



**ONICON**  
Flow and Energy Measurement

# FT-3100

**INLINE  
ELECTROMAGNETIC  
FLOW METER**

ONICON's FT-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 & Water/Glycol Solutions • Process Application Water Flow •

# FT-3100

## INLINE ELECTROMAGNETIC FLOW 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.*

### DESCRIPTION

ONICON FT-3000 series inline electromagnetic flow meters are suitable for measuring electrically conductive liquids in a wide variety of applications. The FT-3100 provides analog and digital outputs for flow rate and programmable pulse outputs for flow totalization and/or alarms.

### 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  $\mu\text{S}/\text{cm}$

### FEATURES

**Exceptional Performance & Accuracy** – FT-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 FT-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

The FT-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.



*For energy measurement applications, the FT-3100 flow meter can be specified together with an ONICON BTU Meter - forming a complete energy measurement system.*

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**SPECIFICATIONS\***

<b>FT-3100 TRANSMITTER</b>		
PERFORMANCE	ACCURACY	±0.4% of reading from 3.3 to 33 ft/sec ±0.75% of reading from 1.3 to 3.3 ft/sec ±0.0075 ft/sec at flow rates less than 1 ft/sec
	MINIMUM CONDUCTIVITY	5 µS/cm
INPUT POWER**	AVAILABLE OPTIONS	<ul style="list-style-type: none"> <li>• Low Power, 24 VAC/DC, 50/60 Hz, 12 VA</li> <li>• High Power, 120 - 240 VAC, 50/60 Hz, 12 VA</li> </ul>
I/O SIGNALS**	AVAILABLE OPTIONS	<ul style="list-style-type: none"> <li>• Two (2) digital outputs, one (1) digital input, and one (1) analog output</li> <li>• MODBUS RTU (RS485)</li> </ul>
ELECTRONICS ENCLOSURE**	IP67 (NEMA 4X) enclosure with display	
	AVAILABLE OPTIONS	<ul style="list-style-type: none"> <li>• Integral mount</li> <li>• Remote (wall) mount with kit, up to 164 ft in fluids with conductivity ≥200 µS/cm</li> </ul>
	DISPLAY	16-character, 8-line, 128x64 graphic LCD with back light
	AMBIENT CONDITION	Transmitter: 14°F to 140°F
PROGRAMMING	AVAILABLE OPTIONS	<ul style="list-style-type: none"> <li>• Menu driven user interface via three (3) programming keys</li> <li>• PC user interface via micro USB and downloadable software</li> </ul>
ELECTRICAL CONNECTIONS	INPUT POWER	Removable terminal blocks for use with 14 - 22 gauge wire
	I/O SIGNALS	Removable terminal blocks for use with 18 - 24 gauge wire
	COIL & ELECTRODES	Removable terminal blocks for use with sensor cable provided
APPROVAL	CE	2014/30/EU EMC Directive
<b>FT-3000 SERIES FLOW SENSOR</b>		
PERFORMANCE	SENSING METHOD	Electromagnetic sensing (no moving parts)
OPERATING CONDITIONS	FLUID TEMPERATURE RANGE	See Liner Selection Table on next page
	FLUID PRESSURE RANGE	See Liner Selection Table on next page
FLOW SENSOR DESIGN**	FLOW TUBE	304 SS
	ELECTRODES	Qty: Three (3), round, 316 SS
FLOW BODY**	AVAILABLE OPTIONS***	<ul style="list-style-type: none"> <li>• Carbon Steel</li> <li>• Polypropylene</li> <li>• Stainless Steel</li> </ul>
FLOW LINER**	AVAILABLE OPTIONS***	<ul style="list-style-type: none"> <li>• PTFE</li> <li>• Ebonite</li> <li>• Polypropylene</li> </ul>
PROCESS CONNECTIONS**	AVAILABLE OPTIONS	<ul style="list-style-type: none"> <li>• Flanged connections ANSI Class 150 or ANSI Class 300</li> <li>• Wafer mount</li> <li>• Threaded (NPT) connections</li> </ul>
APPROVALS	NSF	61
	CE	E97/23/CE PED Directive

\* SPECIFICATIONS subject to change without notice.

\*\* See model codification for additional information regarding option selections.

