



DESCRIPTION

ONICON's FT-3400 series insertion electromagnetic flow meters are suitable for measuring electrically conductive liquids in a wide variety of applications. Each FT-3400 provides current and voltage analog output for flow rate, a high-resolution frequency output to drive peripheral devices, a scalable pulse output for totalization, and a master alarm signal. The FT-3400 provides a contact closure signal for bidirectional applications for flow direction.

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 25 $\mu\text{S}/\text{cm}$

CALIBRATION

All FT-3400 flow meters are wet calibrated in a flow laboratory against standards that are directly traceable to National Institute of Standards and Technology (N.I.S.T.). A certificate of calibration accompanies every meter

GENERAL SPECIFICATIONS

MODEL FT-3400		
PERFORMANCE	ACCURACY	Standard Sensor $\pm 1.0\%$ of reading from 2 - 20 ft/s ± 0.02 ft/s below 2 ft/s Small Pipe Sensor $\pm 1.0\%$ of reading from 1.6 - 16 ft/s ± 0.016 ft/s below 1.6 ft/s
	MINIMUM CONDUCTIVITY	25 $\mu\text{S}/\text{cm}$
INPUT POWER	20 - 28 VDC, 400 mA at 24 VDC 20 - 28 VAC, 60 Hz, 10 VA	
I/O SIGNAL	ANALOG OUTPUT (ISOLATED)	One 4-20mA analog output and one 2-10V or 1-5V analog output, with 2mA and 1V or 0.5V specifically allocated for alarm conditions.
	FREQUENCY OUTPUT	0-15 V peak pulse, 0-500 Hz
	SCALABLE PULSE OUTPUT	Isolated solid state dry contact Contact rating: 30 V, 1.2A Pulse Duration: 0.5, 1, 2 or 6 seconds
ELECTRONICS ENCLOSURE	Weathertight NEMA 4 aluminum enclosure	
ELECTRICAL CONNECTIONS	10' or 25' of PVC jacketed cable with $\frac{1}{2}$ " NPT conduit connection	
FLOW RANGE	0.1 ft/s to 20 ft/s (200:1 turndown)	
SENSING METHOD	Electromagnetic sensing (no moving parts)	
PIPE SIZE RANGE	AVAILABLE OPTIONS	Standard Configuration: 3" - 72" nominal diameter Small Pipe Sensor: 1.25" - 2.5" nominal diameter
LIQUID TEMPERATURE RANGE	15°F to 250°F	

GENERAL SPECIFICATIONS (continued)

AMBIENT TEMPERATURE RANGE	-20°F to 150°F	
OPERATING PRESSURE	400 psi maximum	
PRESSURE DROP	0.1 psi at 12 ft/s in 3" pipe, decreasing as line size increases	
MATERIAL	Wetted metal components: 316 Stainless Steel Sensor head: XAREC Optional: NSF/ANSI 61/372 version	
APPROVAL	UL	UL ANSI/NSF 61 & 372 Drinking Water Safety UL 50 Standard for Enclosures for Electrical Equipment UL 61010-1 Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use
	CE	IEC 61000-6-2 Power-Frequency Magnetic Field, Radiated Immunity and Electrostatic Discharge. IEC 61000-6-4 Radiated Emissions EN 301 489-17 Radiated Emissions, RF Immunity, and Electrostatic Discharge EN 301 328 Wideband transmission systems
	FCC: Part 15, Subpart B	

OPERATING RANGE FOR COMMON PIPE SIZES

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PIPE SIZE (inches)	FLOW RATE (GPM) (0.1 ft/s to 16 ft/s)	PIPE SIZE (inches)	FLOW RATE (GPM) (0.1 ft/s to 20 ft/s)	PIPE SIZE (inches)	FLOW RATE (GPM) (0.1 ft/s to 20 ft/s)
1¼	0.4 - 72	3	2.4 - 460	16	55 - 11,400
1½	0.6 - 99	4	4 - 800	18	70 - 14,600
2	1.0 - 164	6	9 - 1,800	20	86 - 18,100
2½	1.1 - 234	8	16 - 3,100	24	125 - 26,500
		10	24 - 4,900	30	223 - 41,900
		12	35 - 7,050	36	304 - 60,900
		14	42 - 8,600	42	416 - 83,300

METER ORDERING INFORMATION

A B C D EE F

Model FT-3400-

Meter Configuration & I/O
1 = Frequency, Pulse, Iso Analog, 24V AC/DC
2 = Frequency, Pulse, Iso Analog, Dir Contact , 24V AC/DC

