



Technology Solutions

TEK-FLEX 4100A

Explosion-Proof Guided Wave Radar Level Transmitter



LEVEL



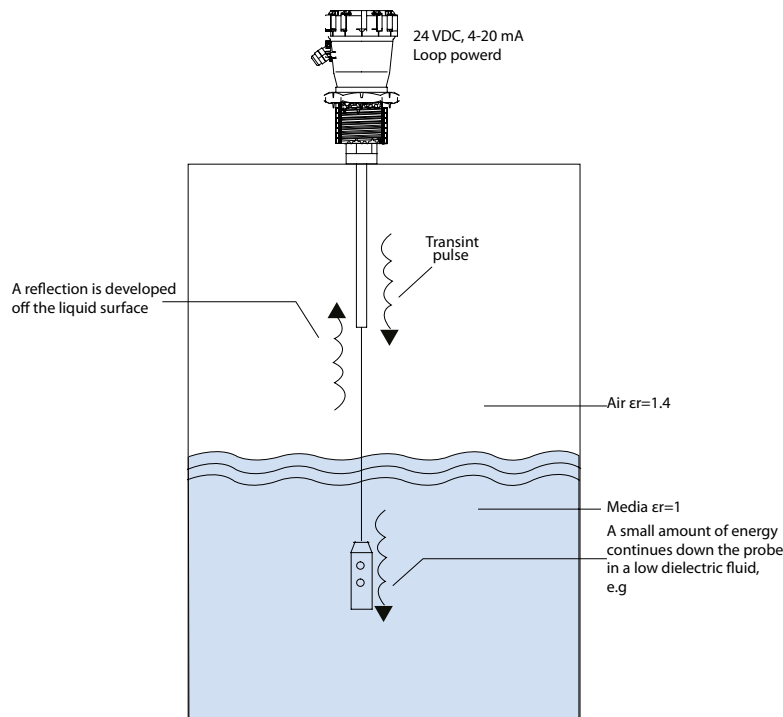
Introduction

Featuring TDR (Time Domain Reflectometry) technology, the Tek-Flex 4100A Explosion-Proof Guided Wave Radar level transmitter provides continuous level measurement in liquids, solids, and slurries. This innovative device has almost no installation restrictions in tanks, silos, and bins up to 65 feet. The Tek-Flex 4100A has a fully isolated 4-20 mA output that can be scaled for tank level or distance. The unit requires 18 to 30 VDC power. The Tek-Flex 4100A ships precisely pre-calibrated for the customer's application for quick installation and setup. TDR technology is not affected by pressure, vacuum, temperature, viscosity, foam, or dust. Changes in dielectric constant or coating of the probe do not affect the level measurement due to the dynamic sensing technology programmed into the artificial intelligence of the Tek-Flex 4100A level transmitter.

Working Principle

Tek-Flex 4100A Explosion-Proof Guided Wave Radar's principle is solely based on microwave technology. Probe is immersed in the liquid or bulk media. High frequency electromagnetic pulses transmitted down the probe are reflected at the point of discontinuity between the air and the process medium. Reflections are measured by high-speed circuitry in the transmitter and establish the measurement level. Microwaves accuracy are not affected by temperature variations, dust, pressure, and viscosity except materials that are used in the tank or chambers. The device sends a low energy microwave pulse down the probe. When the pulse and media come in contact, a constant amount of energy is reflected back up the probe to the device. The level is directly proportional to Time Domain Reflectometry. The transmitter measures the time delay between the transmitted and received echo signals and the on-board microprocessor in the transmitter calculates the distance to the liquid using the formula:

$$\text{Distance} = (\text{speed of light} * \text{time delay})/2$$



Benefits

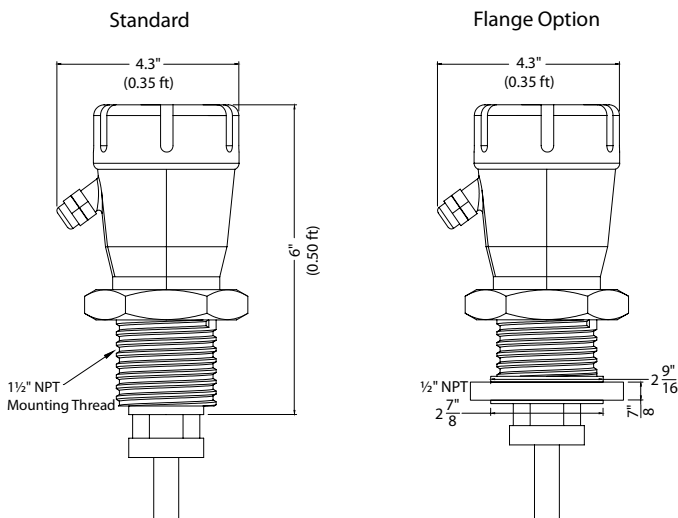
- Revolutionary TDR Technology
- Auto calibration to any dielectric
- Precise continuous level measurement
- Measures liquids, slurries, and solids
- Highly robust measurement due to the 4-wire design, and innovative signal analysis, and constant disturbance signal suppression
- Optional NEMA 7 enclosure for Class 1 Div 1 areas
- Measures up to 10 feet
- Pre-calibrated from factory for easy installation
- High temperature applications
- Programmable fail safe mode
- Economically priced

Applications

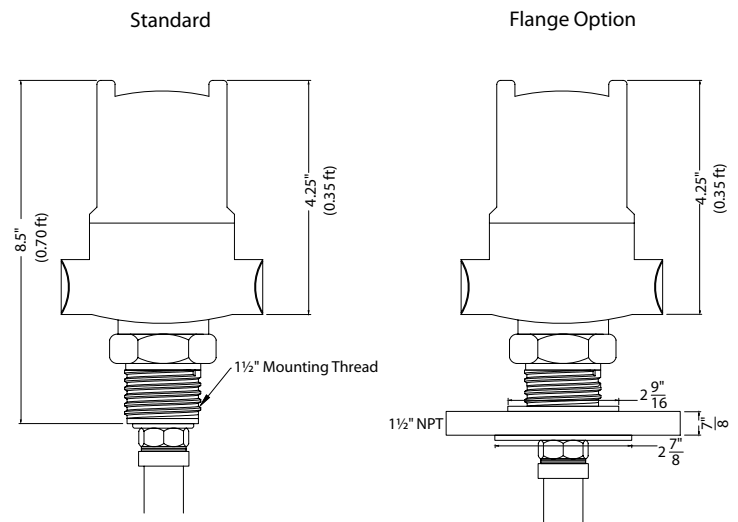
- Iron and steel Industry
- Oil and gas production Industry
- Power Generation Industry
- Pulp and paper Industry
- Chemical Industry
- Food & Beverage Industry

Dimensional Drawing

Nema 4 Enclosure



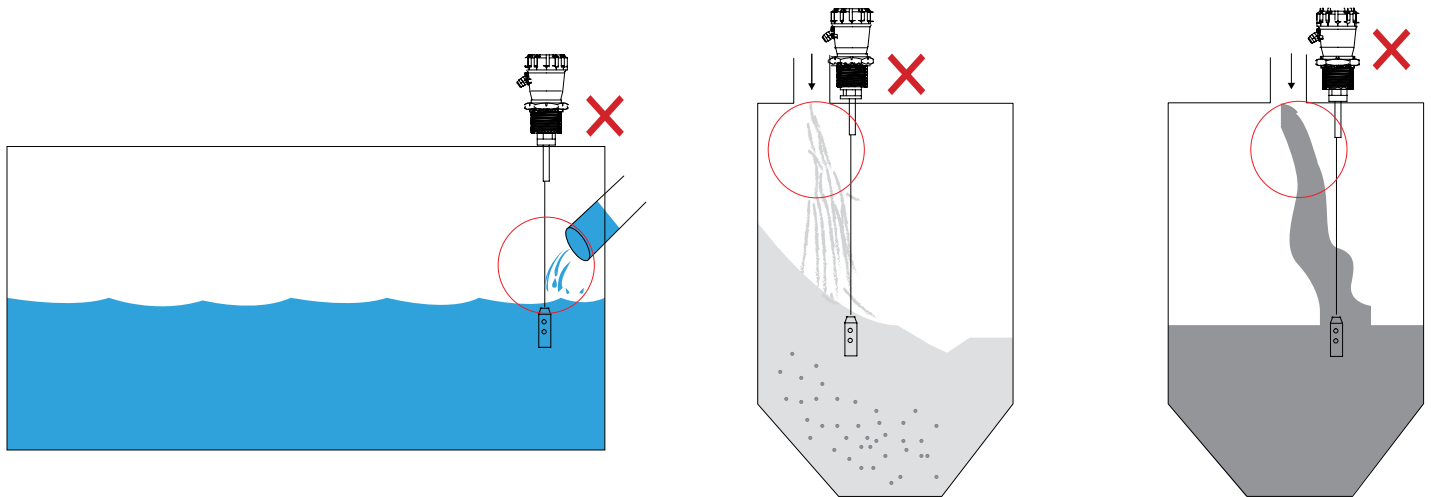
Nema 7 Enclosure



Specifications

Signal Output	Isolated 4-20 mA
Fail Safe Output	3.8 mA, 4 mA, Last Known, 20 mA, 20.2 mA
Operating Voltage	12-30 VDC (residual ripple no greater than 100 mV)
Power Consumption	<3W @ 24 VDC
Communications	RS485 Modbus
Measurement Range	10' with minimum dielectric constant of 0.3
Repeatability	±0.02" (0.001 ft)
Max Operating Temperature	Electronics: -40 °F to 158 °F (-40 to 70 °C) Process/Probe: -40 °F to 398 °F standard
Max Operating Pressure	-14.50 PSI to 580 PSI
Accuracy	±0.039" (0.003 ft) or 0.02% of measured distance, whichever is greatest.
Resolution	0.0008"
Signal Wiring	Recommended Signal Output and Communications Output is Twisted Shielded Pairs, 20-18 AWG
Probe Type/Diameter	Rod Probe: 316 Stainless Steel, 0.25" diameter Wire Cable Probe: 316 Stainless Steel, 0.195" diameter Weighted Assembly: 0.75" diameter
Tensile Load	4,270 lbs
Enclosure	NEMA 6: Coated Epoxy Aluminum with IP67 Sealing NEMA 7: Class 1, Group D Class 2, Group E, F and G Class 3, DIV. 1 and 2
Cable Entries	2 ½" NPT Conduit Entries

Installation



- Minimum nozzle diameter should be 2" from the probe at initial installation.
- Probes should not come in contact with the metallic tank walls, obstructions or structures.
- If using cable probes, take into account the possibility of cable sway encroaching clearance requirements of agitators and augers. If this possibility occurs, secure a ring or mounting connection to the cable weight and to the vessel floor.



Tek-Flex 4100A with $\frac{3}{4}$ " NPT mounting in liquids, slurries, or solids applications

Model Chart

Example	Tek-Flex 4100A	050	W	N6	0	1	048	N	Tek-Flex 4100A-050-W-N6-0-1-048-N
Series	Tek-Flex 4100A								Explosion-Proof Guided Wave Radar Level Transmitter
Probe Range (Up to 120")		XXX							Probe Range in Inches
Probe Type			R T W X C						316 SS Rod (120" max.) 316 SS PTFE Coated Rod (120" max.) Wire Cable (720" max.) PTFE Coated Wire Cable (720" max.) 316 SS Coaxial (120" max.)
Enclosure Rating				N6 XP					NEMA 6 Explosion Proof
Process Connection					0				¾" NPT
Conduit Entries						1 2 3			Two ½" NPT Two Cable Glands One ½" NPT and One Cable Gland
Probe Length							XXX		Probe Length in Inches
Option								N T	None Extreme Temperature -320 °F to 500 °F (-195 °C to 260 °C)

Customer Service and Support



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DOC # TEK/AK/180202/TEK-FLEX/1101



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