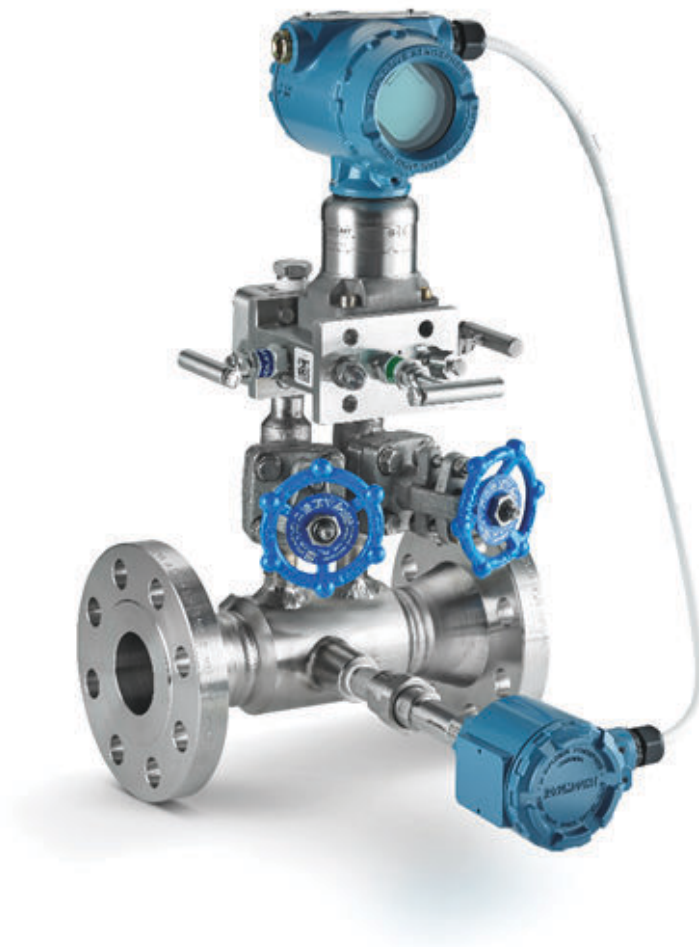


Rosemount[™] 9295 Process Flow Meter



- Multivariable capabilities allow for real-time fully compensated mass and energy flow
- Integral temperature measurement
- Reduce straight pipe requirements with no additional straight pipe run needed for most applications
- Improve accuracy and repeatability with Conditioning Orifice technology
- Redundant measurement capability with dual-transmitter options

DP flow meter selection guide

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



Rosemount 9295 Flow Meters enable best-in-class flow measurement utilizing advanced functionality.

- Up to 0.80 percent mass flow rate accuracy
- Multivariable capabilities allow for real time fully compensated mass and energy flow
- Advanced diagnostics predict and prevent abnormal process conditions
- Installation ready wireless flow solution
- Ultra for Flow measures percent-of-reading performance over 14:1 flow turndown
- 15-year stability, 15-year warranty with 3051S
- Available with 4–20 mA HART®, WirelessHART®, and FOUNDATION™ Fieldbus Protocols

Rosemount 9295 Conditioning Orifice Primary Elements save time and expense when measuring flow in difficult applications and piping arrangements.

- No additional straight pipe requirements outside of the meter spool section
- Discharge coefficient uncertainty (accuracy) up to ± 0.3 percent
- Integral temperature measurement without an additional pipe penetration with the compact design
- Reduce installation costs compared to traditional orifice plates with the integral design
- Conditioning orifice plate is based on industry standards
- Available in various styles providing installation flexibility

Rosemount 9295 Process Meter Primary Element

Rosemount 9295 Process Meter Primary Element utilizes an easy-to-install direct mount primary element assembly.

- No additional straight run required beyond meter spool section
- Up to 0.3% calibrated primary element accuracy

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Ordering information

Table 1: Rosemount 9295 Process Flow Meter Ordering Information

The starred offerings (★) represent the most common options and should be selected for best delivery. The non-starred offerings are subject to additional delivery lead time.

