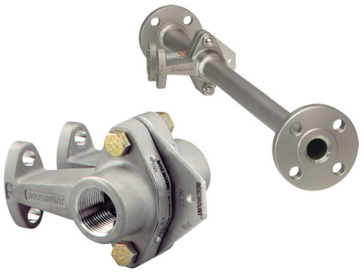
Rosemount 1195 Integral Orifice Primary Element



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 167
Dimensional Drawings: page 221
Installation and Flowmeter Orientation: page 181

Ordering information

Table 1. 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		
S	316 SST	★
Line size		
005	1/2-in. (15 mm)	★
010	1-in. (25 mm)	★
015	1 1/2-in. (40 mm)	★
Process connection		
T1	NPT Female Body (not available with thermowell and RTD)	★
S1(1)	Socket Weld Body (not available with thermowell and RTD)	★
P1	Pipe Ends: NPT threaded	★
P2	Pipe Ends: Beveled	★
D1	Pipe Ends: Flanged, 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	★
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	

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Orifice plate material		
S	316 SST	★
H	Alloy C-276	
M	Alloy 400	
Bore size option		
0066	0.066-in. (1.68 mm) for 1/2-in. Pipe	★
0109	0.109-in. (2.77 mm) for 1/2-in. Pipe	★
0160	0.160-in. (4.06 mm) for 1/2-in. Pipe	★
0196	0.196-in. (4.98 mm) for 1/2-in. Pipe	★
0260	0.260-in. (6.60 mm) for 1/2-in. Pipe	★
0340	0.340-in. (8.64 mm) for 1/2-in. Pipe	★
0150	0.150-in. (3.81 mm) for 1-in. Pipe	★
0250	0.250-in. (6.35 mm) for 1-in. Pipe	★
0345	0.345-in. (8.76 mm) for 1-in. Pipe	★
0500	0.500-in. (12.70 mm) for 1-in. Pipe	★
0630	0.630-in. (16.00 mm) for 1-in. Pipe	★
0800	0.800-in. (20.32 mm) for 1-in. Pipe	★
0295	0.295-in. (7.49 mm) for 1 1/2-in. Pipe	★
0376	0.376-in. (9.55 mm) for 1 1/2-in. Pipe	★
0512	0.512-in. (13.00 mm) for 1 1/2-in. Pipe	★
0748	0.748-in. (19.00 mm) for 1 1/2-in. Pipe	★
1022	1.022-in. (25.96 mm) for 1 1/2-in. Pipe	★
1184	1.184-in. (30.07 mm) for 1 1/2-in. Pipe	★
0010	0.010-in. (0,25 mm) for 1/2-in. Pipe	
0014	0.014-in. (0,36 mm) for 1/2-in. Pipe	
0020	0.020-in. (0,51 mm) for 1/2-in. Pipe	
0034	0.034-in. (0,86 mm) for 1/2-in. Pipe	
Transmitter/body bolt material		
C	316 SST (1 1/2-in. transmitter studs)	★
G[(2)]	High temperature [850 °F (454 °C)]	

Options (include with selected model number)

Extended product warranty		
WR3	3-year limited warranty	★
WR5	5-year limited warranty	★
Temperature sensor		
S[(3)]	Thermowell and RTD (SST Temperature Housing)	
T[(3)]	Thermowell and RTD (Aluminum Temperature Housing)	
Assemble to transmitter		
S4[(4)]	Factory assembly – Attach to transmitter and manifold	

