



Vortex Flow Meters

RNG Series **Insertion-Style Gas Flow Meter**

- **Applications:**
 - Flare gas
 - Stack gas
 - Natural gas
 - Digester gas (BioGas: CH₄ + CO₂)
 - Air
- Not sensitive to gas composition changes
- High accuracy in wet gas applications
- 70:1 turndown ratio
- HART® Communications Protocol



RNG Series Insertion-Style Gas Flow Meter

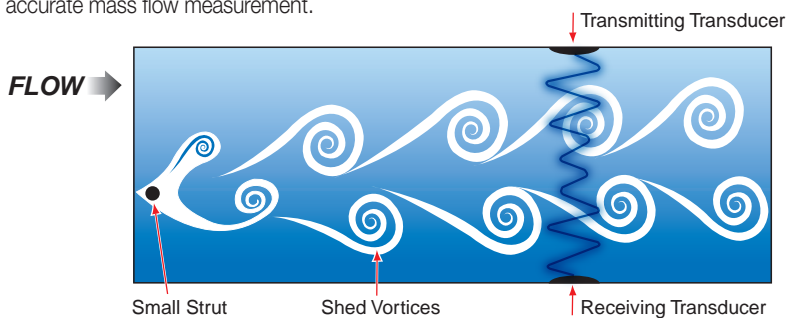
The RNG Series meter is an insertion-style vortex shedding flow meter designed to offer high accuracy measurements over an extremely large flow range. The meters have no moving parts and are virtually maintenance-free. The RNG Series is suitable for most gas types, including air, natural gas, digester gas and biogas applications. All meters in this series are loop-powered devices with standard HART® communications for ease of field programming and system integration.

Operating Principle

An everyday example of a vortex shedding phenomenon is a flag waving in the breeze: the flag waves due to the vortices shed by air moving across the flagpole. Within the flow meter, as flowing gas moves across the tiny strut or “bluff bar”, vortices are also shed but on a smaller scale. The meter transmits an ultrasonic beam through the vortex pattern downstream of the strut. As vortices are shed, the carrier wave of the ultrasonic signal is modified. This change in the carrier wave is measurable and moves in proportion to the number of vortices shed. Digital processing enables the vortices to be counted, and this value is converted into a velocity. Software converts velocity into a volumetric flow rate, in units of measure selected by the operator.

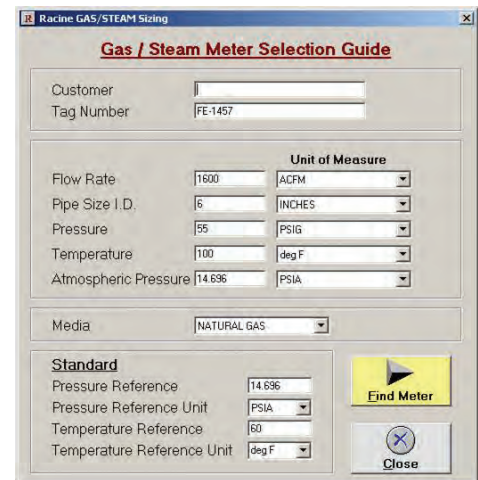
Racine Vortex flow meters utilize the smallest strut in the industry, which allows for high sensitivity; superior performance at very low flow rates; large turndown ratios; and low pressure drop.

Through the use of an internal RTD and an external pressure sensor (optional), the flow meter software will compensate for changes in pressure and temperature, to achieve an accurate mass flow measurement.




Flow Meter Selection

Racine vortex offers a sophisticated software program to aid in the flow meter selection process. The program accounts for system pressure and temperature, as well as media density, viscosity and specific gravity. Select from a complete list of Metric and English engineering units, using default or customized reference standards for pressure and temperature. This program may be downloaded at no charge from www.racinevortex.com.



Specifications



Measured:	Gas/Air
Velocity Range:	2 to 140 FPS (0.6 to 43 MPS)
Operating Temperature:	-20 °F to 300 °F (-28 °C to 150 °C)
Ambient Temperature Limits:	-20 °F to 155 °F (-28 °C to 68 °C)
Operating Pressure:	-5 to 250 PSIG (-.34 to 17.2 BARg)
Humidity:	Up to 95%, non-condensing
Accuracy:	±1% of reading over the upper 90% of the flow range
Repeatability:	0.5% of reading
Input Power:	24 VDC
Signal Output:	2-wire, 4-20 mA loop
Construction:	Stainless steel wetted parts with Teflon® transducers, Viton® o-rings, NEMA 7 transmitter enclosure Standard: 2" 150# ANSI Flange Optional: 2" 300# ANSI Flange, 2" MNPT Coupling, DN 50 Metric Flange
Communications:	HART® Protocol (Via PC with HART Modem)
Certifications:	CE: EN61326-1:2002 Optional Intrinsically Safe conforms to: ATEX  II 2G Ex ib IIB T4 Zone 1 Group IIB T4 (Canada) and AEx ib IIB T4 (USA)
Options:	2 line, 8 digit rate/totalizer display Internal RTD, temperature compensation for mass flow measurement Remote mount electronics

