SmartSonic

Acoustic Wave Level Transmitters

SmartSonic Acoustic Wave Level Transmitters utilize a breakthrough, patented technology to provide accurate measurement even under harsh conditions. SmartSonic transmitters provide a unique combination of strength, performance and value.

Acoustic Wave Transmitters are suitable for a wide range of level and open channel flow applications. Since this technology does not contact the process media, measuring thick, sticky, and high viscosity fluids is simple. Built-in temperature compensation insures an accurate measurement in applications with varying temperatures.

Kenco Acoustic Wave Transmitters are CSA (SmartSonic Integral) Certified and FM (SmartSonic Remote) Approved for use in hazardous areas. This makes them the perfect choice in many Chemical, Petrochemical and Petroleum applications.

FEATURES	BENEFITS OF OWNERSHIP
5° Beam Angle focuses the Acoustic Wave on process media	Reliable Measurement
Automatic Temperature Compensation	Accurate Operation
Onboard display & keypad	Local viewing of process data
Intrinsically Safe / Non-Incendive	Can be used in Hazardous Areas

APPLICATIONS

- **Hydrocarbons**
- **Solvents**
- **Water**
- **Acids**
- **Caustics**
- **Open Channel Flow**
- **Condensate**
- **Clean Liquids**

INDUSTRIES

- **Chemical**
- **Petroleum**
- **Water/Wastewater**
- **Pharmaceutical**
- **Pulp & Paper**
- **Power**
- **Aerospace**

FM APPROVED

CSA

ENGINEERED LIQUID LEVEL SOLUTIONS

www.kenco-eng.com

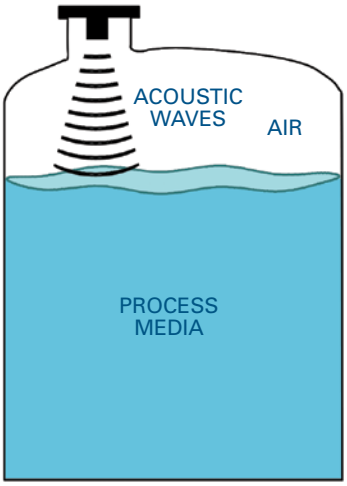
PRINCIPLE OF OPERATION

SmartSonic Transmitters consist of two main components:

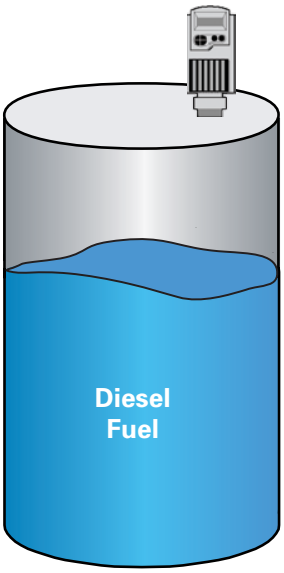
- The Electronics
- The Sensor (Transducer)

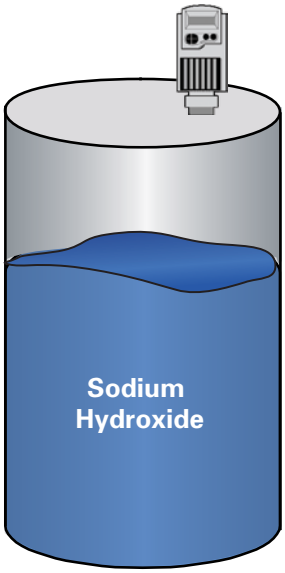
The transducer contains a piezoelectric crystal that converts an electrical signal into acoustic (sound) waves. These acoustic waves are directed through the air toward the process media surface. They are then reflected off of this surface and returned to the transducer. The piezoelectric crystal then converts the received waves into an electrical signal.

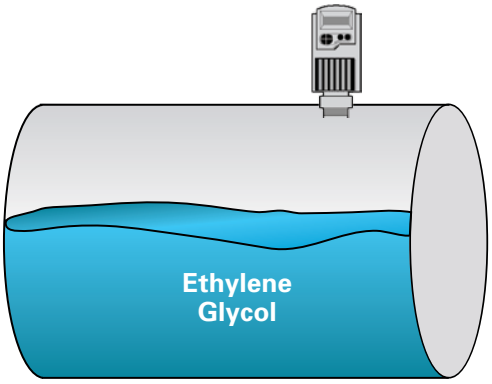
The time difference between the transmitted wave and the received wave is proportional to the distance from the face of the transducer to the process media surface. This distance is used by the electronics to calculate level or open channel flow in the units selected by the operator.

