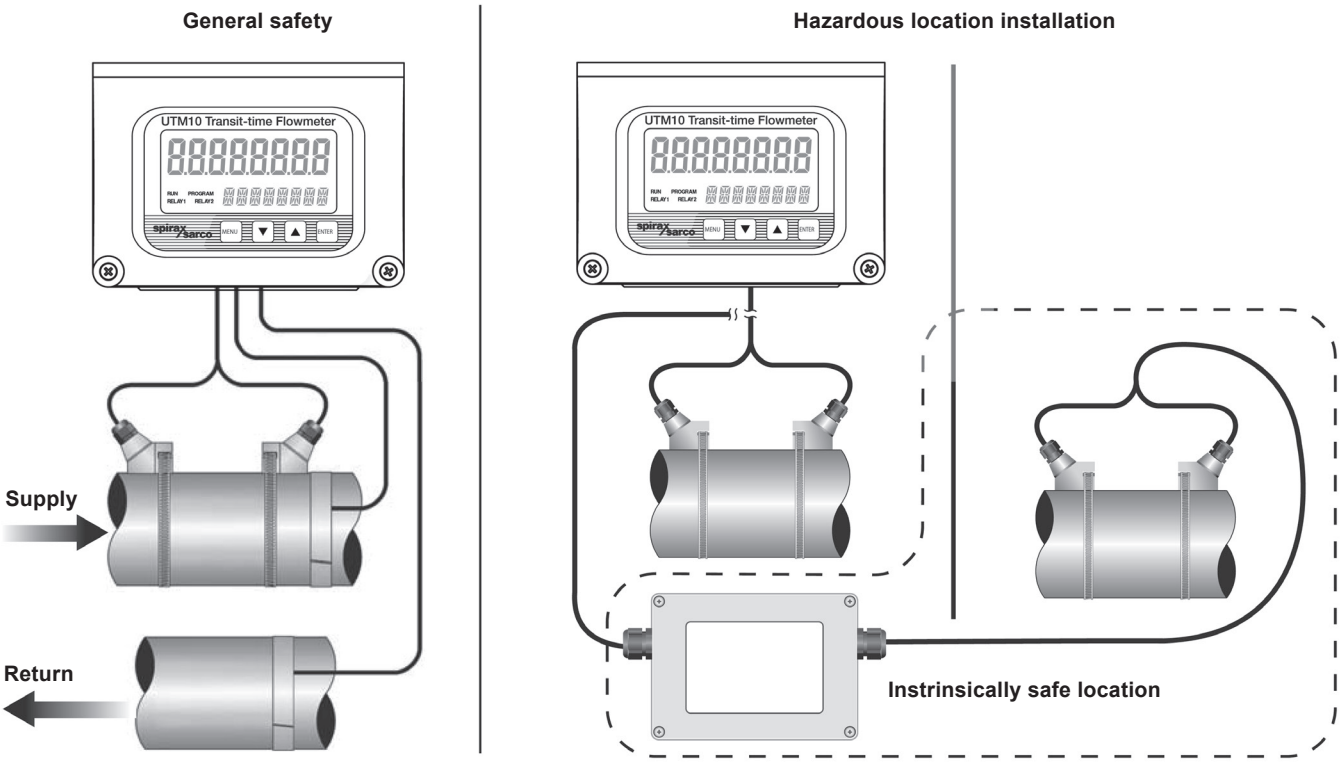
# UTM10 Series
# Ultrasonic Transit-time Flowmeters

## Description

UTM10 ultrasonic flow and energy meters clamp onto the outside of pipes and do not make contact with 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 flowrates. 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 flowmeter, and an energy flowmeter used in conjunction with dual clamp-on, or dual insertion RTDs. The energy flowmeter measures energy usage in kJ, Wh, BTU and Tons 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, BACNet® MS/TP over RS485 communications.; Ethernet connection includes BACNet®/IP, EtherNet/IP™ and Modbus TCP/IP protocols.
- Large, easy-to-read digital display.
- Rugged, aluminium enclosure ensures a long service life in harsh environments.
- Certified for hazardous area installation in Europe and North America.

