

“Smart” Radar Sanitary Ferrule Mtg. Sensors



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FEATURES

Food Grade Teflon Antenna c/w Ferrule Mtg. Base
 Programmable (recommend) and
 Simple push-button calibration
 Output 4- 20 mA / 20- 4mA
 (Isolated on 4 Wire Model's only)
 Optional RS232 OR RS485
 communications with calibration,
 diagnostics & data logging software
 PLC compatible (Modbus RTU)
 Three or four Wire Operation

APPLICATIONS

Food and Beverages
 Water
 Pharmaceutical

MECHANICAL

Conduit Entry : 1/2" NPT x 2
 Enclosure : Aluminum or S.S. 94V0
 Ingress Protection : NEMA 4 (IP65) Type 4 / 4x

ENVIRONMENTAL

Temperature : - 40 to 140°F (- 40 to 60°C)
 Installation Category : Class II
 Approvals : FCC Part 15 - Low Power
 Communication Device

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

TECHNICAL SPECIFICATIONS

Range Code	Operating RANGE In Liquids	Resolution	Mounting Ferrule
017	* - 17 ft. * - 5 m	0.08" 2.0 mm	2.0"/1 1/2" NPT
033	* - 33 ft. * - 10 m	0.15" 3.9 mm	2.0"/1 1/2" NPT
050	* - 50 ft. * - 15 m	0.22" 5.7 mm	2.0"/1 1/2" NPT
100	* - 100 ft. * - 30 m	0.44" 11 mm	2.0"/1 1/2" NPT

Note - * Minimum Range starts at the lower tip of the antenna for high dielectric materials (water). For low dielectric materials allow for longer Minimum Range

Standard Unit
 - Aluminum Housing
 - Teflon Antenna

Sanitary Ferrule - 2"
 Teflon - PTFE



PROCESS

Temperature : PTFE Rod - 40 to 400°F (- 40 to 204°C)
 Pressure : max. 2 bar
 Material Dielectric: Er >2

OPERATIONAL

Operation : Pulse Radar
 Accuracy : +/- 0.1% of max. range in lab using
 4-20mA 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 10 - 30 echo's / sec.
 Frequency : 5.8 GHz or 6.3 GHz.
 Loss of Echo : Hold 1min., 22mA or 2 mA output.
Transmit Power: 50 uW average
Calibration : Via communications port (required).
Diagnostics : (Echo Profile) via communications port
Antenna : Dielectric Rod Std. PP & Optional PTFE

ELECTRICAL SPECIFICATIONS

Power	115 VAC 60 Hz or 230 VAC 50 Hz (+/-20%) , 1.7 VA
ABM400 AC	
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.

New
Feature

"Mini Sonic" Ultrasonic Transmitters - Sanitary Ferrule Mtg.



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FEATURES

- S.S. 316L Face Material c/w Ferrule Mtg.
- Standard 5 feet of interconnection cable
- Simple push-button calibration
- Output 4- 20 mA / 20- 4 mA
- Built-in temperature compensation
- Optional High Level Alarm relay
- dual pole output 5A/230 Vac
- Optional RS485 communications with calibration, diagnostics and data logging software
- PLC compatible
- Three Wire Operation



Std. Sanitary PVC Ferrule 1 1/2" c/w S.S. Face

High Temperature & Pressure Sensor S.S. Ferrule 1 1/2" c/w S.S. Face

APPLICATIONS

Food and Beverages, Water, Pharmaceutical

ENVIRONMENTAL

- Temperature :
 - Electronics Enclosure :- 40 to 140°F(- 40 to 60°C) Continuous Operation
 - Std. Sanitary Nozzle :- 40 to 140°F(- 40 to 60°C) No Steam Cleaning (CIP)
 - S.S. Sanitary :- 40 to 266°F(- 40 to 130°C) for 1/2 Hr. Steam Cleaning. Removed sensor for longer Cleaning cycle, recommended. Not for Continuous Operation
- Pressure : 5 bar Max. using High Temperature & Pressure Sensor
- Installation Category: Class II

Catalogue # - On the Web return to Home Page & Refer to Catalogue Numbering for Ordering Information.