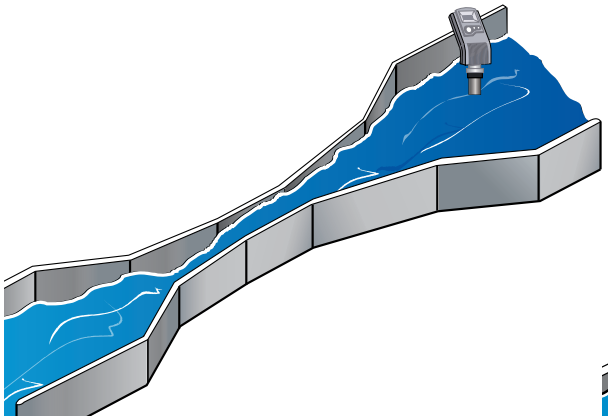


INSTRUMENT MODEL CONFIGURATION

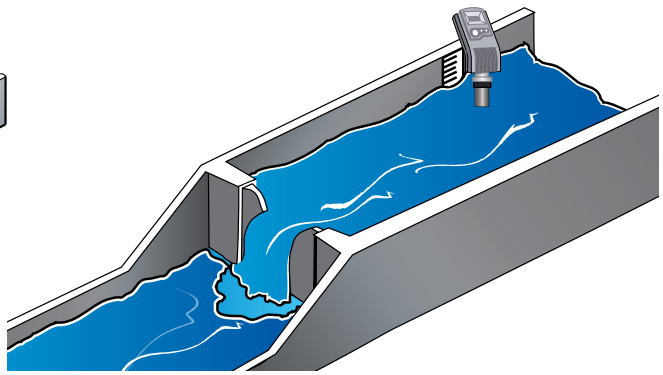








PARSHALL FLUME



CONTRACTED RECTANGULAR WEIR

AGENCY APPROVAL

Agency	Models	Protection Method	Approval
CSA	SmartSonic Integral P2W-L1-ABF-NE P2W-L1-AKF-NE	Intrinsically Safe	Division 1; Class I; Groups A, B, C, D; Class II; Groups E, F, G; NEMA 4X
		Non-Incendive	Division 2; Class I; Groups A, B, C, D; Class II; Groups E, F, G; NEMA 4X
FM	SmartSonic Remote P50-L35V-6N8AE	Non-Incendive	Division 2; Class I; Groups A, B, C, D; Class II; Groups F, G; NEMA 4X

ACOUSTIC WAVE ANGLE

Kenco Acoustic Wave Transmitters produce a 5° conical wave of acoustic energy, which is emitted from the sensor face. This is the tightest focus of energy available anywhere, as compared to other manufacturers Ultrasonic Transmitters. This focused wave provides for a very strong return signal, while allowing for a lower energy transmit wave, resulting in a more reliable measurement with less false echoes.

This low energy focused wave also allows for more flexibility in mounting. The sensor must be mounted in a location that won't allow the wave to touch the wall of the process vessel. Most Ultrasonic Transmitters have a beam angle around 12°. This would require you to mount their sensor further away from the wall, as compared to Kenco's Acoustic Wave Transmitter. The following chart compares the Kenco Transmitter to a standard Ultrasonic Transmitter. All dimensions are in feet.

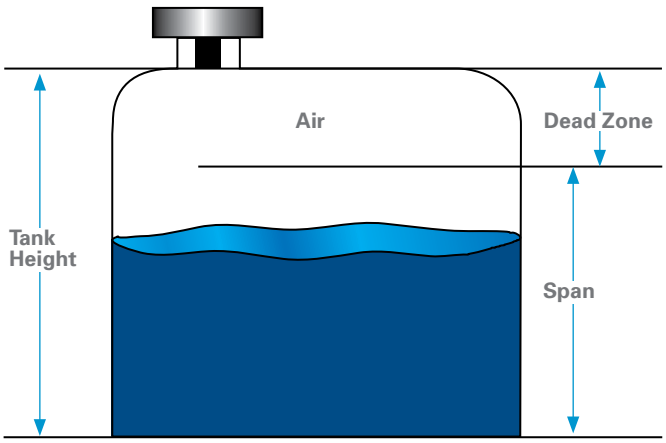
Distance from Sensor Face	Kenco SmartSonic Acoustic Wave Transmitter		Typical Ultrasonic Transmitter	
	5° Diameter Wave	Minimum Distance from Vessel Wall	12° Diameter Wave	Minimum Distance from Vessel Wall
5′	0.44′	0.22′	1.06′	0.53′
10′	0.87′	0.44′	2.13′	1.07′
15′	1.31′	0.66′	3.19′	1.60′
20′	1.75′	0.88′	4.25′	2.13′
25′	2.19′	1.10′	5.31′	2.66′
30′	2.62′	1.31′	6.38′	3.19′
35′	3.06′	1.53′	7.44′	3.72′
40′	3.50′	1.75′	8.50′	4.25′
45′	3.94′	1.97′	9.56′	4.78′
50′	4.37′	2.19′	10.63′	5.32′