## Benefits:

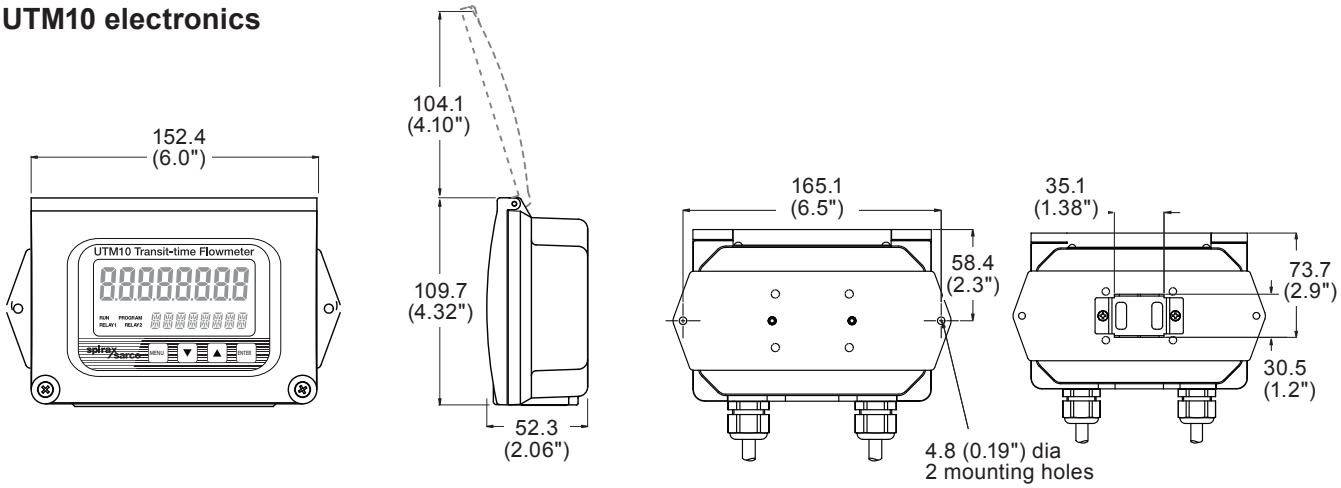
- **Reduced material costs:** The clamp-on sensor eliminates the need for in-line flanges, pipe fittings, strainers, and filters.
- **Reduced installation time:** The UTM10 can be installed and fully operational within minutes.
- **Reduced maintenance costs:** The UTM10 has a non-mechanical operation it will not be subject to wear and tear – Consequently there are no repair kits or replacement parts available or required.
- The UTM10 is a clamp on design unit - Consequently there is **No need to shut down the process for installation or maintenance**.

