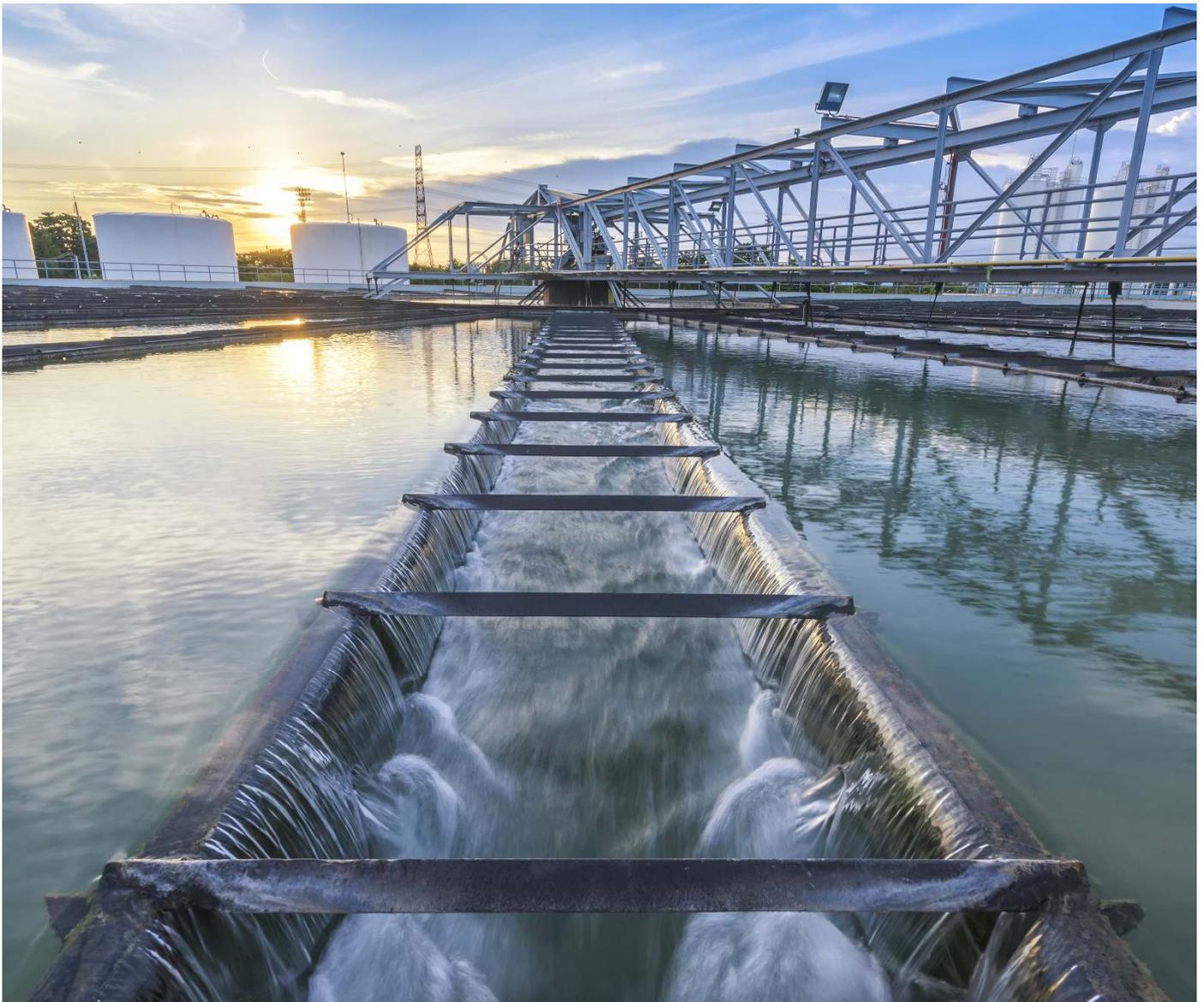


# Extending the life of electronics in harsh environments

*How positive pressurization systems help reduce costs and downtime*



# Extending the life of electronics in harsh environments

## Table of Contents

Introduction	3
The challenges of hostile environments	4
Current protection strategies aren't enough	6
The power of positive pressurization	8
Introducing the Expo's solution – The Mini Environmental Purge System (Mini EPS)	9
The Mini EPS at a glance	10
Next steps	11
About Expo	12



# Introduction

Organizations go to great lengths to protect electronics in explosive environments, but too often they either don't think about or neglect to protect equipment in non-explosive, but damaging environments.