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Optional bore calculation		
BC	Bore Calculation	★
Optional connection		
G1	DIN 19213 Transmitter Connection	★
Adapters for remote mounting		
G2	1/2–14 NPT Remote Adapters – SST	★
G3	1/2–14 NPT Remote Adapters – Alloy C-276	
Pressure testing		
P1(5)	Hydrostatic Testing with Certificate	
Special cleaning		
P2	Cleaning for Special Services	
PA	Cleaning per ASTM G93 Level D (section 11.4)	
Material testing		
V1	Dye Penetrant Exam	
Material examination		
V2	Radiographic Examination (available only with Process Connection code W1, W3, and W6)	
Flow calibration		
WD(6)	Discharge Coefficient Verification	
WZ(6)	Special Calibration	
Special inspection		
QC1	Visual and dimensional inspection with certificate	★
QC7	Inspection and performance certificate	★
Material traceability certification		
Q8	Material Traceability Certification per EN 10204:2004 3.1	★
Code conformance		
J2(7)	ANSI/ASME B31.1	
J3(7)	ANSI/ASME B31.3	
J4(7)	ANSI/ASME B31.8	
Materials conformance		
J5(8)	NACE MR-0175/ISO 15156	
Country certification		
J6	European Pressure Directive (PED)	★
J1	Canadian Registration	
Hardware adjustments and ground screw		
A1	External Ground Screw for Temperature Connection Head	
A2	Cover Clamp and External Ground Screw for Temperature Connection Head	

Table 1. 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.

Typical model number: 1195 S 010 W3 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 or 1.5" Line Option.

(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, 0034, 0066, or 0109.

(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.

Specifications

Performance specifications

Table 2. Discharge Coefficient Uncertainty(1)

Orifice plate bore	Discharge coefficient uncertainty
Bore < 0.160	±2.50%
0.160 ≤ Bore < 0.500	±1.50%
0.500 ≤ Bore ≤ 1.000	±1.00%
1.000 < Bore	±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.

Line sizes

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

Sizing

Contact an Emerson Process Management sales representative for assistance. A "Configuration Data Sheet" is required prior to order for application verification. To complete the Configuration Data Sheet go to: http://www3.emersonprocess.com/Rosemount/DP_Flow/Application/Pages/PCDefault.aspx

Functional specifications

Service

- Liquid
- Gas
- Steam

Process temperature limits

Standard (direct/remote mount)

- –40 °F to 450 °F (–40 °C to 232 °C)

Extended (remote mount only with option code G):

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

Maximum working pressure

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

Table 3. 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.

Physical specifications

Material of construction

Orifice Plate

- 316/316L SST
- Alloy C-276
- 316 SST (CF8M)
- A312 Gr 316/316L

Flange

- A182 Gr 316/316L
- Flange pressure limits are per ANSI B16.5
- Flange face finish per ANSI B16.5, 125 to 250 RMS

Body Bolts/Studs

- Alloy 400 Body
- ASTM A193 Gr B8M studs
- ASTM A193 Gr B8M Class 2 body studs provided for high temperature Option Code G

Transmitter Connection Studs

- ASTM A193 Gr B8M studs

Gaskets/O-rings

- Glass filled PTFE
- Alloy X-750 provided for high temperature Option Code G
- Gaskets and O-rings must be replaced each time the 1195 is disassembled for installation or maintenance.

Orifice type

Square edge–orifice bore sizes

- 0.066-in. and larger

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

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

Note
Integral orifice bodies contain corner tapped pressure ports.

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.

Table 4. Overall Length Dimension

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).

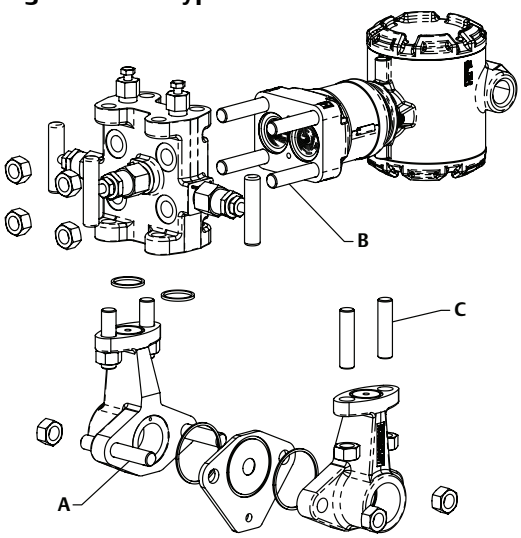
Table 5. Torque Values of Standard Bolts