MEASURING RANGES

Tank Height

SmartSonic Integral
Short Range – 16.4 ft.
Long Range – 49. ft.

SmartSonic Remote
Std. Range – 39.4 ft.



Minimum Dead Zone

SmartSonic Integral
Short Range – 0.8 ft.
Long Range – 1.9 ft.

SmartSonic Remote
Std. Range – 1.3 ft.

Measurement Range

SmartSonic Integral
Short Range – 15.6 ft.
Long Range – 47.3 ft.

SmartSonic Remote
Std. Range – 38.1 ft.

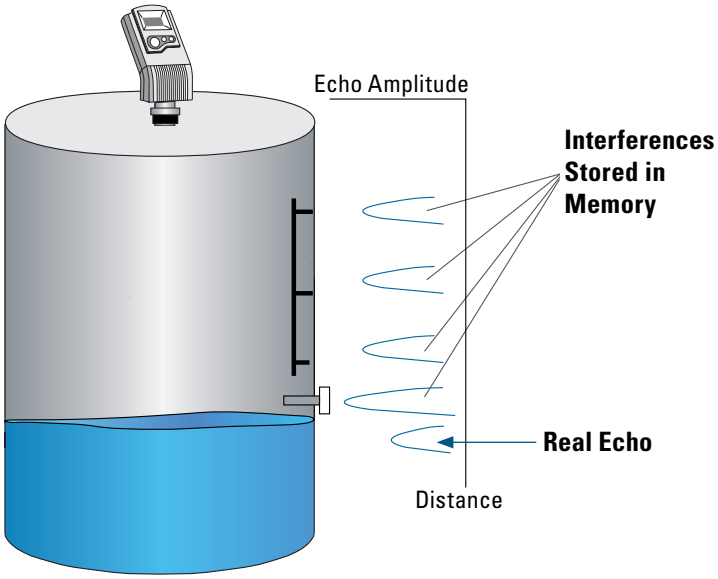
SMARTSONIC INTEGRAL

The SmartSonic Integral is a 24Vdc, two-wire, loop powered transmitter capable of ranges up to 49 feet. The electronics and sensor are contained in a simple, integral package, making installation a breeze.

MODEL NUMBERS

P2W-L1-ABF-NE – Integral with 2" Polypropylene Sensor
P2W-L1-AKF-NE – Integral with 2" PVDF (Kynar) Sensor

DEFINING INTERFERENCE SIGNALS



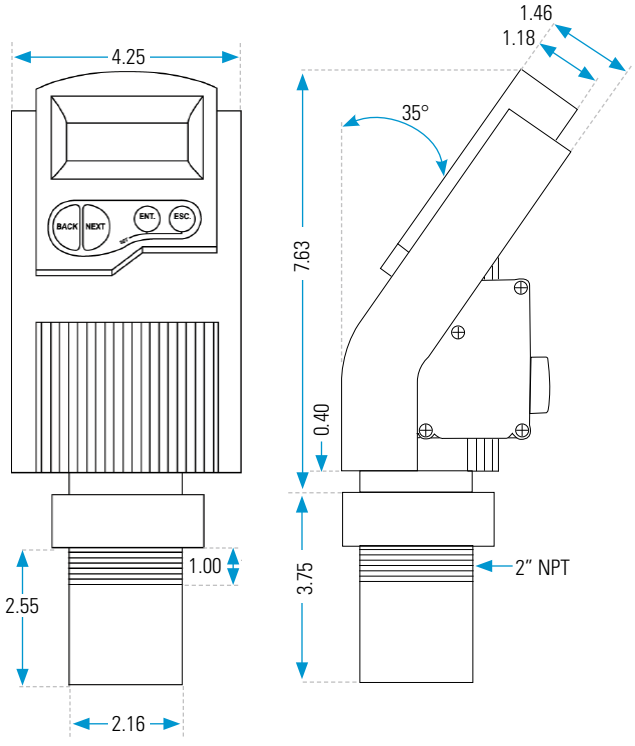
The SmartSonic Integral Transmitter has the ability to locate and store up to six interfering signals (false echoes) in memory. This allows the transmitter to ignore obstructions such as a ladder, man-way entry, side-mounted sensors, etc.

