USonic Metering

Clamp on Ultrasonic Flow BTU meter

Energy costs have placed unprecedented emphasis on controlling and monitoring thermal energy. The TP4000 product combines all the multi-feature sets of our typical flowmeters but takes the next step in offering temperature measurement capabilities. Applying these measurands to the universal energy formula, outputs durable and extremely accurate energy BTU measurements.

With its multiple and powerful features, the TP4000 is perfect for the constantly challenging industrial applications. With application flexibility in mind, the unit accurately captures flow measurements using the combined three approaches: clamp-on, durably built weatherproof enclosure and rich communication features ensure the unit will perform at a high level in any environment.

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OPERATING PRINCIPLE

Based on the transit-time principle, the TP4000 utilizes a pair of ultrasonic transducers that function as both transmitter and receiver. The transducers are installed on the pipe wall, either clamped on the outside of the pipe or inserted into the pipe. The flowmeter operates by alternately transmitting and receiving a coded burst of sound energy between the two transducers. The liquid velocity is determined by the difference in the measured transit-times between beams sent into (downstream) and against (upstream) the direction of liquid flow.

Using a pair of temperature sensors, again installed on the outside of the pipe or inserted into the pipe, allows the TP4000 to capture precise temperature measurements of the liquid flow and as a result calculate the energy between the supply and return pipes.

V method
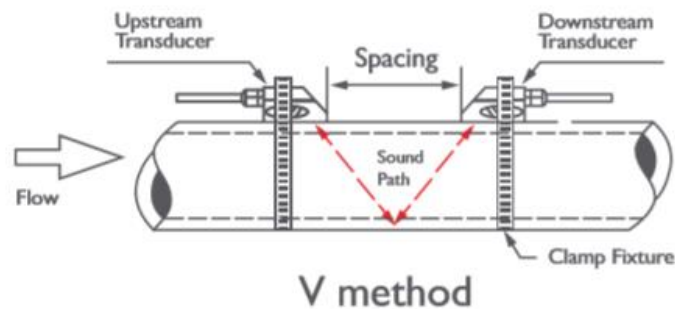
FEATURES AND BENEFITS

- **Conduct clamp on liquid flow, temperature and thermal energy measurements.**
- **Very affordable non-intrusive technology that eliminates cutting the pipe and all the costly in line installations.**
- **Minimize operational costs by capturing precise readings using the state-of-the art transit-time technology.**
- **Cover a wide pipe size range from 3/4" to 120" (DN20 to DN3000).**
- **Multiple input/output features such as 4-20mA, pulse, Modbus and much more.**

- **Flow BTU meter calibrated using a high accuracy NIST standard.**
- **Built for indoor and outdoor with a weatherproof enclosure and robust water-proof transducers.**
- **Extended liquid temperature range: -35°C to +200°C**
- **Multiple input/output features such as 4-20mA, pulse, Modbus and much more.**
- **The excellent feature of detecting reverse flow and energy.**

APPLICATIONS

- **District Heating & Cooling**
- **HVAC/Facility Management**
- **Energy optimization and metering verification**
- **Evaluation and assessment for existing system**
- **Can be used for various industries including but not limited to:**
  Refrigeration and air conditioning; Water/Wastewater; Petrochemical; Power plants …etc.

TRANSMITTER SPECIFICATION:

Measurement principle	Ultrasonic transit-time technology
Flow velocity range	0.01 to 12 m/s, bi-directional
Resolution	0.25 mm/s
Repeatability	0.2 % of reading
Accuracy	±1.0 % of reading at rates >0.3 m/s); ±0.003 m/s of reading at rates < 0.3 m/s
Response time	0.5 s
Sensitivity	0.003 m/s
Averaging of measurement	0-99 s (Damping selectable by the user)
Liquid Types Supported	Both clean and dirty liquids with particle size <50μm
Power Supply	AC: 85-265V DC: 24V/500mA
Enclosure type	Wall-mounted
Degree of protection	IP66 according to EN60529
Operating temperature	-10°C to +60°C

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Housing material	Fiberglass
Display	4 line×16 English letters LCD graphic display, backlit
Units	User Configurable (English and Metric)
Display	Flow rate, energy rate, temperature supply and return
Totalizer	gallons, ft³, barrels, lbs, liters, m³ and more
Thermal energy total	GJ，KWh can be optional
Communication	4-20mA (accuracy 0.1%), OCT, Relay, RS232, RS485 (Modbus), data logger
Security	Password protection keypad lock & system lock
Size	244*196*114mm
Weight	2.4kg

## TRANSDUCERS SPECIFICATIONS:

Degree of protection	IP65 according to EN60529 (IP67 or IP68 Upon request).
Liquid Temperature	Std. Temp.: -35℃ ~ 85℃ for short periods up to 120℃ High Temp.: -35℃ ~ 200℃ for short periods up to 250℃
Pipe diameter range	20-50 mm for type S, 40-1000 mm for type M, 1000-6000 mm for type L
Transducer Size	Type S 48(h)*28(w)*28(d)mm Type M 60(h)*34(w)*32(d)mm Type L 80(h)*40(w)*42(d)mm
Material of transducer	Aluminum for standard temp. sensor, and peek for high temp. sensor
Cable Length	Std:10m
Temperature Sensor	Pt1000, 0 to 200°C, Clamp-on and Insertion type Accuracy: ±0.1 %

