

# • F-3100 SERIES • INLINE ELECTROMAGNETIC FLOW METER



Wafer style meter  
is also available



*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 is used to calculate the flow velocity.*

## DESCRIPTION

ONICON F-3100 series inline 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 4-20 mA 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  $\mu\text{S}/\text{cm}$
- 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, in most applications.



*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

Electronics: 14° to 122° F

Sensor Body: Refer to Material vs. Temp graph

### 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

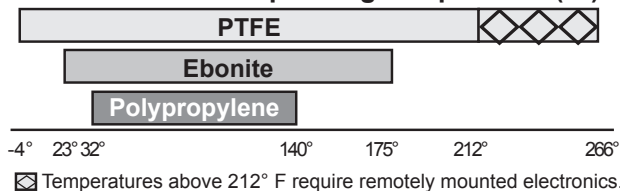
### ELECTRICAL CONNECTIONS

Use 18-22 AWG shielded cable

### FLUID CONDUCTIVITY

- 5 µS/cm minimum

### Liner Material vs. Operating Temperature (°F)



### POWER SUPPLY OPTIONS

- 90 to 265 VAC, 44 to 66 Hz, 35 mA maximum
- 18 to 45 VDC or VAC, 44 to 66 Hz, 300 mA maximum

### DISPLAY

16 character, 2-line alphanumeric LCD displays: flow rate and velocity, flow direction, totals, and alarm messages.

### OUTPUT SIGNALS PROVIDED

- Isolated 4 - 20 mA analog output for flow rate
- (2) Programmable digital/pulse outputs (configurable for frequency, pulse or directional flow)
- Optional: MODBUS RTU (RS485)

### ELECTRONICS ENCLOSURE

- Reinforced Nylon, NEMA 4X (IP65)
- Optional: For outdoor use, epoxy painted aluminum NEMA 6 (IP67)
- Optional: Remote mount transmitter (either version) available, maximum distance from the sensor - up to 164 ft @ conductivities  $\geq 200$  µS/cm.

### MAXIMUM OPERATING PRESSURE

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

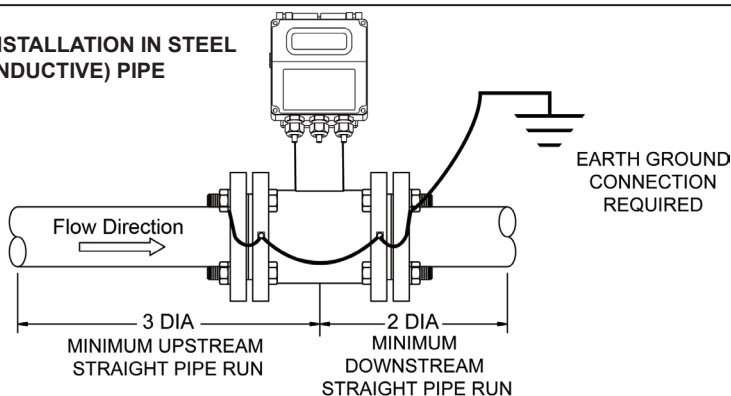
### APPROVALS NSF® - 61

### 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



### F-3100 Model Numbering System

#### F-31BB - CDE

##### BB = Meter Size in Inches

01 = 1"      05 = 5"  
15 = 1.5"    06 = 6"  
02 = 2"      08 = 8"  
25 = 2.5"    10 = 10"  
03 = 3"  
04 = 4"      Above 10":  
BB = meter size

##### 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

### OPERATING RANGE

Pipe Size (Inches)	Flow Rate (GPM) (0.1 ft/sec* - 33 ft/sec)
1	0.2 - 79
1½	0.6 - 203
2	0.9 - 317
2½	1.6 - 536
3	2.4 - 812
4	3.8 - 1,268
5	5.9 - 1,981
6	8.5 - 2,853
8	15 - 5,072
10	24 - 7,925
12	34 - 11,412
14	47 - 15,533
16	61 - 20,288
18	77 - 25,678
20	95 - 31,701
24	137 - 45,649
30	214 - 71,326
36	308 - 102,710
40	380 - 126,803
42	417 - 139,800
48	547 - 182,596

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