expo Technologies

Gas and liquid process analysers: Hazardous area solutions from Expo.

Installing process analysers in hazardous areas requires expert knowledge

Process analysers for gases and liquids are frequently required to be installed in hazardous areas. In many cases, proximity to the process is critical to reduce sample line length and to ensure a fast response. Delivering a safe, reliable, and fully certified analyser system requires know-how and experience.

Expo Technologies' proven purged and pressurized (Ex p) approach, and in-house certification capability, provide a highly flexible solution for the widest range of both liquid and gas analyser applications. Furthermore, Expo will still help you succeed in those cases where certification by a Notified Body is required .

We work with end-users, analyser OEMs, and integrators across process industries to successfully deliver hazardous solutions for applications ranging from the straightforward, for example, oil in water, to the more challenging, for example, sulphur in natural gas.

You can read selected cases in this brochure. Our full library of case studies can be found at https://www.expoworldwide.com/case-studies

With more than 2,500 enclosures supplied, we have a comprehensive Ex p solution bank for most applications.

In-house ATEX & IECEx certification capability for most straightforward analyser projects.

Full in-house enclosure design & fabrication to exact project specifications.

Track-record of delivering more challenging analyser projects in conjunction with Notified Bodies.

Dedicated consultancy service to assess the analyser application against the applicable hazardous area standards.

Globally certified purge systems with power and signal isolation capability (required for Zone 1 & Class I Div 1 applications).

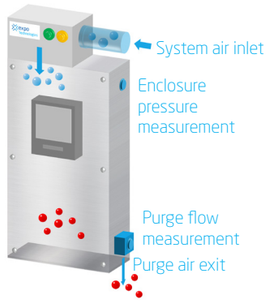
Expo can supply the complete solution

Proven Ex p solutions for analysers

Comprehensive certification support

Flexible enclosure designs

Analyser system protection by Purge & Pressurization



Purge: The purge system supplies clean, dry instrument air to the enclosure at a high flow rate for a preset time, expelling any potentially flammable atmosphere remaining inside. Enclosure pressure and purge flow are monitored. The electrical equipment inside the enclosure is not energised.

Pressurization: After purge is complete, the system supplies sufficient air to maintain a constant pressure inside the enclosure, compensating for any small leaks, preventing ingress of the outside atmosphere. Enclosure pressure is monitored. The electrical equipment inside the enclosure can be energised.

Analyser installation: Introducing a sample gas or liquid into the enclosure becomes an important consideration. For non-flammable samples, there is generally no issue. For flammable samples, a leak may cause a dangerous situation if it comes into contact with live electrical equipment.

Different samples require different solutions

Sample type	Example	Ex p certification process	Mitigation required by standards
Non-flammable gas or flammable gas below LFL*	Chlorine measurement in air	Expo's consultants assess & certify under its Populated Enclosure Certificate.	None—can treat as standard safe area equipment in line with the Expo Schedule of Limitations.**
Flammable gas above LFL*	Sulphur measurement in natural gas	Requires Notified Body assessment & certification. Expo's consultants support the design process and preparation of certification submission.	May need additional mitigation including external flow limiting, constant enclosure dilution. Gas leak detection might also be required.
Non-flammable liquid	Trace measurement of oil in water	Expo's consultants assess & certify under its Populated Enclosure Certificate.	None—can treat as standard safe area equipment in line with the Expo Schedule of Limitations.** Liquid leak detection recommended.
Flammable liquid	Solvent blend analysis	Requires Notified Body assessment & certification. Expo's consultants support the design process and preparation of certification submission.	May need additional mitigation including flow limiting, inert gas purge & pressurization. Vapour leak detection might also be required.

* LFL = Lower flammable limit ** The Expo Schedule of Limitations defines what is permitted under Expo's populated enclosure certificates.

For more detailed information on systems with an internal source of flammable gas or liquid, please refer to the applicable international Purge & Pressurization standards: IEC60079-2, Sections 10-14; NFPA496, Chapter 8.

Selected analyser case studies

Zone 2 Mobile spectrometer cart

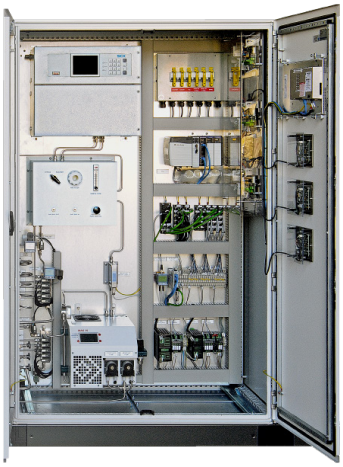
Background
Our client wished to adapt their existing UV spectrometer for use within a Zone 2 pharmaceutical manufacturing area to verify the cleanliness of production vessels and piping. The system would need to be portable so that the spectrometer could be used in various locations within the plant.

Solution
Expo designed and built a mobile Ex p spectrometer cart, fitted with a SmartPurge II, enabling a short purge time after the system was moved within the plant.

After enclosure manufacture at Expo, the spectrometer and other peripheral components were integrated at the client's facility. Some mechanical modifications to the spectrometer were necessary to improve ventilation, without impacting its function. Expo's certification engineers then carried out an on-site inspection before issuing ATEX Zone 2 certification under our Populated Enclosure Certificate.

Zone 1 CEMS analysers (O_2, NO_x, CO & CO_2)

Background
Our client needed to install several continuous emissions monitoring systems (CEMS) within a Zone 1 area of a large industrial complex in Thailand. Compared with other explosion protection methods, Purge & Pressurization (Ex p) was the most practical solution on cost and timescale, although the analysers would require some modifications to meet the internal ventilation requirements of the Ex p standard.



Solution
Custom Ex p enclosures were designed and built, fitted with MiniPurge systems, and shipped to the client for installation of the various analysers. Based on previous analyser projects, Expo engineers were able to recommend an innovative solution to improve the ventilation of the units without impacting their function.

Expo's certification engineers then performed a remote inspection on the completed systems before issuing ATEX Zone 1 certification.

Expo operates in more than 50 countries worldwide. To find out more about how Expo can help you solve your hazardous area problems, get in touch via our website www.expoworldwide.com or through your local channel partner.

You can speak to an applications engineer at one of our manufacturing centres.

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