

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



730 The Kingsway Peterborough , Ont. K9J6W6 Canada
 Tel: (705) 740 – 2010 Web: www.abmsensor.com
 Fax: (705) 740 – 2563 E-mail: info@abmsensor.com

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

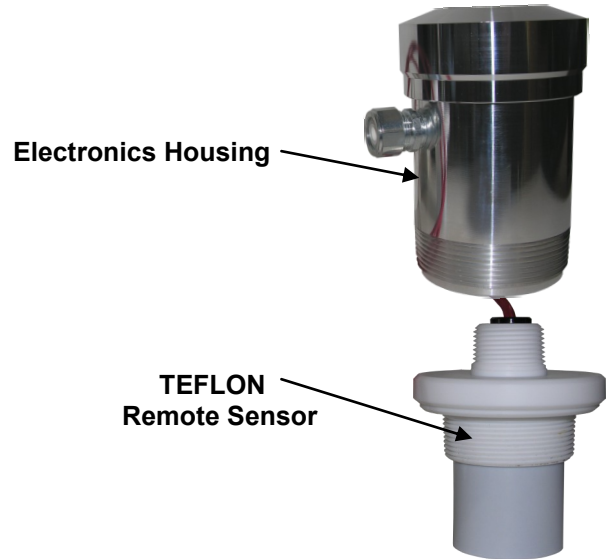
Conduit Entry : 1/2" NPT Hole
 Enclosure : PVC- 94V0 or Aluminum/ S.S.
 Ingress Protection: NEMA 6 (IP68)

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
 ANSI/NEMA 250 (1991) :Enclosures for Electrical Equipment
 FM(CAN.):
 CSA C22.2 No. 1010.1 (2004) Safety Requirements for Electrical 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

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



Example of high temperature ultrasonic sensor

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.
 : Fast Protocol **I.R. 10 - 30 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

Range Code	Beam Angle	OPERATING RANGE In Liquids	Resolution	Mounting
045 Solids *	9°	1.0 - 60 ft. 0.30 - 18.2 m	0.27" 6.8mm	3.0" NPT 3.0"Ø x 3.0" H
052	12°	0.9 - 50 ft.	0.23"	3.0" / 2.0" NPT
070	12°	0.8 - 30 ft. 0.24 - 9.1 m	0.13" 3.4 mm	3.0" / 2.0" NPT 1.8"Ø x 2.25" H
080	12°	0.7 - 20 ft. 0.21 - 6.1 m	0.088" 2.2 mm	3.0" / 2.0" NPT 1.8"Ø x 2.25" H
081	12°	0.6 - 16 ft. 0.18 - 4.9 m	0.07" 1.8 mm	3.0" / 1.5" NPT 1.5"Ø x 2.1" H
148	12°	0.4 - 9 ft.	0.04"	3.0" / 1.0" NPT

* Note Solids Range 1/2 Liquids Range Stated in Chart above

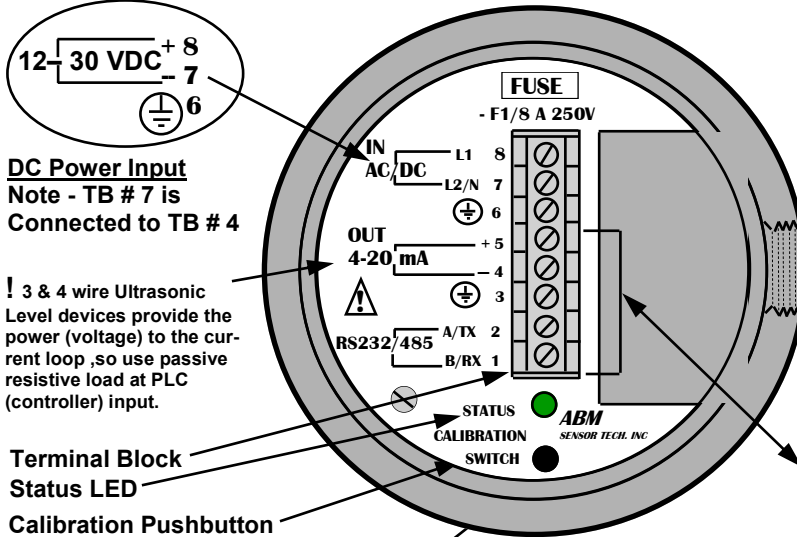
3 & 4 Wire Ultrasonic Sensors User Instruction Manual



