Application story

Druck's PACE 5000 automates production testing in manufacturing medical devices

Druck's customer is one of the world's largest medical device companies who manufacture a wide array of products to meet the needs of healthcare professionals and patients globally.

The company has specific expertise in the development of ureteroscopy technology, which is commonly used in the treatment of kidney stones.

Industry supplied
Biomedical sciences

Application
PACE modular pressure controller used to automate production testing procedures during production of biomedical devices

Product/service
PACE modular pressure controller

Customer type
Manufacturer of medical

Customer's challenge

During the procedure to remove kidney stones a ureteroscope is used to look inside the ureters and kidneys.

Historically, scopes such as these have been expensive which has led to them being utilized on multiple occasions, with the devices that being re-sterilized after use during a procedure in order that they could be re-used. However, the current industry trend is to move to 'single use' devices where a scope is used once and then disposed of. This is driven by recent biomedical studies suggesting that sterilization, while sufficient to meet hygiene standards, is no substitute for using new devices on each occasion to avoid risk of contamination.

Providing a 'single use' device presents manufacturers with several challenges. While 'single use' devices are beneficial to patients in reducing risks of infection from contaminated devices, there is a prevalent challenge to significantly reduce costs of the probe for it to make economic sense for the customers of those producing biomedical devices.

Through advancements in technology and a redesign of their products, Druck's customer has been successful in significantly reducing the costs of these types of devices. There are further costs associated with 'multi-use' biomedical devices. Some of these associated costs include repair and component replacement costs, as well as employment costs for personnel to take care of the cleaning and sterilization processes.

The combined benefits of reduced risk of infection for the patient and reduced cost of a single use product has put Druck's customer in a very good position to respond to this trend in the biomedical device market. The trend towards 'single use' biomedical devices significantly increases the quantity of devices that need to be produced by the manufacturer, who also must maintain product quality and control manufacturing costs. In the single use ureteroscope, the tip features a video feed, LED light source and a pressure sensor.

During the procedure to remove kidney stones, the pressure sensor is of utmost importance as it enables healthcare professions to monitor the patient's kidney pressure.

To ensure the pressure measurement data was reliable and large volumes of pressure sensors could be calibrated at the same time during their manufacturing

process, the customer needed an accurate and fast calibration solution. The calibration solution would need to ensure the accuracy of the pressure sensors when used in their intended application so as not to risk the wellbeing of patients. Furthermore, the calibration solution was required to assure that production of a large volume of biomedical devices by the manufacturer was possible in order to keep pace with demand – where calibration was not a cause of excessive downtime during production of the customer's products.

Druck's solution

Given their familiarity with Druck and the PACE modular pressure controller, the customer was approached by the Druck team to inquire if PACE could be used for this application.

Druck's PACE modular pressure controller provides a fast, flexible and economical solution to pressure control for automated production, test and calibration.

Picture 1: PACE 5000 modular pressure controller

The test requirement for calibrating the pressure sensor within the probe requires simulating multiple pressure and temperature conditions in order to identify and correct for any errors in the pressure reading.

As Druck's PACE pressure controller can control to a demand set-point at a greater speed than any other pressure controller available on the market (typically less than 5 seconds to set-point) the complete test profile of multiple pressure points can be performed in a very short period of time.

There is an additional facet of control in that the set-point needs to be stably held while the pressure reading is being taken. The superior control stability of the PACE (0.001% FS) again comfortably meets this requirement.

The performance specification that the pressure sensors used within the probe must meet is specified as a tight tolerance. The high performance of the PACE control module (0.0016% of Rdg + 0.0033% of FS) provides the customer with an accuracy ratio that provides a very high degree of confidence in the measurement.

It is expected, again due to a further anticipated increase in production volume of the number of units, that the PACE controllers will be used daily. The many years of proven reliability and robustness of PACE in demanding production environments provides the customer with confidence that they will continue to maximize 'up-time' on their production lines.

Druck's added value

The introduction of the PACE 5000 provided the customer with significant benefits:

Speed: enables the customer to perform calibrations quickly helping to increase throughput - allowing Druck's customer to manufacture more quickly.

Precision: provides an accuracy ratio that gives the customer a very high degree of confidence in the measurement.

Control stability: critical to holding pressure constant while reading is being taken.

Reliability and robustness: minimizes risks associated with downtime due to failure of test equipment.

Find out more about Druck's pressure controllers (PACE) here: https://www.bakerhughesds.com/measurementsensing/pressure-measurement-and-calibration/testand-calibration/pressure-controllers-pace

Find out more information about Druck on LinkedIn here: https://www.linkedin.com/company/druckcompany/?viewAsMember=true

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