TECHNICAL SPECIFICATIONS

MODEL	RANGE	RESOLUTION	MOUNTING
ABM300-148UMCX-CPS15	0.33 - 6 ft. 0.10 - 1.8 m	0.03" 0.7 mm	1.5" Ferrule
ABM300-081UMCX-CPS15	0.6 - 16 ft. 0.18 - 4.9 m	0.088" 2.2 mm	1.5" Ferrule

ELECTRICAL SPECIFICATIONS

Power 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
Optional	- communications port RS485

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 echoes / sec.
 - Std. with less damping 6 echoes / sec.
 - Fast Protocol **I.R. 10 echoes / sec. Or More ** IF Required
- Beam Angle : 10 - 12 degree at -3dB
- Loss of Echo : Programmable from 1 min. to 4 min. (Default = 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
- High Level Alarm 5A. Relay has hysteresis and delay of 5% of the tank height, this can be adjusted using communications software. Relay's state changes at 20mA calibration point or at 4 mA calibration point. To switch the above "push-button" or "communication software" can be used. Using push-button press and hold until the light goes off. Continuous green light indicates alarm at 20mA, blinking green indicates alarm at 4 mA. Relay "ON" set point is adjustable using communications software.

MECHANICAL

Std. Interconnection Cable -

5'- Belden #9503 : 3 Pair-24AWG

- Supply 12 - 30 Vdc 1 pair shielded (Red/Blk.)
- Output 4 - 20 mA 1 Pair shielded (Blk./Green)
- Comm. RS485 (optional) 1 Pair Shielded (Blk./Wht.)

Optional Relay Cable -

5'- Belden #9493 :3-18 AWG unshielded

- Relay (optional) DPST 5A /230Vac

Enclosure PVC-94V0

Ingress Protection NEMA 4X (IP65)

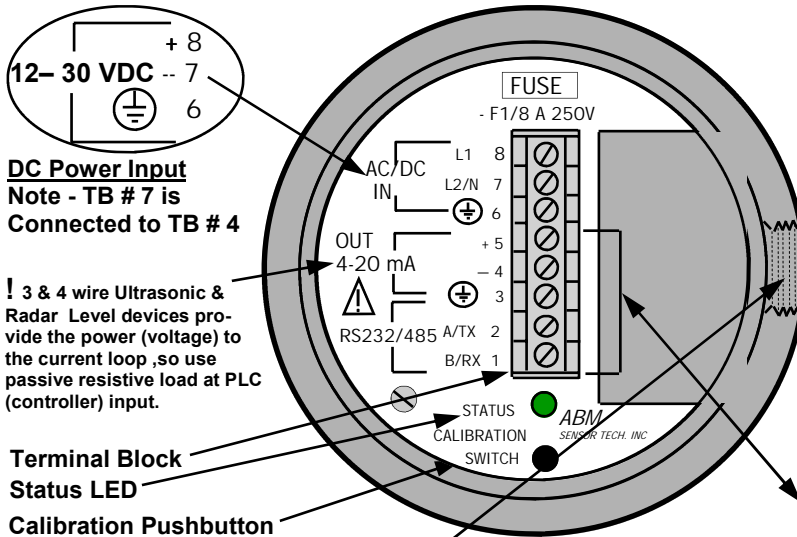
3 & 4 Wire Ultrasonic and Radar Sensors User Instruction Manual



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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.

