



Flow Line Options



SemperSonic™ Portable Transit Time Flow Meter with Transducers

Features & Benefits

- Removable, field-swappable, 200,000-event datalogger module (optional). The logger has an integral DB-9 connection that plugs directly into a PC serial port for very fast 56.7k data uploads.
- Automatic Reynolds Number compensation assures accurate measurements through the laminar, transition and turbulent system flow regions.
- Integral 24 hour rechargeable battery allows extended operation when AC power is not available. Both AC and cigarette socket style power adapters (battery chargers) are included.
- Compartmentalized and padded carrying case keeps the UFTP meter and all of its accessories organized and protected.
- Flow measuring range that exceeds 4000:1. This feature allows the instrument to measure normal process flow rates as well as flows resulting from leaks in piping and valves.
- User configurable rate and totalizer units include: feet, gallons, ft³, mil-gal, barrels, acre-feet, lbs, meters, liters, m³, mil-liters and kg.
- Non-invasive clamp-on transducers are simple and cost efficient to install. Since the transducers do not contact the liquid, fouling and maintenance are eliminated.
- An integral optical interface and Windows® software utility provides complete control of system configuration, calibration and diagnostics-without connecting any wires.

Description

SemperSonic™ Portable Transit Time Flow meters feature the world's most advanced non-invasive flow measurement technology-providing a measuring system with unsurpassed accuracy, versatility, ease of installation and dependability. Although designed primarily for cleaner liquids, the flow meter operates reliably with greater amounts of suspended solids or aeration than previous transit time ultrasonic flow meters were capable of measuring. UFTP is designed for long-or short-term measurement flow surveys on full-pipe liquid systems and is ideal for verifying calibration of permanently mounted flow meters of all types.

The flow meter features a tactile keypad, 24-hour battery (rechargeable), removable 200,000-event data logger (optional) and a 64 x 128 pixel, back-lit graphics display integrated into a watertight enclosure. All SemperSonic™ systems utilize a proprietary dual time-base time expansion algorithm, advanced DSP and digital cross-correlation. UFTP also provides an optical interface which is utilized with the Windows® ULTRALINK™ software utility. The software utility allows simple in-field programming, calibration and software upgrades.

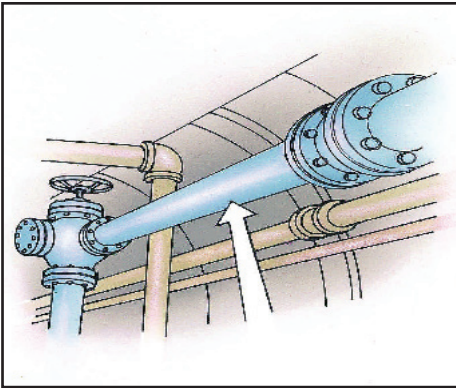
The cost effective and versatile UFTP flow meter comes complete with all accessories necessary for measuring piping systems from 2" [50mm] and higher.

UFTP Accessories Package

UFTP flowmeter comes complete with all accessories necessary for measuring flow rates in piping systems from 2" [50 mm] to 100" [2540 mm]. All of the components of the system are stored neatly in a compartmentalized and padded carrying case [A] (see picture at left). Items included with the UFTP system: UFTP meter [B], ultrasonic transducer set [C], 20 ft. [6m] transducer interconnection cable, 1 tube of acoustic couplant [D], mounting hardware for all pipe sizes [E], AC power converter [F], cigarette-style 12 VDC converter, infrared adapter and UltraLink software utility [G], 4-20 mA interface cable and operations manual.



Installation and Operation



SELECT THE OPTIMUM LOCATION ON THE PIPING SYSTEM

The most critical step in obtaining an accurate flow reading is proper selection of the location to mount the ultrasonic transducers. In general, choose a transducer mounting location that guarantees a full pipe of liquid and contains a minimum of ten pipe diameters (lineal distance equal to 10 times the pipe internal diameter) of straight pipe located upstream, toward the source of flow, and five diameters downstream. Obtain or measure the pipe outside diameter and wall thickness.