## Specifications

| | | |
|---|---|---|
| **System** | | |
| **Liquid types** | Most clean liquids or liquids containing small amounts of suspended solids or gas bubbles | |
| **Velocity range** | Bi-directional to 12 m/s (40 ft/s) | |
| **Flow accuracy** | **UTT10-050S, UTT10-050L** and **UTT10-050H:** ±1% of rate at flows >0.3 m/s (1 ft/s); ±0.003 m/s (0.01 ft/s) at flows <1 ft/s (0.3 m/s) | |
| | **UTT10-025S** and **UTT10-040S:** 25 mm (1") and larger ±1% of rate from 1.2 to 12 m/s (4 to 40 ft/s); ±0.012 m/s (0.04 ft/s) at rates <1.2 m/s (4 ft/s) | |
| | **UTT10-015S** and **UTT10-020S:** ±1% Full-scale (reference the 'Measuring range' under 'Dimensions' on page 3) | |
| **Temperature accuracy (Energy meters only)** | **Option 1:** 0-50°C (32-122°F); Absolute: 0.12°C (0.22°F) Difference: 0.05°C (0.09°F) | |
| | **Option 2:** 0-100°C (32-212°F); Absolute: 0.25°C (0.45°F) Difference: 0.10°C (0.18°F) | |
| | **Option 3:** -40-177°C (-40-350°F); Absolute: 0.60°C (1.10°F) Difference: 0.25°C (0.45°F) | |
| **Sensitivity** | **Flow:** 0.0003 m/s (0.001 ft/s) | |
| | **Temperature: Option 1:** 0.012°C (0.03°F); **Option 2:** 0.025°C (0.05°F); **Option 3:** 0.06°C (0.1°F) | |
| **Repeatability** | 0.5% of reading | |
| **Installation compliance** | **General safety:** | **All models** EN 61010, UL 61010-1 and CSA C22.2 No. 61010-1 |
| | | **Power supply options A and D only** EN 61010-1 |
| | **Hazardous location** (power supply options A and D only)**:** Class 1 Div. 2 Groups C,D,T4; Class II, Division 2, Groups F,G,T4; Class III Division 2 for US/CAN; ATEX II 2 g EX nAT4: UL 1604, CSA 22.2 No. 213, EN 60079-0 and EN 60079-15. Compliant with directives 2004/108/EC, 2006/95/EC, and 94/9/EC on flowmeter systems with transducers constructed with twinaxial cable (all transducers with cables 30 m (100 ft) and shorter) or remote transducers with conduit. | |
| **Transmitter** | | |
| **Power requirements** | **ac:** 95-264 Vac 47-63 Hz @ 17 VA maximum **dc:** 10-28 Vdc @ 5 VA maximum **or** 20-28 Vac 47-63 Hz @ 0.35 A maximum | |
| | **Protection:** auto resettable fuse, reverse polarity and transient suppression | |
| **Display** | **Two line LCD, LED backlit: Top row** 18 mm (0.7") height, 7-segment; **Bottom row** 9 mm (0.35") height, 14-segment | |
| | **Icons:** RUN, PROGRAM, RELAY1, RELAY2 | |
| | **Flowrate indication:** 8-digit positive, 7-digit negative maximum; auto decimal, lead zero blanking | |
| | **Flow accumulator (totalizer):** 8-digit positive, 7-digit negative maximum (reset via keypad press, USP, network command or momentary contact closure) | |
| **Enclosure** | **IP65 (Type 4) construction:** powder-coated aluminium, polycarbonate, stainless steel, polyurethane, nickel-plated steel mounting brackets | |
| | **Size (electronic enclosure only):** W x H x D in mm (inches) 152 x 112 x 56 mm (6.0" x 4.4" x 2.2") | |
| | **Conduit holes:** (**2 x holes**) 12.7 mm (½") NPT female; (**1 x hole**) 19 mm (¾") NPT female | |
| **Temperature** | -40°C to +85°C (-40°F to +185°F) | |
| **Configuration** | 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** | **Flowmeter:** Metres, cubic metres, litres, million litres, kg, Feet, gallons, cubic feet, million gallons, barrels (liquor and oil), acre-feet, lbs. | |
| | **Energy meter:** kJ, kWh, MWh, BTU, MBTU, MMBTU, Tons and the flowmeter list from above | |
| **Inputs/outputs** | **USB 2.0:** for connection of a PC running USP configuration utility | |
| | **RS485:** Modbus RTU command set. **Optional** BACnet MS/TP (Baud rate field selectable 9600 to 76800) | |
| | **10/100 Base-T:** RJ45, communication via Modbus TCP/IP, EtherNet/IP™ and BACnet®/IP | |
| | **4-20 mA:** 12-bit, internal power, can span negative to positive flow/energy rates | |
| | **Flowmeter model only:** 0-1,000 Hz: open-collector, 12-bit, can span negative to positive rates; square-wave or turbine meter simulation outputs. **Energy flowmeter model only:** Total pulse option: Opto isolated open collector transistor. | |
| | **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** and **050L:** IP67 (NEMA 6), CPVC, Ultem®, Nylon cord grip, PVC cable jacket; -40 to 121°C (-40 to 250°F) | |
| | **UTT10-015S** to **UTT10-040S:** IP67 (NEMA 6), CPVC, Ultem®, Nylon cord grip, PVC cable jacket; -40 to 121°C (-40 to 50°F) | |
| | **UTT10-050S** and **050L:** IP68 (NEMA 6P), CPVC, Ultem®, Nylon cord grip, Polyethylene cable jacket; -40 to 121°C (-40 to 250°F) | |
| | **NEMA 6:** Submersible to a depth of 1 m (3 ft) for 30 days max. **NEMA 6P:** Submersible to a depth of 30 m (100 ft) indefinitely | |
| | **UTT10-050H:** IP67 (NEMA 6), PTFE, Vespel, Nickel-plated brass cord grip, PFA cable jacket; -40 to 176°C (-40 to 250°F) | |
| **Frequency** | **UTT10-015S** to **UTT10-040S:** 2 MHz | |
| | **UTT10-050S** and **UTT10-050H:** 1 MHz | |
| | **UTT10-050L:** 500 KHz | |
| **Cables** | RG59 Coaxial, 75 ohm or Twinaxial, 78 ohm (optional Flex armored conduit) | |
| **Cable length** | 300 m (990 ft) maximum in 3 m (10 ft) increments | |
| **RTDs** | **Energy meters only:** RTD platinum 385, 1000 ohm, 3-wire; PVC jacket cable | |
| **Installation** | **UTT10-050S**, **UTT10-050L** and **UTT10-050H:** General and Hazardous Location (see 'Installation compliance' above) | |
| | **UTT10-050S** and **IS Barrier (F option):** "Class I Div 1, Groups C&D T5 Instrinically 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 32-bit O.S. only | |

