Data centres and the fire hazard: why fire protection enclosures are essential

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As UK data centre capacity continues to expand, ensuring electrical resilience under fire conditions is an important design priority. Fire protection enclosures play a vital role in maintaining circuit integrity in the event of a fire, helping facilities sustain safe operation and supporting a controlled shutdown during an incident, as well as assisting safe evacuation and fire suppression. To achieve this, modern polycarbonate fire protection enclosures combine certified fire performance with fast and flexible installation.

Chris Lloyd, Managing Director at Spelsberg UK, explains.

The UK's data centre sector is growing rapidly. Estimates suggest there are over 500 data centres across the UK, with a recent report forecasting that spending will increase to £10bn per year by 2029, a ten-fold increase over five years[1]. This boom is driven by cloud computing and the heralded introduction of AI, and modern society's reliance on this high-value infrastructure means that its protection is vital.

In a data centre, fire risks are heightened due to the volume of electrical connections and their load, supporting dense server arrays, extensive cabling, and backup power. As a result, electrical faults, overheating components, or battery failures are

[1] https://www.reuters.com/business/finance/uk-data-centre-spend-soar-10-billion-year-barbour-abi-2025-10-22/

just some of the potential causes of ignition, and a fire in a data centre can have outsized consequences. Even a confined incident could damage components and force downtime, but if a serious fire takes hold, the potential for data loss, reputational damage, and human safety could lead to far more serious consequences.

Fire protection is key

With high-value stakes, data centre designers go to great lengths to minimise the potential of fire ignition, supported by optimum detectors and effective suppression systems. Even so, it's impossible to guarantee fire prevention for every connection across hundreds of high-power server racks.

In the event of a fire, it's vital to protect the electrical junctions that supply essential facilities such as emergency lighting and backup power, plus additional systems where maintaining a power supply is critical. Protecting these connections during the outbreak of a fire will not only help to maintain operations, but can also be crucial to support evacuation and rapid fire suppression.

While concrete provides high resistance as a fire barrier, it's inherently inflexible. This is a challenge when managing electrical supply and connections in any modern building, but for a data centre that needs miles of cabling and innumerable junctions, relying on concrete is a non-starter. Instead, to give data centre managers the flexibility to scale operations with additional racks, hardware, and essential power connections, surface-mounted enclosures give the freedom to add junctions as required.

E90 certification

To protect the electrical supply, it's essential that surface-mounted enclosures can provide a barrier to extremes of heat and flame. In the event of a fire, the control systems governing safe shutdown of IT hardware might need to run for up to an hour, while fire suppression systems and emergency lighting might need to run for up to 90 minutes.

When selecting a fire-protection enclosure for a data centre, units should be certified between E30, E60, and E90, guaranteeing functional integrity of the enclosures for at least 30, 60, or 90 minutes from the onset of fire. The E90 certification might be needed to protect the supply to functions such as water booster systems to supply extinguishers, smoke and heat extraction systems, as well as evacuation-able fire brigade elevators.

To achieve this level of fire protection, thermoplastic polycarbonate is the choice for its high heat tolerance, and as polycarbonate is non-conductive during a fire, it also removes the risk of short circuit. Within the enclosure, terminal block clamps will typically be made from high temperature-resistant ceramic, securing connections in place while also removing the short-circuit risk. Enclosures can also include integrated fuses that enable nonreactive cable branching, meaning that in the event of a fault, the functional integrity in the main section is unaffected.

Ingress and impact resistance

In the event of fire, it's not just heat and flame that the enclosure must protect against. Sprinkler systems and hoses present a water ingress risk, and during an

emergency situation, the prospect of impact is high. As a result, fire protection enclosures should be rated to IP66, preventing ingress from strong water jets, with an IK08 rating to give high resistance to physical impact.

As well as the need to ensure the highest level of protection, rapid enclosure installation reduces time and cost, particularly when multiple units are required within a data centre environment. In combination, a flexible installation capability with sufficient adjustment options lowers the demand for prior planning of cable architecture and means a faster job on-site.

For example, Spelsberg's WKE fire protection enclosures can be mounted on a fire-resistant wall or ceiling, installed with two pre-fitted lugs that can be rotated around 90° for positioning adjustment. Inside the enclosure, the terminal block can also be adjusted through a choice of 0°, 45°, or 90° positions, secured by a central screw and sliding bracket. The enclosures are pre-assembled so only wiring is required, meanwhile the enclosure cover can be kept safe during wiring with the optional cover-retaining strap.

Fast, simple installation

To optimise cable routing between enclosures and the wider electrical circuits, knock-out membranes enable fast and simple cable installation, with an integrated flange system maintaining the IP rating. Spelsberg's in-house CNC service can also customise enclosures, providing cutting, milling, and drilling according to bespoke designs.

Growth in the UK's data centre market shows no signs of slowing. As our infrastructure increasingly relies on digitalisation, cloud computing and the web, and soon, AI technology, maintaining data centre operations 24/7 is critical. To protect from fire, polycarbonate-based, surface-mounted enclosures not only provide the required level of safety, but their installation flexibility makes it faster and easier to achieve the necessary level of protection.

To find out more about fire protection enclosures, visit here.

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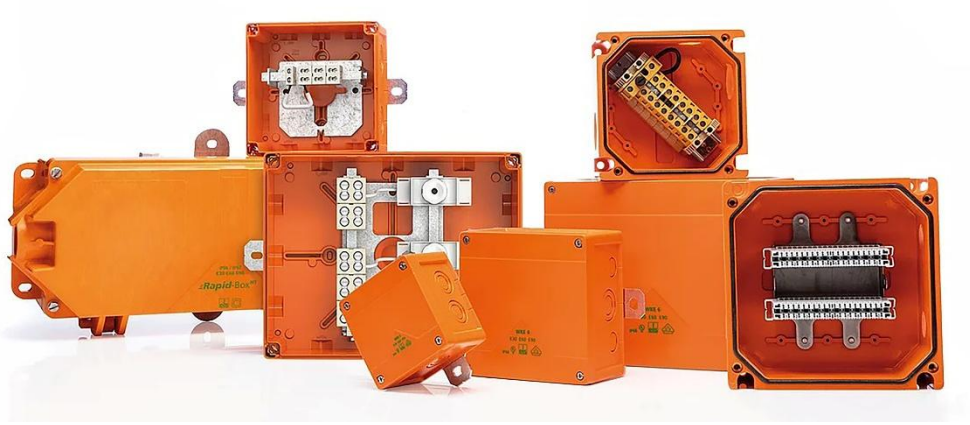

Image 1: Spelsberg WKE-AK small distribution boards offer electrical functional integrity E30 to E90 in the event of a fire.

Image 2: Spelsberg WKE-AK small distribution boards offer electrical functional integrity E30 to E90 in the event of a fire.

About Spelsberg

Spelsberg is one of the largest manufacturers of electrical enclosures in the world. With over 4,000 enclosures available as standard and further customisation possible, it offers solutions for almost any application.

With the largest supply of non-metallic enclosures, ex-stock in the UK, its products are often available for delivery within 24 hours; customisation is possible on any product, including bespoke entries, engraved corporate logos or fitted terminals, within 48 hours. Products can be ordered direct from Spelsberg or from most leading supply specialists including RS, Rapid, Farnell and CPC.

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