Ultrasonic Slurry Meter

Highly Accurate Slurry Measurement from <u>Outside</u> a Pipe

Slurry Flow Meter
Model SFM 6.1

Displays, Transmits, Totalizes and Controls

Optimized for Slurries

Easy, Intuitive Set-Up

5 Button Menu System

Isolated 4-20mA Output

Up to 6 Control Relays

Optional Built In Data Logger

Non-contacting flow monitoring specifically designed for limestone slurry, fly ash slurry, gypsum slurry and many others

Ideal for Slurries

The Greyline SFM 6.1 was specifically developed for the slurry applications found in today's coal fired power plants. Using a proprietary algorithm specifically designed for measuring slurry flow, the SFM 6.1 incorporates more than 25 years of Greyline ultrasonic flow measurement experience.

**External Sensor
No Contact, No Maintenance**

There is no need to shut down your flow or cut into the pipe. The SFM 6.1 sensor mounts on the outside of any metal or plastic pipe ½" in diameter or larger. The SFM 6.1 sends an ultrasonic signal into the pipe and measures acoustic reflections off slurry particles and gas bubbles suspended in the slurry. Installation is easy. No contact is made with the moving fluid and no pipe cutting or drilling is required.

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Non-Contacting Slurry Flow Meter
Measures Flow with Strap-On Ultrasonic Sensor

Designed for Slurries

The SFM 6.1 Slurry Flow Meter works best in applications that would defeat regular contacting flow meters. Because the Sensor is mounted on the outside of the pipe, it is unaffected by abrasive slurries or harsh chemicals. There is no obstruction to flow and no pressure drop.

Easy to Install

Each SFM 6.1 Slurry Flow Meter includes a strap-on ultrasonic sensor, an adjustable stainless steel mounting clamp and sensor coupling compound. The sensor fits on the outside of any pipe diameter ½" (12.7 mm) or larger. It takes just a few minutes to install. There is no need to shut down flow.

Simple, Single-Head Sensor design

Ultrasonic signals are transmitted and received from a single-head sensor. The mounting clamp (included) ensures correct sensor alignment on horizontal or vertical pipes. The SFM 6.1 automatically self-tunes to the cable length up to 500 ft. (152 m).

Works on most Pipes

The Greyline SFM 6.1 Flow Meter measures flow in carbon steel, stainless steel, cast iron, PVC, fiberglass, and lined pipes... any pipe material that conducts ultrasound. Doppler signals cannot transmit through pipe walls which contain air pockets (e.g. concrete or wood), or loose pipe liners (with an air gap between the liner and pipe wall).

### Backlit Matrix Display with Simple, 5-key Menu System

Calibration is easy with the new SFM 6.1 user-friendly menu system. Press the arrow keys to scroll through menus, change settings and enter calibration values. You can select English, Spanish or French menus, enable a password to protect settings and control brightness of the digital display.

Reverse Flow Measurement

The SFM 6.1 measures flow in either direction and displays positive or negative values. You can control the Totalizer to subtract reverse flow, or to totalize forward flow only. The 4mA setting can also be adjusted to a negative flow setting.

Optional Data Logger with USB Thumb Drive Support

Order your SFM 6.1 Slurry Flow Meter with an optional built-in 2 million point data logger. It includes Windows software to display flow charts and tables, and to create dynamic flow reports. Just plug in a standard USB flash drive and log files are downloaded automatically - and fast!
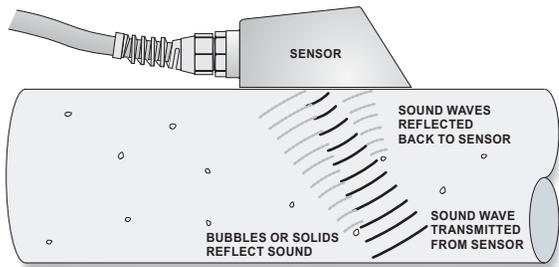
Principle of Operation

The SFM 6.1 Sensor transmits continuous high frequency sound through the pipe wall into the flowing slurry

Sound is reflected back to the Sensor from particles or gas bubbles in the liquid. If the liquid is flowing, the reflected sound returns at an altered frequency (the Doppler effect). The SFM 6.1 continuously measures this frequency shift to accurately measure flow.

Enhanced Signal Processing for Reliable Accuracy

The SFM 6.1 Doppler flow algorithm filters out background noise and interference. The high speed digital signal processor discriminates against weak and distorted signals for increased reliability and accuracy. If the processor cannot measure accurately the meter will display zero flow.

SFM 6.1 Slurry Flow Meter Specifications

Specifications:

Flow Rate Range: ± 0.1 to 40 ft/sec (± 0.03 to 12.2 m/sec) in most applications

Pipe Size: Any pipe ID from ½" to 180" (12.7 mm to 4.5 m)

Accuracy: ±2% of reading or 0.1 ft/sec (0.03 m/sec). Requires solids or bubbles minimum size of 100 microns, minimum concentration 75 ppm. Repeatability: ±0.1%, Linearity ±0.5%

Display: White, backlit matrix - displays flow rate, relay states, 16-digit totalizer, operating mode and calibration menu

Calibration: built-in 5-key calibrator with English, Spanish or French language selection

Power Input: 100-240VAC 50-60Hz (see Options), 5 Watts maximum (with standard features)

Output: Isolated 4-20mA (1000 ohm load max.)

