F-3200
INLINE
ELECTROMAGNETIC
FLOW METER

ONICON’s F-3000 Series is a family of inline flow meters that provide accurate, reliable flow measurement for a variety of applications.

- Chilled Water
- Hot Water
- Domestic Water
- Condenser Water
DESCRIPTION

ONICON F-3000 Series Inline Electromagnetic Flow Meters are suitable for measuring electrically conductive liquids in a wide variety of applications. The F-3200 can be configured to provide analog outputs for flow rate, programmable pulse outputs for flow totalization, and serial communications via an RS485 network.

APPLICATIONS

• HVAC hydronic applications including chilled water, heating hot water and condenser water
• Bi-directional flow for primary/secondary bypass and thermal storage applications
• Domestic cold and hot water applications
• Clean process flow applications with conductivities greater than 5 µS/cm

FEATURES

Exceptional Performance & Accuracy – F-3000 series inline meters deliver unmatched accuracy in installations with just three diameters of straight pipe upstream of the meter!

Easy to Install and Use - Every ONICON meter is individually wet calibrated and programmed for the application - saving start-up and commissioning time!

Excellent Long Term Reliability - ONICON electromagnetic flow meters have no moving parts and employ state-of-the-art electronics, ensuring years of accurate, trouble-free performance.

Redundant Outputs – The F-3000 series inline meters can be ordered with an additional redundant analog output. This optional feature can provide a cost-effective alternative in Mission Critical applications which require redundant flow measurements.

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.

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.
## F-3200 INTEGRAL ELECTROMAGNETIC FLOW METER

### SPECIFICATIONS*

<table>
<thead>
<tr>
<th>F-3200 TRANSMITTER</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PERFORMANCE</strong></td>
<td><strong>ACCUARITY</strong></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>MINIMUM CONDUCTIVITY</strong></td>
</tr>
<tr>
<td><strong>INPUT POWER</strong></td>
<td><strong>AVAILABLE OPTIONS</strong></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>I/O SIGNALS</strong></td>
<td><strong>AVAILABLE OPTIONS</strong></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>ELECTRONICS</strong></td>
<td><strong>ENCLOSURE</strong></td>
</tr>
<tr>
<td><strong>INPUT POWER</strong></td>
<td><strong>AVAILABLE OPTIONS</strong></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>DISPLAY</strong></td>
<td><strong>AMBIENT CONDITIONS</strong></td>
</tr>
<tr>
<td></td>
<td><strong>PROGRAMMING</strong></td>
</tr>
<tr>
<td><strong>I/O SIGNALS</strong></td>
<td><strong>INPUT POWER</strong></td>
</tr>
<tr>
<td></td>
<td><strong>I/O SIGNALS</strong></td>
</tr>
<tr>
<td></td>
<td><strong>COIL &amp; ELECTRODES</strong></td>
</tr>
<tr>
<td><strong>APPROVALS</strong></td>
<td><strong>CE</strong></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### F-3000 SERIES FLOW SENSOR

| **PERFORMANCE**   | **SENSING METHOD** | Electromagnetic sensing (no moving parts) |
| **OPERATING CONDITIONS** | **FLUID TEMPERATURE RANGE** | See Liner Selection Table on back page |
|                    | **FLUID PRESSURE RANGE** | See Liner Selection Table on back page |
| **FLOW SENSOR DESIGN** | **FLOW TUBE** | 304 SS |
|                    | **ELECTRODES** | Qty: Three (3), round, 316 SS |
| **FLOW BODY**     | **AVAILABLE OPTIONS*** | • Carbon Steel |
|                    |               | • Polypropylene |
|                    |               | • Stainless Steel |
| **FLOW LINER**    | **AVAILABLE OPTIONS*** | • PTFE |
|                    |               | • Ebonite |
|                    |               | • Polypropylene |
| **PROCESS CONNECTIONS** | **AVAILABLE OPTIONS** | • Flanged connections ANSI Class 150 or ANSI Class 300 |
|                    |               | • Wafer mount |
| **APPROVALS**     | **NSF/ANSI CE** | 61 |
|                    | **E97/23/CE PED Directive** | |

* SPECIFICATIONS subject to change without notice.
** See model codification for additional information regarding option selections.
*** Selection based on application.
TYPICAL INSTALLATION

