

# F-1000 Series Turbine Flow Meters

*Chilled Water • Hot Water • Domestic Water*



*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 ½" to 72" in diameter. They are an excellent value when measuring water flow in clean closed loop systems.*

**ONICON**  
— Flow and Energy Measurement —



## **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.

## **DESCRIPTION**

ONICON's F-1000 Series is a family of insertion and inline style turbine meters flow meters that provide accurate, reliable flow measurement in a variety of applications. The F-1000 Series meters are suitable for use in pipes ranging in size from ¾ to 72" in diameter. Each model utilizes ONICON's patented electronic turbine rotation sensing system and unique low mass turbine design that is accurate over wide flow ranges with excellent low flow measurement capability.

## **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.<sup>1</sup> 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.*

<sup>1</sup> - 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.



Utility software available allows for programming and field diagnostics.

OPERATING RANGE FOR COMMON PIPE SIZES	
0.17 TO 20 ft/s	
±2% accuracy begins at 0.4 ft/s	
Pipe Size (Inches)	Flow Rate (GPM)
¾	0.4 - 38
1	0.4 - 38
1 ¼	0.8 - 95
1 ½	1 - 130
2	2 - 210
2 ½	2.5 - 230
3	4 - 460
4	8 - 800
6	15 - 1,800
8	26 - 3,100
10	42 - 4,900
12	60 - 7,050
14	72 - 8,600
16	98 - 11,400
18	120 - 14,600
20	150 - 18,100
24	230 - 26,500
30	360 - 41,900
36	510 - 60,900



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

## **GENERAL SPECIFICATIONS**

### **ACCURACY**

- ± 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 <sup>1</sup>
- Optional: NSF/ANSI 61/372 version\* <sup>1</sup>

## **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

<sup>1</sup> Insertion meters only

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TURBINE INSERTION FLOW METER  
NSF/ANSI 61 <MH60590>  
ALSO CLASSIFIED IN ACCORDANCE WITH  
NSF/ANSI 372

## **METER ORDERING INFORMATION**

### **Meter Model Number Coding = F-1**A**BB-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 = 1.25 - 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
- 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