Model	Product description	
9295	Process meter primary element	
Primary element technology		
C	Conditioning orifice	★
Line size		
020	2-in. (50 mm)	★
030	3-in. (80 mm)	★
040	4-in. (100 mm)	★
060	6-in. (150 mm)	★
Pipe schedule		
S40	Schedule 40	★
S80	Schedule 80	
S12	Schedule 120	
S16	Schedule 160	
Equivalent orifice bore		
0827	0.827 in. (21.00 mm) for 2 inch Schedule 40 Meter (0.40 beta)	★
0776	0.776 in. (19.70 mm) for 2 inch Schedule 80 Meter (0.40 beta)	★
0675	0.675 in. (17.14 mm) for 2 inch Schedule 160 Meter (0.40 beta)	★
1034	1.034 in. (26.25 mm) for 2 inch Schedule 40 Meter (0.50 beta)	★
0970	0.970 in. (24.63 mm) for 2 inch Schedule 80 Meter (0.50 beta)	★
0844	0.844 in. (21.42 mm) for 2 inch Schedule 160 Meter (0.50 beta)	★
1240	1.240 in. (31.50 mm) for 2 inch Schedule 40 Meter (0.60 beta)	★
1163	1.163 in. (29.55 mm) for 2 inch Schedule 80 Meter (0.60 beta)	★
1012	1.012 in. (25.71 mm) for 2 inch Schedule 160 Meter (0.60 beta)	★
1227	1.227 in. (31.17 mm) for 3 inch Schedule 40 Meter (0.40 beta)	★
1160	1.160 in. (29.46 mm) for 3 inch Schedule 80 Meter (0.40 beta)	★
1050	1.050 in. (26.66 mm) for 3 inch Schedule 160 Meter (0.40 beta)	★
1534	1.534 in. (38.96 mm) for 3 inch Schedule 40 Meter (0.50 beta)	★
1450	1.450 in. (36.83 mm) for 3 inch Schedule 80 Meter (0.50 beta)	★
1312	1.312 in. (33.32 mm) for 3 inch Schedule 160 Meter (0.50 beta)	★
1994	1.994 in. (50.65 mm) for 3 inch Schedule 40 Meter (0.65 beta)	★
1885	1.885 in. (47.88 mm) for 3 inch Schedule 80 Meter (0.65 beta)	★
1706	1.706 in. (43.32 mm) for 3 inch Schedule 160 Meter (0.65 beta)	★
1610	1.610 in. (40.90 mm) for 4 inch Schedule 40 Meter (0.40 beta)	★
1530	1.530 in. (38.87 mm) for 4 inch Schedule 80 Meter (0.40 beta)	★

Table 1: Rosemount 9295 Process Flow Meter Ordering Information (continued)