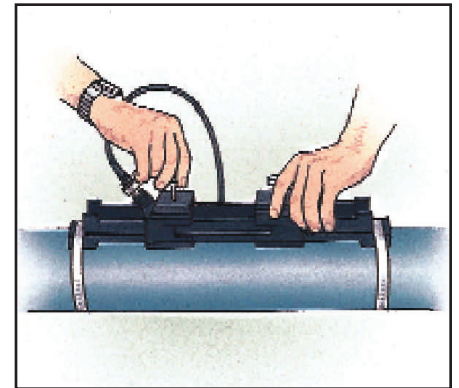


ENTER THE PIPE AND LIQUID INFORMATION INTO THE FLOW METER.

The following information is entered into the UFTP flowmeter via the keypad or on a PC operating the ULTRALINK™ software utility:

- *Pipe Outside Diameter
- *Pipe Wall Thickness
- *Pipe Material (select from list)
- *Pipe Liner Thickness (if present)
- *Liner Material (if present)
- *Fluid Type (select from list)

After entry, the UFTP will calculate and display the proper distance to place the transducers apart on the pipe.

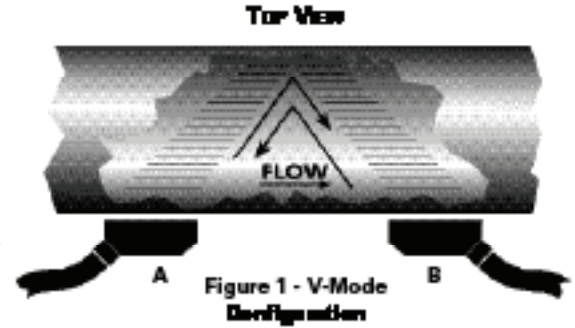


MOUNT THE TRANSDUCERS ONTO THE PIPE.

Remove loose paint, rust or scale from the pipe in the two areas where the transducers will be mounted. Attach the applicable transducer mounting hardware to the pipe with the enclosed straps. Apply a bead of acoustic couplant to the face of each transducer and clamp them to the pipe. Connect the transducer cables between the transducers and the UFTP flowmeter. Press the ON button on the flowmeter and select desired measuring units. The UFTP will begin to measure flow.

Principles of Operation

SemperSonic™ transit time flowmeters utilize two transducers, shown as elements A and B in Figure 1, which function as both ultrasonic transmitters and receivers. The transducers are clamped on the outside of a closed pipe at a specific distance from each other. (The transducers can be mounted in V- mode as shown in Figure 1, W-mode where the sound transverses the pipe four times, or in Z-mode where the transducers are mounted on opposite sides of the pipe. This selection is based on pipe and liquid characteristics.) The flowmeter operates by alternately transmitting and receiving a frequency modulated burst of sound energy between the two transducers. The burst is first transmitted in the direction of fluid flow and then against fluid flow. Since sound energy in a moving liquid is carried faster when it travels in the direction of fluid flow (downstream) than it does when it travels against fluid flow (upstream), a differential in the times of flight will occur. If the fluid is not moving, the time of flight difference will be zero and the flowmeter will indicate zero flow. The sound's time of flight is accurately measured in both directions and the difference in time of flight is calculated. The liquid velocity (V) inside the pipe can be related to the difference in time of flight (dt) through the following equation: $V = K \cdot D \cdot dt$, where K is a constant and D is the distance between the transducers.



ULTRALINK™ SOFTWARE UTILITY



Designed with the user/operator in mind, configuration and calibration of transittime ultrasonic flowmeters have never been as simple and straight forward as with SemperSonic™ Series. Integration of your PC, the UFTP flowmeter and ULTRALINK™ provides the ultimate in operator control. ULTRALINK™ is a software utility that operates on a Windows® PC operating system and communicates with SemperSonic flowmeters through a serial communications port and infrared serial adapter. Since the communication link is infrared light, the user need only be within 10 feet [3 meters] of the UFTP meter – interconnection wires and opening of the meter enclosure are not necessary. Kit includes ULTRALINK™ on a 3.5 inch diskette and one infrared serial adapter. The software and computer are requirements for in-field calibration and some advanced functions of SemperSonic™ systems.

