



Hazardous Area  
Enclosures –  
Complete solutions  
from design to  
certification

Simplifying  
Complexity.

Delivering  
Safety.



With more than 60 years' experience and deep knowledge of hazardous area standards, Expo Technologies develops and delivers simple, robust, certified solutions that improve safety and save our customers time and cost.

We work with electrical panel builders and OEMs across a wide range of industries, including oil & gas, chemical & petrochemical, pharmaceutical & biotechnology, and power generation to design, build and certify hazardous area enclosures to customers exact requirements for both gas and dust service.

Expo enclosures are component certified under ATEX & IECEx for Ex p, Ex t and Ex e Zone 1 & 2 applications. Additionally, our Populated certificates permit us to certify many of the finished enclosures after installation of equipment, significantly reducing the project timescale compared to 3rd party certification.

See page 7 for our Certification Guide.

All of our enclosures are designed at our engineering hub in the UK. They can be manufactured at any of our facilities in the UK, USA & China.



## Expo Technologies Vision

Creating a safer world through elegant design that systematically reduces complexity and risk.

## Expo Technologies Mission

Our mission is to provide world-class, engineered solutions that deliver our clients' capabilities into hazardous and extreme environments. To continuously drive excellence through the development of our people and enhance our trusted position by projecting our expertise into new markets.



# Expo's enclosures provide hazardous area protection for everything from Analysers to Zebra label printers



Around 2,500 hazardous area enclosures built and certified by Expo

Enclosure dimensions up to 2.1m x 4.8m x 1.0m



ATEX & IECEx Component & Populated certificates

## Certification Guide

We offer the following populated certification options across our enclosure range. Note that some certifications will require assistance from Notified Bodies.

Type of Protection	Hazardous Area	Enclosure Contents	Certification		
			IECEX	ATEX	N.American
Purge & Pressurization Exp BS/EN/IEC 60079-2 NFPA496	Zone 1 & 2 Zone 21 & 22 All Class/Divisions All Class/Zones	General purpose equipment with no special certification	✓	✓	NEC & CEC
Increased Safety Ex e BS/EN/IEC 60079-7	Zone 1 & 2 Class I Zone 1 & 2	Equipment certified for appropriate zone	✓	✓	NEC & CEC
Restricted Breathing Ex nR BS/EN/IEC 60079-15 C22.2 No 213	Zone 2 Class I Zone 2	General purpose equipment with low power dissipation	✓	✓	CEC only
Protection by Enclosure Ex t BS/EN/IEC 60079/31 C22.2 No 25	Zone 21 & 22 Class II, Div 2	General purpose equipment with no special certification.	✓	✓	NEC & CEC (Dust tight)

# Not all enclosures are equal

Expo's enclosures are specifically designed to be certified for hazardous area duty, unlike most mass produced, off-the-shelf items.

Each enclosure is built to exactly meet specifications. Here are some of the features available with an Expo enclosure. Most features can be fully customised.



## Typical enclosure specifications

Material of construction (body)	316L stainless steel
Material thickness	1.5 to 3mm depending on overall enclosure dimensions
Maximum dimensions (Some dimensions might be limited by certification)	Single compartment: 2100mm H x 1800mm W x 1000mm D Multi compartment: 2100mm H x 4800mm W x 1000mm D
Form factor	Fast-Track: Standard rectangular Fully Custom: Multi-compartment, complex geometries
Window material	Polycarbonate or laminated glass depending on region & certification
Ingress protection	IP54, IP66, UL50E Type 4X
Seal material	Elastomer type compliant with certification
Door fasteners	Tool operated ¼ turn stainless steel

## Enclosure cooling

Enclosure thermal management is critical to ensure safe operation and system reliability and should be considered as early as possible in the project. If a cooling system is needed, then it is highly likely that it will need to be certified for use in hazardous areas. Expo offers two main cooling solutions, depending on the thermal load:

< 800 watts (2,700 BTU/hr):  
Certified vortex coolers



Running solely on compressed air, vortex coolers are a perfect solution for low heat loads generated by low powered control systems such as PLC's, or where moderately high ambient temperatures are likely.

> 800 watts (2,700 BTU/hr):  
Certified air conditioning units



For larger heat loads, or locations with high ambient temperatures, air conditioning is the best solution. Expo offers a range of certified systems for ATEX, IECEx and North America, with cooling capacities up to 5kW

# With unrivaled experience from building more than 2,500 enclosures, Expo offers two different project approaches: Fast-Track or Fully-Custom

## Fast-Track Standard Enclosure Service



Using standardised building blocks and automated configuration and design tools, Expo's Fast-Track service can deliver you tailor-made enclosures within weeks

Expo manufactures the enclosure to your specifications and delivers to you component certified. If this is an Ex p enclosure, then the purge system will already be installed and tested. The enclosure can then be populated at your facility..

