



Vortex Flow Meters

RNL Series Insertion Liquid Flow Meter

- **Applications**

- Boiler feed water and condensate
- Cooling tower
- Pool and water park
- Chemical processing
- Municipal water treatment
- Ground water monitoring
- Irrigation systems

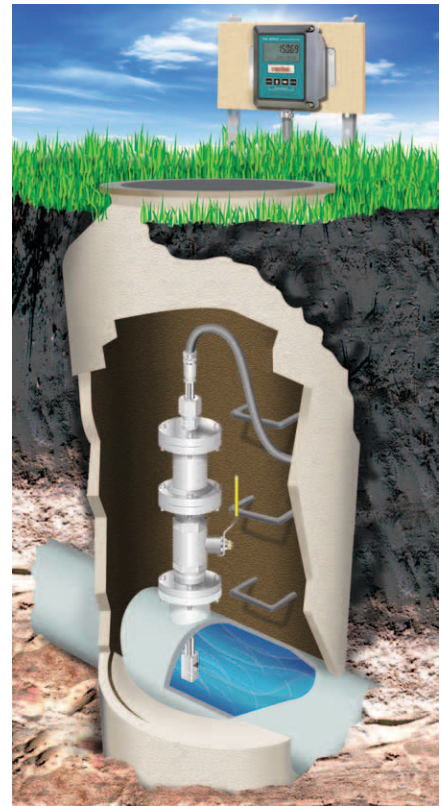
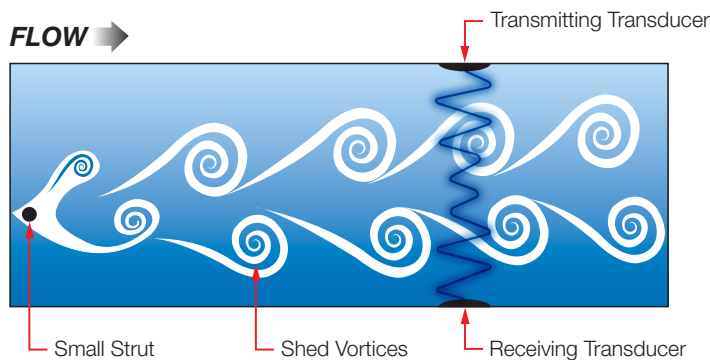
- Pipe sizes 4" (102 mm) and higher
- Very low pressure drop



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 wind moving across the flagpole. Within the flow meter, as flowing liquid moves across the 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 modulates. The modulation of the carrier wave is measurable and proportional 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 low flow rates and low pressure drop.



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. The software may be downloaded at no charge from racinevortex.com.