730 The Kingsway Peterborough, Ont. K9J6W6 Canada
Tel: (705) 740 - 2010 Web: www.abmsensor.com
Fax: (705) 740 - 2563 E-mail: info@abmsensor.com

Inter-Connection Diagram

Top View of Sensor (Access Cover Removed)



DC Power Input
Note - TB # 7 is Connected to TB # 4

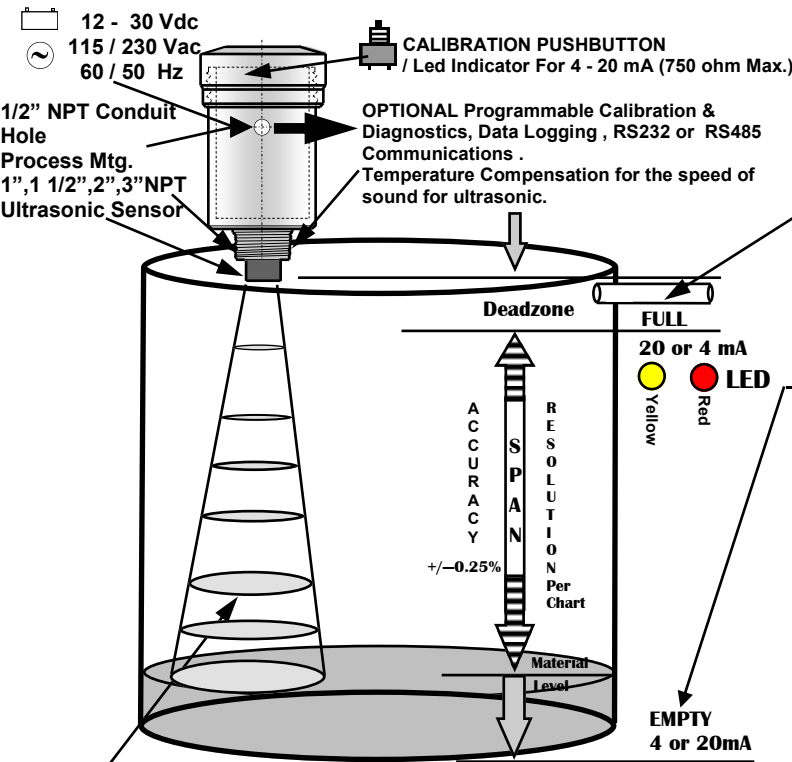
! 3 & 4 wire Ultrasonic Level devices provide the power (voltage) to the current loop, so use passive resistive load at PLC (controller) input.

Terminal Block
Status LED
Calibration Pushbutton

NOTE — Use only 1/2" NPT Conduit

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.



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 or 20 - 4 mA Output

FULL — Calibrate 20 mA or 4mA (Set Near Target)

1. Calibration mode LED color is Green. (for Radar Low Dielectric Materials has to be off)
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 and observe LED flashes to acknowledge the calibration.

EMPTY— Calibrate 4 mA or 20 mA (Set Far Target)

1. Calibration mode LED color is 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—22mA or 2 mA (3.5 mA for 2 Wire)

1. To choose 22mA press and hold button until the light goes off—2 flashes
2. To choose 2mA press and hold button until the light goes off—1 flash

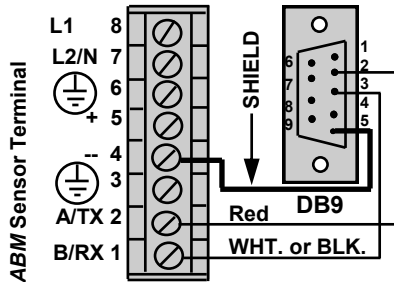
Operation - An ultrasonic pulse is transmitted from the ABM sensor. The pulse travels to the surface being monitored and is reflected off this surface back to the sensor. The time of flight is divided by 2, corrected with temp. and converted to an output signal directly proportional to the material level.

