ULTRASONIC ENERGY METER
Flow & Temperature Monitoring Capability, Modbus® & BACnet Communication

**DIMENSIONS in [mm]**

<table>
<thead>
<tr>
<th>Model</th>
<th>L</th>
<th>D</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>TUF-150-XX</td>
<td>4-21/64</td>
<td>110.00</td>
<td>3/4˝ NPT</td>
</tr>
<tr>
<td>TUF-200-XX</td>
<td>5-1/8</td>
<td>130.00</td>
<td>G1B</td>
</tr>
<tr>
<td>TUF-250-XX</td>
<td>6-19/64</td>
<td>160.00</td>
<td>G11/4B</td>
</tr>
<tr>
<td>TUF-320-XX</td>
<td>7-3/32</td>
<td>180.00</td>
<td>G11/2B</td>
</tr>
<tr>
<td>TUF-400-XX</td>
<td>7-7/8</td>
<td>200.00</td>
<td>G2B</td>
</tr>
</tbody>
</table>

**SPECIFICATIONS**

- **Service:** Clean, compatible liquids.
- **Wetted Materials:** Brass and 316L SS.
- **Range:** See chart.
- **Display:** 8-digit LED.
- **Accuracy:** BTU: EN1434/CJ128 Class 2; Flow: ±(0.02 Qp / Qp)%; Temperature: ±0.1°C.
- **Power Requirements:** 24 VDC or 3.6 V ER26500 lithium metal battery, supplied and installed, battery acts as back-up if power is lost.
- **Power Consumption:** 1 W.
- **Temperature Limits:** Ambient: 41 to 131°F (5 to 55°C); Process: 38 to 203°F (2 to 95°C).
- **Humidity Limit:** ≤ 93%.

**Pressure Limits:** 232 psi (16 bar) for DN15 to DN40; 382 psi (26 bar) for DN50.
**Pressure Drop:** ≤ 1.5 psi (10 kPa).
**Process Connection:** See chart.
**Serial Communications:** Modbus® RTU or BACnet® MSTP (selectable)*.
**Enclosure Rating:** IP65.
**Enclosure Material:** Plastic.
**Repeatability:** Flowmeter: 1%, Electrical Connections: 3 ft (0.91 m) 4x0.2 mm² cable with terminal block.
**Flow Direction:** Unidirectional.
**Mounting Orientation:** Horizontal or vertical.
**Weight:** See chart.
**Agency Approvals:** CE.

**TUF-150/400**

The SERIES TUF Ultrasonic Energy Meter is a highly accurate and stable energy meter that utilizes ultrasonic technology to measure heating and cooling energy consumption. The SERIES TUF is a compact meter with a flowmeter and energy calculator in one, making it great for installation on chillers and boilers.

**FEATURES/BENEFITS**

- Lower maintenance costs with local parameter display and no moving parts
- Serial communication output allows for easy transfer of data
- Flow and temperature monitor in one unit eliminates the need for multiple units

**APPLICATIONS**

- Heat metering
- Utilities billing
- Tenant billing
- Monitoring of water heating or cooling: radiators, fan coils

**INSTRUCTIONS FOR ORDERING**

- Choose 1 ultrasonic energy meter model (includes 2 BSPP pipe fittings, 2 tightening nuts, 2 o-rings, and 1 thermowell with welding collar)
- Choose 1 pipe fitting model given the appropriate fitting size if NPT or BSPT connections are required (for DN15 to DN40 only)*