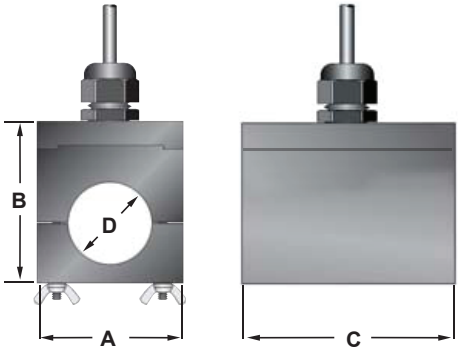
## Dimensions approximate in mm (inches)

### UTM10 electronics

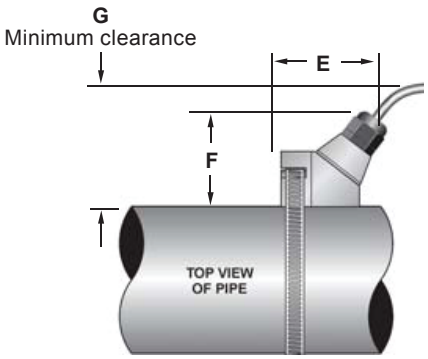



### UTT10 transducer

**UTT10-015S** to **UTT10-040S**
Pipes 12 mm to 40 mm (½" to 1½")




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




| Model | E | F | G |
|---|---|---|---|
| UTT10-050S | 74.9 (2.95") | 69.8 (2.75") | 76.2 (3.00") |
| UTT10-050H | 74.9 (2.95") | 69.8 (2.75") | 76.2 (3.00") |
| UTT10-050L | 86.4 (3.40") | 74.7 (2.94") | 81.3 (3.20") |

| Pipe size | Pipe material | A | B | C | D | Measuring range |
|---|---|---|---|---|---|---|
| DN15 (½") | ASME | 62.5 (2.46") | 59.9 (2.36") | 67.6 (2.66") | 21.3 (0.84") | 8 - 144 litres/min (2 - 38 US gallons/min) |
| | Copper | 62.5 (2.46") | 59.9 (2.36") | 84.6 (3.33") | 15.9 (0.63") | 7 - 102 litres/min (1.8 - 27 US gallons/min) |
| | Tubing | 62.5 (2.46") | 57.9 (2.28") | 94.5 (3.72") | 12.7 (0.50") | 6 - 68 litres/min (1.5 - 18 US gallons/min) |
| DN20 (¾") | ASME | 62.5 (2.46") | 65.3 (2.57") | 67.6 (2.66") | 26.7 (1.05") | 10 - 250 litres/min (2.75 - 66 US gallons/min) |
| | Copper | 62.5 (2.46") | 63.5 (2.50") | 90.4 (3.56") | 22.2 (0.88") | 10 - 204 litres/min (2.5 - 54 US gallons/min) |
| | Tubing | 62.5 (2.46") | 63.5 (2.50") | 90.4 (3.56") | 19.0 (0.75") | 10 - 170 litres/min (2.5 - 45 US gallons/min) |
| DN25 (1") | ASME | 62.5 (2.46") | 74.2 (2.92") | 72.6 (2.86") | 33.4 (1.32") | 13 - 409 litres/min (3.5 - 108 US gallons/min) |
| | Copper | 62.5 (2.46") | 72.9 (2.87") | 96.5 (3.80") | 28.6 (1.13") | 13 - 360 litres/min (3.5 - 95 US gallons/min) |
| | Tubing | 62.5 (2.46") | 2.75 (69.9") | 96.5 (3.80") | 25.4 (1.00") | 13 - 320 litres/min (3.5 - 85 US gallons/min) |
| DN32 (1¼") | ASME | 71.0 (2.80") | 80.8 (3.18") | 79.8 (3.14") | 42.2 (1.66") | 19 - 704 litres/min (5 - 186 US gallons/min) |
| | Copper | 62.5 (2.46") | 76.2 (3.00") | 102.6 (4.04") | 34.9 (1.38") | 17 - 575 litres/min (4.5 - 152 US gallons/min) |
| | Tubing | 62.5 (2.46") | 76.2 (3.00") | 102.6 (4.04") | 31.8 (1.25") | 15 - 514 litres/min (4 - 136 US gallons/min) |
| DN40 (1½") | ASME | 76.7 (3.02") | 86.9 (3.42") | 84.6 (3.33") | 48.3 (1.90") | 23 - 946 litres/min (6 - 250 US gallons/min) |
| | Copper | 68.8 (2.71") | 72.6 (2.86") | 108.7 (4.28") | 41.3 (1.63") | 19 - 814 litres/min (5 - 215 US gallons/min) |
| | Tubing | 68.8 (2.71") | 84.1 (3.31") | 108.7 (4.28") | 38.1 (1.50") | 19 - 757 litres/min (5 - 200 US gallons/min) |

