class 300	720 psi	600 psi	530 psi	500 psi
	Class 600 ⁽⁵⁾	1000 psi	800 psi	700 psi	650 psi
	Class 600 ⁽⁶⁾	1440 psi	1200 psi	1055 psi	997 psi
	Class 900	2160 psi	1800 psi	1585 psi	1497 psi
	Class 1500	3600 psi	3000 psi	2640 psi	2495 psi
	Class 2500	6000 psi	5000 psi	4400 psi	4160 psi

(1) Liner temperature limits must also be considered. Polyurethane, Linatex, and Neoprene have temperature limits of 140 °F (60 °C), 158 °F (70 °C), and 176 °F (80 °C), respectively.

(2) 30- and 36-in. AWWA C207 Table 23 Class D rated to 150 psi at atmospheric temperature.

(3) Option Code C6

(4) Option Code C7

(5) Option Code S6

(6) Option Code S7

Table 23. Temperature vs. Pressure Limits ⁽¹⁾

Sensor Temperature vs. Pressure Limits for AS2129 Table D and E Flanges (4- to 24-in. line sizes)					
Flange Material	Flange Rating	Pressure			
		@ -200 to 50 °C (-320 to 122 °F)	@ 100 °C (212 °F)	@ 150 °C (302 °F)	@ 200 °C (392 °F)
Carbon Steel	D	101.6 psi	101.6 psi	101.6 psi	94.3 psi
	E	203.1 psi	203.1 psi	203.1 psi	188.6 psi

(1) Liner temperature limits must also be considered. Polyurethane, Linatex, and Neoprene have temperature limits of 140 °F (60 °C), 158 °F (70 °C), and 176 °F (80 °C), respectively.

Table 24. Temperature vs. Pressure Limits ⁽¹⁾

Sensor Temperature vs. Pressure Limits for DIN Flanges (15 to 600 mm line sizes)					
Flange Material	Flange Rating	Pressure			
		@ -196 to 50 °C (-320 to 122 °F)	@ 100 °C (212 °F)	@ 150 °C (302 °F)	@ 175 °C (347 °F)
Carbon Steel	PN 10	10 bar	10 bar	9.7 bar	9.5 bar
	PN 16	16 bar	16 bar	15.6 bar	15.3 bar
	PN 25	25 bar	25 bar	24.4 bar	24.0 bar
	PN 40	40 bar	40 bar	39.1 bar	38.5 bar

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Table 24. Temperature vs. Pressure Limits ⁽¹⁾

Sensor Temperature vs. Pressure Limits for DIN Flanges (15 to 600 mm line sizes)					
Flange Material	Flange Rating	Pressure			
		@ -196 to 50 °C (-320 to 122 °F)	@ 100 °C (212 °F)	@ 150°C (302 °F)	@ 175°C (347 °F)
304 Stainless Steel	PN 10	9.1 bar	7.5 bar	6.8 bar	6.5 bar
	PN 16	14.7 bar	12.1 bar	11.0 bar	10.6 bar
	PN 25	23 bar	18.9 bar	17.2 bar	16.6 bar
	PN 40	36.8 bar	30.3 bar	27.5 bar	26.5 bar

(1) Liner temperature limits must also be considered. Polyurethane, Linatex, and Neoprene have temperature limits of 140°F, 158°F, and 176°F, respectively.

Physical Specifications

Non-Wetted Materials

Sensor

AISI Type 304 SST or Type 316L SST

Flanges

Carbon steel, AISI Type 304/304L SST, or Type 316/316L SST

Housing

Welded steel

Paint

Polyurethane

Process Wetted Materials

Lining

PFA, PTFE, ETFE, polyurethane, neoprene, Linatex

Electrodes

316L SST, Nickel Alloy 276 (UNS N10276), tantalum, 80% platinum-20% iridium, titanium

Process Connections

ASME B16.5 (ANSI) Class 150, Class 300, Class 600, Class 900, Class 1500, or Class 2500

0.5- to 36-in. (Class 150)

0.5- to 30-in. (Class 300)

0.5- to 24-in. (Class 600)⁽¹⁾

1- to 12-in. (Class 900)⁽²⁾

1.5- to 12-in. (Class 1500)⁽²⁾

2- to 12-in. (Class 2500)⁽²⁾

AWWA C207 Table 3 Class D

30 and 36 in.

EN 1092 (DIN) PN 10, 16, 25, and 40

PN10: Not available for flange sizes from 15 to 150 mm

PN16: Not available for flange sizes from 15 to 80 mm

PN 25: Not available for flange sizes from 15 to 150 mm

PN40: Available for all flange sizes

AS 2129 Table D and E

0.5 to 36 in.

Electrical Connections

Two 1/2–14 NPT connections with number 8 screw terminals are provided in the terminal enclosure for electrical wiring.

(1) For PTFE and ETFE, maximum working pressure is derated to 1000 psig.

(2) For Class 900 and higher flange ratings, liner selection is limited to resilient liners.

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Grounding Electrode

An optional grounding electrode can be installed similarly to the measurement electrodes through the sensor lining on 8705 sensors. It is available in all electrode materials.

Grounding Rings

Optional grounding rings can be installed between the flange and the sensor face on both ends of the sensor. Single ground rings can be installed on either end of the sensor. They have an I.D. slightly larger than the sensor I.D. and an external tab to attach ground wiring. Grounding rings are available in 316L SST, Nickel Alloy 276 (UNS N10276), titanium, and tantalum.

Lining Protectors

Optional lining protectors can be installed between the flange and the sensor face on both ends of the sensor. The leading edge of lining material is protected by the lining protector; lining protectors cannot be removed once they are installed. Lining protectors are available in 316L SST, Nickel Alloy 276 (UNS N10276), and titanium.

Dimensions

See Figure 18.

Weight

See dimensional tables starting with Table 33 on page 62.



Rosemount 8711 Wafer Sensor Specifications

SPECIFICATIONS

Functional Specifications

Service

Conductive liquids and slurries

Line Sizes

0.15 in. through 8 in. (4 through 200 mm)

Interchangeability

Rosemount 8711 Sensors are interchangeable with 8732 and 8712E Transmitters. System accuracy is maintained regardless of line size or optional features. Each sensor nameplate has a sixteen-digit calibration number that can be entered into a transmitter through the Local Operator Interface (LOI) or the HART Communicator. In a digital fieldbus environment, the 8732E can be configured using any compatible digital fieldbus configuration tool. No further calibration is necessary.

Upper Range Limit

39 ft/s (12 m/s)

Process Temperature Limits

ETFE Lining

-20 to 300 °F (-29 to 149 °C) for 0.5- through 8-in. (15–200 mm) line sizes

PTFE Lining

-20 to 350 °F (-29 to 177 °C)

PFA Lining

-20 to 200 °F (-29 to 93 °C)

Ambient Temperature Limits

-30 to 150 °F (-34 to 65 °C)

Maximum Safe Working Pressure at 100 °F (38 °C)

ETFE Lining

Full vacuum to 740 psi (5.1 MPa) for 0.5- through 8-in. (15 through 200 mm) sensors

PTFE Lining

Full vacuum through 4-in. (100 mm) line sizes. Consult factory for vacuum applications with line sizes of 6 inches (150 mm) or larger.

PFA Lining

Full vacuum to 285 psi (1.96 MPa) for 0.15- and 0.30-in. (4 and 8 mm) sensors

Conductivity Limits

Process liquid must have a conductivity of 5 microsiemens/cm (5 micromhos/cm) or greater for 8711. Excludes the effect of interconnecting cable length in remote mount transmitter installations.

Physical Specifications

Non-Wetted Materials

Sensor

303 SST (ASTM A582)
CF3M or CF8M (ASTM A351)

Coil Housing

Investment cast steel (ASTM A-27)
ASTM A732 (cast), A519, A513, A53 (pipe),
A569, A570 (sheet)

Paint

Polyurethane

Process-Wetted Materials

Lining

ETFE, PTFE and PFA

Electrodes

316L SST, Nickel Alloy 276 (UNS N10276),
tantalum,
80% platinum—20% iridium, titanium

Process Connections

Mounts between these Flange Configurations

ASME B16.5 (ANSI): Class 150, 300

EN 1092 (DIN): PN 10 and 25

BS: 10 Table D, E, and F

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Rosemount 8700 Series

Studs, Nuts, and Washers⁽¹⁾

ASME B16.5 (ANSI)

0.15- through 1-in. (4 through 25 mm):
316 SST, ASTM A193, Grade B8M, Class 1 threaded mounting studs; ASTM A194, Grade 8M heavy hex nuts; SAE per ANSI B18.2.1, Type A, Series N flat washers.

1.5- through 8-in. (40 through 200 mm):
CS, ASTM A193, Grade B7, Class 1 threaded mounting studs; ASTM A194, Grade 2H heavy hex nuts; SAE per ANSI B18.2.1, Type A, Series N flat washers; all items clear, chromate zinc-plated.

EN 1092 (DIN)

4 through 25 mm (0.15- through 1-in.):
316 SST ASTM A193, Grade B8M Class 1 threaded mounting studs; ASTM A194, Grade 8M, DIN 934 H=D, metric heavy hex nuts; 316 SST, A4, DIN 125 flat washers.

40 through 200 mm (1.5- through 8-in.):
CS, ASTM A193, Grade B7 threaded mounting studs; ASTM A194, Grade 2H, DIN 934 H=D, metric heavy hex nuts; CS, DIN 125 flat washers; all items yellow zinc-plated.

Dimensions and Weight

See Figure 17-Figure and Table 25.

Electrical Connections

Two 1/2–14 NPT connections with number 8 screw terminals are provided in the terminal enclosure for electrical wiring.

Grounding Electrode

An optional grounding electrode can be installed similarly to the measurement electrodes through the sensor lining. It is available in all electrode materials.

Grounding Rings

Optional grounding rings can be installed between the flange and the sensor face on both ends of the sensor. They have an I.D. slightly smaller than the sensor I.D. and an external tab to attach ground wiring. Grounding rings are available in 316L SST, Nickel Alloy 276 (UNS N10276), titanium, and tantalum.

(1) 0.15 and 0.30 in. (4 and 80 mm) sensors mount between 1/2-in. flange.

Rosemount 8700 Series



Rosemount 8721 Sanitary Sensor Specifications

Functional Specifications

Service

Conductive liquids and slurries

Line Sizes

$\frac{1}{2}$ - 4 in. (15–100 mm)

Sensor Compatibility and Interchangeability

The Rosemount 8721 Sensors are interchangeable with Rosemount 8732 and 8712E transmitters. System accuracy is maintained regardless of line size or optional features.

Each sensor nameplate has a sixteen-digit calibration number that can be entered into the transmitter through the Local Operator Interface (LOI) or the HART Communicator. In a digital fieldbus environment, the 8732E can be configured using compatible digital fieldbus configuration tool. No further calibration is necessary.

Conductivity Limits

Process liquid must have a conductivity of 5 microsiemens/cm (5 micromhos/cm) or greater. Excludes the effect of interconnecting cable length in remote mount transmitter installations.

Sensor Coil Resistance

5 Ω to 10 Ω (line size dependent)

Flow Rate Range

Capable of processing signals from fluids that are traveling between 0.04 and 39 ft/s (0.01 to 12 m/s) for both forward and reverse flow in all sensor sizes. Full scale continuously adjustable between –39 and 39 ft/s (–12 to 12 m/s).

Sensor Ambient Temperature Limits

14 to 140 °F (–15 to 60 °C)

Process Temperature Limits

PFA Lining

–20 to 350 °F (–29 to 177 °C)

Pressure Limits

Line Size	Max Working Pressure	CE Mark Max. Working Pressure
$\frac{1}{2}$ (15)	300 psi (20.7 bar)	300 psi (20.7 bar)
1 (25)	300 psi (20.7 bar)	300 psi (20.7 bar)
$1\frac{1}{2}$ (40)	300 psi (20.7 bar)	300 psi (20.7 bar)
2 (50)	300 psi (20.7 bar)	300 psi (20.7 bar)
$2\frac{1}{2}$ (65)	300 psi (20.7 bar)	240 psi (16.5 bar)
3 (80)	300 psi (20.7 bar)	198 psi (13.7 bar)
4 (100)	210 psi (14.5 bar)	148 psi (10.2 bar)

Vacuum Limits

Full vacuum at maximum lining material temperature; consult factory.

Submergence Protection (Sensor)

IP68. Continuous submergence to 30 ft. (10 m). Requires conduit entries of the sensor remote junction box be properly sealed to prevent water ingress. This requires the use of sealed IP68 approved cable glands, conduit connections, or conduit plugs. For more details on proper installation techniques for an IP 68/submersible application, reference Rosemount Technical Document 00840-0100-4750 available on www.Rosemount.com.

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Rosemount 8700 Series

Physical Specifications

Mounting

Integrally mounted transmitters are factory-wired and do not require interconnecting cables. The transmitter can rotate in 90° increments. Remote mounted transmitters require only a single conduit connection to the sensor.

Non-Wetted Materials

Sensor

304 Stainless Steel (wrapper), 304 Stainless Steel (pipe)

Terminal Junction Box

Cast aluminum, polyurethane coated
Optional: 304 Stainless Steel

Paint

Polyurethane

Weight

Table 25. 8721 Sensor Weight

Line Size	Sensor Only	008721-0350 Tri-Clamp fitting (each)
0.5	4.84 lbs (2.20 kg)	0.58 lbs (0.263 kg)
1.0	4.52 lbs (2.05 kg)	0.68 lbs (0.309 kg)
1.5	5.52 lbs (2.51 kg)	0.88 lbs (0.400 kg)
2.0	6.78 lbs (3.08 kg)	1.30 lbs (0.591 kg)
2.5	8.79 lbs (4.00 kg)	1.66 lbs (0.727 kg)
3.0	13.26 lbs (6.03 kg)	2.22 lbs (1.01 kg)
4.0	21.04 lbs (9.56 kg)	3.28 lbs (1.49 kg)

Aluminum remote junction box

Approximately 1 pound (0.45 kg)

SST remote junction box

Approximately 2.5 pounds (1.13 kg)

Process Wetted Materials (Sensor)

Liner

PFA with Ra < 32μinch (0.81 μm)

Electrodes

316L SST with Ra < 15 μ in. (0.38 μm)

Nickel Alloy 276 (UNS N10276) with Ra < 15 μ in. (0.38 μm)

80% Platinum-20% Iridium with Ra < 15 μ in. (0.38 μm)

Process Connections

The Rosemount 8721 Sanitary Sensor is designed using a standard IDF fitting as the basis for providing a flexible, hygienic interface for a variety of process connections. The Rosemount 8721 Sensor has the threaded or “male” end of the IDF fitting on the ends of the base sensor. The sensor can be directly connected with user supplied IDF fittings and gaskets. If other process connections are needed, the IDF fittings and gaskets can be provided and welded directly into the sanitary process tubing, or can be supplied with adapters to standard Tri-Clamp® process connections. All connections are PED compliant for group 2 fluids.

Tri-Clamp® Sanitary Coupling

IDF Sanitary Coupling (screw type)

IDF specification per BS4825 part 4

ANSI Weld Nipple

DIN 11850 Weld Nipple

DIN 11851 (Imperial and Metric)

DIN 11864-1 form A

DIN 11864-2 form A

SMS 1145

Cherry-Burrell I-Line

Process Connection Material

316L Stainless Steel with Ra < 32μinch (0.81μm)

Optional Electropolished Surface Finish with Ra < 15μ in. (0.38μ m)

Process Connection Gasket Material

Silicone

EPDM

Viton

Electrical Connections

Two 1/2–14 NPT connections with number 8 screw terminals are provided in the terminal enclosure for electrical wiring.

Sensor Dimensions

Refer to Figure 17.

Product Certifications

Approved Manufacturing Locations

Rosemount Inc. — Eden Prairie, Minnesota, USA

Fisher-Rosemount Tecnologías de Flujo, S.A. de C.V. —
Chihuahua Mexico

Emerson Process Management Flow — Ede, The Netherlands

Asia Flow Technologies Center — Nanjing, China

EUROPEAN DIRECTIVE INFORMATION

The EC declaration of conformity for all applicable European directives for this product can be found on our website at www.rosemount.com. A hard copy may be obtained by contacting your local sales office.

ATEX Directive

Rosemount Inc. complies with the ATEX Directive.

Type n protection type in accordance with EN50 021



- Closing of entries in the device must be carried out using the appropriate EEx e or EEx n metal cable gland and metal blanking plug or any appropriate ATEX approved cable gland and blanking plug with IP66 rating certified by an EU approved certification body.

For Rosemount 8732E transmitters:

Complies with Essential Health and Safety Requirements:

EN 60079-0: 2006

EN 60079-1: 2007

EN 60079-7: 2007

EN 60079-11: 2007

EN 60079-15: 2005

EN 61241-0: 2004

EN 61241-1: 2006

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

Rosemount 8705 and 8707 Magnetic Flowmeter sensors in line size and flange combinations:

Line Size: 1½ in. - 24 in. with all DIN flanges and ANSI 150 and ANSI 300 flanges. Also available with ANSI 600 flanges in limited line sizes.

Line Size: 30 in. - 36 in. with AWWA 125 flanges
QS Certificate of Assessment - EC No. PED-H-100
Module H Conformity Assessment

Rosemount 8711 Magnetic Flowmeter Sensors

Line Sizes: 1.5, 2, 3, 4, 6, and 8 in.

QS Certificate of Assessment - EC No. PED-H-100
Module H Conformity Assessment

Rosemount 8721 Sanitary Magmeter Sensors

in line sizes of 1½ in. and larger:

Module A Conformity Assessment

All other Rosemount 8705/8707/8711/8721

Sensors —

in line sizes of 1 in. and less:

Sound Engineering Practice

Sensors that are SEP are outside the scope of PED and cannot be marked for compliance with PED.

Mandatory CE-marking for sensors in accordance with Article 15 of the PED can be found on the sensor body (CE 0575).

Sensor category I is assessed for conformity per module A procedures.

Sensor categories II – IV, use module H for conformity assessment procedures.

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

Model 8732E, 8712E, and 8712D EN 61326: 2006

Installed signal wiring should not be run together and should not be in the same cable tray as AC power wiring.

Device must be properly grounded or earthed according to local electric codes.

