

Frasers Group, United Kingdom

A bespoke fire detection and extinguishment system for Europe's largest automated warehouse



Aerial shot of Frasers Group Mansfield site

About

Country:

United Kingdom

Customer:

Frasers Group

Location:

Mansfield

Industry:

Retail

Challenges

Frasers Group is a collection of leading retail brands, with stores located in more than 25 countries. To keep up with the rise in online sales and shop collections, the group's principal warehouse has been continuously expanding since 2005. Now covering 13,000 square metres, it's currently one of Europe's largest automated storage and retrieval system (ASRS) sites.

The warehouse has evolved from using pallet racking storage to ASRS. But this can make it difficult to accomplish final extinguishment with traditional firefighting methods. The main challenges that make this project unique are the configuration of the stock and the scale of the stock area.

It's difficult to pinpoint the source of a fire in a warehouse with a single stack of storage and Frasers Group's rack structure and tote storage design, with its six-metre height and lack of gaps or flue spaces, creates a solid wall of storage. Coupled with the 13,000-square-metre footprint, this means that if a fire started at a low level within the stack, it could take longer to detect – giving it more time to take hold. To build a solution capable of dealing with this complex setup, Frasers Group needed a trusted partner.



Solutions

Since construction on the Mansfield warehouse began, we've been collaborating with Frasers Group on a site-wide sprinkler solution. Following the installation of an automated top-loading storage system at the site, we were contracted to build on it with a bespoke fire detection and final extinguishment system.

The main priority was to protect stock and warehouse infrastructure from losses, such as the 2021 fire at Ocado's largest automated warehouse, which cost the retailer around £35 million in lost revenue. Although the sprinkler system alone is designed to suppress and contain a fire, it may struggle to get to the source of a deep-seated fire for total extinguishment and control. So, an additional solution was needed to mitigate the risks.

The goal was to implement a solution that, in addition to the suppression system, meets the FMDS 8-34 requirements. This system will rapidly pinpoint the source of fire with infrared and thermal imaging cameras and achieve final extinguishment in the event of a fire. It will also be a permanent installation that local fire brigades can use for tackling on-site fires.

"Delivering a robust fire detection and extinguishment system in this unique space was no easy feat. Working together with Frasers Group and external stakeholders, we have implemented a fire strategy and system that can deal with any risk quickly and safely, despite the constraints of the architecture."

Johnson Controls

A spokesperson for Frasers Group explained the value delivered by Johnson Controls:

"Our just-in-time business model means that any unplanned disruption to our warehouse operations would greatly affect our bottom line. Continuing our long-standing relationship with Johnson Controls, we have been able to build a fire safety system that not only satisfies our stakeholders and insurers but ensures continuity in the face of crisis."

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Benefits

At Johnson Controls, we advance smart, healthy, sustainable spaces and places. Leveraging our industry-leading expertise, we developed a system to identify the source of the fire, despite the complex storage arrangement. Our team installed infrared cameras with thermal imaging to detect fires from inception and identify the exact location of incidents despite high levels of smoke. The new system offers early and reliable thermal imaging and extinguishment, in a combined system that runs 24 hours a day.

A heat plume from a fire will trigger an automatic sprinkler response. Independently, yet simultaneously, the thermal imaging cameras will provide target location information on the fire position to the water monitors. Once the source has been identified and sprinklers suppress the fire, water monitors are deployed – firing a minimum of 950 litres a minute at a 900-square-metre fire zone to extinguish the blaze.

The water monitors will automatically and continuously oscillate and discharge water over the fire zone, using manual activation. The water monitors can also be both automatically and manually operated by senior personnel or the fire brigade. They can rotate the cannons remotely to ensure damage is kept to a minimum. This dual approach, offering automatic and manual intervention, goes beyond FMDS 8-34 requirements for manual intervention – delivering an involved, robust fire protection system.