

Article published: sensor for dispensing process control

We are proud to have one of our articles published in this month's issue of [Industrial Technology](#) magazine. Entitled **When you have to know your process is right every time...**, it discusses our new [flowplus¹⁶ fluid pressure sensor](#) for process control and validation in critical dispensing and dosing tasks. Download a pdf copy [right here!](#)

SENSORS & SYSTEMS Pharmaceutical Industry

When you have to know your process is **right every time...**

Peter Swansen discusses a new fluid pressure sensor for process control and validation in critical dispensing and dosing tasks.

There are many applications for precision automated fluid dispensing, dosing or filling where the accuracy and repeatability of the dispensed amount is critical, with processes in pharmaceutical formulation or packaging among them, along with applications in medical device manufacture, semiconductor fabrication and many others. One method to help verify the dispensed amount of fluid or liquid is to monitor the system pressure, at other factors being the same, the pressure is directly related to the flow rate. Analysis of pressure against time can be used to give assurance that the correct amount of liquid or fluid has been dispensed.

Pressure monitoring and analysis can reveal the presence of issues which may impact or otherwise affect the material flow. These include: the presence of unaccounted air bubbles in the material, obstructions caused by contamination, clogging caused by agglomeration of films, variable fluid pressure or viscosity that the material reservoir is empty. These issues can result in inconsistent and inaccurate application leading to, for example, over- or under-filling, or insufficient or excessive material being applied. Clearly, the consequences vary according to application and many issues, but include reduced and/or product integrity/performance, poor standards compliance and even, in pharmaceutical applications, risk to health. However, the greater availability of accurate, efficient in-line fluid pressure sensing technology has reinforced the ability to utilise this approach in these applications.

Special flow-mounted fluid pressure sensors require the insertion of an adapter into the flow carrying the material whose flow is to be measured. A drawback to this design is that it can cause fluid spurt or turbulence, potentially disturbing pressure readings and making cleaning difficult.

Most also incorporate a narrow dead chamber or maintain sensitive elements, because the surface of the sensing diaphragm is in constant contact with the material being measured/monitored. It is important to determine potential incompatibilities between the two.



with high temperature resistance (steel) is sufficiently robust to be used in a wide range of applications. The FTM16 formulation used in the sensor has FDA compliance, and therefore can be considered for use in food preparation, biotechnical uses, pharmaceutical or genetic engineering, for example. The new sensor is maintenance free and requires no calibration. Cleaning is straightforward, achieved by flushing during the normal flow channel with a solvent such as isopropanol alcohol and allowing it to dry.

In the laboratory the flowplus will deliver pressure and flow information, and can analyse data and dynamic application flow mechanics using the output and appropriate software. This information is useful in many analytical and lab situations, but also has real value in production environments where, for example, it can detect irregularities caused by air bubbles in adhesives which would disrupt tight tolerance dispensing on medical devices or small drug pills, or identify a shortage building up in fluid lines, so enabling corrective action to be taken.

Connected to a PLC or other control system as part of an automated process, the sensor output can initiate a warning message or error signal which might shut a dispenser to reconfigure or shut down the process, or do so automatically for process variability. The output signal can be used as a flag as part of the quality assurance.

The flowplus pressure sensor is very simple to install into production and laboratory environments, and its standard output signal readily integrates into automation and analytical equipment. The in-line design means there is no dead space, and it is easy to clean and to set up with new fluids. The flowplus dispenser fluid channels, compatible with a large number of liquids and fluids across many uses, including aqueous, drug and medicines, critical ingredients, oils and adhesives. The new sensor has found applications in a range of settings including dispensing, pharmaceutical, research and development, electronics and microelectronics, photonics, process engineering, and waste industry.

[www.fluidmatics.co.uk](#)

Flow Sensor is managing director at Fluidmatics

The flowplus pressure sensor is easy to install into production and lab environments, and its output signal readily integrates into automation and analytical equipment

The new sensor is of in-line design and utilises the industry standard Luer lock type connector on both sides, simplifying integration into many systems. Its compact dimensions also make it easy to install into existing production lines, where space might be at a premium. The sensor provides a standard, calibrated, linear 0-200 output signal via an integral cable and standard M8 connector. The robust signal generated at the source is converted to this signal by an integrated amplifier, allowing the need for an external transmitter or booster, and it is internally stabilised within the operating temperature range of 15-45°C. The 0-200 output is a standard current signal, easily utilised by PLC-based automation or test and measurement systems.

The sensor's flow channel is fully coated with PTFE to fully fluorinated elastomer, this provides optimal resistance to many aggressive chemicals including hydrocarbons and highly corrosive fluids, which combined

28

INDUSTRIAL TECHNOLOGY • March 2014

Article published: sensor for dispensing process control

Supplied by:



INTERTRONICS

12a Station Field Industrial Estate, Banbury Road, Kidlington

Oxfordshire England OX5 1JD

t 01865 842842 e info@intertronics.co.uk

Last updated: November 2018

Statements, technical information and recommendations contained herein are based on tests we believe to be reliable but they are not to be construed in any manner as warranties expressed or implied. The user shall determine the suitability of the product for his intended use and the user assumes all risk and liability whatsoever in connection therewith.