

Application story

Druck offers cost effective solution for precise autoclave pressure control

Based in China, Druck's customer is a market leader in the manufacturer of carbon fiber composite autoclaves. Its autoclaves are used for manufacturing of composite materials used on spacecraft, commercial and military aircraft, satellite and performance vehicles.



Industry supplied
Industrial autoclaves



Application
Autoclave environment control system



Product/service
Druck UNIK 5000 pressure sensor



Customer type
Manufacturer of composite autoclaves

Customer's challenge

The customer's autoclaves are designed to allow the user to set the internal pressure conditions to the required level during the composite material cure cycle via a series of pressurization gradients, dwell times and depressurization gradients. Modulated control valves are used to control these pressures or vacuum and require accurate, repeatable pressure sensors to achieve this.

As many as 50 pressure sensors can be deployed on each autoclave control system, therefore achieving this accurately and reliably, while maintaining a competitive pricing position is paramount. If the pressure sensors are not reliable in their measurement which feeds the control valves, then the pressure will not be distributed at the correct pressure to allow the composite material to form. Equally if the measurement is not repeatable across all the sensors, then this can prevent three-dimensional uniform pressure distribution, which in turn affects the quality of the composite material being formed. Whilst SCADA and PLC control systems are employed to allow infinite composite material solutions, the pressure sensors utilized in this application are required to provide a stable reading from vacuum to positive pressures and this is a considerable challenge for the autoclave manufacturer.

Druck's solution

Accurately and repeatably measuring pressure is at the core of Druck's technology, with almost 50 years' experience in designing and manufacturing pressure sensors. Conscious of the customer needs to find an economical solution, Druck proposed a version of its UNIK 5000 configurable modular pressure sensing platform.

- The UNIK 5000 pressure sensing platform is designed to be customized using a range of predefined components, allowing Druck to offer a cost-effective sensor, leveraging a high-volume product line and short product lead-time, thus allowing the customer to operate a 'Just-in-time' manufacturing process of their own.
- The pressure sensor employs Druck's piezo resistive silicon technology, renowned for its performance, low hysteresis/thermal hysteresis and excellent long-term repeatability, which ensures accurate, stable and repeatable pressure measurement across the entire pressure curve of the autoclaves operating range.

- Robust design, construction, reliability and overall product quality of the Druck UNIK 5000 pressure sensors lowered the cost of ownership for the customer, whilst also increasing the reputation associated with the brand image of the customer's product.



Picture 1: Druck's UNIK 5000 pressure sensing platform

Druck's added value

Having local presence with Druck's China-based application engineering and technical sales specialist teams allowed Druck to discuss the customers' requirements face-to-face in considerable detail. This ensured the precise pressure sensor solution could be designed in order to meet the customer's technical requirements, whilst remaining within their allocated budget for the project.

After configuring the most appropriate solution, Druck was able to leverage the UNIK 5000's short lead-time to quickly get samples of the product to the customer in order that they could substantiate benefits of using Druck's UNIK 5000 pressure sensors for this application. A comparative evaluation of Druck's pressure sensor performance versus a competitor's product was conducted, in which Druck's product outperformed the competitor's equivalent product. Having selected Druck as the successful bidder on the project, the customer was able to take advantage of the short lead time availability offered on the UNIK 5000 and was soon able to build new and upgrade existing composite autoclaves for their much-valued customers.

In addition to Druck's widely renowned product quality and reliability, the excellent long-term stability offered owing to Druck's proprietary resonating silicon technology has meant that using the Druck pressure sensors also lowered the customer's in-service costs. This has been achieved by extending the calibration intervals compared to those that would be required for other pressure sensor suppliers.

Find out more about Druck's pressure sensors and OEM custom sensor solutions here: https://www.bakerhughesds.com/sites/g/files/cozyhq596/files/2019-07/oem_-_expertise_partnership_v2.pdf

View the UNIK5000 datasheet here: https://www.bakerhughesds.com/sites/g/files/cozyhq596/files/2020-03/unik5000_datasheet_920-4831_-_bh.pdf

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