



An Old Technology Gets Some New Looks

Principle of Operation: Differential-pressure (DP) flowmeters rely on a constriction placed in the flow line that creates reduced pressure in the line after the constriction. A 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 that sense the difference in pressure and then use this value to compute flowrate.

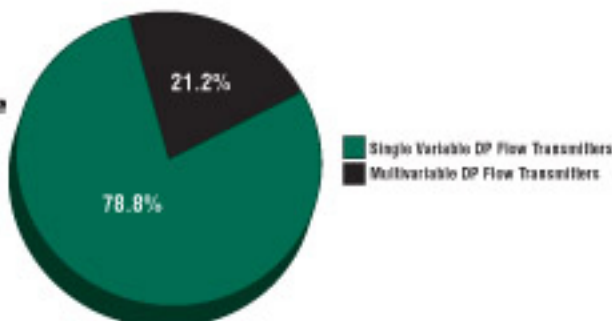
Primary elements are an essential component of differential-pressure (DP) flow measurement. Primary elements place a constriction in the flow line that creates a pressure drop in the line. The DP transmitter uses the difference between upstream pressure and downstream pressure in the line as a basis for computing flow. The following types of primary elements are included in this study:

- Orifice measuring points
- Venturi tubes
- Averaging Pitot tubes
- Flow nozzles
- Wedge elements
- Laminar Flow Elements

Technology & Market Trends: Installed base is probably the single biggest factor that has sustained growth in the DP flow transmitter market in the past four years. Many companies have invested very heavily in pressure transmitter technology and are not likely to abandon this investment. Changing technologies often requires changing suppliers and also has additional start-up and educational costs. Many end-users will choose to stay with their DP transmitters unless they have a particular problem with them or are required to change technologies either by regulations or due to a need to move to a higher performance level. Even in this case, technology improvements by pressure transmitter suppliers may persuade end-users to stick with pressure transmitter technology.

Some companies, such as Emerson Rosemount (www.rosemount.com), offer

Shipments of Multivariable and Differential Pressure Flow Transmitters by Type in 2008 (Percent of Dollars)



Source: Volume X: *The World Market for Flowmeters, 2nd Edition*, published by Flow Research

integrated DP flowmeters that incorporate a primary element with a DP flow transmitter to create a DP flowmeter. This reduces the need for impulse piping and valves and also makes it possible to calibrate the device before shipping with the primary element already attached. Emerson Rosemount offers both its orifice plates and its Annubar averaging Pitot tube as an integrated flowmeter. The popularity of these integrated flowmeters is likely to increase as end-users seek to cut costs and simplify the installation process. Since these integrated flowmeters require a primary element, this is a growth factor for primary elements.

News & Notes: One important change that has occurred in the pressure transmitter market is the March 2006 acquisition of Bristol Babcock by Emerson. 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. The promise of greater reliability is perhaps the strongest driving force behind the pressure transmitter market. While some products may have a higher initial purchase price, end-users cite a number of reasons for shifting to higher performing products. These include the need to conform to regulatory requirements, the need for reliability, a desire to standardize pressure products, and the need to do custody transfer.

Some new transmitters also offer greater accuracy. Higher accuracy provides a reason to shift to higher performance for those users who are motivated by regulations, a desire to standardize, or the need to do custody transfer. End-users seem to be willing to pay for higher performance, although this varies with application and with features.

While primary element suppliers have been less active than DP transmitter suppliers in bringing out product enhancements, the increased interest in primary elements is leading some companies to bring out new products. These include the Senior Model 2000 Orifice Fitting from Emerson Daniel (www.daniel.com), the Accelobar from Veris (www.veris-inc.com), the HHR FlowPak from Fluidic Techniques (www.fluidictechniques.com), the Conditioning Plate from Emerson Rosemount, and the Torus Wedge from Densipro Measurement Services (www.densipro.net). Quite a lot of progress has also been made in the Venturi tube, making it more versatile and shorter in length. Hopefully this trend towards new product development will continue, and more companies will introduce new primary element models and new features with their primary elements. 

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