Dimensions

Display transmitter unit:
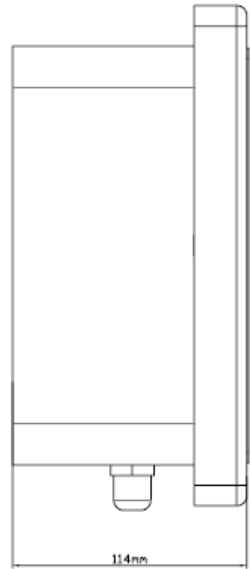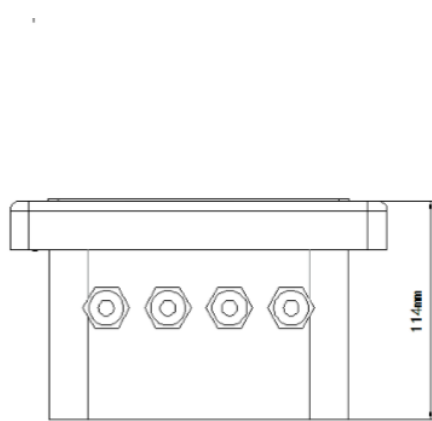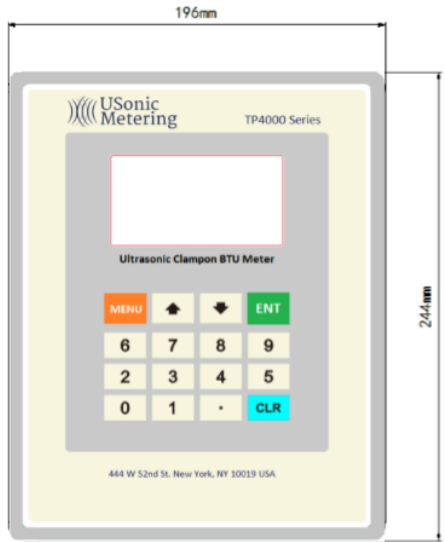
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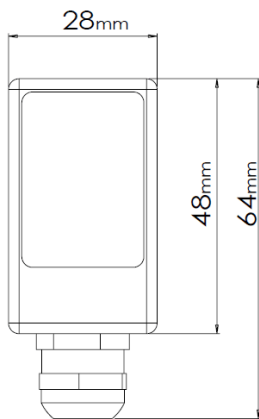
| **S type** | | **M & L type** |

S   48(h)*28(w)*28(d)mm
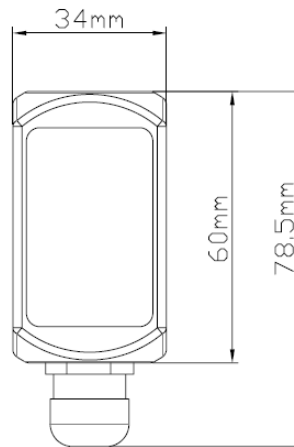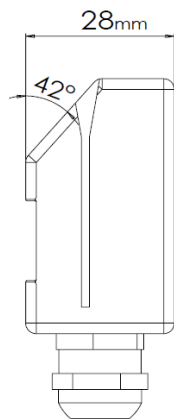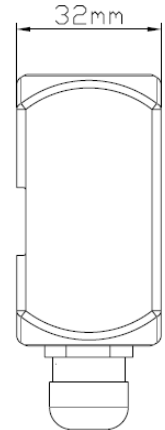
M   60(h)*34(w)*32(d)mm

L   80(h)*40(w)*42(d)mm

Accessories:

Mounting Frame (Upon request)   **Couplant**

SS Clamps   surface-mount PT1000   insertion PT1000

Model Number selection:

TP4000	Wall-mounted Transit Time Clamp-on Series Flowmeters								
	Power supply								
A	85-265VAC								
D	24VDC								
S	65W Solar supply (including solar board)								
	Output Selection 1								
N	N/A								
1	4-20mA (accuracy 0.1%)								
2	OCT								
3	Relay Output (Totalizer or Alarm)								
4	RS232 Output								
5	RS485 Output (ModBus-RTU Protocol)								
6	Data storage fuction								
7	GPRS (GPRS Software needs extra $1000)								
	Output Selection 2								
	Same as above								
	Output Selection 3								
	Transducer Type								
S	DN20-50								
M	DN40-1000								
L	DN1000-6000								
	Transducer Rail								
N	None								
RS	DN20-50								
RM	DN40-600 (For larger pipe size, pls contact us.)								
	Transducer Temperature								
S	-35 ~ 85°C (for short periods up to 120°C)								
H	-35 ~ 200°C (Only for S,M sensor.)								
	Temperature Input Sensor								
N	None								
T	Clamp-on PT1000(DN20-1000) (0 ~ 200°C)								
	Pipeline Diameter								
DNX	e.g.DN20—20mm, DN6000—6000mm								
	Cable length								
10m	10m (standard 10m)								
Xm	Common cable Max 300m(standard 10m)								
XmH	High temp. cable Max 300m								

TP4000 —A — 1 — 2 — 3 /LTC— M — N — S— N — DN100 — 10m   (example configuration)

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About USonic Metering

USonic Metering is a global leader in flow and energy management solutions. Through continuous innovation, we transform complex ultrasonic technology into affordable, reliable solutions for accurate flow and energy measurement. USonic Metering offers water, heat, electricity, and gas meters as well as AMR/AMI solutions. To find out how we can help today, please tell us about your application.

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