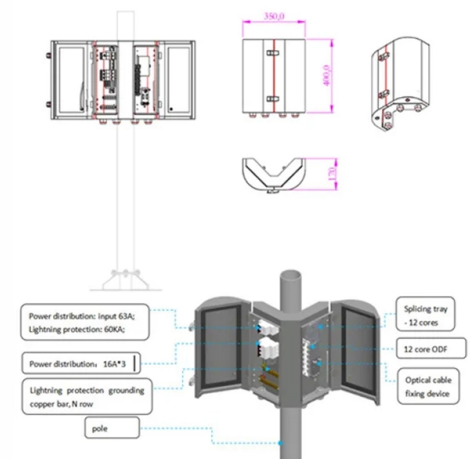


The longest low-voltage busbar in the distribution cabinet



Article Overview

The maximum length of a low-voltage busbar in a distribution cabinet is not fixed by standard but is determined by thermal, mechanical, and electrical constraints according to IEC 61439.

Key Considerations

1. **Thermal Limits:** The busbar must not exceed the permissible temperature rise under continuous load. IEC 61439 specifies that the maximum working temperature for copper or aluminum busbars is typically 140°C, considering an ambient temperature of 35°C. Longer busbars have higher resistance, which increases heat generation, so the length must be limited to prevent overheating . 2. **Voltage Drop:** Longer busbars increase voltage drop along the conductor. For low-voltage systems (up to 1000 V AC), the voltage drop should generally remain below 3-5% to ensure proper operation of connected equipment. This requirement indirectly limits the maximum busbar length depending on current rating and cross-sectional area . 3. **Mechanical Support:** Busbars must be supported at intervals to withstand mechanical forces from their own weight and short-circuit electromagnetic forces. IEC 61439 recommends spacing supports to prevent bending or vibration. Excessive length without adequate support can compromise structural integrity . 4. **Short-Circuit Withstand:** Long busbars experience higher mechanical stress during short-circuit events. The busbar length must be compatible with its cross-section and support design to safely withstand fault currents . 5. **Practical Design:** In practice, low-voltage busbars in distribution cabinets are often limited to 2-3 meters for straight runs, de...

Article Content

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