TTFM 6.1

Great things come in threes, the meter made to make your life easy...

With the TTFM 6.1, you never need to be an expert in non-contacting flow measurement to get the best results in your application.

Every flow measurement application is different, and if you want the best results, choosing the right non-contacting meter can take a lot of time and research. The TTFM 6.1 from Pulsar Measurmement has been designed to be the easiest to choose, use, and maintain.

As the saying goes, great things come in threes. With only three easy-to-select transducer sizes that work on all common pipe materials, the TTFM 6.1's intuitive and powerful hardware combined with our world-class support team will help make you look and feel like an expert.

Easy to Choose

With three easy-to-select transducer sizes that work on all common pipe materials, and options tailored to fit your application, the TTFM 6.1 is the best choice to specify for your next clean-fluid flow application.

Easy to Use & Maintain

With interchangeable, clamp-on transducers, standard mounting hardware, and quick setup menu, installation is quick and shutdown free. Perfect for both retrofits and new installations. With no moving parts, there is little-to-no maintenance required, and with solid state components, there is no drift in performance over time ensuring accuracy and peace of mind.

THE RIGHT METER FOR

- Treated Water
- Raw Water
- Cooling Water
- Chemicals
- Hydraulic Oil
- Low-Conductivity Water
- Water / Glycol Solutions
- Diesel & Fuel Oils

Easy Assistance Anywhere

With real-time sales and application support direct from Pulsar Measurement, world-class assistance is just a phone call away. For applications which require periodic recalibration, we're ready to support you with our comprehensive calibration techniques and fast turnaround service.

Non-Contacting Flow Measurement

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

User-Friendly Operating System

Use the built-in keypad for fast and easy programming with a menu selection of pipe diameter, pipe material, liquid type, and measurement units (gallons, liters, etc.). In the event of a power outage or disruption, the TTFM 6.1 retains settings, calibration values, and totalizer readings with its onboard memory.

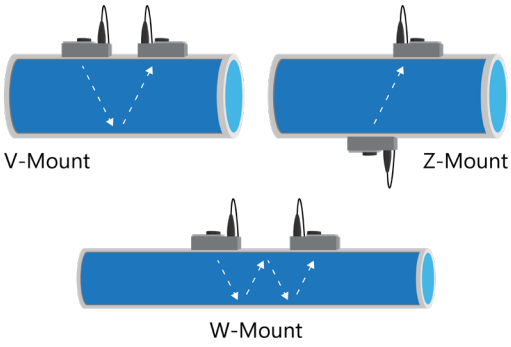
Industrial Automation Protocols

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

Wide Range of Applications

Powerful new signal processing and multiple transducer options allow the TTFM 6.1 to be used accurately and without complicated setup on a wide range of pipe materials and applications.

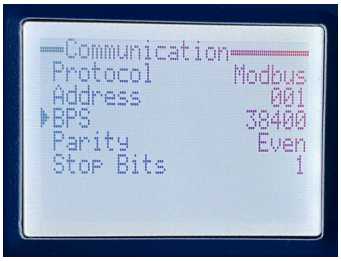
Measures Flow from the Outside of Pipes



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 can 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, and the pipe must be full. The choice of V, Z, or W mounting method depends on the application and pipe diameter.



Simple Menu System for Fast & Easy Start-Up

Start-up can be done in a few minutes, using the built-in 5-button keypad to enter the pipe material, outer diameter, 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 the 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.

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.