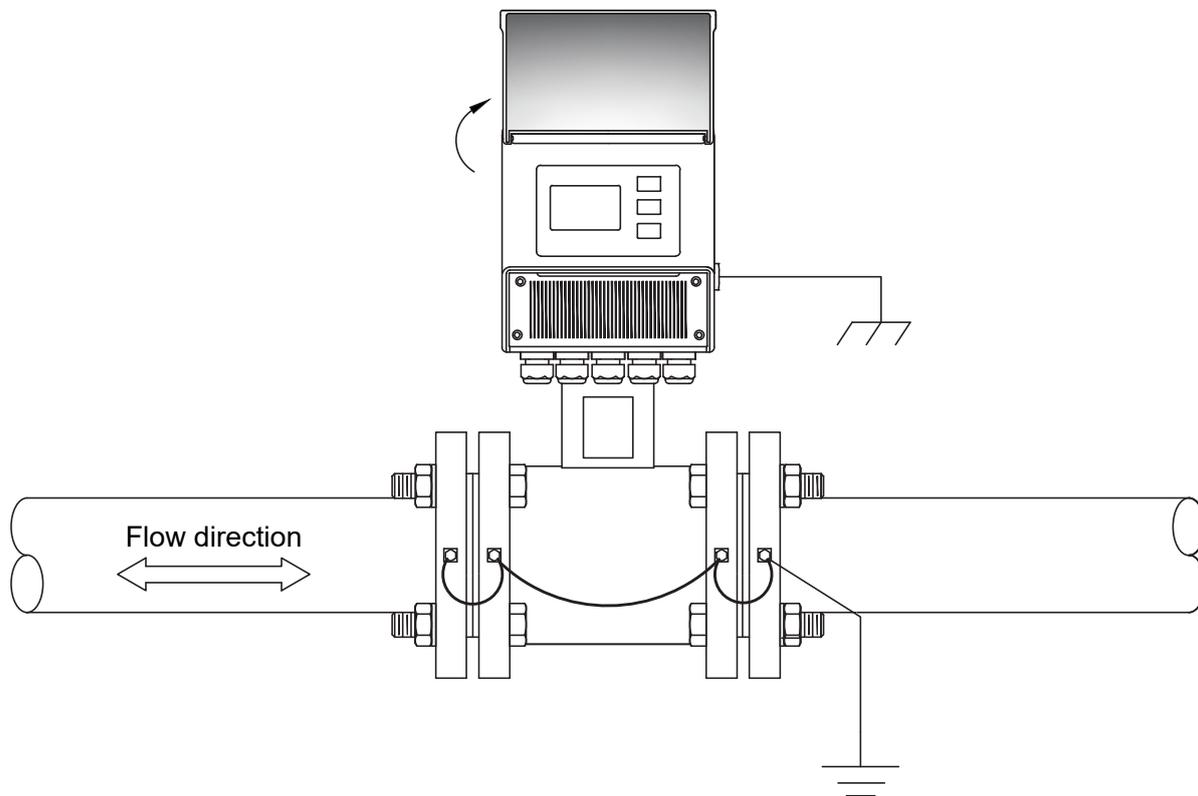
\*\*\* Selection based on application.

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



FLANGED AND WAFER MODELS OPERATING RANGE					
PIPE SIZE (INCHES)	FLOW RATE (GPM) (0.1 ft/sec - 33 ft/sec)	PIPE SIZE (INCHES)	FLOW RATE (GPM) (0.1 ft/sec - 33 ft/sec)	PIPE SIZE (INCHES)	FLOW RATE (GPM) (0.1 ft/sec - 33 ft/sec)
1	0.2 - 79	5	5.9 - 1,981	14	47 - 15,533
1½	0.6 - 203	6	8.5 - 2,853	16	61 - 20,288
2	0.9 - 317	8	15 - 5,072	18	77 - 25,678
2½	1.6 - 536	10	24 - 7,925	20	95 - 31,701
3	2.4 - 812	12	34 - 11,412	24	137 - 45,649
4	3.8 - 1,268				

THREADED MODELS OPERATING RANGE					
PIPE SIZE (INCHES)	FLOW RATE (GPM) (0.1 ft/sec - 33 ft/sec)	PIPE SIZE (INCHES)	FLOW RATE (GPM) (0.1 ft/sec - 33 ft/sec)	PIPE SIZE (INCHES)	FLOW RATE (GPM) (0.1 ft/sec - 33 ft/sec)
¼	0.004 - 1.12	½	0.038 - 12.46	1	0.152 - 49.84
⅜	0.014 - 4.49	¾	0.085 - 28.03		

## METER ORDERING INFORMATION

### Meter Model Number Coding = FT-31GG-HIJKL-BCDE

FLOW SENSOR CONFIGURATION INFORMATION	
<b>GG = Meter Size (inches)</b>	
<b>Flanged and Wafer Models</b>	
01 = 1"	25 = 2½"
15 = 1½"	03 = 3"
02 = 2"	04 = 4"
05 = 5"	08 = 8"
10 = 10"	nn = Meter Size, 12 - 24"
<b>Threaded Models</b>	
AA = ¼"	AC = ½"
AB = ⅜"	AD = ¾"
AE = 1"	
<b>H = Liner Material</b>	<b>JK = Body Material</b>
1 = PTFE	11 = Carbon Steel w/ SS Electrodes
2 = Polypropylene	41 = 304 SS w/ SS Electrodes
3 = Ebonite	51 = 316 SS w/ SS Electrodes
	91 = Polypropylene w/ SS Electrodes
<b>I = Process Connection</b>	<b>L = Electronics Enclosure Mounting Configuration</b>
0 = Wafer connection	1 = Integral
1 = ANSI 150 flanges	2 = Remote
3 = ANSI 300 flanges	
A = NPT thread	
TRANSMITTER CONFIGURATION INFORMATION	
<b>BC = Outputs</b>	
10 = One (1) AO, two (2) DO and one (1) DI	
11 = One (1) AO, two (2) DO and one (1) DI w/ MODBUS (RS485)	
<b>D = Electronics Enclosure</b>	
1 = IP67 (NEMA 4X) enclosure w/ display	
<b>E = Input Power</b>	
1 = Low power, 24 VAC/VDC	
2 = High power, 120 - 240 VAC	