Specifications-TRANSMITTER

Power Requirements: Internal 12 V lead-acid Gel Cell battery provides 24 hrs of continuous operation @ 20°C. Charging: Wall mount power converter 115 or 230 VAC 50/60 Hz ± 15% @ 5 VA max; 12-15 VDC @ 2.5 VA max.

Velocity: -40 to +40 FPS [-12 to +12 MPS]

Outputs: All output modules are optically isolated from earth and system grounds. A maximum of two modules may be installed.

Standard Options: 4-20 mA 800 Ohms max; 12-bit resolution; passive or active

Data Logger 200,000-event, 16-bit, integral DB-9 RS232C connection, can be removed and installed without disconnecting system power; data transfer rates to 57.6K.

Other Options: Pulse Output MOSFET, 0.21 Ohms, 100 V max., 0-2,500 Hz

Relay Two separate Form C relays, 200 VAC max. @ 0.5 A resistive **RS232C** data rate to 57.6K **RS485** supports up to 119 drops **Heatflow** supports two 1,000 Ω RTDs, multiplexed, 12-bit resolution.

Display: 128 x 64 pixel graphics LCD, LED back lit. Two user selectable font sized 0.35" [8.9mm] or 0.2" [5.0 mm] 8 digit rate, 8 digit totalizer [resettable]

Units Rate: User configured feet, gallons, ft³, mil-gal, barrels, acre-feet, lbs., meters, liters, m³, mil-liters, Kg (with Heatflow options: BTUs, calories, Watts) (rate time:

sec, min, hr, day)

Totalizer: (NET, FWD, REV or BATCH) gallons, ft³, barrels, acre-feet, lbs., liters, m³, Kg (with Heatflow options: BTUs, calories, Watts)

Ambient Conditions: -40 to 185°F (-40 to 85°C), 0-95% relative humidity, non-condensing.

Enclosure: NEMA 4X, (IP-66) while open, NEMA 6 (IP-68) while closed, ABS with SS hardware. Electronic enclosure: 14.00 (355.6)W x 6.06 (153.9) H x 10.56 (268.2) D inches (mm): 14.8 (6.7) lbs. (Kg)

Accuracy Flow Rate: ±0.5% of reading at rates > 1 FPS for field calibrated systems; ±1% of reading at rates > |1 FPS [0.3 MPS]| uncalibrated; ±0.01 FPS (0.0003 MPS) at rates < |1FPS [0.3 MPS]|

Sensitivity: Flow: 0.001 FPS [0.0003 MPS]

Repeatability: ±0.01% of reading

Response Time: Flow: 0.3-30 seconds, user configured, to 100% of vcalue, step change in flow.

Security: Keypad lockout, four digit user selected access code

Approvals: Ordinary Area

ULTRALINK™ Utility: IBM compatible, Windows® 95/98/2000/XP operating system.

Specifications-TRANSDUCER

Liquid Types Supported: Virtually all non-aerated liquids.

Transducer to Transmitter Distance: (Std) 20 feet [6.09 meters], (Opt) lengths to 990 feet [300 meters]