3&4 Wire Ultrasonic Sensors Communication Interconnection Dtl.



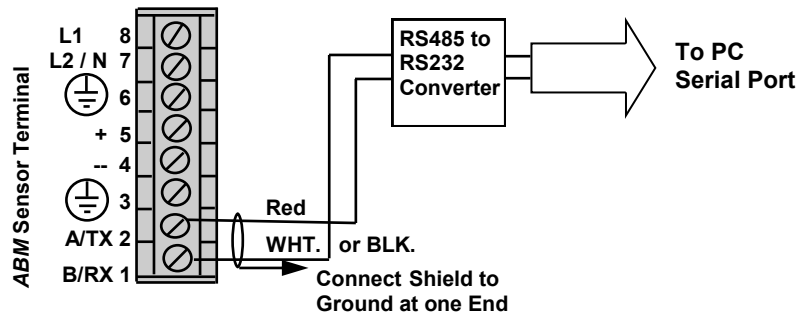
730 The Kingsway Peterborough, Ont. K9J6W6 Canada
 Tel: (705) 740 - 2010 Web: www.abmsensor.com
 Fax: (705) 740 - 2563 E-mail: info@abmsensor.com

Fig. # 1 RS232 Connection



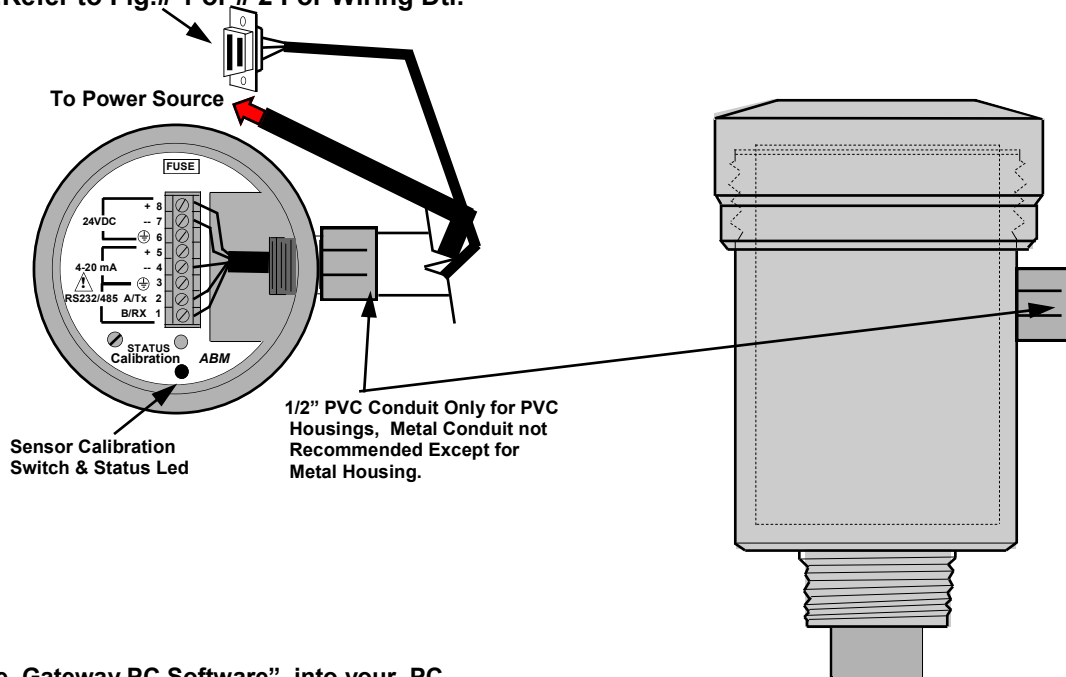
Note - Connect the shield to ABM Sensor Terminal #4.

Fig. # 2 RS485 Connection



Note - Connect the shield to ABM Sensor Terminal #3.

Connect to Serial Port of PC, use Extension Cable length as required, Refer to Fig.# 1 or # 2 For Wiring Dtl.



