



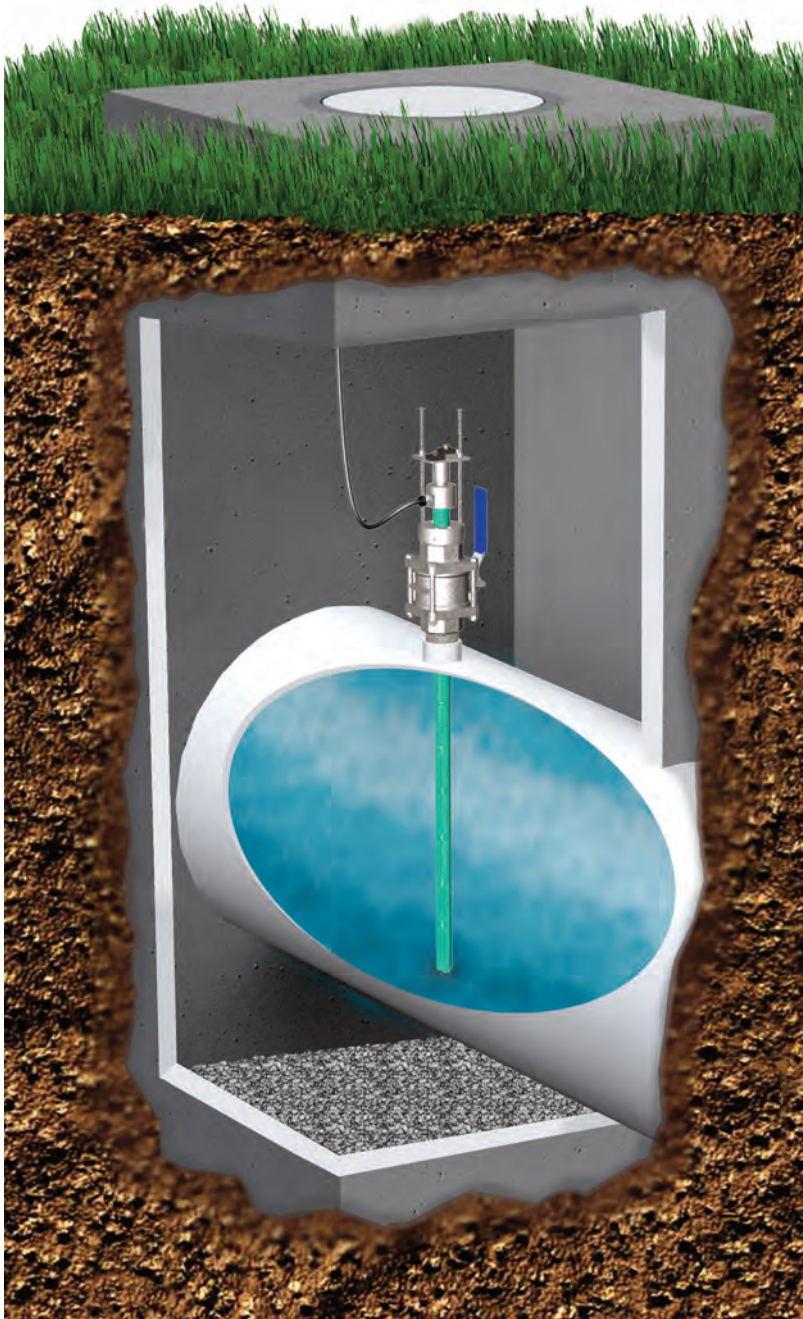
# FPI Mag™ SPI Mag™ Insertion Flow Meters



Full Profile  
Insertion Flow Meter.



# Easy to install, rivals performance



## **Ease of hot tap installation**

The FPI Mag (Full Profile Insertion) Flow Meter installs without interrupting service, de-watering lines, cutting pipe or welding flanges. The easy hot tap installation makes the FPI Mag particularly cost-effective for retrofit application replacing flow meters, or in sites never metered before.

