

spirax/sarco

Clamp-On Ultrasonic Flow and Energy Meter for Liquids

Description

UTM10 ultrasonic flow and energy meters clamp onto the outside of pipes and do not contact the internal liquid. The technology has inherent advantages over alternate devices including: low-cost installation, no pressure head loss, no moving parts to maintain or replace, no fluid compatibility issue, and a large, bi-directional measuring range that ensures reliable readings even at very low and high flow rates. UTM10 is available in a variety of configurations that permit the user to select a meter with features suitable to meet particular application requirements.

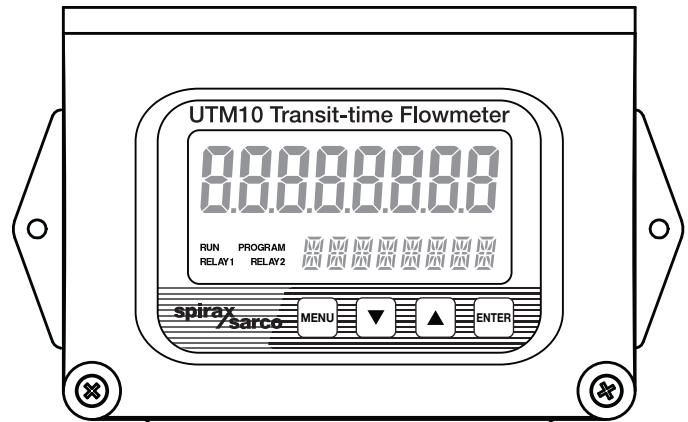
The UTM10 is available in two versions: a stand-alone flow meter, and an energy flow meter used in conjunction with dual clamp-on RTDs. The energy flow meter measures energy usage in BTU, Tons, kJ and Wh and is ideal for retrofit, chilled water and other HVAC applications.

Features

- May be used to measure clean liquids as well as those with small amounts of suspended solids or aeration (e.g., surface water, sewage).
- Bi-directional flow measurement system. Totalizer options include forward, reverse and net total.
- Modbus RTU over RS485 communications; Ethernet connection includes BACNet®/IP, EtherNet/IP™ and Modbus TCP/IP protocols.
- Large, easy-to-read digital display.
- Rugged, aluminum enclosure ensures a long service life in harsh environments.
- Certified for hazardous area installation in North America and Europe.

Benefits

- Reduced material costs: clamp-on sensor eliminates the need for in-line flanges, pipe fittings, strainers, and filters.
- Reduced installation time: the UTM10 may be installed and fully operational within minutes.
- Reduced maintenance costs: with no moving parts, there is nothing on the UTM10 to wear down – no repair kits or replacement parts are needed.
- No need to shut down the process for installation or maintenance due to clamp-on sensor design.



Clamp-On Ultrasonic Flow and Energy Meter for Liquids

Specifications

System

Liquid Types	Most clean liquids or liquids containing small amounts of suspended solids or gas bubbles
Velocity Range	Bi-directional to 40 FPS (12 MPS)
Flow Accuracy	UTT10-050S/050L/050H: $\pm 1\%$ of rate at flows > 1 FPS; ± 0.01 FPS (0.003 MPS) at flows < 1 FPS (0.3 MPS) UTT10-025S - UTT10-040S: $1"$ (25 mm) and larger $\pm 1\%$ of rate from 4 to 40 FPS (1.2 to 12 MPS); ± 0.04 FPS (0.012 MPS) at rates < 4 FPS (1.2 MPS) UTT10-015S - UTT10-020S: $\pm 1\%$ Full Scale
Temperature Accuracy (Energy Meters Only)	Option 1: 32-122 °F (0-50 °C); Absolute: 0.22 °F (0.12 °C) Difference: 0.09 °F (0.05 °C) Option 2: 32-212 °F (0-100 °C); Absolute: 0.45 °F (0.25 °C) Difference: 0.18 °F (0.1 °C) Option 3: -40-350 °F (-40-177 °C); Absolute: 1.1 °F (0.6 °C) Difference: 0.45 °F (0.25 °C)
Sensitivity	Flow: 0.001 FPS (0.0003 MPS) Temperature: Option 1: 0.03 °F (0.012 °C); Option 2: 0.05 °F (0.025 °C); Option 3: 0.1 °F (0.06 °C)
Repeatability	0.5% of reading
Installation Compliance	General Safety: UL 61010-1, CSA C22.2 No. 61010-1 and EN 61010-1 Hazardous Location: Class I Division 2 Groups C,D; Class II and III, Division 2, Groups C, D, F, and G for US/CAN; ATEX II 2 G Ex nA II T4: UL 1604, CSA 22.2 No. 213, EN 60079-0 and EN 60079-15 CE: EN61326-1:2006 on meter systems with integral flow transducers, transducers constructed with twinaxial cable or remote transducers with conduit