Pipe Sizes: (Std) 2-100 inches [50 - 2540 mm] pipe

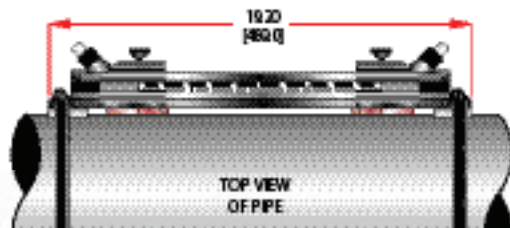
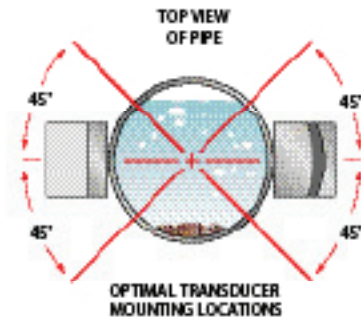
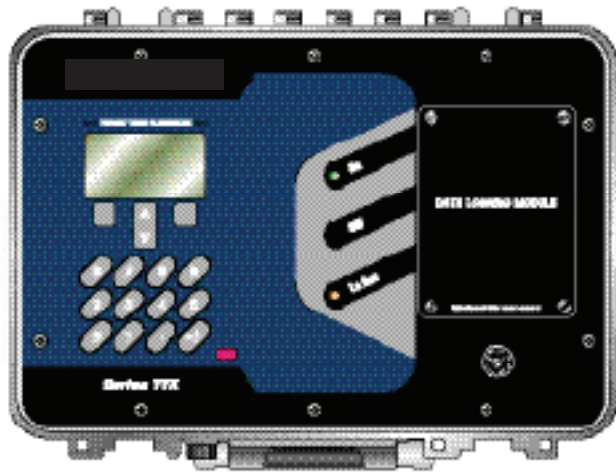
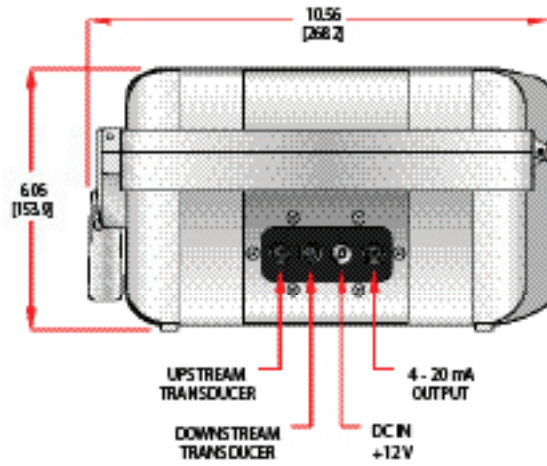
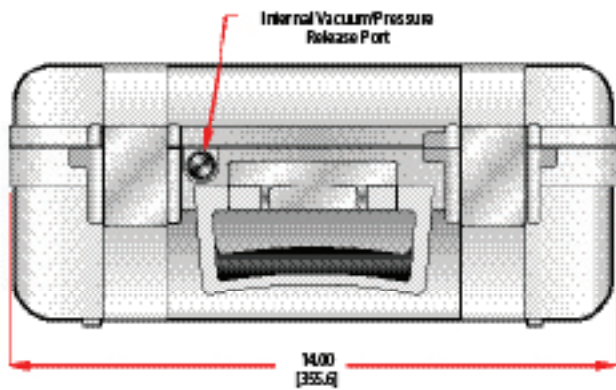
Environment: (Std) -40° to +250°F [-40° to +121°C]; Optional -40° to +400°F [-40° to +200°]; NEMA 6 (IP-68)

Housing Material: CPVC, Ultem™ and Nylon

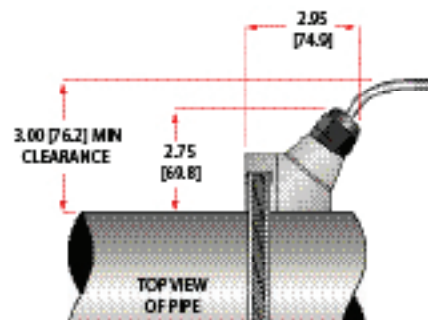
Approvals: (Std) Ordinary Area; (Opt) | Class I Div. 1 Groups C and D; Class II Div. 1 Groups E,F and G (pending)

Dimensional Specifications

Mechanical Dimensions: Inches (mm)



10" (250mm) Scaled Mounting Track



Pipes Larger than 2" (50mm)