Technical Specifications

GENERAL SPECIFICATIONS

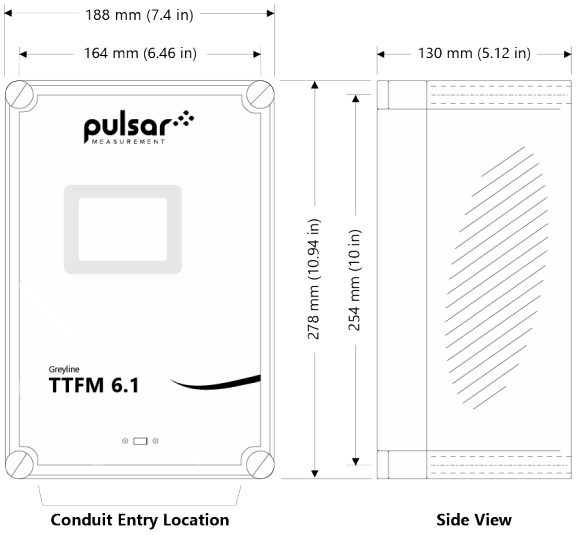
Operating Parameters:	For clean liquids in full pipes with less than 2% solids or gas bubbles
Programming:	Built-in 5-button keypad with English, French, and Spanish menu language selection
Electronics Enclosure:	NEMA4X (IP66) polycarbonate with clear, shatterproof cover
Flow Velocity Range:	+/- 0.02 m/s to 12.2 m/s (+/- 0.07 ft/s to 40 ft/s)
Accuracy:	±1% of reading from 0.46 to 12.2 m/s (1.5 to 40 ft/s); ±0.0046 m/s (±0.015 ft/s) for velocities below 0.46 m/s (1.5 ft/s). 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:	• 100-240 V AC (50/60 Hz), 10 VA maximum • Optional: 9-32 V DC, 10 W maximum
Analog Output:	Isolated 4-20mA, 0-5 V, 1 kΩ load maximum
Control Relays:	• 2 Relays, form 'C' dry contacts rated 5 A SPDT; programmable flow alarm and/or flow proportional pulse • Optional: 4 additional (6 total), rated 5 A SPDT
Data Logger:	Built-in 128 MB data logger with USB output and Windows software. Capacity for approx. 26 million data points
Operating Temp. (Electronics):	-20 °C to 60 °C (-5 °F to 140 °F)
Approximate Shipping Weight:	5.5 kg (12 lb)
Approvals:	CE, CSA, UL/EN 61010-1

TRANSDUCER SPECIFICATIONS

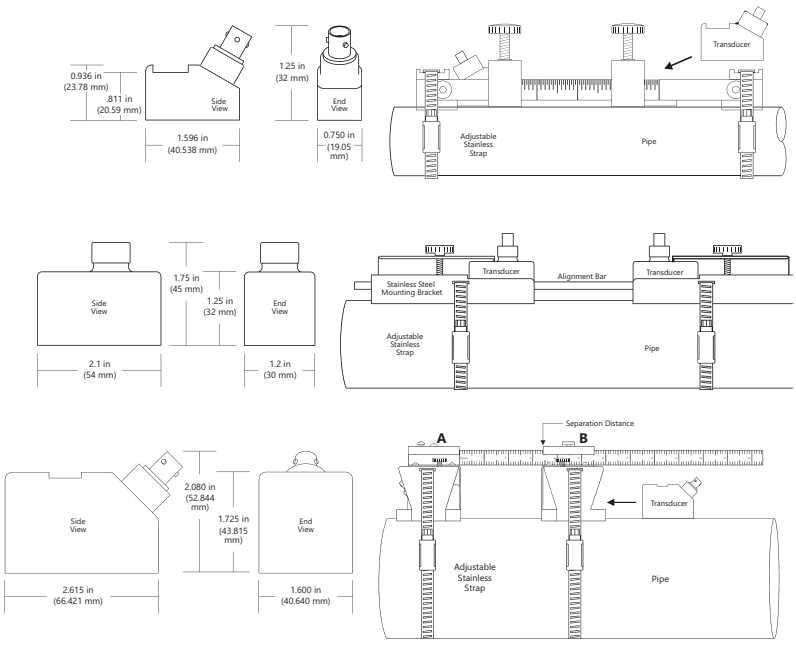
Pipe Diameter, Nominal:	SE16A: Recommended for 15 mm to 40 mm (0.5 in to 1.5 in), Suitable for 15 mm to 150 mm (0.5 in to 6 in) SE16B: Recommended for 50 mm to 250 mm (2 in to 10 in), Suitable for 50 mm to 1,200 mm (2 in to 48 in) SE16C: Recommended for 300 mm to 1,200 mm (12 in to 48 in), Suitable for 100 mm to 1,200 mm (4 in to 48 in)
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
Operating Frequency:	SE16A: 2.56 MHz SE16B: 1.28 MHz SE16C: 640 kHz
Operating Temperature:	-40 °C to 150 °C (-40 °F to 300 °F)
Transducer Mounting Kit:	SE16A: Includes stainless steel track with pipe clamps, built-in ruler, and coupling tape. SE16B: Includes set of stainless steel transducer brackets, clamps, alignment bar, and coupling tape. SE16C: Includes set of stainless steel transducer brackets, clamps, alignment bar with built-in ruler, and coupling tape.
Transducer Cables:	Triaxial, 7.6 m (25 ft) with BNC connectors and seal jackets (extendable up to 152.4 m (500 ft))
Hazardous Locations:	• Non-incendive for Class I, Div 2, Groups A, B, C, D • Optional: Intrinsically safe for Class I, Div 1, Groups C, D; Class II, Groups E, F, G; Class III; Encl. Type 4