Transmitter

Power Requirements	AC: 95-264 VAC 47-63 Hz @ 17 VA max. DC: 10-28 VDC @ 5 VA max. Protection: auto resettable fuse, reverse polarity and transient suppression
Display	Two line LCD, LED backlight; Top row 0.7 inch (18mm) height, 7-segment; Bottom row 0.35 inch (9 mm) height, 14-segment Icons: RUN, PROGRAM, RELAY1, RELAY2 Flow rate indication: 8-digit positive, 7-digit negative max.; auto decimal, lead zero blanking Flow accumulator (totalizer): 8-digit positive, 7-digit negative max. (reset via keypad press, USP, network command or momentary contact closure)
Enclosure	Type 4 (IP65) Construction: powder-coated aluminum, polycarbonate, stainless steel, polyurethane, nickel-plated steel mounting brackets Size (electronic enclosure only): 6.0" W x 4.4" H x 2.2" D (152 mm W x 112 mm H x 56mm D) Conduit Holes: (2) 1/2" NPT female; (1) 3/4" NPT female; Optional Cable Gland Kit
Temperature Configuration	-40 °F to +185 °F (-40 °C to +85 °C) Via optional keypad or PC running USP software (Note: not all configuration parameters are available from the keypad – i.e. flow and temperature calibration and advanced filter settings)
Engineering Units	Flow Meter: Feet, gallons, cubic feet, million gallons, barrels (liquor and oil), acre-feet, lbs., meters, cubic meters, liters, million liters, kg Energy Meter: BTU, MBTU, MMBTU, Tons, kJ, kWh, MWh and the Flow Meter list from above
Inputs/Outputs	USB 2.0: for connection of a PC running USP configuration utility RS485: Modbus RTU command set 10/100 Base-T: RJ45, communication via Modbus TCP/IP, EtherNet/IP™ and BACnet®/IP 4-20mA: 12-bit, internal power, can span negative to positive flow/energy rates Flow Meter Model Only: 0-1,000 Hz: open-collector, 12-bit, can span negative to positive rates; square-wave or turbine meter simulation outputs Two Alarm Outputs: open-collector, configure as rate alarm, signal strength alarm or totalizer pulse

