Transit Time Flow Meter

with Clamp-on Ultrasonic Transducers

New!

Ultrasonic Flowmeter

Model TTFM 1.0

Displays, Totalizes
Transmits and Controls

Backlit LCD Display
Simple 5-key Calibration
Password Protected
4-20mA/0-5V Output
Plug & Play Options

Accurate Flow Measurement of Clean Liquids with Non-Contacting Transducers

Non-Contacting Flow Measurement

Ultrasonic transducers mount on the outside of plastic or metal pipes to measure flow rate of clean, non-aerated fluids like water, chemicals, and oils. The clamp-on transducers can be mounted without shutting down flow. There is no pressure drop and no obstruction. Transducer separation distance is calculated by the flowmeter according to pipe diameter and wall thickness.

User-Friendly Operating System

Use the built-in keypad for fast, easy calibration 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.

GREYLINE instruments inc.

RELIABLE MEASUREMENT AND CONTROL

www.greyline.com

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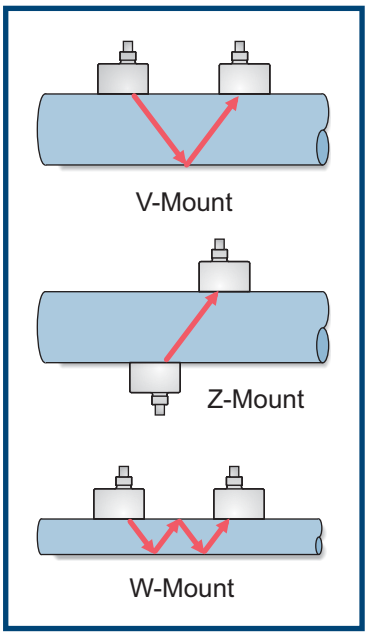


Measures Flow from the Outside of Metal and Plastic Pipes

The TTFM 1.0 Transit Time Flowmeter works by measuring the “transit time” or “time of flight” 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 1.0 is able to accurately calculate the flow rate. Because the ultrasonic signal is forced to cross the pipe, an average of the flow profile is calculated. So compensation for laminar or turbulent flow is automatic.

TTFM 1.0 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. V-Mount is the most common method while Z-Mount is used for larger pipes or weak signal applications and W-Mount for smaller pipes.

Works with Clean Liquids

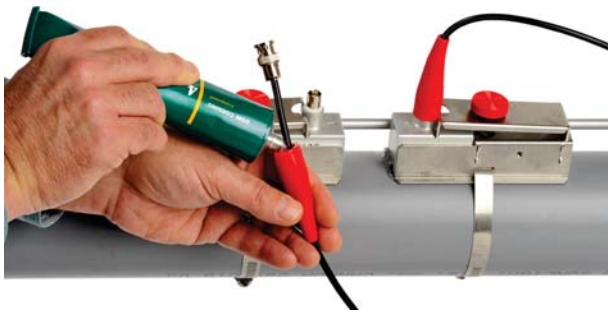
The TTFM 1.0 Transit Time Flowmeter is designed for flow measurement of clean, non-aerated liquids in full pipes. High concentrations of solids or gas bubbles (>2% by volume) will attenuate sound and the Transit Time ultrasonic signal may not be able to cross the pipe. A Greyline Doppler-type flow meter is recommended for applications with solids or bubbles (eg. wastewater or slurries).

Works from the Outside of Common Pipe Materials

Mount the TTFM 1.0 ultrasonic transducers on the outside of metal or plastic pipes including carbon steel, stainless steel, ductile iron, cast iron, PVC, PVDF, fiberglass, 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, Easy Start-up and Calibration

Calibration and 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 1.0 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 1.0 will immediately begin to display, transmit and totalize flow.



Transducer Installation in Wet Locations

The TTFM 1.0 Transit Time Flowmeter transducers are rated for accidental submersion up to 10 psi (0.75 bar). The flowmeter will continue to operate and measure flow accurately during periods of submergence. Plastic seal jackets on the cables can be filled with coupling compound to provide additional moisture protection for the BNC cable connectors.

