

Legacy Technology Adds Features to Meet Modern Application Needs

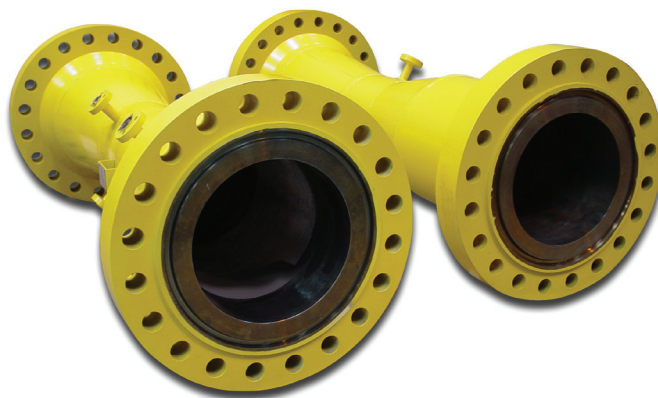
A differential-pressure (DP) flowmeter requires a means to detect the difference in upstream vs. downstream pressure in the flow line. While this can be done with a manometer, today's DP flowmeters use differential-pressure transmitters to sense the difference in pressure and compute flowrate. DP flowmeters are among the most traditional of flowmeters, and their large installed base means that they still exert a powerful force on the flowmeter market.

The history of DP flow measurement goes back to at least the 17th century, though the measurement of flow using nozzles dates back to the Roman Empire. In 1738, Bernoulli developed his famous equation for flowrate calculation.

The development of primary elements for use in measuring DP flow also began about this time. Henri Pitot presented a paper on the use of the "Pitot tube" in 1732. Giovanni Battista Venturi published his work on the Venturi principle for measuring flow in 1797. However, Venturi's work was not developed for commercial application until 1887 when Clemens Herschel used Venturi's work to develop the first commercial flowmeter based on it. In 1898, Herschel published his paper, "The Venturi Water Meter." Max Gehre received one of the first patents on orifice flowmeters in 1896. The first commercial orifice-plate flowmeter appeared in 1909 and was used to measure steam flow.

In the past, pressure transmitter suppliers sold DP transmitters and users ordered their primary elements separately. Now companies are selling their DP transmitters already integrated with a primary element, such as an Annubar or an orifice plate.

DP meters excel at measuring clean liquids, steams, and



*Venturi tube-based differential-pressure flowmeters.
(Photo courtesy of ABB)*

gases when pressure drop is not a major issue. DP meters are also a good fit for applications that require low-to-medium accuracy, and where price is a consideration. The promise of greater reliability is perhaps the strongest driving force behind the pressure transmitter market.

Over the past several years, pressure transmitter suppliers have released a number of new products with advanced features. These features promise higher accuracy, greater reliability, enhanced self-diagnostics, and more advanced communication protocols. **FC**

For more information on Flow Research's work in the area of differential-pressure flow measurement, visit **FlowDP.com**.

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