

# Smart Sonic Ultrasonic Transmitters



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## Instruction Manual

925-0156 Rev A

***BINMASTER***<sup>®</sup>

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## General Specifications

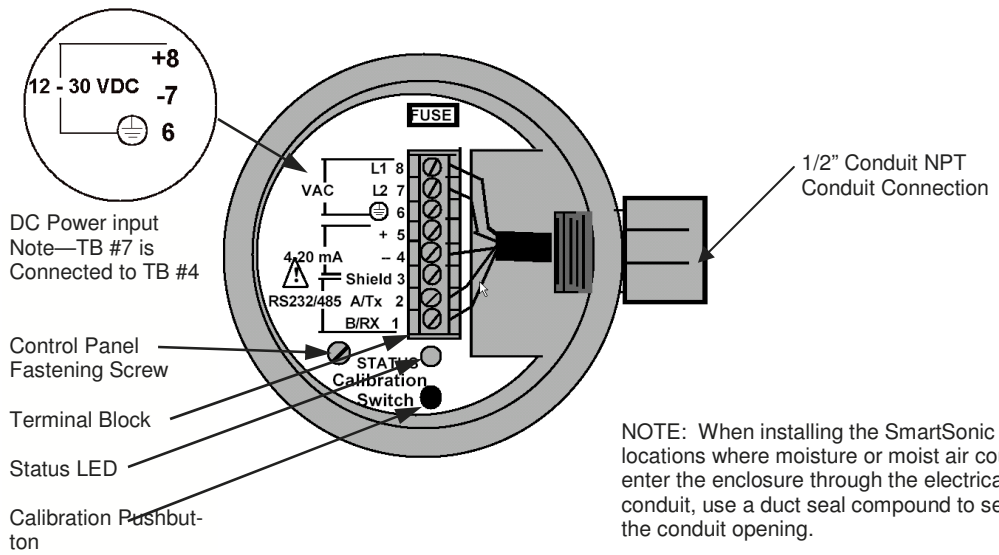
<b>Conduit Entry:</b>	1/2" NPT (PVC conduit only)
<b>Enclosure:</b>	PVC-94VO
<b>Enclosure Rating:</b>	NEMA 4X(IP65)
<b>Temperature:</b>	-40 to +140° F (-40 to 60° C)
<b>Pressure:</b>	2 bar
<b>Approvals:</b>	Entela—CSA/UL
<b>Accuracy:</b>	+/- 0.25% of maximum range
<b>Beam Angle:</b>	6°-12° conical at -3dB
<b>Loss of Echo:</b>	Hold 30 seconds, 22 mA
<b>Temperature Compensation:</b>	Continuous in transducer
<b>Temperature Sensor failure:</b>	23 mA
<b>Calibration:</b>	Push-button or programmable via optional communication port
<b>Diagnostics:</b>	Via communication port (echo profile, echo stability, operation errors)
<b>Power AC:</b>	AC units 115 VAC 60Hz or 230 VAC 50Hz, 1.7 VA
<b>Power: DC 3 Wire:</b>	DC units 12 to 30 VDC, 0.07 A max @ 24 VDC
<b>DC 2 Wire Loop Powered:</b>	DC Loop Powered units, 12 to 28 VDC, 0.025 A max @ 24 VDC
<b>Output:</b>	4-20 mA, optional RS-232, RS-485, or Modbus
<b>4 to 20 mA Max. Loop Resistance</b>	110 VAC @ 750 Ohms (isolated) 12 VDC @ 250 Ohms 24 VDC @ 750 Ohms

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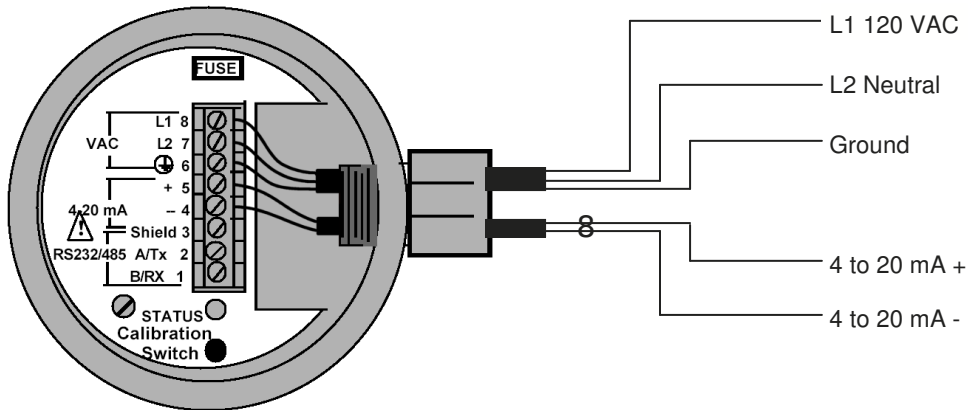
## Operation

