Guided Wave Radar Application Guidelines

Model 3300 Differentiating Features

- The first 2-wire Guided Wave Radar (GWR) that can measure both level and interface.
- Fully rotating, dual compartment head protects electronics from moisture
- Electronics housing can be separated from an installed probe
- Dynamic Gain Optimization™ eases setup by adjusting single strength to match application
- High capacity, power-efficient micro-controller increases measurement reliability and capability on a 2-wire platform
- Radar Configuration Tool with installation wizard and waveform plot provides easy configuration and service

Application Advantages of GWR

- Measures level directly - not impacted by changes in density, dielectrics, or conductivity
- Measures vaporous materials
- No moving parts
- Measures Interface Applications
- Measures in small tanks, geometrically difficult tank, and long nozzles
- Displacer and capacitance are easily replaced
- Measures foam better than non-contacting radar
- Handles turbulent and low dielectric fluids
- Measures solids, powders, and granules

Interface Application Guidelines

- Lower dielectric fluid must be on top.
- The two liquids must have a dielectric difference of at least 10
- The upper layer dielectric must be known (In-field determination is possible)
- The upper fluid layer thickness must be at least 4-in. (1 dm) for rigid probes and 8-in. (2 dm) for flexible probes for the interface to be detectable
- The maximum thickness of the upper layer is dependent upon its dielectric
- Coax or twin lead styles available
- Target applications, low upper layer dielectric (< 3), high lower layer dielectric (> 20)

Probe Styles

Coax Probes

Common Uses:

- Mini stilling well and isolates the probe from external conditions
- Low dielectric and high turbulent applications
- Foam requires isolation from liquid surface
- The tank installation is geometry restricted
- Where inlet fluid flow may contact the probe
- Clean liquids only

Avoid Using:

- With sticky, viscous, coating media

Twin Lead Probes and Cables

Common Uses:

- Top-of-foam measurement is desired
- When the coax probe cannot be used

Avoid Using:

- With media that coats

Single Lead Probes and Cables

Common Uses:

- Only option for powders and granules
- Sticky and viscous media

Avoid Using:

- For interface applications
- With restrictive nozzles
- Where the probe may contact walls or obstacles

Table 1: Model 3300 Series Guided Wave Radar Probe Selection Guide

Measurements	Coaxial	Rigid Twin	Flexible Twin	Rigid Single	Flexible Single
Level	G	G	G	G	G
Interface (liquid/liquid)	G	G	G	NR	NR
Process Medium Characteristics					
Changing density	G	G	G	G	G
Changing dielectric (see note 1)	G	G	G	G	G
Wide pH variations	G	G	G	G	G
Pressure changes	G	G	G	G	G
Temperature changes	G	G	G	G	G
Condensing vapors	G	G	G	G	G
Bubbling/ boiling surfaces	G	G	AP	G	AP
Foam (mechanical avoidance)	AP	NR	NR	NR	NR
Foam (measurement of top of foam)	NR	AP	AP	AP	AP
Foam (measurement of foam and liquid)	NR	AP	AP	NR	NR
Clean liquids	G	G	G	G	G
Liquid with dielectric < 2.5	G	AP	AP	NR	AP
Coating liquids	NR	NR	NR	AP	AP
Viscous liquids	NR	AP	AP	AP	G
Crystallizing liquids	NR	NR	NR	AP	AP
Solids, granules, powders	NR	NR	NR	G	G
Dust	NR	NR	NR	G	G
Tank Environment Considerations					
Probe will be close (<12in./30cm) to tank wall/disturbing object	G	AP	AP	NR	NR
High turbulence	G	G	AP	G	AP
Turbulent conditions causing breaking forces	NR	NR	AP	NR	AP
Long and small mounting nozzles (diameter < 6 in (15 cm) and height > diameter + 4 in (10 cm))	G	AP	NR	NR	NR
Angled or slanted surface (viscous or solids materials)	NR	AP	AP	AP	G
Liquid or vapor spray may touch probe	G	NR	NR	NR	NR
Disturbing EMC environment in tank	AP	NR	NR	NR	NR

Note 1) For overall level applications, a changing dielectric has no affect on the measurement. For interface measurements, a changing dielectric in the top fluid will degrade the accuracy of the measurement.

G = Good
AP = Application Dependent
NR = Not Recommended

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