

3 & 4 Wire Self Compensating Ultrasonic Transmitters Standard Mtg.



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

- 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 or RS485 Communications with calibration, diagnostics and data logging software
- PLC compatible (Modbus RTU)
- Three or Four Wire Operation
- Self cleaning operation of sensor face



APPLICATIONS

- Food and Beverages
- Water / Wastewater
- Chemicals, Oils
- Solids (Models 25U, 45U Below)
- Solids Range Approx. 1/2 of liquid

MECHANICAL

- Conduit Entry : 1/2" NPT Hole (PVC conduit only)
- Enclosure : PVC - 94V0
- Ingress Protection : Standard Unit NEMA 4X (IP65)
: Special Order NEMA 6 (IP68)
Requires "Thread Sealant" on all Threads

CATALOGUE # - On the Web Site return to Home Page & Refer to Catalogue Number Structure for Ordering information. In Product Documentation refer to Page 3.

TECHNICAL SPECIFICATIONS

Range Code	Operating Range In Liquids	Resolution	Mounting
025	1.4 - 90 ft. 0.40 - 27.4m	0.41" 10 mm	6.0"/1.0" NPT
045	1.0 - 60 ft. 0.30 - 18.2 m	0.27" 6.8 mm	3.0" NPT
052	0.9 - 50 ft. 0.27 - 15.2 m	0.23" 5.7 mm	3.0"/2.0" NPT
070	0.8 - 30 ft. 0.24 - 9.1 m	0.13" 3.4 mm	3.0"/2.0" NPT
080	0.7 - 20 ft. 0.21 - 6.1 m	0.088" 2.2 mm	3.0"/2.0" NPT
081	0.6 - 16 ft. 0.18 - 4.9 m	0.07" 1.8 mm	3.0"/1.5" NPT
148	0.4 - 9 ft. 0.12 - 2.7 m	0.04" 0.98 mm	3.0"/1.0" NPT

ENVIRONMENTAL

- Temperature :
Std. - 40 to 140°F (-40 to 60°C)
High - 40 to 266°F (-40 to 130°C) Teflon Sensor
- Pressure : Max. 2 bars
- Approvals : Entela Certified File #8294
- CAN/CSA C22.2 No. 1010.1-M92 +A2,
- IEC 61010-1:90 + A1:92 +A2:95
- UL 61010A-1(2002)
- ABMXXX Series-25U Approvals Pending

Installation Category : Class II

OPERATIONAL

- Accuracy : +/-0.1% 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.
: Std. with less damping 6 echo's / sec.
: Fast Protocol **I.R. 10 - 30 echo's / sec.
** IF Required
- Beam Angle : 6 -12 degrees 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