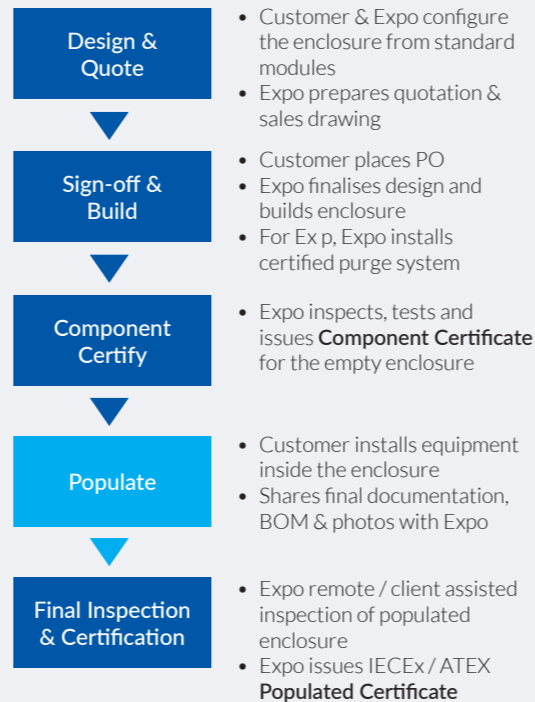
For systems using purge & pressurization, Expo holds populated enclosure certificates for ATEX & IECEx, so it can offer a full certification service on the finished system, giving significant time and cost benefits. For most projects, provided we have received all the required documentation, the final inspection process is quick and straightforward and may not need a site visit by an Expo Certification Engineer.

Typical fast-track applications include:

Electrical control panels	Simple electrical control panels, PCs, monitors & printers	Non-hazardous analysers	Remote I/O panels
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### Expo's Fast-Track Process

The fastest and most straightforward way to deliver a fully certified system on time and budget.



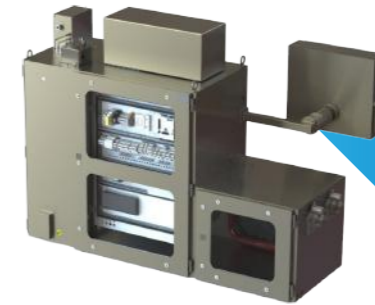
### Expo's Fully-Custom Process

The most effective way to solve challenging enclosure design, build and certification projects.



\* Certification path dependent on scope and configuration

## Fully-Custom Enclosure Service



Some projects call for special shapes and sizes of enclosures, non-standard features or very special applications, and may also require input from a Notified Body during the design phase or final certification.

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.

Typical fully-custom applications include:

Complex electrical control panels	Hazardous gas and liquid analysers	Extra-large / multi-section panels	Motor control / VFD panels
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Depending on the scope, we can work with your team to install and integrate your equipment and hold factory acceptance testing for final sign-off.

After the enclosure is populated and tested, Expo can manage the certification process directly, or work with a Notified Body if the scope falls outside of Expo's populated certificates.

Innovation case study

# Highly custom enclosure for magnetic bearing controls



## Application

Expo's client is a leader in active magnetic bearing systems for large turbomachinery and high-performing rotating equipment used in many applications, including hydrocarbon extraction and processing. The bearings require sophisticated control systems which require special protection when used in hazardous areas. Expo's brief was to create a standardised enclosure design that was suitable for use on skid-mount systems in a wide range of low & high-temperature ambient conditions, and could be UL certified.

## Challenges

Internal design - many of the internal components were heavy, requiring complex and precise mounting arrangements.

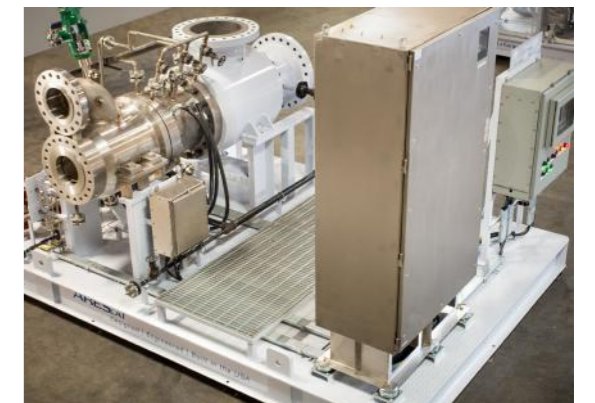
Thermal management - the core control module had a high heat output when in operation and needed to be maintained within a certain temperature range, while low ambient temperatures presented start-up challenges.

Certification - the requirement to use all UL approved components to ensure acceptance in the North American market

## Solution & Outcome

Expo designed a heavy-duty, UL approved 4X enclosure which incorporated custom mounting arrangements for the control components.

To meet the low temperature specification, our standard purge system was adapted for installation inside the enclosure. Insulation was also installed on many of the internal surfaces, and provision was made for anti-frost heating to be installed by the user. High ambient temperatures required the installation of a UL approved air conditioning unit.



## Application

Expo's client manufactures special electrostatic cleaning units that prolong the life of lubricating oil used in rotating machinery. Use of this technology reduces downtime and increases machine reliability. A batch of cleaning units were required for an offshore oil and gas installation, so a certified solution was needed.

## Challenges

Protection method – identify the most appropriate method of hazardous area protection.

Environment – the offshore location presented challenges due weather, ambient temperatures and corrosion

Mobility – the systems were required to be mobile, to enable them to move between machines

Thermal management – the cleaning systems circulated oil at potentially high temperatures

Liquid leakage – provision was needed to detect any significant oil leakage

## Solution & Outcome

A custom purged & pressurized mobile enclosure was designed and built, running on anti-static wheels, to house the oil cleaning unit. The cleaning system itself was modified to ensure adequate purging, while thermal insulation was selectively applied to the hotter parts of the system.

A vortex cooler was fitted to provide additional thermal management. Liquid leak detection was installed along with an enclosure over-temperature alarm. Quick-connects were fitted for oil inlet and outlet connections, as well as the purge gas supply, allowing the unit to be moved and easily plugged in at the new location.







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](http://www.expoworldwide.com) or through your local channel partner.

**Alternatively, speak to an applications engineer at one of our manufacturing centres.**

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