Stud and nut torque specifications (1)	
Transmitter bolts	**Torque**
All Line sizes and gasket types	32 lb-ft (44 N-m)
Manifold bolts	
All Line sizes and gasket types	32 lb-ft (44 N-m)
Orifice body bolts (2)	
1/2-in. (15 mm) Line size (all gasket types)	60 lb-ft (82 N-m)
1-in. (25 mm) Line size (all gasket types)	60 lb-ft (82 N-m)
1 1/2-in. (40 mm) Line size (PTFE gasket)	60 lb-ft (82 N-m)
1 1/2-in. (40 mm) 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.

Figure 1. Bolt Types



A. Orifice Body Bolts (2X)
B. Transmitter Bolts (4X)
C. Manifold Bolts (4X)

Table 6. Weight (weights are approximate)

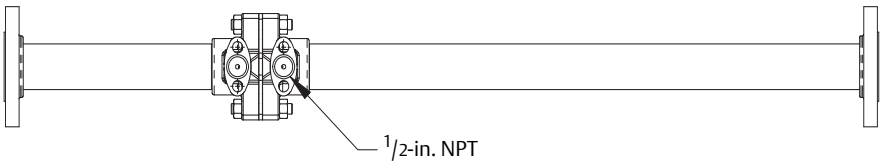
Line size	1195 only		With flanged piping(1)	
	lb	kg	lb	kg
1/2-in. (15 mm)	4.0	1.8	8	3.6
1-in. (25 mm)	6.0	2.7	12	5.4
1 1/2-in. (40 mm)	8.0	3.6	25	11.3

(1) As supplied with standard lengths, ANSI Class 150 flanges.

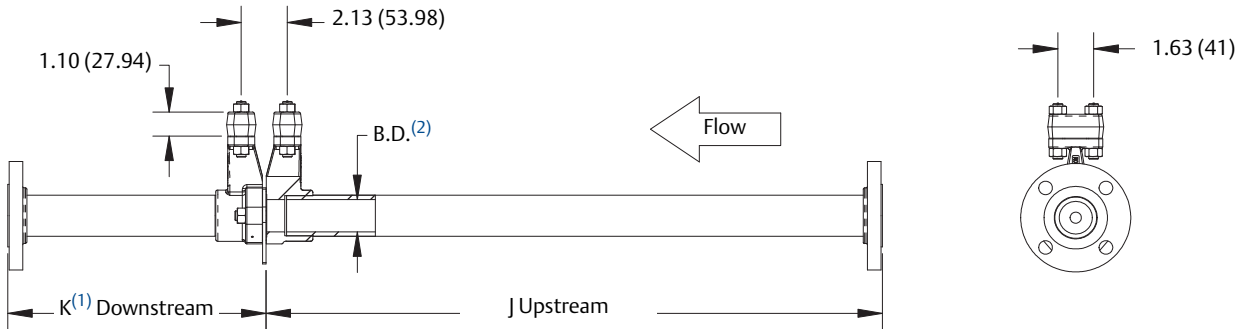
1195 dimensional drawings

Rosemount 1195 Integral Orifice Plate

Top view



Bottom view | **End view**



Dimensions are in inches (millimeters).

Table 37. 1195 Integral Orifice Plate Dimensional Data

Dimension	Line size		
	1/2-in. (15 mm)	1-in. (25 mm)	1 1/2-in. (40 mm)
J (Beveled/Threaded pipe ends)	12.54 (318.4)	20.24 (514.0)	28.44 (722.4)
J (RF slip-on, RTJ slip-on, RF-DIN slip-on)	12.62 (320.4)	20.32 (516.0)	28.52 (724.4)
J (RF 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)(2)	0.664 (16.86)	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).

(2) B.D is diameter of the precision bored portion of the upstream and downstream piping.