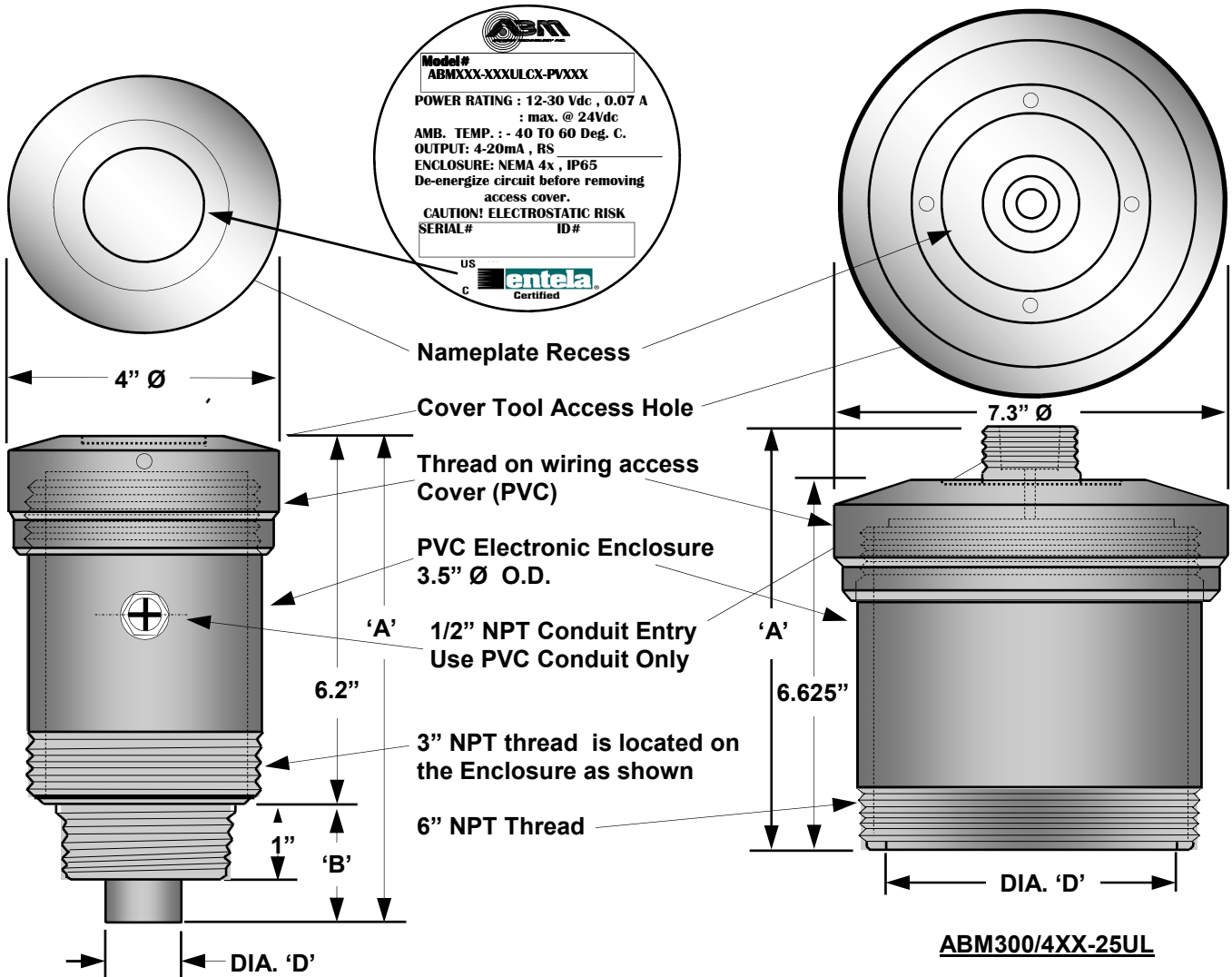
ELECTRICAL SPECIFICATIONS

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
Output	4-20 mA Output 6.1 uA resolution
	750 Ohms (Isolated on 4 Wire only)
	Optional RS232 or RS485 communications port.

3 & 4 Wire Ultrasonic Transmitters Outline Dimensional Dtl.



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Level Sensor PVC Housing						
Model #	Operating Range	Operating Frequency	Mounting Thread	Dimension 'A'	Dimension 'B'	Dimension 'D'
ABM300/4XX- 025UL	90'	25 KHz	6"/ 1 " NPT	7.625"	N/A	5.75"
ABM300/4XX- 045UL	60'	45 KHz	3 " NPT	8.9"	3.0"	3.0"
ABM300/4XX- 052UL	50'	52 KHz	3"/ 2 " NPT	9.3"	3.05"	2.2"
ABM300/4XX- 070UL	30'	70 KHz	3"/2 " NPT	8.5"	2.25"	1.8"
ABM300/4XX- 080UL	20'	80 KHz	3"/2 " NPT	8.5"	2.25"	1.8"
ABM300/4XX- 081UL	16'	81 KHz	3"/1.5" NPT	8.4"	2.1"	1.5"
ABM300/4XX-148UL	9'	148 KHz	1 " NPT	8.25"	2.0"	1.1"

3 & 4 Wire Level Transmitter Sensor Outline Detail

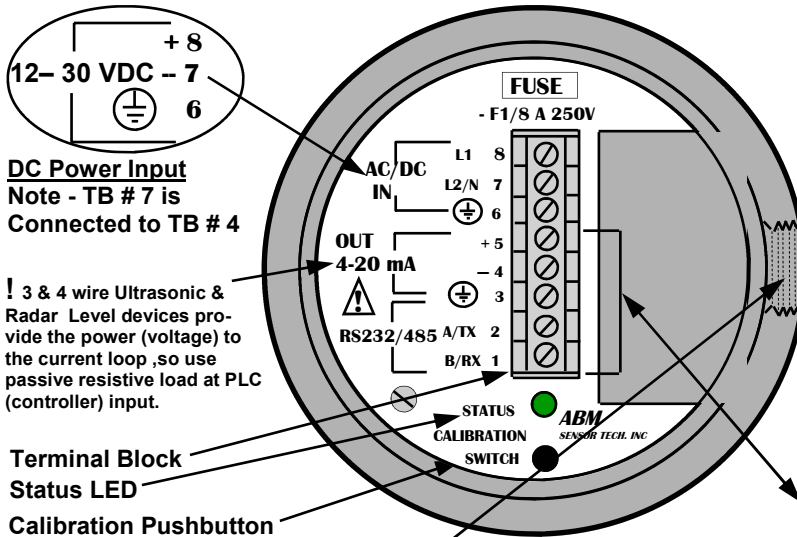
3 & 4 Wire Ultrasonic and Radar Sensors User Instruction Manual



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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 & Radar Level devices provide the power (voltage) to the current loop, so use passive resistive load at PLC (controller) input.