Transducers

Type	Compression mode propagation, clamp-on
Construction	UTT10-050S/050L: NEMA 6 (IP 67), CPVC, Ultem®, Nylon cord grip, PVC cable jacket; -40 to 250°F (-40 to 121°C) UTT10-015S - UTT10-040S: NEMA 6 (IP 67), CPVC, Ultem®, Nylon cord grip, PVC cable jacket; -40 to 250°F (-40 to 121°C) UTT10-050S/050L: NEMA 6P (IP 68) option, CPVC, Ultem®, Nylon cord grip, Polyethylene cable jacket; -40 to 250°F (-40 to 121°C) NEMA6: Submersible to a depth of 3ft (1m) for 30 days max. NEMA6P: Submersible to a depth of 100ft (30m) indefinitely
Frequency	UTT10-015S - UTT10-040S: 2 MHz UTT10-050S/050H: 1 MHz UTT10-050L: 500 KHz
Cables	RG59 Coaxial, 75 ohm or Twinaxial, 78 ohm (optional armored conduit)
Cable Length	990 feet (300 meter) max. in 10 ft. (3 m) increments
RTDs	Energy Meters Only: Platinum 385, 1,000 ohm, 3-wire; PVC jacket cable
Installation	DTT10-050S (S option)/050L/050H: General and Hazardous Location (see Installation Compliance) DTT10-050S and IS Barrier (F option): "Class I Div I, Groups C&D T5 Intrinsically Safe Exia," "CSA C22.2 No. 's 142 & 157, UL 913 & 916"

Software Utilities

USP	Utilized to configure, calibrate and troubleshoot Flow and Energy meters. Connection via USB A/B cable; software is compatible with Windows 95, Windows 98, Windows 2000, Windows XP, Windows Vista® and Windows® 7
EnergyLink	Utilized to monitor a network of Flow and Energy meters. Connection via RS485. Operates within Microsoft Excel®2003 and Microsoft Excel®2007.

Clamp-On Ultrasonic Flow and Energy Meter for Liquids

UTM10 Network Options

UTM10 Network

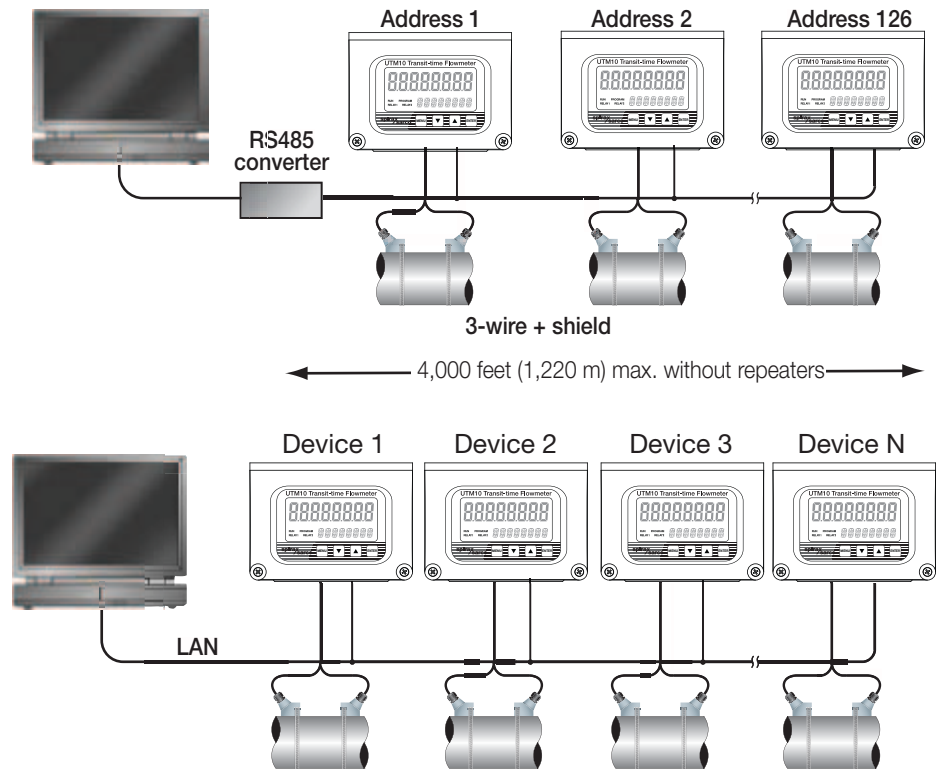
All UTM10 meters come equipped with RS485 drivers and utilize a Modbus RTU command set (data can be returned in single-precision, double-precision, integer or floating point values). Up to 126 UTM10 products can be run on a single daisy-chain network and be individually queried for flow rate, positive flow accumulator, negative flow accumulator, negative flow accumula Excel®, application detailed below.