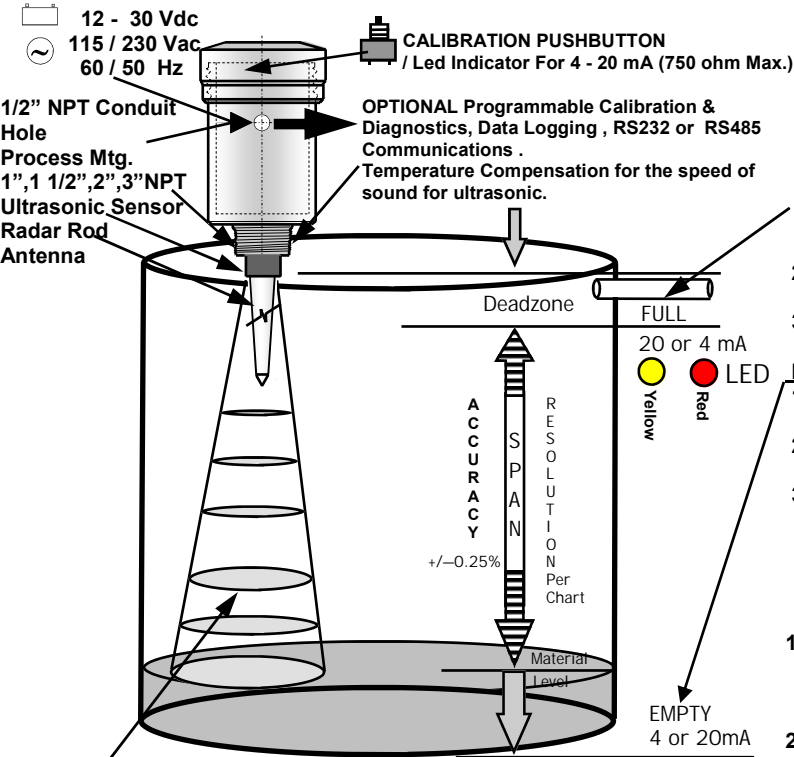
Terminal Block
 Status LED

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.



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.

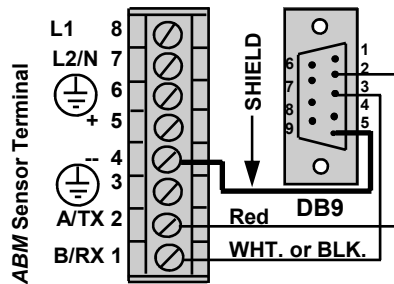
DWG 10A363R1

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



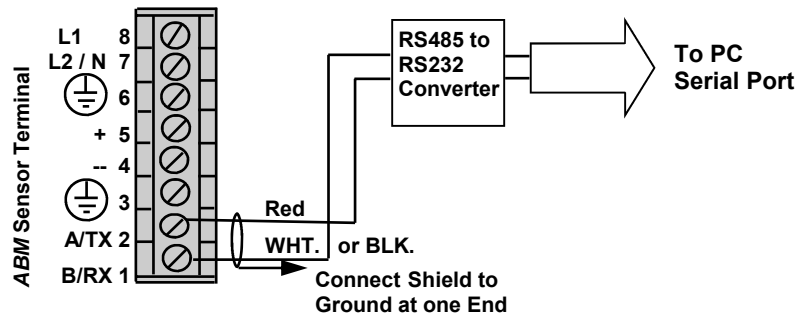
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Fig. # 1 RS232 Connection