## **Economical for medium and large line sizes**

The total installed cost of conventional full bore meters increases dramatically as the pipe diameter increases due to greater materials costs and more complex installation. Installation costs for medium and large lines are reduced more than 45% by eliminating the need for heavy equipment or extensive manpower. In comparison, the Full Profile Insertion Mag offers unbeatable value in both cost of installation and cost of ownership. This makes the FPI Mag the preferred choice for municipal water and wastewater.

## **Insertion design for total accessibility**

The insertion design fits in confined spaces and offers total accessibility. The Full Profile Insertion Mag is removable in pipes under pressure for easy inspection, cleaning, calibration or verification with our NIST traceable lab.

## **Multi-electrodes deliver accurate full profile**

The Full Profile Insertion Mag's unique operating principle delivers accuracy unmatched by other insertion mag meters and rivals the performance of a full-bore mag meter. Continuous measurement across the entire flow profile compensates for variable flow profiles, including swirls and turbulent conditions.

## **Robust construction for operational longevity**

The sensor body is made from heavy-duty 316 stainless steel for maximum structural integrity. A NSF certified 3M fusion-bonded epoxy coating ensures superior long-term operation.

## **Virtually no recalibration or maintenance**

The FPI Mag's highly stable flow sensor comes pre-calibrated from McCrometer's NIST traceable Calibration Lab and requires no recalibration in the field. With no moving parts, the FPI Mag's simply designed sensor contains nothing to wear or break, and it is generally immune to clogging by sand, grit or other debris.

# of full-bore mag meter

## Now Available in a Bi-Directional Model

The 394L FPI Mag flow meter provides bi-directional measurement, which is important in many municipal water treatment, distribution and storage applications. The most common applications include: storage tanks, water selling or sharing, multiple water sources and ring main distribution systems. Bi-directional measurement can provide useful information when measuring in complex piping configurations or in locations that have never been measured before.

## Municipal Water and Wastewater Treatment

The Full Profile Insertion Mag supports a wide range of water and wastewater treatment applications:

### **Water**

- Distribution
- Effluent
- Pumping Stations
- UV Dosing
- Filter Balancing & Backwash
- Wells & Booster Stations

### **Wastewater**

- Effluent
- Recycle/Reclaim

## Industrial Facilities

The Full Profile Insertion Mag is ideal for a variety of applications for power plants (including cogeneration), paper mills, chemical & petrochemical plants, metals & mining, and food & beverage. Applications include:

- Cooling Water
- Fire Water
- Feed Water
- Raw Water
- Inlet To Surge Basin
- Effluent Wastewater

Also suitable for chilled water in campus style facilities, hospitals, airports, hotels, casinos, etc.