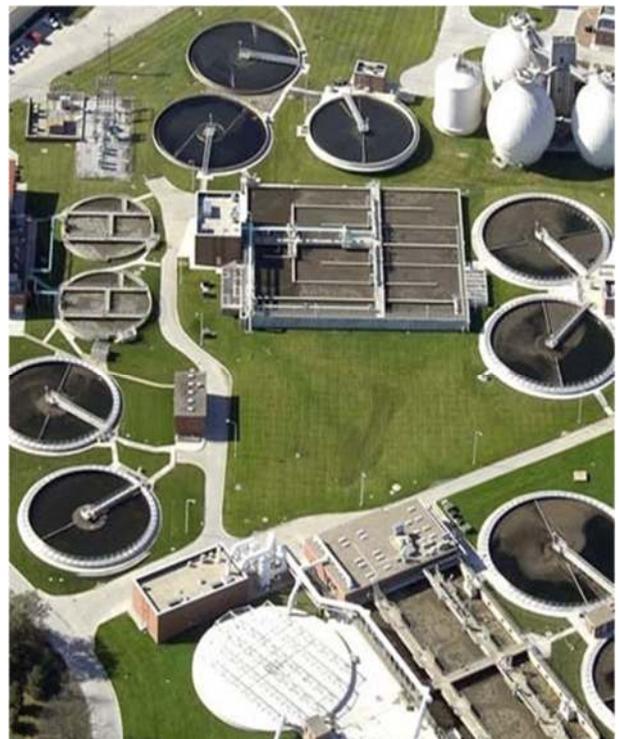
Harsh conditions in these kinds of environments can cause a number of problems – impeding process efficiency and sapping productivity from the business. Worst of all, costs rise unnecessarily as organizations must replace expensive electronics before their intended end of life.

It's clear that simply dealing with these issues as they arise isn't enough; too much time and money is wasted. Proactive, preventative action is a necessity for any organization relying on electronic equipment for day-to-day operations in corrosive or dusty environments.

If you're experiencing issues with equipment malfunctions and failures, upgrading your facilities or getting feedback from the field about problems with electronics, it's time to consider a preventative protection solution.

In this paper, we explore:

- The business impact of operating electronics in harmful environments.
- How positive pressurization can help mitigate or eliminate these issues.
- A simple, cost-effective solution for protecting your equipment – and your business.

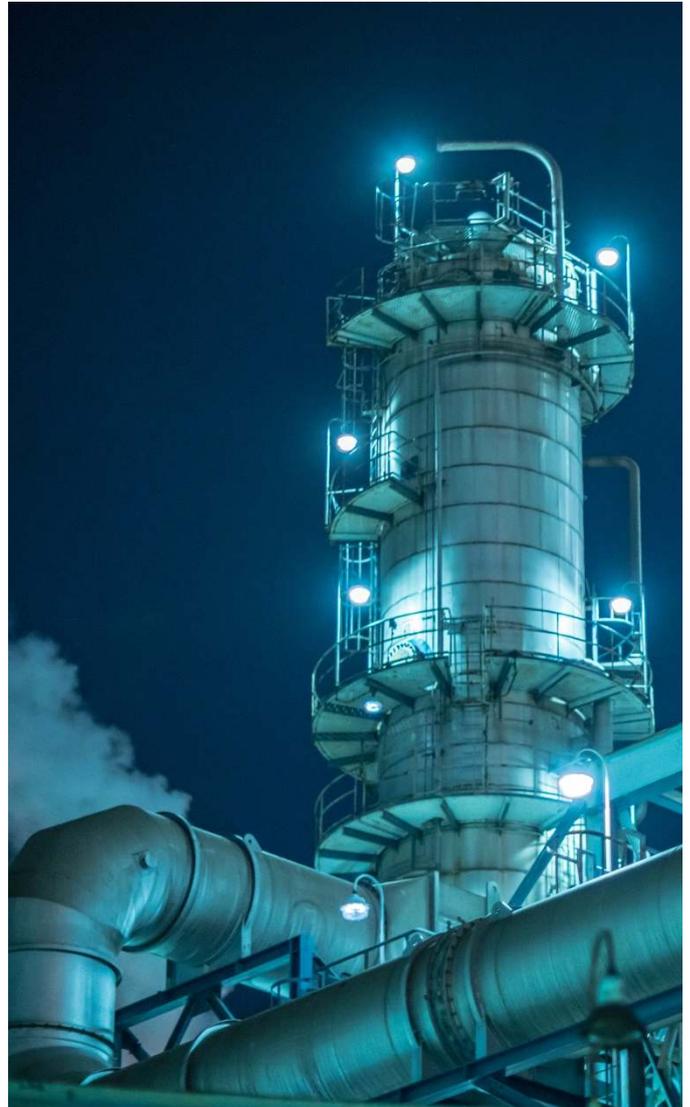


# The challenges of hostile environments

Even when environments are non-explosive, equipment can still be at risk. Some environments may contain harmful elements which damage electronics in these areas. When these elements enter enclosures, they can cause partial or complete failure of electronics, potentially in critical control applications.

