Area-Velocity Flow Meter

for Open Channels and Pipes – No Flume or Weir required

Area-Velocity Flow Meter

Model AVFM

Display, Transmit and Totalize
Open Channel Flow in
Pipes and Rectangular channels

Measures Velocity + Level to Calculate Flow

Area-Velocity Flowmeter

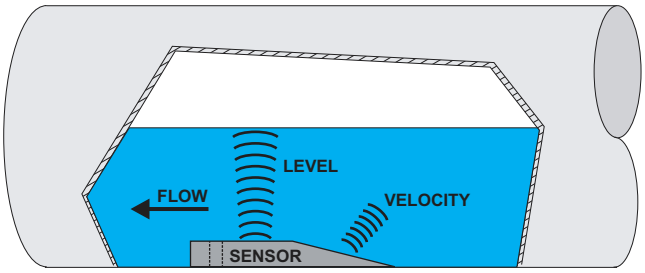
Monitor flow through open channels, partially full sewer pipes and surcharged pipes *without* a flume or weir. Ideal for municipal stormwater, combined effluent, raw sewage and irrigation water.

Streamlined Ultrasonic Sensor

Uses a submerged ultrasonic sensor to continuously measure both Velocity and Level in the channel. The sensor is resistant to fouling and corrosion. It is tolerant of turbulence and high approach velocity. Can be configured with the standard submerged velocity-level sensor, or with submerged velocity plus a separate non-contacting ultrasonic level sensor.

Flow Monitor for Open Pipes & Channels

Installation is Easy!



SUBMERGED ULTRASONIC SENSOR
MEASURES LEVEL AND VELOCITY

The AVFM Area-Velocity Flow Meter measures both Head and Velocity to calculate flow volume in an open channel or pipe. Calibration is simple: enter the pipe ID or channel width and the AVFM automatically computes flow volume and displays the flow rate.

The AVFM sensor mounts inside the pipe or at the bottom of a rectangular channel. No special compounds, tools or hardware are required. The sensor is a completely sealed ultrasonic unit with no orifices or ports

Recommended Channel Conditions

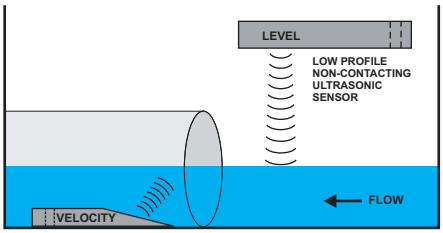
Best accuracy from the AVFM will be obtained if the flow is evenly distributed rather than turbulent. The channel should not have elevation changes immediately upstream of the sensor mounting location. Pipe or channel slope should not exceed 3%. The water should not be highly turbulent and approach velocity should be less than 3 ft/sec (1 m/sec). Downstream conditions are not a factor as long as the flow profile is not affected right at the sensor location.

Tolerates Difficult Flow Conditions

The AVFM can measure flow velocity up to 20 ft/sec (6 m/sec). Special electronics and software sample and average the highs and lows of turbulent flow to provide accurate readings. The standard velocity/level sensor will measure flow in both partially full and surcharged pipes with pressure up to 10 psi. No special set-up or adjustment is required.

Alternate Sensor Configurations

The standard sensor measures both velocity and level with a single submerged probe. It is installed with one set-screw into the pipe or channel floor, or inserted in the stainless steel mounting bracket (supplied). Optional sensor models are available for special applications: the flow sensor built into a pipe section or spool piece, or a separate non-contacting ultrasonic level sensor with a submerged velocity sensor for manhole applications. Sensor cable can be extended up to 500 ft. (150 m).



Two 4-20mA Outputs

Transmit to external loggers, chart recorders, controllers or remote displays. Through the AVFM calibration menu you can configure each of the two 4-20mA outputs separately to your choice of Level, Velocity or Flow.

No Calculations - No Programming Codes

Calibrate the AVFM by entering the pipe diameter or channel width and select your choice of measurement units from a simple menu. You can display water level, velocity or flow in gallons, liters, ft3 or m3. Calibration parameters are stored through power interruptions. The AVFM will resume normal operation as soon as power is restored.