The SmartSonic transmitter features high efficiency, narrow beam design technology using a wide frequency bandwidth to enhance operation in difficult applications. The transmitter performs particularly well in harsh environments where vessel temperatures vary. SmartSonic uses smart signal processing to eliminate unwanted echoes from tank walls, standpipes, and other tank structures that often cause error readings by other ultrasonic devices. The unit's transducer uses a built-in, self-cleaning operation to eliminate buildup or condensation. SmartSonic's sensor probes are designed to adapt to the internal tank conditions, automatically adjusting power and receiver sensitivity to any distance and reflecting surface. This technology ensures the same echo is maintained over the entire operating range which enhances measurement accuracy.

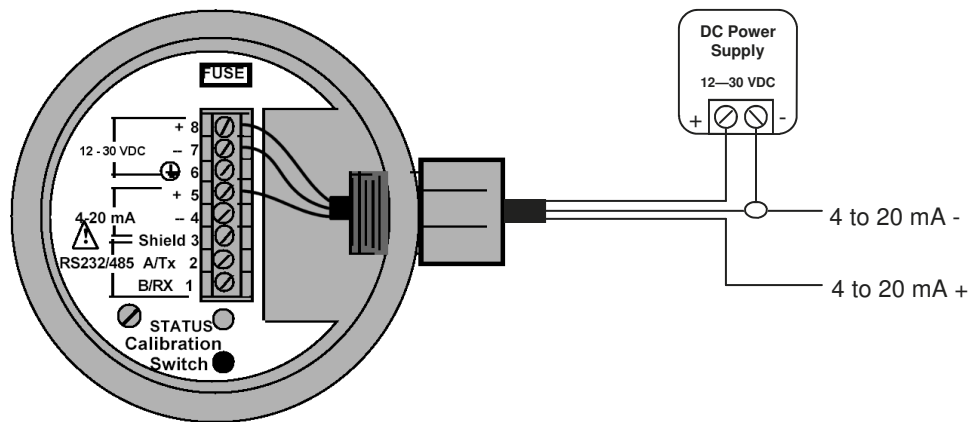
The transmitter can be programmed to simply send a 4-20 mA analog output signal directly to an existing control system or send data by RS-232 or RS-485 to a PC running SmartSonic's calibration/data logging software program.



## AC Wire Diagram



## DC 3 Wire Diagram



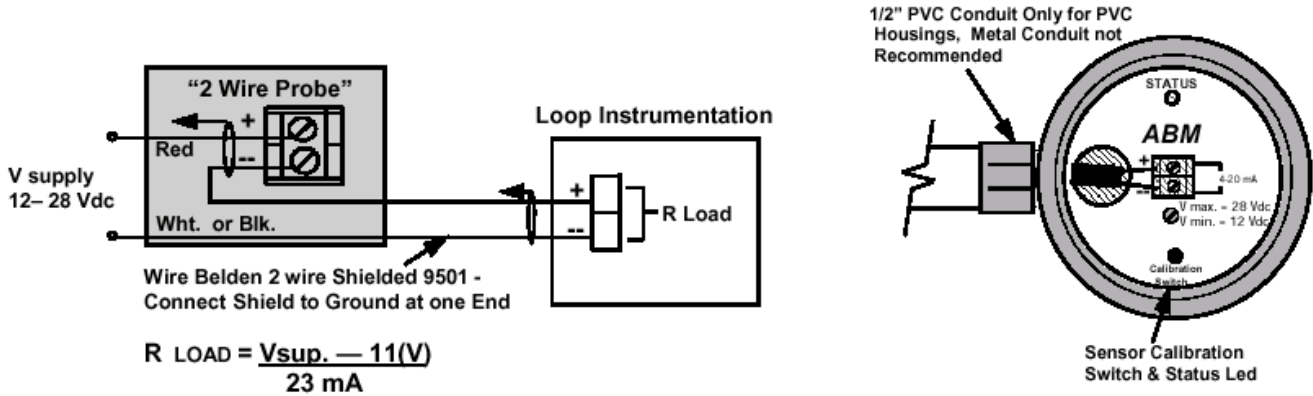
### Wire/Cable for AC Units

115/230 VAC.....3 wire unshielded, 22AWG (7X30), 300V  
4-20 mA.....1 pair shielded, 24AWG (7X32), 300V

