

# DP DIAGNOSTICS

**MONITOR, VERIFY, AND TRUST YOUR DP METER**

Venturi Flow Meters for Wet Gas Flow Applications

With Optional Diagnostic Capabilities



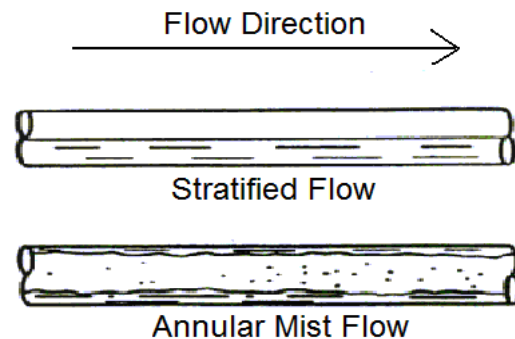
- The Venturi Meter is a Popular Flow Meter for Wet Gas Flow
- Wet Gas Induces a Positive Gas Flow Error on a Venturi Meter
- Liquid Flow is Found By a Tracer Dilution Test
- The Gas Flow Error Can be Corrected with a Suitable Correction Factor (e.g. de Leeuw)
- The Pressure Loss Ratio (PLR) is the Ratio of Permanent Pressure Loss to Traditional Differential Pressure
- The Venturi PLR is Sensitive to Liquid Loading
- Changes in PLR Instigate Tracer Dilution Tests

## Venturi Meter Based Wet Natural Gas Flow Metering

- Size: 3" to 24" for any pipe schedule.
- Flanges: #150 - #2500 (any specific connection on request).
- Material: All standard materials available.
- Length: Standard Wet Gas Venturi Meters are approximately 14D long and can be shorter.
- DP Transmitter: Any manufacturer's transmitters may be used.
- Calibration Requirements: Supplied single phase calibrated. Venturi meters supplied with a wet gas tested on request.
- Installation Requirements: Typically > 5D straight length upstream. Typically only 1D straight length downstream.
- Performance: Wet gas flow correction factor uncertainty dependent.



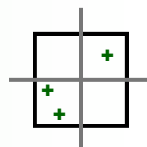
Wet Gas Venturi under FAT.



Liquid dispersion or "flow" patterns.



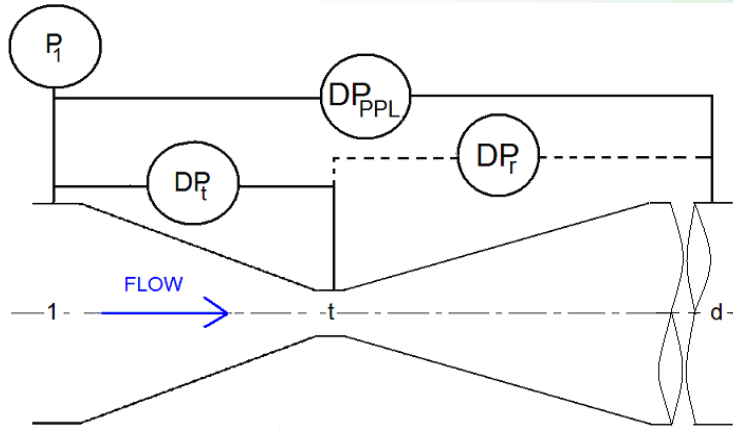
2-Phase Separated / 2-Phase Mist / Multiphase Transitional Flow



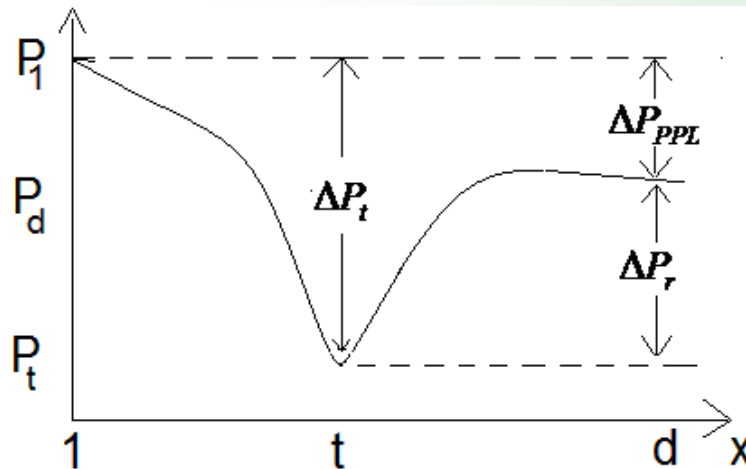
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DP Diagnostics Supplies a **Unique**, Powerful, Industrially Proven, **Patent Pending** Diagnostics System



