

Bürkert Fluid Control Systems

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bürkert
FLUID CONTROL SYSTEMS

SUCCESS STORY

Bürkert < > Kiwa ExVision

Helping to create an explosive atmosphere on a daily basis

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Helping to create an explosive atmosphere on a daily basis

Gas blending is a very important application in the gas segment. This technology plays a key role across many industries, from heat treatment to medicine to analytics. Gas is an invisible but powerful medium. This is particularly evident in the generation of potentially explosive atmospheres. Designing and manufacturing a component for use in potentially explosive atmospheres requires considerable engineering skill, but designing and creating a facility in which these components are tested could be considered even more challenging. For one ATEX certification company this meant calling in Bürkert Fluid Control Systems to help create a bespoke testing facility.



Pneumatically activated ball valves Type 8805 are used in the whole system.

The ball valves are used to control the flow of gas and act as isolation points within the system.

Open planning process

Based in Apeldoorn in the Netherlands, Kiwa ExVision is an independent test and certification organisation that provides a range of services for manufacturers of equipment and components designed for use in potentially explosive atmospheres. In order to deliver the most efficient service to its clients, the company wanted to create a new test facility that would allow a pre-set mixture of explosive gases to be used for testing the integrity of new components. The engineers at Kiwa ExVision had a very clear idea of what they wanted but they realised that making the concept a reality would require a different type of expertise. As one of the leading manufacturers of control and measuring systems for fluids and gases, Bürkert Fluid Control Systems has over 25 years' experience in delivering solutions for hazardous areas to a wide range of industries and applications.

The development of ATEX and IECEx certified versions of Bürkert's industry leading components as well as complete control systems has been supported by the establishment of a centre of competence in Menden, Germany. It is here that the majority of the design and manufacturing work would be completed. Pieter van Breugel, Managing Director of Kiwa ExVision, explains further: "The design process was very open and cooperative which meant that we could explain our requirements while the Bürkert engineers could explain any limiting design factors. Our list was quite extensive; clearly it had to be safe but we also needed reliability and accuracy to ensure that each test could be repeated precisely."

Precision and control at the top

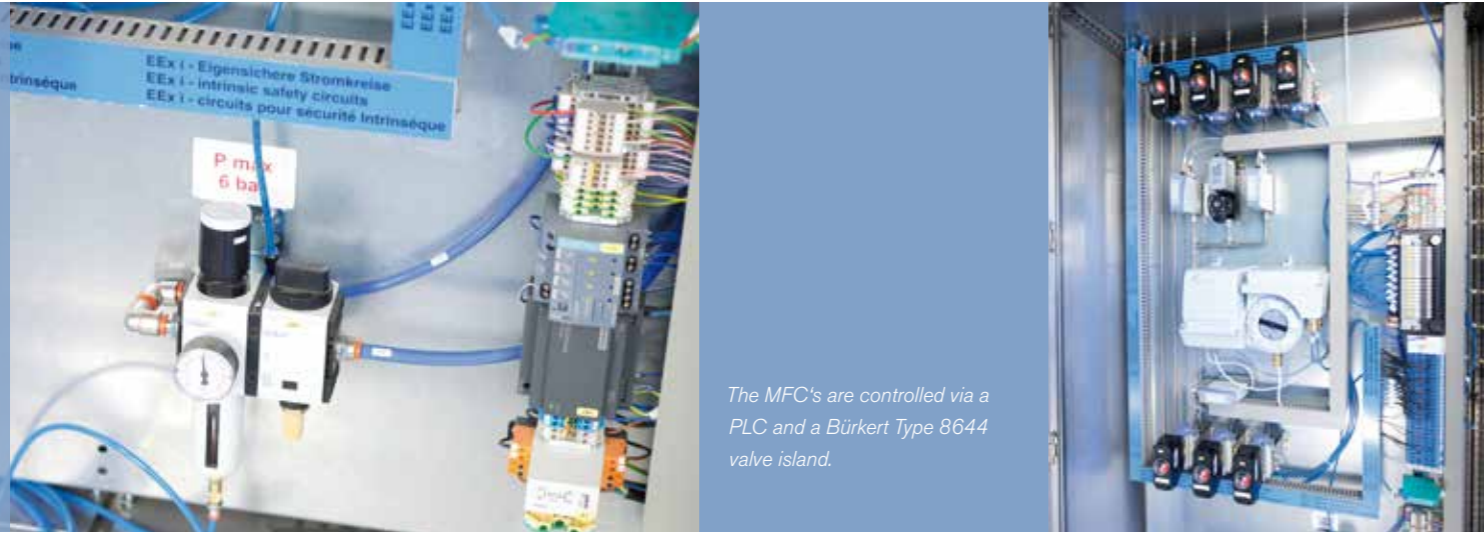
The test procedure for new components that are designed to operate in potentially explosive atmospheres requires them to be filled with a specified mixture of explosive gases and then placed