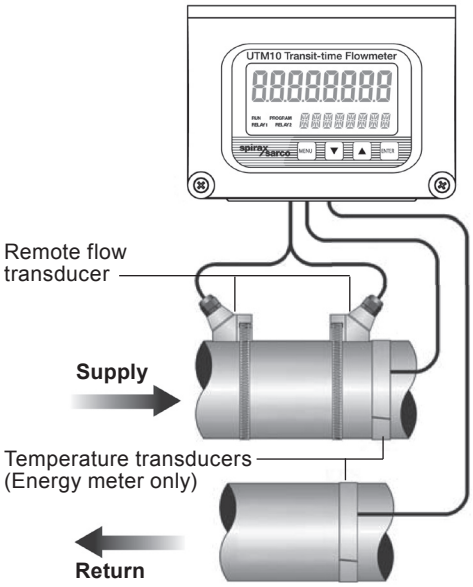
## Meter with remote flow transducer

The UTM10 is available with remote mounted transducers that permit separation of up to 300 m (990 ft) 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. CPVC are rated to 121°C (250°F) and PTFE are rated to 176°C (350°F).

### Common features:

- Rate-Total backlit display
- 4 - 20 mA output
- 0 - 1000 Hz rate pulse and dual alarm outputs (Flowmeter model only)
- USB programming port
- RS485 Modbus network connection
- Remote totalizer reset

**UTM10 energy meter with remote mounted transducers and strap-on RTD's**




## How to order the UTM ultrasonic transit-time flowmeter

| Category | Description | | Suffix codes |
|---|---|---|---|
| **Model** - see Note 1 | Velocity meter | | UTM10-S |
| | Energy meter - see Notes 2 and 3 | | UTM10-E- |
| **Electrical power** | **dc** | **10 - 28 Vdc @ 5 watts maximum** | **D** |
| | **ac** | 95 - 264 Vac, 47 to 63 Hz @ 17 VA maximum | A |
| | | 20 - 28 Vac, 47 to 63 Hz @ 17 VA maximum | C |
| **Digital communications** | **STD - Modbus RTU** - see Note 1 | | **N** |
| | BACnet MS/TP | | B |
| | 10/100 Base-T (Ethernet/IP, BACnet/IP, Modbus TCP/IP), **BACnet MS/TP** | | C |
| | 10/100 Base-T (Ethernet/IP, BACnet/IP, Modbus TCP/IP), **Modbus RTU** | | E |
| | Totalizing pulse (Isolated open collector) - see Note 3 | | P |
| **Energy temperature range** | None, if selected Electronics Model UTM10-S only | | 0 |
| | Model UTM10-E only | 0 to 50°C (32 to 122°F) | 1 |
| | | 0 to 100°C (32 to 212°F) | 2 |
| | | -40 to 176°C (-40 to 350°F) | 3 |
| **Approvals** | General Safety | See the 'Specifications' on page 2 under 'Installation compliance' | N |
| | General Safety, Hazardous Location and CE | | F |
| **Example** | | | **UTM10-E-A-N-3-N** |

**Notes:**

1. All electronics have a 4 button keypad, remote mounted transducers, General Safety Approvals, 4 - 20 mA output, Modbus RTU output, USB connection, 1000 Hz output UTM10-S only.
2. Energy, 4 - 20 mA output, Dual 1000 Ohm RTD connection, Modbus RTU output, USB connection. **RTD's ordered separately**.
3. Totalizing pulse is for the Energy Option only. The pulse is an optically-isolated open-collector, 30 Vdc max., 100 mA max., at 15 Hz max. rate with 50% duty cycle.