Optional 50,000 point Data Logger

Choose the built-in data logger option if you want the AVFM to store time and date-stamped flow values from 1 second to 30 minute intervals. Or use the convenient 'Flow Report' format where total, minimum, maximum and average flow rates are stored in your choice of hourly or daily summaries. Transfer flow logs to your PC or laptop through the AVFM RS232 output (included with the data logger option). Use 'Greyline Logger' software for data retrieval by dial-up connection through modems and phone lines, or by direct connection to the RS232 output. This powerful software displays data in both graph and table formats and exports to graphic or text file formats for use in other programs. Runs on any PC with Windows™ 95, 98, 2000, NT or XP.

Optional Intrinsically Safe Sensor

The AVFM sensor and cable is rated Intrinsically Safe for installation in Class I,II,III Div. I,II, Groups C,D,E,F,G hazardous locations when connected through three optional Intrinsic Safety Barriers (factory-installed inside the AVFM electronics enclosure). Electronics can be mounted in a general purpose area up to 500 ft. (150 m) from the sensor.

AVFM Specifications

General Specifications — Greyline AVFM Area-Velocity Flow Monitor

Electronics Enclosure:	Watertight and dust tight NEMA4X (IP 66) polycarbonate with clear, shatterproof cover
Accuracy:	Level: ±0.25% of Range. Velocity: ±2% of Reading. Repeatability and Linearity: ±0.1%
Displays:	Numeric Values: large 4 digit LCD; Menu/Status/Totalizer: 16 digit alphanumeric
Programming:	3-button keypad with Menu selection. Calibration parameters are Password protected
Power Input:	100-130VAC 50/60Hz, 7.5 watts maximum
Outputs:	2 Isolated 4-20mA, 1000 ohm, (programmable for Flow, Head or Velocity)
Control Relays:	3 Relays, form 'C' dry contacts rated 5 amp SPDT; programmable for flow proportional pulse (sampler/totalizer), flow and/or level alarm
Electrical Surge Protection:	Sensor, 4-20mA and AC power input
Operating Temp. (electronics):	-5° to 140°F (-20° to 60°C)
Approximate Shipping Weight:	10 lbs. (4.5 kg)

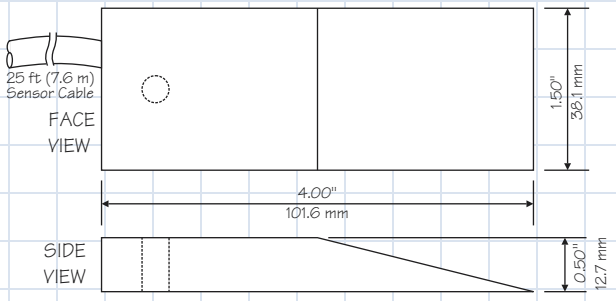
QZ-A Sensor

Velocity Measurement Range:	0.1 to 20 ft/sec (0.03 to 6.2 m/sec)
Level Measurement Range:	Minimum Head: 1 in (25.4 mm). Maximum Head: 15 ft. (4.57 m)
Operating Temperature:	5 to 150°F (-15 to 65°C)
Exposed Materials:	PVC, epoxy resin, polyurethane
Sensor Cable:	25 ft. (7.6 m) submersible polyurethane jacket, shielded, 3-coaxial
Sensor Mounting:	includes MB-QZ stainless steel mounting bracket
Temperature Compensation:	Automatic, continuous

