

Summary of Continuous Level and Point Level Detection Technology Advantages and Limitations

TECHNOLOGY	LIQUIDS	SOLIDS	ADVANTAGES	LIMITATIONS
Differential Pressure – purged bubbler system	X		Suitable for turbulent surfaces, foams, heavy vapor space.	Introduction of purge gas into process. Viscous materials. Hydrostatic head; must account for minimum density.
Differential Pressure – diaphragm seals and capillary tubes	X		No moving parts. Suitable for turbulent surfaces, foams, heavy vapor space.	Lower process connection. Hydrostatic head; must account for minimum density. Fill fluid limits maximum temperature.
Non-Contact Radar	X	X	No moving parts. No contact with process media.	Foams, heavy vapors may impact the signal. Vessels with significant obstructions or internals may cause false echoes.
Guided Wave Radar	X	X	No moving parts. Suitable for turbulent surfaces, foams, heavy vapor space.	Internal wave guide – consider installation feasibility from both an internal and external perspective. High-viscosity materials may coat wave guide creating false echoes. Low-dielectric materials.
Magnetostrictive	X		Not impacted by vapor space.	Internal probe with moving parts – consider installation feasibility from both an internal and external perspective. High-viscosity materials, water under freezing conditions, and rapid level changes may impact the operation of the magnetic float. Density changes.
Ultrasonic	X	X	No moving parts. No contact with process media. Suitable for low-dielectric fluid applications.	Unable to be used in full vacuum applications. Dust, heavy vapor, and foam may impact the signal. Pressure, temperature, and vapor composition impact the measurement. Turbulence may dampen the response.
Capacitance/Radio Frequency (RF) Admittance	X	X	No moving parts. Suitable for high-temperature, high-pressure, harsh environments.	Internal probe – consider installation feasibility from both an internal and external perspective. Measurement impacted by changing dielectric and heavy foam. Coating may dampen the response.
Laser	X	X	No moving parts. No contact with process media. Narrow, focused beam.	Dust, heavy vapor, and foam may impact the signal. Clear, still fluids may not return the surface signal.
Nuclear	X	X	No moving parts. Noninvasive – no process connection needed and no contact with process media. Suitable for high-temperature, high-pressure, harsh environments and materials.	Expensive. Radiation safety officer, licensing, maintenance, and handling requirements. Level impacted by density changes.
Load Cells (weight)	X	X	External to the vessel. No contact with process media and not impacted by process conditions.	Difficult for retrofit applications.
Float or Displacer Switch	X			Mechanical moving parts without diagnostic capability. High-viscosity materials may impact the operation of the float/displacer.
Vibrating Fork	X		No moving parts. Not impacted by process conditions.	Viscous materials may bridge the forks causing false trips.