

Digital Dosing: New Metering Pump Platform

By Klaus Müller and Hans Jørgen Andersen

The last couple of years have seen the introduction of an entirely new generation of diaphragm metering pumps. These pumps incorporate digital robotic-like technology to improve accuracy and process control, saving money by lowering the amount of chemicals used and reducing the number of pump sizes required by large users of dosing pumps. All this is achieved while simplifying the operation of metering pumps and, at the same time, opening up an almost limitless number of potential new features and benefits. What started 70 years ago as a convenient form of capacity adjustment for a positive displacement pump has finally evolved into the instrument that Sheen and other pioneers in the metering pump industry foresaw: a new level of intelligence within the dosing pump, where flow inducement is less important than measurement of what is being dispensed.



Using state of the art stepper or brushless DC motors, in combination with software to vastly improve the intelligence of the electronic control, the new generation of digital dosing pumps is able to operate always at full stroke length. Elimination of the need for stroke adjustment and the ability to vary capacity solely by means of a software-controlled speed adjustment permit huge turndown ratios $\times 10^3$ e.g., 1000:1. This is achieved without all the accompanying complexity and inaccuracy of earlier versions of high turndown metering pumps. This feature alone offers significant savings, since the number of pump sizes needed to cover the entire range of flow is greatly reduced without any sacrifice in accuracy.

The precise speed control also permits easier priming, more accurate handling of difficult liquids such as sodium hypochlorite that tend to off-gas, and the metering of more viscous fluids. Naturally eliminating the need for stroke control also means the pump has fewer parts and doesn't require knobs or other forms of mechanical adjustment. These all result in lower costs.

Digital Dosing: New Metering Pump Platform

Published on Chem.Info (<http://www.chem.info>)



Key innovations incorporated into the new generation of digital dosing pumps include the ability to monitor precisely pressure, flow, and amp draw on the motor on a continuous basis. Monitoring pressure allows the user to determine when the accuracy of the pump is being compromised because of air or gas bubbles, cavitation, or leaking check valves. It also permits the pump to self-adjust to compensate for these effects. Monitoring flow continuously within the pump gives the feedback needed to adjust pump speed as system conditions change or as air or gas is introduced into the pump. Combining dosing, measuring, and regulating into one machine means that the user doesn't have to make any calculations to determine the pump's flow setting but merely inputs the desired flow rate. The flow rate that is programmed in is what the pump delivers, without the need of costly independent flow measurement. This new generation of digital dosing pumps has lower pressure pulsations and higher accuracy than its predecessors, even at extremely low flow rates.

Where will metering pumps go from here? The new platform of digital dosing opens up a whole new world of possibilities to designers of metering pumps and to the companies that use them. Tomorrow's metering pumps will be able to monitor, troubleshoot, perform diagnostics, and appropriately adjust and recalibrate their operation to conform to process control variables, all done seamlessly, and if necessary, remotely and via wireless signals.

Use of metering pumps as precise control instruments will allow more concentrated chemicals to be used and will allow many accessories such as flow meters, back pressure valves, and pulsation dampeners to be eliminated. Metering pumps will become more user friendly, and costs will be further reduced as advances in control software continue and as economies of scale kick in for the new generation of digital dosing pumps.

Klaus Müller and Hans Jørgen Andersen are technical experts with Grundfos, a leading manufacturer of pumps. Additional information is available from Grundfos Pumps Corp., Olathe, KS, at 913-227-3400 or by visiting www.grundfos.com/us/dosing.

Digital Dosing: New Metering Pump Platform

Published on Chem.Info (<http://www.chem.info>)

Source URL (retrieved on 04/26/2015 - 9:12am):

http://www.chem.info/product-releases/2007/07/digital-dosing-new-metering-pump-platform?qt-recent_content=0