UTM10 Base-T Network

If equipped with the optional Ethernet communications module, the UTM10 can be plugged into a LAN and queried for flow rate, positive flow accumulator, negative flow accumulator, supply temperature, return temperature and signal strength. The module contains Modbus TCP/IP, EtherNet/IP™ and BACnet®/IP network compatibility.

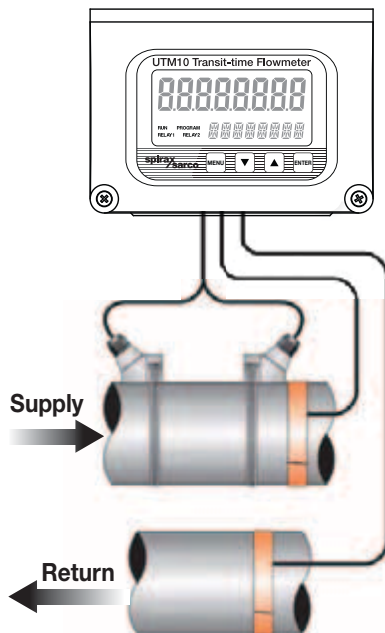
USP Software

Operating from a standard, low-cost PC, USP software operates within Microsoft® Excel® and provides an efficient method of monitoring and archiving data from a network of UTM10 Energy meters. USP software automatically backs up accumulated energy data every hour, day, month, quarter and year into convenient spreadsheet formats suitable for input into invoicing systems. The Current Readings screen provides real time measurements from all UTM10 meters on the network (up to 126 meters can be connected on a single RS485 network). Data displayed includes: Location name, Room Number, UTM10 address, a good/bad communication indicator, the time and date of the last reading, flow signal level, energy flow rate, energy accumulation, supply temperature and return temperature. The software can be configured to "auto run" should PC power be interrupted or the PC be turned off. The software can also be configured to reset the energy accumulators on all network meters at the beginning of every month or quarter.

