

NUS ULTRASONIC LEVEL TRANSMITTER



Flow
Pressure
Level
Temperature
measurement
monitoring
control



N2

- Measuring Ranges to 23 feet in Liquids, 11.5 feet in Solids
- Narrow 5.5° Beam Angle
- PVDF Wetted Parts
- Accuracy 0.25% of Full Scale
- 2-Wire and 4-Wire Versions



USA

KOBOLD Instruments Inc.
1801 Parkway View Drive
USA-Pittsburgh, PA 15205
☎ +1 412-788-2830
Fax +1 412-788-4890
E-mail: info@koboldusa.com



CANADA

KOBOLD Instruments Canada Inc.
9A Aviation
Pointe-Claire, QC H9R 4Z2
☎ +1 514-428-8090
Fax +1 514-428-8899
E-mail: kobold@kobold.ca

Visit KOBOLD Online at
www.kobold.com

Model:
NUS

Features

- Measuring ranges to 23 feet in liquids, 11.5 feet in solids
- Narrow 5.5° beam angle
- PVDF wetted parts
- Accuracy 0.25% of full scale
- 2-wire and 4-wire versions

The NUS series ultrasonic level transmitter is the ideal choice for continuous non-contact level measurement in liquids or coarse grained, or pelletized solids. This non-contact level measurement technique allows reliable measurement of dirty, viscous, and coating medium. The NUS series boasts an extremely narrow beam cone allowing for measurements in tall tanks while minimizing the chances of problems due to obstructions in the tank.

The NUS comes in DC powered 2-wire transmitter or an AC powered 4-wire transmitter version. A front panel mounted LED level indicator is standard.

Advanced Features

The NUS series offers many advanced features including 11-point linearization, fixed echo suppression, automatic stirrer echo suppression and output damping. These features allow the NUS series to be used in applications which render most other ultrasonics useless. Calibration and setup is a simple task performed using a push-button driven menu.

Specifications

Maximum Pressure: 40 PSIG
Process Temperature: -40°F to 176°F
Measuring Ranges: See table
Accuracy: 0.25% of Max. Range
Resolution: ±0.12"
Fitting/Sensor Material: PVDF
Housing material: Epoxy coated aluminum, polycarbonate
Operating Frequency:
 1-1/2" NPT: 70 KHZ
 2" NPT: 50 KHZ
Beam Cone Angle: 5.5°
Output: 4-20mA 2-wire or 4-wire depending on model number



KOBOLD NUS Ultrasonic Level Transmitter

Maximum Loop Load:	600 ohms	Electric Connection:	1/2" NPT conduit
Power Requirements:	12-36 VDC (2-wire) or 90-127 VAC (4-wire) depending on model number	Electrical Protection:	NEMA 4X/IP65
		Display (optional):	4-digit LED

NUS Measuring Ranges

Model	Measuring Range	
	Liquids	Solids
NUS-XX81 & NUS-XX83 (2" NPT)	1.3 to 23.0 ft.	1.3 to 15ft.
NUS-XX51 & NUS-XX53 (1-1/2" NPT)	0.8 to 13.1 ft.	0.8 to 6.6 ft.

NUS Ordering Information

Description	Fitting Size NPT	Model Number	
		w/out Display	w/ Display
12-36 VDC, 2-wire	1-1/2"	NUS-1053N	NUS-2053N
90-127 VAC, 4-wire	1-1/2"	NUS-1051N	NUS-2051N
12-36 VDC, 2-wire	2"	NUS-1083N	NUS-2083N
90-127 VAC, 4-wire	2"	NUS-1081N	NUS-2081N

