

How to splice optical fibers in an explosion-proof junction box



Overview

Fibre Optic Splice Boxes for Hazardous Areas Explosion-Proof Fibre Optic Termination Solution for Hazardous Locations. Engineered for safety, reliability.

Key Takeaways

Splicing optical fibers in an explosion-proof junction box requires using certified hazardous-area enclosures, following strict safety protocols, and performing precise fiber preparation and fusion splicing. Choosing the Right Junction Box

For hazardous environments, select a junction box certified for explosive atmospheres (Zone 1 or 2 for gases, Zone 21 or 22 for dust). Examples include the BXJ93 from Warom or AXIS TX1401, which are ATEX and IECEx certified and constructed from stainless or carbon steel for durability and ingress protection (IP66). These boxes feature internal splice trays, multiple cable gland entries, and secure covers to maintain explosion-proof integrity.

Safety Precautions

- **Personal Protection:** Wear industrial safety goggles, cut-resistant gloves, and anti-static clothing to prevent injury from fiber shards and static discharge.
- **Workspace Setup:** Ensure the area is free from ignition sources and that the box is de-energized if electrical components are present. Use anti-static mats and wrist straps to protect sensitive splicing equipment.



- **Fiber Waste Management:** Dispose of stripped fiber coatings and shards in sealed containers to prevent contamination or injury .

Fiber Preparation

- **Strip the Fiber:** Use a precision fiber stripper suitable for the fiber coating (typically 250µm for bare fibers, 900µm for coated fibers). Apply uniform pressure to avoid microfractures .

- **Clean the Fiber:** Use high-purity alcohol wipes to remove debris and coating residue.

- **Cleave the Fiber:** Use a high-quality cleaver to produce a flat, perpendicular end face for low-loss splicing.

Splicing Procedure

- **Install Fiber in Splice Tray:** Place fibers in the internal splice tray of the explosion-proof box, ensuring proper routing and strain relief.

- **Fusion Splicing:** Use a fusion splicer to join fibers. Follow the splicer manufacturer's instructions, ensuring electrodes are clean and power is stable .

- **Protect the Splice:** Apply a heat-shrink splice protector or mechanical sleeve to maintain fiber integrity.

- **Organize and Secure:** Arrange fibers neatly in the tray to prevent bending below the minimum bend radius. Close the tray and secure the box cover with captive screws to maintain explosion-proof certification .

Final Checks

- **Verify splice loss** using an optical power meter or OTDR.

- **Ensure all cable glands** are tightened and the enclosure is sealed to maintain IP66 protection.

- **Confirm that the box remains compliant** with ATEX/IECEx standards after installation . By following these steps, you can safely and effectively splice optical fibers in an explosion-proof junction box while maintaining both high-performance connectivity and hazardous-area safety compliance.

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