F-3000 SERIES
Inline Electromagnetic Flow Meters

ONICON's F-3000 series inline electromagnetic flow meters are wet calibrated in a flow laboratory against standards that are directly traceable to international standards. A certificate of calibration accompanies every meter. ONICON's F-3000 series inline electromagnetic flow meters are suitable for measurement of electrically conductive liquids in a wide variety of applications.

ONICON
Flow and Energy Measurement

• F-3000 SERIES •
INLINE ELECTROMAGNETIC FLOW METER

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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-3000 series inline electromagnetic flow meters are suitable for measuring electrically conductive liquids in a wide variety of applications. The F-3000 can be configured to provide analog outputs for flow rate, programmable pulse outputs for flow totalization and serial communications via an RS485 network.

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 µS/cm
- Domestic/municipal water

GENERAL SPECIFICATIONS

ACCURACY

Accuracy is associated with the selected transmitter:

Basic Transmitter:

± 0.4% of reading from 3.3 to 33 ft/s
± 0.75% of reading from 1 to 3.3 ft/s
± 0.0075 ft/s at flows less than 1 ft/s

Advanced Transmitter:

± 0.2% of reading from 1.6 to 33 ft/s
± 0.0033 ft/s from 0.033 to 1.6 ft/s

CALIBRATION

Every ONICON F-3000 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 - F-3000 series meters are capable of delivering ± 0.2% of reading accuracy with as little as three diameters of straight pipe upstream of the meter, a level of performance unmatched by other products.

Easy to Install and Use - Every ONICON meter is individually wet 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.

Redundant Outputs – Some versions of the F-3000 series meters can be equipped with redundant outputs, providing complete redundancy for up to three output signals. This option provides a cost-effective alternative to using a redundant flow meter in mission critical applications.

For energy measurement applications, the F-3000 flow meter can be specified together with an ONICON Btu Meter - forming a complete energy measurement system

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GENERAL SPECIFICATIONS

SENSING METHOD
Electromagnetic sensing (no moving parts)

FLUID TEMPERATURE RANGE
Refer to Liner Selection table below

OUTER BODY MATERIALS OPTIONS
Carbon Steel, painted
316 Stainless Steel

FLOW TUBE (Internal)
304 Stainless Steel

CONNECTION TYPES AVAILABLE
Wafer
ANSI Class 150 flange
ANSI Class 300 flange
NPT threads, line sizes up to 1”

ELECTRICAL CONNECTIONS
Removable terminal blocks, for use with 18-22 AWG shielded cable

FLUID CONDUCTIVITY
5 µS/cm minimum

POWER SUPPLY OPTIONS
24 VAC/DC, 10 W (12 VA) typical
100 - 240 VAC, 12 VA typical

DISPLAY
Basic Transmitter:
16 character, 2-line alphanumeric LCD displays: flow rate and velocity, flow direction, totals and alarm messages.
Advanced Transmitter:
Backlit 16 character, 8-line graphic LCD displays: flow rate and velocity, flow direction and totals, short term data and error messages.

OUTPUT SIGNALS PROVIDED
Isolated 4 - 20 mA analog output for flow rate
Two (2) isolated programmable digital/pulse outputs (configurable for frequency, pulse, alarm or directional flow)
Optional Features:
- MODBUS RTU (RS485)
- Advanced Transmitter Only: Redundant output option with second isolated analog output for flow rate and two additional isolated programmable pulse outputs

ELECTRONICS ENCLOSURE
Basic Transmitter:
Reinforced nylon, NEMA 4X (IP66)
Optional Features:
- Epoxy painted aluminum NEMA 6 (IP67)
- Remote mount, maximum distance from the sensor - up to 164 ft at conductivities ≥ 200 µS/cm.

Advanced Transmitter:
Epoxy painted aluminum housing, NEMA 6 (IP67)
Optional Feature:
- Remote mount, maximum distance from the sensor - up to 325 ft at conductivities ≥ 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
CE NSF-61

NOTE: Specifications are subject to change without notice.

