



## FIXED AND RETRACTABLE INSERTION VORTEX FLOW METERS 2200, 3100 SERIES



### DESCRIPTION

The **2200 Series fixed insertion** and **3100 Series retractable vortex flow meters** are used to measure the flow rate of water or water/glycol mixtures in 2" to 20" pipes. Each flow meter is factory calibrated and scaled to provide precise output signals. No complex field adjustments or confusing measurement routines are required to install the flow meters. Simple design, easy installation, reliable performance, and low cost make these flow meters an excellent choice for commercial HVAC applications.

### FEATURES

- **No moving parts**
- **Easy to install**
- **Reliable and robust design**
- **Wide flow range - 15:1 turndown ratio**
- **Microprocessor based piezo resistive sensor technology**
- **Optional integral display**

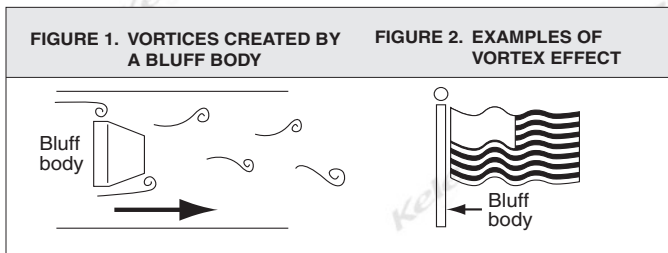


2200 Series with optional display and Thredolet® mount

### OPERATION

As flow passes a bluff body in the flow stream, vortices are alternately formed on either side of the bluff body (Figure 1). According to well-proven physical laws, the frequency at which vortices are alternately formed is directly proportional to the average flow velocity. The vortices create low- and high-pressure zones behind the bluff body. A vortex flow meter has a sensing element that detects these low- and high-pressure zones and the frequency at which they are created to measure flow.

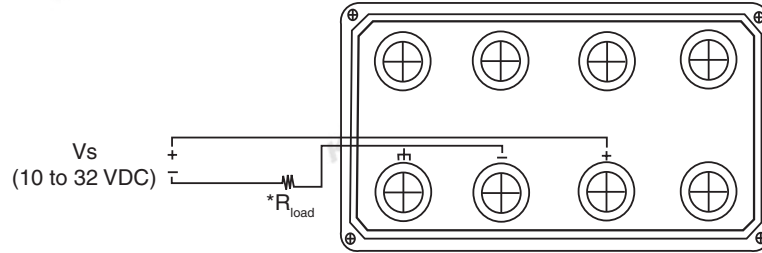
The fluttering of a flag (Figure 2) is one example of how vortices are created. The flag pole acts as a bluff body to the blowing wind as the flag waves from the force of the vortices alternately created.



SPECIFICATIONS	
<b>Supply Voltage</b>	10-32 VDC
<b>Maximum Output Impedance</b>	R(load) = 50 (Vs-10)
<b>Output Signal</b>	4-20 mA loop-powered standard (pulse output available special order)
<b>Connections</b>	2200: 1-1/2" MNPT 3100: 2" MNPT
<b>Wiring Terminations</b>	Screw terminals inside housing
<b>Conduit Connection Configuration</b>	3/4" FNPT For factory pre-configuration, specify pipe size, pipe material/schedule and maximum flow rate. Separately available Hydro-Flow Field-Pro software is available for field configuration
<b>Accuracy</b>	± 1% of full scale (combined linearity and repeatability)
<b>Display</b>	Optional, LCD alternates between showing 4-digit flow rate and 8-digit total flow
<b>Engineering Units</b>	English, gallons; metric, cubic meters (other units available upon request or can be configured using Hydro-Flow Field-Pro software)
<b>Operating Temperature Velocity Range</b>	-20° to 140°F (-29° to 60°C) 1 fps (0.3 mps) minimum, 15 fps (4.5 mps) maximum
<b>Pipe Size Range</b>	2200: 2" to 20" (5 to 50 cm) 3100: 3" to 20" (8 to 50 cm)
<b>Installation</b>	Install in straight pipe section with a minimum distance of 10 pipe diameters upstream and 5 pipe diameters downstream to any bend, obstruction or transition
<b>Mounting</b>	Thredolet®, or piping tee (2200 Series only)
<b>Media Compatibility</b>	Water, water/glycol mixtures, condensate
<b>Media Temperature Range</b>	32° to 160°F (0° to 71°C)
<b>Maximum Pressure</b>	400 psig (2759 kPa) for Thredolet® mount, 150 psig (1035 kPa) for piping tee mount
<b>Materials Of Construction</b>	Reinforced polycarbonate enclosure, Ultem® plastic vortex shedder, 316 SS shedder bar, stainless steel stem, EPDM o-rings, brass compression fitting, aluminum/nickel-plated retractor (3300 Series only)
<b>Enclosure Rating</b>	NEMA 6
<b>Warranty</b>	2 years

## FIXED AND RETRACTABLE INSERTION VORTEX FLOW METERS 2200, 3100 SERIES

### WIRING



4-20 mA wiring  
\*  $R_{load}$  maximum =  $50 (V_s - 10)$

6

### FLOW RANGES

Pipe size in (mm)		2" (50)	3" (80)	4" (100)	6" (150)	8" (200)	10" (250)	12" (300)	14" (350)	16" (400)	18" (450)	20" (500)
2200 Series	Minimum flow gpm (m <sup>3</sup> /h)	10.6 (2.4)	23.4 (5.4)	40 (9.2)	100 (23)	167 (38)	267 (61)	368 (83)	418 (95)	568 (129)	734 (167)	934 (212)
	Maximum flow gpm (m <sup>3</sup> /h)	160 (36.3)	350 (79.5)	600 (136)	1500 (341)	2500 (557)	4000 (909)	5500 (1249)	6250 (1420)	8500 (1931)	11000 (2498)	14000 (3180)
3100 Series	Minimum flow gpm (m <sup>3</sup> /h)	N/A	26.6 (6.0)	40 (9.0)	100 (23)	167 (38)	267 (61)	366 (83)	417 (95)	567 (129)	733 (167)	933 (212)
	Maximum flow gpm (m <sup>3</sup> /h)	N/A	400 (90.8)	600 (136)	1500 (341)	2500 (557)	4000 (909)	5500 (1249)	6250 (1420)	8500 (1931)	11000 (2498)	14000 (3180)

### ORDERING INFORMATION

MODEL	DESCRIPTION
2200	Fixed insertion vortex flow meter
3100	Retractable insertion vortex flow meter
PIPE SIZE	DESCRIPTION
02	2" pipe (fixed insertion only)
03	3" pipe
04	4" pipe
06	6" pipe
08	8" pipe
10	10" pipe
12	12" pipe
14	14" pipe
16	16" pipe
18	18" pipe
20	20" pipe
MOUNTING	DESCRIPTION
1	Thredolet®
4	Tee (2" size only)
OUTPUT, DISPLAY OPTIONS	DESCRIPTION
2-1-1	4-20 mA output, no display
2-2-1	4-20 mA output, display, English units

2200      06      1      2-1-1

**Example:** 2200-06-1-2-1-1 Fixed insertion flow meter, 6" pipe, Thredolet® mount, 4-20 mA, no display

**Notes:** Other options and configurations available. Separately ordered configuration software also available for field configuration. Consult Kele with calibration information when ordering (pipe size, fluid temperature and pressure, max flow rate).

Software - FieldPro - EC10011