## How to order the UTT ultrasonic transit-time transducers

| Category | Description | Suffix codes |
|---|---|---|
| **Model** | Transducers, all rated to 121°C (250°F) (CPVC, Ultem®) | UTT10- |
| **Line size (nominal)** | 15 mm (½") | 015S |
| | 20 mm (¾") | 020S |
| | 25 mm (1") — 2.0 MHz transducers, maximum temperature 121°C (250°F) | 025S |
| | 32 mm (1¼") | 032S |
| | 40 mm (1½") | 040S |
| | Standard, 50 mm (2") and larger, 1.0 MHz transducers, max. temperature 121°C (250°F) | 050S |
| | Large pipe, 610 mm (24") and larger, 0.5 MHz transducers, max. temperature 121°C (250°F) | 050L |
| | High temperature, 50 mm (2") and larger, 1.0 MHz transducers, max. temperature 177°C (350°F) | 050H |
| **Pipe material** | 050S, 050L, 050H transducers only | X |
| | ASME pipe (015S to 040S only) | M |
| | Copper pipe (015S to 040S only) | C |
| | Standard tubing (015S to 040S only) | P |
| **Cable length** - see Note 2 | 6 m (20 ft) | 020 |
| | 15 m (50 ft) | 050 |
| | 30 m (100 ft) | 100 |
| | >30 m (100 ft) in 3 m (10 ft) increments **Suffix code** = Total length of cable in ft e.g.: 190 ft **= 190** | Cutomer to specify |
| **Conduit and submersible option** | None | N |
| | Armored flex conduit - see Note 1 | A |
| | Submersible NEMA 6P (050S without conduit) | S |
| | Submersible NEMA 6P (050L without conduit) | T |
| | Submersible NEMA 6P (050S and 050L with armored flex conduit) - see Note 1 | V |
| **Conduit length** | None | 000 |
| | 6 m (20 ft) | 020 |
| | 15 m (50 ft) | 050 |
| | 30 m (100 ft) | 100 |
| | >30 m (100 ft) in 3 m (10 ft) increments **Suffix code** = Total length of cable in ft e.g.: 190 ft **= 190** | Cutomer to specify |
| **Approvals** | Standard, General Safety, Hazardous Locations - See 'Installation Compliance', Page 2 | S |
| | Class 1 Division 1 Groups C and D, 050S transducers only (Includes IS Barriers) | F |
| **Example** | | **UTT10-050S-X-020-N-000-S** |

**Notes:**
**1.** Armored flex conduit can be ordered with conduit option A and V only.
**2.** Twinaxial cable, 78 Ω up to 30 m (100 ft), greater than 30 m (100 ft) RG59 Coaxial Cable, 75 Ω.

| Accessories | P/N | | Description | |
|---|---|---|---|---|
| **Strap-on RTD kit** | URTD-C-20 | **Please note:** When ordering the UTM10-E you must also order the RTD kit. | Clamp on RTD | 6 m (20 ft) cable |
| | URTD-C-50 | | | 15 m (50 ft) cable |
| | URTD-C-100 | | | 30 m (100 ft) cable |

**Note:** That the strap-on RTD kit includes 2 RTDs, heat sink compound, and installation tape. RTDs are 1000 Ω Pt., Insert 205°C (400°F).

| | | | |
|---|---|---|---|
| **Insertion RTD kit** | INS-RTD-C-20 | Insertion RTD | 6 m (20 ft) cable |
| | INS-RTD-C-50 | | 15 m (50 ft) cable |
| | INS-RTD-C-100 | | 30 m (100 ft) cable |

**Note:** That the insertion RTD kit includes 2 RTDs, 76 mm (3") insertion depth. 6.35 mm (¼") O.D.. RTDs are 1000 Ω Pt, 260°C (500°F).

| | | | |
|---|---|---|---|
| **Mounting tracks** | UTMT-10 | 254 mm (10") | Scaled transducer mounting track assembly |
| | UTMT-16 | 406 mm (16") | |

**Note:** For UTT10-050S transducers only

## How to order example:

1 off Spirax Sarco UTM10-E-A-N-3-N ultrasonic transit-time flowmeter plus
1 off URTD-C-20 clamp-on RTD with 6 m cables.
and
1 off Spirax Sarco UTT10-050SX020N000S ultrasonic transit-time transducer.