For example:

- Water and wastewater environments often contain ammonia or hydrogen sulphide, which are corrosive to electronics components.
- Food and beverage manufacturing facilities may include processes that result in splashing or dusty environments, which can cause short circuits or power outages.
- Industrial facilities often have processes that create corrosive substances, which can potentially damage critical control equipment.
- Naturally corrosive atmospheres, including sea-mist environments at coastal facilities and high-humidity environments, such as tropical climates, can also cause failures and reduce the life of electronics.



The damage these types of environments cause to electronics has several short and long-term effects.

Malfunctions or equipment failures mean field workers lose control over key processes. This creates inefficiencies that increase the time and cost of production. In addition, it can lead to field workers creating manual workarounds, hiding the true extent of the problem from management oversight.



Loss of electronics functionality causes delays and stoppages that slow down production, leaving workers and production lines idle while costs continue to mount.

For any business, equipment downtime means lost production time. But in industries such as petrochemicals, for example, every minute of downtime has a significant impact on revenue generation – and a lasting impact on the bottom line.

Perhaps the biggest problem, however, is that the damage caused in these environments can artificially shorten the lifespan of expensive electronics, so equipment must be replaced more often. This has a threefold impact on the business through unnecessarily high procurement costs, excessive business disruption and increased downtime during scheduled maintenance cycles.

*“The damage caused in these environments can artificially shorten the lifespan of expensive electronics, so equipment must be replaced more often”*



## Current protection strategies aren't enough

Many businesses rely on the integrity of enclosures to keep their equipment protected. But electronics enclosures all have leakage points, which creates the potential for corrosive gas or dust to enter and damage electronics.

The cycling of electrical equipment inside enclosures creates fluctuating temperature changes. These changes produce a kind of 'respiration' in the enclosure, drawing in moisture and contaminants from outside.



While each enclosure will have been specified to an ingress protection (IP) rating suitable for its environment, installation processes and variations in external humidity can damage the integrity of even the highest IP68-rated enclosures.

In most use cases, total protection from the ingress of harmful elements is almost impossible to guarantee.

Other organizations attempt to control the surrounding environment by relocating vulnerable equipment in well-ventilated rooms or outdoor locations to get around the problems caused by damaging environmental conditions.

While this can be effective in some circumstances, it's clearly not a practical solution for every application.



*“Instead of relying on the structural integrity of enclosures, or relocating applications to different areas, organizations must find a protective solution that prevents damaging*

Neither of these strategies will ever be completely effective – and simply coping with the issues is not an adequate response.

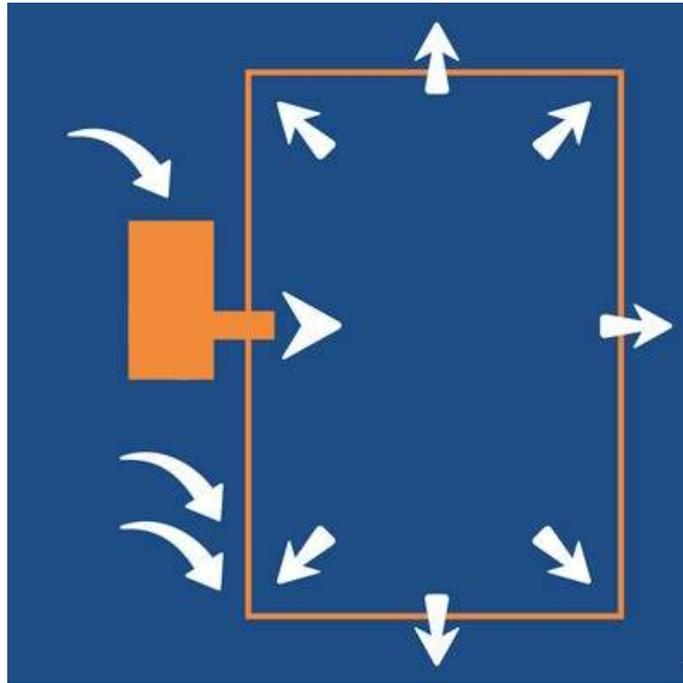
Although the risk is less obvious in non-explosive environments, it’s still very real. There may not be immediate risk to human life, but the risk to the business from increased costs and lost productivity cannot be ignored.