inside a larger, blast-proof container. This container is then also filled with the same mixture of gases. Once all the safety checks have been made the gas inside the new component is ignited and there is a small bang, hopefully. In this event the component has contained the small explosion and has passed this aspect of the certification process. If, however, there is a considerably larger explosion then unfortunately the component has failed the test but the blast-proof container has performed its function.

The Bürkert components in detail

The task of selecting and mixing the gases to a number of preset ratios is performed by a series of Bürkert mass flow controllers, including the Type 8712, which are controlled via a PLC and a Bürkert type 8644 valve island. Although the volumes of the gases are relatively small, the precision of flow is key in delivering pre-specified and repeatable gas mixtures. Throughout the design Type 8805 pneumatically activated ball valves are used to control the flow of gas and act as isolation points within the system.

Mass flow controllers types 8626 and 8712 for gases are compact and integrated devices, benefiting from Bürkert's experience in measuring, controlling and regulating gases and liquids. Both types measure the gas flow rate directly in the gas flow, regardless of pressure and temperature, allowing precise measuring results and fast reaction to control deviation. The main stainless steel control cabinet is connected to gas bottles containing hydrogen, propane, methane, acetylene, ethane, nitrogen for calibration and dry air with a certified oxygen content of 20.9%. Clearly working in this environment meant that all of the circuits must be intrinsically safe and the design and construction of the cabinet must also pass the ATEX and IECEx certification itself.



The MFC's are controlled via a PLC and a Bürkert Type 8644 valve island.

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Peter van Breugel
(Managing Director Kiwa ExVision)

The second cabinet, which is also certified for Zone 1 operation, contains additional Type 8805 isolation valves and flashback arrestors for additional safety. This cabinet controls the flow of gas into the explosion container and once it is full of the prescribed gas, it is isolated and the valves provide a feedback signal to indicate this status. The final component within the project was the operator's station that consisted of an HMI screen for which the graphics and software were designed and programmed by the Bürkert engineers. This provides a complete overview of the process as well as incorporating a number of fail-safe systems and full operational control of the facility. Once again the experts at Kiwa ExVision outlined their requirements for the control panel and trusted the Bürkert designers to deliver a comprehensive package that was simple to operate. The continuous communication between the participants of the project has meant that the completed facility has passed all certification requirements on the first attempt.

From trust to confidence

Pieter van Breugel, concludes, "We chose to work with Bürkert on this project because our top priority was the reliability of operation and the knowledge that the test facility would be safe and capable of repetitive tests with minimal down time. This meant we had to trust the process engineers, the quality and accuracy of the components, and the build integrity of the system. The open and collaborative approach with Bürkert has delivered a new test facility that has now been operational for over a year without any problems."

The main stainless steel control cabinet is connected to gas bottles containing hydrogen, propane, methane, acetylene, ethane, nitrogen for calibration.