Rosemount combination cable model number 08712-0752-0001 (ft) or 08712-0752-0003 (m) is required to be used to meet EMC requirements.

Low Voltage Directive (2006/95/EC)

Model 8732E, 8712E, and 8712D - EN 61010 -1: 2001

Other important guidelines

Only use new, original parts.

To prevent the process medium escaping, do not unscrew or remove process flange bolts, adapter bolts or bleed screws during operation.

Maintenance shall only be done by qualified personnel.

CE Marking

Compliance with all applicable European Union Directives. (Note: CE Marking is not available on Rosemount 8712H).

IECEx Certificates

C-Tick Marking

Rosemount Inc. complies with the following IEC Requirements.

For Rosemount 8732E transmitters:

IEC 60079-0: 2004

IEC 60079-0: 2007

IEC 60079-1: 2007

IEC 60079-11: 2006

IEC 60079-15: 2005

IEC 60079-7: 2006

IEC 61241-0: 2004

IEC 61241-1: 2004

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Rosemount 8700 Series

HAZARDOUS LOCATIONS PRODUCT APPROVALS OFFERING

The Rosemount 8700 Series Magnetic Flowmeters offer many different hazardous locations certifications. The table below provides an overview of the available hazardous area approval options. Equivalent hazardous locations certifications for sensor and transmitter must match in integrally mounted magnetic flowmeter systems. Remote mounted magnetic flowmeter systems do not require matched hazardous location certifications. For complete information about the hazardous area approval codes listed, see Hazardous Location Certifications starting on page 52.

Table 26. Factory Mutual (FM) Approvals Offering

	Transmitter	8732E			8712E ⁽¹⁾			8712H ⁽¹⁾
	Sensor	8705	8707	8711	8705	8707	8711	8707
Hazardous Area Approval Code								
Non-Classified Locations								
Transmitter		NA	NA	NA	NA	NA	NA	N0
Sensor		NA	N0	NA	NA	N0	NA	N0
Suitable for Class I, Division 1								
Explosion-Proof								
Trans: Groups C, D T6		E5 ⁽²⁾	-	E5	-	-	-	-
Sensor: Groups C, D T6		E5 ⁽²⁾	-	E5	-	-	-	-
Explosion-Proof with Intrinsically Safe Output								
Trans: Groups C, D T6		E5 ⁽²⁾⁽³⁾	-	E5 ⁽³⁾	-	-	-	-
Sensor: Groups C, D T6		E5 ⁽²⁾	-	E5	-	-	-	-
Suitable for Class I, Division 2								
Non-Flammable Fluids								
Trans: Groups A,B,C,D T4		N0	N0	N0	N0	N0	N0	N0
Sensor: Groups A,B,C,D T5		N0	N0 ⁽⁴⁾	N0	N0	N0 ⁽⁴⁾	N0	N0 ⁽⁴⁾
Flammable Fluids								
Trans: Groups A,B,C,D T4		N5	N5	N5	N5	N5	N5	N5
Sensor: Groups A,B,C,D T5		N5	N5 ⁽⁴⁾	N5	N5	N5 ⁽⁴⁾	N5	N5 ⁽⁴⁾
Non-Flammable Fluids with Intrinsically Safe Output								
Trans: Groups A,B,C,D T4		N0 ⁽³⁾	N0 ⁽³⁾	N0 ⁽³⁾	-	-	-	-
Sensor: Groups A,B,C,D T5		N0	N0 ⁽⁴⁾	N0	-	-	-	-
Other Certifications		Product Certification Code⁽⁵⁾						
Canadian Registration Number (CRN)		CR	CR	Standard	CR	CR	Standard	CR
European Pressure Equipment Directive (PED)		PD	-	PD	PD	-	PD	-
NSF 61 Drinking Water ⁽⁶⁾		DW	-	DW	DW	-	DW	-

(1) Remote Transmitter Only

(2) Available in line sizes 0.5 in. to 8 in. (15 mm to 200 mm) only

(3) For I.S. Output, Output Code B or F must be ordered

(4) 8707 Sensor has Temp Code - T3C

(5) Product Certification Codes are added to the Sensor model number only

(6) Only available with PTFE or Polyurethane Lining Material and 316L SST Electrodes

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Table 27. Canadian Standards Association (CSA) Approvals Offering

	Transmitter	8732E			8712E ⁽¹⁾			8712H ⁽¹⁾
	Sensor	8705	8707	8711	8705	8707	8711	8707
Hazardous Area Approval Code								
Non-Classified Locations								
Transmitter		NA	-	NA	NA	-	NA	-
Sensor		NA	-	NA	NA	-	NA	-
Suitable for Class I, Division 2								
Non-Flammable Fluids								
Trans: Groups A,B,C,D T4		N0	N0	N0	N0	N0	N0	N0
Sensor: Groups A,B,C,D T5		N0	N0 ⁽²⁾	N0	N0	N0 ⁽²⁾	N0	N0 ⁽²⁾
Other Certifications		Product Certification Code⁽³⁾						
Canadian Registration Number (CRN)		CR	CR	Standard	CR	CR	Standard	CR
European Pressure Equipment Directive (PED)		PD	-	PD	PD	-	PD	-
NSF 61 Drinking Water ⁽⁴⁾		DW	-	DW	DW	-	DW	-

(1) Remote Transmitter Only

(2) 8707 Sensor has Temp Code - T3C

(3) Product Certification Codes are added to the Sensor model number only

(4) Only available with PTFE or Polyurethane Lining Material and 316L SST Electrodes

Table 28. ATEX Approvals Offering

	Transmitter	8732E		8712E ⁽¹⁾	
	Sensor	8705	8711	8705	8711
Hazardous Area Approval Code					
Non-Hazardous					
Trans: LVD and EMC		NA	NA	NA	NA
Sensor: LVD and EMC		NA	NA	NA	NA
Equipment Category 2					
Gas Group IIB					
Trans: Ex d IIB T6		ED	ED	-	-
Sensor: Ex e ia IIC T3...T6		KD ⁽²⁾	KD ⁽²⁾	-	-
Gas Group IIC					
Trans: Ex d IIC T6		E1	E1	-	-
Sensor: Ex e ia IIC T3...T6		E1	E1	-	-
Gas Group IIB with Intrinsically Safe Output					
Trans: Ex de [ia] IIB T6		ED ⁽³⁾	ED ⁽³⁾	-	-
Sensor: Ex e ia IIC T3...T6		KD ⁽²⁾	KD ⁽²⁾	-	-
Gas Group IIC with Intrinsically Safe Output					
Trans: Ex de [ia] IIC T6		E1 ⁽³⁾	E1 ⁽³⁾	-	-
Sensor: Ex e ia IIC T3...T6		E1	E1	-	-
Equipment Category 3					
Gas Group IIC					
Trans: Ex nA nL IIC T4		N1	N1	N1	N1
Sensor: Ex nA [L] IIC T3...T6		N1	N1	N1	N1
Equipment Category 1 - Dust Environment					
Dust Environment Only					
Trans: Dust Ignition Proof		ND	ND	-	-
Sensor: Dust Ignition Proof		ND	ND	-	-

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Rosemount 8700 Series

Table 28. ATEX Approvals Offering

Other Certifications	Product Certification Code ⁽⁴⁾			
Canadian Registration Number (CRN)	CR	Standard	CR	Standard
European Pressure Equipment Directive (PED)	PD	PD	PD	PD
NSF 61 Drinking Water ⁽⁵⁾	DW	DW	DW	DW

(1) Remote Transmitter Only

(2) With integral mount transmitter, approval is valid for Gas Group IIB

(3) For I.S. Output, Output Code B or F must be ordered

(4) Product Certification Codes are added to the Sensor model number only

(5) Only available with PTFE or Polyurethane Lining Material and 316L SST Electrodes

Table 29. IECEx Approvals Offering

	Transmitter	8732E ⁽¹⁾		8712E	
	Sensor	8705	8711	8705	8711
Hazardous Area Approval Code					
Non-Hazardous					
Trans: Low Voltage and EMC		NA	NA	NA	NA
Sensor: Low Voltage and EMC		NA	NA	NA	NA
Suitable for Zone 1					
Gas Group IIB					
Trans: Ex d IIB T6		EF	EF		
Gas Group IIC					
Trans: Ex d IIC T6		E7	E7		
Gas Group IIB with Intrinsically Safe Output					
Trans: Ex de [ia] IIB T6		EF ⁽²⁾	EF ⁽³⁾		
Gas Group IIC with Intrinsically Safe Output					
Trans: Ex de [ia] IIC T6		E1 ⁽³⁾	E1 ⁽³⁾		
Suitable for Zone 2					
Gas Group IIC					
Trans: Ex nA nL IIC T4		N7	N7	N7	N7
Suitable for Zone 20					
Dust Environment Only					
Trans: Dust Ignition Proof		NF	NF		
Other Certifications	Product Certification Code ⁽³⁾		Product Certification Code ⁽⁴⁾		
Canadian Registration Number (CRN)	CR	Standard	CR	Standard	
European Pressure Equipment Directive (PED)	PD	PD	PD	PD	
NSF 61 Drinking Water ⁽⁵⁾	DW	DW	DW	DW	

(1) Available in remote mount configuration only. Requires equivalent ATEX approval on the sensor

(2) For I.S. Output, Output Code B or F must be ordered

(3) Product Certification Codes are added to the Sensor model number only

(4) Product Certification Codes are added to the Sensor model number only

(5) Only available with PTFE or Polyurethane Lining Material and 316L SST Electrodes

HAZARDOUS LOCATION CERTIFICATIONS

Equivalent Hazardous Location Certifications for sensor and transmitter must match in integrally-mounted magnetic flowmeter systems. Remote-mounted systems do not require matched hazardous location certification option codes.

North American Certifications Factory Mutual (FM)

NOTE

For intrinsically safe (IS) outputs on the 8732E output option code B, F or P must be selected.

IS outputs for Class I, Division 1, Groups A, B, C, D.

Temp Code – T4 at 60°C

NOTE

For the 8732E transmitters with a local operator interface (LOI), the lower ambient temperature limit is -20 °C.

N0 Division 2 Approval (All transmitters)

Reference Rosemount Control Drawing 08732-1052 (8732E).

Class I, Division 2, Groups A, B, C, D

Temp Codes – T4 (8712 at 40°C),

T4 (8732 at 60°C: -50 °C ≤ Ta ≤ 60 °C)

Dust-ignition proof Class II/III, Division 1, Groups E, F, G

Temp Codes – T4 (8712 at 40°C), T5 (8732 at 60°C), T6

Enclosure Type 4X

N5 Division 2 Approval (All Transmitters) For sensors with IS electrodes only

Reference Rosemount Control Drawing 08732-1052 (8732E).

Class I, Division 2, Groups A, B, C, D

Temp Codes – T4 (8712 at 40°C)

T4 (8732 at 60°C: -50 °C ≤ Ta ≤ 60 °C)

Dust-ignition proof Class II/III, Division 1, Groups E, F, G

Temp Codes – T4 (8712 at 40°C), T5 (8732 at 60°C),

Enclosure Type 4X

E5 Explosion-Proof Approval (8732 only)

Reference Rosemount Control Drawing 08732-1052

Explosion-Proof for Class I, Division 1, Groups C, D

Temp Code – T6 at 60°C

Dust-ignition proof Class II/III, Division 1, Groups E, F, G

Temp Code – T5 at 60°C

Class I, Division 2, Groups A, B, C, D

Temp Codes – T4 at 60°C

Enclosure Type 4X

Canadian Standards Association (CSA)

NOTE

For intrinsically safe (IS) outputs on the 8732E output option code B, F or P must be selected.

IS outputs for Class I, Division 1, Groups A, B, C, D.

Temp Code – T4 at 60°C

N0 Division 2 Approval

Reference Rosemount Control Drawing 08732-1051 (8732E only)

Class I, Division 2, Groups A, B, C, D

Temp Codes – T4 (8732 at 60°C: -50 °C ≤ Ta ≤ 60 °C),

Dust-ignition proof Class II/III, Division 1, Groups E, F, G

Temp Codes – T4 (8712 at 40°C), T5 (8732 at 60°C)

Enclosure Type 4X

European Certifications

NOTE

For intrinsically safe (IS) outputs on the 8732E output option code B, F or P must be selected.

IS outputs for Ex de [ia] IIB or IIC T6

E1 ATEX Flameproof

8732 - Certificate No.: KEMA 07ATEX0073 X  II 2G

Ex de IIC or Ex de [ia] IIC T6 (-50°C ≤ Ta ≤ +60 °C)

with LOI (-20°C ≤ Ta ≤ +60 °C)

V_{max} = 250 V AC or 42 V DC

CE 0575

ED ATEX Flameproof

8732 - Certificate No.: KEMA 07ATEX0073 X  II 2G

Ex de IIB or Ex de [ia] IIB T6 (-50°C ≤ Ta ≤ +60 °C)

with LOI (-20°C ≤ Ta ≤ +60 °C)

V_{max} = 250 V AC or 42 V DC

CE 0575

ND ATEX Dust

8732 - Certificate No.: KEMA 06ATEX0006

Ex tD A20 IP66 T 100 °C  II 1D

With IS: [Ex ia] IIC Ex Symbol II⁽¹⁾G

Amb. Temp. Limits: (-20 °C ≤ Ta ≤ + 65 °C)

V_{max} = 250 V AC or 42 V DC

CE 0575

(1) Max surface temperature is 40 °C above the ambient temperature conditions. Tmax = 100 °C

Product Data Sheet

00813-0100-4727, Rev UB

April 2010

Rosemount 8700 Series

SPECIAL CONDITIONS FOR SAFE USE

(KEMA 07ATEX0073 X):

If the Rosemount 8732 Flow Transmitter is used integrally with the Rosemount 8705 or 8711 Sensors, it shall be assured that the mechanical contact areas of the Sensor and Flow Transmitter comply with the requirements for flat joints according to standard EN/IEC 60079-1 clause 5.2.

The relation between ambient temperature, process temperature, and temperature class is to be taken from the table under (15 - description) above. **(See Table 31)**

The electrical data is to be taken from the summary under (15 - electrical data) above. **(See Table 30)**

If the Rosemount 8732 Flow Transmitter is used integrally with the Junction Box, it shall be assured that the mechanical contact areas of the Junction Box and Flow Transmitter comply with the requirements for flanged joints. Contact Rosemount Inc. for requirements and dimensions of Flanged Joints.

INSTALLATION INSTRUCTIONS:

The cable and conduit entry devices and blanking elements shall be of a certified flameproof type, suitable for the conditions of use and correctly installed. With the use of conduit, a certified stopping box shall be provided immediately to the entrance of the enclosure.

INSTALLATION INSTRUCTIONS:

The cable and conduit entry devices and the closing elements shall be of a certified increased safety type, suitable for the conditions of use and correctly installed.

At ambient temperatures above 50°C, the flow meter shall be used with heat resistant cables with a temperature rating of at least 90°C.

A Junction Box in type of explosion protection increased safety "e" may be attached to the base of the Rosemount 8732E Flow Transmitter, permitting remote mounting of the Rosemount 8705 and 8711 Sensors.

The Junction Box is classified as II 2 G Ex e IIB T6 and certified under KEMA 07ATEX0073 X and KEMA 03ATEX2052X.

N1 ATEX Type n

8712E - ATEX Certificate No: BASEEFA 05ATEX0170X

EEx nA nL IIC T4 (Ta = -40 °C to + 60 °C)

V_{max} = 42 V DC

CE 0575

SPECIAL CONDITIONS FOR SAFE USE (X)

The apparatus is not capable of withstanding the 500V insulation test required by Clause 6.8.1 EN 60079-15: 2005. This must be taken into account when installing the apparatus.

8732 HART

ATEX Certificate No: BASEEFA 07ATEX0203X  II 3G

Ex nA nL IIC T4 (-50 °C ≤ Ta ≤ + 60 °C)

with LOI (-20 °C ≤ Ta ≤ + 60 °C)

V_{max} = 42 V DC

CE 0575

8732 digital fieldbus

ATEX Certificate No: BASEEFA 07ATEX0203X  II 3(1)G

Ex nA nL [ia] IIC T4 (-50 °C ≤ Ta ≤ + 60 °C)

with LOI (-20 °C ≤ Ta ≤ + 60 °C)

V_{max} = 42 V DC

CE 0575

SPECIAL CONDITIONS FOR SAFE USE (X)

The apparatus is not capable of withstanding the 500V insulation test required by Clause 6.8.1 of EN 60079-15: 2005. This must be taken into account when installing the apparatus.

International Certifications

IECEx

NOTE

For intrinsically safe (IS) outputs on the 8732E output option code B, F or P must be selected.

IS outputs for Ex [ia] or IIC

E7 IECEx Flameproof

8732 - Certificate No.: KEM 07.0038X

Ex de IIC T6 Gb or Ex de [ia Ga] IIC T6 Gb

(-50 °C ≤ Ta ≤ +60 °C)

with LOI (-20°C ≤ Ta ≤ +60 °C)

V_{max} = 250 V AC or 42 V DC

EF IECEx Flameproof

8732 - Certificate No.: KEM 07.0038X

Ex de IIB T6 Gb or Ex de [ia IIC Ga] IIB T6 Gb

(-50 °C ≤ Ta ≤ +60 °C)

with LOI (-20°C ≤ Ta ≤ +60 °C)

V_{max} = 250 V AC or 42 V DC

NF IECEx Dust

8732 - Certificate No.: KEM 07.0038X

Ex tD A20 IP66 T 100 °C or

with IS: [Ex ia Ga] IIC

T6 (-50 °C ≤ Ta ≤ +60 °C)

with LOI (-20°C ≤ Ta ≤ +60 °C)

V_{max} = 250 V AC or 42 V DC

Rosemount 8700 Series

SPECIAL CONDITIONS FOR SAFE USE (KEM 07.0038X):

If the Rosemount 8732 Flow Transmitter is used integrally with the Rosemount 8705 or 8711 Sensors, it shall be assured that the mechanical contact areas of the Sensor and Flow Transmitter comply with the requirements for flat joints according to standard EN/IEC 60079-1 clause 5.2.

