

# F-3100 SERIES IN-LINE ELECTROMAGNETIC FLOW METER



*Faraday's Law states that a voltage will be induced in a conductor (the conductive fluid) when it passes through a magnetic field (generated by the meter) and that voltage will be directly proportional to the velocity of the conductor (the fluid). This voltage is measured by electrodes on opposite sides of the flow tube and used to calculate the flow velocity.*

## DESCRIPTION

ONICON F-3100 series in-line electromagnetic flow meters are suitable for measurement of electrically conductive liquids, in a wide variety of applications. Inherently bi-directional, each F-3100 series meter is equipped with ONICON's standard transmitter that provides a single analog 4-20mA output for flow rate and two programmable pulse outputs.

## APPLICATIONS

- Chilled water, hot water, condenser water & water/glycol/brine solutions used in HVAC
- Bi-directional flow for primary/secondary bypass
- Process flow with conductivity greater than 5 $\mu$ S/cm
- Domestic/Municipal water

## GENERAL SPECIFICATIONS

### ACCURACY

Accurate to within:

- $\pm 0.4\%$  of reading from 3.3 to 33 ft/s
- $\pm 0.75\%$  of reading from 1 to 3.3 ft/s
- $\pm 0.0075$  ft/s at flows less than 1 ft/s

(continued on back)

## CALIBRATION

Every ONICON F-3100 series flow meter is wet calibrated in a flow laboratory against standards that are directly traceable to international standards. A certificate of calibration accompanies every meter.

## FEATURES

**Exceptional Performance & Accuracy** - ONICON F-3100 series meters deliver  $\pm 0.4\%$  of reading accuracy with as little as 3 diameters of straight pipe upstream of the meter, an exceptional level of performance by any standard.

**Easy to Install and Use** - Every ONICON meter is individually calibrated, configured and programmed using customer specific application data. Complex field programming is not required.

**Excellent Long Term Reliability** - ONICON electromagnetic flow meters have no moving parts. In addition, state-of-the-art electronics and proprietary noise filtering algorithms ensure years of accurate, trouble-free performance. This makes them the ideal choice for critical measurement applications or applications where water quality is less than ideal.

**Advanced Design Features** - Each meter is equipped with a multifunction user interface and display. Advanced programming options include an empty pipe detector, auto-zero and auto-calibration capabilities. A number of alarm options are also available.

**Installation Flexibility** - The F-3100 is an ideal choice for difficult installations as it only requires 3 diameters of straight pipe upstream and 2 diameters downstream for proper operation.



*For energy measurement applications, specify the F-3100 flow meter together with the System-10 BTU meter to form an energy measurement system with exceptional accuracy and reliability.*

## GENERAL SPECIFICATIONS (cont.)

### SENSING METHOD

Electromagnetic sensing (no moving parts)

### AMBIENT TEMPERATURE RANGE

-4° to 140° F

### OUTER BODY MATERIAL OPTIONS

- Carbon Steel, Painted
- 316 Stainless Steel

### FLOW TUBE (internal)

304 Stainless Steel

### CONNECTION TYPES AVAILABLE

- ANSI Class 150 Flange
- ANSI Class 300 Flange
- Wafer

### ELECTRICAL CONNECTIONS

Use 18-22 AWG shielded cable

### POWER SUPPLY OPTIONS

- 90 to 265 VAC, 45 to 66 Hz, 35 mA maximum
- 10 to 63 VDC, 15 to 45 VAC, 300 mA maximum

### OUTPUT SIGNALS PROVIDED

- Isolated 4 - 20mA analog output for flow rate
- (2) Programmable digital/pulse outputs (configurable for frequency, pulse or directional flow)

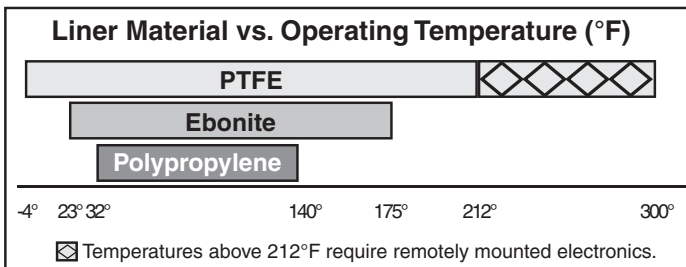
### ELECTRONICS ENCLOSURE

- Reinforced Nylon, NEMA 4X (IP65)
- (Optional) Remote mount transmitter version available, maximum distance from the sensor 65ft

### MAXIMUM OPERATING PRESSURE

230 - 580 psi depending on liner material and flange rating (Consult ONICON when higher pressure ratings are required)

### APPROVALS

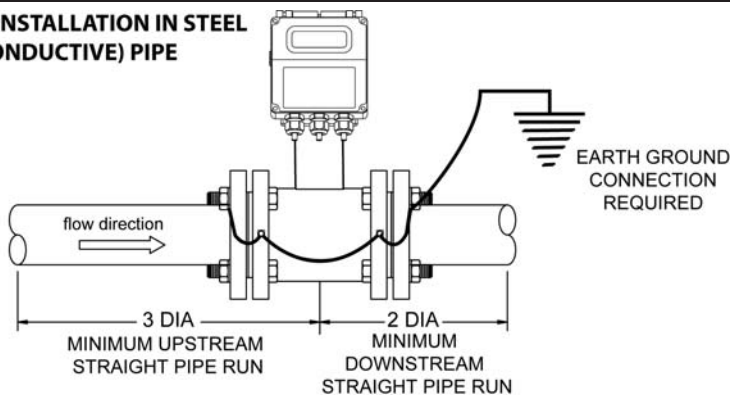


**Liner Material vs. Meter Size**

PTFE																				
Polypropylene									Ebonite											
1"	1.5"	2"	2.5"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	30"	36"	40"	42"	48"

Meter Sizes in Inches (other sizes available upon request)

### TYPICAL INSTALLATION IN STEEL (CONDUCTIVE) PIPE



### OPERATING RANGE

Meter Size (Inches)	Flow Rate (GPM) (0.1 ft/sec* - 33 ft/sec)
1	0.3 - 89
1.5	0.6 - 210
2	1.0 - 345
2.5	1.5 - 493
3	2.3 - 761
4	4.0 - 1311
5	6.2 - 2060
6	9.0 - 2975
8	16 - 5151
10	25 - 8119
12	35 - 11,645
14	43 - 14,197
16	57 - 18,806
18	73 - 24,062
20	91 - 29,965
24	132 - 43,712
30	210 - 69,185
36	304 - 100,479
40	378 - 124,577
42	417 - 137,596
48	547 - 180,535

\*Note: The default low flow cut-off is set for 0.1 ft/sec

### F-3100 Model Numbering System

#### F-31BB - CDE

- BB = Meter Size in Inches
  - 01 = 1"    06 = 6"
  - 15 = 1.5"    08 = 8"
  - 02 = 2"    10 = 10"
  - 25 = 2.5"
  - 03 = 3"    Above 10":
  - 04 = 4"    BB = meter size
  - 05 = 5"
- ◇ C = Body Material & Liner Material
  - 1 = Carbon steel / PTFE
  - 2 = Carbon steel / Polypropylene
  - 3 = Carbon steel / Ebonite
- ◇ D = Wafer or Flange Connection
  - 0 = Wafer
  - 1 = ANSI 150 Flange
  - 3 = ANSI 300 Flange
- E = Integral or Remote Mount Electronics Enclosure
  - 1 = Integral Mount
  - 2 = Remote Mount

Default configurations include the following:

- (2) 316 SS electrodes
- Viton o-rings on Polypropylene lined meters