

# Marsh-McBirney FLO-TOTE® 3 Electromagnetic Area/Velocity Flow Meter Sensor

*The Marsh-McBirney Flo-Tote 3 Flow Meter Sensor, when combined with a Hach FL900 Series Flow Logger, provides an ideal solution for cost-effective portable flow monitoring. (For permanent flow monitoring applications, use with Flo-Station.) Electromagnetic sensor technology provides highly accurate flow measurements.*



FLOW

WW

IW

C

## Features and Benefits

The Marsh-McBirney Flo-Tote 3 Electromagnetic Flow Meter Sensor measures both velocity and depth in the same cross-section providing accurate measurements based on the Continuity Equation. Combined with the portable FL900 Flow Logger or permanent Flo-Station, users have an ideal solution for their flow measurement needs.

### Accurate Flow Measurement

Flo-Tote 3 provides the user with highly accurate flow measurements under a wide range of flows and site conditions. The flow accuracy of the Flo-Tote is based upon the accurate measures of both velocity and depth in hydraulic flow labs, as well as under actual sewer conditions. Verification of our specifications by an independent flow laboratory assures you of our commitment to accuracy.

### Disconnectable, Interchangeable and Field Replaceable Sensor

Provides easy maintenance and eliminates meter down time.

### Grease Tolerant Sensor

Grease shedding electrodes allow for reliable data collection even in these difficult environments.

### Q-Stick Band/Sensor Install Tool

Sensor and band can be safely and easily installed from street level with the Q-Stick tool eliminating confined space entry.

### Ideal for a Variety of Open Channel Sizes & Shapes

- Wastewater Sewers- Round, Rectangular, and Odd Shaped
- Storm Sewers
- Creeks, Rivers, and Streams

### Applications

- Inflow/Infiltration Studies
- Modeling/Sewer System Evaluation
- EPA Permitting Requirements
- Combined Sewer Overflow (CSO Monitoring)
- Sewer System Evaluation
- Wastewater Treatment Plant Balancing

DW = drinking water WW = wastewater municipal PW = pure water / power  
IW = industrial water E = environmental C = collections FB = food and beverage



Be Right™

## Specifications\*

### FLO-TOTE 3 FLOW METER SENSOR

#### Material

Polyurethane

#### Dimensions

13,6 L x 4,4 W x 2,8 H cm (5,37 L x 1,73 W x 1,10 H in.)

#### Weight

1,1 kg (2,4 lb) with 30 ft cable

#### Operating Temperature

0 to 45°C (32 to 113°F)

#### Storage Temperature

-20 to 52°C (-4 to 125°F)

#### Power Requirements

Supplied by FL900 Logger, Flo-Logger/Logger XT, or Flo-Station

### VELOCITY MEASUREMENT

#### Method

Electromagnetic (Faraday's law)

#### Range

-1,5 to 6,1 m/s (-5 to +20 ft/s)

#### Accuracy

±2% of reading

#### Zero Stability

±0,015 m/s (±0,05 ft/s) at 0 to 3 m/s (0 to 10 ft/s)

#### Resolution

±0,003 m/s (0,01 ft/s)

### DEPTH MEASUREMENT

#### Method

Submerged pressure transducer

#### Standard Operating Range

10 mm to 3,5 m (0,4 to 138 in.)

Contact customer service for extended ranges.

#### Accuracy

±1% of reading

#### Zero Stability

±0,009 m (±0,03 ft.), for 0 to 3 m (0 to 10 ft.)

Includes non-linearity, hysteresis and velocity effects.

#### Resolution

2,5 mm (0,1 in.)

#### Over Range Protection

2X range

### FLOW MEASUREMENT

#### Method

Conversion of water depth and pipe size to fluid area. Conversion of local velocity reading to mean velocity. Multiplication of fluid area by mean velocity to equal flow rate.

#### Conversion Accuracy

±5,0% of reading. Assumes appropriate site calibration coefficient, pipe flowing 10% to 90% full with a level greater than 5,08 cm (2 in.).