The relation between ambient temperature, process temperature, and temperature class is to be taken from the table under (15 - description) above. **(See Table 31)**

The electrical data is to be taken from the summary under (15 - electrical data) above. **(See Table 30)**

If the Rosemount 8732 Flow Transmitter is used integrally with the Junction Box, it shall be assured that the mechanical contact areas of the Junction Box and Flow Transmitter comply with the requirements for flanged joints according to standard EN/IEC 60079-1 clause 5.2.

INSTALLATION INSTRUCTIONS:

The cable and conduit entry devices and blanking elements shall be of a certified flameproof type, suitable for the conditions of use and correctly installed. With the use of conduit, a certified stopping box shall be provided immediately to the entrance of the enclosure.

N7 IECEX Type n

8712E - Certificate No: IECEX BAS 07.0036X

Ex nA nL IIC T4 ($T_a = -40\text{ °C}$ to $+60\text{ °C}$)

$V_{\max} = 42\text{ V DC}$

SPECIAL CONDITIONS FOR SAFE USE (X)

The apparatus is not capable of withstanding the 500V insulation test required by Clause 6.8.1 of IEC 60079-15: 2005. This must be taken into account when installing the apparatus.

8732 HART

Certificate No: IECEX BAS 07.0062X

Ex nA nL IIC T4 ($-50\text{ °C} \leq T_a \leq +60\text{ °C}$)

with LOI ($-20\text{ °C} \leq T_a \leq +60\text{ °C}$)

$V_{\max} = 42\text{ V DC}$

8732 digital fieldbus

Certificate No: IECEX BAS 07.0062X

Ex nA nL [ia] IIC T4 ($-50\text{ °C} \leq T_a \leq +60\text{ °C}$)

with LOI ($-20\text{ °C} \leq T_a \leq +60\text{ °C}$)

$V_{\max} = 42\text{ V DC}$

SPECIAL CONDITIONS FOR SAFE USE (X)

The apparatus is not capable of withstanding the 500V insulation test required by Clause 6.8.1 of EN 60079-15: 2005. This must be taken into account when installing the apparatus.

NEPSI - China

NOTE

For intrinsically safe (IS) outputs on the 8732E output option code B, F or P must be selected.

IS outputs for Ex de [ia] IIB or IIC T6

E3 NEPSI Flameproof

8732 - Certificate No.: GYJ071438X

Ex de IIC or Ex de [ia] IIC T6 ($-50\text{ °C} \leq T_a \leq +60\text{ °C}$)

with LOI ($-20\text{ °C} \leq T_a \leq +60\text{ °C}$)

$V_{\max} = 250\text{ V AC}$ or 42 V DC

EP NEPSI Flameproof

8732 - Certificate No.: GYJ071438X

Ex de IIB or Ex de [ia] IIB T6 ($-50\text{ °C} \leq T_a \leq +60\text{ °C}$)

with LOI ($-20\text{ °C} \leq T_a \leq +60\text{ °C}$)

$V_{\max} = 250\text{ V AC}$ or 42 V DC

InMetro - Brazil

NOTE

For intrinsically safe (IS) outputs on the 8732E output option code B, F or P must be selected.

IS outputs for Ex de [ia] IIB or IIC T6

E2 InMetro Flameproof

8732 - Certificate No.: NCC 5030/08

BR-Ex de IIC or BR-Ex de [ia] IIC T6 ($-50\text{ °C} \leq T_a \leq +60\text{ °C}$)

with LOI ($-20\text{ °C} \leq T_a \leq +60\text{ °C}$)

$V_{\max} = 250\text{ V AC}$ or 42 V DC

EB InMetro Flameproof

8732 - Certificate No.: NCC 5030/08

BR-Ex de IIB or BR-Ex de [ia] IIB T6 ($-50\text{ °C} \leq T_a \leq +60\text{ °C}$)

with LOI ($-20\text{ °C} \leq T_a \leq +60\text{ °C}$)

$V_{\max} = 250\text{ V AC}$ or 42 V DC

KOSHA - Korea

NOTE

For intrinsically safe (IS) outputs on the 8732E output option code B, F or P must be selected.

IS outputs for Ex de [ia] IIB or IIC T6

E9 KOSHA Flameproof

8732 - Certificate No.: 2008-2094-Q1X

Ex de IIC or Ex de [ia] IIC T6 ($-50\text{ °C} \leq T_a \leq +60\text{ °C}$)

with LOI ($-20\text{ °C} \leq T_a \leq +60\text{ °C}$)

$V_{\max} = 250\text{ V AC}$ or 42 V DC

EK KOSHA Flameproof

8732 - Certificate No.: 2008-2094-Q1X

Ex de IIB or Ex de [ia] IIB T6 ($-50\text{ °C} \leq T_a \leq +60\text{ °C}$)

with LOI ($-20\text{ °C} \leq T_a \leq +60\text{ °C}$)

$V_{\max} = 250\text{ V AC}$ or 42 V DC

Sensor Approval Information

North American Certifications

Factory Mutual (FM)

- N0 Division 2 Approval for Non-Flammable Fluids (All Sensors)**
Class I, Division 2, Groups A, B, C, D
Temp Code – T5 (8705/8711 at 60°C)
Temp Code – T3C (8707 at 60°C)
Dust-Ignition proof Class II/III, Division 1, Groups E, F, G
Temp Code – T6 (8705/8711 at 60°C)
Temp Code – T3C (8707 at 60°C)
Enclosure Type 4X
- N0 for 8721 Hygienic Sensor**
Factory Mutual (FM) Ordinary Location;
CE Marking; 3-A Symbol Authorization #1222;
EHEDG Type EL
- N5 Division 2 Approval for Flammable Fluids (All Sensors)**
Class I, Division 2, Groups A, B, C, D
Temp Code – T5 (8705/8711 at 60°C)
Temp Code – T3C (8707 at 60°C)
Dust-Ignition proof Class II/III, Division 1, Groups E, F, G
Temp Code – T6 (8705/8711 at 60°C)
Temp Code – T3C (8707 at 60°C)
Enclosure Type 4X
- E5 Explosion-Proof (8705 and 8711 Only)**
Explosion-Proof for Class I, Division 1, Groups C, D
Temp Code – T6 at 60°C
Dust-Ignition proof Class II/III, Division 1, Groups E, F, G
Temp Code – T6 at 60°C
Class I, Division 2, Groups A, B, C, D
Temp Code – T5 at 60°C
Enclosure Type 4X

Canadian Standards Association (CSA)

- N0** Suitable for Class I, Division 2, Groups A, B, C, D
Temp Code – T5 (8705/8711 at 60°C)
Temp Code – T3C (8707 at 60°C)
Dust-Ignition proof Class II/III, Division 1, Groups E, F, G
Enclosure Type 4X
- N0 for 8721 Hygienic Sensor**
Canadian Standards Association (CSA) Ordinary Location;
CE Marking; 3-A Symbol Authorization #1222;
EHEDG Type EL

European Certifications

- ND ATEX Dust**
Certificate No.: KEMA 06ATEX0006  II 1D max
T = 40 °K(1) Amb. Temp. Limits: (-20 °C = Ta = +65 °C)
Vmax = 40 V DC (pulsed)
IP 66
CE 0575
- N1 ATEX Non-Sparking/Non-incendive**
Certificate No: KEMA02ATEX1302X  II 3G
EEx nA [L] IIC T3... T6
Ambient Temperature Limits -20 to 65°C

SPECIAL CONDITIONS FOR SAFE USE (X):

The relation between ambient temperature, process temperature and temperature class is to be taken from the table under (15-description) above. - (See Table 13) The electrical data is to be taken from the summary under (15-electrical data above). (See Table 12)

E1, ATEX Increased Safety with IS Electrodes

KD Certificate No: KEMA03ATEX2052X  II 1/2G
EEx e ia IIC T3... T6 (Ta = -20 to +60°) (See Table 31)
CE 0575
Vmax = 40 V

SPECIAL CONDITIONS FOR SAFE USE (X):

The relation between ambient temperature, process temperature and temperature class is to be taken from the table under (15-description) above. - (See Table 11) The electrical data is to be taken from the summary under (15-electrical data above). (See Table 12)

INSTALLATION INSTRUCTIONS:

At ambient temperature above 50°C, the flowmeter shall be used with heat resistant cables with a temperature rating of at least 90°C.

A fuse with a rating of maximum 0,7 A according to IEC 60127-1 shall be included in the coil excitation circuit if the sensors are used with other flow transmitters (e.g. Rosemount 8712).

International Certifications

NEPSI - China

E3, NEPSI Increased Safety with IS Electrodes

EP Certificate No: GYJ071438X
Ex e ia IIC T3... T6 (Ta = -20 to +60°) (See Table 31)
Vmax = 40 V

InMetro - Brazil

E2, InMetro Increased Safety with IS Electrodes

EB Certificate No: NCC 5030/08
BR-Ex e ia IIC T3... T6 (Ta = -20 to +60°) (See Table 31)
Vmax = 40 V

KOSHA - Korea

E9, KOSHA Increased Safety with IS Electrodes

EK Certificate No: 2005-2233-Q1X
Ex e ia IIC T3... T6 (Ta = -20 to +60°) (See Table 31)
Vmax = 40 V

Rosemount 8700 Series

Table 30. Electrical Data

Rosemount 8732 Flow Transmitter	
Power supply:	250 V AC, 1 A or 42 V DC, 1 A, 20 W maximum
Pulsed output circuit:	30 V DC (pulsed), 0,25 A, 7,5 W maximum
4-20 mA output circuit:	30 V DC, 30 mA, 900 mW maximum
Rosemount 8705 and 8711 Sensors	
Coil excitation circuit:	40 V 0,5 A, 20 W maximum
Electrode circuit:	in type of explosion protection intrinsic safety EEx ia IIC, $U_i = 5 \text{ V}$, $I_i = 0.2 \text{ mA}$, $P_i = 1 \text{ mW}$, $U_m = 250 \text{ V}$

Table 31. Relation between ambient temperature, process temperature, and temperature class⁽¹⁾

Meter Size (Inches)	Maximum Ambient Temperature	Maximum Process Temperature	Temperature Class
1/2	149°F (65°C)	239°F (115°C)	T3
1	149°F (65°C)	248°F (120°C)	T3
1	95°F (35°C)	95°F (35°C)	T4
1 1/2	149°F (65°C)	257°F (125°C)	T3
1 1/2	122°F (50°C)	148°F (60°C)	T4
2	149°F (65°C)	257°F (125°C)	T3
2	149°F (65°C)	167°F (75°C)	T4
2	104°F (40°C)	104°F (40°C)	T5
3 - 4	149°F (65°C)	266°F (130°C)	T3
3 - 4	149°F (65°C)	194°F (90°C)	T4
3 - 4	131°F (55°C)	131°F (55°C)	T5
3 - 4	104°F (40°C)	104°F (40°C)	T6
6	149°F (65°C)	275°F (135°C)	T3
6	149°F (65°C)	230°F (110°C)	T4
6	149°F (65°C)	167°F (75°C)	T5
6	140°F (60°C)	140°F (60°C)	T6
8-60	149°F (65°C)	284°F (140°C)	T3
8-60	149°F (65°C)	239°F (115°C)	T4
8-60	149°F (65°C)	176°F (80°C)	T5
8-60	149°F (65°C)	156°F (69°C)	T6

(1) This table is applicable for the E1 and KD approval codes only.

Product Data Sheet

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Rosemount 8700 Series

Table 32. Relation between the maximum ambient temperature, the maximum process temperature, and the temperature class⁽¹⁾

Maximum Ambient Temperature	Maximum process temperature °F (°C) per temperature class			
	T3	T4	T5	T6
0.5 in. sensor size				
149°F (65°C)	297°F (147°C)	138°F (59°C)	54°F (12°C)	18°F (-8°C)
140°F (60°C)	309°F (154°C)	151°F (66°C)	66°F (19°C)	28°F (-2°C)
131°F (55°C)	322°F (161°C)	163°F (73°C)	79°F (26°C)	41°F (5°C)
122°F (50°C)	334°F (168°C)	176°F (80°C)	90°F (32°C)	54°F (12°C)
113°F (45°C)	347°F (175°C)	189°F (87°C)	102°F (39°C)	66°F (19°C)
104°F (40°C)	351°F (177°C)	199°F (93°C)	115°F (46°C)	79°F (26°C)
95°F (35°C)	351°F (177°C)	212°F (100°C)	127°F (53°C)	90°F (32°C)
86°F (30°C)	351°F (177°C)	225°F (107°C)	138°F (59°C)	102°F (39°C)
77°F (25°C)	351°F (177°C)	237°F (114°C)	151°F (66°C)	115°F (46°C)
68°F (20°C)	351°F (177°C)	248°F (120°C)	163°F (73°C)	127°F (53°C)
1.0 in. sensor size				
149°F (65°C)	318°F (159°C)	158°F (70°C)	72°F (22°C)	34°F (1°C)
140°F (60°C)	331°F (166°C)	171°F (77°C)	84°F (29°C)	46°F (8°C)
131°F (55°C)	343°F (173°C)	183°F (84°C)	97°F (36°C)	59°F (15°C)
122°F (50°C)	351°F (177°C)	196°F (91°C)	109°F (43°C)	72°F (22°C)
113°F (45°C)	351°F (177°C)	207°F (97°C)	122°F (50°C)	84°F (29°C)
104°F (40°C)	351°F (177°C)	219°F (104°C)	135°F (57°C)	97°F (36°C)
95°F (35°C)	351°F (177°C)	232°F (111°C)	145°F (63°C)	109°F (43°C)
86°F (30°C)	351°F (177°C)	244°F (118°C)	158°F (70°C)	122°F (50°C)
77°F (25°C)	351°F (177°C)	257°F (125°C)	171°F (77°C)	135°F (57°C)
68°F (20°C)	351°F (177°C)	270°F (132°C)	183°F (84°C)	145°F (63°C)
1.5 in. sensor size				
149°F (65°C)	297°F (147°C)	160°F (71°C)	88°F (31°C)	55°F (13°C)
140°F (60°C)	307°F (153°C)	171°F (77°C)	97°F (36°C)	66°F (19°C)
131°F (55°C)	318°F (159°C)	181°F (83°C)	108°F (42°C)	77°F (25°C)
122°F (50°C)	329°F (165°C)	192°F (89°C)	118°F (48°C)	88°F (31°C)
113°F (45°C)	340°F (171°C)	203°F (95°C)	129°F (54°C)	97°F (36°C)
104°F (40°C)	351°F (177°C)	214°F (101°C)	140°F (60°C)	108°F (42°C)
95°F (35°C)	351°F (177°C)	223°F (106°C)	151°F (66°C)	118°F (48°C)
86°F (30°C)	351°F (177°C)	234°F (112°C)	160°F (71°C)	129°F (54°C)
77°F (25°C)	351°F (177°C)	244°F (118°C)	171°F (77°C)	140°F (60°C)
68°F (20°C)	351°F (177°C)	255°F (124°C)	181°F (83°C)	151°F (66°C)

Rosemount 8700 Series

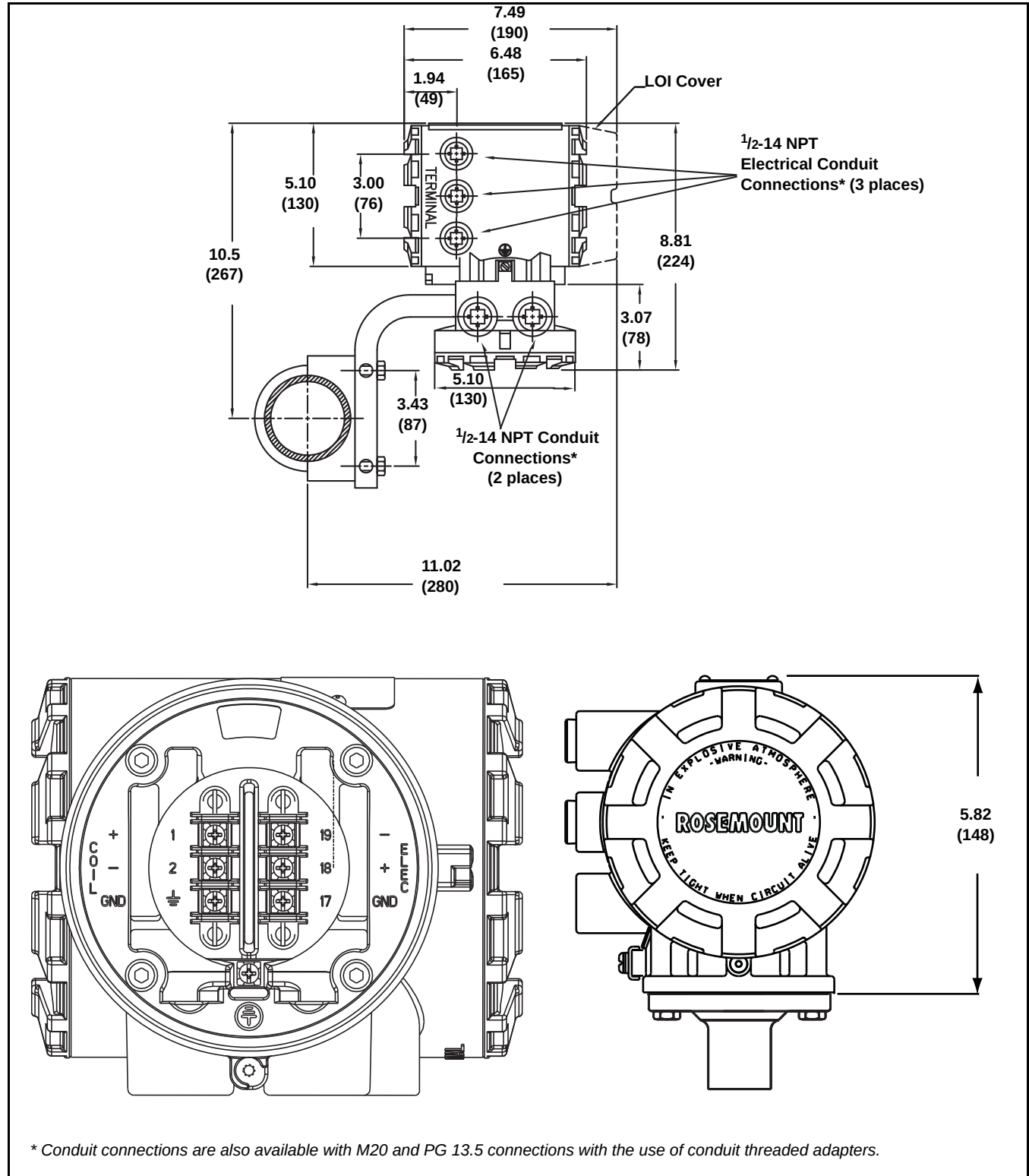
Table 32. Relation between the maximum ambient temperature, the maximum process temperature, and the temperature class⁽¹⁾