B = Network Communications
0 = No Communications module

C = Reserved for Bluetooth

D = Enclosure Type and Process Connection
1 = NEMA 4 Enclosure with 10' PVC Cable
2 = NEMA 4 Enclosure with 25' PVC Cable

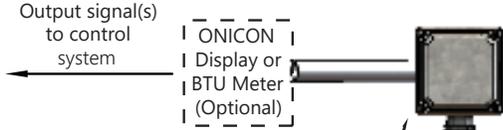
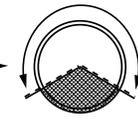
EE = Pipe Size Range and Meter Length	
A2 = for pipes 1.25 - 2.5" (20" stem)	F7 = for pipes 3 - 72" (26" stem)
C3 = for pipes 3 - 10" (18" stem)	F8 = for pipes 3 - 72" (28" stem)
D4 = for pipes 3 - 16" (20" stem)	G1 = for pipes 12 - 72" (30" stem)
E5 = for pipes 3 - 22" (22" stem)	G2 = for pipes 12 - 72" (34" stem)
F6 = for pipes 3 - 72" (24" stem)	

F = Wetted Material
1 = Temp < 150°F , 316 SS, XAREC, Viton
2 = Temp ≤ 250°F , 316 SS, XAREC, FKM, Viton
3 = Temp < 180°F , 316 SS, XAREC, EPDM, NSF rated

INSTALLATION DETAILS

Typical Meter Installation
(New Construction or Scheduled Shutdown)

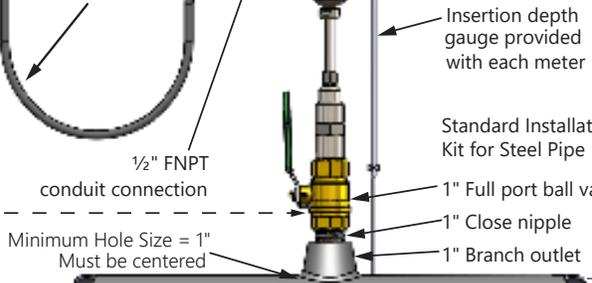
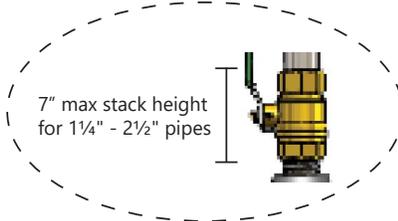
- Install in vertical or horizontal pipe
- For horizontal pipe position meter anywhere in upper 240°



NOTE:
Grounding rings placed before and after the meter are required for installation on non-metallic or lined pipes.

Allow enough slack in the flexible conduit to permit the meter to be removed from the valve.

CLEARANCE REQUIRED FOR INSTALLATION
Typically 30" - 36" depending on pipe size and height of valve assembly.

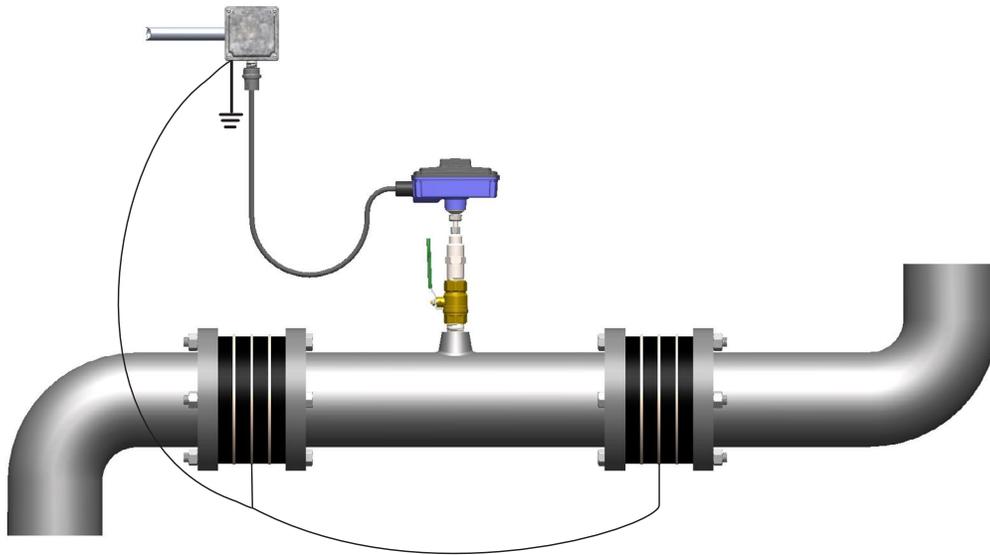


Note: Installation kits vary based on pipe material and application. For installations in pressurized (live) systems, use "Hot tap" 1/4 inch installation kit and drill hole using a 1 inch wet tap drill.