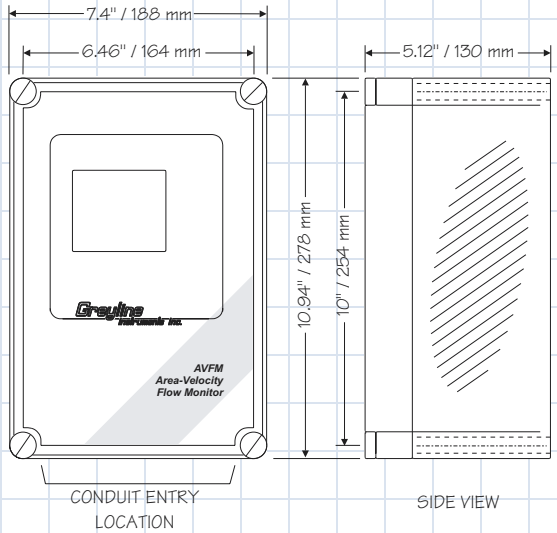
Options

Data Logging:	Programmable 50,000 point data capacity, time and date stamped or formatted flow reports including Total, Average, Minimum, Maximum and Times of occurrence. Includes RS232 output, serial cable and Windows software
Sensor Cable:	50 ft. (15 m) submersible, continuous from Sensor - or splice up to 500 ft (150 m)
Sensor Cable Junction Box:	Watertight NEMA4 steel with connection terminal strip
Power Input:	200-250VAC 50/60Hz, 12VDC or 24VDC
Enclosure Heater:	Thermostatically controlled - recommended for temperatures below 32°F (0°C)
Intrinsic Safety Barriers:	For Sensor mounting in Class I,II,III, Div. I,II, Groups C,D,E,F,G hazardous locations
Sensors:	Separate non-contacting ultrasonic level sensor and QZ-B velocity sensor
Sensor Mounting Bands:	Stainless steel sensor mounting bands for pipes from 6” to 24” (150 to 600 mm) diameter

Dimensions



QZ-A VELOCITY/LEVEL SENSOR



ELECTRONICS ENCLOSURE

New Open Channel Flow Monitor

Measures Velocity + Level to calculate Flow

New AVFM

Area-Velocity Flow Monitor

Recommended for:

- ☑ Sewer Flow Monitoring and Reporting
- ☑ Infiltration Studies
- ☑ Stormwater Monitoring
- ☑ Natural Streams
- ☑ Irrigation Water

New – AVFM Area-Velocity Flow Meter

- Flow measurement in Pipes and Rectangular Channels
- Ideal where Flumes or Weirs are difficult to install
- Tolerates Turbulence and high approach Velocity
- Install without stopping Flow

The AVFM Area-Velocity Flow Meter includes a submerged ultrasonic sensor that is installed at the bottom of an open pipe or channel. Exposed materials are all plastic so the sensor resists fouling and corrosion. It has no moving parts and no orifices, ports or electrodes.

The AVFM displays and totalizes flow. It includes two 4-20mA outputs (individually programmable for Flow, Level or Velocity), plus three control relays for level alarms or flow proportionate pulse output for samplers and chlorinators. It is easy to calibrate with the built-in, 3-button keypad and menu system. A built-in 50,000 point data logger with RS232 output is optional. Intrinsic Safety Barriers for sensor and cable installation in hazardous rated channels is also optional.

How to Order

Contact a Greyline sales representative in your area or phone one of our sales engineers. Describe your requirements and receive our prompt quotation.

Applications Support

Take advantage of Greyline's applications experience. Phone toll free 1-888-473-9546 for advice on applications, installation or service for Greyline instruments.

No Risk Appraisal

The Greyline AVFM Area-Velocity Flow Meter must meet your requirements. Discuss your application with a Greyline representative to arrange a 30-day trial.

The Greyline Guarantee

Quality of Materials and Workmanship - Each instrument manufactured by Greyline is warranted against defects in materials and workmanship for a period of one year from date of purchase. Refer to our limited warranty included with each product.

Greyline instruments inc.

RELIABLE MEASUREMENT AND CONTROL

Canada: 16456 Sixsmith Dr., Long Sault, Ont. K0C 1P0
Tel: 613-938-8956 / 888-473-9546 Fax: 613-938-4857
USA: 105 Water St., Massena NY 13662
Tel: 315-788-9500 / 888-473-9546 Fax: 315-764-0419
Internet: www.greyline.com E-mail: info@greyline.com

021101