



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

| | | |
|---------------------------|--|--|
| PERFORMANCE | ACCURACY | $\pm 1.0\%$ of reading from 2 - 20 ft/s ± 0.02 ft/s below 2 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 (1) 4-20 mA analog output, and one (1) 0-10 V or 0-5 V analog output |
| | 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 20' 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 (1.25" - 2.5" Coming in Q2 2024) |
| LIQUID TEMPERATURE RANGE | 15°F to 250°F | |
| 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 | |

GENERAL SPECIFICATIONS (continued)

| | | |
|----------|---|--|
| 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

| OPERATING RANGE FOR COMMON PIPE SIZES* | | | | | |
|--|---------------------------------------|--------------------|---------------------------------------|--------------------|---------------------------------------|
| 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) | PIPE SIZE (inches) | FLOW RATE (GPM) (0.1 ft/s to 20 ft/s) |
| 1¼ | 0.4 - 95 | 6 | 9 - 1,800 | 18 | 70 - 14,600 |
| 1½ | 0.6 - 130 | 8 | 16 - 3,100 | 20 | 86 - 18,100 |
| 2 | 1.0 - 200 | 10 | 24 - 4,900 | 24 | 125 - 26,500 |
| 2½ | 1.1 - 230 | 12 | 35 - 7,050 | 30 | 223 - 41,900 |
| 3 | 2.4 - 460 | 14 | 42 - 8,600 | 36 | 304 - 60,900 |
| 4 | 4 - 800 | 16 | 55 - 11,400 | | |

*1.25" to 2.5" coming in Q2 2024

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 |

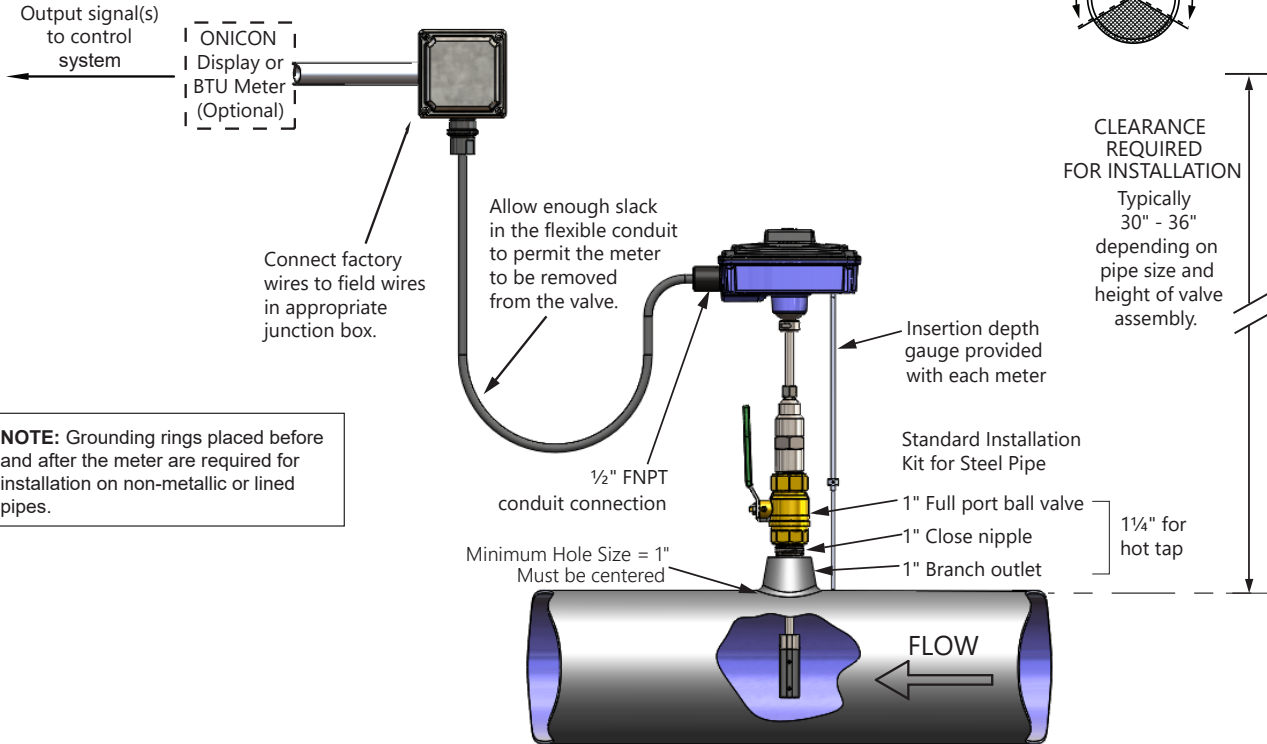
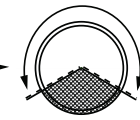
| | |
|--|----------------------------------|
| EE = Pipe Size Range and Meter Length | |
| A1 for pipes 1.25 - 2.5" (Coming in Q2 2024) | F7 for pipes 3 - 72" (26" stem) |
| C3 for pipes 3 - 10" (18" stem) | F8 for pipes 3 - 72" (28" stem) |
| D4 for pipes 3 - 16" (20" stem) | G1 for pipes 12 - 72" (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°



