Standalone versus integrated package

References

Multiphase Flow Metering Principles

MFM Fundamentals

Categories of Instruments

Density, \( ? \)

Velocity, \( ?v \)

Momentum, \( ?v^2 \)

Mass Flow, \( ?v \)

Elemental analysis

The Four Possible Routes to MFM

Options for Measurement

Possible Device Combinations

Techniques depending on homogenisation

Techniques not dependent on homogenisation

Techniques depending on flow separation

Key Multiphase Flow Metering Techniques

Density Measurement

Weighing of pipe

The vibrating tube densitometer

Acoustic attenuation

Impedance

Single-beam gamma densitometer

Broad-beam gamma densitometer

Multi-beam gamma densitometer

Gamma-ray scattering

Neutron absorption

Neutron scattering

Microwave attenuation

Internal (GRAB) sampling

Isokinetic sampling

Infrared

Tomography

Velocity Measurement

Turbine flow meters

Vortex shedding meter

Acoustic velocity (pulse and return)

Acoustic cross-correlation

Electromagnetic flow meter

Pulsed photon activation

Pulsed neutron activation
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