Maximum Ambient Temperature	Maximum process temperature °F (°C) per temperature class			
	T3	T4	T5	T6
2.0 in. sensor size				
149°F (65°C)	289°F (143°C)	163°F (73°C)	95°F (35°C)	66°F (19°C)
140°F (60°C)	300°F (149°C)	172°F (78°C)	104°F (40°C)	75°F (24°C)
131°F (55°C)	309°F (154°C)	183°F (84°C)	115°F (46°C)	84°F (29°C)
122°F (50°C)	318°F (159°C)	192°F (89°C)	124°F (51°C)	95°F (35°C)
113°F (45°C)	329°F (165°C)	201°F (94°C)	135°F (57°C)	104°F (40°C)
104°F (40°C)	338°F (170°C)	212°F (100°C)	144°F (62°C)	115°F (46°C)
95°F (35°C)	349°F (176°C)	221°F (105°C)	153°F (67°C)	124°F (51°C)
86°F (30°C)	351°F (177°C)	232°F (111°C)	163°F (73°C)	135°F (57°C)
77°F (25°C)	351°F (177°C)	241°F (116°C)	172°F (78°C)	144°F (62°C)
68°F (20°C)	351°F (177°C)	252°F (122°C)	183°F (84°C)	153°F (67°C)
3 to 60 in. sensor size				
149°F (65°C)	351°F (177°C)	210°F (99°C)	117°F (47°C)	75°F (24°C)
140°F (60°C)	351°F (177°C)	223°F (106°C)	129°F (54°C)	90°F (32°C)
131°F (55°C)	351°F (177°C)	237°F (114°C)	144°F (62°C)	102°F (39°C)
122°F (50°C)	351°F (177°C)	250°F (121°C)	156°F (69°C)	117°F (47°C)
113°F (45°C)	351°F (177°C)	264°F (129°C)	171°F (77°C)	129°F (54°C)
104°F (40°C)	351°F (177°C)	266°F (130°C)	183°F (84°C)	144°F (62°C)
95°F (35°C)	351°F (177°C)	266°F (130°C)	198°F (92°C)	156°F (69°C)
86°F (30°C)	351°F (177°C)	266°F (130°C)	203°F (95°C)	171°F (77°C)
77°F (25°C)	351°F (177°C)	266°F (130°C)	203°F (95°C)	176°F (80°C)
68°F (20°C)	351°F (177°C)	266°F (130°C)	203°F (95°C)	176°F (80°C)

(1) This table is applicable for N1 option codes only.

Dimensional Drawings

Figure 8. Rosemount 8732E Transmitter



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Figure 9. Rosemount 8712D/E/H Transmitter

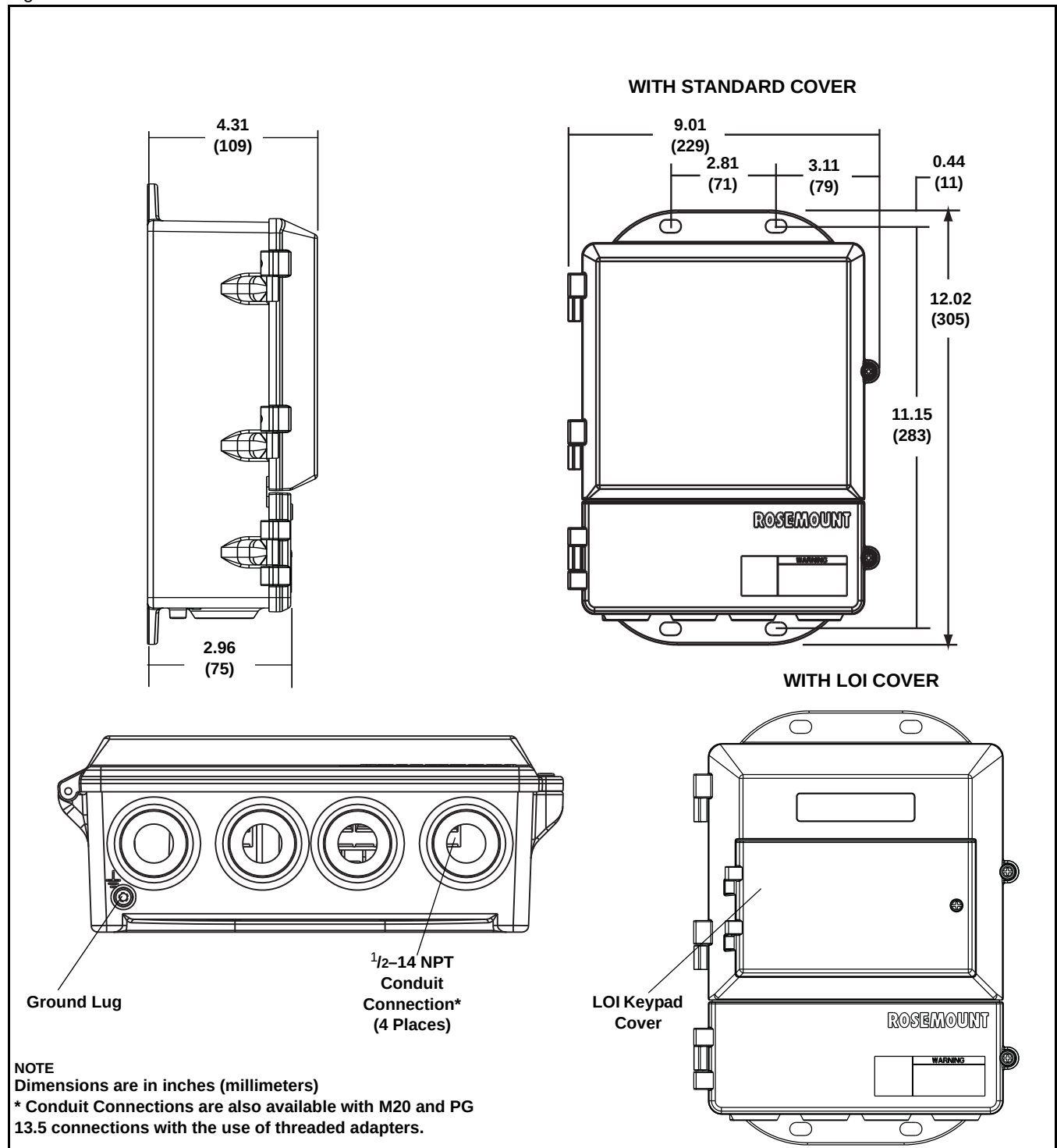
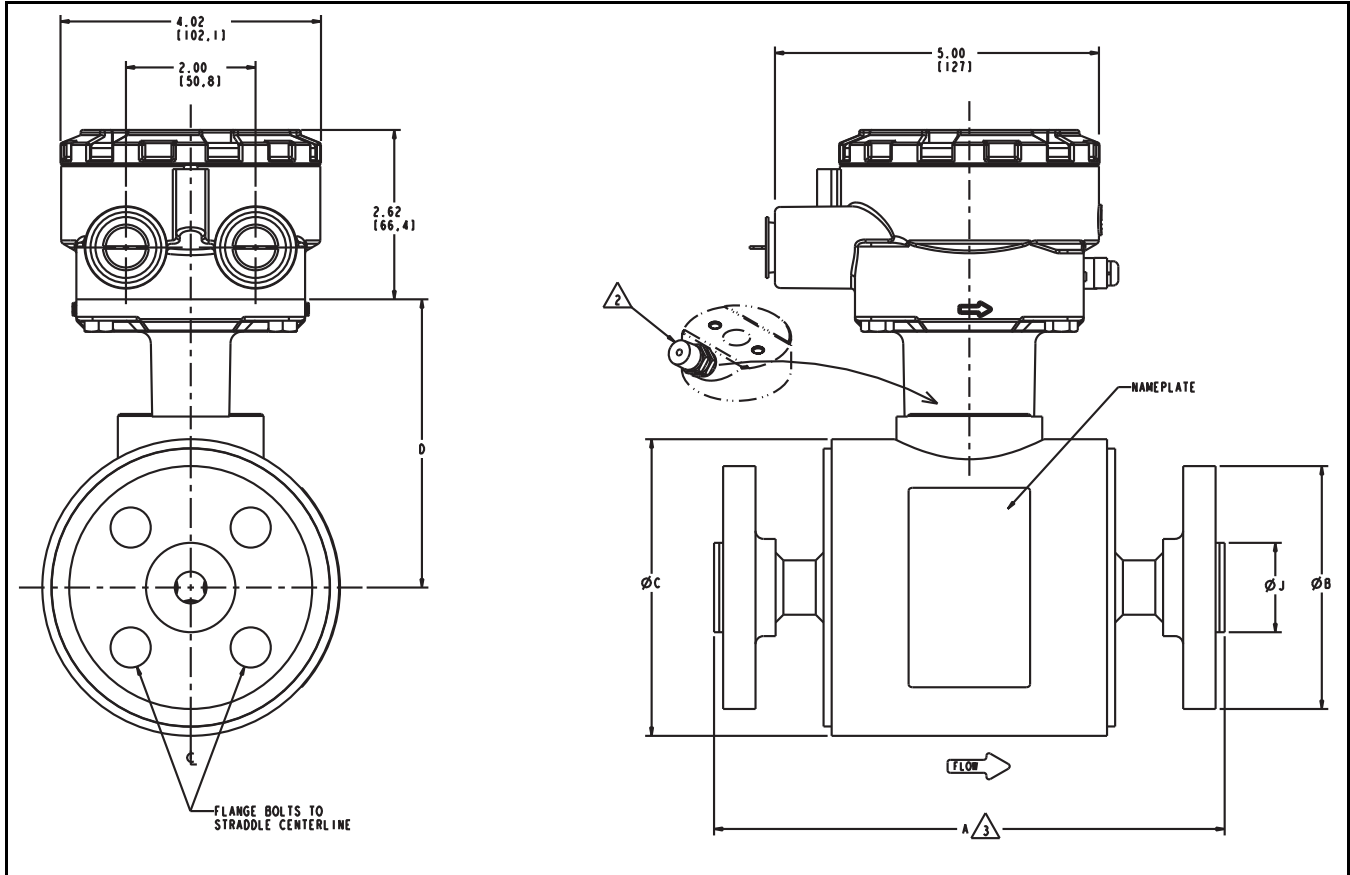


Figure 10. 0.5-in. through 2-in. Slip-on Flanges - Low pressure ($P \leq \text{ANSI } 300\#$)



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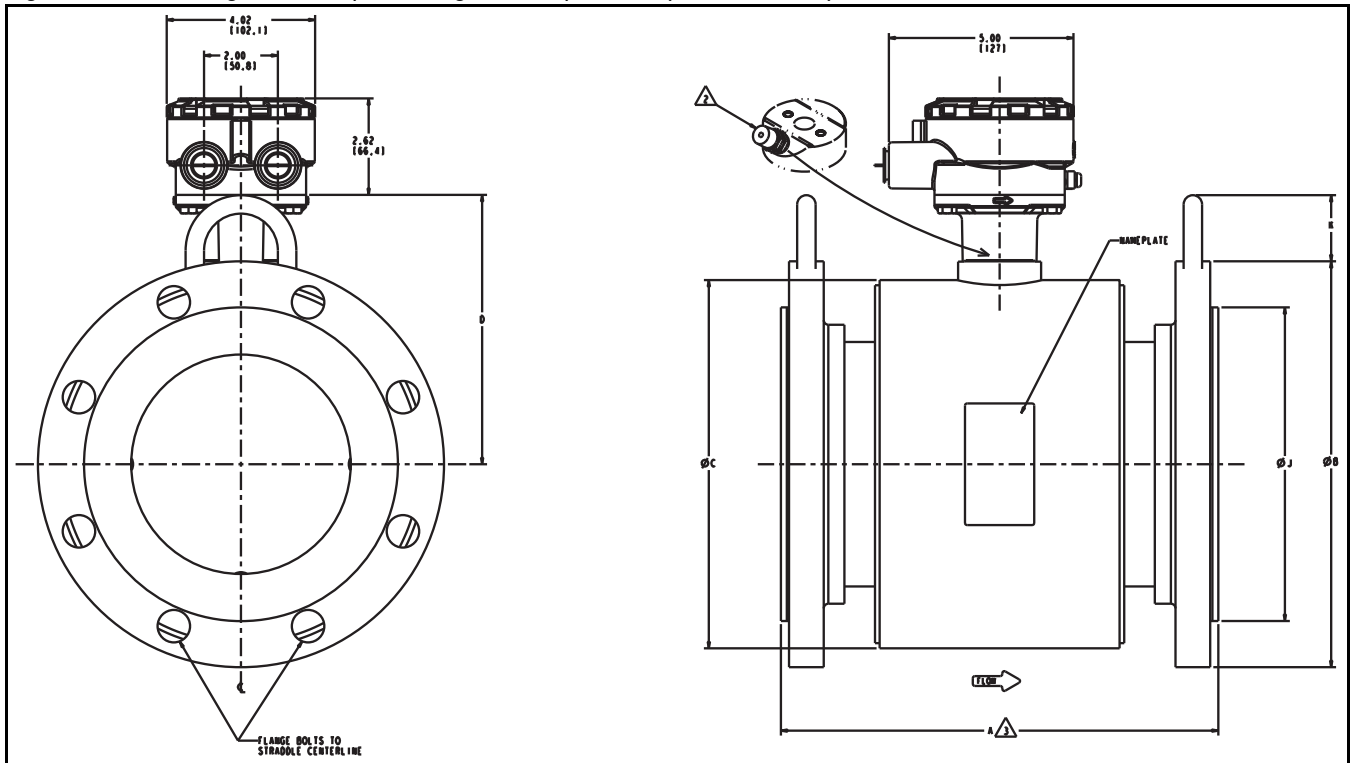
Table 33. 0.5-in. through 2-in. Slip-on Flanges (mm)

Size, Description	Overall Length	Dim "A" Poly	Body Dia. DIM "C"	CL to UMB DIM "D"	Liner Dia. on Face DIM "J"	Sensor Weight lbs. (kg)
	Dim "A"					
"0.5 (15) ANSI - 150#, SO / RF	7.88 (200)	7.88 (200)	4.50 (114)	4.41 (112)	1.38 (35)	15 (6.8)
"0.5 (15) ANSI - 300#, SO / RF	7.88 (200)	7.88 (200)	4.50 (114)	4.41 (112)	1.38 (35)	22 (10.0)
"0.5 (15) DIN - PN40, SO / RF	7.88 (200)	7.88 (200)	4.50 (114)	4.41 (112)	1.77 (45)	20 (9.1)
"0.5 (15) AUST. TABLE ""D"", SO / RF	7.88 (200)	7.88 (200)	4.50 (114)	4.41 (112)	1.38 (35)	15 (6.8)
"0.5 (15) AUST. TABLE ""E"", SO / RF	7.88 (200)	7.88 (200)	4.50 (114)	4.41 (112)	1.38 (35)	22 (10.0)
"0.5 (15) JIS - 10K, SO / RF	7.88 (200)	7.88 (200)	4.50 (114)	4.41 (112)	2.01 (51)	10 (4.5)
"0.5 (15) JIS - 20K, SO / RF	7.88 (200)	7.88 (200)	4.50 (114)	4.41 (112)	2.01 (51)	11 (4.7)
"1 (25) ANSI - 150#, SO / RF	7.88 (200)	7.88 (200)	4.50 (114)	4.41 (112)	2.00 (51)	18 (8.2)
"1 (25) ANSI - 300#, SO / RF	7.88 (200)	7.88 (200)	4.50 (114)	4.41 (112)	2.00 (51)	22 (10.0)
"1 (25) DIN - PN40, SO / RF	7.88 (200)	7.88 (200)	4.50 (114)	4.41 (112)	2.88 (73)	20 (9.1)
"1 (25) AUST. TABLE ""D"", SO / RF	7.88 (200)	7.88 (200)	4.50 (114)	4.41 (112)	2.00 (51)	18 (8.2)
"1 (25) AUST. TABLE ""E"", SO / RF	7.88 (200)	7.88 (200)	4.50 (114)	4.41 (112)	2.00 (51)	22 (10.0)
"1 (25) JIS - 10K, SO / RF	7.88 (200)	7.88 (200)	4.50 (114)	4.41 (112)	2.64 (67)	13 (5.9)
"1 (25) JIS - 20K, SO / RF	7.88 (200)	7.88 (200)	4.50 (114)	4.41 (112)	2.64 (67)	14 (6.4)
"1.5 (40) ANSI - 150#, SO / RF	7.87 (200)	7.88 (200)	5.21 (132)	4.82 (122)	2.88 (73)	22 (10.0)
"1.5 (40) ANSI - 300#, SO / RF	7.87 (200)	7.88 (200)	5.21 (132)	4.82 (122)	2.88 (73)	24 (10.9)
"1.5 (40) DIN - PN40, SO / RF	7.87 (200)	7.88 (200)	5.21 (132)	4.82 (122)	3.46 (88)	22 (10.0)
"1.5 (40) AUST. TABLE ""D"", SO / RF	7.87 (200)	7.88 (200)	5.21 (132)	4.82 (122)	2.88 (73)	22 (10.0)
"1.5 (40) AUST. TABLE ""E"", SO / RF	7.87 (200)	7.88 (200)	5.21 (132)	4.82 (122)	2.88 (73)	24 (10.9)
"1.5 (40) JIS - 10K, SO / RF	7.87 (200)	7.88 (200)	5.21 (132)	4.82 (122)	3.19 (81)	17 (7.5)
"1.5 (40) JIS - 20K, SO / RF	7.87 (200)	7.88 (200)	5.21 (132)	4.82 (122)	3.19 (81)	18 (8.2)
"2 (50) ANSI - 150#, SO / RF	7.87 (200)	7.88 (200)	5.21 (132)	4.82 (122)	3.62 (92)	26 (11.8)
"2 (50) ANSI - 300#, SO / RF	7.87 (200)	7.88 (200)	5.21 (132)	4.82 (122)	3.62 (92)	28 (12.7)
"2 (50) DIN - PN40, SO / RF	7.87 (200)	7.88 (200)	5.21 (132)	4.82 (122)	4.02 (102)	26 (11.8)
"2 (50) AUST. TABLE ""D"", SO / RF	7.87 (200)	7.88 (200)	5.21 (132)	4.82 (122)	3.62 (92)	26 (11.8)
"2 (50) AUST. TABLE ""E"", SO / RF	7.87 (200)	7.88 (200)	5.21 (132)	4.82 (122)	3.62 (92)	28 (12.7)
"2 (50) JIS - 10K, SO / RF	7.87 (200)	7.88 (200)	5.21 (132)	4.82 (122)	3.78 (96)	19 (8.7)
"2 (50) JIS - 20K, SO / RF	7.87 (200)	7.88 (200)	5.21 (132)	4.82 (122)	3.78 (96)	19 (8.7)

