2, 3 & 4 Wire Self Compensating Ultrasonic Transmitters with Remote Transducers

FEATURES
Automatic adjustment to any environment
Simple push-button calibration (Accurate)
Output 4-20 mA / 20-4 mA
(Isolated on 4 Wire Model’s only)
Built-in temperature compensation
Optional RS232 and RS485 or HART 7 (2 Wire only)
Communications with calibration, diagnostics
and data logging software
PLC compatible (Modbus RTU)
Two, Three & Four Wire Operation
Self cleaning operation of sensor face

APPLICATIONS
High Temperature Environments,
Beverages, Pharmaceutical / Water
Chemical, Oils, Wastewater, Solids 045 model

MECHANICAL
Conduit Entry: 1/2" NPT Hole
Enclosure: PVC 94V0 or Aluminum/ S.S.
Ingress Protection: NEMA 6 (IP68)

ENVIRONMENTAL
Temperature:
Electronics Enclosure: -40 to 140°F (-40 to 60°C)
Continuous Operation
Std. Mtg. Thread: -40 to 140°F (-40 to 60°C)
High Temp. (Teflon Sensor): -40 to 266°F (-40 to 130°C)
Pressure: 2 bar Std.
Installation Category: Class II
Approvals - FM (USA):
FM3810 (2005) Electrical Electronic Test, Measuring and
Process Control Equipment
Equipment for Measurement, Control and
Laboratory Use - Part 1: General Requirements
CSA C22.2 No. 94 (2011) Special Purpose Enclosures

CATALOGUE # - On the Web return to Home Page & Refer to
catalogue Number Structure for Ordering information.
In Product Documentation refer to page 4.

ELECTRICAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>Power</th>
<th>115 VAC 60 Hz or 230 VAC 50 Hz (+/-20%)</th>
<th>1.7 VA</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABM400 AC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ABM300 DC</td>
<td>12 to 30 VDC, 0.07 A max. @ 24 Vdc R load = (Vs - 6) / 24 mA</td>
<td></td>
</tr>
<tr>
<td>ABM200 LP</td>
<td>12 to 28 VDC, 0.025 A max. @ 24 Vdc</td>
<td></td>
</tr>
<tr>
<td>Output</td>
<td>4-20 mA Output 6.1 mA resolution 750 Ohms (Isolated on 4 Wire only) Optional RS232 or RS485 Communications Port</td>
<td></td>
</tr>
</tbody>
</table>

OPERATIONAL

Accuracy: +/-0.10% of max. range
(in lab using 4-20 Ma current output)
+/-0.25% of max. range (typically in field)
Response Time: Standard Unit 2 - 3 echo’s / sec.
** IF Required
Beam Angle: 10 -12 degree at –3dB
Loss of Echo: Hold 1 min., 22mA or 2 mA output
Temp. Comp.: In transducer
Calibration: Push-button or programmable
via optional communications port
Diagnostics: (Echo Profile) via communications port

TECHNICAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>Range Code</th>
<th>Beam Angle</th>
<th>OPERATING RANGE</th>
<th>Resolution</th>
<th>Mounting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solids *</td>
<td>9°</td>
<td>1.0 - 60 ft.</td>
<td>0.27”</td>
<td>3.0” NPT</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.30 - 18.2 m</td>
<td>0.88”</td>
<td>1.5”Ø x 2.1” H</td>
</tr>
<tr>
<td>052</td>
<td>12°</td>
<td>0.9 - 50 ft.</td>
<td>0.23”</td>
<td>3.0”/ 2.0” NPT</td>
</tr>
<tr>
<td>070</td>
<td>12°</td>
<td>0.8 - 30 ft.</td>
<td>0.13”</td>
<td>3.0”/ 2.0” NPT</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.24 - 9.1 m</td>
<td>3.4 mm</td>
<td>1.8”Ø x 2.25” H</td>
</tr>
<tr>
<td>080</td>
<td>12°</td>
<td>0.7 - 20 ft.</td>
<td>0.088”</td>
<td>3.0”/ 2.0” NPT</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.21 - 6.1 m</td>
<td>2.2 mm</td>
<td>1.8”Ø x 2.25” H</td>
</tr>
<tr>
<td>081</td>
<td>12°</td>
<td>0.6 - 16 ft.</td>
<td>0.07”</td>
<td>3.0”/ 1.5” NPT</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.18 - 4.9 m</td>
<td>1.8 mm</td>
<td>1.5”Ø x 2.1” H</td>
</tr>
<tr>
<td>148</td>
<td>12°</td>
<td>0.4 - 9 ft.</td>
<td>0.04”</td>
<td>3.0”/ 1.0” NPT</td>
</tr>
</tbody>
</table>

* Note Solids Range 1/2 Liquids Range Stated in Chart above.
**WARNING**—Changes or Modifications not expressly approved by ABM Sensor Technology Inc. could void the user's authority to operate the equipment.

**Wiring Information**
- Ground shield at one end only.
- All terminal block wiring must be rated for 250V.
- Power input wiring must be protected by a 15A double pole circuit breaker.
- Terminal is for use only with equipment which has no live parts which are accessible.
- Terminal is for use with equipment which maintains basic insulation from hazardous voltage under normal and single fault conditions.
- Connection used at the remote end of external circuit.