Flow Ranges*

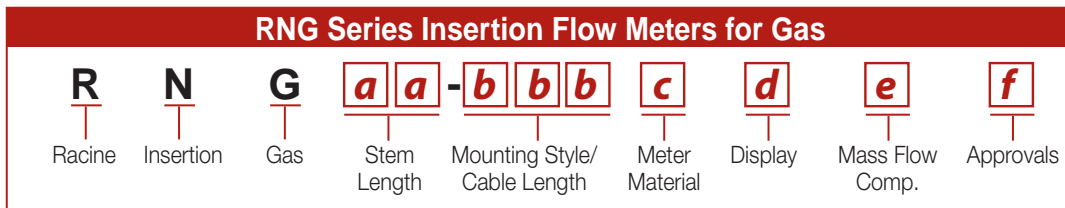
Flow Range in SCFM, 60 °F in AIR Flow Range in Nm³/hr, 16 °C in AIR

Pipe Size	PRESSURE IN PSIG (BARg)												Pressure Drop (Inches H ₂ O) at 50% Max. Flow**						
	0 (0)		25 (1.7)		50 (3.4)		75 (5.2)		100 (6.9)		125 (8.6)			150 (10.3)		200 (13.8)		250 (17.2)	
	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.		MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
3" 76 mm	6	412	15	1054	25	1717	34	2381	44	3045	53	3708	62	4208	81	4208	100	4208	1
4" 102 mm	10	694	27	1873	44	3053	60	4233	77	5413	94	6593	111	7482	145	7482	178	7482	0.7
6" 152 mm	22	1560	60	4215	98	6870	136	9524	174	12179	212	14833	250	16834	326	16834	402	16834	0.6
8" 203 mm	40	2774	107	7493	174	12213	242	16932	309	21651	377	26370	444	29927	579	29927	714	29927	0.4
10" 254 mm	62	4335	167	11708	273	19082	378	26456	483	33830	589	41204	694	46760	905	46760	1115	46760	0.2
12" 305 mm	89	6242	241	16860	393	27479	544	38097	596	48715	848	59334	999	67335	1303	67335	1606	67335	0.1

*Consult RACINE Flow Meter Sizing Software for temperature and pressure conditions other than those listed here, available at www.racinevortex.com
Consult factory for larger pipe sizes

**Pressure drop data for air at 14.7 psig and 60 °F (0 BARg and 16 °C)

Part Number Construction



All meters include 4-20 mA output, HART® Communication Protocol and NEMA 7 XP transmitter enclosure

Part Number:

R N



aa Stem Length

- 12) 12" Stem
- 24) 24" Stem
- 36) 36" Stem
- 48) 48" Stem
- 60) 60" Stem

**bbb Mounting Style/
Cable Length**

- 150) 2" x 150# Flange¹
- 151) 2" x 150# Flange + 10' cable²
- 152) 2" x 150# Flange + 25' cable²
- 153) 2" x 150# Flange + 50' cable²
- 300) 2" x 300# Flange¹
- 301) 2" x 300# Flange + 10' cable²
- 302) 2" x 300# Flange + 25' cable²
- 303) 2" x 300# Flange + 50' cable²
- NPT) 2" MNPT Fitting¹
- NP1) 2" MNPT Fitting + 10' cable²
- NP2) 2" MNPT Fitting + 25' cable²
- NP3) 2" MNPT Fitting + 50' cable²
- D50) DN 50 Flange¹
- D51) DN 50 Flange^{2,3} + 10' cable²
- D52) DN 50 Flange^{2,3} + 25' cable²

f Approvals

- S) Standard (CE only)
- A) ATEX Ex II 2G ib IIB T4

e Mass Flow Compensation

- N) No Temperature Input or Mass Flow Compensation
- T) Integral RTD, Temperature Compensation for Mass Flow Measurement⁵

d Display

- N) No Display
- D) Integral 8-Digit LCD, Indicator and Totalizer⁴

c Meter Material

- S) 316 Stainless Steel (standard)
- T) PTFE Coated, Wetted Components

¹ Integral mount transmitter

² Remote mount transmitter (Not available with Intrinsically Safe version)