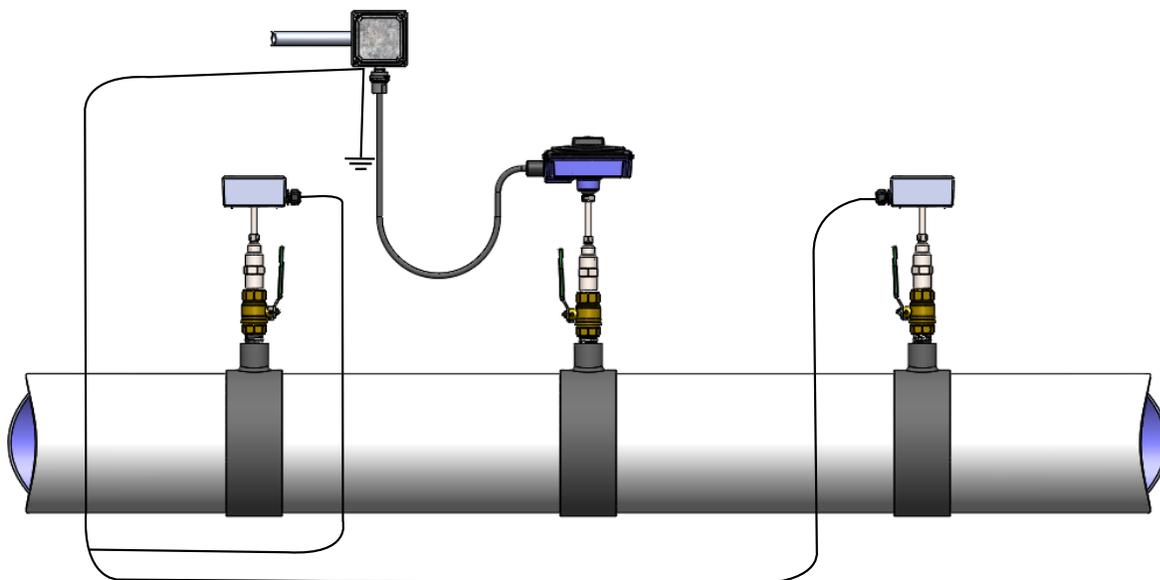
Optional Grounding Rings or Probes Accessory in Non-Conductive Pipe

Grounding rings or probes are required whenever meters are installed in non-metallic or lined pipes. Grounding rings or probes placed before and after the meter eliminate electrical noise that will interfere with the proper operation of the meter. ONICON provides grounding rings or probes as an optional accessory.