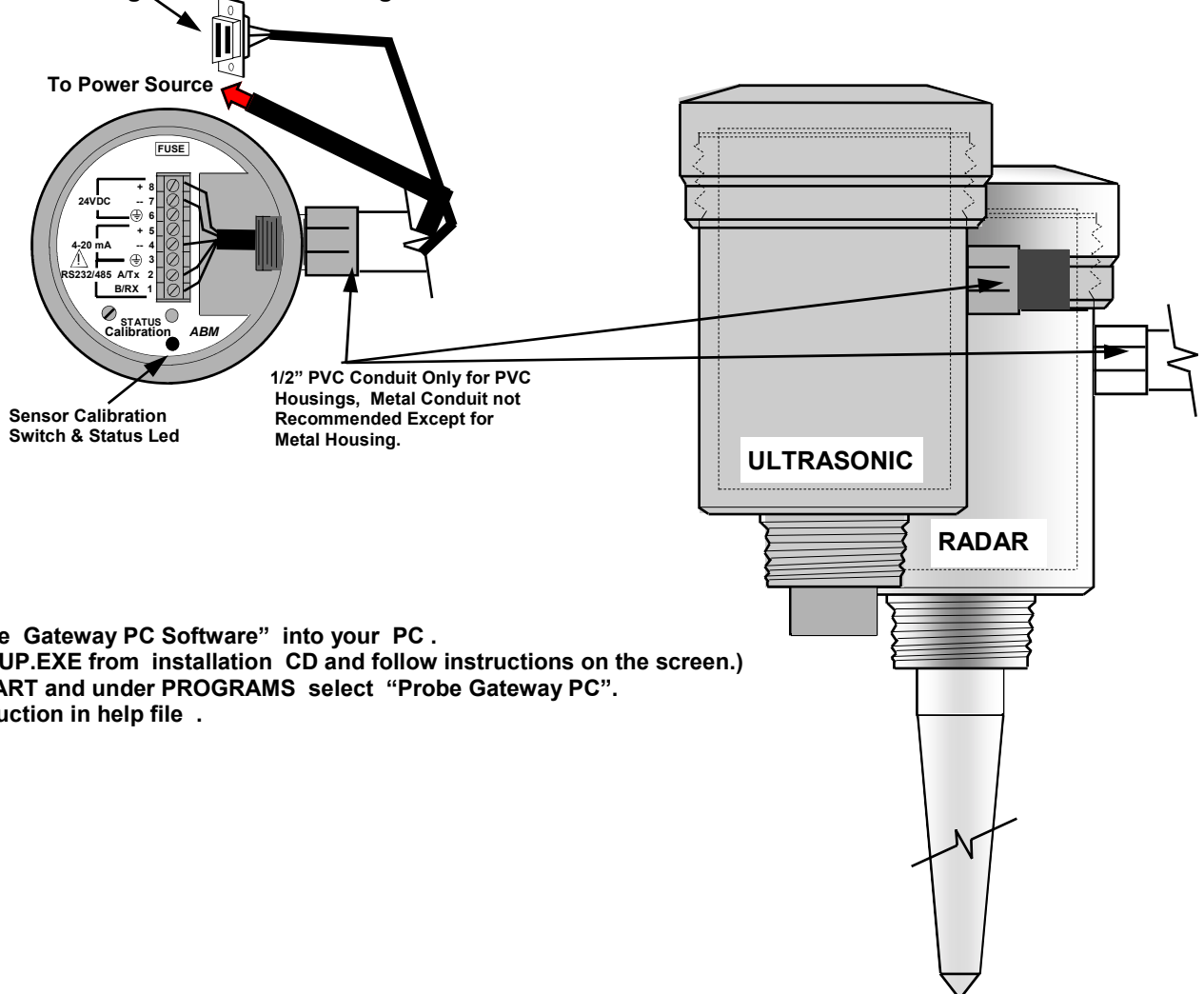
Note – Connect the shield to ABM Sensor Terminal #4.

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.