1449	1.449 in. (36.80 mm) for 4 inch Schedule 120 Meter (0.40 beta)	★
1375	1.375 in. (34.93 mm) for 4 inch Schedule 160 Meter (0.40 beta)	★
2013	2.013 in. (51.13 mm) for 4 inch Schedule 40 Meter (0.50 beta)	★
1913	1.913 in. (48.59 mm) for 4 inch Schedule 80 Meter (0.50 beta)	★
1812	1.812 in. (46.02 mm) for 4 inch Schedule 120 Meter (0.50 beta)	★
1719	1.719 in. (43.66 mm) for 4 inch Schedule 160 Meter (0.50 beta)	★
2617	2.617 in. (66.47 mm) for 4 inch Schedule 40 Meter (0.65 beta)	★
2487	2.487 in. (63.17 mm) for 4 inch Schedule 80 Meter (0.65 beta)	★
2356	2.356 in. (59.83 mm) for 4 inch Schedule 120 Meter (0.65 beta)	★
2235	2.235 in. (56.76 mm) for 4 inch Schedule 160 Meter (0.65 beta)	★
2426	2.426 in. (61.62 mm) for 6 inch Schedule 40 Meter (0.40 beta)	★
2304	2.304 in. (58.53 mm) for 6 inch Schedule 80 Meter (0.40 beta)	★
2200	2.200 in. (55.89 mm) for 6 inch Schedule 120 Meter (0.40 beta)	★
2075	2.075 in. (52.70 mm) for 6 inch Schedule 160 Meter (0.40 beta)	★
3033	3.033 in. (77.03 mm) for 6 inch Schedule 40 Meter (0.50 beta)	★
2881	2.881 in. (73.16 mm) for 6 inch Schedule 80 Meter (0.50 beta)	★
2751	2.751 in. (69.86 mm) for 6 inch Schedule 120 Meter (0.50 beta)	★
2594	2.594 in. (65.87 mm) for 6 inch Schedule 160 Meter (0.50 beta)	★
3942	3.942 in. (100.13 mm) for 6 inch Schedule 40 Meter (0.65 beta)	★
3745	3.745 in. (95.11 mm) for 6 inch Schedule 80 Meter (0.65 beta)	★
3576	3.576 in. (90.82 mm) for 6 inch Schedule 120 Meter (0.65 beta)	★
3372	3.372 in. (85.64 mm) for 6 inch Schedule 160 Meter (0.65 beta)	★
XXXX	Custom orifice bore	
Mounting type		
A1	ANSI Class 150 RF	★
A3	ANSI Class 300 RF	
A6	ANSI Class 600 RF	
A9	ANSI Class 900 RF	
Flange, body, impulse material		
S	316/L stainless steel	★
C	Carbon steel (A350 LF2)	
Orifice material		
S	316/L stainless steel	★
C	Carbon steel (A350 LF2)	
Transmitter connection platform		
3	Direct mount flow transmitter	★
7	Remote mount flow transmitter with NPT taps	★
8	Remote mount flow transmitter with SW taps	

Table 1: Rosemount 9295 Process Flow Meter Ordering Information (continued)

Root valves		
L0	No valves required, left-handed	★
L1	OS&Y gate valves, left-handed	★
R0	No valves required, right-handed	
R1	OS&Y gate valves, right-handed	
Assembly options		
SJ	Attach pressure transmitter and manifold	★
SK	Attach temperature sensor only	★
SL	Attach pressure transmitter, manifold, and temperature sensor	★
SM	Link with remote mount pressure transmitter and manifold	
SN	Attach temperature sensor with remote mount pressure transmitter and manifold	★
S0	No secondary sensing elements	

Table 2: Options

Include with selected model number.

Redundant taps		
R18	180 degree orientation	
Extended product warranty		
WR3	3-year limited warranty	★
WR5	5-year limited warranty	★
Pressure testing		
P1	Hydrostatic testing	
O-Ring and thread sealing options		
G5	Graphite O-rings and thread sealant	★
Material testing		
V1	Dye penetrant exam with certificate	
Material examination		
V2	Radiographic examination of flange butt welds	
Positive material identification		
Q76	Positive Material Identification (PMI)	
Flow calibrations		
WD	Flow calibration	
Special inspection		
QC1	Visual and dimensional inspection with certificate	
Material traceability certification		
Q8	Material traceability certification per EN 10204: 2004_3.1	
Code conformance		
J2	ANSI / ASME B31.1	
J3	ANSI / ASME B31.3	

Table 2: Options (continued)

Country certification		
J1	Canadian Registration (CRN)	
J6	European Pressure Directive (PED)	
NACE® certificate		
Q15	NACE MR-0175 / ISO 15156	
Typical model number: 9295 C S 020 S40 1234 A1 S S 3 L1 SJ		

Specifications

Performance specifications

Table 3: Process Meter Primary Element Uncertainty - No Straight Run

Beta Ratio	Discharge Coefficient Uncertainty Calibration Option (WD)	Discharge Coefficient Uncertainty Standard
0.20 - 0.40	±0.50%	±1.00% ⁽¹⁾
0.41 - 0.50	± 0.90%	±1.00%
>0.50	±1.40%	±1.50%

(1) For 2" (50 mm) pipe size, add an additional 0.50 percent.

* For beta <0.50 and Re/D of <8000, add an additional 1.5 percent; for beta >0.50 and Re/D of <16000, add an additional 1.5 percent.