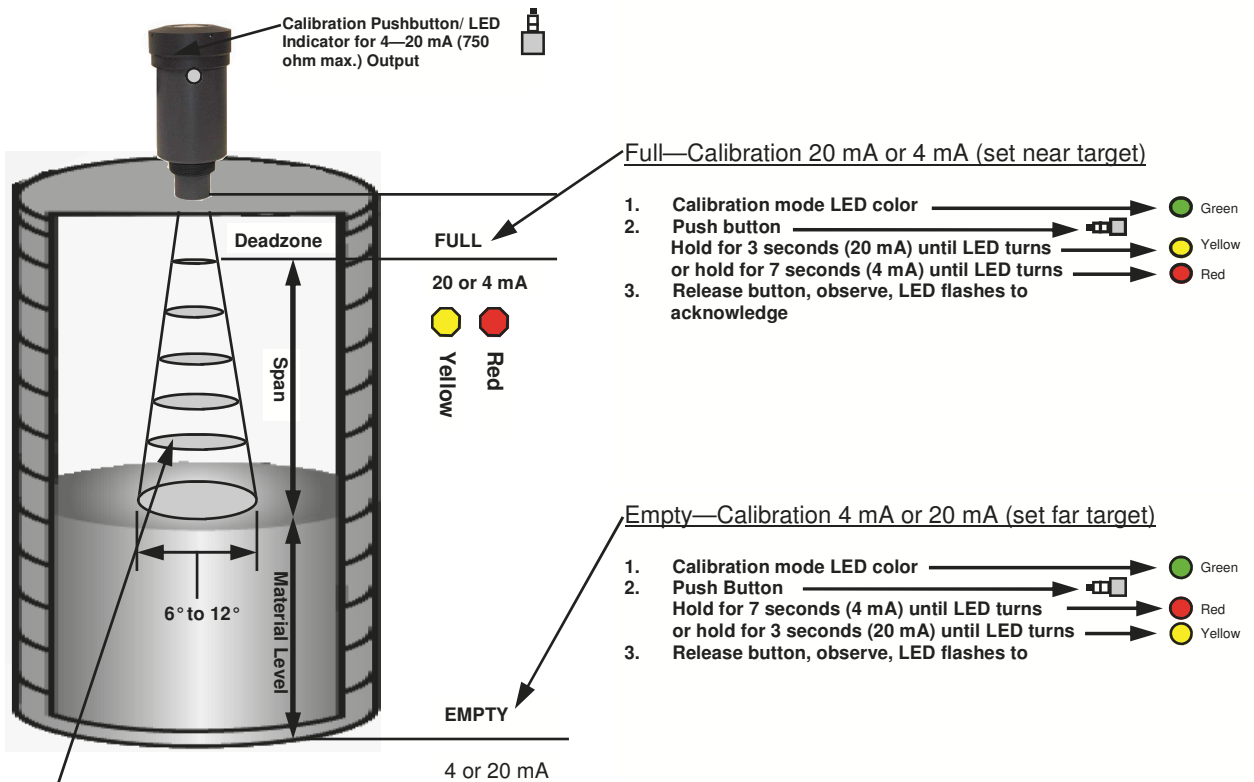
### Wire/Cable Recommendation for 3—Wire DC Units

