

Case story | SEM-SAFE® high-pressure water mist system

Reliable fire suppression

At Verne Global's Icelandic data centre

Danfoss Fire Safety A/S



Verne Global data centre campus, Iceland

The 100% renewable-powered data centre

Verne Global operates a state-of-the-art 40-acre data centre campus in Iceland. Connected to the country's stable and 100% renewable-powered electricity grid, the facility is the ideal location for organisations running computer applications with high power requirements, and is home to some of the world's most exciting and innovative Artificial Intelligence projects. It is also a popular destination for companies focused on reducing the carbon footprint of their data centre operations.

Designed to take advantage of Iceland's unique climate

Iceland's temperate climate allows Verne Global to cool its data centre with fresh air 365 days of the year. Not only does this negate the need for costly air-conditioning units – savings that it is able to pass on to customers – it means carbon emissions are kept to a minimum.

The facility has been specially designed to draw and filter air from the outside, before circulating it within the data halls in order to cool the equipment.

Design requires an innovative approach to fire safety

Ensuring that the data centre is always working optimally – with minimal downtime – is mission-critical to both Verne Global and its many customers, which makes fire safety a key priority. However, the facility's design means that traditional approaches to fire suppression – using gas or sprinkler systems – are not appropriate. Gas would disperse too quickly in the fresh air while the cylinders used in these systems require a considerable amount of space, which is of a premium in data centre environments. Gas systems are also time consuming and costly to refill after discharge. Meanwhile sprinklers and low-pressure mist systems could cause considerable water damage to the equipment housed within the data centre.

Protecting high-value equipment with SEM-SAFE®

With Verne Global building a number of ultra-high density pods on its campus – each of which is custom-engineered to house supercomputers and other high-value technology solutions – it wanted to install an advanced suppression system that would not only protect this valuable equipment from fire, but also from water damage. Having assessed a number of commercially available solutions, it elected to install Danfoss Fire Safety's SEM-SAFE® high-pressure water mist solution.

Optimum fire protection

The SEM-SAFE® high-pressure water system provides instant fire suppression by releasing micro-droplets of water directly onto the affected area. These droplets form an ultra-fine mist, which tackles the fire in two ways; by cooling the flames and by simultaneously starving the fire of oxygen, thereby preventing re-ignition. High-pressure water mist is highly effective in the fight against fire, providing excellent protection against heat damage.

Intelligent design minimises water damage

A key benefit of the SEM-SAFE® system is that the mist is highly targeted at the source of fire. If a fire is detected and confirmed by the alarm system, a section valve will open immediately, allowing water to flow into the otherwise dry distribution pipe network. No other valves will open, ensuring that the mist is deployed exactly where it is required and nowhere else. Furthermore, the high-pressure water mist produces a high level of atomisation, which means water droplets are exceptionally small; which further reduces the risk of water damage.

Bespoke design, backed up by local support

Key to Verne Global's decision to deploy the SEM-SAFE® system was Danfoss Fire Safety's reputation for excellent customer support. With operations across the globe – including in Iceland – the Verne Global team had peace of mind that the deployment would be closely managed; vital as this was the first of deployment of its type in the country. The on-the-ground team was ably assisted by the specialist experts at the Danfoss Fire Safety headquarters in Denmark, which created a bespoke design, allowing the Verne Global team to visualise the entire system prior to the deployment.

Danfoss Fire Safety's system is the ideal fit for our data centre. Not only is it rigorously and independently tested to suppress fires, it is designed to minimise water damage too, which is crucial considering the value of the IT equipment located within our ultra-high density pods. Local presence was also an important factor in us choosing the company as a strategic supplier. This was a mission-critical deployment for Verne Global, so having a highly-professional team on the ground – backed up with first-class support in Denmark – was immensely reassuring."

Helgi Helgason

Managing Director, Verne Global, Iceland

Cost efficient, scalable design

For data centres, efficiency is of paramount importance, and this is particularly the case for Verne Global, which specialises in providing sustainable solutions. The SEM-SAFE® system is highly efficient. Its pump unit has a compact design, while – unlike gas suppression techniques – the system can be used multiple times, doesn't require any expensive refills and is virtually maintenance-free. In the event of a false discharge, the system can be stopped and will be immediately ready for re-use; a feature not possible with alternative solutions. It also comprises high-quality, durable stainless-steel pipes that further reduce the system's total cost of ownership. Finally, it is easy to scale and configure; ideal as Verne Global continues to bring more ultra-high density data centre pods online.

Aligned with environmental goals

Organisations often locate their equipment at the Verne Global campus because it is 100% powered by geothermal and hydroelectric electricity. The SEM-SAFE® system has been designed with the environment in mind. Lubricated by water rather than oil, there is zero risk of contamination, while the system also boasts low power and water consumption.

SEM-SAFE® advantages

The SEM-SAFE® system comprises a high-pressure modular pump unit, section valves, piping and water mist nozzles. With small pipe dimensions, large coverage and minimal water consumption, SEM-SAFE® high-pressure water mist is a reliable choice to protect data centres against fire, offering:

- ✓ Reliable fire suppression
- ✓ Protection for IT equipment
- ✓ Compatibility with fresh air cooling
- ✓ Low energy consumption
- ✓ No refill costs
- ✓ Maintenance-free pumps
- ✓ FM accreditation

About Danfoss

Danfoss is a Danish multinational company, that manufactures products and services used in cooling, heating, air conditioning, fire safety, drives, power modules and much more. With over 28,000 employees and operations in over 100 countries, Danfoss is fully committed to developing sustainable and climate friendly solutions for greener cities and more efficient district energy networks.

SEM-SAFE®

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