Easy to Use, Non-Contacting Flow Meter

for Accurate Flow Measurement of "Difficult" Fluids from Outside a Pipe

Doppler Flow Meter

Model DFM 6.1

Displays, Transmits
Totalizes and Controls

Backlit LCD
Simple 5-Key Calibration
Password Protected
4-20mA / 0-5V Output
128 MB Data Logger
Modbus ® or HART Optional

Non-Contacting Flow Measurement and Control
Ultrasonic Sensor mounts on any Pipe

Ideal for "Difficult Liquids"

Greyline Doppler Flow Meters monitor the flow rate of dirty or aerated liquids including: wastewater, sewage, slurries, abrasives, and viscous liquids. Recommended for full pipes and any fluid that contains solids or bubbles.

External Sensor
No Contact, No Maintenance

The DFM 6.1 clamp-on sensor is mounted on the outside of any pipe ½ inch / 12.7mm diameter or larger. To measure velocity an acoustic signal is reflected back to the sensor from moving particles or gas bubbles suspended in the fluid. Flow is calculated based on configured pipe ID.

Installation is easy - without shutting down the flow system. No contact is made with the moving fluid and no pipe cutting or drilling is required. There is no fouling or scale build-up on the sensor.

The DFM 6.1 Doppler Flow Meter includes an ultrasonic sensor, an easy to use 5-key calibration system, a large digital flow rate display with totalizer, isolated 4-20mA output, 26 million point data logger, and two programmable control relays. The sensor is classified as non-incendive and an intrinsically safe sensor is optional.

Greyline
Precision Flow Measurement
An ONICON Brand

Non-Contacting Doppler Flow Meter
Measures Flow with Clamp-On Ultrasonic Sensor

Designed for "difficult" liquids

The DFM 6.1 Doppler 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 abrasives or harsh fluids. There is no obstruction to flow and no pressure drop.

Enhanced Signal Processing and Industrial Noise Immunity for Reliable Accuracy

The DFM 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.

Easy to Install

Each DFM 6.1 Doppler Flow Meter includes a clamp-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 DFM 6.1 automatically self-tunes to the cable length up to 500 ft.(152 m).

Works on most Pipes

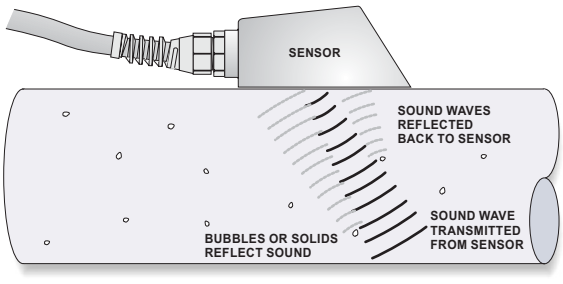
The Greyline DFM 6.1 Flow Meter measures flow in PVC, carbon steel, stainless steel, cast iron, HDPE ductile iron, and concrete lined ductile iron... any pipe material that conducts ultrasound. Doppler signals cannot transmit through pipe walls which contain air pockets (e.g. concrete or wood), or loose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

Backlit Display with Easy to Use, 5-key Menu System

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

Reverse Flow Measurement

The DFM 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.



26 Million Point Data Logger

The DFM 6.1 Doppler Flow Meter comes standard with a built-in 26 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.

Principle of Operation

The DFM 6.1 Sensor transmits continuous high frequency sound through the pipe wall into the flowing liquid.

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 DFM 6.1 continuously measures this frequency shift to accurately measure velocity.

DFM 6.1 Doppler Flow Meter

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) whichever is greater. 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

Configuration: built-in 5-button keypad with English, French or Spanish language selection

Power Input: 100-240VAC 50-60Hz 10VA maximum. Optional: 9-32VDC, 10 Watts maximum

Output: Isolated 4-20mA (1000 ohm load max.) or 0-5VDC (Field Selectable)

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

Data Logger: Built-in 26 million point logger with USB output and Windows™ software

Enclosure: watertight, dust tight NEMA4X (IP 66) polyester with a clear polycarbonate face

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

Shipping Weight: 14 lbs (6.3 kg)

Approvals: CE, CSA/UL/EN 61010-1

Sensor:

Model SE4 single-head ultrasonic with 25 ft (7.6 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)

Exposed Materials: 316SS

Options:

Sensors: Intrinsic Safety Barriers for Sensor mounting in Class I, II, III, Div I, II, Groups C, D, E, F, G, hazardous locations

Industrial Automation Protocols: Modbus® RTU via RS-485 or HART (field selectable)

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, thermostatically controlled to -40°F (-40°C)

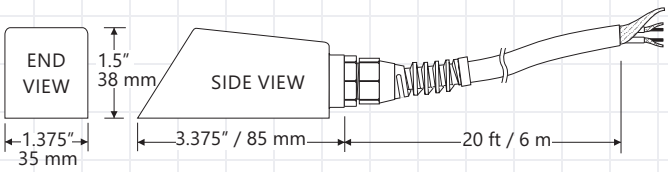
Control Relays: 4 additional (6 total) rated 5 amp SPDT

Applications:

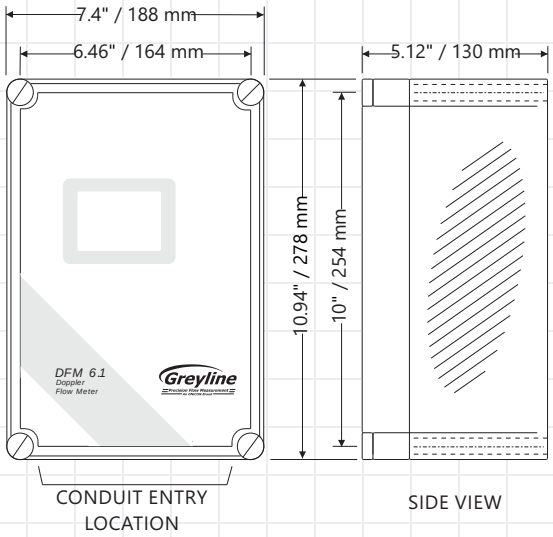
Recommended for: liquids containing suspended solids or bubbles minimum size of 100 microns, minimum concentration 75 ppm.

Pipe Materials: steel, stainless steel, cast iron, ductile iron, concrete lined ductile iron, PVC, HDPE, or 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

Dimensions



SE4 ULTRASONIC DOPPLER SENSOR



ENCLOSURE

Non-Contacting Doppler Flow Meter

Measures, Displays, Totalizes and Controls from Outside a Pipe

Designed for:

- ☑ ***Raw Sewage***
- ☑ ***Viscous liquids***
- ☑ ***Sludge and Slurries***
- ☑ ***Solvents***
- ☑ ***Pulp stock***
- ☑ ***Food products***
- ☑ ***Lubricating Oils***
- ☑ ***Crude Oil***

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

Greyline DFM 6.1 Doppler Flow Meter

The DFM 6.1 flow sensor installs *without cutting the pipe*. It takes just a few minutes to mount on the *outside* of any pipe. Configuration 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
- Noise suppression circuitry filters background noise and electrical interference from industrial environments
- 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 DFM 6.1 Doppler 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
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An ONICON Brand

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