ONICON’s F-1000 Series is a family of insertion and inline turbine flow meters that provide accurate measurement over a wide flow range in pipe sizes ranging from \( \frac{3}{4} \)” to 72” in diameter. They are an excellent value when measuring water flow in clean closed loop systems.
FEATURES

• **The Dual Turbine Advantage**
  Dual counter-rotating turbines with mirrored helixes reduce the effects of the most common type of flow distortion, the swirl caused by bends and elbows. This reduces the upstream straight run requirements in some applications.

• **Programmable with Built-in Diagnostics**
  The USB interface makes field programming simple. Advanced diagnostics provide real-time data from the meter.

• **Excellent Long-term Reliability**
  Patented electronic sensing is resistant to scale and particulate matter. Low mass turbines with engineered jewel bearing systems provide a mechanical system that virtually does not wear.

• **Simplified Hot Tap Insertion Design**
  Allows for insertion and removal by hand without system shut-down for insertion meters.

• **Unmatched Price vs. Performance**
  Individually wet-calibrated, highly accurate instrumentation at very competitive prices.

THREE DIFFERENT STYLES

• **F-1100 single turbine insertion meters**
  Suitable for use in 1¼ - 72” pipes

• **F-1200 dual turbine insertion meters**
  Suitable for use in 2½ - 72” pipes

• **F-11XX single turbine inline meters**
  Available as ¾ and 1” meters.

APPLICATIONS

• Chilled water or hot water & water/glycol solutions for HVAC

• Domestic/municipal water

• Clean process water

CALIBRATION

Every F-1000 series meter is wet-calibrated using N.I.S.T.$^1$ traceable standards. A certificate of calibration is provided with each meter.

Axially mounted turbines riding on sapphire bearings virtually eliminate the mechanical load on the tungsten carbide shaft on which they ride.

$^1$ - National Institute of Standards and Technology
THREE DIFFERENT OUTPUT VERSIONS

Frequency & Scaled Pulse/Alarm Outputs
This version provides a high-resolution frequency output and a scaled pulse output for totalizing flow. The frequency output allows for connection to ONICON Btu meters or displays. The scaled pulse output may also be configured as an alarm.

Frequency, Analog & Scaled Pulse/Alarm Outputs
This version provides a high-resolution frequency output, an analog output for flow rate and a scaled pulse output for totalizing flow. The frequency output allows for connection to ONICON Btu meters or displays. The scaled pulse output may also be configured as an alarm.

Frequency, Isolated Analog & Scaled Pulse/Alarm Outputs
This version provides a high-resolution frequency output, an isolated analog output for flow rate and a scaled pulse output for totalizing flow. The frequency output allows for connection to ONICON Btu meters or displays. The scaled pulse output may also be configured as an alarm.

OPERATING RANGE FOR COMMON PIPE SIZES
0.17 TO 20 ft/s
±2% accuracy begins at 0.4 ft/s

<table>
<thead>
<tr>
<th>Pipe Size (Inches)</th>
<th>Flow Rate (GPM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>¾</td>
<td>0.4 - 38</td>
</tr>
<tr>
<td>1</td>
<td>0.4 - 38</td>
</tr>
<tr>
<td>1 ¼</td>
<td>0.8 - 95</td>
</tr>
<tr>
<td>1 ½</td>
<td>1 - 130</td>
</tr>
<tr>
<td>2</td>
<td>2 - 210</td>
</tr>
<tr>
<td>2½</td>
<td>2.5 - 230</td>
</tr>
<tr>
<td>3</td>
<td>4 - 460</td>
</tr>
<tr>
<td>4</td>
<td>8 - 800</td>
</tr>
<tr>
<td>6</td>
<td>15 - 1,800</td>
</tr>
<tr>
<td>8</td>
<td>26 - 3,100</td>
</tr>
<tr>
<td>10</td>
<td>42 - 4,900</td>
</tr>
<tr>
<td>12</td>
<td>60 - 7,050</td>
</tr>
<tr>
<td>14</td>
<td>72 - 8,600</td>
</tr>
<tr>
<td>16</td>
<td>98 - 11,400</td>
</tr>
<tr>
<td>18</td>
<td>120 - 14,600</td>
</tr>
<tr>
<td>20</td>
<td>150 - 18,100</td>
</tr>
<tr>
<td>24</td>
<td>230 - 26,500</td>
</tr>
<tr>
<td>30</td>
<td>360 - 41,900</td>
</tr>
<tr>
<td>36</td>
<td>510 - 60,900</td>
</tr>
</tbody>
</table>

Utility software available allows for programming and field diagnostics.

