Transit Time Flow Meter

with Clamp-on Ultrasonic Transducers

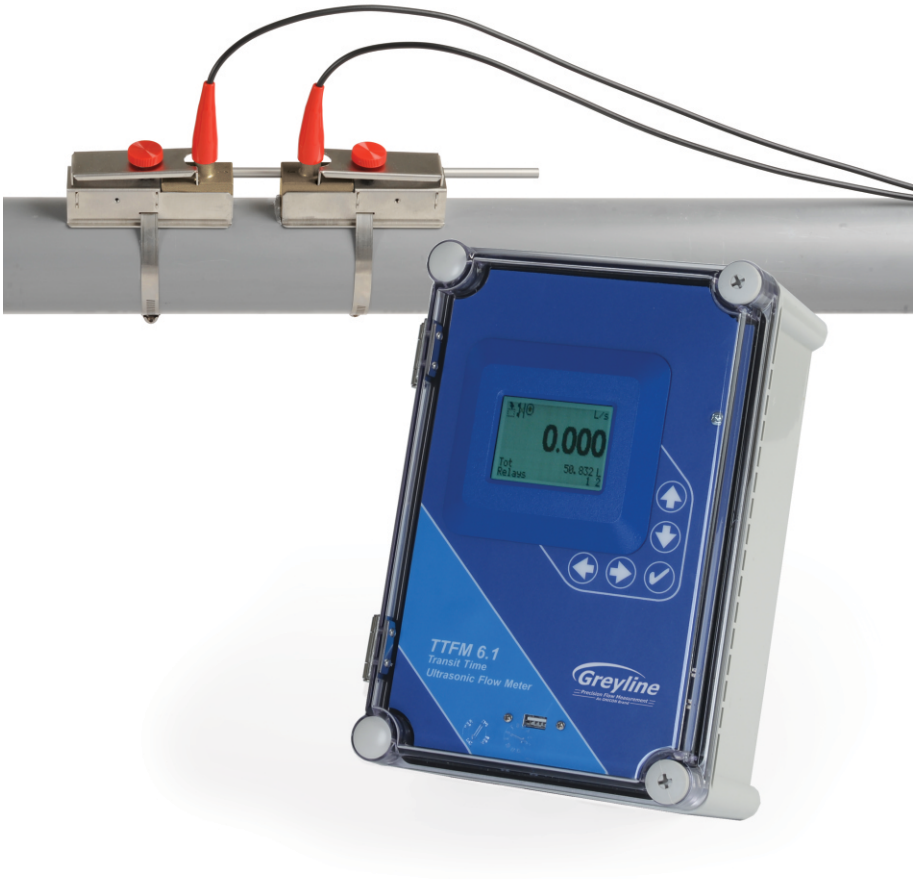
New!

Ultrasonic Flow Meter

Model TTFM 6.1

Displays, Totalizes, Transmits and Controls

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



Accurate Flow Measurement of Clean Liquids with Non-Contacting Transducers

Non-Contacting Flow Measurement

Ultrasonic transducers mount on the outside of pipes to measure flow rate of clean, non-aerated fluids like water, chemicals, and oils. The clamp-on transducers can be mounted without system shutdown. There is no pressure drop and no obstruction.

User-Friendly Operating System

Use the built-in keypad for fast and easy programming, with menu selection of pipe diameter, pipe material, liquid type and measurement units (gallons, liters etc.) Settings, calibration values and totalizer are retained during power interruptions.

Industrial Automation Protocols

Instantaneous flow rate, volume total, run hours, and diagnostic information is just some of the information available via optional Modbus RTU or HART communications.

Application Optimization

Custom engineered flow meters are now available with the TTFM 6.1. Provide your application parameters to Greyline at the time of order, and you'll receive a flow meter optimized for that application.

Greyline
Precision Flow Measurement
An ONICON Brand

www.greyline.com

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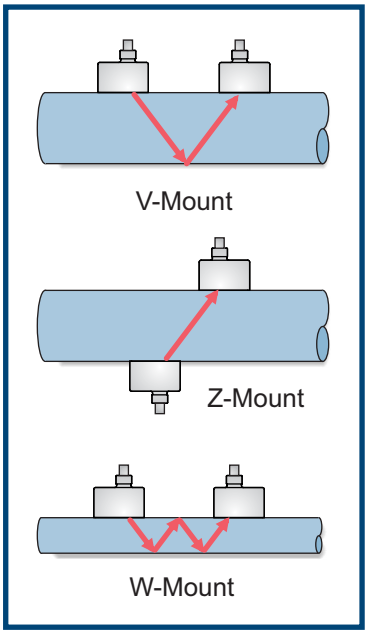


Measures Flow from the Outside of Metal and Plastic Pipes

The TTFM 6.1 Transit Time Flow Meter works by measuring the time of flight difference for ultrasonic sound pulses transmitted from one transducer to another. Depending on the mounting configuration, the signal may cross the pipe once, twice or four times. The time between transmitted and received signals is precisely measured by the flow meter. Ultrasonic signals are sent upstream and then downstream with the transducers alternating their functions as transmitters/receivers.

