

Flow Configuration (cont.)

Flow Rate

Flow Units

<input type="checkbox"/> StdCuft/s	<input type="checkbox"/> StdCuft/min	<input type="checkbox"/> StdCuft/h	<input type="checkbox"/> StdCuft/d
<input type="checkbox"/> StdCum/h	<input type="checkbox"/> StdCum/d	<input type="checkbox"/> lbs/sec★	<input type="checkbox"/> lbs/min
<input type="checkbox"/> lbs./hour	<input type="checkbox"/> lbs/day	<input type="checkbox"/> grams/sec	<input type="checkbox"/> grams/min
<input type="checkbox"/> grams/hour	<input type="checkbox"/> kg/sec	<input type="checkbox"/> kg/min	<input type="checkbox"/> kg/hour
<input type="checkbox"/> NmlCuM/hour	<input type="checkbox"/> NmlCuM/day	<input type="checkbox"/> mton/hour	<input type="checkbox"/> mton/day
<input type="checkbox"/> Special (other units available on request)			

Flow Rate

Low PV (minimum) _____ (0.00 ★) High PV (Full Scale): _____ (100 lbs/sec)

Fluid Type (Select One)

Gas Liquid Steam

Fluid Information (Complete one section only)

Steam (ASME Saturated and/or Superheated)

Natural Gas NOTE: If you selected Natural Gas, complete Compressibility Factor Information on page 54

Gas or Liquid from AIChE database: Select ONE fluid name below:

<input type="checkbox"/> Acetic Acid	<input type="checkbox"/> Cyclopropane	<input type="checkbox"/> Isopropanol	<input type="checkbox"/> n-Heptane	<input type="checkbox"/> 1-Dodecanol
<input type="checkbox"/> Acetone	<input type="checkbox"/> Divinyl Ether	<input type="checkbox"/> Methane	<input type="checkbox"/> n-Hexane	<input type="checkbox"/> 1-Heptanol
<input type="checkbox"/> Acetonitrile	<input type="checkbox"/> Ethane	<input type="checkbox"/> Methanol	<input type="checkbox"/> n-Octane	<input type="checkbox"/> 1-Heptene
<input type="checkbox"/> Acetylene	<input type="checkbox"/> Ethanol	<input type="checkbox"/> Methyl Acrylate	<input type="checkbox"/> n-Pentane	<input type="checkbox"/> 1-Hexene
<input type="checkbox"/> Acrylonitrile	<input type="checkbox"/> Ethylamine	<input type="checkbox"/> Methyl Ethyl Keton	<input type="checkbox"/> Oxygen	<input type="checkbox"/> 1-Hexadecanol
<input type="checkbox"/> Air	<input type="checkbox"/> Ethylbenzene	<input type="checkbox"/> Methyl Vinyl Ether	<input type="checkbox"/> Pentafluorothan	<input type="checkbox"/> 1-Octanol
<input type="checkbox"/> Allyl Alcohol	<input type="checkbox"/> Ethylene	<input type="checkbox"/> m-Chloronitrobenzen	<input type="checkbox"/> Phenol	<input type="checkbox"/> 1-Octene
<input type="checkbox"/> Ammonia	<input type="checkbox"/> Ethylene Glycol	<input type="checkbox"/> m-Dichlorobenzene	<input type="checkbox"/> Propane	<input type="checkbox"/> 1-Nonanal
<input type="checkbox"/> Argon	<input type="checkbox"/> Ethylene Oxide	<input type="checkbox"/> Neon	<input type="checkbox"/> Propadiene	<input type="checkbox"/> 1-Nonanol
<input type="checkbox"/> Benzene	<input type="checkbox"/> Fluorene	<input type="checkbox"/> Meopentane	<input type="checkbox"/> Pyrene	<input type="checkbox"/> 1-Pentadecanol
<input type="checkbox"/> Benzaldehyde	<input type="checkbox"/> Furan	<input type="checkbox"/> Nitric Acid	<input type="checkbox"/> Propylene	<input type="checkbox"/> 1-Pentanol
<input type="checkbox"/> Benzyl Alcohol	<input type="checkbox"/> Helium-4	<input type="checkbox"/> Nitric Oxide	<input type="checkbox"/> Styrene	<input type="checkbox"/> 1-Pentene
<input type="checkbox"/> Biphenyl	<input type="checkbox"/> Hydrazine	<input type="checkbox"/> Nitrobenzene	<input type="checkbox"/> Sulfur Dioxide	<input type="checkbox"/> 1-Undecanol
<input type="checkbox"/> Carbon Dioxide	<input type="checkbox"/> Hydrogen	<input type="checkbox"/> Nitroethane	<input type="checkbox"/> Toluene	<input type="checkbox"/> 1,2,4-Trichlorobenzene
<input type="checkbox"/> Carbon Monoxide	<input type="checkbox"/> Hydrogen Chloroide	<input type="checkbox"/> Nitrogen	<input type="checkbox"/> Trichloroethylen	<input type="checkbox"/> 1,1,2-Trichloroethane
<input type="checkbox"/> Carbon Tetrachlorid	<input type="checkbox"/> Hydrogen Cyanide	<input type="checkbox"/> Nitromethane	<input type="checkbox"/> Vinyl Acetate	<input type="checkbox"/> 1,1,2,2-Tetrafluoroethane
<input type="checkbox"/> Chlorine	<input type="checkbox"/> Hydrogen Peroxide	<input type="checkbox"/> Nitrous Oxide	<input type="checkbox"/> Vinyl Chloride	<input type="checkbox"/> 1,2-Butadiene
<input type="checkbox"/> Chlorotrifluoroethylen	<input type="checkbox"/> Hydrogen Sulfide	<input type="checkbox"/> n-Butane	<input type="checkbox"/> Vinyl Cyclohexan	<input type="checkbox"/> 1,3-Butadiene
<input type="checkbox"/> Chloroprene	<input type="checkbox"/> Isobutane	<input type="checkbox"/> n-Butanol	<input type="checkbox"/> Water	<input type="checkbox"/> 1,2,5-Trichlorobenzene
<input type="checkbox"/> Cycloheptane	<input type="checkbox"/> Isobutene	<input type="checkbox"/> n-Butyraldehyde	<input type="checkbox"/> 1-Butene	<input type="checkbox"/> 1,4-Dioxane
<input type="checkbox"/> Cyclehexane	<input type="checkbox"/> Isobutylbenzene	<input type="checkbox"/> n-Butyronitrile	<input type="checkbox"/> 1-Decene	<input type="checkbox"/> 1,4-Hexadiene
<input type="checkbox"/> Cyclopentane	<input type="checkbox"/> Isopentane	<input type="checkbox"/> n-Decane	<input type="checkbox"/> 1-Decanal	<input type="checkbox"/> 2-Methyl-1-Pentane
<input type="checkbox"/> Cyclopentene	<input type="checkbox"/> Isoprene	<input type="checkbox"/> n-Dodecane	<input type="checkbox"/> 1-Decanol	<input type="checkbox"/> 2,2-Dimethylbutane
		<input type="checkbox"/> n-Heptadecane	<input type="checkbox"/> 1-Dodecene	

