pulsar MEASUREMENT

DFM 6.1

Ideal for full pipes and any liquid containing gas bubbles or suspended solids

Accurate Flow Measurement of "Difficult" Fluids from outside a Pipe

Ideal for "Difficult" Fluids

Pulsar Measurement 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 12.7 mm (0.5 in) diameter or larger. To measure velocity an acoustic signal is reflected to the sensor from moving particles or gas bubbles suspended in the fluid. Flow is calculated based on the configured pipe inside diameter.

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 configuration 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 for Class I Div 2 locations, and an intrinsically safe sensor is optional, for Class I Div 1 locations.

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 abrasive or harsh fluids. There is no obstruction to flow and no pressure drop.

THE RIGHT METER FOR

- Wastewater
- Industrial Effluent
- Stormwater
- Combined Sewers
- Natural Streams
- Irrigation Water

Enhanced Signal Processing & 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 12.7 mm (0.5 in) or larger. It takes just a few minutes to install. There is no need to shut down the 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 152.4 m (500 ft).

Works On All Common Pipe Materials

The 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 that 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

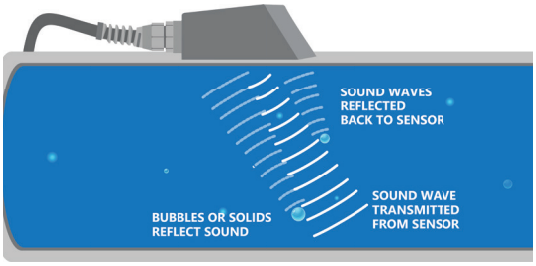
Configuration is easy with the new DFM 6.1 user-friendly menu system. Press the arrow keys to scroll through menus, change settings, and enter calibration values. You can select English, French, or Spanish menus, enable a password to protect settings, and control the brightness of the digital display.

Reverse Flow Measurement

The DFM 6.1 measures flow in either direction and will display 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 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.

Technical Specifications

GENERAL SPECIFICATIONS

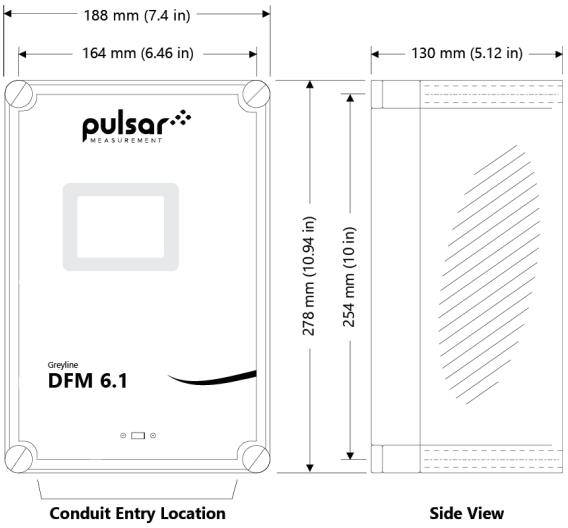
Operating Parameters:	Liquids containing suspended solids or bubbles minimum size of 100 microns, minimum concentration 75 ppm
Programming:	Built-in 5-button keypad with English, French, or Spanish language selection
Electronics Enclosure:	NEMA4X (IP66) polyester with a clear polycarbonate face
Accuracy:	±2% of reading or 30 mm/s (1.2 in/s) 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
Power Input:	• 100-240 V AC 5,060 Hz, 10 VA maximum • Optional: 9-32 V DC, 10 W maximum
Analog Output:	Isolated 4-20mA (1 kΩ load max.) or 0-5 VC (field selectable)
Control Relays:	Qty 2, rated 5 A SPDT, programmable flow alarm, and/or proportional pulse
Data Logger:	Built-in 26 million point logger with USB output and Windows software
Operating Temp. (Electronics):	-23 °C to 60 °C (-10 °F to 140 °F)
Approximate Shipping Weight:	6.3 kg (14 lb)
Approvals:	CE, CSA/UL/EN 61010-1

TRANSDUCER SPECIFICATIONS

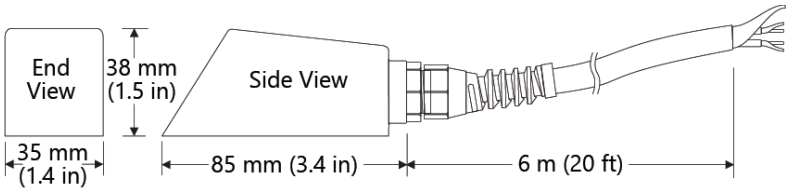
Transducer:	SE4 single-head stainless steel ultrasonic with 7.6 m (25 ft) shielded cable and designed to withstand accidental submersion to 10 psi.
Pipe Diameter:	Any pipe ID from 12.7 mm to 4.5 m (0.5 in to 15 ft)
Flow Rate Range:	±0.03 m/s to 12.2 m/s (±0.1 ft/s to 40 ft/s)
Pipe Materials:	Steel, stainless steel, cast iron, ductile iron, concrete-lined ductile iron, PVC, HDPE, or any contiguous pipe material that conducts sound, including lined pipes with a liner bonded to the pipe wall. Avoid pipes with loose insertion liners and pipe walls that contain air.
Operating Temperature:	-40 °C to 150 °C (-40 °F to 300 °F)
Transducer Mounting Kit:	Adjustable stainless steel mounting kit for pipes 12.7 mm (0.5 in) ID or larger.
Hazardous Locations:	Standard: Certified Non-Incendive for sensor mounting in Class I, Division 2, Groups A, B, C, D hazardous locations Optional: Certified Intrinsically Safe for sensor mounting in Class I, Division 1, Groups C and D; Class II, Groups E, F, and G; Class III; Type 4 Optional: Certified Intrinsically Safe for sensor mounting in ATEX/IECEx Zone 0, Ex ia IIB T4 Ga, hazardous locations

POPULAR OPTIONS

Industrial Automation Protocols:	Modbus RTU via RS485 or HART (field selectable)
Transducer Cables:	• 15.2 m (50 ft) continuous shielded coaxial pair • 30.5 m (100 ft) continuous shielded coaxial pair, or splice up to 152.4 m (500 ft) with junction box.
Enclosure Heater:	Thermostatically controlled to -40 °C (-40 °F)
Sunscreen:	Enclosure sunscreen for outdoor installations



DFM 6.1 Front & Side View



SE4 Ultrasonic Doppler Sensor

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.

pulsar MEASUREMENT

Delivering the Measure of Possibility

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