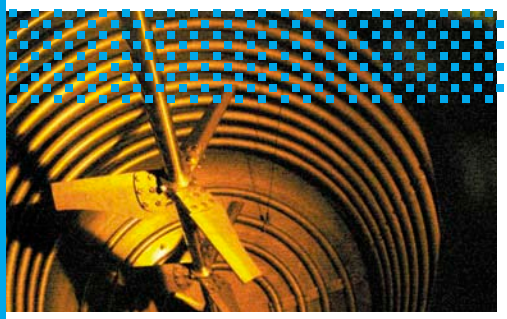
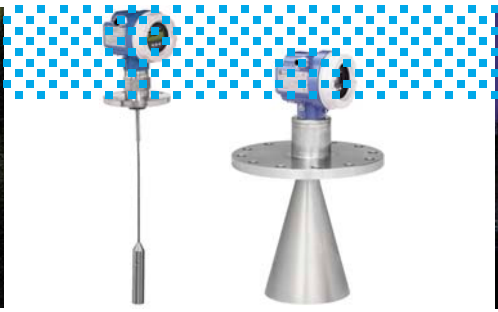
Level | Pressure | Flow | Temperature | Liquid Analysis | Registration | Systems Components | Services | Solutions

Level Measurement in Reactor Vessels

Micropilot M and Levelflex M with Liquiphant overfill protection





Levelflex M
& Micropilot M

Chemical plant

Two Micropilot M FMR 230 with 8" antenna (DN200) and one Levelflex M FMP 40 with 0.16" (4mm) cable are mounted in three identical vessels to measure the level of solvents. In addition a Liquiphant M FTL 51 overfill protection is installed.

Company Profile

Chemical company located in Italy that produces chemical intermediates and additives used in various production processes.

Applications

Three reactor vessels:
Diameter = 8.2 ft (2.5m)
Height = 10.5 ft (3.2m)
Multi-stage agitators

Process

Medium = mixing of solvents
Pressure = ambient
Temperature = 284° to 356°F
(140 to 180°C)
Explosion hazardous area

Measurement Solution

The Levelflex FMP 40 is mounted in a reactor where the temperature is below 300°F (150°C). The cable is fixed at the bottom, around the heating coil. Guided radar (TDR) technology is preferred in this kind of applications since materials with lower dielectric constant can be measured.

At the time of the installation the high temperature Levelflex version was not available yet. Thus a free field radar instrument (FMR230) is mused in the two reactors where the temperature can reach 356°F (180°C). The large 8" (DN200) antenna is used to achieve a small beam angel and thus to minimize the interference with echoes from heating coils.

In addition to the continuous time-of-flight measurement instruments a Liquiphant FTL 51 tuning fork is used for overfill protection in all of these tanks.

Instrument description

The Levelflex M is a top-mounted, compact level transmitter for process control or inventory/storage applications that operates with micro-impulse radar on the guided time-of-flight principle.

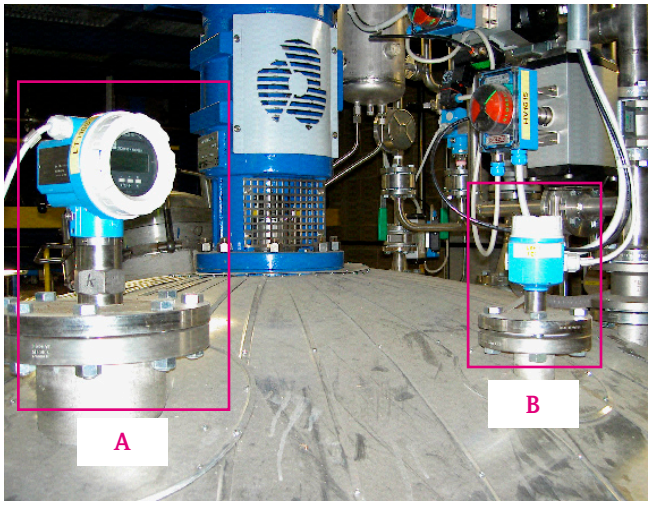
The Micropilot is a "downward-looking" free field radar measuring system, operating based on the time-of-flight method. It measures the distance from the reference point (process connection) to the product surface. Radar impulses are emitted by an antenna, reflected off the product surface and received again by the radar system.

The Liquiphant M is a level limit switch for use in all liquids. The function is not affected by flow, turbulence, bubbles, foam, vibration, bulk solids content, or buildup.

The Liquiphant M is thus an ideal replacement for float switches, gap switches, capacitance, and other technologies.

Endress+Hauser

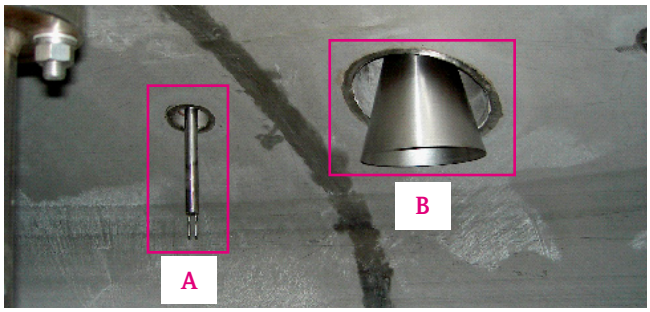
People for Process Automation



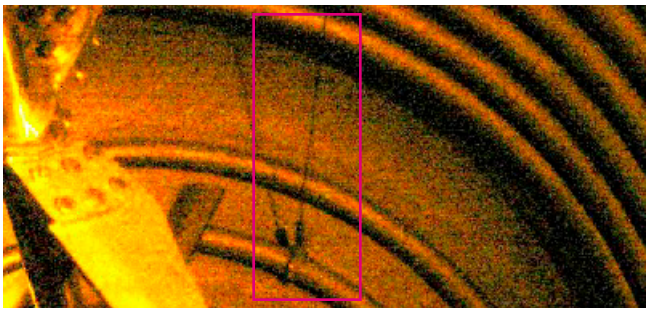
(A) FMP 40 and (B) FTL 51 installation on the tank roof

FMR 230 installation on the tank roof

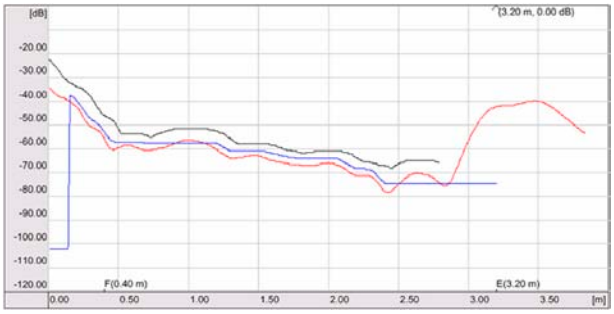
View inside the tank



The tuning fork (A) and the horn of the radar (B) inside the tank



Levelflex cable tied down on a heating coil



Envelope curves of the FMR 230

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