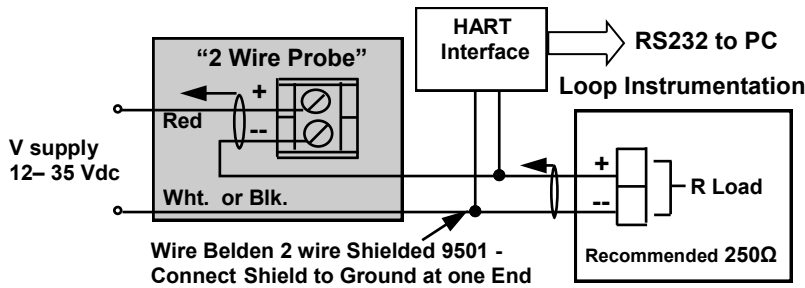
- 1) Load "Probe Gateway PC Software" into your PC.
(Select SETUP.EXE from installation CD and follow instructions on the screen.)
- 2) Click on START and under PROGRAMS select "Probe Gateway PC".
- 3) Follow instruction in help file .

2 Wire Ultrasonic Transmitter User Instruction Manual

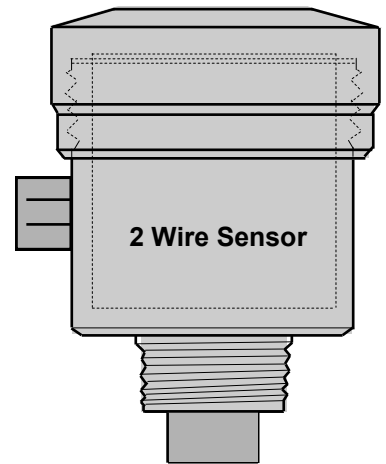
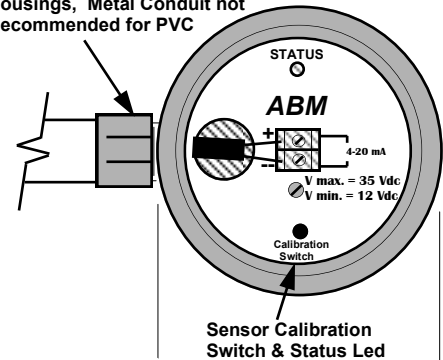


730 The Kingsway Peterborough, Ont. K9J6W6 Canada
 Tel: (705) 740 – 2010 Web: www.abmsensor.com
 Fax: (705) 740 – 2563 E-mail: info@abmsensor.com

Fig. # 1 - "2 Wire Sensor" Wiring Connection

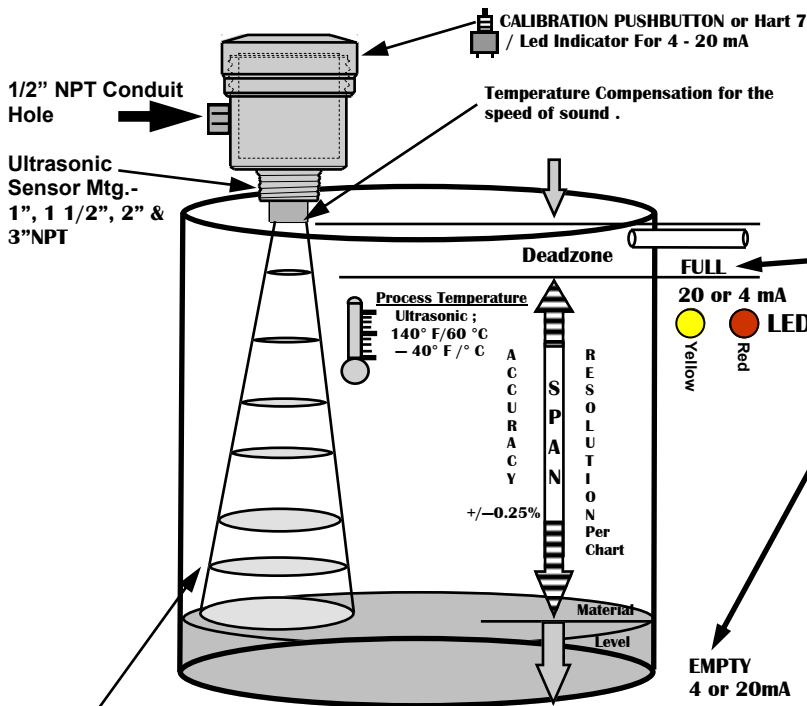


1/2" PVC Conduit Only for PVC Housings, Metal Conduit not Recommended for PVC



Typical Installation

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



Calibration: 4 -20 or 20 -4 mA Output - use Push-button FULL – Calibrate 20 mA or 4mA (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–22mA or 3.5 mA