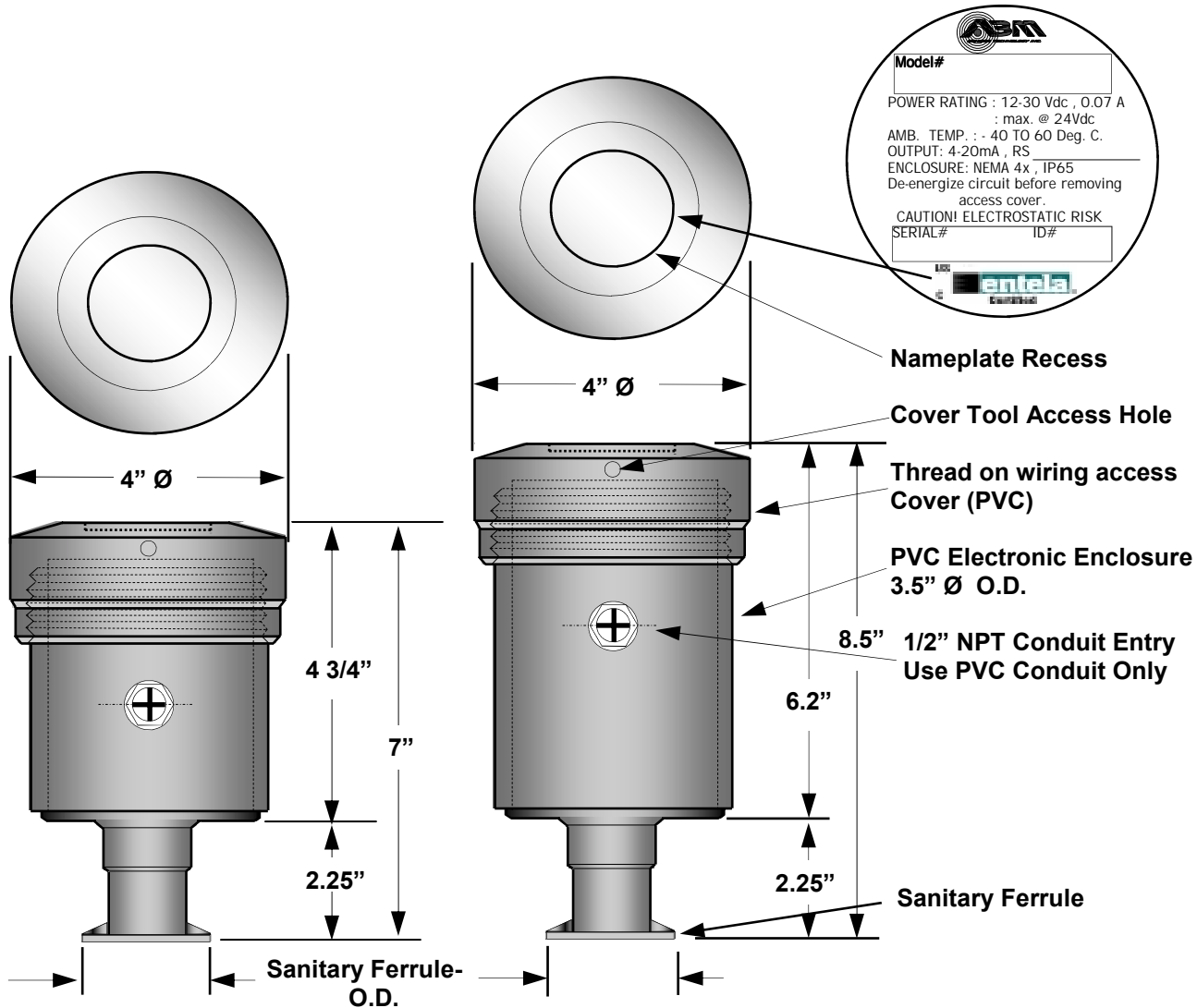


- 1) Load "Probe Gateway PC Software" into your PC .
(Select SETUP.EXE from installation CD and follow instructions on the screen.)
- 2) Click on START and under PROGRAMS select "Probe Gateway PC".
- 3) Follow instruction in help file .

2 ,3 & 4 Wire Sanitary Ultrasonic Transmitters Outline Dimensional Dtl.



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Model# _____

POWER RATING : 12-30 Vdc , 0.07 A
 : max. @ 24Vdc

AMB. TEMP. : - 40 TO 60 Deg. C.

OUTPUT: 4-20mA , RS _____

ENCLOSURE: NEMA 4x , IP65

De-energize circuit before removing access cover.

CAUTION! ELECTROSTATIC RISK

SERIAL# _____ ID# _____

antela
 Control

ABM 2 Wire Loop powered Probe

ABM 3&4 Probe

Model #	Operating Liquid Range	Operating Frequency	Level Sensor PVC Housing	
			Sanitary Ferrule O.D. 1.5"	Sanitary Ferrule O.D. 2"
ABMXXX- 070ULCX-PVS20	30'	70 KHz	N/A	2.5"
ABMXXX- 080ULCX-PVS20	20'	80 KHz	N/A	2.5"
ABMXXX- 081ULCX-PVSXX	16'	81 KHz	1.9"	2.5"
ABMXXX- 148ULCX-PVSXX	9'	148 KHz	1.9"	2.5"

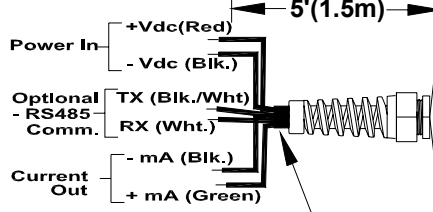
"Mini Sonic" Ultrasonic Transmitters Interconnection Diagram



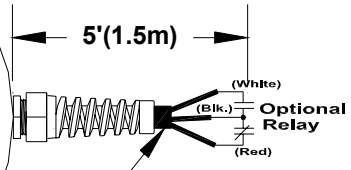
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Interconnection Diag.

