

Explosion-proof network cabinet processing



Overview

R. STAHL | EXpressure | Enclosure technology | Ex-cabinets EXpressure enables easy project engineering of explosion-protected control systems and distribution.

Key Takeaways

Explosion-proof network cabinets are designed to safely house network equipment in hazardous areas by controlling pressure, heat, and electrical risks while complying with international safety standards. Design and Pressure Management

Modern explosion-proof cabinets, such as EXpressure Ex d enclosures, use stainless steel wire mesh in the walls to dissipate pressure and absorb heat in the event of an explosion, reducing internal pressure to below 1 bar. Wall thicknesses can be as low as 2 mm, making the cabinets lighter while maintaining safety. This design allows for flexible retrofitting and integration of digital industrial electronics, including routers, switches, LTE, and 5G devices, in hazardous areas .

Standards and Certifications

Explosion-proof cabinets must comply with international standards such as IEC 60079, EN50014, and NEMA. These standards ensure that the enclosures can withstand flammable gases, liquids, and dust in environments like oil exploration, chemical plants, food processing, and biopharmaceutical facilities . Cabinets are typically rated for Zones 1, 2, 21, and 22, depending on the level of hazard.

Network Integration



Explosion-proof cabinets support both wired and wireless industrial networks. Industrial Ethernet and Wi-Fi solutions can be installed using certified enclosures, allowing seamless integration with existing IT networks. Wireless access points can be mounted inside Ex d, Ex tb, or Ex ec certified housings, ensuring safe operation in Zones 1 and 21 while maintaining high-performance signal transmission . Fiber optic media converters and high-speed Ethernet terminals are often used to extend transmission distances safely.

Hardware and Accessories

Cabinet components such as locks, hinges, handles, and electronic fingerprint locks are designed to withstand high and low temperatures, heavy loads, and harsh outdoor conditions. Stainless steel and reinforced materials improve durability, corrosion resistance, and safety. Explosion-proof antennas and HF isolators ensure that wireless signals do not pose a hazard in Ex areas .

Thermal Management

Maintaining optimal internal temperature is critical. Solutions include purge/pressurization systems that replace hazardous atmospheres with inert gas or air at sufficient pressure to prevent ingress of ambient air. Certified thermal management systems mitigate condensation and overheating, ensuring reliable operation of network equipment in hazardous locations .

Practical Considerations

- Choose the appropriate zone rating based on the environment.
- Ensure compatibility with existing network components to simplify maintenance.
- Use modular and lightweight designs for easier installation and retrofitting.
- Implement regular inspections and maintenance to maintain safety and performance. Explosion-proof network cabinets provide a safe, flexible, and future-proof solution for industrial networking in hazardous areas, enabling the deployment of modern digital and wireless technologies without compromising safety .

Article Content

Industrial Ethernet in Hazardous Areas | R. STAHL

We ensure the symbiosis of digital data transmission with reliable explosion protection. This is why we offer explosion-protected

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