TTFM 1.0 Specifications

General Specifications

Greyline TTFM 1.0 Ultrasonic Transit Time Flow Meter

Operating Parameters:	For clean liquids in full pipes with less than 2% solids or gas bubbles
Calibration:	Built-in 5-key calibrator 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 or 0.1 ft/sec (0.03 m/sec), whichever is greater 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 (see Options), 4.0 Watts maximum (with standard features)
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
Operating Temp. (electronics):	-5° to 140°F (-20° to 60°C)
Approximate Shipping Weight:	12 lbs. (5.5 kg)

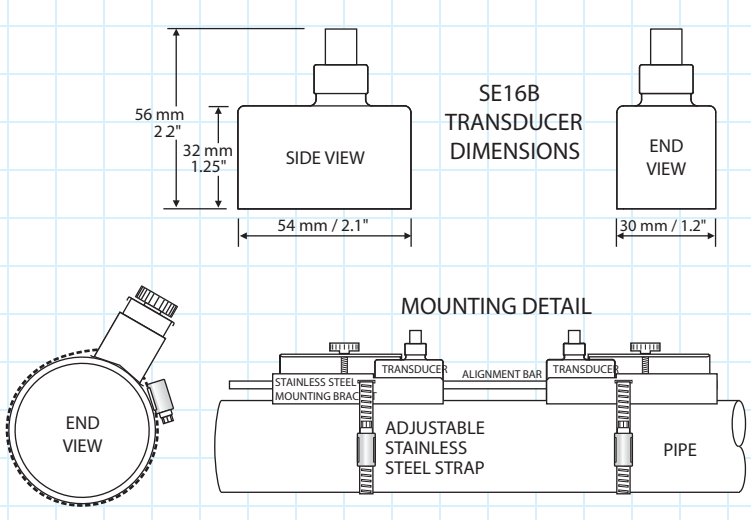
Transducer Specifications

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, cast iron, PVC, PVDF, fiberglass, copper, brass, aluminum and pipes with bonded liners including epoxy, rubber and Teflon
Flow Velocity:	±0.07 to 39 ft/sec (±0.02 to 12 m/sec) typical
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:	RG-58 coaxial, 25 ft (7.6 m) with BNC connectors and seal jackets
Certification:	Non-incendive for Class I Division 2, Groups A,B,C,D hazardous locations

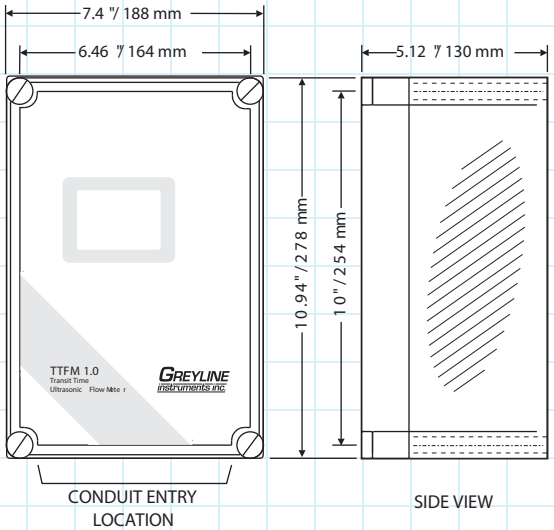
Popular Options

Transducer Cables:	50 ft (15 m) coaxial with BNC connectors and seal jackets or splice up to 250 ft (75 m) shielded coaxial with NEMA4X (IP66) Junction Box
Power Input:	9-32 VDC
Control Relays:	4 additional (6 total), rated 5 amp SPDT
Enclosure Heater:	Thermostatically controlled - recommended for temperatures below 32°F (0°C)
Sunscreen:	Enclosure sunscreen for outdoor installations
Data Logger:	Built-in 2-million point logger with USB output and Windows™ software

Dimensions



SE16B TRANSDUCERS



ENCLOSURE

New Ultrasonic Flowmeter for Clean Liquids in Metal and Plastic Pipes

Recommended For:

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

The TTFM 1.0 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% particulate or gas bubbles.

Easy to Install

Install the TTFM 1.0 Transit Time Flowmeter without cutting the pipe or shutting down flow. It operates on a wide range of metal and plastic pipe sizes and takes just a few minutes to calibrate and start-up.

The flowmeter 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 1.0 Advanced Features

Plug-and-play options including a 2-million point data logger and extra control relays can be installed at any time. Power consumption is low (4 Watts typical) with standard AC and optional DC power input. Display backlight brightness is adjustable and 4-20mA output and relays can be disabled to reduce power consumption.

The TTFM ultrasonic transducers are waterproof and designed to operate in wet environments or during accidental submersion. Transducer cable length can be field- extended up to 250 ft (75 m) with optional shielded cable and junction box.

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 1-888-473-9546 for advice and information on applications, installation or service for Greyline instruments.

No Risk Appraisal

The Greyline TTFM 1.0 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.

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