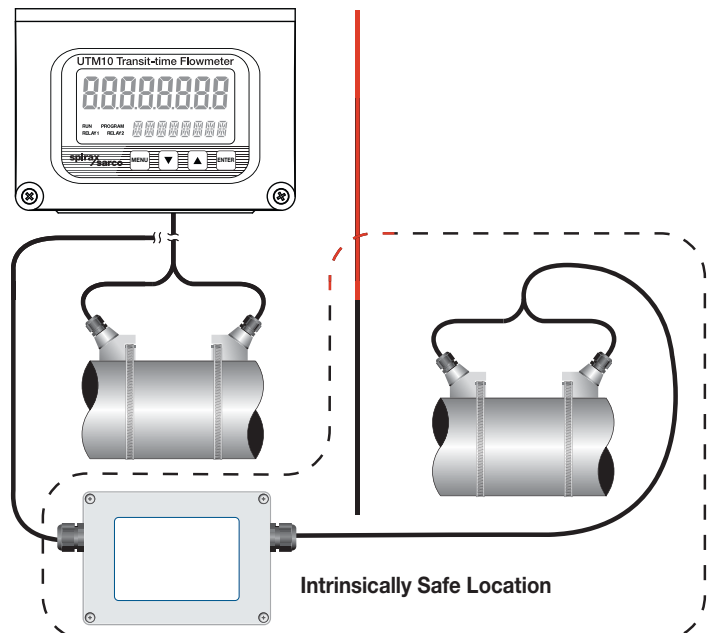


Compliance

General Safety



Hazardous Location Installation

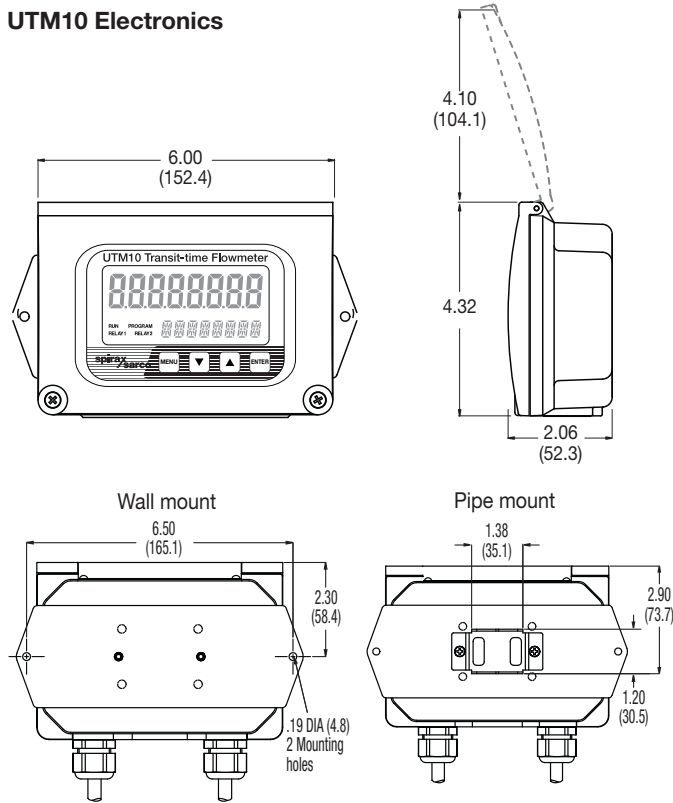


Clamp-On Ultrasonic Flow and Energy Meter for Liquids

Dimensional Specifications

Mechanical Dimensions: Inches (mm)

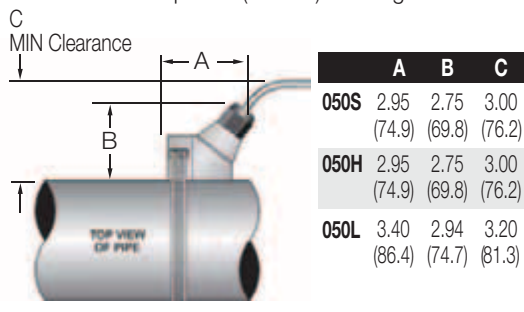
UTM10 Electronics



UTT10 Transducer Dimensions: Inches (mm)