Table 4: Process Meter Primary Element Uncertainty - Greater than 20 D Straight Run *

Beta Ratio	Discharge Coefficient Uncertainty Calibration Option (WD)	Discharge Coefficient Uncertainty Standard
0.20 - 0.40	±0.30%	±1.00% ⁽¹⁾
0.41 - 0.50	±0.40%	±0.75%
>0.50	±0.50%	±0.75%

(1) For 2" (50mm) pipe size, add an additional 0.50 percent.

* For beta <0.50 and Re/D of <8000, add an additional 1.5 percent; for beta >0.50 and Re/D of <16000, add an additional 1.5 percent.

Applicability of the above performance specifications over a specified turndown range is dependent on the performance class of the transmitter:

- 3051S with Ultra for Flow: Up to 14:1
- 3051S Classic – 8:1

The turndown statement above assumes a primary element sized to produce at least 100 inH₂O.

Sizing

Contact an Emerson sales representative assistance. A Configuration Data Sheet is required prior to order for application verification. To complete the Configuration Data Sheet, go to: [Emerson.com/Rosemount/DP-Flow-Configuration-Assistant](https://www.emerson.com/Rosemount/DP-Flow-Configuration-Assistant).

Functional specifications

Service

- Liquid
- Gas
- Vapor (Steam)

Process temperature limits

Direct mount transmitter

- -20 to 450 °F (-29 to 232 °C)

Remote mount transmitter

- 316 SST -20 to 850 °F (-29 to 454 °C)
- Carbon Steel -20 to 700 °F (-29 to 371 °C)

Differential pressure limits

Table 5: Maximum Allowable DP (Measurement in inH₂O [bar])

Line size inches (mm)	Temp °F (°C)	DP limit inH ₂ O (bar)
≤ 6 (152)	850 (454)	1200 (2.98)

Maximum working pressure

Pressure retention per ANSI B16.5 Class 900 or ordered flange rating.

Vibration effect

Qualified per IEC60068-2-6 (10-500 Hz, m/s² acceleration amplitude, 20 sweep cycles) for field with general application or pipeline with low vibration level.

Note

For applications where vibration is expected, Emerson recommends remote-mount configuration.

Physical specifications

Temperature measurment for primary element technology

Integral RTD

- Utilizes Emerson 214C non-intrusive RTD with up to ANSI CL900 pressure rating; 100 ohm resistance.

Physical details

Body

- 316/316L SST or A350 LF2 Carbon Steel

Manifold head/valves

- 316 SST

Flange studs, nuts, and gaskets

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

Gasket and O-rings

- Flange gaskets are customer supplied.
- O-rings are available as spare parts
- Emerson recommends replacing gaskets and O-rings when the Rosemount 9295 is disassembled.

Transmitter connections

Direct mount

- Available with Rosemount 3051SMV and 3051S transmitters.

Remote mount

- Primary Element available with ½-in. NPT (standard) or ½ in. socket weld connections
- Remote Mount transmitter connections available with ½-in. NPT

Conditioning orifice design

Orifice type

- Square-edged

Orifice pressure taps

- Flange tap spacing

Equivalent orifice bore size for conditioning orifice meters

- The actual diameter of each bore of the conditioning orifice is ½ the diameter of the equivalent single hole orifice (e.g., if the equivalent bore is 2.000 inches, the actual diameter of each of the four conditioning orifice bores will be 1.000 inch).

Installation requirements

Table 6: Straight Pipe Requirements*

	Type of Flow Disturbance UPstream of Flow Meter	Diameters of Straight Pipe Run Needed
Upstream (inlet) side of primary	Single 90 ° bend in the same plane	0
	Two or more 90 ° bend in same plane	0
	Two or more 90 ° bend in different planes	0
	Up to 10° of swirl	0
	Reducer (One line size)	0
	Butterfly Valve (75% - 100% open)	0
Downstream (outlet) side of primary (all disturbances)		0