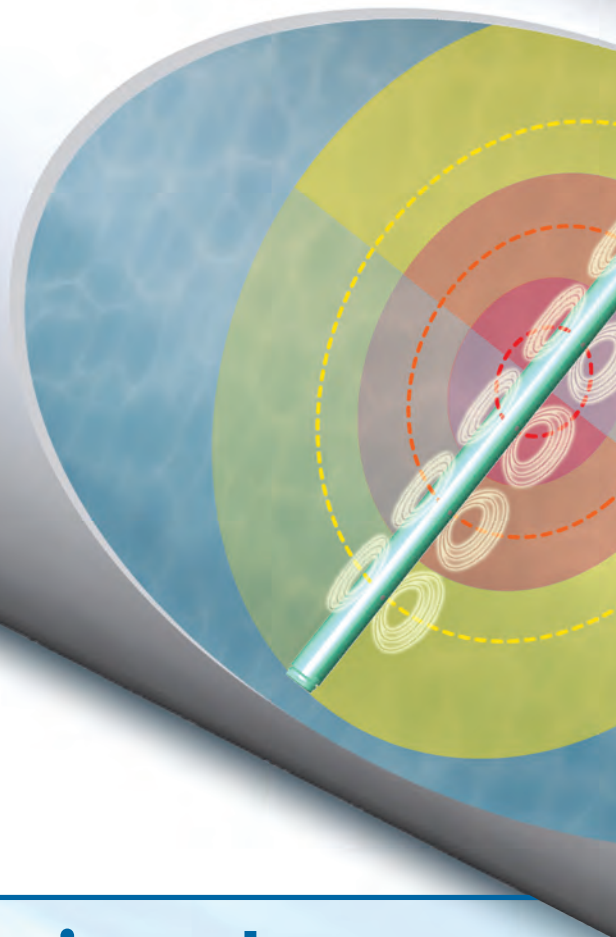
## Key FPI Mag Specs In Brief \*

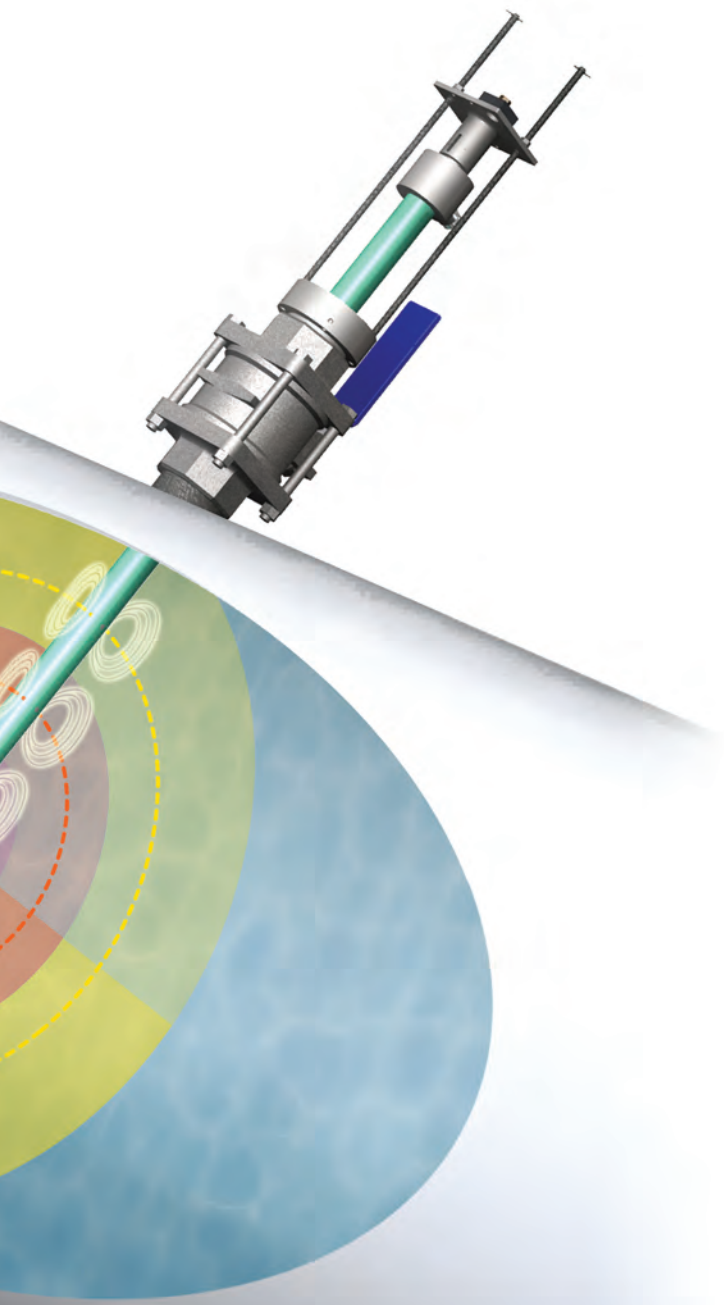


- **Range:** Nominal pipe size availability
- **Accuracy:**  $\pm 1\%$  of reading  $\pm 0.03$  ft/s ( $\pm 0.009$  m/s) zero stability from 0.3 to 20 ft/s velocity range (0.09 to 6 m/s)
- **Linearity:** 0.3% of range
- **Repeatability:** 0.20% of range
- **Pipe Sizes:** 4-138 inches (101.6 mm - 3.5 m)

## How it works

Both the FPI and SPI Mag operate based on Faraday's law of electromagnetic induction. The FPI Mag's streamline sensor features multiple electrodes across the entire pipe diameter. Electrode pairs are located so that each pair measures an equal cross-sectional area. The velocity measurements are added and averaged, providing an area-weighted average velocity across the pipe's centerline. Flow is then calculated by multiplying the average velocity by the cross-sectional area of the pipe.

