

Model 284L, 285L & 287L
Revolutionary Technology
utilizing multiple measuring-point for unsurpassed accuracy

L Series

With thousands of installations worldwide, our customers have consistently demonstrated their trust in Multi-Mag's accuracy, outstanding operating performance, ease of installation and significant cost savings.

Multiple Electrodes Constantly Profile the Flow to Optimize Accuracy

An array of electromagnetic electrodes are strategically located on the insertable sensor that spans the entire pipe diameter. This insertable sensor continuously measures and averages flow unlike flowmeters that provide only a single point flow measurement.

The streamlined sensor shape minimizes flow disturbances, thus providing minimal pressure drop, unlike vortex meters, turbine meters, and orifice plates. Multi-Mag requires significantly less energy to operate than most flowmeters, including pitot tubes.

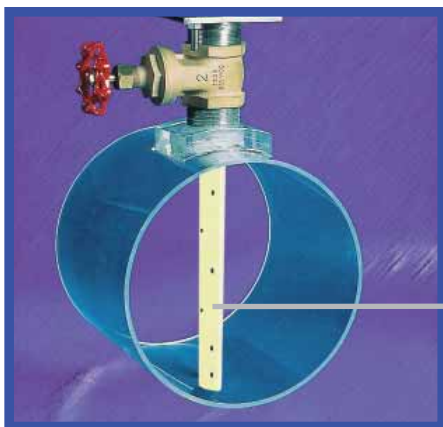
Costs for most flowmeters, including spool-piece magmeters increase substantially as pipe size increases. Not so with Multi-Mag.

Accurate Flow Measurement for:

- Cooling Water
- Raw Water
- Filter Balancing
- Backwash Monitoring
- Water Containing Sand/Grit
- Chilled Water
- Well Field Monitoring

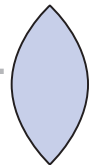
"A 40 year old Venturi meter at a major station cracked. We first replaced it with a single point insertion magmeter. Accuracy over a range of flows from 4-40 MGD was required. We found the accuracy of the single point insertion meter would degrade when different combinations of pumps were used. To solve this problem we installed a Multi-Mag over four years ago. Multi-Mag has given us the accuracy and extra confidence we need in our pump station flows."

*Bob Merrill
Division Foreman
United Water - NJ*



A single patented sensor with multiple electrodes constantly measures flow profiles unlike single point flowmeters. Sensors available for 2" and 3" Taps

Streamlined sensor shape does not disrupt water flow and has negligible pressure loss resulting in lower energy costs.



2 Year Sensor Warranty

L Series

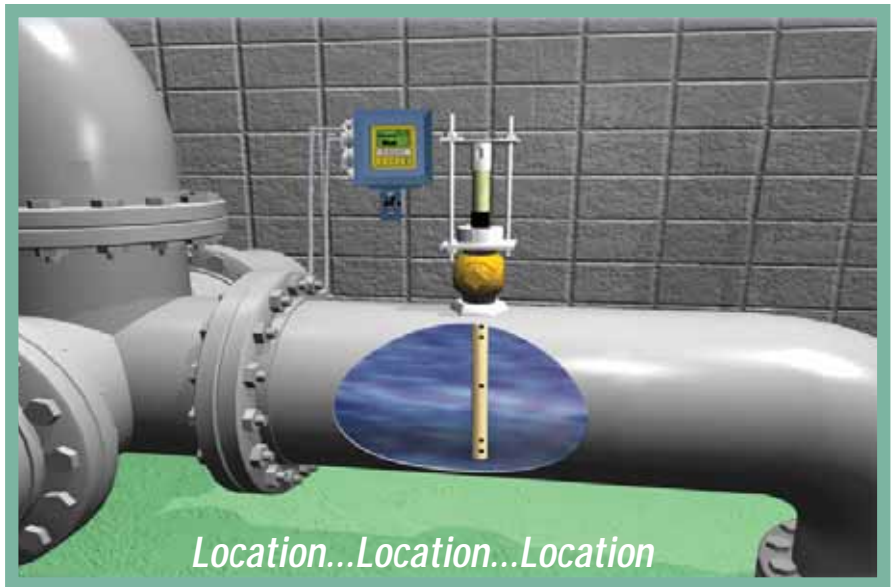
Compact state-of-the-art transmitter(s) available with menu-driven software for easy set-up.