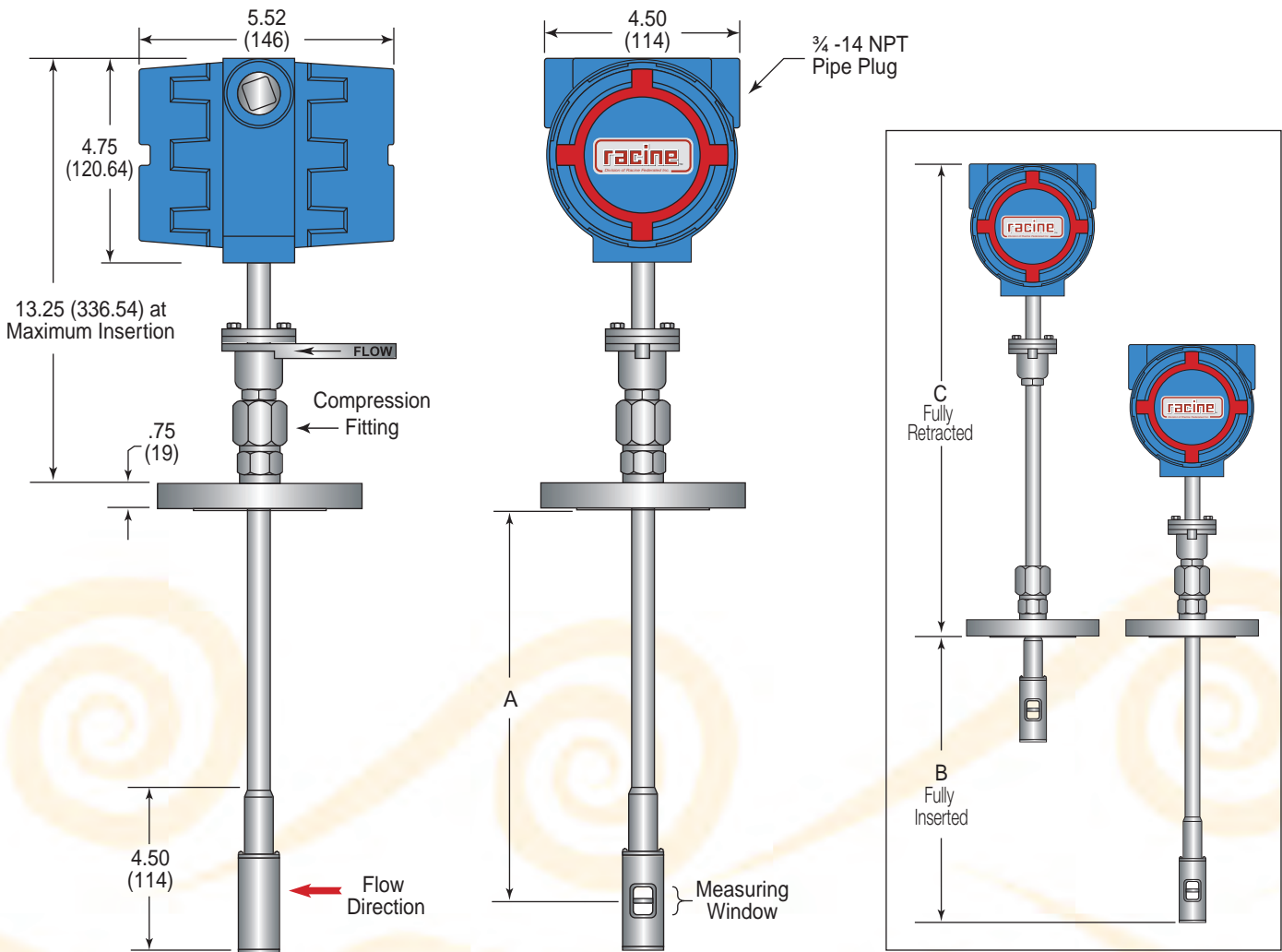
³ Flange to DIN 2527 specifications

⁴ Not available with Intrinsically Safe version

⁵ Pressure compensation requires external pressure sensor

Dimensional Drawings

Inches (mm)			
Model	DIM A NOMINAL	DIM B	DIM C
RNG12	12 (305)	13.2 (337)	22.2 (565)
RNG24	24 (610)	25.2 (641)	34.2 (870)
RNG36	36 (914)	37.2 (946)	46.2 (1175)
RNG48	48 (1219)	49.2 (1251)	58.2 (1480)
RNG60	60 (1524)	61.2 (1556)	70.2 (1784)



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