Installation Guidelines

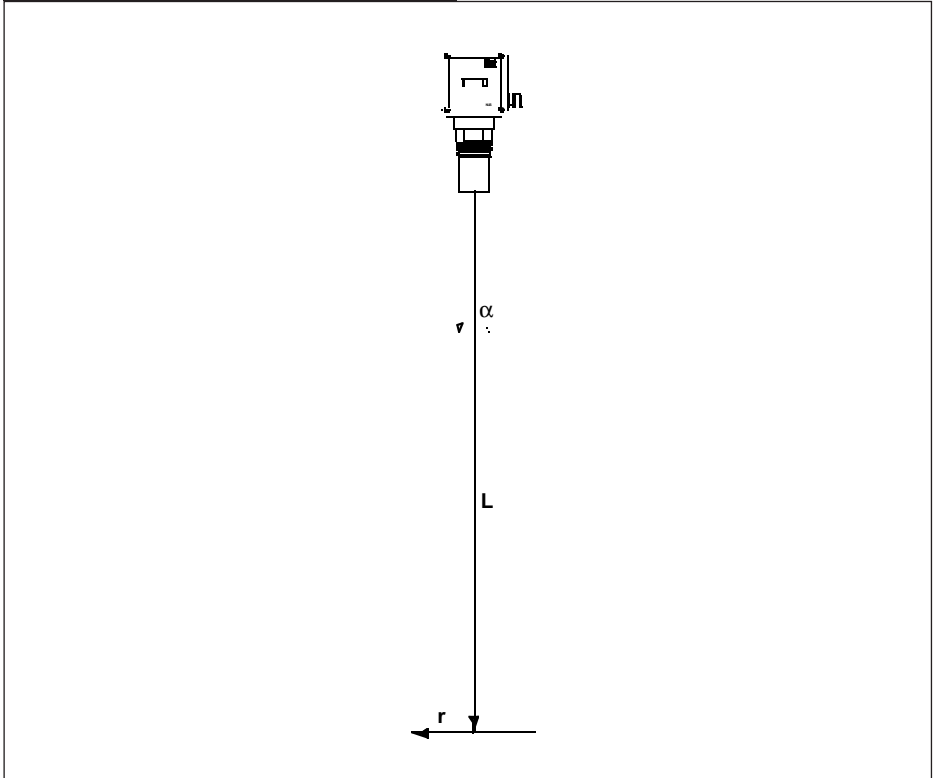
Beam Cone Interference

The ultrasonic pulse propagates from the transducer face at a beam angle α of 5.5° . Any object (i.e. piping, nozzles etc.) which is within the radius, r of the beam cone can cause interference echo returns (see sketch). While it is the best practice install the transducer such that there are no obstructions within the beam cone, the fixed target suppression function may eliminate false echoes caused by obstructions. The beam cone radius, r for any distance from the transducer face is given by:

$$r = L \times 0.048 \text{ where,}$$

r = beam cone radius in inches
 L = distance from transducer face in inches

Beam Cone Interference



N2

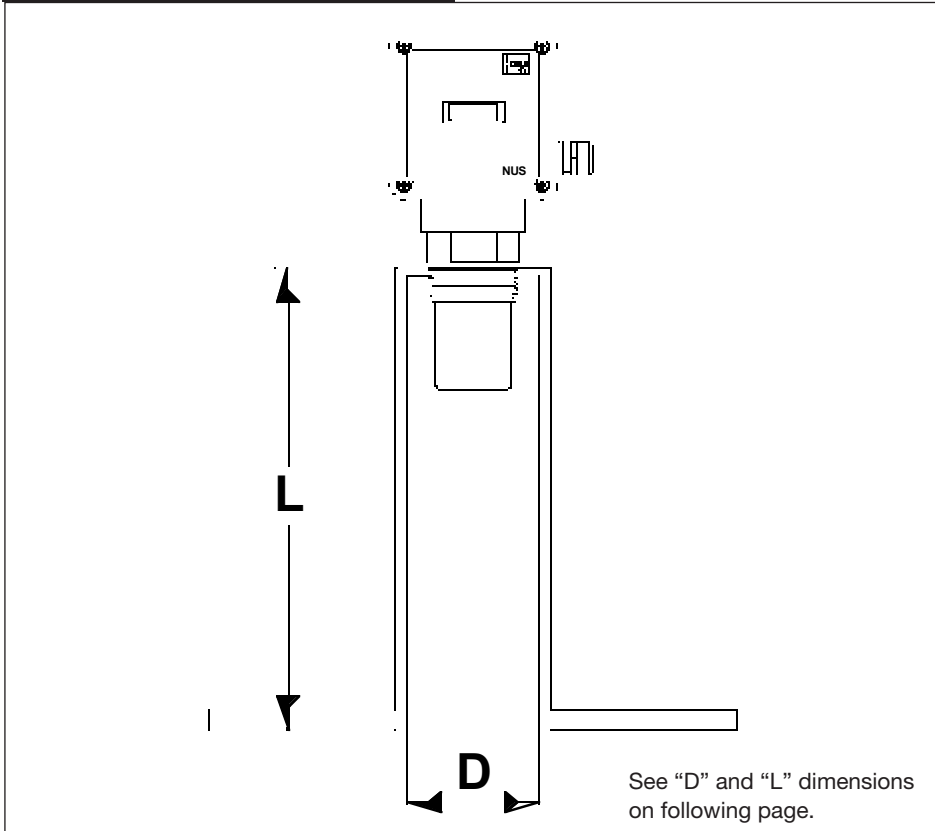
Transducer Deadband

When an ultrasonic transducer pulses, there is a transition period between the time that the pulse is sent and the time that the transducer is able to receive returns. This period of time equates to a specific distance from the transducer face within which echoes cannot be heard. Within the deadband, level cannot be sensed. The deadband specifications for the NUS series are as follow:

Fitting Size	Deadband
2" NPT	1.3 feet
1-1/2" NPT	0.8 feet

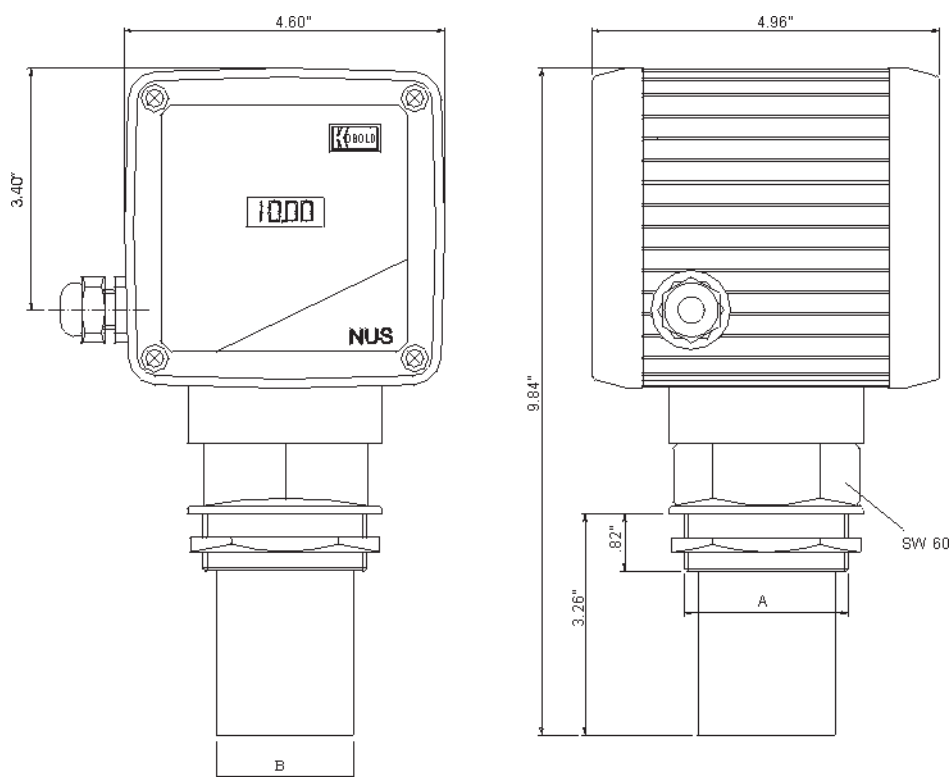
If it is undesirable to lose this amount of measuring capability at the top of a tank, the NUS can be mounted in a nozzle to elevate the transducer above the tank and compensate for the level indicating capability lost by the deadband. The interior surfaces of the nozzle must be smooth and cannot have any edges, couplings, weld seams, etc. Ensure that material or condensation do not build up on the nozzle.

Transducer Deadband



See "D" and "L" dimensions on following page.

Dimensions



Model	A	B
NUS-XX81 & NUS-XX83	2" NPT	2"
NUS-XX51 & NUS-XX53	1-1/2" NPT	1-1/2"

Maximum Nozzle Length		
Fitting Size	D	Max. L
1-1/2" NPT	2"	6"
1-1/2" NPT	3"	9.5"
1-1/2" NPT	4"	15"
2" NPT	3"	9.5"
2" NPT	4"	15"

See Transducer Deadband drawing on previous page.