

Price of Low-Voltage Dense Busbars



Article Overview

The price of low-voltage dense busbars is calculated by combining material cost, physical dimensions, fabrication complexity, and additional engineering factors such as insulation, bends, and tap-offs.

Step 1: Determine Material and Dimensions

The first step is to select the conductor material—typically copper or aluminum. Copper offers higher conductivity but is more expensive, while aluminum is cheaper and lighter but requires a larger cross-section to carry the same current. Calculate the volume of metal required using the busbar's length, width, and thickness. For rectangular busbars, the cross-sectional area directly affects both current-carrying capacity and material cost.

Step 2: Account for Electrical and Thermal Requirements

Busbar sizing must satisfy current rating, temperature rise, and short-circuit withstand. Use DC resistance $R = \rho / (\text{width} \times \text{thickness})$ and AC resistance adjustments for skin effect to determine losses. Ensure the busbar can handle the rated current without exceeding temperature limits (typically 70K above ambient for bare conductors). These calculations influence the required cross-section, which in turn affects material cost.

Step 3: Include Fabrication and Design Complexity

The number of bends, tap-off points, joints, and insulation increases labor and tooli...

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Distinguishing High and Low Voltage Busbars

Voltage Level High Voltage Busbars: Typically refer to busbars with a rated voltage of 1kV and above, including common voltages

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