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Figure 11. 3-in. through 36-in. Slip-on Flanges - Low pressure ($P \leq \text{ANSI } 300\#$)



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Table 34. 3-in. through 36-in. Slip-on Flanges (mm)

Size, Description	Overall Length	Dim "A" Poly	Body Dia. DIM "C"	CL to UMB DIM "D"	Liner Dia. on Face DIM "J"	Lift Ring Height DIM "K"	Sensor Weight lbs. (kg)
	Dim "A" PTFE						
"3 (80) ANSI - 150# SO / RF"	7.87 (200)	7.87 (200)	7.21 (183)	5.82 (148)	5.00 (127)	1.70 (43)	42 (19.1)
"3 (80) ANSI - 300# SO / RF"	8.63 (219)	8.63 (219)	7.21 (183)	5.82 (148)	5.00 (127)	1.70 (43)	47 (21.3)
"3 (80) DIN - PN40 SO / RF"	7.87 (200)	7.87 (200)	7.21 (183)	5.82 (148)	5.43 (138)	1.70 (43)	26 (11.8)
"3 (80) AUST. TABLE "D" SO / RF"	7.87 (200)	7.87 (200)	7.21 (183)	5.82 (148)	5.00 (127)	1.70 (43)	42 (19.1)
"3 (80) AUST. TABLE "E" SO / RF"	7.87 (200)	7.87 (200)	7.21 (183)	5.82 (148)	5.00 (127)	1.70 (43)	47 (21.3)
"3 (80) JIS - 10K SO / RF"	7.87 (200)	7.87 (200)	7.21 (183)	5.82 (148)	4.96 (126)	1.70 (43)	29 (13.2)
"3 (80) JIS - 20K SO / RF"	7.87 (200)	7.87 (200)	7.21 (183)	5.82 (148)	5.20 (132)	1.70 (43)	35 (16.0)
"4 (100) ANSI - 150# SO / RF"	9.84 (250)	9.84 (250)	7.91 (201)	6.17 (157)	6.19 (157)	1.70 (43)	57 (25.9)
"4 (100) ANSI - 300# SO / RF"	10.88 (276)	10.87 (276)	7.91 (201)	6.17 (157)	6.19 (157)	1.70 (43)	65 (29.5)
"4 (100) DIN - PN16 SO / RF"	9.84 (250)	9.84 (250)	7.91 (201)	6.17 (157)	6.22 (158)	1.70 (43)	48 (21.8)
"4 (100) DIN - PN40 SO / RF"	9.84 (250)	9.84 (250)	7.91 (201)	6.17 (157)	6.38 (162)	1.70 (43)	65 (29.5)
"4 (100) AUST. TABLE "D" SO / RF"	9.84 (250)	9.84 (250)	7.91 (201)	6.17 (157)	6.19 (157)	1.70 (43)	57 (25.9)
"4 (100) AUST. TABLE "E" SO / RF"	9.84 (250)	9.84 (250)	7.91 (201)	6.17 (157)	6.19 (157)	1.70 (43)	65 (29.5)
"4 (100) JIS - 10K SO / RF"	9.84 (250)	9.84 (250)	7.91 (201)	6.17 (157)	5.95 (151)	1.70 (43)	36 (16.4)
"4 (100) JIS - 20K SO / RF"	9.84 (250)	9.84 (250)	7.91 (201)	6.17 (157)	6.30 (160)	1.70 (43)	45 (20.6)
"6 (150) ANSI - 150# SO / RF"	11.81 (300)	11.81 (300)	9.98 (253)	7.30 (185)	8.50 (216)	1.70 (43)	71 (32.2)
"6 (150) ANSI - 300# SO / RF"	13.06 (332)	13.06 (332)	9.98 (253)	7.30 (185)	8.50 (216)	1.70 (43)	93 (42.2)
"6 (150) DIN - PN16 SO / RF"	11.81 (300)	11.81 (300)	9.98 (253)	7.30 (185)	8.35 (212)	1.70 (43)	81 (36.7)
"6 (150) DIN - PN25 SO / RF"	11.81 (300)	11.81 (300)	9.98 (253)	7.30 (185)	8.58 (218)	1.70 (43)	87 (39.6)
"6 (150) DIN - PN40 SO / RF"	13.06 (332)	13.06 (332)	9.98 (253)	7.30 (185)	8.58 (218)	1.70 (43)	93 (42.2)
"6 (150) AUST. TABLE "D" SO / RF"	11.81 (300)	11.81 (300)	9.98 (253)	7.30 (185)	8.50 (216)	1.70 (43)	71 (32.2)
"6 (150) AUST. TABLE "E" SO / RF"	11.81 (300)	11.81 (300)	9.98 (253)	7.30 (185)	8.50 (216)	1.70 (43)	93 (42.2)
"6 (150) JIS - 10K SO / RF"	11.81 (300)	11.81 (300)	9.98 (253)	7.30 (185)	8.35 (212)	1.70 (43)	66 (30.0)
"6 (150) JIS - 20K SO / RF"	11.81 (300)	11.81 (300)	9.98 (253)	7.30 (185)	9.06 (230)	1.70 (43)	85 (38.7)
"8 (200) ANSI - 150# SO / RF"	13.78 (350)	13.78 (350)	11.92 (303)	8.27 (210)	10.62 (270)	1.70 (43)	145 (65.8)
"8 (200) ANSI - 300# SO / RF"	15.60 (396)	15.60 (396)	11.92 (303)	8.27 (210)	10.62 (270)	1.70 (43)	162 (73.5)
"8 (200) DIN - PN10 SO / RF"	13.78 (350)	13.78 (350)	11.92 (303)	8.27 (210)	10.55 (268)	1.70 (43)	110 (49.9)
"8 (200) DIN - PN16 SO / RF"	13.78 (350)	13.78 (350)	11.92 (303)	8.27 (210)	10.55 (268)	1.70 (43)	110 (49.9)
"8 (200) DIN - PN25 SO / RF"	13.78 (350)	13.78 (350)	11.92 (303)	8.27 (210)	10.94 (278)	1.70 (43)	162 (73.5)
"8 (200) DIN - PN40 SO / RF"	15.60 (396)	15.60 (396)	11.92 (303)	8.27 (210)	11.22 (285)	1.70 (43)	162 (73.5)
"8 (200) AUST. TABLE "D" SO / RF"	13.78 (350)	13.78 (350)	11.92 (303)	8.27 (210)	10.62 (270)	1.70 (43)	145 (65.8)
"8 (200) AUST. TABLE "E" SO / RF"	13.78 (350)	13.78 (350)	11.92 (303)	8.27 (210)	10.62 (270)	1.70 (43)	162 (73.5)
"8 (200) JIS - 10K SO / RF"	13.78 (350)	13.78 (350)	11.92 (303)	8.27 (210)	10.32 (262)	1.70 (43)	82 (37.3)
"8 (200) JIS - 20K SO / RF"	15.60 (396)	15.60 (396)	11.92 (303)	8.27 (210)	10.83 (275)	1.70 (43)	137 (62.3)
"10 (250) ANSI - 150# SO / RF"	15.00 (381)	14.76 (376)	14.64 (372)	9.69 (246)	12.75 (324)	2.00 (51)	195 (88.5)
"10 (250) ANSI - 300# SO / RF"	17.13 (435)	16.89 (430)	14.64 (372)	9.69 (246)	12.75 (324)	2.00 (51)	300 (99.8)
"10 (250) DIN - PN10 SO / RF"	15.00 (381)	14.76 (376)	14.64 (372)	9.69 (246)	12.60 (320)	2.00 (51)	220 (99.8)
"10 (250) DIN - PN16 SO / RF"	15.00 (381)	14.76 (376)	14.64 (372)	9.69 (246)	12.60 (320)	2.00 (51)	220 (99.8)
"10 (250) DIN - PN25 SO / RF"	15.00 (381)	14.76 (376)	14.64 (372)	9.69 (246)	13.19 (335)	2.00 (51)	220 (99.8)
"10 (250) DIN - PN40 SO / RF"	17.13 (435)	16.89 (430)	14.64 (372)	9.69 (246)	13.58 (345)	2.00 (51)	300 (99.8)
"10 (250) AUST. TABLE "D" SO / RF"	15.00 (381)	14.76 (376)	14.64 (372)	9.69 (246)	12.75 (324)	2.00 (51)	195 (88.5)
"10 (250) AUST. TABLE "E" SO / RF"	15.00 (381)	14.76 (376)	14.64 (372)	9.69 (246)	12.75 (324)	2.00 (51)	300 (99.8)
"12 (300) ANSI - 150# SO / RF"	18.00 (457)	17.76 (452)	16.80 (427)	10.77 (274)	15.00 (381)	2.00 (51)	330 (149.7)
"12 (300) ANSI - 300# SO / RF"	20.14 (512)	19.89 (506)	16.80 (427)	10.77 (274)	15.00 (381)	2.00 (51)	435 (197.3)
"12 (300) DIN - PN10 SO / RF"	18.00 (457)	17.76 (452)	16.80 (427)	10.77 (274)	14.57 (370)	2.00 (51)	330 (149.7)
"12 (300) DIN - PN16 SO / RF"	18.00 (457)	17.76 (452)	16.80 (427)	10.77 (274)	14.88 (378)	2.00 (51)	330 (149.7)
"12 (300) DIN - PN25 SO / RF"	18.00 (457)	17.76 (452)	16.80 (427)	10.77 (274)	15.55 (395)	2.00 (51)	330 (149.7)
"12 (300) DIN - PN40 SO / RF"	20.14 (512)	19.89 (506)	16.80 (427)	10.77 (274)	16.14 (410)	2.00 (51)	435 (197.3)
"12 (300) AUST. TABLE "D" SO / RF"	18.00 (457)	17.76 (452)	16.80 (427)	10.77 (274)	15.00 (381)	2.00 (51)	330 (149.7)
"12 (300) AUST. TABLE "E" SO / RF"	18.00 (457)	17.76 (452)	16.80 (427)	10.77 (274)	15.00 (381)	2.00 (51)	435 (197.3)

Table 35. 14-in. through 36-in. with Slip-On Flanges (mm)

Size, Description	Overall Length						
	Dim. "A" PTFE	Dim. "A" Poly	Body Dim. "C"	CL to UMB Dim. "D"	Liner on Face Dim. "J"	Lift Ring Height Dim. "K"	Sensor Weight (lbs.)
"14 (350) ANSI - 150# SO / RF"	20.91 (531)	20.83 (529)	18.92 (481)	11.83 (300)	16.25 (413)	2.00 (51)	380 (172.4)
"14 (350) ANSI - 300# SO / RF"	23.16 (588)	23.08 (586)	18.92 (481)	11.83 (300)	16.25 (413)	2.00 (51)	573 (259.9)
"14 (350) DIN - PN10 SO / RF"	20.91 (531)	20.83 (529)	18.92 (481)	11.83 (300)	16.93 (430)	2.00 (51)	370 (167.8)
"14 (350) DIN - PN16 SO / RF"	20.91 (531)	20.83 (529)	18.92 (481)	11.83 (300)	17.24 (438)	2.00 (51)	370 (167.8)
"14 (350) DIN - PN25 SO / RF"	23.16 (588)	23.08 (586)	18.92 (481)	11.83 (300)	17.72 (450)	2.00 (51)	370 (167.8)
"14 (350) DIN - PN40 SO / RF"	23.16 (588)	23.08 (586)	18.92 (481)	11.83 (300)	18.31 (465)	2.00 (51)	573 (259.9)
"14 (350) AUST. TABLE "D" SO / RF"	20.91 (531)	20.83 (529)	18.92 (481)	11.83 (300)	16.25 (413)	2.00 (51)	380 (172.4)
"14 (350) AUST. TABLE "E" SO / RF"	20.91 (531)	20.83 (529)	18.92 (481)	11.83 (300)	16.25 (413)	2.00 (51)	573 (259.9)
"16 (400) ANSI - 150# SO / RF"	23.88 (607)	23.80 (607)	20.94 (532)	12.84 (326)	18.50 (470)	3.13 (80)	470 (213.2)
"16 (400) ANSI - 300# SO / RF"	26.13 (664)	26.05 (664)	20.94 (532)	12.84 (326)	18.50 (470)	3.13 (80)	755 (213.2)
"16 (400) DIN - PN10 SO / RF"	23.88 (607)	23.80 (607)	20.94 (532)	12.84 (326)	18.98 (482)	3.13 (80)	500 (213.2)
"16 (400) DIN - PN16 SO / RF"	23.88 (607)	23.80 (607)	20.94 (532)	12.84 (326)	19.29 (490)	3.13 (80)	500 (213.2)
"16 (400) DIN - PN25 SO / RF"	26.13 (664)	26.05 (664)	20.94 (532)	12.84 (326)	19.88 (505)	3.13 (80)	500 (213.2)
"16 (400) DIN - PN40 SO / RF"	26.13 (664)	26.05 (664)	20.94 (532)	12.84 (326)	21.06 (535)	3.13 (80)	755 (213.2)
"16 (400) AUST. TABLE "D" SO / RF"	23.88 (607)	23.80 (607)	20.94 (532)	12.84 (326)	18.50 (470)	3.13 (80)	470 (213.2)
"16 (400) AUST. TABLE "E" SO / RF"	23.88 (607)	23.80 (607)	20.94 (532)	12.84 (326)	18.50 (470)	3.13 (80)	755 (213.2)
"18 (450) ANSI - 150# SO / RF"	26.85 (682)	26.77 (680)	23.46 (596)	14.10 (358)	21.00 (533)	3.13 (80)	592 (268.5)
"18 (450) ANSI - 300# SO / RF"	29.97 (761)	29.89 (759)	23.46 (596)	14.10 (358)	21.00 (533)	3.13 (80)	1010 (458.1)
"18 (450) DIN - PN10 SO / RF"	26.85 (682)	26.72 (679)	23.46 (596)	14.10 (358)	20.94 (532)	3.13 (80)	522 (236.8)
"18 (450) DIN - PN16 SO / RF"	26.85 (682)	26.72 (679)	23.46 (596)	14.10 (358)	21.65 (550)	3.13 (80)	595 (269.9)
"18 (450) DIN - PN25 SO / RF"	29.97 (761)	29.89 (759)	23.46 (596)	14.10 (358)	21.85 (555)	3.13 (80)	693 (314.3)
"18 (450) DIN - PN40 SO / RF"	29.97 (761)	29.89 (759)	23.46 (596)	14.10 (358)	22.05 (560)	3.13 (80)	915 (415.0)
"18 (450) AUST. TABLE "D" SO / RF"	26.85 (682)	26.77 (680)	23.46 (596)	14.10 (358)	21.00 (533)	3.13 (80)	592 (268.5)
"18 (450) AUST. TABLE "E" SO / RF"	26.85 (682)	26.77 (680)	23.46 (596)	14.10 (358)	21.00 (533)	3.13 (80)	1010 (458.1)
"20 (500) ANSI - 150# SO / RF"	29.78 (756)	29.70 (754)	25.48 (647)	15.11 (384)	23.00 (584)	3.13 (80)	680 (308.4)
"20 (500) ANSI - 300# SO / RF"	33.04 (839)	32.96 (837)	25.48 (647)	15.11 (384)	23.00 (584)	3.13 (80)	1180 (535.2)
"20 (500) DIN - PN10 SO / RF"	29.78 (756)	29.70 (754)	25.48 (647)	15.11 (384)	23.03 (585)	3.13 (80)	680 (535.2)
"20 (500) DIN - PN16 SO / RF"	29.78 (756)	29.70 (754)	25.48 (647)	15.11 (384)	24.02 (610)	3.13 (80)	680 (535.2)
"20 (500) DIN - PN25 SO / RF"	33.04 (839)	32.96 (837)	25.48 (647)	15.11 (384)	24.21 (615)	3.13 (80)	680 (535.2)
"20 (500) DIN - PN40 SO / RF"	33.04 (839)	32.96 (837)	25.48 (647)	15.11 (384)	24.21 (615)	3.13 (80)	1180 (535.2)
"20 (500) AUST. TABLE "D" SO / RF"	29.78 (756)	29.70 (754)	25.48 (647)	15.11 (384)	23.00 (584)	3.13 (80)	680 (535.2)
"20 (500) AUST. TABLE "E" SO / RF"	29.78 (756)	29.70 (754)	25.48 (647)	15.11 (384)	23.00 (584)	3.13 (80)	1180 (535.2)
"24 (600) ANSI - 150# SO / RF"	35.75 (908)	35.67 (906)	30.03 (763)	17.39 (442)	27.25 (692)	3.13 (80)	1020 (462.7)
"24 (600) ANSI - 300# SO / RF"	39.38 (1000)	39.30 (998)	30.03 (763)	17.39 (442)	27.25 (692)	3.13 (80)	1865 (845.9)
"24 (600) DIN - PN10 SO / RF"	35.75 (908)	35.67 (906)	30.03 (763)	17.39 (442)	26.97 (685)	3.13 (80)	1000 (453.6)
"24 (600) DIN - PN16 SO / RF"	35.75 (908)	35.67 (906)	30.03 (763)	17.39 (442)	28.54 (725)	3.13 (80)	1000 (453.6)
"24 (600) DIN - PN25 SO / RF"	39.38 (1000)	39.30 (998)	30.03 (763)	17.39 (442)	28.35 (720)	3.13 (80)	1000 (453.6)
"24 (600) DIN - PN40 SO / RF"			30.03 (763)	17.39 (442)	28.94 (735)	3.13 (80)	1615 (734.2)
"24 (600) AUST. TABLE "D" SO / RF"	35.75 (908)	35.67 (906)	30.03 (763)	17.39 (442)	27.25 (692)	3.13 (80)	1020 (462.7)
"24 (600) AUST. TABLE "E" SO / RF"	35.75 (908)	35.67 (906)	30.03 (763)	17.39 (442)	27.25 (692)	3.13 (80)	1865 (845.9)
"30 (750) AWWA CLASS D SO / RF"	37.00 (940)	36.93 (938)	35.50 (902)	20.13 (511)	33.75 (857)	3.13 (80)	1400 (635.0)
"30 (750) MSS SP44 - 150# SO / RF"	41.56 (1056)	41.48 (1054)	35.50 (902)	20.13 (511)	33.75 (857)	3.13 (80)	1782 (808.3)
"30 (750) MSS SP44 - 300# SO / RF"	47.25 (1200)	47.17 (1198)	35.50 (902)	20.13 (511)	33.75 (857)	3.13 (80)	2610 (1183.9)
"30 (750) AUST. TABLE "D" SO / RF"	37.00 (940)	36.93 (938)	35.50 (902)	20.13 (511)	34.96 (888)	3.13 (80)	1530 (694.0)
"30 (750) AUST. TABLE "E" SO / RF"	41.56 (1056)	41.48 (1054)	35.50 (902)	20.13 (511)	34.84 (885)	3.13 (80)	1663 (754.3)
"36 (900) AWWA CLASS D SO / RF"	40.63 (1032)	40.55 (1030)	43.37 (1102)	24.00 (1022)	40.25 (1022)	3.13 (80)	1975 (895.8)
"36 (900) MSS SP44 - 150# SO / RF"	47.25 (1200)	47.17 (1198)	43.37 (1102)	24.00 (1022)	40.25 (1022)	3.13 (80)	2777 (1259.6)
"36 (900) AUST. TABLE "D" SO / RF"	40.63 (1032)	40.55 (1030)	43.37 (1102)	24.00 (1022)	41.34 (1050)	3.13 (80)	2213 (1003.8)
"36 (900) AUST. TABLE "E" SO / RF"	47.25 (1200)	47.17 (1198)	43.37 (1102)	24.00 (1022)	41.34 (1050)	3.13 (80)	2437 (1105.4)

