

Article Overview

In modern edge banding machines, the power distribution box supplies and protects electrical components, while the PLC coordinates motor control, sensors, and actuators for automated operation.

Power Distribution Box Overview

The power distribution box in an edge banding machine serves as the central hub for electrical supply. It distributes power to motors, heating units, and auxiliary devices while providing protection through circuit breakers, fuses, and grounding. Typical wiring includes:

- o Power input terminals (R, S, T) for three-phase supply
 - o Motor output terminals (U, V, W) for feeding, pre-milling, trimming, and polishing motors
 - o Control terminals (DI1-DI5, AI1, etc.) for PLC signals
 - o Protective earth (PE) to prevent electrical leakage and ensure operator safety
- Frequency converters (VFDs) are often installed in the distribution box to regulate motor speed, allowing precise control of feeding, trimming, and polishing operations. Each motor may require different frequency settings, e.g., feeding motors at 50 Hz, pre-milling at 185 Hz, and trimming motors at 80-102 Hz .

PLC Role and Architecture

The PLC acts as the brain of the edge banding machine, coordinating all mechanical and electrical operations. Key components include:

- o CPU: Executes control programs, processes sensor inputs, and generates output commands
 - o Digital Inputs/Outputs: Connect to limit switches, photoelectric sensors, emergency stops, solenoids, relays, and indicator lamps
 - o Analog Inputs/Outputs: Interface with temperature sensors, pressure transducers, and variable speed drives
- PLCs enable automated control of multiple functions such as feeding, gluing, trimming, pressing, scraping, and polishing. They also allow parameter adjustments via touchscreens, improving operational convenience and reducing manual intervention .

Integration with Frequency Converters

Frequency converters are integrated with the PLC to control motor speed dynamically. Wiring involves:

- o Power input from the distribution box
- o Motor output to the respective machine units

- o Control signals from the PLC for start/stop, speed adjustment, and mode selection
- o Grounding to prevent electrical hazards Proper configuration requires motor auto-tuning and professional commissioning to ensure safe and efficient operation .

Practical Considerations

- o Ensure correct voltage and phase matching for local power supply
- o Use high-quality circuit protection to prevent overloads
- o Maintain clear labeling and organized wiring for troubleshooting
- o Integrate touchscreen interfaces for real-time monitoring and parameter adjustment

Summary

The power distribution box provides safe and organized electrical supply, while the PLC coordinates all machine operations, integrating with frequency converters and sensors for precise, automated edge banding. Proper installation, grounding, and parameter tuning are essential for reliable and efficient operation in furniture manufacturing environments.

Edge Banding Machine usage Plywood Production voltage 380 V Platform Dimensions 4000mm*1500mm (157.48in*59.06in) core

In this project, we developed a complete automation system for a PVC edge banding machine using Delta PLC and

Key attributes type Edge Banding Machine usage Plywood Production voltage 380 V Platform Dimensions 4000mm*1500mm core

Steel Enclosure Box Making Process Uncoiler-> Straightening->Servo feeder->Hydraulic device-> Guide

Key attributes type Edge Banding Machine usage Plywood Production voltage 220 V Platform Dimensions 1500mm*3000mm core

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PLC control system for edge banding machine, touch screen control, easy to use, English interface display,

easy to use, just simple

Key attributes type Edge Banding Machine voltage 220 V usage Plywood Production Material Type Wood, PVC core components

The article discusses edge banding machines, detailing types like manual, semi-automatic, and automatic, material

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