Level | Pressure | Flow | Temperature | Liquid Analysis | Registration | Systems Components | Services | Solutions

FMP40 Level Measurement in Liquid Hexane-Chemical

Reliable radar measurement in low dielectric liquid

Chemical plant

Levelflex FMP40 with coax probe

Vitamins

A Levelflex M with coaxial probe is used to measure liquid Hexane. Due to the patented End of Probe (EOP) algorithm used in this TDR instrument, the measurement is stable and reliable even in low dielectric materials

Company profile

Chemical plant in Texas

This company manufactures vitamin additives.

Application

The liquid Hexane is used in processes as catalysts or to wash out certain elements. The level has to be maintained at 50% of a small buffer tank with a nitrogen blanket above the liquid Hexane. In addition to the level instrument, the tank is equipped with a marked sight glass to allow a manual level inspection.

Tank dimensions:	18” diameter, 4 foot length
Temperature:	110 to 120°F
Measuring range:	16.5”

Application challenges

The low dielectric constant of the liquid (below 2.0) is critical to this application, generally resulting in frequent “echo losses” of other radar time of flight instruments and poor measurement performance

Instrument description

Levelflex M FMP40 with coax probe for liquids.

- FM IS Class I, Div. 1
- Viton o-ring seal
- 2”, 150 lb ANSI flange, 316L SS
- 2-wire, 4 to 20 mA HART
- Aluminum housing
- Local 4-line LCD

End of Probe algorithm

The Levelflex can measure the level of a material with very low dielectric constant by using two redundant methods: the surface reflection and the evaluation of the End of Probe shift.

An electromagnetic wave traveling through a material with a dielectric constant higher than 1 will slow down. Therefore, the reflection of the probe end is delayed compared to the probe end reflection of a material-free probe. This time shift is dependent on the material level and the dielectric constant of that specific material under process conditions. When a reflection of the surface is detected, the level is derived from this signal. In addition, the specific dielectric constant of a product under process conditions can be determined combining the level and the time shift of the End of Probe signal.

In case the surface reflection is too weak, the level is derived from the shift of the End of Probe signal, using the last calculated dielectric constant of the material. This mode will operate until a signal from the surface is detected again and the dielectric constant of the material can be updated.

For more information, contact
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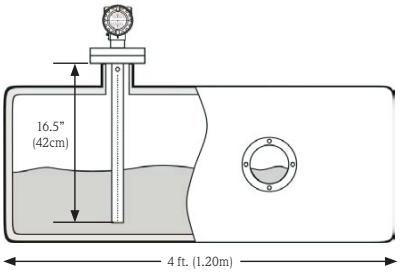
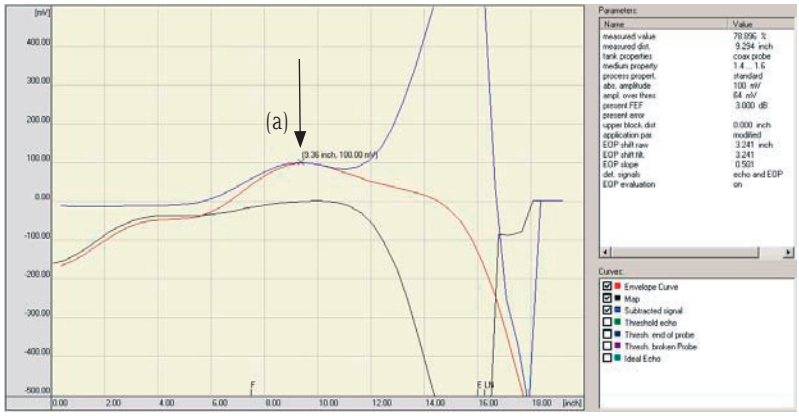
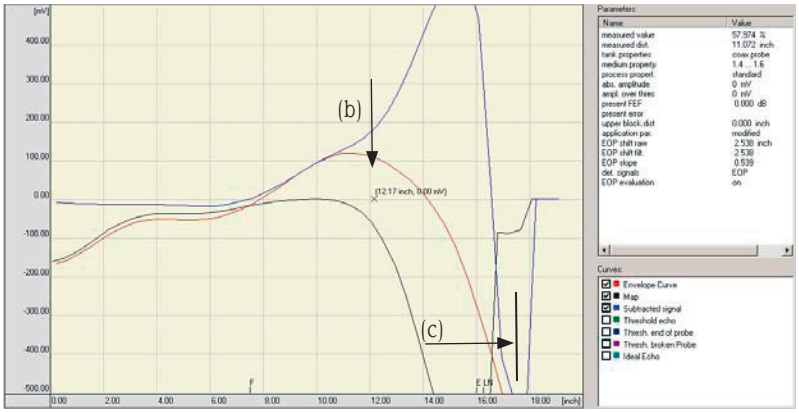


Installation scheme for the Levelflex M



Envelope curve 1: Levelflex M gets a reflection (a) from the surface of th eliquid and derives the level and the current propagation parameter from this reflection.



Envelope curve 2: The reflection of the surface (b) in an almost empty tank is not strong enough to provide a good signal. Levleflex M calculates the level from the end of the probe shift (c) and the last derived propagation parameters.

ISO 9001:2000 Certified

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