Ordering Information

FLO-CORP MODEL NUMBER BUILDER

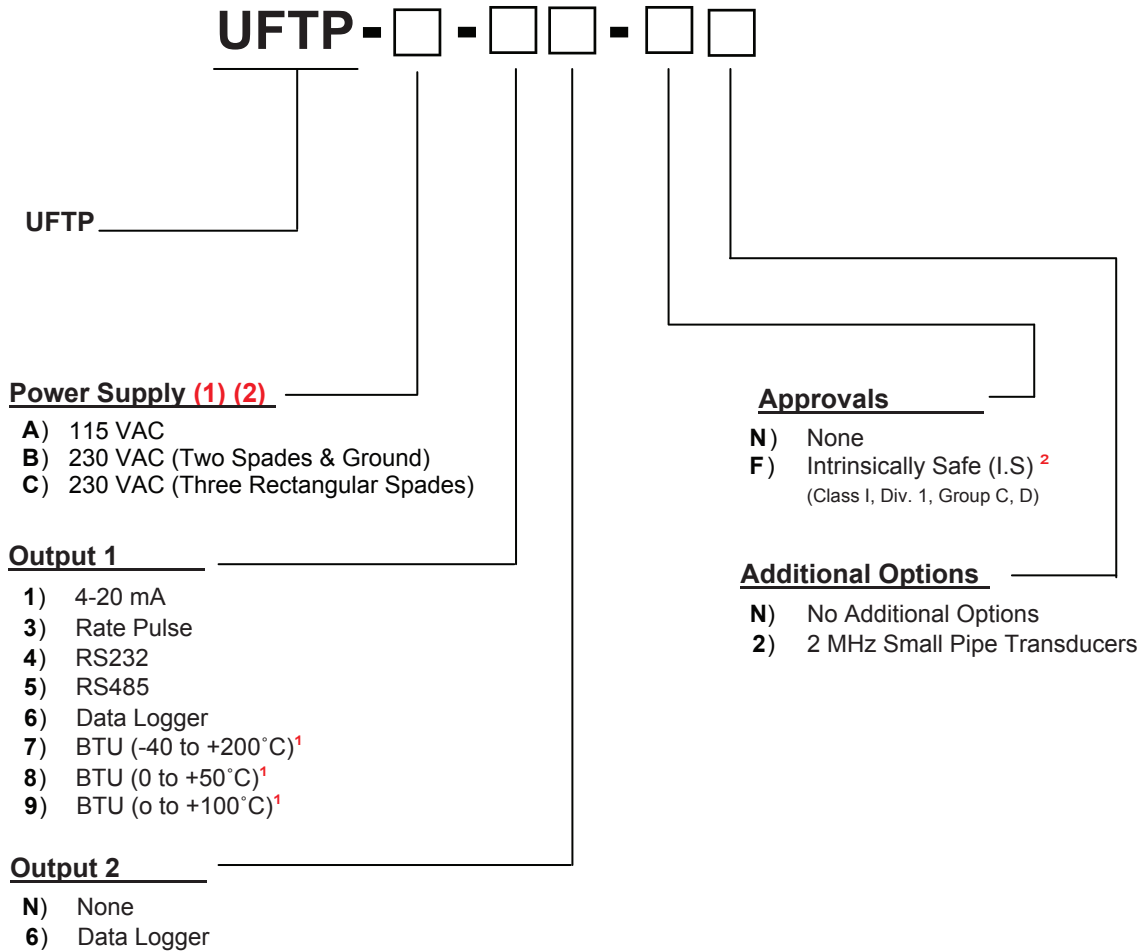
For Assistance Call 330.468.0180

Use the diagram below, working from left to right to construct your Flo-Corp Model Number. Simply match the category number to the corresponding box number.

For Replacement parts, please contact Flow Line Options

SemperSonic™ Portable Transit Time Flow Meter with Transducers (Pipe Sizes 2" & Up)

Model Number Builder



¹ BTU option includes interface box RTDs, installation tape and silicone heat sink compound.
² Intrinsically Safe (I.S.) option requires UFTT-1 Transducers. Must be ordered separately.

Ordering Notes

- 1) Select the best configuration based on your requirements.
- 2) This unit comes standard with (1) padded carrying case, (2) ultrasonic transducer set for pipe sizes < 2", 20 ft. of cable, acoustic couplant, mounting hardware, AC power converter, auto-style 12 VDC converter, infrared adapter, and 4-20 mA interface cable.