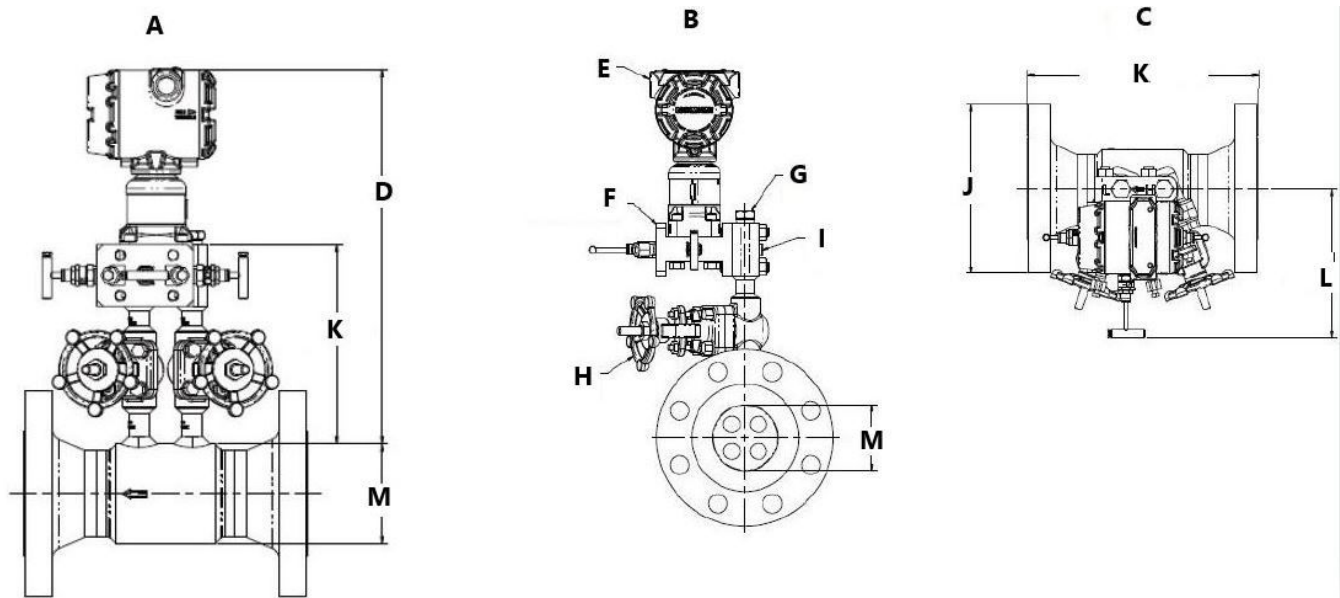
*Distance in number of pipe diameters.

Note

- If a disturbance is not listed, then consult an Emerson representative.
- Straight pipe lengths are measured from the upstream and downstream flanges of the 9295. A zero diameter requirement implies that the 9295 can be installed directly adjacent to a disturbance.

Dimensional drawings

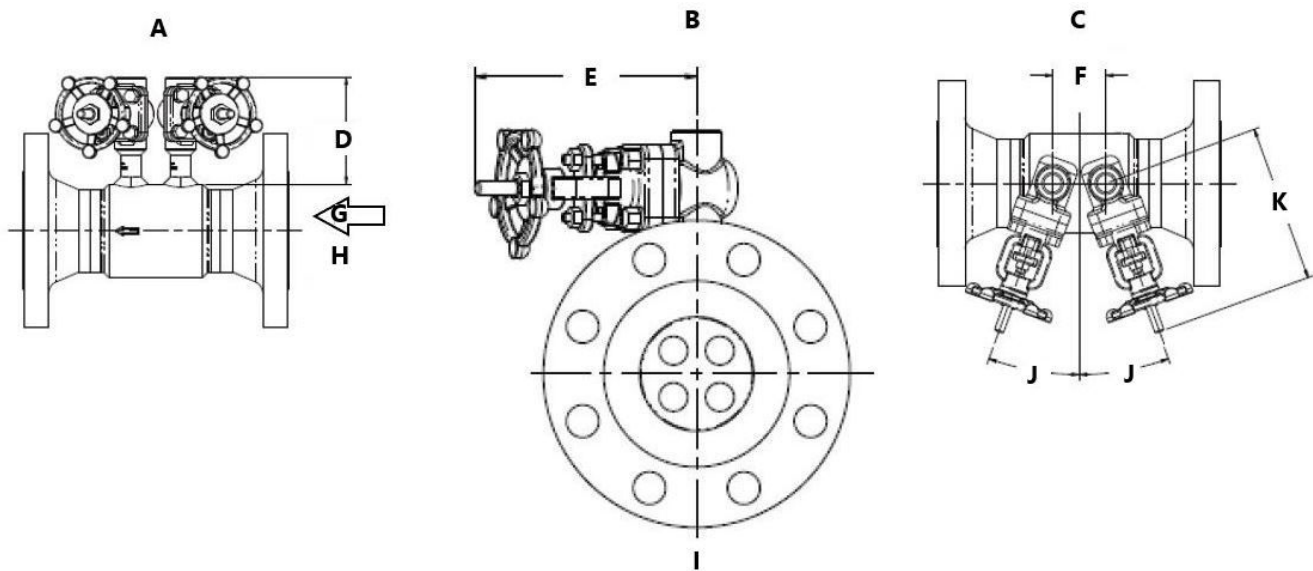
Figure 1: Rosemount 9295 with Integral Transmitter