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Figure 12. 0.5-in. through 36-in. with W3 Option

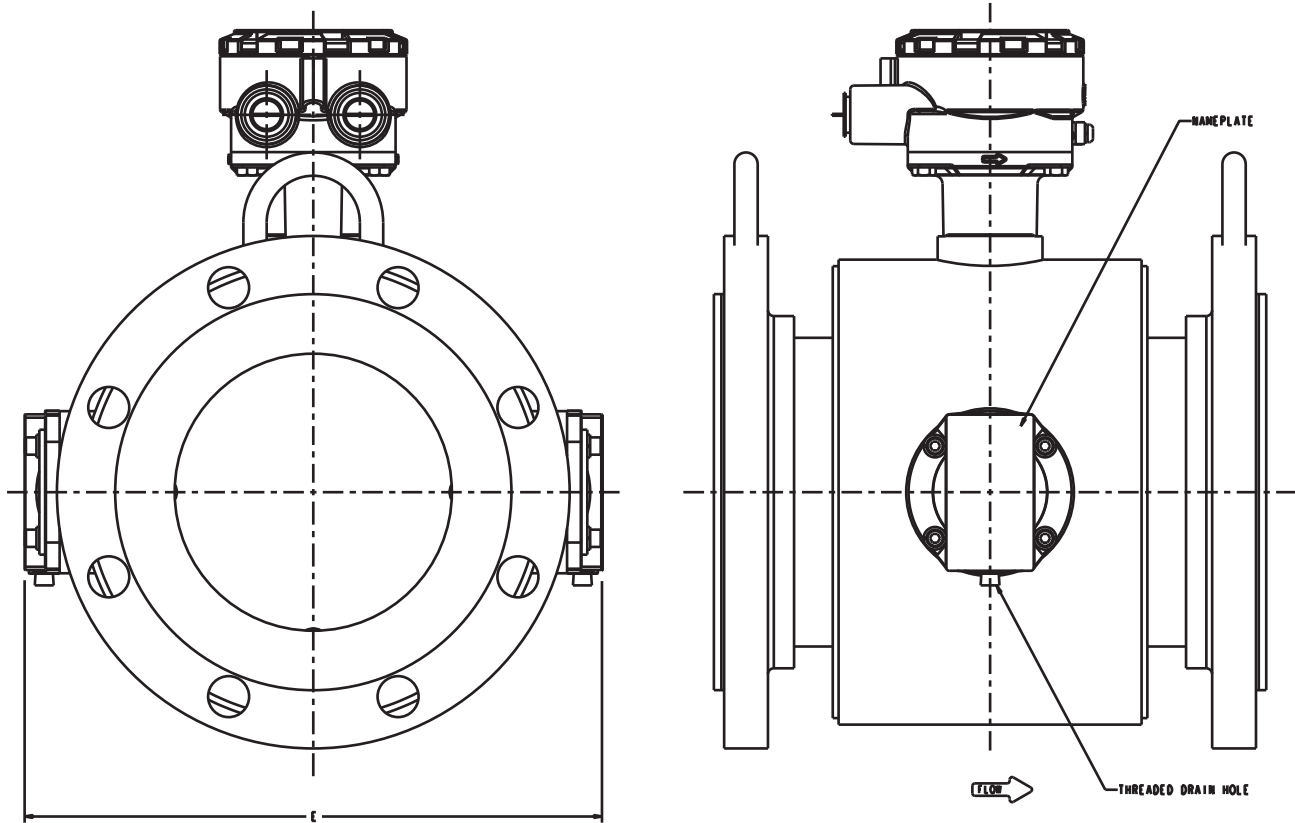


Table 36. Body Width with Electrode Access (W3)

Size -- in (mm) All Flanges	Body Width with W3 DIM "E" (in.)	Body Width with W3 DIM "E" (mm)
0.5 (15)	6.22	158
1 (25)	6.68	170
1.5 (40)	7.47	190
2 (50)	7.47	190
3 (80)	9.45	240
4 (100)	10.15	258
6 (150)	12.34	313
8 (200)	14.28	363
10 (250)	17.00	432
12 (300)	19.15	486
14 (350)	21.28	541
16 (400)	23.30	592
18 (450)	25.82	656
20 (500)	27.84	707
24 (600)	32.39	823
30 (750)	38.04	966
36 (900)	45.91	1166

Figure 13. Lining Protector / Grounding Ring Assembly

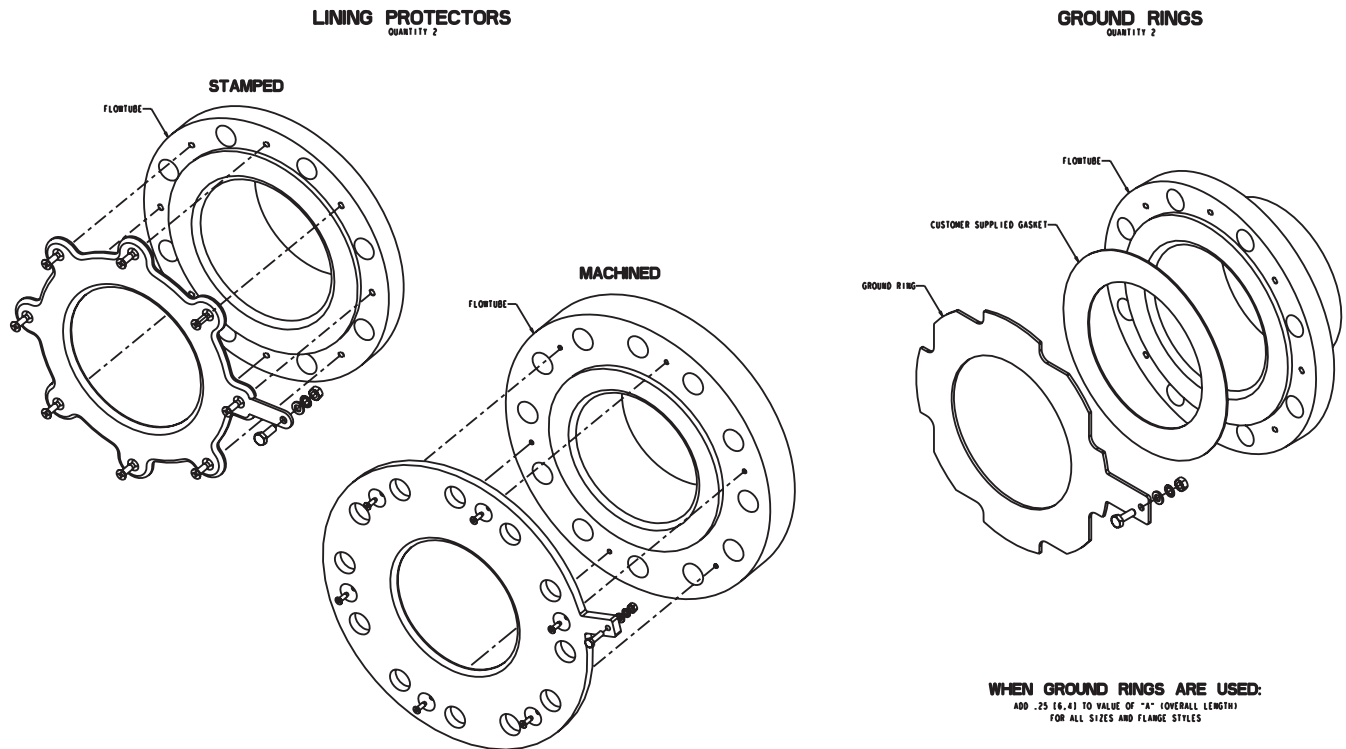


Table 37. When Liner Protectors Are Used

Flange Style	Sensor Size	Add This Value to "A" (Overall Length)
ANSI	0.5-in. through 10-in.	.25 (6,4)
	12-in. through 24-in.	.60 (15,2)
	30-in.	.75 (19)
	36-in.	1.0 (25,4)
DIN	0.5-in. through 8-in.	.25 (6,4)
	10-in.	.75 (19)
	12-in.	1.0 (25,4)
	14-in. through 24-in.	.60 (15,2)
	30-in.	.75 (19)
	36-in.	1.0 (25,4)

4.00
(101.6)

2.00
(50.8)

2.62
(66.4)

FLANGE BOLTS TO
STRADDLE CENTERLINE

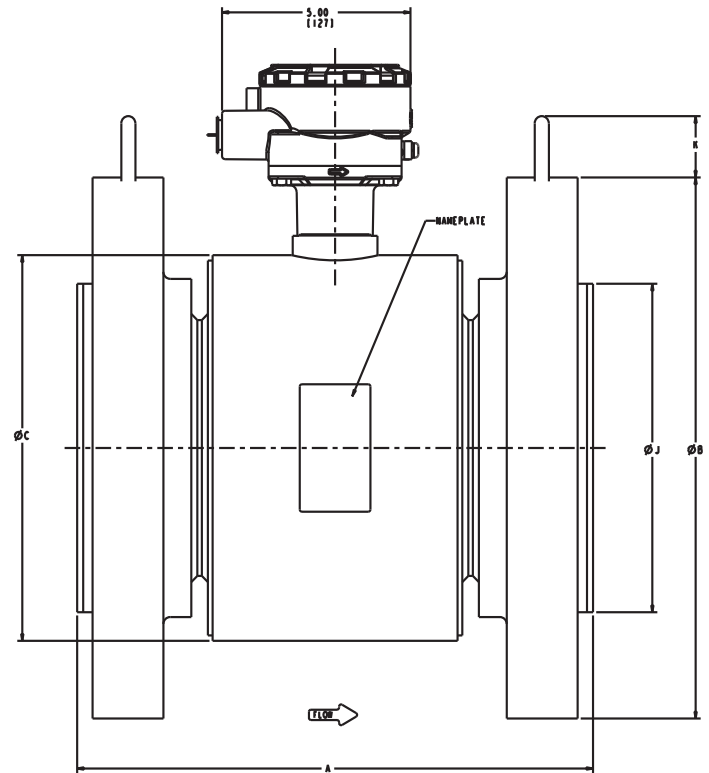


Table 38. 0.5-in. through 24-in. with Slip-on Flanges (mm) High pressure (P_≥600#)

Size, Description	Overall Length						
	DIM "A" PTFE	DIM "A" Poly	Body DIM "C"	CL to UMB DIM "D"	Liner on Face DIM "J"	Lift Ring Height DIM "K"	Sensor Weight lbs. (kg)
"0.5 (15) ANSI - 600# DERAT. SO / RF"	8.38 (213)	8.38 (213)	4.50 (114)	4.41 (112)	1.38 (35)		15 (6.8)
"1 (25) ANSI - 600# DERAT. SO / RF"	8.67 (220)	8.67 (220)	4.50 (114)	4.41 (112)	2.00 (51)		24 (10.9)
"1 (25) ANSI - 600# FULL SO / RF"		8.56 (217)	4.50 (114)	4.41 (112)	2.00 (51)		24 (10.9)
"1 (25) ANSI - 900# SO / RF"		9.68 (246)	4.50 (114)	4.41 (112)	2.00 (51)	1.70 (43)	30 (13.6)
"1.5 (40) ANSI - 600# DERAT. SO / RF"	8.63 (219)	8.63 (219)	5.21 (132)	4.82 (122)	2.88 (73)		22 (10.0)
"1.5 (40) ANSI - 600# FULL SO / RF"		8.54 (217)	5.21 (132)	4.82 (122)	2.88 (73)		22 (10.0)
"1.5 (40) ANSI - 900# SO / RF"		9.52 (242)	5.21 (132)	4.82 (122)	2.88 (73)	1.70 (43)	42 (19.1)
"2 (50) ANSI - 600# DERAT. SO / RF"	8.78 (223)	8.78 (223)	5.21 (132)	4.82 (122)	3.62 (92)		30 (13.6)
"2 (50) ANSI - 600# FULL SO / RF"		8.66 (220)	5.21 (132)	4.82 (122)	3.62 (92)		30 (13.6)
"2 (50) ANSI - 900# SO / RF"		10.28 (261)	5.21 (132)	4.82 (122)	3.62 (92)	1.70 (43)	63 (28.6)
"3 (80) ANSI - 600# DERAT. SO / RF"	12.40 (315)	12.40 (315)	7.21 (183)	5.82 (148)	5.00 (127)	1.70 (43)	52 (23.6)
"3 (80) ANSI - 600# FULL SO / RF"		12.22 (310)	7.21 (183)	5.82 (148)	5.00 (127)	1.70 (43)	52 (23.6)
"3 (80) ANSI - 900# SO / RF"		12.82 (326)	7.21 (183)	5.82 (148)	5.00 (127)	1.70 (43)	89 (40.4)
"4 (100) ANSI - 600# DERAT. SO / RF"	12.83 (326)	12.83 (326)	7.91 (201)	6.17 (157)	6.19 (157)	1.70 (43)	75 (34.0)
"4 (100) ANSI - 600# FULL SO / RF"		12.65 (321)	7.91 (201)	6.17 (157)	6.19 (157)	1.70 (43)	75 (34.0)
"4 (100) ANSI - 900# SO / RF"		13.89 (353)	7.91 (201)	6.17 (157)	6.19 (157)	2.00 (51)	138 (62.6)
"6 (150) ANSI - 600# DERAT. SO / RF"	14.23 (361)	14.21 (361)	9.98 (253)	7.30 (185)	8.50 (216)	1.70 (43)	120 (54.4)
"6 (150) ANSI - 600# FULL SO / RF"		14.01 (356)	9.98 (253)	7.30 (185)	8.50 (216)	1.70 (43)	120 (54.4)
"6 (150) ANSI - 900# SO / RF"		17.58 (447)	9.98 (253)	7.30 (185)	8.50 (216)	2.00 (51)	274 (124.3)
"8 (200) ANSI - 600# DERAT. SO / RF"	16.72 (425)	16.69 (424)	11.92 (303)	8.27 (210)	10.62 (270)	1.70 (43)	200 (90.7)
"8 (200) ANSI - 600# FULL SO / RF"		16.49 (419)	11.92 (303)	8.27 (210)	10.62 (270)	1.70 (43)	200 (90.7)
"8 (200) ANSI - 900# SO / RF"		20.61 (523)	11.92 (303)	8.27 (210)	10.62 (270)	3.13 (80)	499 (226.3)
"10 (250) ANSI - 600# DERAT. SO / RF"	19.54 (496)	19.30 (490)	14.64 (372)	9.69 (246)	12.75 (324)	2.00 (51)	455 (206.4)
"10 (250) ANSI - 600# FULL SO / RF"		18.75 (476)	14.64 (372)	9.69 (246)	12.75 (324)	2.00 (51)	455 (206.4)
"10 (250) ANSI - 900# SO / RF"		21.57 (548)	14.64 (372)	9.69 (246)	12.75 (324)	3.13 (80)	707 (320.7)
"12 (300) ANSI - 600# FULL SO / RF"		21.80 (554)	16.80 (427)	10.77 (274)	15.00 (381)	2.00 (51)	570 (258.5)
"12 (300) ANSI - 900# SO / RF"		23.49 (597)	16.80 (427)	10.77 (274)	15.00 (381)	3.13 (80)	1008 (457.2)
"14 (350) ANSI - 600# FULL SO / RF"		25.44 (646)	18.92 (481)	11.83 (300)	16.25 (413)	2.00 (51)	775 (352.3)
"16 (400) ANSI - 600# FULL SO / RF"		28.94 (735)	20.94 (532)	12.84 (326)	18.50 (470)	3.13 (80)	1104 (501.8)
"18 (450) ANSI - 600# FULL SO / RF"		32.42 (823)	23.46 (596)	14.10 (358)	21.00 (533)	3.13 (80)	1410 (641.0)
"20 (500) ANSI - 600# FULL SO / RF"		36.55 (928)	25.48 (647)	15.11 (384)	23.00 (584)	3.13 (80)	1827 (830.5)
"24 (600) ANSI - 600# FULL SO / RF"		41.05 (1043)	30.03 (763)	17.39 (442)	27.25 (692)	3.13 (80)	2700 (1227)