POPULAR OPTIONS

Industrial Automation Protocols:	Modbus RTU via RS485 or HART (field selectable)
Transducer Cables:	• 15.2 m (50 ft) triaxial with BNC connectors and seal jackets • 30.5 m (100 ft) triaxial with BNC connectors and seal jackets
Enclosure Heater:	Thermostatically controlled to -40 °C (-40 °F) — recommended for temperatures below 0 °C (32 °F)
Sunscreen:	Enclosure sunscreen for outdoor installations

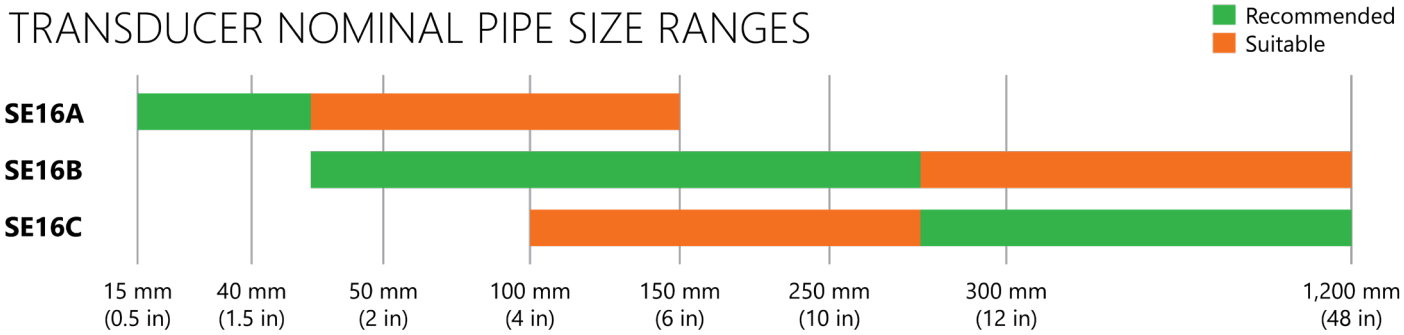


TTFM 6.1 drawing front and side



SE16A, SE16B & SE16C Transducers & Mounting

TRANSDUCER NOMINAL PIPE SIZE RANGES



Delivering the Measure of Possibility

Pulsar Measurement offers worldwide professional support for all of our products, and our network of global partners all offer full support and training. Our facilities in Malvern, UK and Largo, USA are home to technical support teams who are always available to answer your call or attend your site when required. Our global presence, with direct offices in the UK, USA, Canada, and Malaysia, allows us to create close relationships with our customers and provide service, support, training, and information throughout the lifetime of your product.

For more information, please visit our website:

www.pulsarmeasurement.com

pulsar MEASUREMENT

INFO@PULSARMEASUREMENT.COM

United States
+1 888-473-9546

Canada
+1 855-300-9151

United Kingdom
+44 (0) 1684 891371

Asia
+60 102 591 332

Oceania
+61 428 692 274

pulsarmeasurement.com

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