TYPICAL INSTALLATION IN STEEL (CONDUCTIVE) PIPE

Flow direction

EARTH GROUND CONNECTION REQUIRED

3 DIA MINIMUM UPSTREAM STRAIGHT PIPE RUN

2 DIA MINIMUM DOWNSTREAM STRAIGHT PIPE RUN

EARTH GROUND CONNECTION REQUIRED

FLANGED AND WAFER MODELS OPERATING RANGE

<table>
<thead>
<tr>
<th>PIPE SIZE (Inches)</th>
<th>FLOW RATE (GPM) (0.1 ft/sec - 33 ft/sec)</th>
<th>PIPE SIZE (Inches)</th>
<th>FLOW RATE (GPM) (0.1 ft/sec - 33 ft/sec)</th>
<th>PIPE SIZE (Inches)</th>
<th>FLOW RATE (GPM) (0.1 ft/sec - 33 ft/sec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.2 - 79</td>
<td>5</td>
<td>5.9 - 1,981</td>
<td>16</td>
<td>61 - 20,288</td>
</tr>
<tr>
<td>1¼</td>
<td>0.6 - 203</td>
<td>6</td>
<td>8.5 - 2,853</td>
<td>18</td>
<td>77 - 25,678</td>
</tr>
<tr>
<td>2</td>
<td>0.9 - 317</td>
<td>8</td>
<td>15 - 5,072</td>
<td>20</td>
<td>95 - 31,701</td>
</tr>
<tr>
<td>2½</td>
<td>1.6 - 536</td>
<td>10</td>
<td>24 - 7,925</td>
<td>24</td>
<td>137 - 45,649</td>
</tr>
<tr>
<td>3</td>
<td>2.4 - 812</td>
<td>12</td>
<td>34 - 11,412</td>
<td>42</td>
<td>417 - 139,800</td>
</tr>
<tr>
<td>4</td>
<td>3.8 - 1,268</td>
<td>14</td>
<td>47 - 15,533</td>
<td>48</td>
<td>547 - 182,596</td>
</tr>
</tbody>
</table>
METER ORDERING INFORMATION

Meter Model Number Coding = F-32BB-CDEF(-SPC)

<table>
<thead>
<tr>
<th>F-32BB = Inline Electromagnetic Flow Meter</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BB = Meter Size</strong></td>
</tr>
<tr>
<td>01 = 1”</td>
</tr>
<tr>
<td>15 = 1.5”</td>
</tr>
<tr>
<td>02 = 2”</td>
</tr>
<tr>
<td>25 = 2.5”</td>
</tr>
<tr>
<td>03 = 3”</td>
</tr>
<tr>
<td>nn = meter size, 12” - 48”</td>
</tr>
<tr>
<td><strong>C = Body Material, Liner and Electrode Configuration</strong></td>
</tr>
<tr>
<td>1 = Carbon Steel, PTFE Liner and 3 SS Electrodes</td>
</tr>
<tr>
<td>2 = Carbon Steel, Polypropylene Liner, 3 SS Electrodes and Viton O-rings</td>
</tr>
<tr>
<td>3 = Carbon Steel, Ebonite Liner and 3 SS Electrodes</td>
</tr>
<tr>
<td><strong>D = Process Connection</strong></td>
</tr>
<tr>
<td>0 = Wafer Connection</td>
</tr>
<tr>
<td>1 = ANSI 150 Flanges</td>
</tr>
<tr>
<td>3 = ANSI 300 Flanges</td>
</tr>
<tr>
<td><strong>E = Input Power</strong></td>
</tr>
<tr>
<td>1 = Low Power, 24 VAC/DC</td>
</tr>
<tr>
<td>2 = High Power, 120 - 240 VAC</td>
</tr>
<tr>
<td><strong>F = Electronics Enclosure Mounting Configuration</strong></td>
</tr>
<tr>
<td>4 = Integral IP67 enclosure</td>
</tr>
<tr>
<td>5 = Remote IP67 enclosure</td>
</tr>
<tr>
<td><strong>SPC = Special Configuration</strong></td>
</tr>
<tr>
<td>101 = Aux outputs, redundant analog and pulse signals</td>
</tr>
<tr>
<td>102 = MODBUS RTU (RS485) serial communication</td>
</tr>
</tbody>
</table>

LINER SELECTION TABLE

<table>
<thead>
<tr>
<th>Material</th>
<th>Line Size Flanged and Wafer</th>
<th>Grade</th>
<th>Color</th>
<th>Temperature Range</th>
<th>Pressure Range Based on Liner</th>
<th>Abrasion Resistance (Carbon Steel = 100)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ebonite</td>
<td>8 - 48”</td>
<td>Food</td>
<td>Amber</td>
<td>32°F - 175°F</td>
<td>580 psi</td>
<td>90 - 118</td>
</tr>
<tr>
<td>Polypropylene</td>
<td>1 - 6”</td>
<td>Food</td>
<td>Gray</td>
<td>32°F - 140°F</td>
<td>232 psi</td>
<td>122</td>
</tr>
<tr>
<td>PTFE</td>
<td>1 - 48”</td>
<td>Food</td>
<td>White</td>
<td>0 - 266°F</td>
<td>580 psi</td>
<td>78</td>
</tr>
</tbody>
</table>

Notes

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.