**Example:** TUF-150-MD, Fitting Size: A, select pipe fitting Model WM-ACC-C01 or WM-ACC-C11.

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**Model Chart**

<table>
<thead>
<tr>
<th>Ultrasonic Energy Meter Model</th>
<th>Pipe Size</th>
<th>Flow Transmitter, 1/4” NPT</th>
<th>GPM (LPM)</th>
<th>Pressure Limits: 232 psi (16 bar) for DN15 to DN40; 382 psi (26 bar) for DN50.</th>
</tr>
</thead>
<tbody>
<tr>
<td>TUF-150-MD</td>
<td>DN25</td>
<td>A</td>
<td>BACnet®</td>
<td>Pressure Drop: ≤ 1.5 psi (10 kPa).</td>
</tr>
<tr>
<td>TUF-250-MD</td>
<td>DN32</td>
<td>C</td>
<td>Modbus®</td>
<td>Serial Communications: Modbus® RTU or BACnet® MSTP (selectable)*.</td>
</tr>
<tr>
<td>TUF-300-MD</td>
<td>DN40</td>
<td>D</td>
<td>Modbus®</td>
<td>Enclosure Rating: IP65.</td>
</tr>
<tr>
<td>TUF-400-MD</td>
<td>DN50</td>
<td>E</td>
<td>Modbus®</td>
<td>Enclosure Material: Plastic.</td>
</tr>
<tr>
<td>TUF-500-MD</td>
<td>DN65</td>
<td>F</td>
<td>Modbus®</td>
<td>Repeatability: Flowmeter: 1%, Electrical Connections: 3 ft (0.91 m) 4x0.2 mm² cable with terminal block.</td>
</tr>
<tr>
<td>TUF-1000-MD</td>
<td>DN100</td>
<td>G</td>
<td>Modbus®</td>
<td>Flow Direction: Unidirectional.</td>
</tr>
<tr>
<td>TUF-1250-MD</td>
<td>DN125</td>
<td>H</td>
<td>Modbus®</td>
<td>Mounting Orientation: Horizontal or vertical.</td>
</tr>
<tr>
<td>TUF-1500-BN</td>
<td>DN15</td>
<td>I</td>
<td>BACnet®</td>
<td>Weight: See chart.</td>
</tr>
<tr>
<td>TUF-2000-BN</td>
<td>DN20</td>
<td>J</td>
<td>Modbus®</td>
<td>Agency Approvals: CE.</td>
</tr>
<tr>
<td>TUF-2500-BN</td>
<td>DN25</td>
<td>K</td>
<td>Modbus®</td>
<td></td>
</tr>
<tr>
<td>TUF-3000-BN</td>
<td>DN32</td>
<td>L</td>
<td>Modbus®</td>
<td></td>
</tr>
<tr>
<td>TUF-4000-BN</td>
<td>DN40</td>
<td>M</td>
<td>Modbus®</td>
<td></td>
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<tr>
<td>TUF-5000-BN</td>
<td>DN50</td>
<td>N</td>
<td>Modbus®</td>
<td></td>
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<tr>
<td>TUF-6500-BN</td>
<td>DN65</td>
<td>O</td>
<td>Modbus®</td>
<td></td>
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<tr>
<td>TUF-8000-BN</td>
<td>DN80</td>
<td>P</td>
<td>Modbus®</td>
<td></td>
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<tr>
<td>TUF-10000-BN</td>
<td>DN100</td>
<td>Q</td>
<td>Modbus®</td>
<td></td>
</tr>
<tr>
<td>TUF-12500-BN</td>
<td>DN125</td>
<td>R</td>
<td>Modbus®</td>
<td></td>
</tr>
</tbody>
</table>

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**Model Chart**

<table>
<thead>
<tr>
<th>Pipe</th>
<th>Process Connection Size</th>
<th>Weight (lb)</th>
<th>Fitting Size</th>
<th>Weight (lb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>WM-ACC-C01</td>
<td>0.6 (0.3)</td>
<td>C</td>
<td>1.8 (0.8)</td>
</tr>
<tr>
<td>B</td>
<td>WM-ACC-C11</td>
<td>0.6 (0.3)</td>
<td>D</td>
<td>2.3 (1.1)</td>
</tr>
<tr>
<td>C</td>
<td>WM-ACC-C03</td>
<td>1.2 (0.5)</td>
<td>E</td>
<td>4.4 (2.2)</td>
</tr>
</tbody>
</table>

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*Each model includes 1 fitting.

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**TUF-500**

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**TUF-200**

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**TUF-250**

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**TUF-320**

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**TUF-400**

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**TUF-650**

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**TUF-800**

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**TUF-1000**

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**TUF-1250**

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**TUF-1500**

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**TUF-2000**

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**TUF-2500**

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**TUF-3000**

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**TUF-4000**

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**TUF-5000**

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**TUF-6500**

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**TUF-8000**

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**TUF-10000**

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**TUF-12500**

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*"M-BUS available upon request.