*Our Insertable Magmeter Measures Flow Where Others Can't...Close to Bends and Elbows
Consult Factory Regarding Your Application*

Benefits

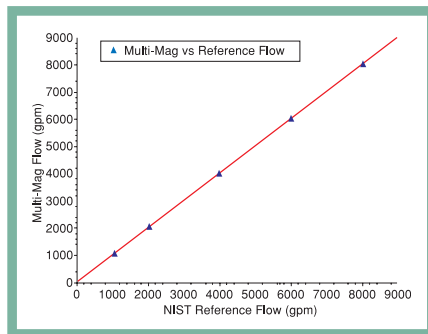
- Installs Close to Bends/Elbows*
- Electromagnetic Technology*
- 2 Year Sensor Warranty*
- No Ports to Clog*
- For pipe sizes 4" and up*
- Low and/or High Flow Rates*
- Quick Installation*
- No System Shutdown*
- Streamlined Sensor Shape*
- Creates Negligible Pressure Loss*
- Never Requires Calibration*



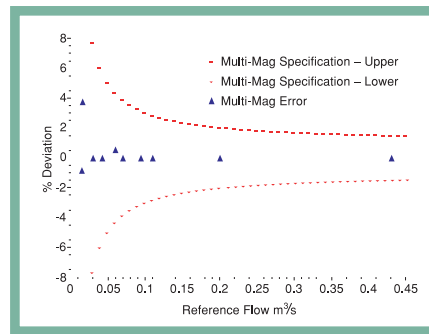
"The Authority had a need to monitor the flow characteristics at an existing water booster station and then transmit the information to our filtration plant. A previous insertion meter did not provide accurate information even though it was installed at a recommended location. The Multi-Mag's adaptability to a unique piping arrangement enabled the Authority to install an accurate meter within the station at a quarter of the cost."

*Bob Softcheck
General Manager
North Fayette County Municipal Authority
Dunbar, PA*

1% Accuracy Verified Worldwide by Independent Flow Laboratory Test Results



In February 1996, the National Institute of Standards and Technology (NIST) collected performance data on a Multi-Mag in a 9.95-inch pipe. The Multi-Mag was subjected to velocities in excess of 30 ft/s and exceeded its design goals for accuracy. $\pm 0.3\%$ of reading was achieved over the entire flow range.



In April 1995, tests were conducted on a 400 mm pipe by the Water Research Institute of Bratislava, Slovakia. A typical flow accuracy of $\pm 0.2\%$ of reading/ ± 5 mm/s was attained by the Multi-Mag.

The Water Research Center (WRC) located in England conducted Multi-Mag testing for several large water companies. The results of this evaluation solidly confirm that Multi-Mag is capable of accurately measuring flow close to bends and elbows.





Specifications – Multi-Mag™ Models 284L, 285L & 287L

Measurement

Volumetric flow in filled flow conduits 4" (101.6 mm) to 120" (3 m) utilizing insertable electromagnetic averaging sensor. Flow indication in English Std. or Metric units. Contact factory for larger pipe sizes.

Flow Measurement

Method: Electromagnetic (Faraday's Law)

Zero Stability: ± 0.03 ft/s (± 0.009 m/s)

285L & 287L Accuracy:

$\pm 1\%$ of reading \pm zero stability $+0.3$ to $+20$ ft/s (0.09 to 6 m/s)

Has reverse flow indication.

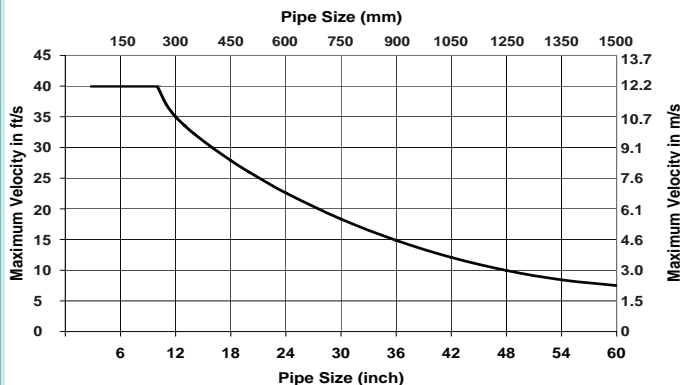
284L Bidirectional Accuracy:

$\pm 1\%$ of reading \pm zero stability $+0.3$ to $+20$ ft/s (0.09 to 6 m/s)

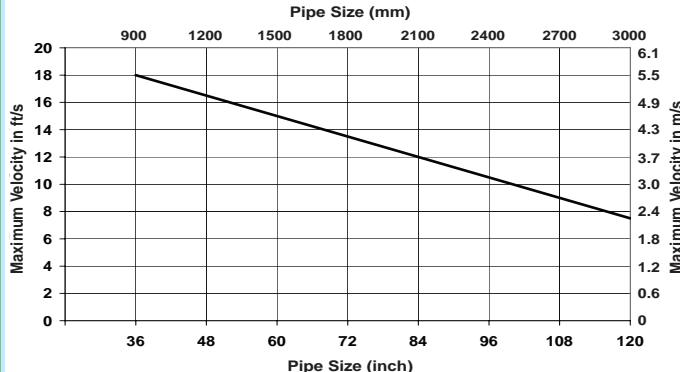
$\pm 1\%$ of reading \pm zero stability -0.3 to -20 ft/s (-0.09 to -6 m/s)

Max. Allowable Velocity: See Velocity range chart

Maximum Velocity for different Pipe Sizes - 2" Multi-Mag



Maximum Velocity for different Pipe Sizes - 3" Multi-Mag



(Contact factory for velocities in excess of the specifications above.)