The transit time in the direction of flow is always faster than the transit time against the flow. By comparing these differences with precision timing circuits, the TTFM 6.1 is able to accurately calculate the flow rate. Because the ultrasonic signal is transmitted across the pipe, an average of the flow profile is calculated.

TTFM 6.1 transducers can be mounted on vertical or horizontal pipes. The pipe must be full. Choice of V, Z or W mounting method depends on the application and pipe diameter.

Works with Clean Liquids

The TTFM 6.1 Transit Time Flow Meter is designed for flow measurement of fairly clean, non-aerated liquids in full pipes. High concentrations of solids or gas bubbles (>2% by volume) will attenuate sound and the Transit Time ultrasonic signal may not be able to cross the pipe. A Greyline Doppler flow meter (DFM) is recommended for applications with solids or bubbles (eg. wastewater or slurries).

Works from the Outside of Common Pipe Materials

Mount the TTFM 6.1 ultrasonic transducers on the outside of many pipes including carbon steel, stainless steel, ductile iron, concrete lined ductile iron, cast iron, PVC, HDPE, PVDF, copper, brass, aluminum and pipes with bonded liners including epoxy, rubber and Teflon. Avoid pipes made with porous materials (e.g. wood or concrete) or with loose insertion liners.

Simple Menu System for Fast and Easy Start-up

Start-up can be done in a few minutes. Use the built-in 5-button keypad to enter the pipe material and OD, wall thickness and fluid type. The TTFM 6.1 will display the correct transducer separation distance and mounting method. Secure the stainless steel pipe clamps and align the mounting brackets on the outside of the pipe. Put coupling compound (included) on the transducer faces and insert them into the mounting brackets. The TTFM 6.1 will immediately begin to display, transmit and totalize flow.

Transducer Installation in Wet Locations

The TTFM 6.1 Transit Time Flow Meter transducers are rated for accidental submersion up to 10 psi (0.75 bar). The Flow Meter will continue to operate and measure flow accurately during temporary periods of submergence.

TTFM 6.1 Specifications

General Specifications

Greyline TTFM 6.1 Ultrasonic Transit Time Flow Meter

Operating Parameters:	For clean liquids in full pipes with less than 2% solids or gas bubbles
Programming:	Built-in 5-button keypad with English, French and Spanish menu language selection
Electronics Enclosure:	Watertight and dust tight NEMA4X (IP 66) polycarbonate with clear, shatterproof cover
Accuracy:	±1% of reading from 1.5 to 40 ft/sec (0.5 to 12.0 m/sec) and ±0.015 ft/sec (±0.0046 m/sec) for velocity below 1.5 ft/sec (0.46 m/sec). Repeatability & Linearity: ±0.25%
Display:	White, backlit matrix - displays 5-digit flow rate with floating decimal,14-digit totalizer, relay status, operating mode and calibration menu
Power Input:	100-240VAC 50-60Hz, 10 VA maximum Optional: 9-32VDC, 10 Watts maximum
Analog Output:	Isolated 4-20mA / 0-5V, 1000 ohm load maximum, programmable offset
Control Relays:	2 Relays, form 'C' dry contacts rated 5 amp SPDT; programmable flow alarm and/or flow proportional pulse Optional: 4 additional (6 total), rated 5 amp SPDT
Data Logger:	Built-in 128MB data logger with USB output and Windows™ software. Capacity for approx. 26 million data points
Operating Temp. (electronics):	-5° to 140°F (-20° to 60°C)
Approximate Shipping Weight:	12 lbs. (5.5 kg)
Approvals:	CE, CSA/UL/EN 61010-1