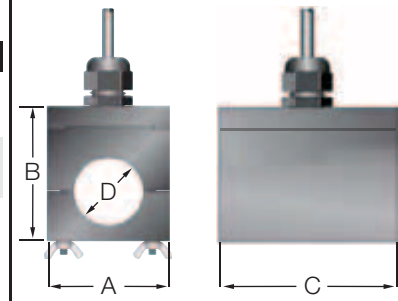
Pipe Size	Pipe Material	A	B	C	D	Measuring Range
1/2"	ANSI	2.46 (62.5)	2.36 (59.9)	2.66 (67.6)	0.84 (21.3)	2 - 38 GPM 8 - 144 LPM
	Copper	2.46 (62.5)	2.36 (59.9)	3.33 (84.6)	0.63 (15.9)	1.8 - 27 GPM 7 - 102 LPM
	Tubing	2.46 (62.5)	2.28 (57.9)	3.72 (94.5)	0.50 (12.7)	1.5 - 18 GPM 6 - 68 LPM
3/4"	ANSI	2.46 (62.5)	2.57 (65.3)	2.66 (67.6)	1.05 (26.7)	2.75 - 66 GPM 10 - 250 LPM
	Copper	2.46 (62.5)	2.50 (63.5)	3.56 (90.4)	0.88 (22.2)	2.5 - 54 GPM 10 - 204 LPM
	Tubing	2.46 (62.5)	2.50 (63.5)	3.56 (90.4)	0.75 (19.0)	2.5 - 45 GPM 10 - 170 LPM
1"	ANSI	2.46 (62.5)	2.92 (74.2)	2.86 (72.6)	1.32 (33.4)	3.5 - 108 GPM 13 - 409 LPM
	Copper	2.46 (62.5)	2.87 (72.9)	3.80 (96.5)	1.13 (28.6)	3.5 - 95 GPM 13 - 360 LPM
	Tubing	2.46 (62.5)	2.75 (69.9)	3.80 (96.5)	1.00 (25.4)	3.5 - 85 GPM 13 - 320 LPM
1-1/4"	ANSI	2.80 (71.0)	3.18 (80.8)	3.14 (79.8)	1.66 (42.2)	5 - 186 GPM 19 - 704 LPM
	Copper	2.46 (62.5)	3.00 (76.2)	4.04 (102.6)	1.38 (34.9)	4.5 - 152 GPM 17 - 575 LPM
	Tubing	2.46 (62.5)	3.00 (76.2)	4.04 (102.6)	1.25 (31.8)	4 - 136 GPM 15 - 514 GPM
1-1/2"	ANSI	3.02 (76.7)	3.42 (86.9)	3.33 (84.6)	1.90 (48.3)	6 - 250 GPM 23 - 946 LPM
	Copper	2.71 (68.8)	2.86 (72.6)	4.28 (108.7)	1.63 (41.3)	5 - 215 GPM 19 - 814 LPM
	Tubing	2.71 (68.8)	3.31 (84.1)	4.28 (108.7)	1.50 (38.1)	5 - 200 GPM 19 - 757 LPM

UTT10-050S/050L/050H Pipes 2" (50 mm) and larger



UTT10-015S to UTT10-040S

Pipes 1/2" to 1.5" (12 mm to 40 mm)



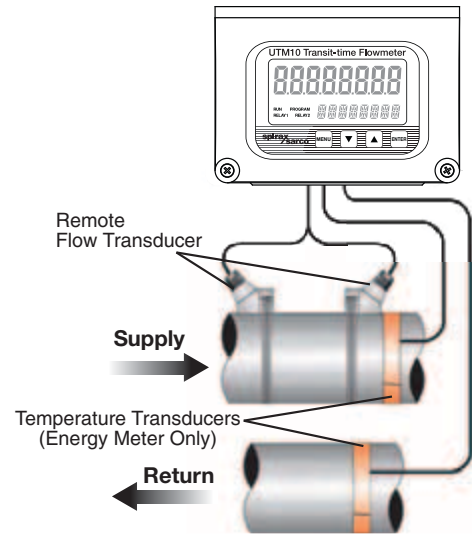
Clamp-On Ultrasonic Flow and Energy Meter for Liquids

Meter with Remote Flow Transducer

UTM10 is available with remote mounted transducers that permit separation of up to 990 feet (300 m) using coaxial or twinaxial cable. This design is utilized when pipes are located in areas that are not convenient for viewing, or on piping systems with severe vibration. PVC constructed transducers are rated to 185 °F (85 °C), CPVC are rated to 250 °F (121 °C) and PTFE are rated to 350 °F (176 °C).

Common Features:

- Rate-Total backlit display
- 4-20mA Output
- 0-1,000 Hz Rate Pulse and Dual Alarm Outputs (Flow Meter Model Only)
- USB Programming Port
- RS485 Modbus Network Connection
- Remote Totalizer Reset



How To Order

Ultrasonic Transit-time Meter

Category	Description	Suffix codes			
Model ¹	Velocity Meter	UTM10-S ²			
	Energy Meter	UTM10-E ³			
Electrical Power	DC, 10-28 VDC @ 5 watts maximum		D		
	AC, 95-264 VAC, 47 to 63 Hz @ 17 VA maximum		A		
Digital Communications	STD (4-20mA, Pulse, Modbus RTU)			00	
	10-100 Base T, (Modbus TCP/IP, BACnet/IP, TCP/IP)			10	
Energy Temperature Range	None, if selected Electronics Model S				0
	32 to 122 °F (0 to 50°C)				1
	32 to 212 °F (0 to 100°C)				2
	-40 to 350 °F (-40 to 176°C)				3
Example	UTM10-EA001				