Each reading is stored as a false echo, until a reading is achieved that indicates the real echo. This program must be run with the vessel empty. If more than six false echoes are recorded before the real echo, the transmitter must be relocated.

SPECIFICATIONS

Description		Specification
Power Supply		12-28 Vdc
Maximum Range	Short Range	16.4 feet
	Long Range	49.2 feet
Minimum Dead Zone	Short Range	0.8 feet
	Long Range	1.9 feet
Maximum Span	Short Range	15.6 feet
	Long Range	47.3 feet
Frequency		25 kHz
Output Signal		4-20mA
Loop Resistance		750Ω @ 28Vdc
Diagnostic / Failure Alarm		22 mA
Wave Angle		5° @ 3db
User Interface	Display	4 Character LCD
	Keypad	4 Button
Process Connection		2" NPT
Temperature Range		-40°F to 158°F
Accuracy		±0.25% of max. range
Resolution		0.04" (1 mm)
Enclosure Material		ABS + UV
Transducer Material		ECTFE coated aluminum
Cable Entry		½" NPT
Weight		3.1 lbs

DIMENSION – INCHES



SMARTSONIC REMOTE

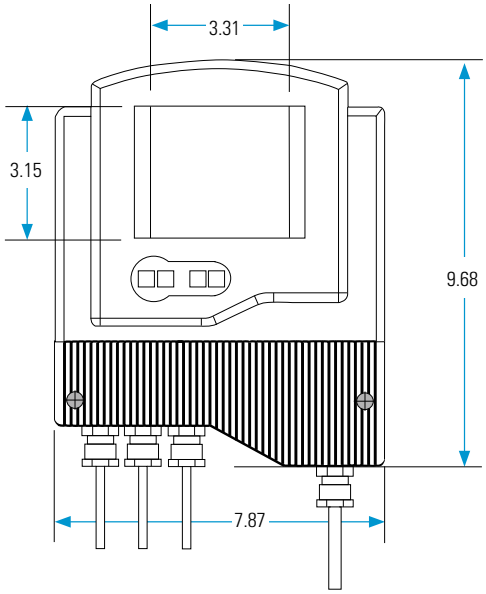
The SmartSonic Remote is a 100-230Vac powered transmitter. The sensor is separate from the electronics, and can be mounted up to 328 feet away from the electronics. The SmartSonic Remote also comes standard with (5) SPDT Relays for alarm or pump control.

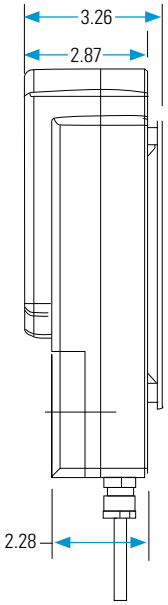
Just like the SmartSonic Integral, the SmartSonic Remote can locate and store interfering signals (false echoes). In fact, the SmartSonic Remote can store up to eight false echoes in memory.

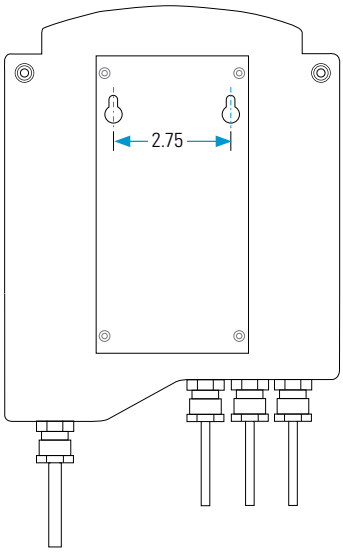
MODEL NUMBERS

P50-L35V-6N8AE - Remote Transmitter
PN5-XGB-1-C – 1" NPT Polypropylene Transducer
PN5-XGD-1-C – 1" NPT PVDF (Kynar) Transducer
KAWC-xx – Remote Cable (xx = Length in Feet)
ACC-I – Remote Cable Connector

