USFT-B Series Liquid Ultrasonic Flow Transmitters

Loop Powered 4-20 mA Output, Flows to 120 GPM, 3/4" to 2" Pipe, Brass

DESCRIPTION

DEI USFT-B Ultrasonic flow transmitters are ideal for measurement of flow rates of acoustically conductive liquids including most clean liquids and many liquids with entrained solids.

Main advantages include excellent long term stability, no pressure drop, broad fluid compatibility, high accuracy and low cost. Also, there are no moving parts.

At the heart of the transmitter is a proprietary mixed signal ASIC which allows sophisticated timing, control and transducer drive circuitry to be combined on a single integrated circuit. The ASIC uses a special algorithm that is an improvement upon the standard single-path measurement technique. Using the "sing around" method, the ultrasonic transducer alternates between transmitting and receiving to measure differences in flight time between upstream and downstream transmissions. A sound pulse is transmitted from an upstream transducer towards a downstream transducer like a traditional time-of-flight measurement. However, the received sound pulse then triggers a second downstream transmission that then triggers a third and so on for a specific number of cycles. This process is repeated in the upstream direction.

Because it takes an average flight time over multiple cycles to compute the difference in flight times, the approach yields a significant improvement in timing accuracy when compared with the time-of -flight difference of a single sound pulse in each direction. This algorithm, combined with the pico-second timing resolution of the ASIC, provides the precise time measurement capability necessary for compact, small diameter ultrasonic meters.

The output of the transmitter is unaffected by changes in fluid temperature, density and viscosity as the flow calculation is independent of the speed of sound.

Wetted materials include ULTEM® encapsulated ultrasonic transducers with a choice of elastomer seals and Brass body material.

SPECIFICATIONS

GENERAL

Flow Range: Bi-directional, field selectable per "Standard Models" table
Accuracy: ±0.75% of full scale
Operating Temperature: -40 to 190°F (-40 to 87.8°C)
Response Time: User selectable, 2 or 10 seconds
Viscosity Range: 0.2 to 150 cSt (0.2 to 150 mPas)
Liquid Density: 30.6 to 74.9 lb/cu.ft. (490 to 1200 kg/m3)
Max. Working Pressure:
3/4" to 2": 250 PSI (17.2 bars)
Pipe Sizes: 3/4", 1", 1 1/2"
Pipe Connections:
Sizes 3/4" to 2"- Female NPT, BSP
Electrical Enclosure: Integral to Body casting with gasketed cover; One 1/2" NPT conduit connection (plugged when model ordered with metric threads) and one M16 x 1.5 connection (plugged when model ordered with NPT threads)
Electrical Connections: Screw terminal connections on PC board
Enclosure Rating: NEMA 4 (IP 65)
Power Supply: 18 to 36 VDC

WETTED MATERIALS

Ultrasonic Transducers: ULTEM® Encapsulated
Seals: EPDM, Buna-N, Neoprene™, FKM, or other
Body Material: Brass (UNS C83600)

OUTPUT

Analog: 2-wire, 4-20 mA output; Output is 4 mA from zero to min. flow (see Standard Model table)
Error Detection: An optically isolated sink output is activated under certain detectable fault conditions, such as transducer failure or overly noisy output due to flow stream anomalies, as might be seen due to excessive bubble entrainment. The optional Fault output is an optically isolated NPN transistor capable of sinking up to 25 mA from a voltage source of no more than 48 VDC.
Direction of Flow: Optional output to indicate direction of flow is available. Activation or deactivation of an optically isolated 25 mA sink output indicates flow direction. Error detection is not available when this option is ordered.
Optional Temperature Sensor: (T-D8) 3 wire RTD, 100 Ohm, Platinum, Class A, IEC60751, built into transducer shell for monitoring process temperature. 8 pin electrical connector standard with this option. See below.

NEMA 4 eight-pin receptacles installed in transmitter conduit connection and factory wired along with mating circular connectors simplify field installation.

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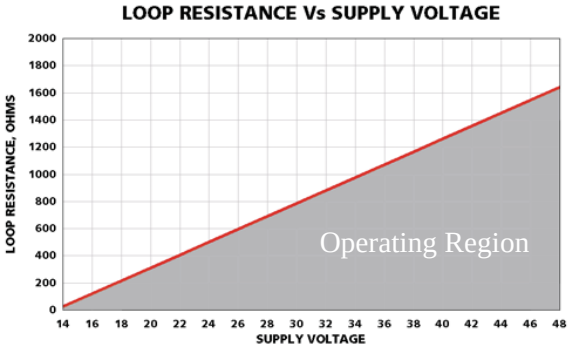
STANDARD MODELS

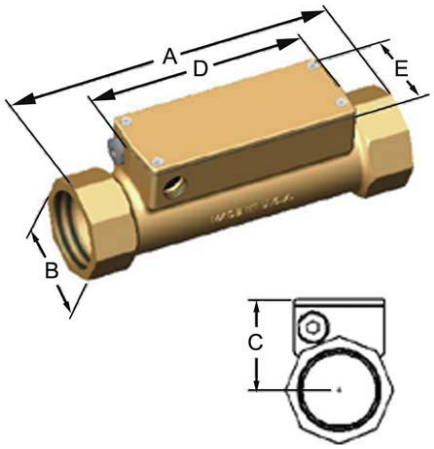
Model	Pipe Size	*Field Selectable Full Scale	Min.	Max.
USFT-B-.75	.75" NPT	L	0.23	15
		H	0.38	25
USFT-B-1.0	1.0" NPT	L	0.45	30
		H	0.75	50
USFT-B-1.5	1.5" NPT	L	0.60	40
		H	1.20	80
USFT-B-2.0	2.0" NPT	L	0.90	60
		H	1.80	120
		L = Low H = High	*Other F.S. ranges can be requested	



MODEL NUMBER CONFIGURATION

Model	GPM Ranges*	Transducer Seal	Options
USFT-B-.75N	15/25G	-E = EPDM -B = Buna-N -N = Neoprene® -V = FKM	T-D8 Temperature Sensor
USFT-B-1.0N	30/50G		
USFT-B-1.5N	40/80G		
USFT-B-2.0N	60/120G		
*For custom ranges please call.			

DIMENSIONS



Pipe Size	Dimensions (Inches) A	B	C	D	E
3/4" & 1"	9.20	1.62	2.06	6.40	2.40
1-1/2" & 2"	9.88	2.75	2.51	6.40	2.40