

Color Standards for Secondary Wiring in Distribution Cabinets



Overview

A Guide to Electrical Wiring Colors Coding | DuraLabelThe sections below break down how wire color standards differ by system and voltage, where confusion.

Key Takeaways

Secondary wiring in distribution cabinets typically follows IEC/NEN-EN-IEC 61439 color codes, with black for main power, red for AC control, blue for DC control, and green-yellow for protective earth.IEC/NEN-EN-IEC 61439 Color Guidelines

In distribution cabinets, the NEN-EN-IEC 61439 standard provides flexible color coding for secondary wiring, focusing on safety and clarity rather than strict mandatory colors . Key recommendations include:

- Black: AC and DC main power chains
- Red: AC control current chains
- Blue: DC control current chains
- Orange (dark blue/orange): Power chains that remain live even when the main switch is off, such as potential-free contacts leaving the cabinet



- **Green-Yellow:** Protective earth (PE), recommended but not strictly mandatory if the wire's start and end points are clearly identifiable. The standard allows exceptions when insulation in the recommended colors is unavailable, such as in multi-core cables. Unlike installation wiring outside the cabinet (which follows NEN 1010 with strict color rules), inside the cabinet, partial coding or marking at connection points is often sufficient.

AC and DC Wiring Considerations

- **AC Systems:** IEC color codes are widely adopted in Europe and other regions. Live wires can use black, brown, or gray for three-phase systems, while neutral is blue and protective earth is green-yellow.
- **DC Systems:** For control circuits or DC-powered equipment, blue is commonly used for positive or control lines, and black may be used for negative or main DC power chains.
- **Protective Earth:** Always green-yellow, even in cabinets, to ensure safety and easy identification.

Practical Recommendations

- **Labeling:** Even when color coding is flexible, labeling wires at both ends improves safety and maintenance efficiency.
- **Consistency:** Maintain consistent color usage within a cabinet to avoid confusion, especially in complex control or automation systems.
- **Testing:** Always verify wiring with a multimeter before maintenance, as older installations may not follow current standards.

Summary

For secondary wiring in distribution cabinets, IEC/NEN-EN-IEC 61439 color codes provide a practical framework: black for main power, red for AC control, blue for DC control, orange for live auxiliary circuits, and green-yellow for protective earth. While some flexibility exists, clear identification through color, labeling, or marking is essential for safety, compliance, and ease of maintenance.

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