1. To choose 22mA press and hold button until the light goes off—2 flashes
2. To choose 3.5mA press and hold button until the light goes off—1 flash

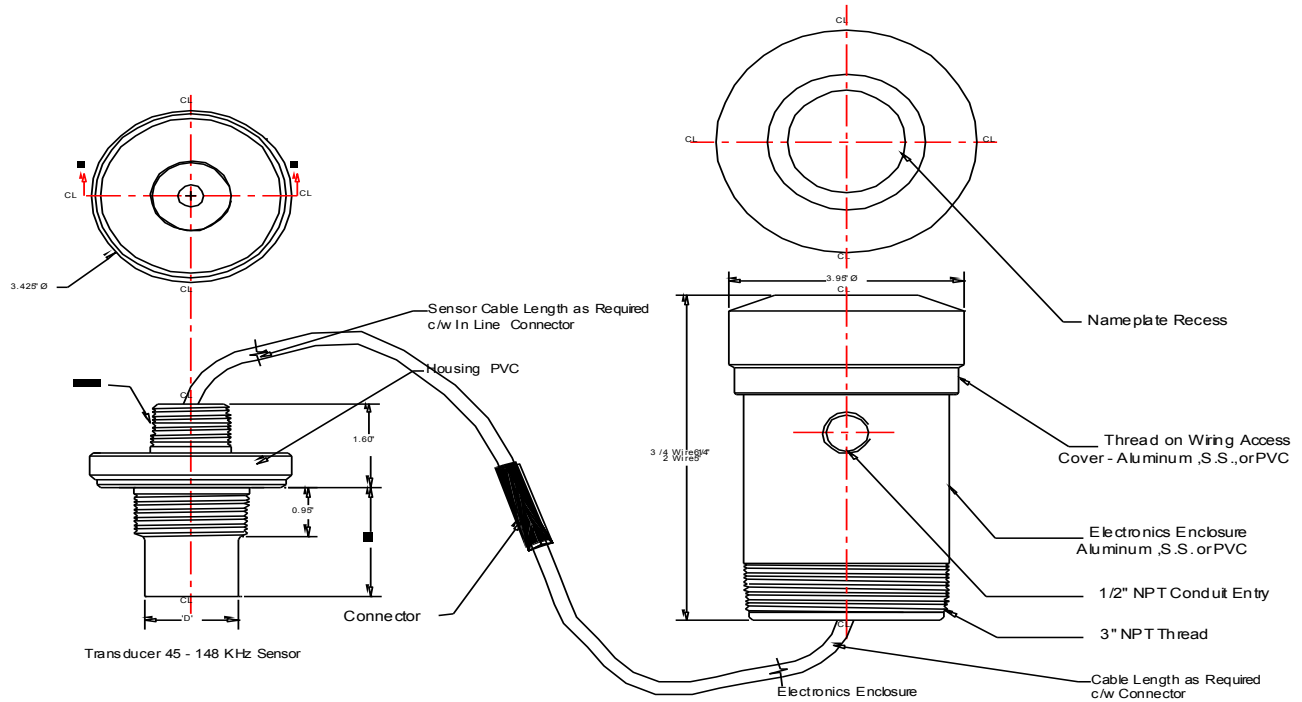
- Or use HART 7 (Fig. # 1)

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 .

2, 3 & 4 Wire Ultrasonic Transmitters with Remote Transducers



730 The Kingsway Peterborough, Ont. K9J6W6 Canada
 Tel: (705) 740 - 2010 Web: www.abmsensor.com
 Fax: (705) 740 - 2563 E-mail: info@abmsensor.com



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

Note 1) XXX = ABM200 or ABM 300 OR ABM400 As Required
 Note 2) ABM45U has no Mtg. Threads on Sensor body