24 VDC + 4-20 mA.....3 wire shielded, 24AWG (7X32), 300V

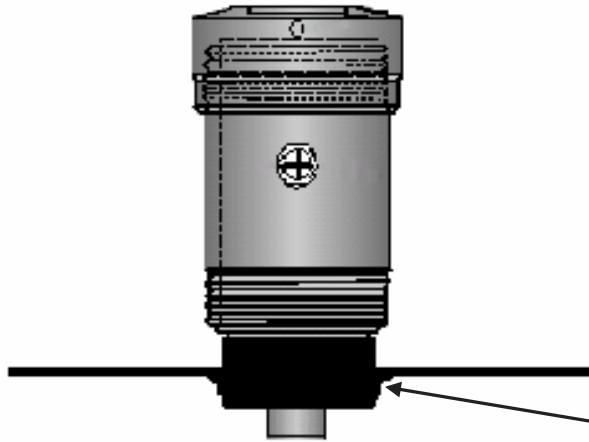
2 Wire DC 4/20 mA Loop Powered



Calibration—4-20 or 20-4 mA Output



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

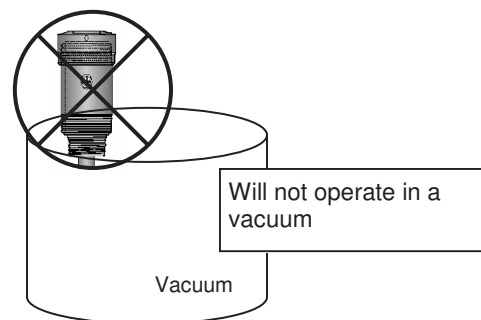
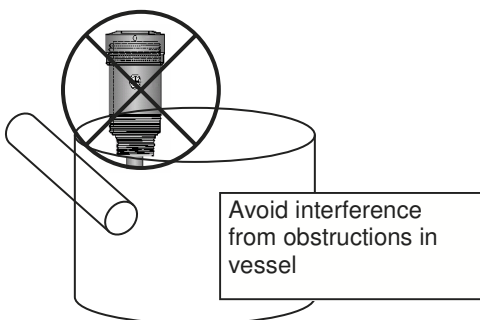
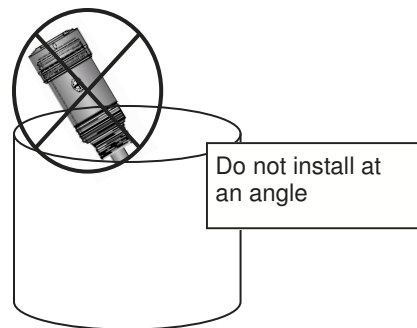
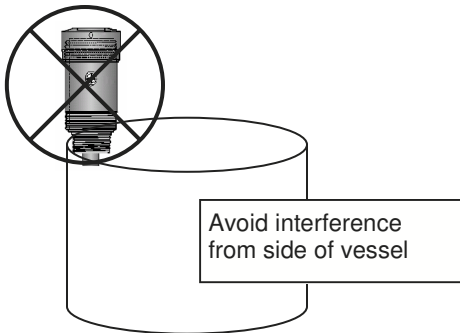


**Mounting:**

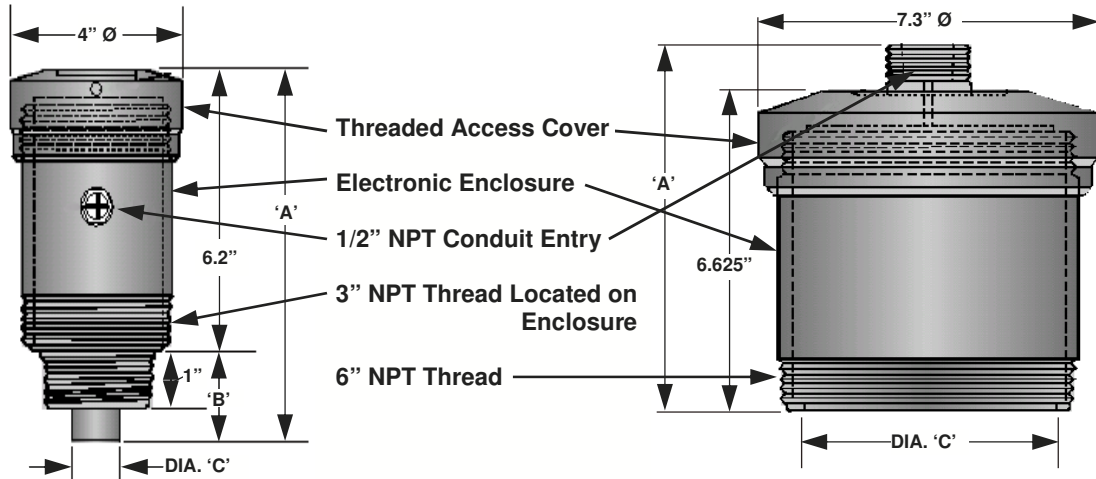
Mounting the SmartSonic Transmitter is critical to the proper operation of the unit. The unit can be directly mounted by simply threading the sensor directly into a metal or plastic mounting flange. If an extended standpipe is used for mounting, please consult the factory for assistance. The thread size of the unit is dependent upon the specific model (see specifications).