Instead of relying on the structural integrity of enclosures, or relocating applications to different areas, organizations must find a protective solution that prevents damaging elements from entering the enclosures in the first place.



## The power of positive pressure

Environmental pressurization systems offer a simple, cost-effective way to provide preventative protection for electronics in the harsh environments that occur in a broad range of industries. These systems use clean, dry compressed air or inert gas to maintain a positive pressure within the enclosure.



By regulating the enclosure's pressure, harmful gases and dusts are prevented from entering and accumulating, so equipment and instrumentation can operate without risk of damage from external elements.

This means workers in the field can maintain the functionality and control they need to effectively execute key processes. And the resulting decrease in downtime means higher productivity and greater operational efficiency – as well as increased employee morale, which is itself a key factor in productivity.

Alongside the operational benefits, there are also important financial benefits from protecting equipment with positive pressurization. Extending the life of electronic equipment means lower capital expenses from procuring replacements, and there's also less business disruption from installing new equipment.

For many organizations, the electronics that underpin their operations can be extremely expensive. By extending the lifespan of this equipment, businesses can expect to see huge cost savings while maintaining higher levels of productivity.



# Introducing the Expo's solution – The Mini Environmental Purge System (Mini EPS)

Expo Technologies' Mini EPS is a simple, compact and complete system designed specifically for harmful environments. It complements our portfolio of solutions for hazardous and explosive environments by providing cost-effective protection in non-hazardous areas.

The Mini EPS is also the only self-contained positive pressurization product on the market, so there's no need to procure and install multiple products to create a functional system.

It also ensures enclosure protection during maintenance and storage, by maintaining a UL50E 4X/IP66 seal with the enclosure even when disconnected from an air source.



Like all our preventative protection solutions, with the MiniEPS users get:

## *Simplicity*

- Fast and easy to install, with flexible mounting configurations
- Simple to retrofit in existing enclosures
- Easy to manage, monitor and maintain in the field

## *Expertise*

- Bring our experts onboard during the design process to help you ensure your enclosures keep vital equipment protected
- Get advice on installing or retrofitting the MiniEPS on your enclosures, based on extensive experience working with customers around the world

## *Protection*

- Extend the life of the expensive electronic equipment
- Enable preventative maintenance to reduce failures and loss of functionality
- Reduce downtime and replacements by eliminating a common source of equipment failure



## MiniEPS at a glance

- The only all-in-one system on the market—one model number defines the whole product
- Compact size and flexible mounting configurations—maximise usage of the internal space within the enclosure
- Easy installation and retrofitting to new or existing enclosures
- Clear status indication for simple monitoring—red/green indicator, so no misinterpretation of gauges or dials
- Built-in overpressure protection to limit enclosure pressure to 10 mbar
- Compliance with UL50e, type 4X and IP66, so installing



## Next steps

To protect your equipment, your operations and your bottom line, coping with the problems caused by corrosive and dusty environments isn't an option. By using preventative solutions – including positive pressurization systems, such as our own MiniEPS – you'll be able to safeguard productivity and operational efficiency while saving time, money and effort on replacing electronic equipment earlier than necessary.

## Get in touch

If you'd like to learn more about our preventative protection solutions, or need some expert advice on how to keep your electronic equipment protected, contact us today.



# 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 end-users, integrators, and OEMs across a wide range of industries, including oil & gas, chemical & petrochemical, pharmaceutical & biotechnology, and power generation.

We are experts in electrical protection by purge and pressurisation, having been involved from the very beginning and helping to write the first standards. Our purge and pressurisation systems provide protection to more than 9,000 large electric motors and generators all around the globe,

Expo Technologies Ltd.  
Unit 2, The Summit,, Hanworth Road,  
Sunbury on Thames,  
TW16 5DB, UK.  
T:+44 (0) 208 398 8011  
E: sales@expoworldwide.com

Expo Technologies Inc.  
9140 Ravenna Road, Unit #3,  
Twinsburg,  
OH 44087, USA  
T: +1 440 247 5314  
E: Sales.na@expoworldwide.com

Qingdao Expo M&E Technologies Co.  
Ltd.  
329 Huashan Er Lu,  
Jimo City, Qingdao,  
266200 China  
T: +86 532 8906 9858

