Air Bubbler Technology Overview

Air Bubbler Theory

- A constant flow of pressurized air is applied to a tube.
- A pressure transducer monitors the air pressure in the tube.

Air Bubbler Theory

- The pressure in the tube is equal to the pressure at the bottom of the tank.
- The liquid level equals the pressure in the tube divided by the density of the liquid.

Air Bubbler Theory

- As long as the material density remains constant, the pressure is proportional to the liquid level in the tank.

Air Bubbler Advantages

- Not affected by foam or turbulence
- Can be used in small diameter pipes
- Easy to understand / old technology
- Large installed base

Air Bubbler Disadvantages

- Contacting technology
- Bubbler line is subject to clogging
- Higher power consumption than Ultrasonic systems
- Requires periodic maintenance.
- Accuracy is dependent on a constant air supply
Common Applications

- Determine head thru a Flume or Weir
- Level in a Lift Station
- Tank level when foam is present
- Can be used with atmospheres other than air.

The SIEMENS Solution

91F60 Combination Filter-Regulator

- Provides constant flow of clean dry air.
- Range from 1 – 60 psig
- Not required if customer has existing regulator / filter

Series 62 Constant-Differential Relay

- Provides constant volumetric rate of air flow
- Eliminates the effects of variations in the plant air supply
- 62VNA model includes Rotometer for air flow indication

SITRANS P Pressure Transmitters

- Gage Pressure Transmitters used for vented or open top vessels
- Differential Pressure Transmitters used for pressurized or sealed vessels

Pressure Transmitter Types

- Absolute Pressure references to full vacuum
- Gauge Pressure references to atmosphere
- Differential Pressure references to a second pressure input
Pressure Transmitter Operation

- Process pressure is applied to the high pressure diaphragm.
- Reference pressure is applied to the low pressure diaphragm.
- Pressure changes cause deflection in the diaphragms.

Pressure Transmitter Operation

- The deflection of the high and low pressure diaphragms is transmitted thru Silicon Fluid to the Measuring Diaphragm Sensor.
- This deflection causes the Measuring Diaphragm Sensor to flex.

Pressure Transmitter Operation

- The Measuring Diaphragm Sensor is a resistive bridge circuit.
- When the Measurement Diaphragm is flexed, resistance changes result in a voltage output change proportional to pressure.