Inline meters are provided with meter couplings. Couplings are available with NPT or copper sweat process connections.
GENERAL SPECIFICATIONS

ACCUACY
± 0.5% of reading at calibrated velocity
Insertion: ± 1% of reading from 3 to 30 ft/s (10:1 range)
± 2% of reading from 0.4 to 20 ft/s (50:1 range)
Inline: ± 2% of reading from 0.8 to 38 GPM (50:1 range)

SENSING METHOD
Electronic impedance sensing (non-magnetic and non-photoelectric)

PIPE SIZE RANGE
Insertion: 1¼ through 72” nominal diameter
Inline: Threaded or sweat union fittings - ¾ or 1”

SUPPLY VOLTAGE
24 ±4 V AC/DC at 100 mA

LIQUID TEMPERATURE RANGE
Medium Temp: 150° F continuous, 200° F peak
High Temp: 280° F continuous, 300° F peak
Meters operating above 250° F require 316 SS construction option

AMBIENT TEMPERATURE RANGE
-5° to 160° F (-20° to 70° C)

OPERATING PRESSURE
400 PSI maximum

PRESSURE DROP
Insertion: Less than 1 PSI at 20 ft/s in 1½” pipe, decreasing in larger pipes and lower velocities
Inline: 3 PSI at maximum flow rate

MATERIAL
Wetted material:
Electroless nickel plated brass stem
Optional: 316 stainless steel
Optional: NSF/ANSI 61/372 version

OUTPUT SIGNALS AVAILABLE
Frequency Output
0-15 V peak pulse, programmable max Hz
Scaled Pulse / Alarm Output
Isolated solid state dry contact
Contact rating: 100 mA, 50 V
Contact duration: Field programmable; 50, 100, 500 or 1000 ms
Analog Output (non-isolated)
Signal type: 4-20 mA, 0-10 V or 0-5 V (jumper selectable)
Output range: Field programmable
Isolated Analog Output
Signal type: 4-20 mA, 0-10 V or 0-5 V (jumper selectable)
Output range: Field programmable

ELECTRONICS ENCLOSURE
NEMA4 enclosure
Optional: Submersible enclosure

ELECTRICAL CONNECTIONS
Standard: 10’ of cable with ½” NPT conduit connection
Optional: Indoor DIN connector with 10’ of plenum rated cable

METER ORDERING INFORMATION

Meter Model Number Coding = F-1ABB-CC-DD-EFGH

A = Number of Turbines
1 = Single Turbine
2 = Dual Turbine

BB = Meter Type
00 = Insertion
34 = ¾” Inline
01 = 1” Inline

CC = Outputs
00 = Freq. and Scaled Pulse
10 = Freq., analog and Scaled Pulse
11 = Freq., Iso. Analog, and Scaled Pulse

DD = Meter Type and Pipe Size Range
A1 = 1.25 - 2.5” (F-1100 Only)
B2 = 2.5 – 4.0” (F-1100 Only)
C3 = 2.5 – 10”
D4 = 2.5 – 16”
E5 = 2.5 – 22”
F6 = 2.5 – 72”
00 = Inline

E = Wetted Materials
1 = Electroless Ni Plated Brass
2 = 316 SS
3 = Bronze Body, Inline

F = Electronics Enclosure
2 = NEMA 4 Weathertight Enclosure
3 = NEMA 6 Submersible Enclosure

G = Wiring Connection
2 = 10’ PVC Jacketed Cable, Pig Tail with ½” Conduit Adapter
5 = 10’ Plenum Rated Cable, DIN Connector
6 = 25’ PVC Jacketed Cable, Pig Tail with ½” Conduit Adapter
7 = 10’ Submersible Cable with Connector

H = Process Adapter
1 = 1” NPT Adapter, Medium Temperature (Temp. </= 150° F)
2 = 1” NPT Adapter, High Temperature (Temp. </= 280° F)
3 = 1” NPT Adapter, NSF Rated for Domestic Water
9 = Inline, coupling adapters based on pipe material