Custom Gas or Liquid

Enter custom fluid name _____

NOTE: If defining a custom fluid, complete the density and viscosity information on page 55

Required For Natural Gas Only

Compressibility Factor Information

Choose desired characterization method, and only enter values for that method:

			<u>Mole</u>	
<input type="checkbox"/>	Detail Characterization Method (AGA8 1992)			
CH4	Methane mole percent	_____	%	0-100 percent
N2	Nitrogen mole percent	_____	%	0-100 percent
CO2	Carbon Dioxide mole percent	_____	%	0-100 percent
C2H6	Ethane mole percent	_____	%	0-100 percent
C3H8	Propane mole percent	_____	%	0-12 percent
H2O	Water mole percent	_____	%	0-Dew Point
H2S	Hydrogen Sulfide mole percent	_____	%	0-100 percent
H2	Hydrogen mole percent	_____	%	0-100 percent
CO	Carbon Monoxide mole percent	_____	%	0-3.0 percent
O2	Oxygen mole percent	_____	%	0-21 percent
C4H10	i-Butane mole percent	_____	%	0-6 percent ⁽²⁾
C4H10	n-Butane mole percent	_____	%	0-6 percent ⁽²⁾
C5H12	i-Pentane mole percent	_____	%	0-4 percent ⁽³⁾
C5H12	n-Pentane mole percent	_____	%	0-4 percent ⁽³⁾
C6H14	n-Hexane mole percent	_____	%	0-Dew Point
C7H16	n-Heptane mole percent	_____	%	0-Dew Point
C8H18	n-Octane mole percent	_____	%	0-Dew Point
C9H20	n-Nonane mole percent	_____	%	0-Dew Point
C10H22	n-Decane mole percent	_____	%	0-Dew Point
He	Helium mole percent	_____	%	0-3.0 percent
Ar	Argon mole percent	_____	%	0-1.0 percent
<input type="checkbox"/>	Gross Characterization Method, Option 1 (AGA8 Gr-Hv-Co2)			Valid Range
	Specific gravity at 14.73 psia and 60 °F	_____		0.554-0.87
	Volumetric Gross Heating Value at Base Conditions	_____	BTU/SCF	477-1150 BTU/SCF
	Carbon Dioxide mole percent	_____	%	0-30 percent
	Hydrogen mole percent	_____	%	0-10 percent
	Carbon Monoxide mole percent	_____	%	0-3 percent
<input type="checkbox"/>	Gross Characterization Method, Option 2 (AGA8 Gr-CO2-N2)			Valid Range
	Specific gravity at 14.73 psia and 60 °F	_____		0.554-0.87
	Carbon Dioxide mole percent	_____	%	0-30 percent
	Nitrogen mole percent	_____	%	0-50 percent
	Hydrogen mole percent	_____	%	0-10 percent
	Carbon Monoxide mole percent	_____	%	0-3 percent