Notes:

¹All electronics have a 4 button keypad, remote mounted transducers, Class 1 Division 2 and CE Approvals, 4-20mA output, Modbus RTU output, USB connection, and cable gland connections

²Velocity meter has two 0-1000 Hz open control outputs

³Energy meter has connection for Dual 3 wire 1000 Ohm RTDs

Clamp-On Ultrasonic Flow and Energy Meter for Liquids

How To Order Ultrasonic Transit-time Transducer

Category	Description	Suffix codes					
Model	Transducers, all rated to 121°C (250°F) (CPVC, Ultem®)	UTT10-					
Line Size (nominal)	15mm (1/2") 2.0 MHz transducers, maximum temperature 121°C (250°F)		015S				
	20mm (3/4") 2.0 MHz transducers, maximum temperature 121°C (250°F)		020S				
	25mm (1") 2.0 MHz transducers, maximum temperature 121°C (250°F)		025S				
	32mm (1 1/4") 2.0 MHz transducers, maximum temperature 121°C (250°F)		032S				
	40mm (1 1/2") 2.0 MHz transducers, maximum temperature 121°C (250°F)		040S				
	Standard, 2" and larger, 1.0 MHz transducers, maximum temperature 121°C (250°F)		050S				
	Large pipe, 24" and larger, 0.5 MHz transducers, maximum temperature 121°C (250°F)		050L				
	High Temperature, 2" and larger, 1.0 MHz transducers, maximum temperature 177°C (350°F)		050H				
Pipe Material	050S, 050L, 050H transducers			X			
	ANSI Pipe			M			
	Copper Tube			C			
	Standard Tubing			P			
Cable Length	20 ft (6M)				020		
	50 ft (15m)				050		
	100 ft (30M)				100		
	Custom in 10 ft (3m) increments greater than 100 feet (30m)				C00		
Conduit & Submersible Option	None					N	
	Armored Flex					A	
	Submersible NEMA 6P (050S without conduit)					S	
	Submersible NEMA 6P (050L without conduit)					T	
	Submersible NEMA 6P (050S and 050L with conduit)					U	
Conduit Length	None						000
	20 ft (6M)						020
	50 ft (15m)						050
	100 ft (30M)						100
	Custom in 10 ft (3m) increments greater than 100 feet (30m)						C00
Approvals	Standard, Class 1, Division 2, CE						S
	Class 1 Division 1 Groups C & D, 050S transducers only						F
Example	UTT10-050SX020N000F						

Note: Armored Flex conduit can be ordered with conduit option A and U only.

Accessories	P/N	Description
RTD Kit	URTD-C-20	Clamp on RTD 20 ft cables
	URTD-C-50	Clamp on RTD 50 ft cables
	URTD-C-100	Clamp on RTD 100 ft cables

Note: RTD Kit includes 2 RTD, heat sink compound, and installation tape. RTDs are 1000 ohm, 400 F.

Mounting Tracks	UTMT-10	10" Scaled Transducer Mounting Track Assembly
	UTMT-16	16" Scaled Transducer Mounting Track Assembly

Note: For UTT-10-050S transducers only

ULTEM is a registered trademark of General Electric Company.
 CSA is a registered trademark of the Canadian Standards Association.
 BACNET is a registered trademark of American Society of Heating,
 Refrigerating and Air-Conditioning Engineers (ASHRAE)

WINDOWS, EXCEL and VISTA are registered trademarks of Microsoft Corp.
 VESPEL is a registered trademark of E.I. du Pont de Nemours and Company.