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Figure 15. 1-in. through 24-in. Weld Neck Flanges - High Pressure Meters (ANSI 600# - ANSI 2500#)

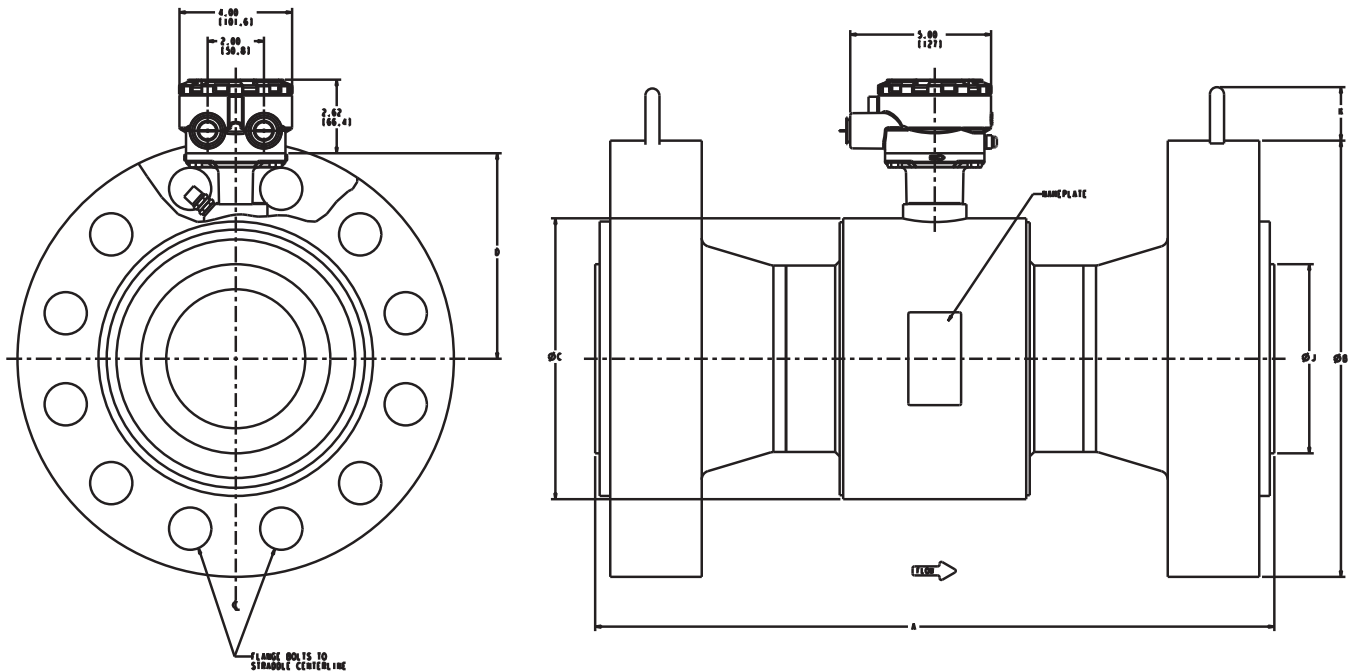


Table 39. 1-in. through 24-in. Weld Neck Flanges (mm)

Size, Description	DIM "A" Neoprene	DIM "A" Linatex	DIM "A" Poly	Body DIM "C"	CL to UMB DIM "D"	Liner on Face DIM "J"	Lift Ring Height DIM "K"	Sensor Weight lbs. (kg)
1.5 (40) ANSI - 1500# WN / RTJ	13.12 (333)	13.12 (333)	13.12 (333)	5.21 (132)	4.82 (122)	3.62 (92)	1.70 (43)	43.8 (19.9)
2 (50) ANSI - 1500# WN / RTJ	14.92 (379)	14.92 (379)	14.92 (379)	5.21 (132)	4.82 (122)	4.88 (124)	1.70 (43)	85.9 (39.1)
2 (50) ANSI - 2500# WN / RTJ	17.01 (432)	17.01 (432)	17.01 (432)	5.21 (132)	4.82 (122)	5.25 (133)	1.70 (43)	116 (52.7)
3 (80) ANSI - 1500# WN / RTJ	16.42 (417)	16.42 (417)	16.42 (417)	7.21 (183)	5.82 (148)	6.62 (168)	1.70 (43)	153 (69.6)
3 (80) ANSI - 2500# WN / RTJ	20.70 (526)	20.70 (526)	20.70 (526)	7.21 (183)	5.82 (148)	6.62 (168)	1.70 (43)	257 (116.6)
4 (100) ANSI - 1500# WN / RTJ	18.33 (466)	18.33 (466)	18.33 (466)	7.91 (201)	6.17 (157)	7.62 (194)	2.00 (51)	226 (102.7)
4 (100) ANSI - 2500# WN / RTJ	24.12 (613)	24.12 (613)	24.12 (613)	7.91 (201)	6.17 (157)	8.00 (203)	2.00 (51)	407 (185)
6 (150) ANSI - 1500# WN / RTJ	24.12 (613)	24.12 (613)	24.12 (613)	9.98 (253)	7.30 (185)	9.75 (248)	2.00 (51)	521 (236.9)
6 (150) ANSI - 2500# WN / RTJ	32.32 (821)	32.32 (821)	32.32 (821)	9.98 (253)	7.30 (185)	11.00 (279)	2.00 (51)	1048 (476.4)
8 (200) ANSI - 1500# WN / RTJ	29.11 (739)	29.11 (739)	29.11 (739)	11.92 (303)	8.27 (210)	12.50 (318)	3.13 (80)	937 (425.9)
8 (200) ANSI - 2500# WN / RTJ	37.53 (953)	37.53 (953)	37.53 (953)	11.92 (303)	8.27 (210)	13.38 (340)	3.13 (80)	1722 (782.7)
10 (250) ANSI - 1500# WN / RTJ	32.44 (824)	32.44 (824)	32.44 (824)	14.64 (372)	9.69 (246)	14.62 (371)	3.13 (80)	1643 (746.8)
10 (250) ANSI - 2500# WN / RTJ	45.86 (1165)	45.86 (1165)	45.86 (1165)	14.64 (372)	9.69 (246)	16.75 (425)	3.13 (80)	3280 (1491)
12 (300) ANSI - 1500# WN / RTJ	37.76 (959)	37.76 (959)	37.76 (959)	16.50 (419)	10.77 (274)	17.25 (438)	3.13 (80)	2597 (1181)
12 (300) ANSI - 2500# WN / RTJ	52.41 (1331)	52.41 (1331)	52.41 (1331)	16.50 (419)	10.77 (274)	19.50 (495)	3.13 (80)	4961 (2255)

Figure 16. Standard Wafer Magmeters

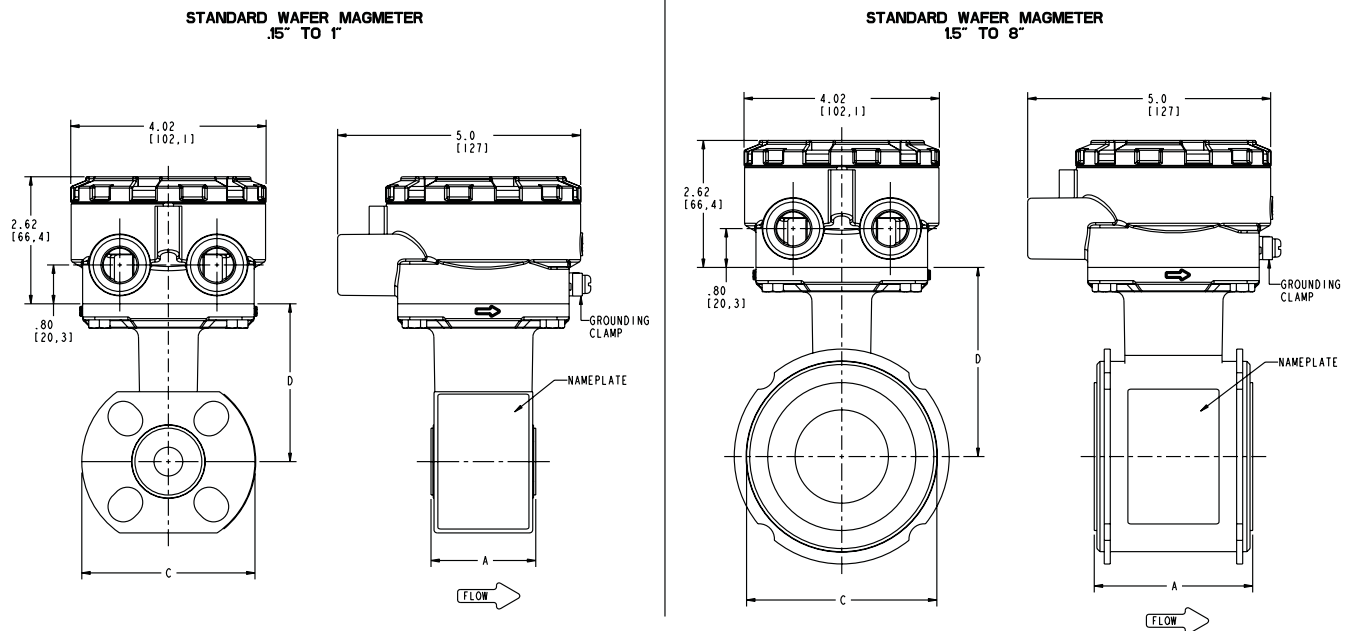


Table 40. 0.15-in. through 8-in. Wafer (mm)

Size, Description	Overall Length			Body DIM "C"	CL to UMB DIM "D"	Liner on Face DIM "J"	Sensor Weight lbs. (kg)
	DIM "A" PTFE	DIM "A" ETFE	DIM "A" PFA				
0.15 (4) WAFER UP TO ANSI - 150# / DIN PN16			2.17 (55)	3.56 (90)	3.25 (83)	1.37 (35)	4 (1.8)
0.3 (8) WAFER UP TO ANSI - 150# / DIN PN16			2.17 (55)	3.56 (90)	3.25 (83)	1.37 (35)	4 (1.8)
0.5 (15) WAFER UP TO ANSI - 300# / DIN PN40	2.21 (56)	2.16 (55)		3.56 (90)	3.25 (83)	1.38 (35)	4 (1.8)
1 (25) WAFER UP TO ANSI - 300# / DIN PN40	2.26 (57)	2.13 (54)		4.50 (114)	3.56 (90)	1.94 (49)	5 (2.3)
1.5 (40) WAFER UP TO ANSI - 300# / DIN PN40	2.88 (73)	2.73 (69)		3.29 (84)	3.67 (93)	2.42 (61)	5 (2.3)
2 (20) WAFER UP TO ANSI - 300# / DIN PN40	3.32 (84)	3.26 (83)		3.92 (99)	3.89 (99)	3.05 (77)	7 (3.2)
3 (80) WAFER UP TO ANSI - 300# / DIN PN40	4.71 (120)	4.62 (117)		5.17 (131)	4.51 (115)	4.41 (112)	13 (5.9)
4 (100) WAFER UP TO ANSI - 300# / DIN PN40	5.87 (149)	5.83 (148)		6.39 (162)	5.12 (130)	5.80 (147)	22 (10.0)
6 (150) WAFER UP TO ANSI - 300# / DIN PN40	7.08 (180)	6.87 (174)		8.57 (218)	6.22 (158)	7.86 (200)	35 (15.9)
8 (200) WAFER UP TO ANSI - 300# / DIN PN40	9.06 (230)	8.86 (225)		10.63 (270)	7.25 (184)	9.86 (250)	60 (27.2)

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Figure 17. Dimensional Drawings of Rosemount 8721 Sensors Typical of 1 through 4inch (25 through 100mm) line sizes.

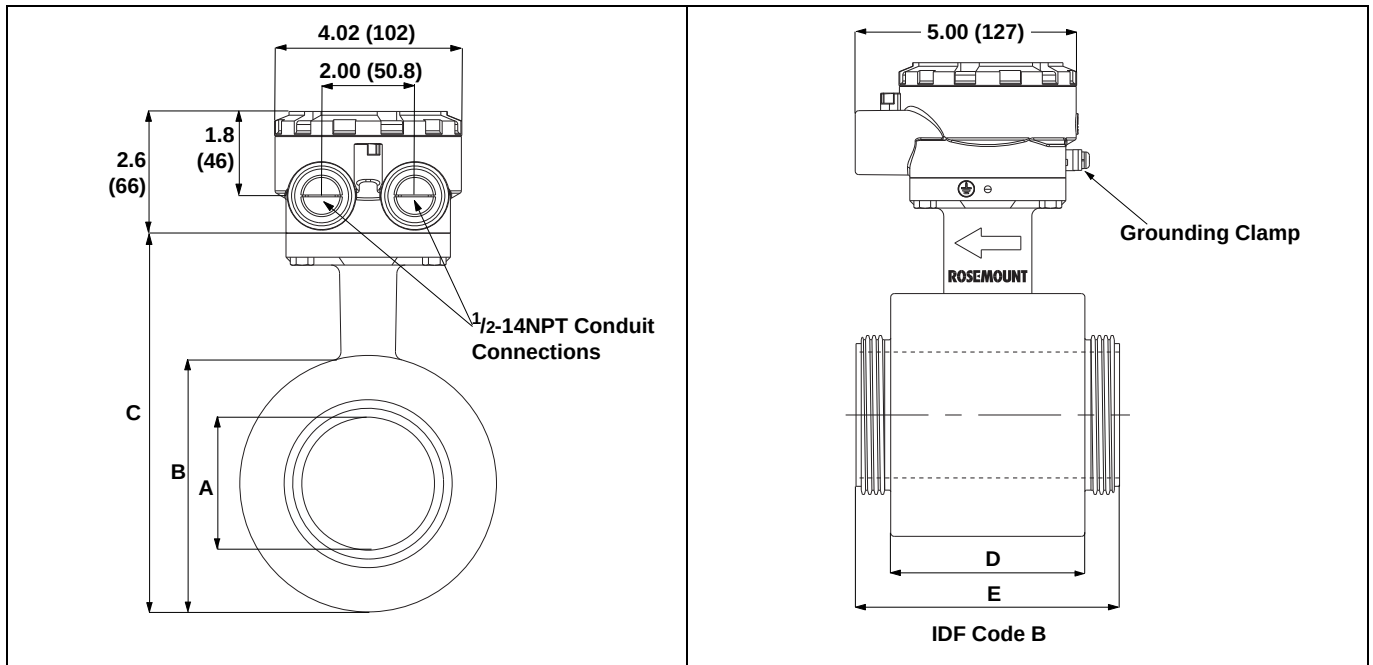


Table 41. Rosemount 8721 Dimensions in Inches (Millimeters). Refer to Dimensional Drawing Figure 17.

Line Size	Sensor Dimensions A	Body Diameter B	Sensor Height C	Body Length D	IDF Length E
1/2 (15)	0.62 (15.8)	2.87 (73.0)	5.51 (140.0)	2.13 (54.0)	3.66 (93.0)
1 (25)	0.87 (22.2)	2.87 (73.0)	5.51 (140.0)	2.13 (54.0)	3.66 (93.0)
1 1/2 (40)	1.37 (34.9)	3.50 (88.9)	6.14 (155.9)	2.40 (61.0)	3.96 (100.5)
2 (50)	1.87 (47.6)	4.00 (101.5)	6.63 (168.5)	2.83 (72.0)	4.41 (112.0)
2 1/2 (65)	2.38 (60.3)	4.53 (115.0)	7.17 (182.0)	3.58 (91.0)	5.23 (133.0)
3 (80)	2.87 (73.0)	5.57 (141.5)	8.21 (208.5)	4.41 (112.0)	5.98 (152.0)
4 (100)	3.84 (97.6)	6.98 (177.0)	9.61 (244.0)	5.20 (132.0)	6.77 (172.0)

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Figure 18. Dimensional Drawings of Rosemount 8721 Sensors Typical of 1 through 4inch (25 through 100mm) line sizes