Standard Cable



Optional Cable

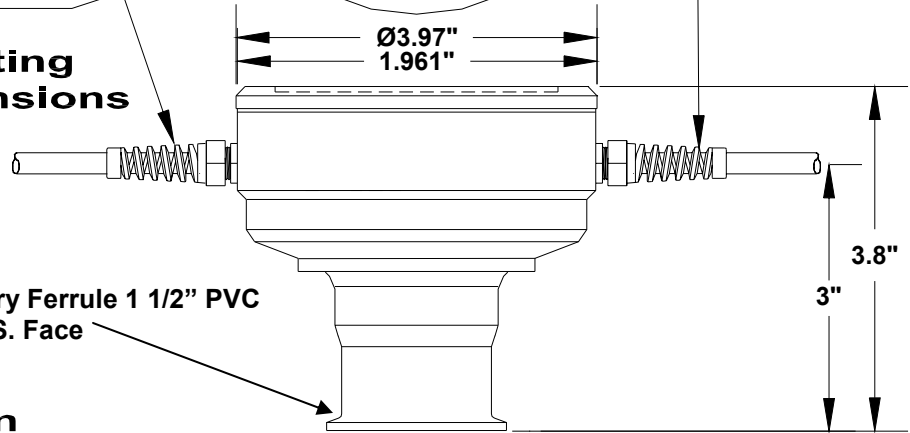


Standard Belden #9503
3 Pair #24 AWG
Shielded

Optional Belden #9493
3 - #18 AWG Unshielded

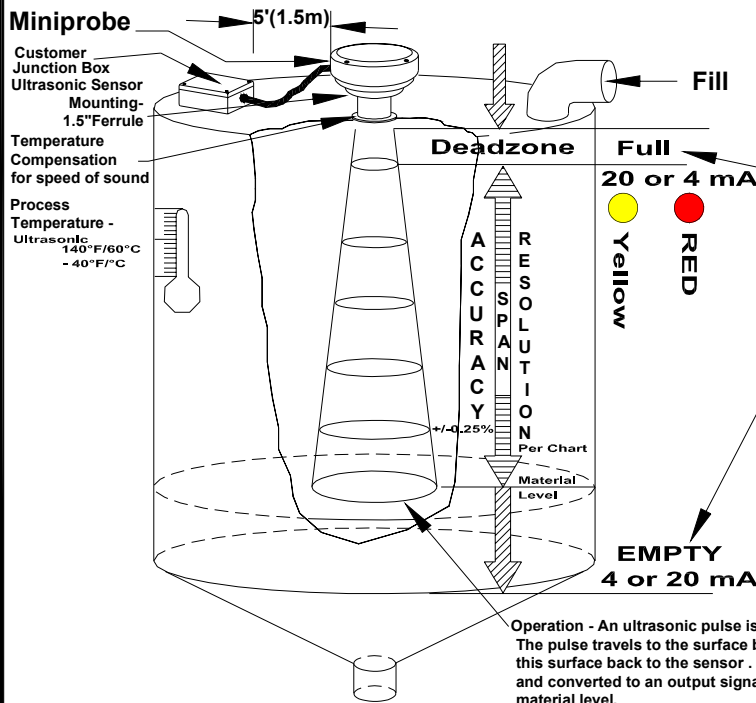
Calibration Switch

Mounting Dimensions



Sanitary Ferrule 1 1/2" PVC
c/w S.S. Face

Installation & Calibration



- Calibration - 4-20 or 20-4 mA Output**
FULL - Calibration 20 mA or 4 mA (Set Near Target)
1. Calibration mode LED colour is Green.
 2. Push button and hold until LED turns Yellow (20mA) or push button and hold until LED turns Red (4 mA).
 3. Release button, observe LED flashes to acknowledge the calibration.
- EMPTY - Calibrate 4mA or 20mA (Set Far Target)**
1. Calibration mode LED colour is Green.
 2. Push button and hold until LED turns Red (4mA) or push button and hold until LED turns Yellow (20ma).
 3. Release button, observe LED flashes to acknowledge the calibration.

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.