Case Study

Hydrogen analysis for zero carbon transport

Working with a leading gas analyser manufacturer on hazardous area protection for a hydrogen system

Overview

As the hydrogen distribution network for fuel cell powered vehicles grows, so does the need to guarantee the quality of the hydrogen, especially as fuel cells are sensitive to contamination. A leading measurement and analytical instrument manufacturer wished to develop a hazardous area version of their standard H2 analyser. They came to Expo because of our expertise in hazardous area solutions for safe area equipment, as well as our experience with flammable gas analysers.

Project Brief

Work with the customer to develop a hazardous area enclosure solution for an existing H2 quality analyser that could be certified for zone 2 areas, such as H2 dispensing installations.

Challenges

If possible the client wished to avoid excessive modification of the analyser for the hazardous area application.

Although the analyser requires only a small sample flow of H2, the enclosure would still be classed as having an internal source of release (ISOR - the potential for a release of hazardous gas inside the protected enclosure itself). This requires additional safety features and a more complex certification process under standard 60079-2.

Outcome

Expo's engineers worked with the client to design a bespoke Ex p enclosure with a continuous flow (CF) X purge system, plus a purge interface unit for power & signal control. After the initial enclosure purge, the CF system provides a constant air flow through the enclosure at a sufficient rate to dilute any leak of the incoming H2 sample gas to below 25% of the lower explosive limit (LEL) as required by the standard 60079-2.

As an additional safety feature, Expo installed a certified H2 leak detector inside the enclosure, interlocked to the incoming power.

Expo's consultancy team developed the certification plan along with a Notified Body to deliver the required certification. This was necessary as systems with ISOR fall outside of Expo's standard populated certificate.

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Expo Products and Services

Custom Enclosure Service

With Expo's fully custom process, a dedicated engineer will work with you to develop exactly what you need and agree on a detailed budget and project timeline with milestones. As this is a highly flexible service, we can adapt the plan if your project requirements change.

Click here for more information.

MiniPurge Type X

IECEx, ATEX & UL certified purge and pressurization systems for Zone 1, Class I Div 1 applications

Features

- Global approvals
- Purge flow capacity up to 900 Nl/min
- Leakage Compensation or Continuous Flow
- Stainless steel enclosure construction

Expo's Minipurge type X range provides a full purge and pressurization solution for electrical enclosures and other equipment installed in Zone 1 or Class I Div 1 hazardous environments. With a range of flow capacities up to 900 Nl/min, the systems are suitable for large enclosures up to 5.4m³ volume.

Click here for more information.

MiniPurge interface unit (MIU)

IECEx, ATEX & INMETRO Ex d certified solutions for enclosure power and signal isolation.

Features

- Global Ex d approvals
- Isolates low power signals and up to 32 A power
- Compatible with MiniPurge & SmartPurge II
- Aluminium construction

Expo's Interface Units provide switching of power and signals to the pressurized enclosure, using a control signal from the purge system. This capability is required for enclosures installed in Zone 1/21 or Class I/II Div 1 hazardous locations.

Click here for more information.

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Design services

Expo Technologies' team of consultants and certification engineers have the experience and knowledge to support our customers through the certification process for equipment to be used in Hazardous Areas.

From concept design through to maintenance, Expo Technologies works with you to reduce the risks and accelerate your entry into global markets.

Click here for more information.

Certification consultancy

Our Certification Engineer works with the customer through the following steps, to make sure the design is compliant with the Expo's Schedule of Limitations (SoL), ensuring successful project completion. The SoL defines the scope of what can be certified under Expo's populated enclosure certificate and is broad enough to cover most applications.

Click here for more information.