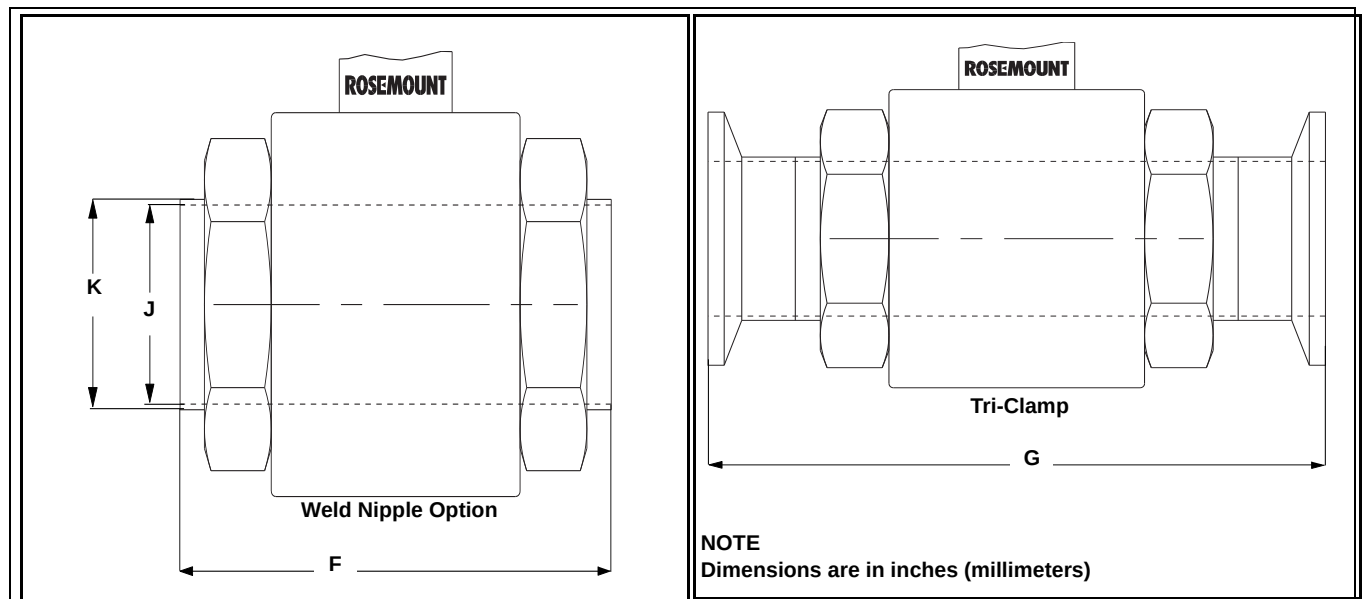


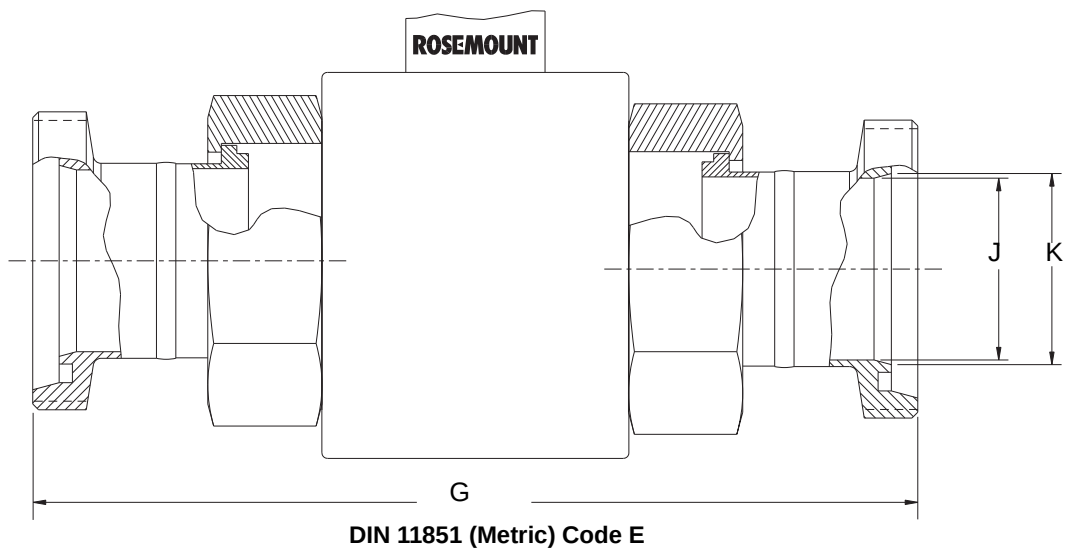
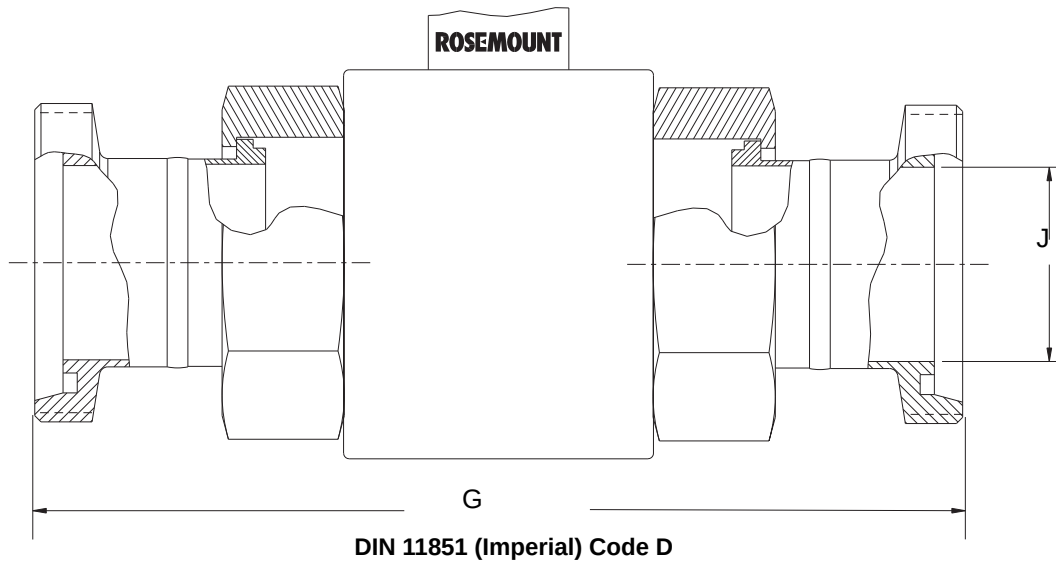
Table 42. Rosemount 8721 Process Connection Lay Length in Inches (Millimeters). Refer to Figure 18.

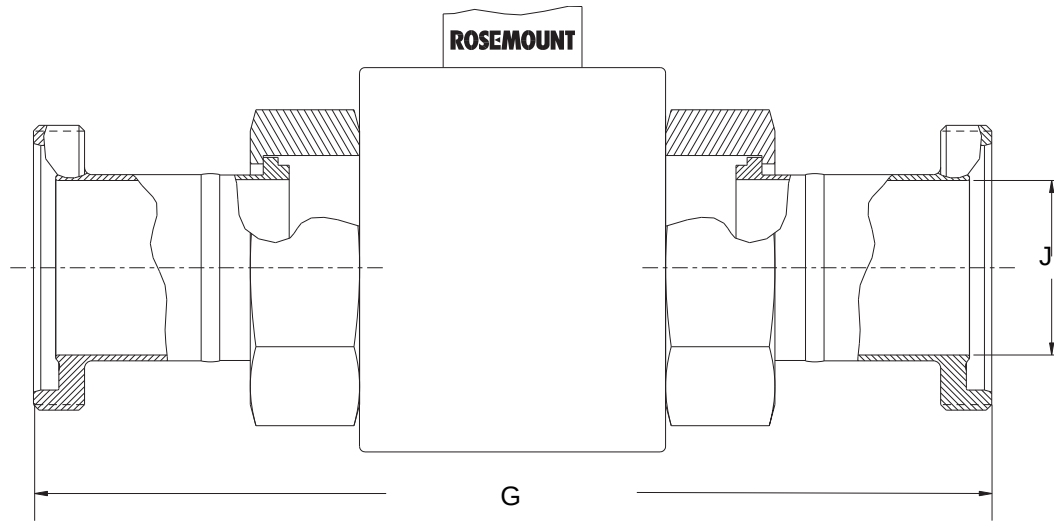
Line Size	Weld Nipple Length F	Weld Nipple Sensor ID J	Weld Nipple Sensor OD K	Tri Clamp Length G	HP Option Length G	DIN 11851 (Met and Imp) Length G	DIN 11851 (Met and Imp) ID J	DIN 11851 (Metric) ID J
1/2 (15)	5.61 (142)	0.62 (15.75)	0.75 (19.05)	8.31 (211)	NA	8.33 (211)	0.62 (15.75)	0.79 (19.99)
1 (25)	5.61 (142)	0.87 (22.2)	1.00 (25.65)	7.85 (199)	9.85 (250)	7.89 (200)	0.85 (21.52)	1.02 (26.01)
1 1/2 (40)	5.92 (150)	1.37 (34.9)	1.68 (42.7)	8.17 (207)	9.91 (252)	8.53 (217)	1.37 (34.85)	1.50 (38.00)
2 (50)	6.35 (161)	1.87 (47.6)	2.01 (51.05)	8.60 (218)	9.91 (252)	9.10 (231)	1.87 (47.60)	1.97 (50.01)
2 1/2 (65)	7.18 (182)	2.37 (60.3)	2.51 (63.75)	9.43 (239)	9.91 (252)	10.33 (262)	2.37 (60.30)	2.60 (65.99)
3 (80)	7.93 (201)	2.87 (73.0)	3.01 (76.45)	10.18 (258)	9.91 (252)	11.48 (291)	2.87 (72.97)	3.19 (81.03)
4 (100)	9.46 (240)	3.84 (97.6)	4.01 (101.85)	11.70 (297)	NA	13.72 (349)	3.84 (97.61)	3.94 (100.00)

Line Size	DIN 11864-1 Length G	DIN 11864-2 Length G	SMS 1145 Length G	Cherry-Burrell I-Line Length G
1/2 (15)	NA	NA	NA	NA
1 (25)	8.98 (228.0)	8.86 (225.0)	6.87 (174)	7.17 (182)
1 1/2 (40)	9.72 (247.0)	9.57 (243.0)	7.50 (190)	7.80 (198)
2 (50)	10.16 (258.0)	10.00 (254.0)	7.93 (201)	8.42 (214)
2 1/2 (65)	11.89 (302.0)	11.54 (293.0)	9.07 (230)	9.49 (241)
3 (80)	12.95 (329.0)	12.44 (316.0)	9.82 (249)	10.37 (263)
4 (100)	14.57 (370.0)	14.21 (361.0)	11.67 (296)	12.15 (309)

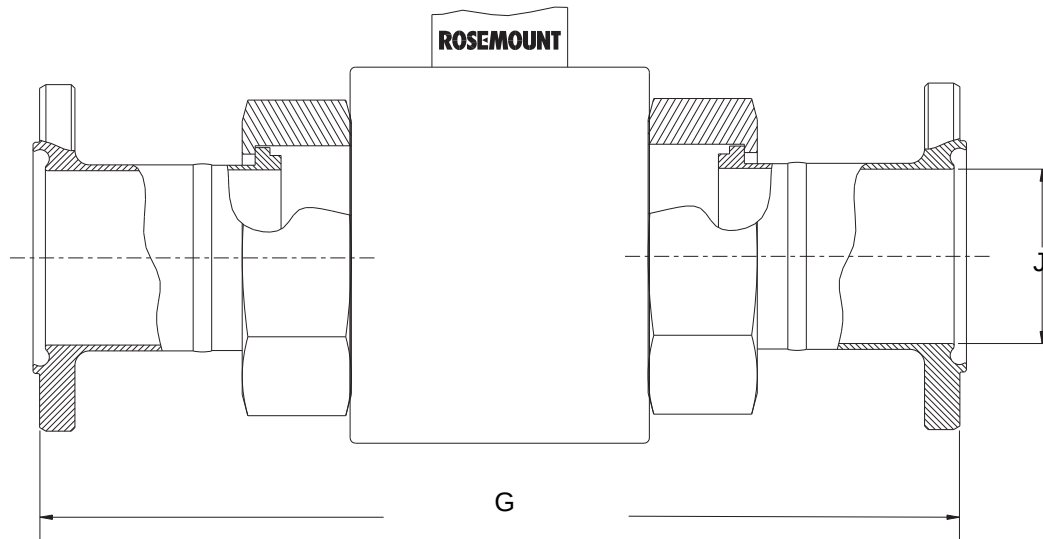
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11864-2

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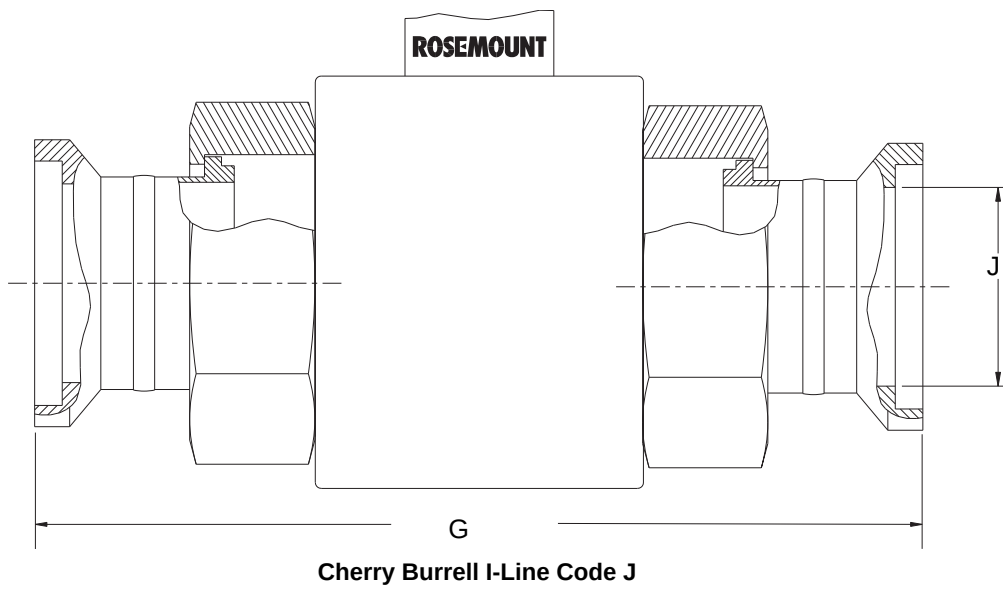
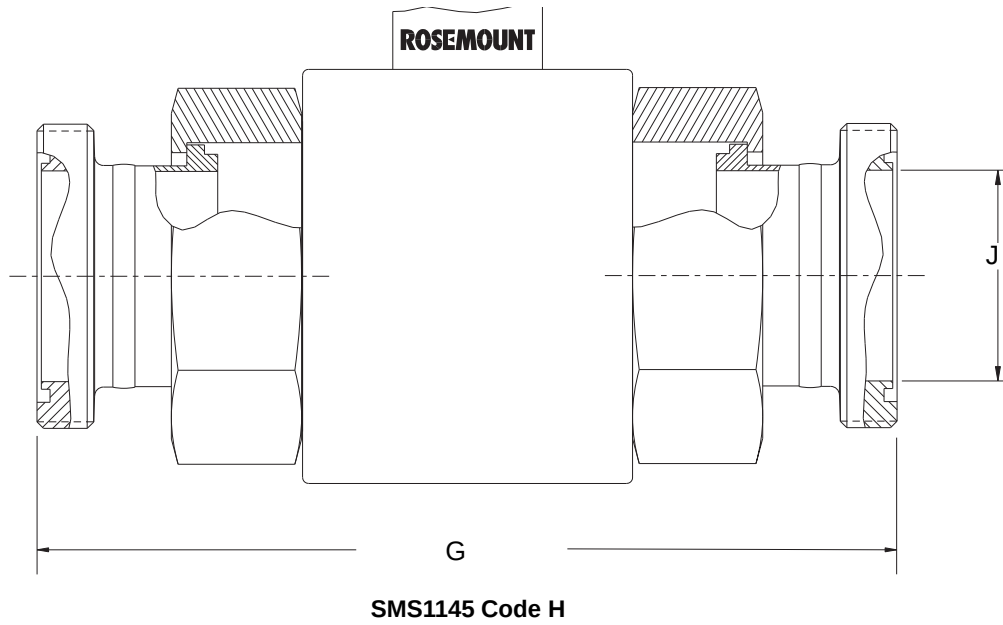
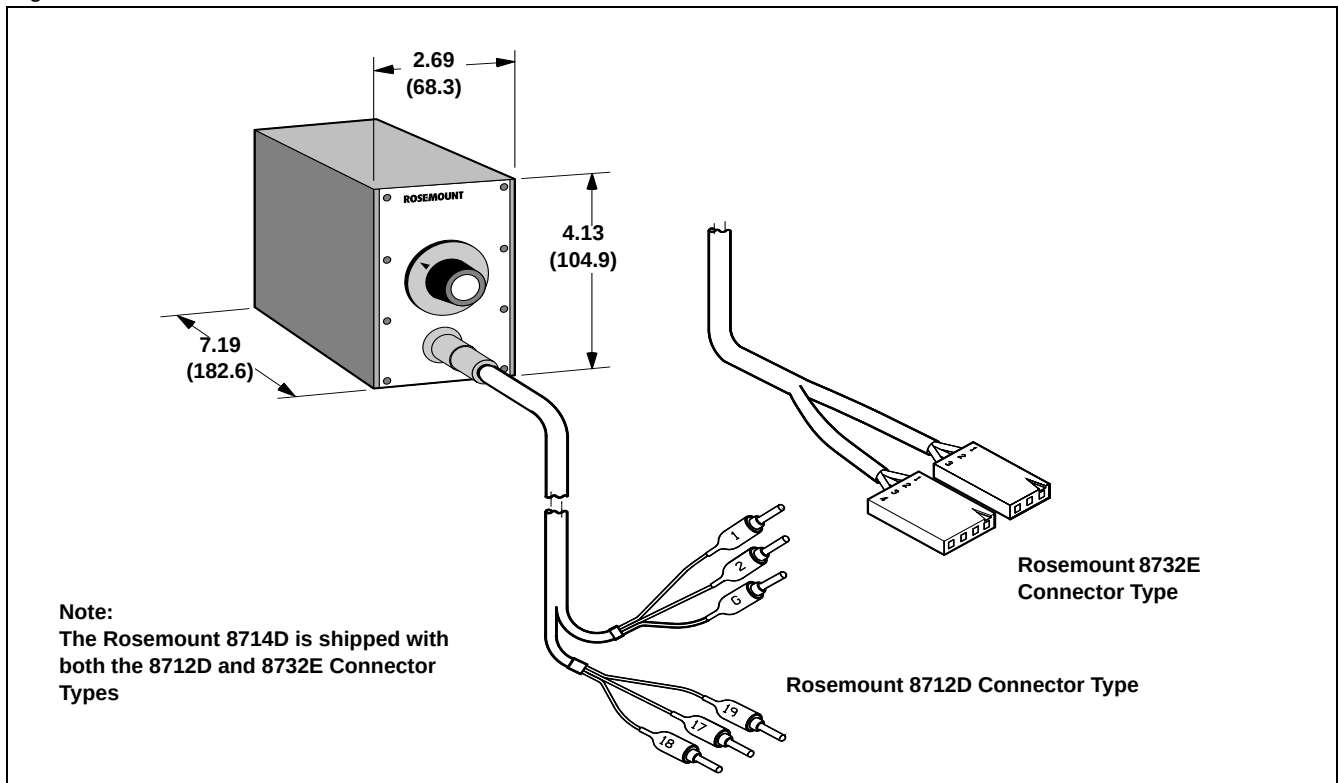


Figure 19. Rosemount 8714D Calibration Standard



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