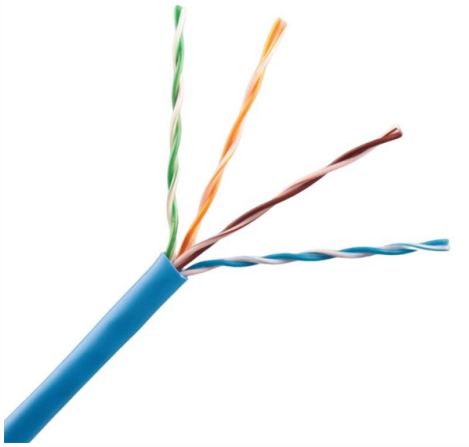
Design of Cabinets for Automated Equipment



Overview

Switch cabinet & control system construction We design all types of control cabinets for you: from small distribution boards and terminal boxes to junction.

Key Takeaways

A well-designed cabinet for automated equipment protects components, organizes wiring, ensures thermal management, and facilitates maintenance for reliable industrial operation.

Purpose and Function

Control cabinets serve as the central hub for automation systems, housing critical components such as PLCs, power supplies, I/O modules, HMIs, circuit breakers, and network devices. They protect sensitive electronics from dust, moisture, vibration, oil mist, and accidental contact, while consolidating power and control signals to optimize operational efficiency and safety. In automated systems, cabinets also facilitate signal exchange between different subsystems, ensuring smooth coordination across complex machinery.

Key Design Considerations1. Enclosure and Protection: Choose materials like stainless steel, carbon steel, or aluminum for durability. Select an IP rating appropriate for the environment (commonly IP54 or IP55) to balance protection against dust and liquids with ventilation needs.



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Ensure the cabinet can withstand vibration, heat, and continuous operation typical in industrial settings. 2. Component Layout: Mount components on a back panel or sub-plate for secure attachment.

Use DI

N rails for modular devices like relays, terminal blocks, and safety relays. Allocate 20–30% of internal space for wiring to maintain organization and allow future expansion. Position heat-generating components to optimize airflow and prevent hotspots.

3. Wiring and Cabling: Separate power and signal cables to reduce interference. Use wire ducts and cable ties to route cables neatly and simplify maintenance.

Plan wiring using CAD software to ensure accuracy and safety before construction. 4. Thermal Management: Include ventilation, fans, or heat exchangers to maintain optimal internal temperatures.

Monitor heat buildup, especially in cabinets housing drives or high-power components. 5. Safety and Maintenance: Install main disconnect switches, circuit breakers, fuses, and surge protection to safeguard equipment.

Ensure easy access to components for troubleshooting and upgrades. Consider modular design to simplify retrofitting or replacing PLCs and other devices. 6.

Communication and Networking: Integrate Industrial Ethernet switches, routers, and communication buses for connectivity with other systems or cloud platforms. Plan for future expansion to accommodate additional sensors or automation modules.

Best Practices

Conduct a thorough assessment of environmental conditions (temperature, humidity, dust, vibration) before design. Use customized cabinets tailored to the specific automation system rather than generic enclosures to reduce long-term maintenance issues. Test the completed cabinet for electrical integrity, thermal performance, and accessibility before deployment.

By following these principles, cabinets for automated equipment can enhance system reliability, simplify maintenance, and extend the operational lifespan of industrial automation systems.

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PPA ENERGO sro – Energy solutions

The switchboard equipment is installed in empty cabinets, which allows for the creation of complex assembly units, high variability of equipment content, as well as modular design.

Control Cabinet Manufacturer

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