DIMENSION – INCHES



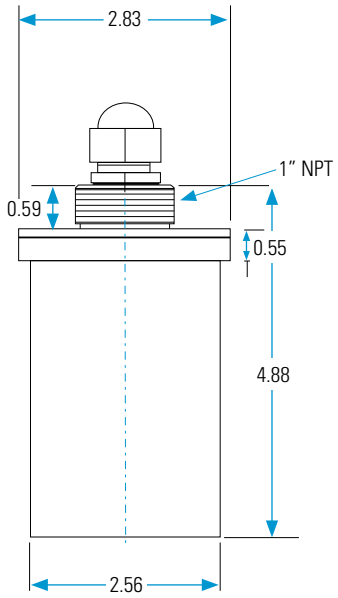




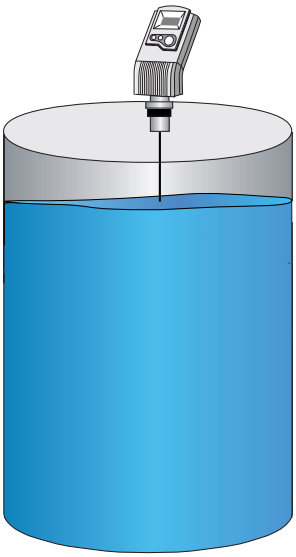
SPECIFICATIONS

Description		Specification
Power Supply		100-230 Vac
Maximum Range		39.4 feet
Minimum Dead Zone		1.3 feet
Maximum Span		38.1 feet
Frequency		50 kHz
Output Signal	Analog	4-20mA
	Digital	RS-422; MODBUS-RTU
	Discrete	(5) SPDT Relays
Relay Ratings	AC	2A @ 220Vac
	DC	2A @ 30Vdc
User Interface	Display	Graphical LCD
	Keypad	4 Button
Wave Angle		5° @ 3db
Mounting Connection		1" NPT
Temperature Range	Ambient	-40°F to 140°F
	Process	-40°F to 212°F
Accuracy		±0.2% of max. range
Resolution		0.04" (1 mm)
Enclosure Material		ABS + UV
Transducer Housing Material		Polypropylene or PVDF
Transducer Material		Glass Reinforced Epoxy
Cable Length (Default 16.4 ft.)		up to 328 ft. (std.); up to 656 ft. (opt.)
Weight	Electronics	2.4 lbs
	Sensor	1.1 lbs.

TRANSDUCER

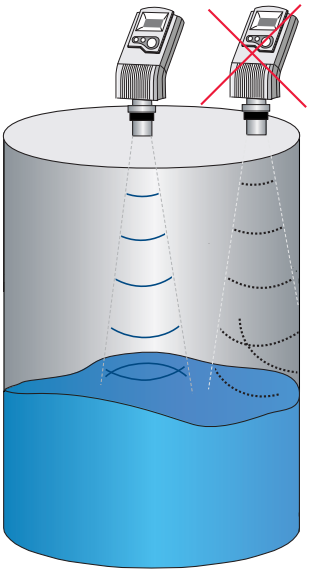


MOUNTING CONSIDERATIONS



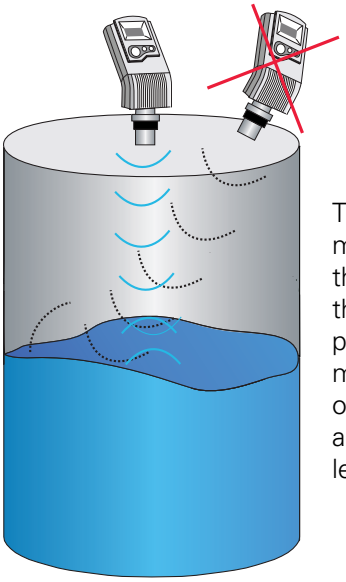
The transmitter must be mounted in such a way, as to prevent the process fluid level from entering the Dead Zone.

If the level enters the Dead Zone, an error will occur, and the transmitter will not measure the fluid level



While the narrow wave diameter of the Kenco Acoustic Wave Transmitters allows you to mount the sensor closer to the vessel wall, than other Ultrasonic transmitters, it is recommended to mount the sensor at least 1.64 feet away from the wall.

The sensor needs to be mounted as far away as possible from processes that can interfere with the Acoustic Wave. This example shows a fluid filling inlet.



The sensor must be mounted perpendicular with the process fluid level. Even the slightest mounting off perpendicular will affect the measurement. Anything over 4° will usually result in a loss of echo or at the very least, an inaccurate reading

HOW TO PROCEED

Selecting a new Kenco Acoustic Wave Level Transmitter for your application is a snap!

1. Contact your local Kenco Representative and ask for an Applications Data Sheet.
2. Complete the sheet
3. Return the sheet for evaluation

An experienced Applications Engineer will evaluate your application, and select the best instrument to meet your needs. That's it!! It is that simple. So what are you waiting for?

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