⁽²⁾ The summation of i-Butane and n-Butane cannot exceed 6 percent.

⁽³⁾ The summation of i-Pentane and n-Pentane cannot exceed 4 percent.

Required for Custom Gas Only

Gas Compressibility and Viscosity Information

1. Fill in the following operating pressures and operating temperatures.
 Min and max values must match values entered under Process Operating Conditions.

Operating Pressures		Operating Temperatures	
(1) _____ min	(5) _____ min	(8) _____ [$^{1/3}(\text{max-min})$]+min	
(2) _____ [$^{1/3}(\text{max-min})$]+min	(6) _____ [$^{1/2}(\text{max-min})$]+min	(9) _____ [$^{2/3}(\text{max-min})$]+min	
(3) _____ [$^{2/3}(\text{max-min})$]+min	(7) _____ max		
(4) _____ max			

2. Transfer the values from the above section to the numbered lines below.

3. Check one Density/Compressibility box, then enter the 12 values for each pressure/temperature range.

4. Check one Viscosity box, then enter values for each temperature. (At least one viscosity value is required.)

5. Enter values for molecular weight, isentropic exponent, and standard density (or standard compressibility).

Pressure	Temperature	<input type="checkbox"/> Density in Kg/CuM	<input type="checkbox"/> Density in Lbs/CuFt	<input type="checkbox"/> Compressibility	Temperature	<input type="checkbox"/> Viscosity in Centipoise	<input type="checkbox"/> Viscosity in Lbs/Ft Sec	<input type="checkbox"/> Viscosity in Pascal Sec
(1) _____	(5) _____	_____	_____	_____	(5) _____	_____	_____	_____
(2) _____	(5) _____	_____	_____	_____	(8) _____	_____	_____	_____
(3) _____	(5) _____	_____	_____	_____	(9) _____	_____	_____	_____
(4) _____	(5) _____	_____	_____	_____	(7) _____	_____	_____	_____
(1) _____	(6) _____	_____	_____	_____				
(2) _____	(6) _____	_____	_____	_____	Molecular Weight	_____	_____	_____
(3) _____	(6) _____	_____	_____	_____	Isentropic Exponent	_____ 1.4 ★	_____	_____
(4) _____	(6) _____	_____	_____	_____				
(1) _____	(7) _____	_____	_____	_____				
(2) _____	(7) _____	_____	_____	_____				
(3) _____	(7) _____	_____	_____	_____				
(4) _____	(7) _____	_____	_____	_____				

Standard density/compressibility _____ (at standard reference conditions specified on page 57)

NOTE: All customer gas configuration information must be completed. Order will be delayed if fields are left blank.

Required for Custom Liquid Only

Liquid Density and Viscosity Information

NOTE: Only fill out this page if you have selected a custom liquid.

1. Fill in the following operating temperatures. (Min and max values must match values entered under Process Operating Conditions)

Operating Temperatures

- (a) _____ min
- (b) _____ [$^{1/3}(\text{max}-\text{min})$]+min
- (c) _____ [$^{2/3}(\text{max}-\text{min})$]+min
- (d) _____ max

2. Transfer the values from the above section to the lettered lines below.

3. Check one Density box, then enter values for each temperature and the standard density.

4. Check one Viscosity box, then enter values for each temperature. (At least one viscosity value is required.)

	<input type="checkbox"/> Density in Lbs/CuFt <input type="checkbox"/> Compressibility		<input type="checkbox"/> Viscosity in Centipoise <input type="checkbox"/> Viscosity in Lbs/Ft Sec <input type="checkbox"/> Viscosity in Pascal Sec
Temperature		Temperature	
(a) _____	_____	(a) _____	_____
(b) _____	_____	(b) _____	_____
(c) _____	_____	(c) _____	_____
(d) _____	_____	(d) _____	_____

Standard density/compressibility _____ (at standard reference conditions specified on page 57)

NOTE: All customer gas configuration information must be completed. Order will be delayed if fields are left blank.

