



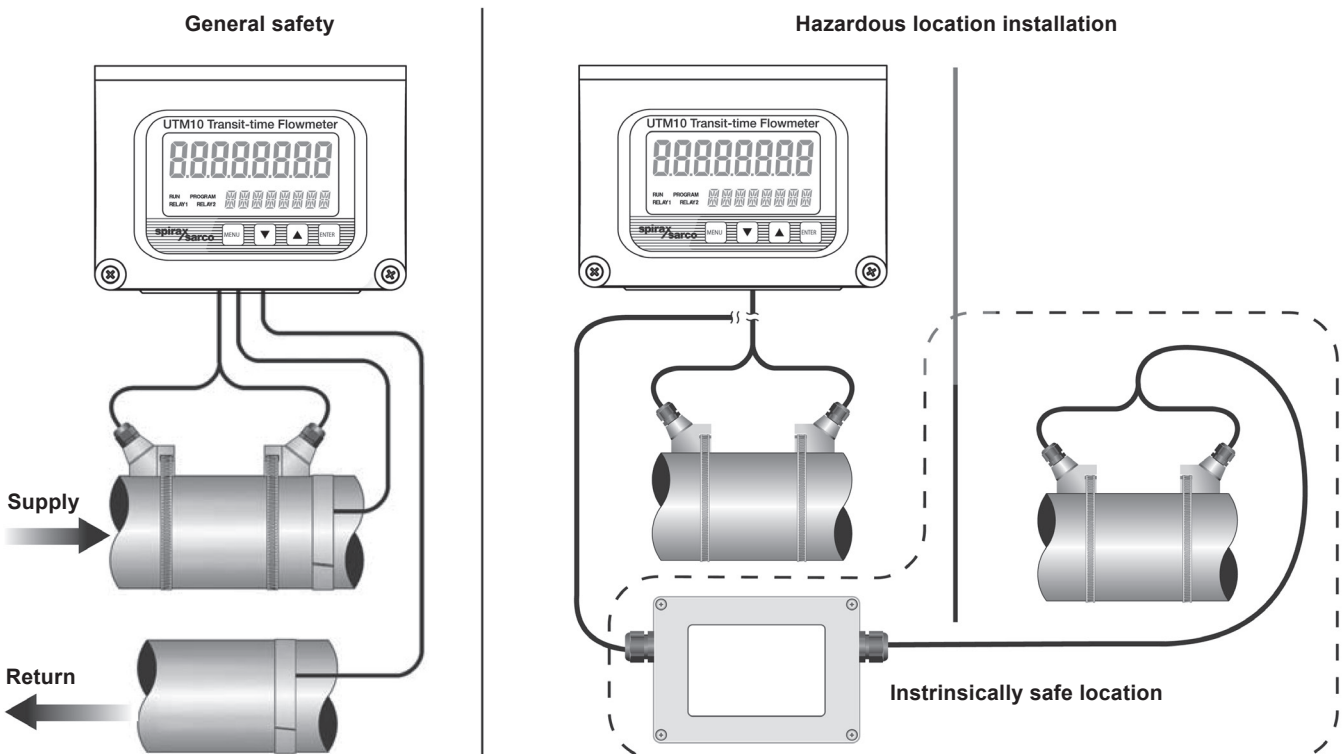
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MI Issue 4

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:

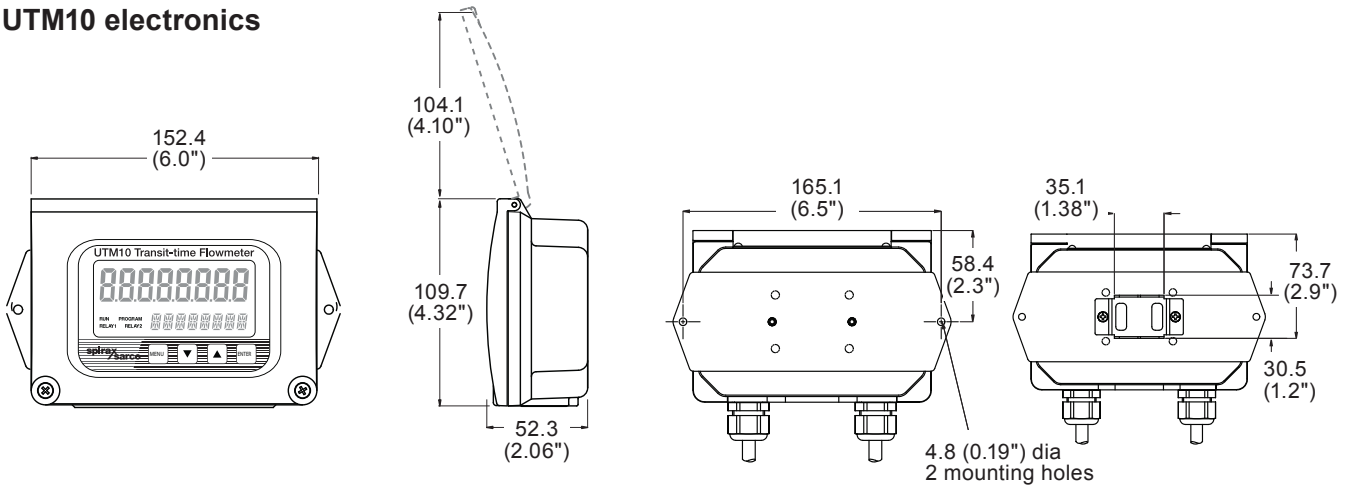
- **Reduced material costs:** The clamp-on sensor eliminates the need for in-line flanges, pipe fittings, strainers, and filters.
- **Reduced installation time:** The UTM10 can be installed and fully operational within minutes.
- **Reduced maintenance costs:** The UTM10 has a non-mechanical operation 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 backlight: 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 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 32-bit O.S. only

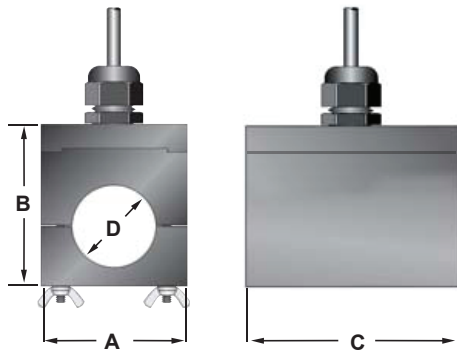
Dimensions approximate in mm (inches)

UTM10 electronics



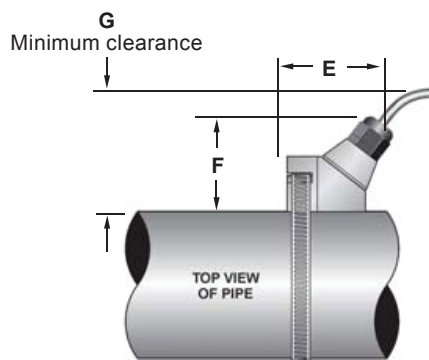
UTT10 transducer

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



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")	72.9 (2.87")	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)

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")

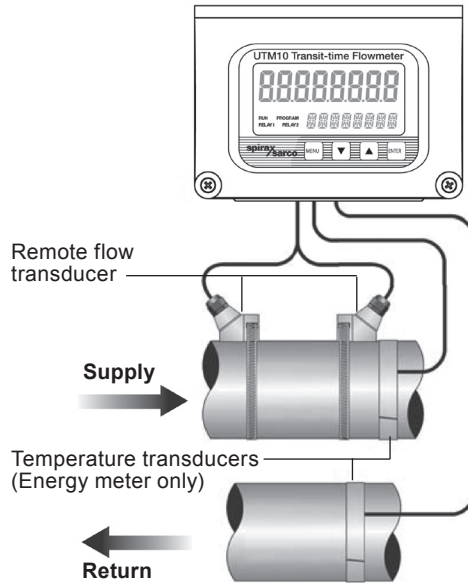
Meter with remote flow transducer

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 0 to 50°C (32 to 122°F)	1
	UTM10-E 0 to 100°C (32 to 212°F)	2
	only -40 to 176°C (-40 to 350°F)	3
Approvals	General Safety	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")	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	Customer 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	Customer 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.	
	URTD-C-50		
	URTD-C-100		
		6 m (20 ft) cable	
		Clamp on RTD	15 m (50 ft) cable
			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.

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