Terminal Block

Status LED

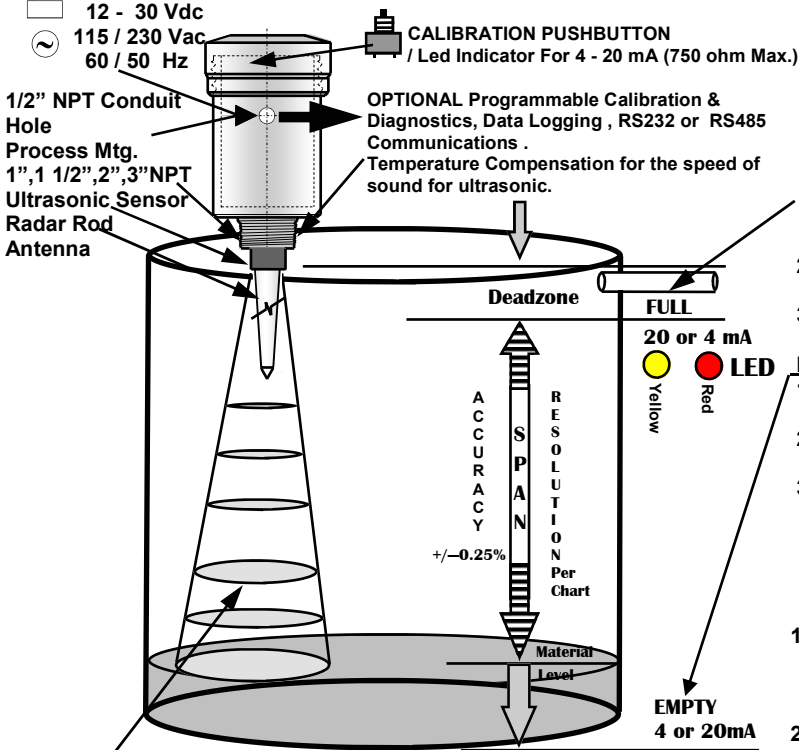
Calibration Pushbutton

NOTE — Use only 1/2" NPT Conduit

Typical Installation

- 1) Direct mounting ultrasonic sensor - Simply thread sensor directly into metal or plastic nozzle.
- 2) Radar unit must be installed into metal fitting with the antenna pointing downward.
- 3) Do not mount in the center of a domed tank.

- 12 - 30 Vdc
- 115 / 230 Vac
- 60 / 50 Hz



Operation - An ultrasonic/electromagnetic 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 .

FCC INFORMATION TO RADAR USERS

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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

Calibration — 4 -20 or 20 - 4 mA Output

For Radar programmable through communication is recommended.

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, observe LED flashes to acknowledge the calibration.

EMPTY— Calibrate 4 mA or 20 mA (Set Far 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 Red (4 mA) or push button and hold until LED turns Yellow (20 mA)
3. Release button, observe LED flashes to acknowledge the calibration.

For Radar to turn the Low Dielectric Materials operation mode ON and OFF (this mode is recommended for materials with dielectric constant lower than 4 and also to eliminate multiple reflections in tank.)

- 1) To turn the Low Dielectric Materials ON. Push button and hold until LED goes OFF after the sequence of Yellow ,Red and turns Off. The Low Dielectric Material operation is On when the LED'S Green light blinks constantly.
- 2) To turn the Low Dielectric Materials OFF. Push button and hold until LED goes OFF after the sequence of Yellow , Red and Turns OFF. The Low Dielectric Material operation is OFF when LED is continuously Green.
- 3) Use communication software.

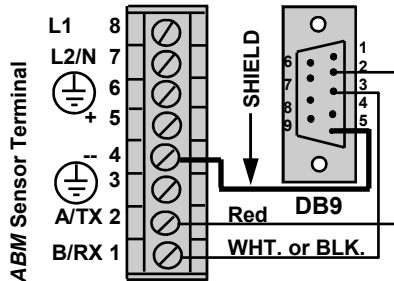
DWG 10A363R1

3&4 Wire Ultrasonic and Radar Sensors Communication Interconnection Dtl.