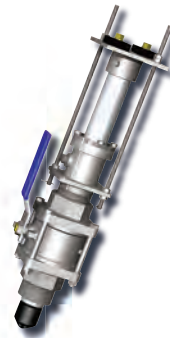




The SPI Mag's flow sensor first generates an electromagnetic field that creates a voltage in the liquid. Two velocity electrodes and the ground electrodes then measure this voltage. A faster water velocity produces higher voltage, indicating a higher rate of liquid flow.



### Key SPI Mag Specs in Brief\*



McCrometer also offers the SPI Mag (Single Point Insertion) Flow Meter as an economical choice for clean and dirty applications with solids. It measures forward flow only, is suitable for pipe sizes from 2 to 96 inches. The SPI can be easily re-located to various line sizes.

It is suitable for municipal water/wastewater applications including:

- **Wastewater:** Effluent, Waste Activated Sludge (WAS), Return Activated Sludge (RAS), Reclaim/recycle
- **Clean Water:** Raw Water Intake, Clear Wells

The Single Point Insertion Mag is available in one Model 282L with the following basic specs\*:

- **Range:** Nominal pipe size availability
- **Accuracy:**  $\pm 2\%$  of reading  $\pm 0.03$  ft/s ( $\pm 0.009$  m/s) zero stability from 0.3 to 20 ft/s velocity range (0.09 to 6 m/s)
- **Pipe Sizes:** 2 - 96 inches (51 mm - 2.4 m)
- Has reverse flow indication

### L Series Converter



The FPI Mag and SPI Mag utilize our pre-programmed L Series Converter\*:

- Six point curve-fitting algorithm to improve accuracy
- 4-20mA (1000 ohm) analog output
- RS485 port for easy connection to DCS
- 8 line graphical display
- 3 key touch programming
- Rugged enclosure meets IP67

\* See data sheet for complete specs and order information

# McCrometer.

## Addressing today's challenges.



**Maintaining and updating municipal water facilities and industrial process plants is a constant challenge. The FPI Mag and SPI Mag Insertion Flow Meters are the ideal retrofit solution. With their hot-tap installation and plug-and-play converter, these meters can be installed rapidly and easily without service interruption. This allows you to provide 24/7 operation while improving process control and ensuring delivery accountability.**

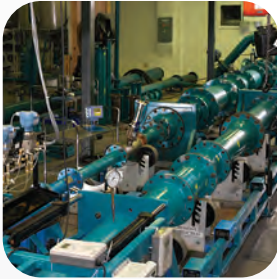
**Replacing Meters  
Confined Spaces  
Medium and Large  
Line Sizes  
Sites Never  
Metered Before**



# The McCrometer value difference



For 55 years, McCrometer has demonstrated an unyielding commitment to integrity which is reflected in our stringent flow meter calibration processes. Each flow meter is individually wet calibrated in one of our two world-class NIST traceable calibration facilities and delivered with a Certificate of Calibration.



Our Hemet, California factory boasts a robust Calibration Test Lab that enables production of the most accurate and precise flow instrumentation. The test facility utilizes three gravimetric systems and two volumetric systems providing accuracy and calibration tests of flow meters from 1/2 to 20-inch diameter, with flow rates up to 4,000 gpm.



Our large volume test facility is located in Porterville, California. This facility is one of the world's largest volumetric test facilities owned by a meter manufacturer, and it offers accuracy and calibration tests of flow meters from 3 to 72-inch diameter, with flow rates up to 60,000 gpm.

**Represented by**



**McCROMETER**

[www.mccrometer.com](http://www.mccrometer.com)

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