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 BSSP 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

**EXAMPLE**

**MODEL CHART**

<table>
<thead>
<tr>
<th>Ultrasonic Energy Meter Size</th>
<th>Pipe Size</th>
<th>Fitting Size</th>
<th>Communication</th>
<th>Meter Connection</th>
<th>GPM (LPM)</th>
<th>Power Consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>TUF-150-MD</td>
<td>DN15</td>
<td>1/2</td>
<td>A</td>
<td>Modbus®</td>
<td>0.1 (0.5)</td>
<td>6.6 (25)</td>
</tr>
<tr>
<td>TUF-200-MD</td>
<td>DN20</td>
<td>3/4</td>
<td>B</td>
<td>Modbus®</td>
<td>0.2 (0.8)</td>
<td>11 (42)</td>
</tr>
<tr>
<td>TUF-250-MD</td>
<td>DN25</td>
<td>1-1/4</td>
<td>C</td>
<td>Modbus®</td>
<td>0.3 (1.2)</td>
<td>26 (100)</td>
</tr>
<tr>
<td>TUF-320-MD</td>
<td>DN32</td>
<td>1-1/2</td>
<td>D</td>
<td>Modbus®</td>
<td>0.5 (2)</td>
<td>47 (175)</td>
</tr>
<tr>
<td>TUF-400-MD</td>
<td>DN40</td>
<td>1-1/2</td>
<td>E</td>
<td>Modbus®</td>
<td>0.9 (3)</td>
<td>44 (167)</td>
</tr>
<tr>
<td>TUF-500-MD</td>
<td>DN50</td>
<td>2</td>
<td>F</td>
<td>Modbus®</td>
<td>1.3 (5)</td>
<td>66 (250)</td>
</tr>
<tr>
<td>TUF-650-MD</td>
<td>DN65</td>
<td>2-1/2</td>
<td>G</td>
<td>Modbus®</td>
<td>2.2 (8.3)</td>
<td>110 (417)</td>
</tr>
<tr>
<td>TUF-800-MD</td>
<td>DN80</td>
<td>3</td>
<td>H</td>
<td>Modbus®</td>
<td>3.5 (13.3)</td>
<td>176 (667)</td>
</tr>
<tr>
<td>TUF-1000-MD</td>
<td>DN100</td>
<td>4</td>
<td>I</td>
<td>Modbus®</td>
<td>5.3 (20)</td>
<td>264 (1000)</td>
</tr>
<tr>
<td>TUF-1250-MD</td>
<td>DN125</td>
<td>5</td>
<td>J</td>
<td>Modbus®</td>
<td>8.8 (33)</td>
<td>440 (1867)</td>
</tr>
</tbody>
</table>

**DIMENSIONS in [mm]**

<table>
<thead>
<tr>
<th>Model</th>
<th>L</th>
<th>D</th>
<th>H</th>
<th>ØD1</th>
<th>ØD2</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>TUF-150-MD</td>
<td>4-1/4</td>
<td>1/4</td>
<td>1-1/4</td>
<td>7-9/32</td>
<td>110</td>
<td>6-1/2</td>
</tr>
<tr>
<td>TUF-200-MD</td>
<td>5-1/8</td>
<td>1/2</td>
<td>1-1/2</td>
<td>7-7/8</td>
<td>125</td>
<td>10-7/16</td>
</tr>
<tr>
<td>TUF-250-MD</td>
<td>7-7/8</td>
<td>1-1/2</td>
<td>1-1/2</td>
<td>310</td>
<td>180</td>
<td>11-3/2</td>
</tr>
<tr>
<td>TUF-320-MD</td>
<td>7-7/8</td>
<td>1-1/2</td>
<td>1-1/2</td>
<td>330</td>
<td>180</td>
<td>12-13/4</td>
</tr>
<tr>
<td>TUF-400-MD</td>
<td>7-7/8</td>
<td>1-1/2</td>
<td>1-1/2</td>
<td>330</td>
<td>180</td>
<td>12-13/4</td>
</tr>
</tbody>
</table>

**SPECIFICATIONS**

- **Service:** Clean, compatible liquids.
- **Wetted Materials:** Brass and 316L SS.
- **Range:** See chart.
- **Display:** 8-digit LED.
- **Accuracy:** BTU: EN 1434/CJ128 Class 2; Flow: ±(2+(0.02 Qp / Q))%.
- **Temperature:** ±0.1°C.
- **Power Requirements:** 24 VDC/VAC (model dependent) 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: 36 to 203°F (2 to 95°C).
- **Humidity Limit:** <93%.
- **Agency Approvals:** CE.
- **Enclosure Material:** Plastic.
- **Repeatability:** Flowmeter, 1%.
- **Electrical Connections:** 3.0 (9.1 mm) 4x0.2 mm2 cable with terminal block.
- **Flow Direction:** Unidirectional.
- **Mounting Orientation:** Horizontal or vertical.
- **Weight:** See chart.

**DIAGRAM**

- **Dimensions:** [TUF-150/400]
- **Details:** [Series TUF]

**FLOW & TEMPERATURE MONITORING CAPABILITY, MODBUS® AND BACNET COMMUNICATION**

**Power Requirements:** 232 psi (16 bar) for DN15 to DN40; 362 psi (25 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.

**Agency Approvals:** CE.