Threaded Mounting Flange (1", 1 1/2", 2", or 3" NPT)

**Positioning**





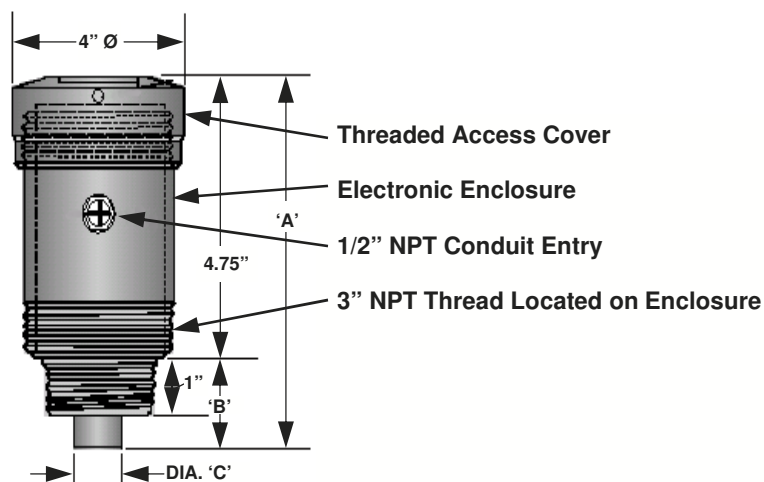


Models SS300/400-45U,52U,70U,80U,81U,and 148U

Model SS300/400-25U Only

	MODEL	RANGE	RESOLUTION	OPERATING FREQUENCY	MOUNTING	DIMENSION 'A'	DIMENSION 'B'	DIMENSION 'C'
110/230 VAC—4 Wire	SS400-25U	1.4-90 ft 0.40-27.4 m	0.41" 10 mm	25 KHz	6.0"/1.0" NPT	7.625"	N/A	5.75"
	SS400-45U	1.0-60 ft 0.30-18.2 m	0.19" 5 mm	45 KHz	3.0" NPT	8.9"	3.0"	3.0"
	SS400-52U	0.9-50 ft 0.27-15.2 m	0.16" 4 mm	52 KHz	3.0" or 2.0" NPT	9.3"	3.05"	2.2"
	SS400-70U	0.8-30 ft 0.24-9.1 m	0.12" 3 mm	70 KHz	3.0" or 2.0" NPT	8.5"	2.25"	1.8"
	SS400-80U	0.7-20 ft 0.21-6.1 m	0.08" 2 mm	80 KHz	3.0" or 2.0" NPT	8.5"	2.25"	1.8"
	SS400-81U	0.6-16 ft 0.18-4.9 m	0.08" 2 mm	81 KHz	3.0" or 1.5" NPT	8.4"	2.1"	1.5"
	SS400-148U	0.4-9 ft 0.12-2.7 m	0.04" 1 mm	148 KHz	3.0" or 1.0" NPT	8.25"	2.0"	1.1"
12 to 30 VDC—3 Wire	SS300-25U	1.4-90 ft 0.40-27.4 m	0.41" 10 mm	25 KHz	6.0"/1.0" NPT	7.625"	N/A	5.75"
	SS300-45U	1.0-60 ft 0.30-18.2 m	0.19" 5 mm	45 KHz	3.0" NPT	8.9"	3.0"	3.0"
	SS300-52U	0.9-50 ft 0.27-15.2 m	0.19" 5 mm	52 KHz	3.0" NPT	9.3"	3.05"	2.2"
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	SS300-80U	0.7-20 ft 0.21-6.1 m	0.08" 2 mm	80 KHz	3.0" or 2.0" NPT	8.5"	2.25"	1.8"
	SS300-81U	0.6-16 ft 0.18-4.9 m	0.08" 2 mm	81 KHz	3.0" or 1.5" NPT	8.4"	2.1"	1.5"
	SS300-148U	0.4-9 ft 0.12-2.7 m	0.04" 1 mm	148 KHz	3.0" or 1.0" NPT	8.25"	2.0"	1.1"

**2 Wire - 4/20mA Loop Powered**



Models SS200-70U,80U,81U,and 148U

MODEL	RANGE	RESOLUTION	OPERATING FREQUENCY	MOUNTING	DIMENSION 'A'	DIMENSION 'B'	DIMENSION 'C'
SS200-70U	0.8—30 ft 0.24—9.1 m	0.12" 3 mm	70 KHz	3.0" or 2.0" NPT	7.05"	2.25"	1.8"
SS200-80U	0.7—20 ft 0.21—6.1 m	0.08" 2 mm	80 KHz	3.0" or 2.0" NPT	7.05"	2.25"	1.8"
SS200-81U	0.6—16 ft 0.18—4.9 m	0.08" 2 mm	81 KHz	3.0" or 1.5" NPT	6.95"	2.1"	1.5"
SS200-148U	0.4—9 ft 0.12—2.7 m	0.04" 1 mm	148 KHz	3.0" or 1.0" NPT	6.8"	2.0"	1.1"

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