- A. Front view
- B. Side view
- C. Top view
- D. 14.75 - 15.71 in. (374,7 - 399,0 mm)
- E. Rosemount transmitter
- F. Rosemount 305 series 3-valve manifold
- G. 2x ½-in. NPT hex head plug
- H. 2x OS&Y gate valve, bolted bonnet, API 602 CL800 or CL1500
- I. 2x ¼-in socket head plug
- J. Flange OD per B16.5
- K. Meter length .13 (3,3)
- L. 7.63 in. (193,8 mm) **OPEN**; 6.63 in. (168,4 mm) **CLOSED**
- M. Meter Ø OD

Note

Dimensions are in inches (mm).

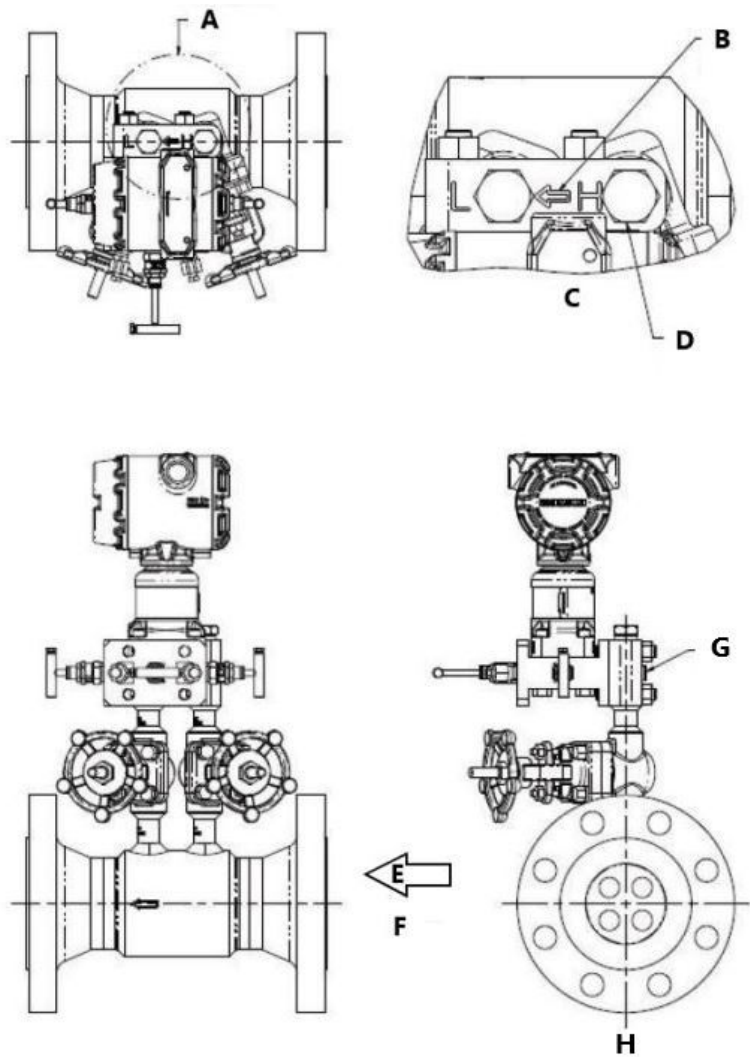
Figure 2: Rosemount 9295 Remote Mount Transmitter