Grounding Rings Installation



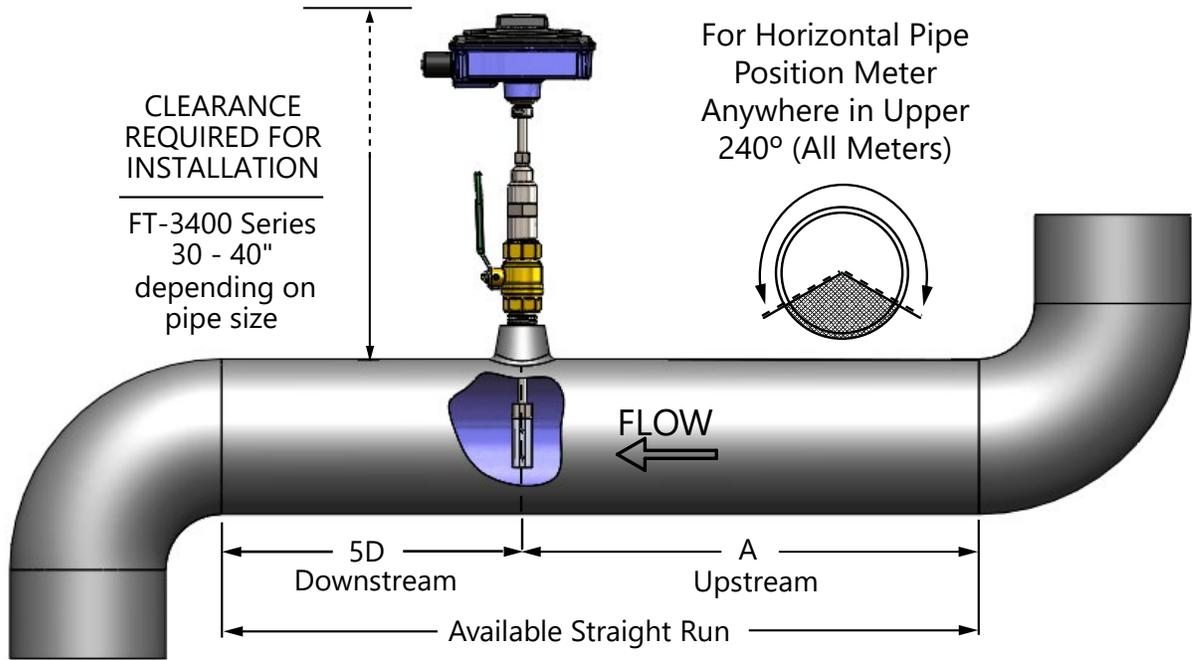
Grounding Probes Installation



*** Additional straight run may be required upstream of the upstream grounding ring/probe based on the nature of the upstream obstruction. Refer to the chart on the next page to determine how much straight run is required.**

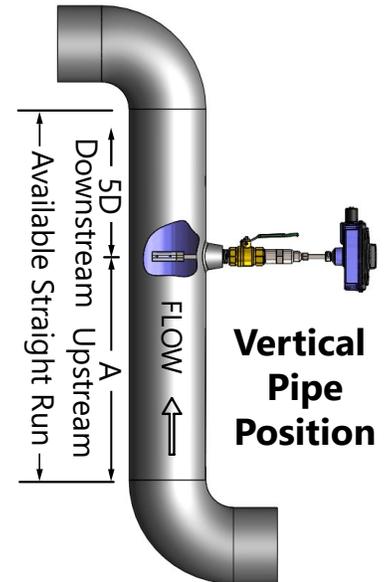
MINIMUM STRAIGHT RUN REQUIREMENT

The straight run requirements presented below represent the minimum requirements for accurate flow measurement. For optimum performance, provide as much additional straight run as possible.



For 3" and larger pipe diameters

Upstream obstruction	(A) Minimum straight run required upstream of meter location
Single bend preceded by ≥ 9 diameters of straight pipe	10 Diameters
Pipe size reduction / expansion in straight pipe run	10 Diameters
Single bend preceded by ≤ 9 diameters of straight pipe	15 Diameters
Outflowing tee / Pump outflow	20 Diameters
Multiple bends out of plane	30 Diameters
Inflowing tee	30 Diameters
Control / Modulating valve	30 Diameters



WIRING CONNECTIONS

	Wire Color	Description	Notes
POWER / GROUND	Red	(+) 24V Supply voltage	Connect to power supply (+): DC (+) or AC (line) 22-26VDC, 1.2A, 25Watts or 20-28VAC, 30VA, 60hz
	Black	(-) Isolated supply voltage common	
	Green / Yellow	Earth ground connection	Required for meter operation
FREQUENCY OUT	Green	(+) Isolated frequency output	Required when connecting to ONICON display or BTU meter
	Yellow	(-) Frequency output common	
ANALOG OUT	Blue	(+) Isolated 4-20mA analog output	2mA = Master Alarm
	White	(+) Isolated 2-10V or 1-5V analog output	Configurable via PC app 1V = Master Alarm for 2-10V or 0.5V = Master Alarm for 1-5V
	Brown	(-) Isolated analog output common	
DRY CONTACT (Scaled Pulse or Alarm)	Orange / Black	Dry Contact 1	Pulse scaled output for totalization. Example: 1 pulse per 10 gal / 1 pulse per 100 gal
	White / Black		
	Gray / Black	Dry Contact 2	Master Alarm Contact
	Violet / Black		
	Gray	Dry Contact 3	Bidirectional Contact (only available on the FT-3400-2)
	Violet		

FT-3400 SUBMITTAL AND DATA SHEET



ITEM	TAG/QTY	APPLICATION	LIQUID TYPE	DESIGN FLOW	METER MODEL SELECTION	GROUNDING RINGS	REFERENCE SHEET	ASSOCIATED PERIPHERAL	NOTES
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									

FT-3400 SUBMITTAL AND DATA SHEET

TO:

DATE:

PROJECT NAME:

CONTRACTOR:

ENGINEER:

ONICON REP:

SUBMITTAL FOR:

RECORD

APPROVAL

APPROVED BY:

RELEASED FOR:

MANUFACTURING AND SHIPMENT

HOLD FOR RELEASE

APPROVED

APPROVED AS NOTED

DISAPPROVED

EXPLANATION:

PLEASE RETURN APPROVED DRAWINGS TO:

ATTENTION:

SUBMITTED BY:

