



F78MP Series Air Radar

Radar is one of the most advanced forms of level measurement technology available in the dry bulk solids industry. Radar measures the level of material by monitoring the time it takes for an emitted microwave pulse to travel from the level meter to the surface of the material being measured and back to the meter. The time is calculated into distance which is then translated into a level measurement.

Many bulk solid materials will generate dust during a silo's fill cycle – the amount of dust will depend on the application. Compared to technologies that make contact with the material and even to some non-contact technologies, air radar is the ideal choice for dusty environments.

The F78MP Series through-air radar sensor transmits at a 78 GHz frequency. Frequency is the number of transmitting cycles per unit of time and is measured in hertz. Higher frequencies yield shorter wavelengths – shorter wavelength not only means more signal return, but also better signal reliability. Any frequency in the microwave spectrum from one to 100 GHz will pass through the dust in a vessel equally well – but not all frequencies are reliable when faced with vessel obstructions, high angles of repose, fine powders, or low dielectric constant materials.

The 78 GHz frequency of the F78MP Series allows the sensor to have a narrow beam angle of 4 degrees combined with a range of up to 100 meters (328 feet). An antenna fitted with an aiming flange is used to direct the beam angle to an optimal position at the material surface to get an accurate level measurement reading. The F78MP Series has the advantage of a small antenna which makes installation simple – the transmitter can be installed nearly anywhere on top of a vessel. The narrower beam angle allows the unit to focus on a particular point of the material and see past potential obstructions in a vessel. By being able to see past obstructions, such as internal ladders or cross-beams, the radar unit will not mistake these obstructions as real material level. The narrow beam angle also allows the use of this technology in silos that may have bolts, seams or corrugations on the side wall.

The F78MP Series has a built-in emitter and antenna to prevent material build-up. The emitter/antenna is protected by a PEEK (PolyEtherEtherKetone) lens, which is what prevents material build-up. The smooth outer surface prevents most dusty materials from accumulating. In extreme applications where material does build-up, a unique, multi-port air purge system will keep the lens clean and dry.

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