- A. Front view
- B. Side view
- C. Top view
- D. 4.35 - 5.0 in. (11,5 - 129,2 mm)
- E. 6.0 in. (152 mm)
- F. 2.126 in. (54,00 mm)
- G. Flow
- H. Flow is from right to left as you look at the valves.
- I. Looking downstream
- J. 20 in. (508 mm)
- K. 6.3 in. max (160 mm max)

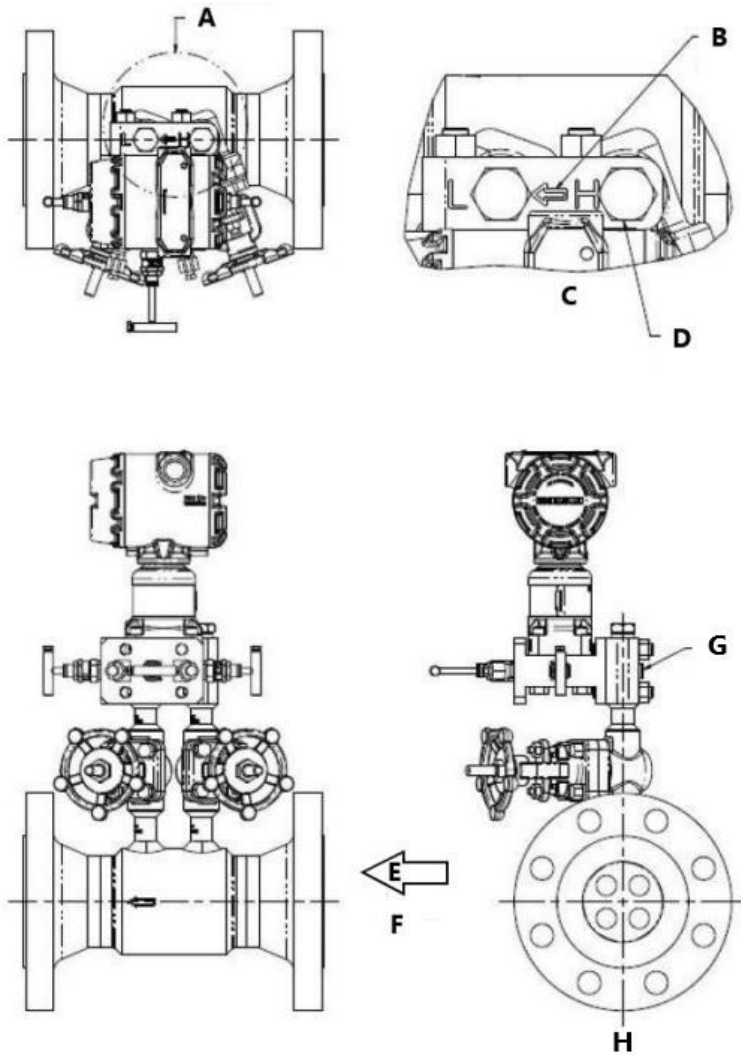
Note

For additional product dimensions, see the 9295 Primary Element Type 1 Drawing.
Dimensions are in inches (mm).

Figure 3: Direct Mount, Left-Handed



- A. See Detail A
- B. Flow is from right to left as you look at the valves.
- C. Detail A, Scale 1/1
- D. 2x 1/2-in hex head plug
- E. Flow
- F. Flow is from right to left as you look at the valves.
- G. 2x 1/4-in NPT socket head plug
- H. Looking downstream

Figure 4: Direct Mount, Right Handed

- A. See Detail B
- B. Flow is from left to right as you look at the valves.
- C. 2x 1/2-in hex head plug
- D. Detail B Scale 1/1
- E. Flow
- F. Flow is from left to right as you look at the valves.
- G. 2x 1/4-in NPT socket head plug
- H. Looking upstream

For more information: www.emerson.com

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