**Recommended Wiring**
For AC Sensor
- Power 3 Wire unshielded 22 AWG, 300 V
- Current Output 1 Pair shielded 24 AWG, 300 V
- Communication 1 Pair shielded 24 AWG, 300 V

For DC Sensor
- Power & Current output 3 Wire shielded 24 AWG, 300 V
- Communication 1 Pair shielded 24 AWG, 300 V

**Calibration**
- 4-20 mA
- DC Power Input
- Note - TB # 7 is Connected to TB # 4
- 3 & 4 wire Ultrasonic Level devices provide the power (voltage) to the current loop, so use passive resistive load at PLC (controller) input.

**Typical Installation**
1) Direct mounting ultrasonic sensor - Simply thread sensor directly into metal or plastic nozzle.
2) Do not mount in the center of a domed tank.

**Note**—Use only 1/2” NPT Conduit

**Deadzone**
- +/-0.25%

**Accuracy**
- Resolution 1/SPAN Per Chart

**Material Level**
- 20 or 4 mA
- FULL Red
- FULL Yellow
- EMPT 4 or 20mA

**Operation**
An ultrasonic pulse is transmitted from the ABM sensor. The pulse travels to the surface being monitored and is reflected off this surface back to the sensor. The time of flight is divided by 2, corrected with temp. and converted to an output signal directly proportional to the material level.
1) Load “Probe Gateway PC Software” into your PC.
   (Select SETUP.EXE from installation CD and follow instructions on the screen.)

2) Click on START and under PROGRAMS select “Probe Gateway PC”.

3) Follow instruction in help file.
Typical Installation

1) DIRECT MOUNTING ULTRASONIC SENSOR - SIMPLY THREAD SENSOR DIRECTLY INTO METAL OR PLASTIC NOZZLE.

Operation - An ultrasonic pulse is transmitted from the ABM sensor. The pulse travels to the surface being monitored and is reflected off this surface back to the sensor. The time of flight is divided by 2 and converted to an output signal directly proportional to the material level.

Calibration:

4-20 or 20-4 mA Output - use Push-button
FULL – Calibrate 20 mA or 4 mA (Set Near Target)
1. Calibration mode LED color is Blinking Green.
2. Push button and hold until LED turns Yellow (20 mA) or push button and hold until LED turns Red (4 mA)
3. Release button at Yellow or Red and observe LED flashes to acknowledge the calibration.

EMPTY – Calibrate 4 mA or 20 mA (Set Far Target)
1. Calibration mode LED color is Blinking Green.
2. Push button and hold until LED turns Red (4 mA) or push button and hold until LED turns Yellow (20 mA)
3. Release button at Yellow or Red and observe LED flashes to acknowledge the calibration.

LOSS OF ECHO – 22 mA or 3.5 mA
1. To choose 22 mA press and hold button until the light goes off – 2 flashes
2. To choose 3.5 mA press and hold button until the light goes off – 1 flash

- Or use HART 7 (Fig. #1)
2, 3 & 4 Wire Ultrasonic Transmitters with Remote Transducers

<table>
<thead>
<tr>
<th>Model #</th>
<th>Operating Range</th>
<th>Operating Frequency</th>
<th>Mounting Thread NPT</th>
<th>Dimension 'A'</th>
<th>Dimension 'B'</th>
<th>Dimension 'D'</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABMXXX-045UL</td>
<td>60' (18.2 m)</td>
<td>45 KHz</td>
<td>1&quot;</td>
<td>7.75&quot; (197mm)</td>
<td>3.0&quot; (76.2mm)</td>
<td>3.0&quot; (76.2mm)</td>
</tr>
<tr>
<td>ABMXXX-052UL</td>
<td>50' (15.2 m)</td>
<td>52 KHz</td>
<td>1/2&quot;</td>
<td>7.8&quot; (198mm)</td>
<td>3.05&quot; (77.5mm)</td>
<td>2.2&quot; (55.9mm)</td>
</tr>
<tr>
<td>ABMXXX-070UL</td>
<td>30' (9.1 m)</td>
<td>70 KHz</td>
<td>1/2&quot;</td>
<td>7.0&quot; (178mm)</td>
<td>2.25&quot; (57.2mm)</td>
<td>1.8&quot; (45.7mm)</td>
</tr>
<tr>
<td>ABMXXX-080UL</td>
<td>20' (6.1 m)</td>
<td>80 KHz</td>
<td>1/2&quot;</td>
<td>7.0&quot; (178mm)</td>
<td>2.25&quot; (57.2mm)</td>
<td>1.8&quot; (45.7mm)</td>
</tr>
<tr>
<td>ABMXXX-081UL</td>
<td>16' (4.9 m)</td>
<td>81 KHz</td>
<td>1/2&quot;</td>
<td>6.85&quot; (174mm)</td>
<td>2.1&quot; (53.3mm)</td>
<td>1.5&quot; (38.1mm)</td>
</tr>
<tr>
<td>ABMXXX-148UL</td>
<td>9' (2.7 m)</td>
<td>148 KHz</td>
<td>1/2&quot;</td>
<td>6.75&quot; (172mm)</td>
<td>2.0&quot; (50.8mm)</td>
<td>1.1&quot; (27.9mm)</td>
</tr>
</tbody>
</table>

Note 1) XXX = ABM200 or ABM 300 OR ABM400
Note 2) ABM-4SU has no Mtg. Threads on Sensor body