ONICON’s F-3500 series insertion electromagnetic flow meters are suitable for measuring electrically conductive liquids in a wide variety of applications. Each F-3500 provides a single analog output for flow rate, a high resolution frequency output to drive peripheral devices, a scalable pulse output for totalization, and an empty pipe alarm signal.
• F-3500 SERIES •
INSERTION ELECTROMAGNETIC
FLOW METER

DESCRIPTION

ONICON Incorporated's F-3500 series insertion electromagnetic flow meters are suitable for measuring electrically conductive liquids in a wide variety of applications. Each F-3500 provides a single analog output for flow rate, a high resolution frequency output to drive peripheral devices, a scalable pulse output for totalization, and an empty pipe alarm signal.

Two versions of the F-3500 are now available. The standard configuration F-3500 is suitable for pipe sizes ranging from 3” to 72” in diameter. The small pipe configuration F-3500 is suitable for pipes ranging in size from 1¼” to 2½” in diameter.

Optional remote displays and BTU measurement systems are also available for both versions.

APPLICATIONS
• Accurate, reliable flow measurement for HVAC applications
• Ideal for monitoring open loop condenser water flow
• Hot tap design simplifies domestic water retrofit installations
• Cost-effective way to monitor flow in larger pipe sizes
• Suitable for use in water and water/glycol systems

CALIBRATION

Every ONICON flow meter is wet calibrated in a flow laboratory against standards that are directly traceable to NIST*. A certificate of calibration accompanies every meter.

ONICON’s F-3500 Insertion Electromagnetic Flow Meter combined with the System-20 BTU Meter forms an energy measurement system with unsurpassed accuracy and reliability.

*National Institute of Standards and Technology

FEATURES

Simple Installation and Commissioning - Factory programmed and ready for use upon delivery.

Exceptional Performance & Value - Cost-effective insertion style design provides accuracy and reliability normally only found in more expensive full bore devices.

Excellent Long Term Reliability - Low maintenance, no-moving-parts flow sensing technology works well in difficult flow measurement applications such as open loop condenser water flow.

Highly Accurate Over a Wide Flow Range - Highly efficient sensor design and continuous auto-zero function improve accuracy and sensitivity, particularly at low flow rates.

Simplified Hot Tap Insertion Design - Standard on every insertion flow meter, this feature allows for insertion and removal by hand without a system shutdown.

Ideal Solution for Retrofits - The innovative hot tap adapter design allows for wet tapping pipes without interrupting flow.
GENERAL SPECIFICATIONS

ACURACY
± 1.0% of reading from 2 - 20 ft/s
± 0.02 ft/s below 2 ft/s

FLOW RANGE
0.1 ft/s to 20 ft/s (200:1 turndown)

SENSING METHOD
Electromagnetic sensing (no moving parts)

PIPE SIZE RANGE
Standard Configuration: 3 – 72” nominal diameter
Small Pipe Configuration: 1¼ – 2½” nominal diameter

INPUT POWER
20 - 28 VDC, 250 mA at 24 VDC
20 - 28 VAC, 60 Hz, 6 VA

LIQUID TEMPERATURE RANGE
15°F to 250°F

AMBIENT TEMPERATURE RANGE
-20°F to 150°F

OPERATING PRESSURE
400 psi maximum

PRESSURE DROP
Standard Configuration: 0.1 psi at 12 ft/s in 3” pipe,
            decreasing as line size increases
Small Pipe Configuration: 0.33 psi at 8 ft/s in 1.25” pipe,
            decreasing as the line size increases

OUTPUT SIGNALS PROVIDED
Analog Output (Isolated)
Selectable: 4-20 mA, 0-10 V or 0-5 V

Frequency Output
0-15 V peak pulse, 0-500 Hz

Scalable Pulse Output
Isolated solid state dry contact
Contact rating: 50 VDC, 100 mA maximum
Pulse Duration: 0.5, 1, 2 or 6 seconds

MATERIAL
Wetted metal components: 316 Stainless Steel
Sensor head: XAREC
Optional: NSF/ANSI 61/372 version

ELECTRONICS ENCLOSURE
Weathertight NEMA 4 aluminum enclosure

ELECTRICAL CONNECTIONS
10’ of PVC jacketed cable with ½” NPT conduit connection
Dedicated earth wire required
4-wire minimum for power and analog output
Additional wires required for pulse, frequency and alarm outputs

STRAIGHT RUN INFORMATION

<table>
<thead>
<tr>
<th>Minimum Installation Recommendation Table</th>
<th>Meters</th>
<th>Upstream (Y)</th>
<th>Downstream (X)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uni-Directional</td>
<td>80% or 10 Dia.</td>
<td>20% or 5 Dia.</td>
<td></td>
</tr>
<tr>
<td>Bi-Directional</td>
<td>50% or 10 Dia.</td>
<td>50% or 10 Dia.</td>
<td></td>
</tr>
</tbody>
</table>

For Horizontal Pipe
Position Meter
Anywhere in Upper
240° (All Meters)

Clearance Required for Installation
F-3500 Series
30 - 40°
depending on pipe size

NOTE: Specifications are subject to change without notice.
TYPICAL METER INSTALLATION
(New construction or scheduled shutdown)

- Install in vertical or horizontal pipe
- For horizontal pipe position meter anywhere in upper 240°

**NOTE:** Installation kits vary based on pipe material and application. For installations in pressurized (live) systems, use “Hot Tap Installation Kit” and drill hole using a 1” wet tap drill.

**CLEARANCE REQUIRED FOR INSTALLATION**
Typically 30° - 35° depending on pipe size and height of valve assembly.

**CONNECT FACTORY WIRES TO FIELD WIRES IN APPROPRIATE JUNCTION BOX.**

**OUTPUT SIGNALS TO CONTROL SYSTEM**

**CONNECT ½” FNPT CONDUIT TO PERMIT THE METER TO BE REMOVED FROM THE VALVE.**

**INSERTION DEPTH GAUGE PROVIDED WITH EACH METER**

**MINIMUM HOLE SIZE = 1”**
- Must be centered
- **1¼” for hot tap**

**FLOW**

**METER ORDERING INFORMATION**

**Meter Model Number Coding = F-35AA-BB-CC-DEFG(-SPC)**

- **F-35AA = Insertion Electromagnetic Flow Meter**
  - 00 = Insertion electromagnetic flow meter
  - **BB = Outputs**
    - 11 = Frequency, isolated analog, scaled pulse and alarm (dry contacts)
    - 12 = Frequency, isolated analog, bi-directional, scaled pulse and alarm (dry contacts)*
  - **CC = Pipe Size Range and Meter Length**
    - A1 = 1.25 - 2.5” (F-3500 Small Pipe)
    - C3 = 3.0 - 10.0”
    - D4 = 3.0 - 16.0”
    - E5 = 3.0 - 22.0”
    - F6 = 3.0 - 72”
  - **D = Process Connection**
    - 1 = 1” NPT adapter, ¾" stem
  - **E = Wetted Material**
    - 1 = 316 SS, XAREC, Viton, Temp < 150°F
    - 2 = 316 SS, XAREC, FKM, Temp ≤ 250°F
    - 3 = 316 SS, XAREC, EPDM, NSF rated for domestic water
  - **F = Electronics Enclosure**
    - 1 = NEMA 4 weathertight enclosure
  - **G = Wiring Connection**
    - 1 = 10’ PVC jacketed cable, pig tail with ½” conduit adapter
  - **SPC = Special Configuration**

*For 3” and larger pipes*