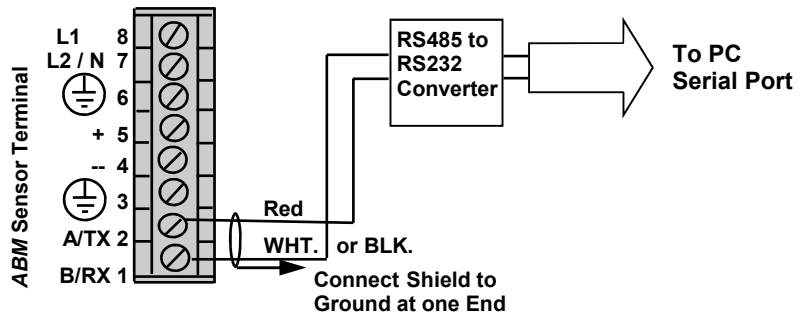
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Fig. # 1 RS232 Connection



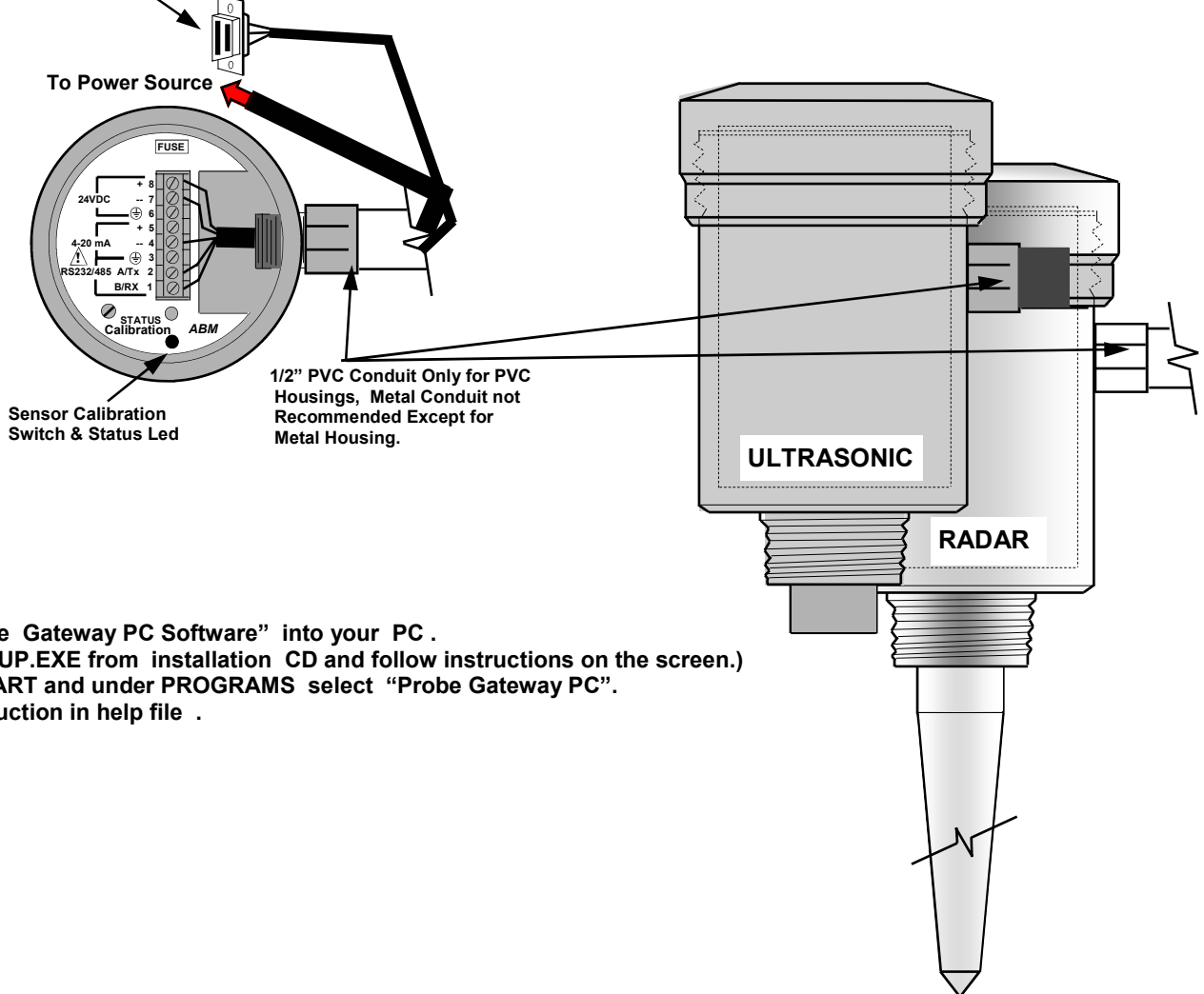
Note - Connect the shield to ABM Sensor Terminal #4.

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 .