### TEMPERATURE MEASUREMENT

#### Method

1 wire digital thermometer

#### Range

-10 to 85°C (14 to 185°F)

#### Accuracy

±2°C (±3,5°F)

### SENSOR CABLE

#### Material

Polyurethane jacketed

#### Length

Available in specified lengths from 9 to 300 m.

#### Connectors

To use with portable FL900 Series Logger or Flo-Logger: Sensor with connector end (9 to 300 m lengths)

Sensor with junction box, desiccant hub, sealant/potting kit and connector; allows for usage with conduit (9 to 300 m lengths)

Important Note: The sensor cable assembly with desiccant hub is compatible with either the Marsh McBirney Flo-Logger/Logger XT or the Hach FL900 Series Flow Loggers. When using this cable assembly with the Marsh McBirney Flo-Logger, do not disconnect the desiccant cartridge that is attached to the Flo-Logger itself.

If using Tote 3 cable with Flo-Station, sensor will have bare leads on cable end (9 to 300 m lengths), and there will be no desiccant hub, as the air tube terminates inside of the Flo-Station housing.

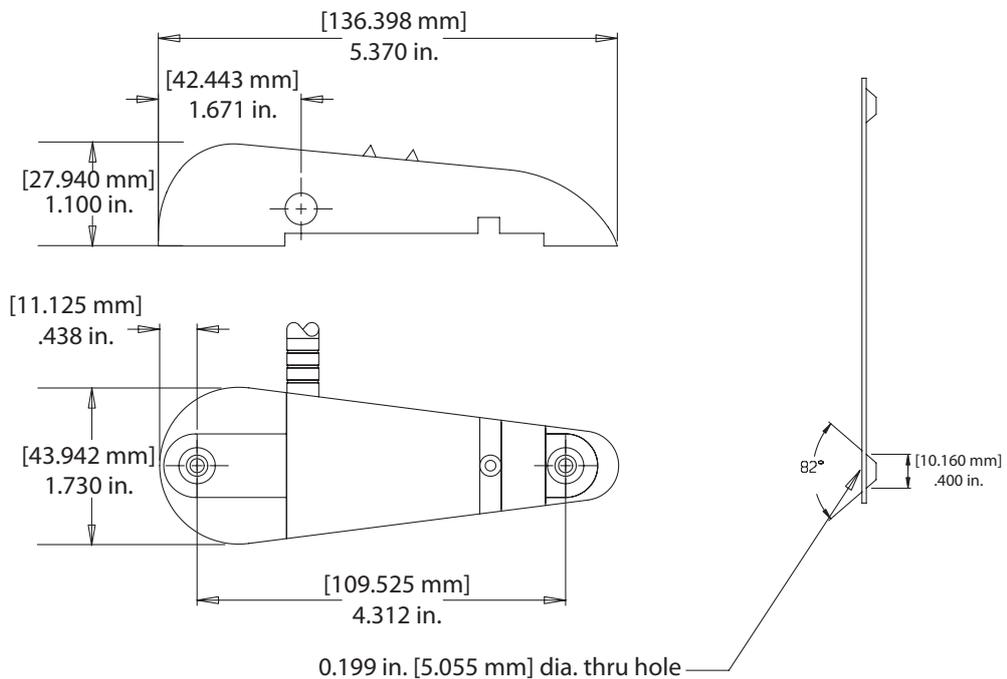


Flo-Tote 3 Electromagnetic Flow Meter Sensor meets CE requirements.