Liner Selection Based on Physical Characteristics

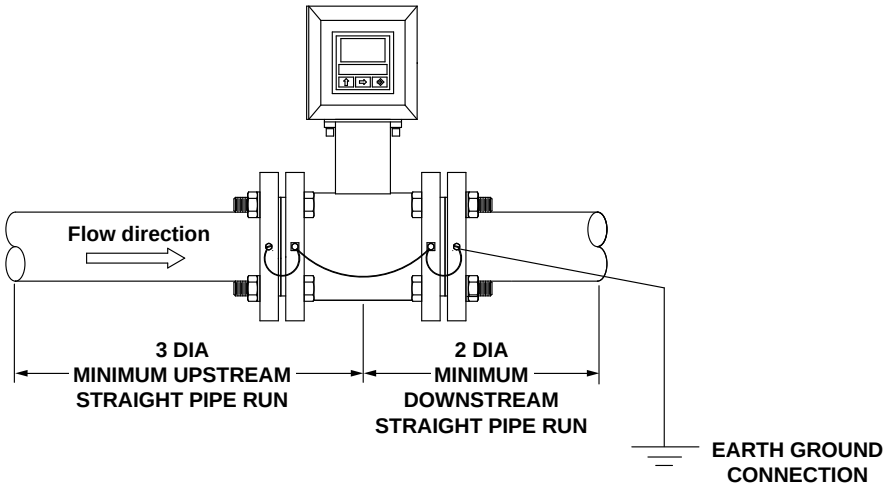
Material	Line Size Flanged and Wafer	Grade	Color	Temperature Range °F	Pressure Range Based on Liner PSI	Abrasion Resistance (Carbon Steel = 100)
Ebonite	8 - 48"	Food	Amber	32 to 175°	580 (1,2,3)	90-118
Polypropylene	1 - 6"	Food	Gray	32 to 140°	232 (4)	122
PTFE	1 - 48"	Food	White	0 to 266°	580 (1,2,5,6)	78

Notes	Description
1	Flanged meter pressure rating is the lesser of 580 psi or the flange rating.
2	Wafer style meters above 6" are limited to 232 psi.
3	Remote mount electronics option required for application temperature above 212° F.

TYPICAL METER INSTALLATION

TYPICAL INSTALLATION IN STEEL (CONDUCTIVE) PIPE

TYPICAL INSTALLATION IN STEEL (CONDUCTIVE) PIPE



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

METER ORDERING INFORMATION

Meter Model Number Coding = F-3ABB-CDEF(-SPC)

F-3AXX = Inline Electromagnetic Flow Meter

A = Transmitter Series

1 = Basic Transmitter

2 = Advanced Transmitter

BB = Meter Size (Inches)

Flanged / Wafer Models

01 = 1” 04 = 4”

15 = 1.5” 05 = 5”

02 = 2” 06 = 6”

25 = 2.5” 08 = 8”

03 = 3” 10 = 10”

nn Meter size, 12 through 48”

Threaded Models

AA = 1/4” AD = 3/4”

AB = 3/8” AE = 1”

AC = 1/2”

D = Process Connection

0 = Wafer Connection

1 = ANSI 150 Flanges

3 = ANSI 300 Flanges

A = NPT thread

E = Input Power

1 = Low Power, 24 VAC/DC

2 = High Power, 100 - 240 VAC

F = Electronics Enclosure Mounting Configuration

1 = Integral NEMA 4X (IP66) enclosure (Basic Transmitter)

2 = Remote NEMA 4X (IP66) enclosure (Basic Transmitter)

4 = Integral NEMA 6 (IP67) enclosure

5 = Remote NEMA 6 (IP67) enclosure

SPC = Special Configuration

101 = Aux outputs, redundant analog and pulse signals (Advanced Transmitter)

102 = MODBUS RTU RS485 serial communication

C = Body Material, Liner and Electrode Configuration

1 = Carbon Steel, PTFE Liner and 3 SS Electrodes

2 = Carbon Steel, Polypropylene Liner, 3 SS Electrodes and Viton O-rings

3 = Carbon Steel, Ebonite Liner and 3 SS Electrodes

4 = 304 SS Body, PTFE Liner and 3 SS Electrodes (Threaded Models Only)

9 = Polypropylene (PP) Body with PP Liner (Threaded Models Only)