Specifications

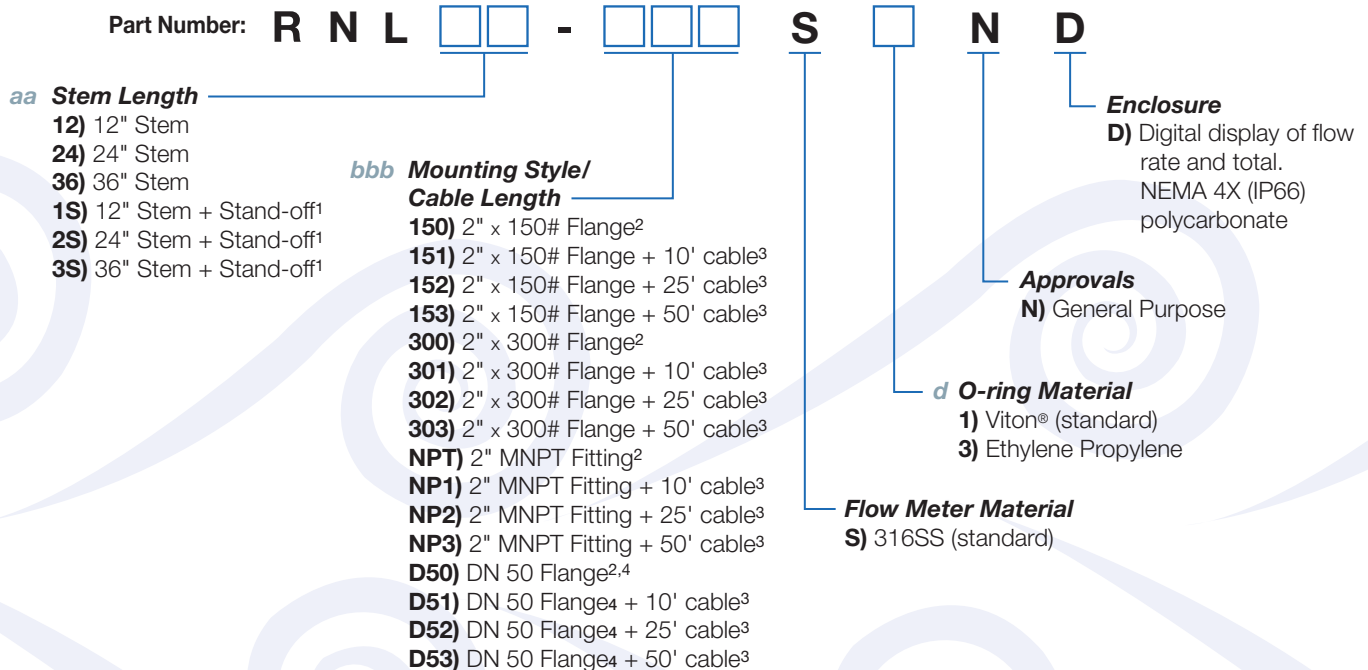
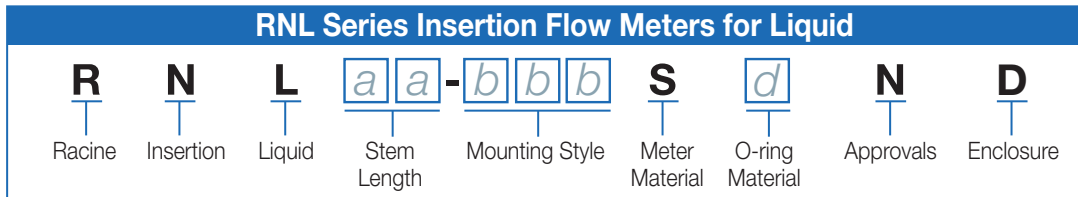
Measured	Liquids
Velocity Range	2 to 18 FPS (0.6 to 5.5 MPS)
Accuracy	±2% of reading
Repeatability	0.5% of reading
Process Temperature	Maximum 300 °F (148 °C)
Ambient Temperature Limits	-20 °F to +110 °F (-28 °C to +43 °C)
Operating Pressure	-5 to 250 PSIG (-0.3 to 17 BARg)
Input Power	10 to 30 VDC
Signal Output	4-20 mA (two-wire loop)
Enclosure	NEMA 4X (IP66) polycarbonate
Maximum Viscosity	10 centistokes - consult factory for higher viscosity
Display	Flow rate and total w/programmable keypad

Flow Ranges*

Based on water at 1 cSt at 73 °F schedule 40 pipe				
NOMINAL PIPE SIZE in. (mm)	GPM		LPM	
	MINIMUM	MAXIMUM	MINIMUM	MAXIMUM
4.0 (102)	78	705	295	2669
6.0 (152)	176	1586	667	6004
8.0 (203)	313	2820	1185	10675
10.0 (254)	490	4406	1855	16679
12.0 (305)	705	6344	2668	24015
14.0 (356)	960	8635	3634	32687
16.0 (406)	1253	11279	4743	42696
18.0 (457)	1586	14275	6003	54037
20.0 (508)	1958	17623	7411	66710

*Consult RACINE Flow Meter Selection Software for temperature and pressure conditions other than those listed here, available at racinevortex.com

Part Number Construction



¹ Additional physical barrier between sensor head and transmitter

² Integral mount transmitter

³ Remote mount transmitter

⁴ Flange to DIN 2527 specifications

Stem Length Selection Procedure

Before purchasing a RNL insertion liquid flow meter, it is necessary to calculate the stem length required for a particular piping system. In order to complete this calculation, some knowledge of the piping system must be known. The variables required are:

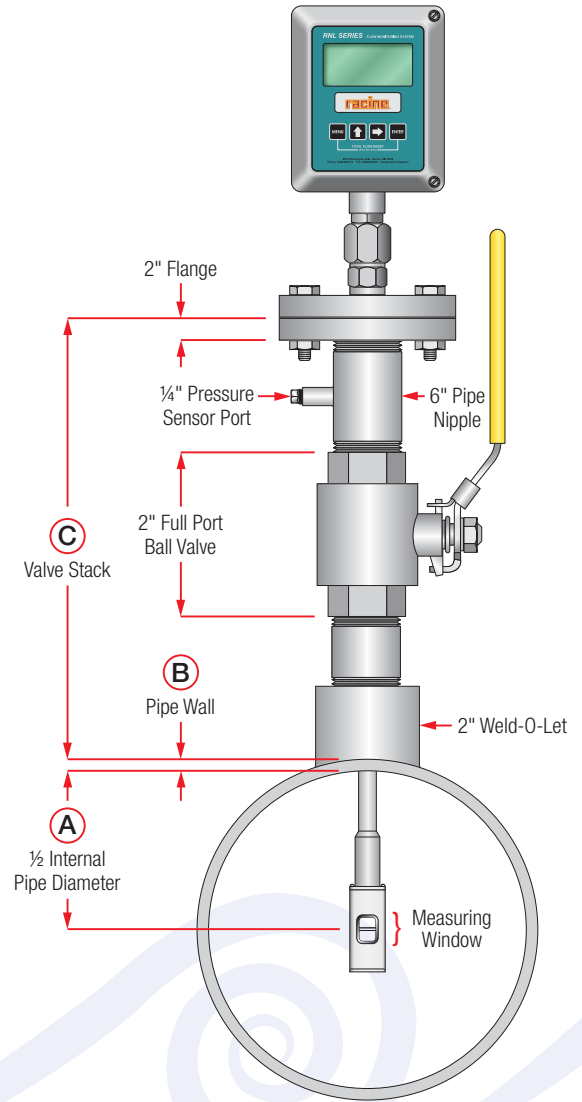
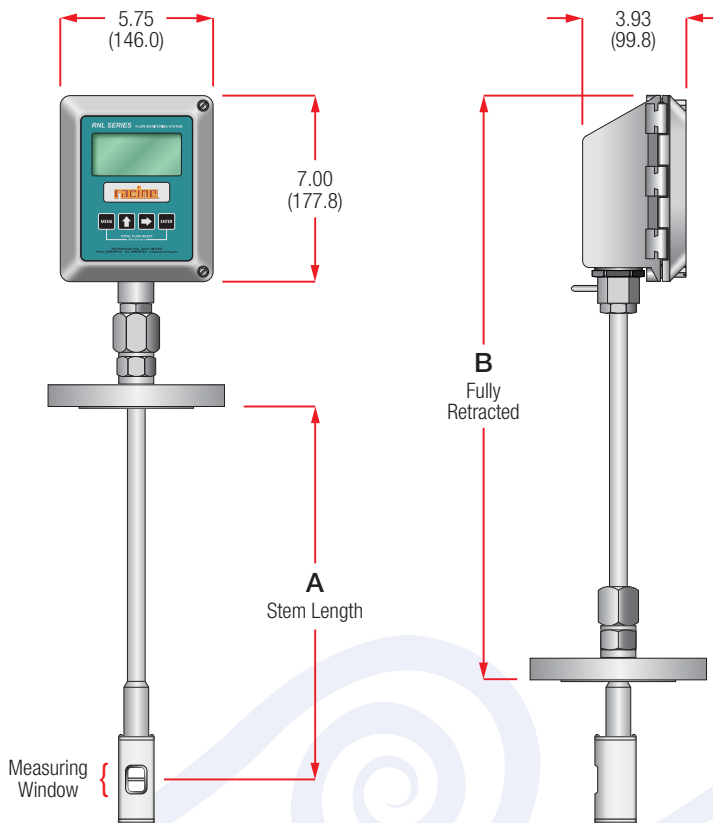
- ½ Internal pipe diameter (A)
- Pipe wall thickness (B)
- Length of the valve stack (C)

Using this information and referring to the picture below, a minimum stem length can be determined.

Minimum Stem Length Required = A + B + C

Dimensional Drawings

Inches (mm)



Insertion hardware kits available with flanged or NPT connections.

Model	Dim. A	Dim. B
RNL12	12.0 (305)	20.6 (523)
RNL24	24.0 (610)	32.6 (828)
RNL36	36.0 (914)	44.6 (1133)



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