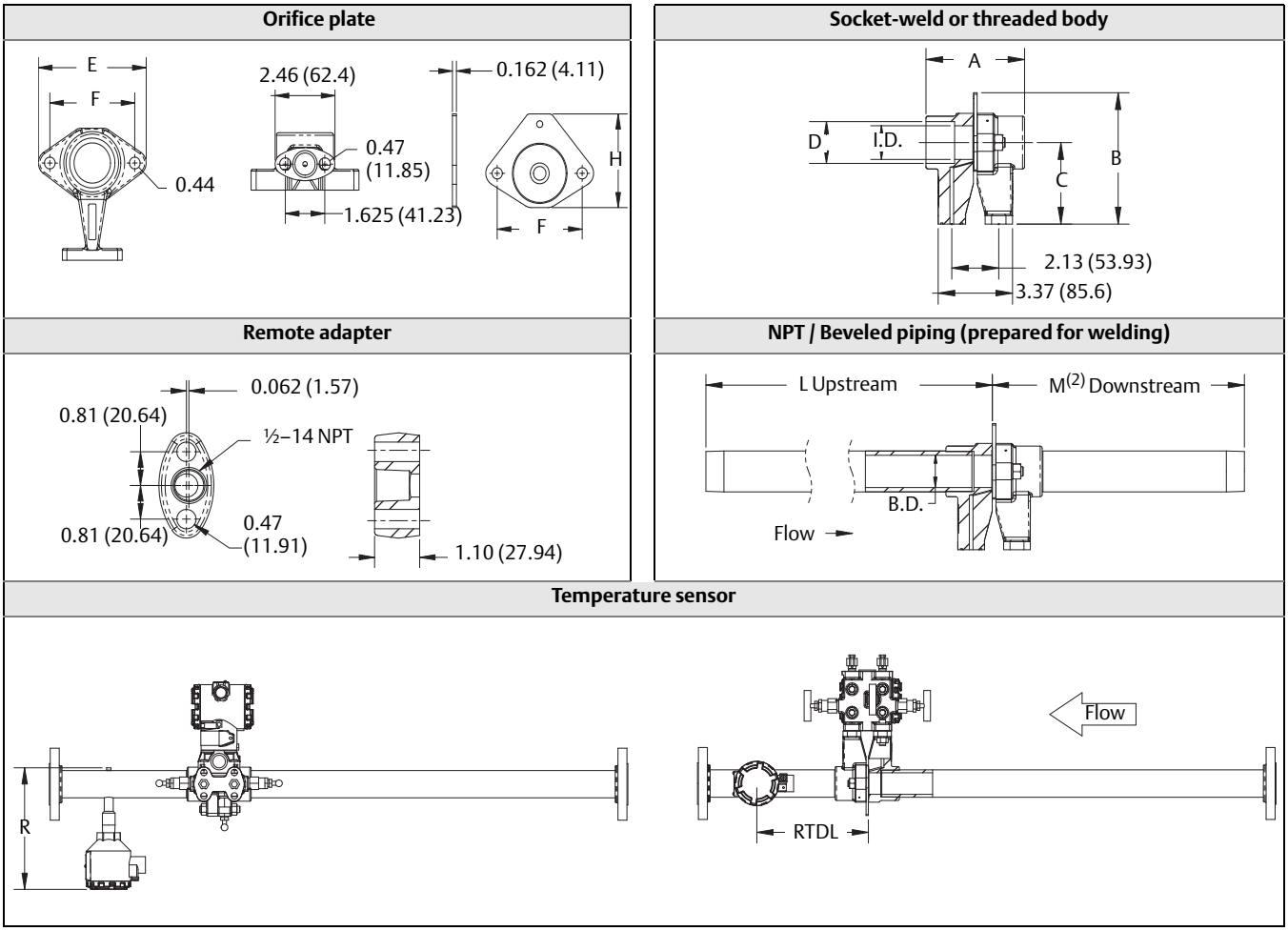


Table 38. 1195 Integral Orifice Dimensional Data

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.