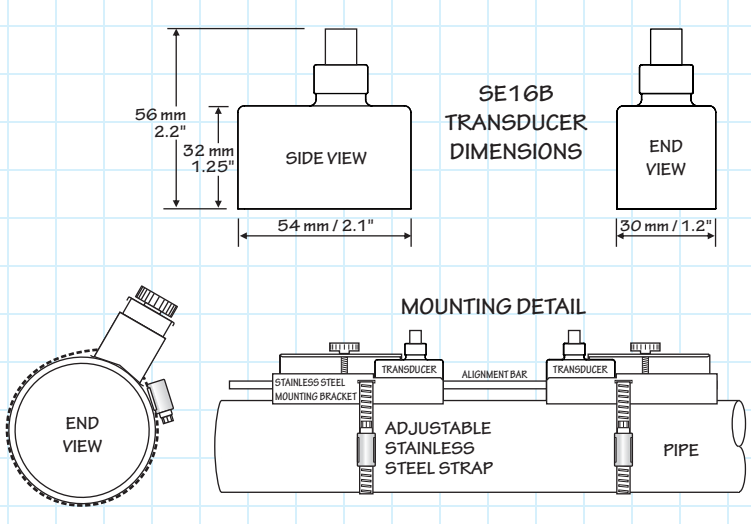
Transducer Specifications

Pipe Diameter:	2” to 48” (50 mm to 1200 mm)
Pipe Materials:	Any metal or plastic sonic conducting material including carbon steel, stainless steel, ductile iron, concrete lined ductile iron, cast iron, PVC, HDPE, PVDF, fiberglass, copper, brass, aluminum and pipes with bonded liners including epoxy, rubber and Teflon
Flow Velocity Range:	: ±0.07 to 40 ft/sec (±0.02 to 12 m/sec)
Operating Frequency:	1.28 MHz
Operating Temperature:	-40° to 300°F (-40° to 150°C)
Transducer Mounting Kit:	Includes set of stainless steel pipe clamps, alignment bar and coupling compound
Transducer Cables:	Triaxial, 25 ft (7.6 m) with BNC connectors and seal jackets (extendable up to 500 ft / 150 m)
Hazardous Locations:	Non-incendive for Class 1 Div 2, Groups A,B,C,D Optional: Intrinsically safe for Class 1 Div 1, Groups A,B,C,D

Popular Options

Industrial Automation Protocols:	Modbus® RTU via RS-485 or HART (field selectable)
Transducer Cables:	50 ft (15 m) triaxial with BNC connectors and seal jackets 100 ft (30 m) triaxial with BNC connectors and seal jackets Extendable to 500 ft / 150 m with options TXC extra cable and JB4X junction box
Enclosure Heater:	Thermostatically controlled to -40°F/C - recommended for temperatures below 32°F (0°C)
Sunscreen:	Enclosure sunscreen for outdoor installations

Dimensions



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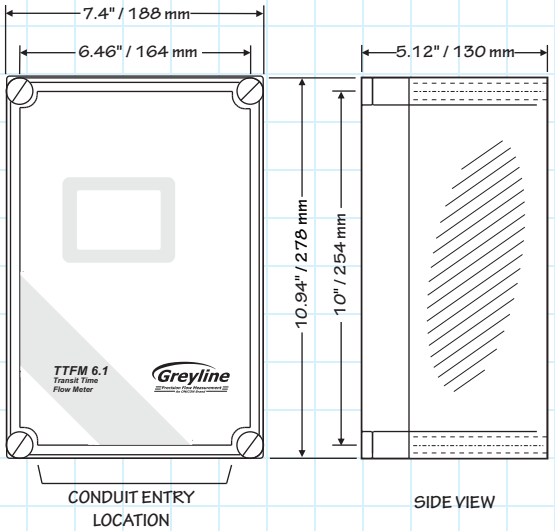
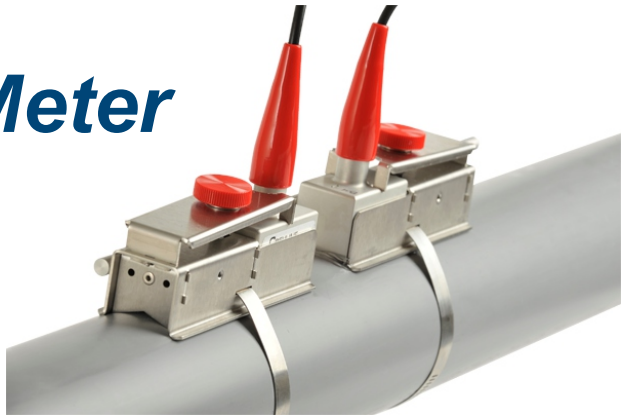


ENCLOSURE

New Ultrasonic Flow Meter for Clean Liquids



Recommended For:

- potable water
- river water
- cooling water
- low-conductivity water
- water/glycol solutions
- hydraulic oil
- diesel and fuel oils
- chemicals

The TTFM 6.1 Transit Time Flowmeter is ideal to measure flow rate of clean, non-aerated fluids in full pipes. Works best on fluids that have less than 2% by volume particulate or gas bubbles.

Easy to Install

Install the TTFM 6.1 Transit Time Flow Meter without cutting the pipe or shutting down flow. It operates on a wide range of pipe materials and sizes and takes just a few minutes to program and start-up.

The flow meter works by injecting sound through the pipe wall and into the flowing liquid. The transducers transmit ultrasonic signals back and forth. The up and downstream “transit times” are precisely measured and compared to calculate the flow rate. Advanced signal processing software and electronics suppress interference and measure flow with high repeatability and accuracy.

TTFM 6.1 Advanced Features

Optional Modbus® RTU via RS-485 serial or HART communication provides multiple data points on a single twisted-pair connection. Data includes but is not limited to: flow rate, flow total, diagnostic information, and the ability to reset volume totals from the Modbus® connection. BAUD rate, network address, parity, and number of stop bits for Modbus communications are easily programmed and changed via the 5-button keypad.

The TTFM features advanced diagnostics like signal strength, measured fluid sonic velocity and indicaton of transducer integrity.

How to Order

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

Applications Support

Take advantage of Greyline's applications experience. Call 1-888-473-9546 for advice and information on applications, installation or service for Greyline instruments.

No Risk Appraisal

The Greyline TTFM 6.1 Transit Time 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
Precision Flow Measurement
An ONICON Brand

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