## Engineering Specifications

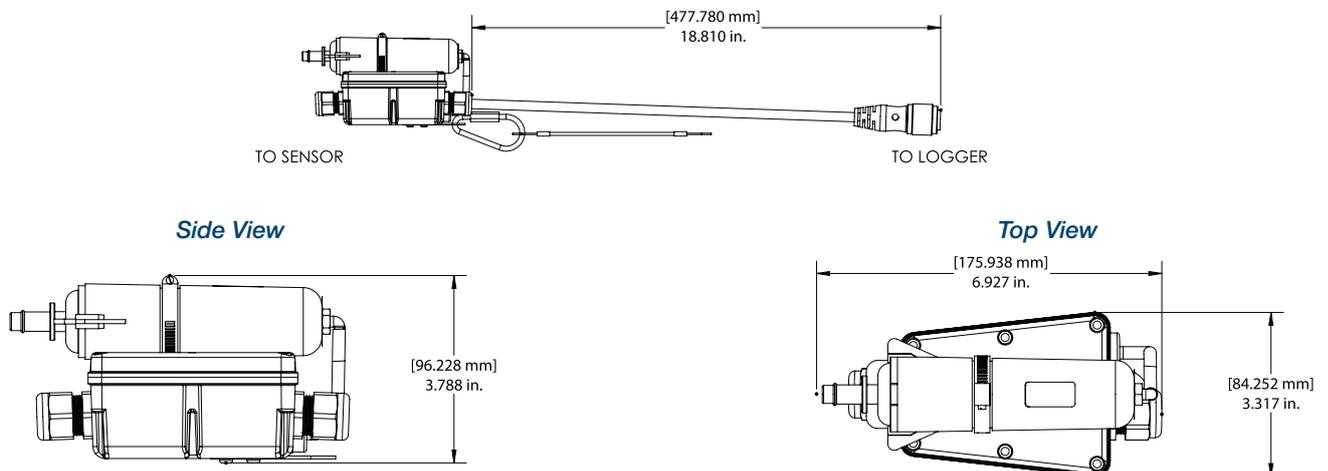
1. The flow meter shall be capable of directly measuring both velocity and depth in the same cross section.
2. The method of measurement shall be electromagnetic.
3. The range of velocity measurement shall be -1,5 to +6,1 m/s (-5 to +20 ft/s)
4. The accuracy of the velocity measurement shall be  $\pm 2\%$  of reading.
5. Zero stability of the velocity measurement shall be  $\pm 0,015$  m/s ( $\pm 0,05$  ft/s) at 0 to 3 m/s (0 to 10 ft/s).
6. The range for depth measurement shall be 10 mm to 3,5 m (0,4 to 138 in.).  
(Contact customer service for extended ranges.)
7. The accuracy of the depth measurement shall be  $\pm 1\%$  of reading.
8. Zero stability of the depth measurement shall be  $\pm 0,009$  m ( $\pm 0,03$  ft), for 0 to 3 m (0 to 10 ft). Includes non-linearity, hysteresis and velocity effects.
9. The flow sensor shall be the Marsh-McBirney Flo-Tote 3 Open Channel Flow Meter Sensor.

## Dimensions



*Flo-Tote 3 Electromagnetic Flow Meter Sensor*

The desiccant hub assembly includes a junction box to connect sensor cable to the desiccant and subsequently to the FL900 Logger. The desiccant can easily be replaced without need to purchase a separate desiccant module.



*Desiccant Hub Assemblies for use with portable FL900 Series Loggers and Flo-Logger.*

*(Sensor cable for use with Flo-Station will not contain a desiccant hub and will have bare wires on cable end.)*

## Ordering Information

### Flo-Tote 3 Sensor with Cable

**EM9000-XXX\*** For FL900 Logger, Flo-Logger/Logger XT  
Includes sensor with cable, sealed desiccant hub and connector to logger.

**Model 3000-9** For Flo-Station  
(Specify cable length of Hach Prod. No. 360001901\*)  
Includes sensor and cable with bare leads.

*\*Contact customer service for product numbers.*

#### Available Cable Lengths (in meters)

9	38	68	120	210
18	45	76	135	240
23	53	91	150	270
30	61	105	180	300

See Lit. No. 2709 UK (standard models) for FL900 Series Flow Logger ordering information.

### Mounting Hardware

Mounting Bands - Several configurations available. Consult customer service.

### Accessories & Spares

**8755500** Bulk desiccant beads (680 g)

**At Hach, it's about learning from our customers and providing the right answers. It's more than ensuring the quality of water—it's about ensuring the quality of life. When it comes to the things that touch our lives...**

**Keep it pure.**

**Make it simple.**

**Be right.**

**For current price information, technical support, and ordering assistance, contact the Hach office or distributor serving your area.**

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Lit. No. 2712 UK  
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