Primary Element Information

Select Differential Producer (Select One)

- | | |
|--|--|
| <input type="checkbox"/> 405P Compact Orifice
<input type="checkbox"/> 405C Compact Conditioning Orifice
<input type="checkbox"/> 1195 Integral Orifice
<input type="checkbox"/> 485 <i>Annubar</i> / 3095 MFA Mass ProBar ★
<input type="checkbox"/> 485 <i>Annubar</i> / 3095 MFA Mass ProBar, Constant K
<input type="checkbox"/> Calibrated 485 <i>Annubar</i> / 3095 MFA Mass ProBar
<input type="checkbox"/> <i>Annubar</i> diamond II+/ Mass ProBar
<input type="checkbox"/> Calibrated <i>Annubar</i> Diamond II+/ Mass ProBar
<input type="checkbox"/> <i>Annubar</i> Diamond II (1999)
<input type="checkbox"/> Nozzle, Long Radius Wall Taps, ASME
<input type="checkbox"/> Nozzle, Long Radius Wall Taps, ISO
<input type="checkbox"/> Nozzle, ISA 1932, ISO
<input type="checkbox"/> Orifice, D & D/2 Taps, ISO | <input type="checkbox"/> Orifice, Corner Taps, ISO
<input type="checkbox"/> 1595 Conditioning Orifice
<input type="checkbox"/> Orifice, Flange Taps, AGA3
<input type="checkbox"/> Small Bore Orifice, Flange Taps, ASME
<input type="checkbox"/> Venturi Nozzle, ISO
<input type="checkbox"/> Orifice, Flange Taps, ISO
<input type="checkbox"/> Orifice, 2 ¹ / ₂ D & 8D Taps
<input type="checkbox"/> Orifice, Corner Taps, ASME
<input type="checkbox"/> Orifice, Flange Taps, ASME
<input type="checkbox"/> Orifice d & D/2 Taps, ASME
<input type="checkbox"/> Venturi, Rough Cast/Fabricated Inset, ASME
<input type="checkbox"/> Venturi, Rough Cast Inlet, ISO
<input type="checkbox"/> Venturi, Machined Inlet, ASME
<input type="checkbox"/> Venturi, Welded Inlet, ISO |
|--|--|

Product Data Sheet

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Rosemount 3051S

Primary Element Information (cont.)

Selecting Area Averaging Meter, V-Cone[®], or calibrated primary element requires a constant value for discharge coefficient: _____ .

- Area Averaging Meter V-Cone Calibrated Venturi Calibrated output
Primary Element Minimum Diameter (d) _____ in. mm
at _____ °F °C in. at 68 °F ★
or

Sensor Series No. _____ (Enter series designation)

Differential Producer Material (Select One)

- Carbon Steel SST 304 SST316
 Hastelloy C Monel

Pipe Tube Information

Pipe Tube Diameter (Pipe ID) (D) _____ in. mm at _____ °F °C in. at 68 °F ★

Pipe Tube Material (Select One) Carbon Steel ★ SST 304 SST 316
 Hastelloy C Monel

Process Operating Conditions

Operating Differential Pressure Range _____ to _____

- Differential Pressure Units (DP) inH₂O-68 °F inH₂O-4 °C ftH₂O-68 °F mmH₂O-68 °F
 mPa mmH₂O-4 °C psi bar mbar
 inHg 0°C g/SqCm Kg/SqCm Pa kPa
 mmHg 0°C torr Atm

Operating Static Pressure Range _____ to _____

- Static Pressure Units (SP) inH₂O-68 °F inH₂O-4 °C ftH₂O-68 °F mmH₂O-68 °F
 mPa mmH₂O-4 °C psi bar mbar
 inHg 0°C g/SqCm Kg/SqCm Pa kPa
 mmHg 0°C torr Atm

Operating Temperature Range _____ to _____ °F °C

Fixed Process Temperature Value: _____

NOTE: For steam applications, temperatures must be equal to or greater than the saturation temperature at the given pressures. All Process operating conditions information must be completed.

Atmospheric Pressure

Atmospheric Pressure _____ psia kPa (absolute) Bar 14.696 psia ★

Standard Reference Conditions

**NOTE: The information is required if any of the following flow units were selected:
StdCuft/s, StdCuft/min, StdCuft/h, StdCuft/d, StdCum/h, StdCum/d**

Standard Reference Conditions:

- Standard Pressure _____ psia Bar 14.696 psia ★ (gas/steam only)
 kPa (absolute)
Standard Temperature _____ °F★ °C 60 °F ★ (For steam, 212 °F ★)

Rosemount 3051S

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For RMD Internal Use Only

House Order No.: _____
Line Item No.: _____
Transmitter Serial No.: _____
RCC Tech.: _____

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