Venturi with Optional Extra DP Transmitters for Diagnostic Capabilities

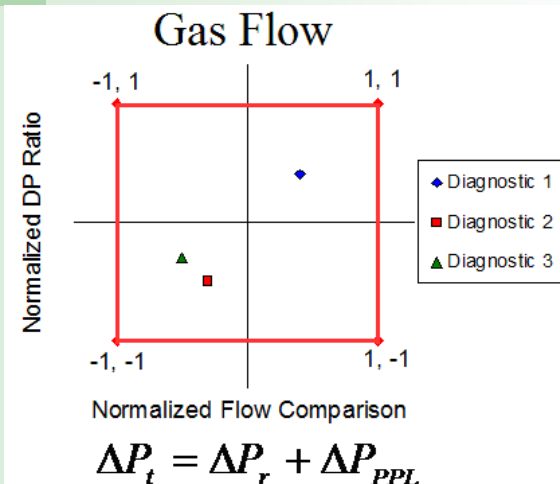


Pressure Field through the Venturi Meter

- A Downstream Pressure Tap Allows 3 DP's to be Read.
- The Pressure Field Through the Meter is Monitored.
- The Diagnostic System Multiplies the Meters Capability.
- 3 DP's are Compared to Assure Correct Meter Operation.
- A Simple Live Diagnostics Plot is Shown in the Control Room.
- Wet gas flow creates a specific pattern on the diagnostic plot.
- The Diagnostic Plot Can be Zeroed to a Specific Wet Gas Flow. There by Indicating When the Liquid Loading Changes.



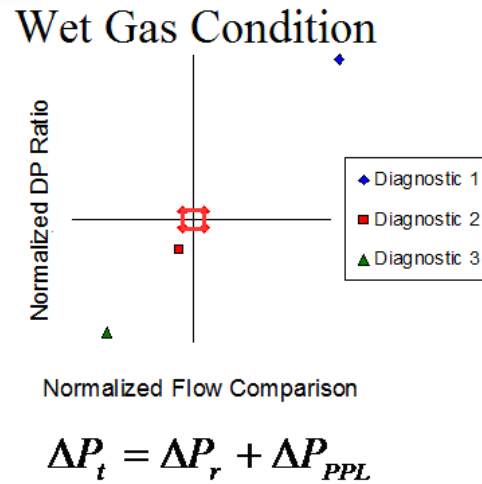
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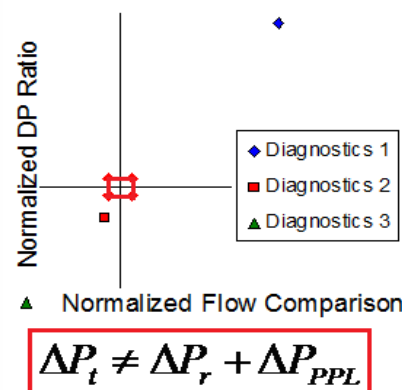
Gas flow, Venturi Meter



Wet Gas Flow Hydrate Formation.

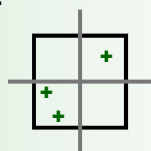


Wet gas flow, Venturi Meter



Signal of False DP Reading

- Wet Gas Flow Adversely Affects the DP Readings – Hydrates, Scale, Wax and Salts Can Block Taps, Transmitters Can be Easily Saturated etc. – the Diagnostics Continually Verifies the DP's are True.
- Wet Gas Flow Conditions Can Change Periodically. The Diagnostics Offer a User Friendly Immediate Visual Indication of a Changing Flow Condition, e.g. Changes in the Liquid Loading.



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