Control Relays: Qty 2, rated 5 amp SPDT, programmable flow alarm and/or proportional pulse

Enclosure: NEMA4 stainless steel with window

Electronics Operating Temperature: -10° to 140°F (-23° to 60°C)

Sensitivity: adjustable. Damping: adjustable

Electrical Surge Protection: Sensor, 4-20mA output and AC power input

Shipping Weight: 21 lbs (10 kg)

Sensor:

Model SE4 single-head ultrasonic with 20 ft (6 m) shielded cable and stainless steel mounting kit for pipes ½" (12.7 mm) ID or larger. Designed to withstand accidental submersion to 10 psi. Certified non-incendive for Class I Division 2, Groups A,B,C,D hazardous locations

Sensor Operating Temperature: -40° to 300°F (-40° to 150°C)

Options:

Sensors: Intrinsic Safety Barriers for Sensor mounting in Class 1 Div.1 hazardous locations

Sensor Cable: 50 ft. (15 m) or 100 ft. (30 m) continuous shielded coaxial pair, or splice up to 500 ft (152 m) with Junction Box. Self tunes to extended cable

Enclosure Heater: for outdoor installation, 16 watt thermostatically controlled to -40°F (-40°C)

Data Logger: Built-in 2 million point logger with USB output and Windows™ software

Power input: 9-32VDC, rated 9W (typical 3.7W with standard features)

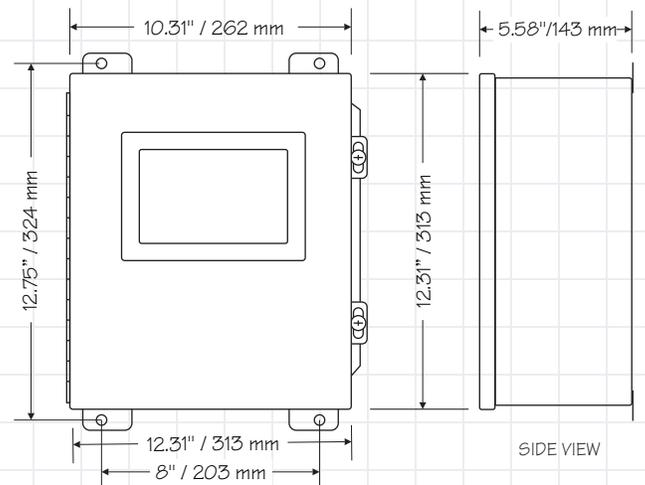**Control Relays:** 4 additional (6 total) rated 5 ampere SPDT

Applications:

Recommended for: Limestone, gypsum, fly ash and bottom ash slurries and liquids containing suspended solids or bubbles, minimum size of 100 microns, minimum concentration 75 ppm.

Sensor Mounting Location: 6-10 pipe diameters from elbows, tees (turbulence increasing devices) and >30 pipe diameters from pumps, controlling valves and pipe discharge. Sensor mounts on Vertical or Horizontal pipes.

Pipe Materials: steel, stainless steel, cast iron, PVC, fiberglass, any contiguous pipe material that conducts sound, including lined pipes with liner bonded to pipe wall. Avoid pipes with loose insertion liners and pipe walls which contain air (concrete, wood etc.).

Dimensions

END VIEW
1.5" 38 mm
SIDE VIEW
1.375" 35 mm
3.375" / 85 mm
20 ft / 6 m
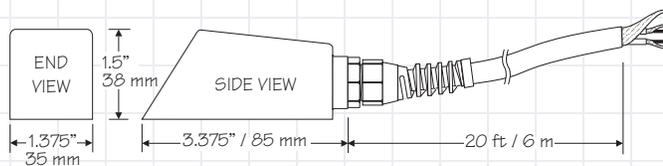
SE4 ULTRASONIC
SLURRY SENSOR

10.31" / 262 mm
5.58"/143 mm
12.75" / 324 mm
12.31" / 313 mm
12.31" / 313 mm
8" / 203 mm
SIDE VIEW

ENCLOSURE

Non-Contacting Slurry Flow Meter

Monitors, Displays, Totalizes and Controls from Outside a Pipe

Designed for:

- ☑ *Limestone Slurry*
- ☑ *Fly Ash Slurry*
- ☑ *Gypsum Slurry*
- ☑ *Sludge*
- ☑ *Raw Sewage*
- ☑ *Chemicals and Acids*
- ☑ *Solvents*
- ☑ *Viscous liquids*
- ☑ *Lubricating Oils*
- ☑ *Crude Oil*
- ☑ *Cooling Water*

Ideal for full pipes and any liquid containing gas bubbles or solids larger than 100 microns and in concentrations greater than 75 ppm.

Greyline SFM 6.1 Slurry Flow Meter

The SFM 6.1 flow sensor installs *without cutting the pipe*. It takes just a few minutes to mount on the *outside* of any pipe. Calibration is easy with the built-in, 5-button keypad. Select your choice of flow units and enter pipe diameter through the user-friendly calibration menu. Enable password protection to prevent tampering.

Special Features

- Digital processing system tracks flow signals accurately and auto-zeroes with signal loss
- Noise suppression circuitry filters "dirty" power and electrical interference from most VFD's
- Automatically converts between measurement units (e.g. gallons or liters)
- Calibration data and Totalizer values are stored automatically during power interruptions
- Output "simulation" function simplifies calibration of remote devices (e.g. chart recorders or controllers)
- Self-tunes to Sensor cable length

Benefits of Non-Contacting Flow Measurement

No Contact means no maintenance, no sensor fouling, no obstruction to flow, no pressure drop, no corrosion and no pipe cutting or drilling for installation.

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 and information on applications, installation or service for Greyline instruments.
No Risk Appraisal	The Greyline SFM 6.1 Slurry 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.

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RELIABLE MEASUREMENT AND CONTROL