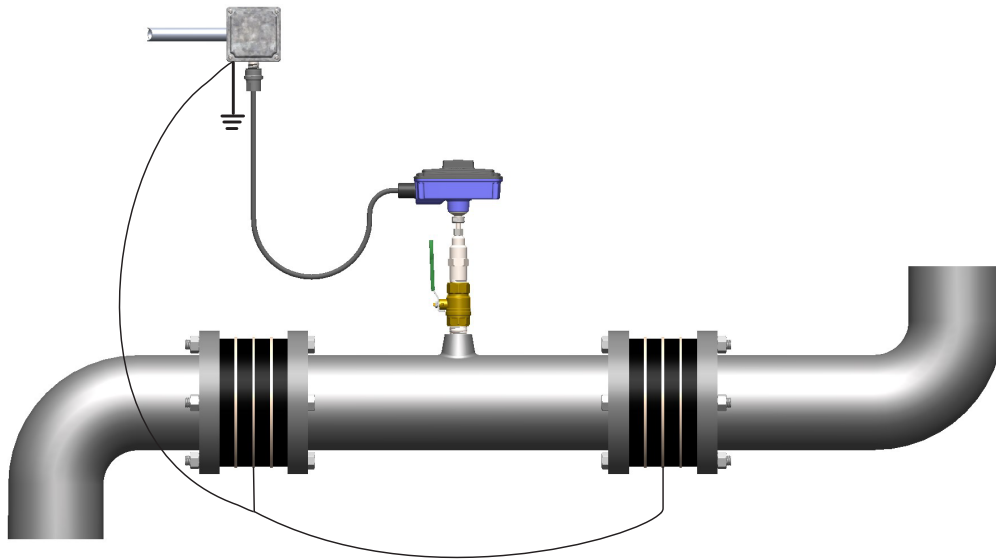
NOTE: Grounding rings placed before and after the meter are required for installation on non-metallic or lined pipes.

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

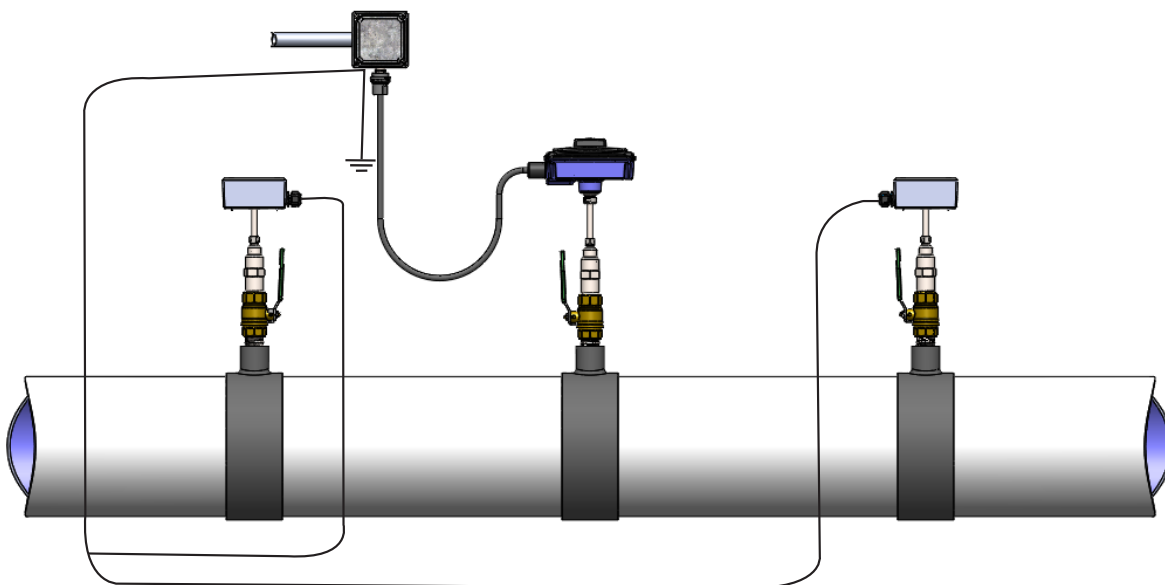
Optional Grounding Rings or Probes Accessory in Non-Conductive Pipe