Materials

284L & 285L: Coated Fiberglass

287L: Fiberglass

Insertion Hardware: 316 Stainless Steel exposed to flow

Compression Seal: Silicone Rubber

Sensor Electrodes:

284L & 285L - 316 Stainless Steel electrodes

287L - Carbon electrodes

Transmitter-Enclosure:

IP67 Aluminum die-casted enclosure.

Transmitter-Dimensions:

5.75 in. H x 5.75 in. W x 6.69 in. D

(14.6 cm H x 14.6 cm W x 17 cm D).

Weight: 6.8 lbs. (3.1 kg).

Configuration and Set-Up

Programming can be easily done on site using the keypad. Three levels of user defined password protection are provided.

Outputs

Analog: 4-20mA 1000 Ohms galvanically isolated and fully programmable.

Pulse: 2 Pulse/Frequency/Alarm outputs programmable for high/low flow rates, percent of range, empty pipe, fault conditions, forward/reverse, polarity (normally open/close), analog over-range, pulse over-range, etc.

Environmental

Minimum Conductivity: 5 umho/cm (5 uS/cm).

Pressure/Temperature Limits:

Sensor: Flow Temperature Range

32° to 110°F (0° to 44°C) @ 250 psi.

Sensor may be submersed.

Electronics: Temperature limits:

Operating and Storage: -4° to 140°F

(-20°C to +60°C).

Electrical Connections

Compression gland seals for 0.125" to 0.375" diameter round cable.

Keypad and Display

Can be used to access and change all set-up parameters using three membrane keys and a LCD display.

Isolation

Galvanic separation to 50VDC between analog, pulse/alarm, and earth/ground.

Electrical Safety

Meets ANSI/ISA-S82.10-1988 and S82.03-1988.

Power Supply

Universal switch mode.

AC: 90-265VAC/44-66 Hz (20W/25VA) or

DC: 10-35 VDC (20W)

AC or DC must be specified at time of ordering.

Vibration Specification

Meets BS2011: Part 2.1Fc: 1983

Internal Totalizer

6-digit totalizer. Can be programmed to reset via external input or the keypad. Reset from keypad is password protected.

Test Mode and Output Circuit Loop Verification

After transmitter has been programmed, operation of the test mode will drive all outputs to a programmed value which provides a total system test.

Multi-Mag Flowmeter Includes

- IP67 enclosure.
- 3 button numerical keypad.
- One graphical backlit LCD display.
- Two programmable open-collector outputs.
- One 4-20mA flow output.
- RS 485.
- Multi-Mag™ Sensor (Available for 2 or 3 inch tap. Customer specified) with 20-foot sensor cable.
- Installation and Operation Manual.

Options

- DC Power.
- Additional 4-20mA output.
- Pole mounting kit.
- Sun shield.
- Sensor insertions tool.
- Stainless steel ID tag.
- Valves.
- Additional sensor cable up to 300' (for longer lengths, consult factory).

Ordering Requirements

At the time of ordering, please be prepared to provide the following information:

- Model.
- Stack height.
- Pressure.
- Minimum flow.
- Maximum flow.
- Typical flow.
- Fluid.
- Pipe I.D.
- Cable length.
- Temperature.
- Any other chemicals in use.

Specifications are for products at the time the literature was printed. Due to continuous product testing and improvement, all specifications are subject to change without notice and without McCrometer's obligation to retrofit existing products. McCrometer® and Marsh Multi-Mag™ are trademarks of McCrometer, Inc. All other trademarks represented in this document are trademarks of their respective owners. Note: Periodic cleaning may be required depending on the concentration of substances such as manganese or iron. The sensor is relatively easy to remove and clean. Marsh Multi-Mag™ may not be suitable where stringy material such as grasses or sea weed, raqs, bio-film or leaves are likely to collect on the sensor.



3255 WEST STETSON AVENUE • HEMET, CALIFORNIA 92545 USA
TEL: 951-652-6811 • 800-220-2279 • FAX: 951-652-3078

Printed In The U.S.A.

Lit. # 24510-53 Rev. 3.2/03-09

Copyright © 2006-2009 McCrometer, Inc. All printed material should not be changed or altered without permission of McCrometer. Any published technical data and instructions are subject to change without notice. Contact your McCrometer representative for current technical data and instructions. Made in U.S.A. under one or more of the following patent numbers: 4015471, 4083246, 4459848, 4549434, 4688432, 4455870, 4669308, 4821580, 5313842, 5385056 and 5811688