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



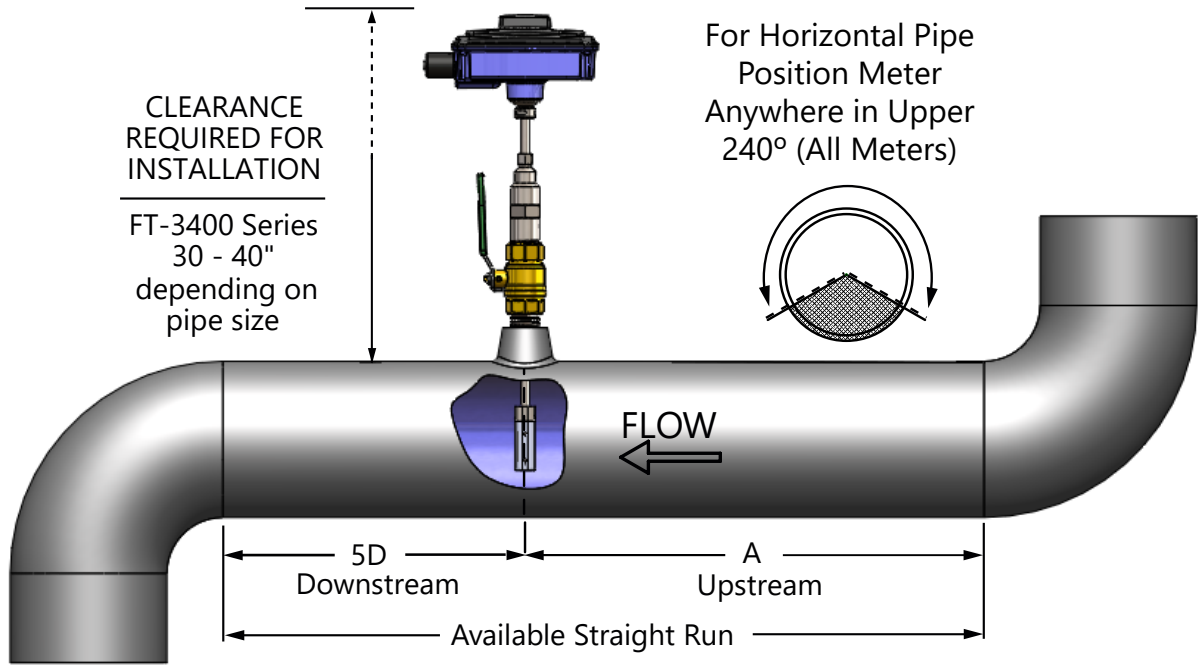
Grounding Probes Installation



*** 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.**

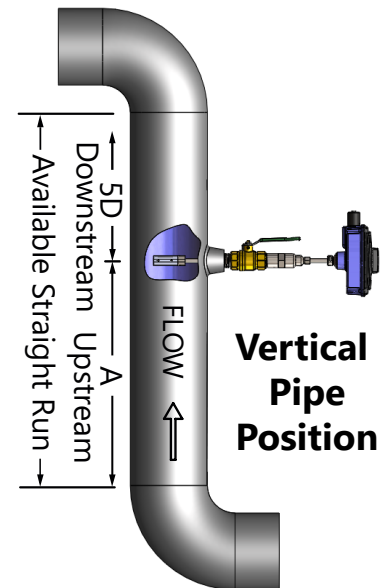
MINIMUM STRAIGHT RUN REQUIREMENT

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:

