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Electronic Control System in an E Coating Line ST-EC-ECS3000

The electronic control system of an E coating line plays a vital role in the electrophoretic coating process. As a core part of modern E coating equipment, it ensures stable operation, consistent coating quality, and efficient production. Below are its main functions and advantages, as typically applied in advanced solutions provided by ShengTai Painting Equipment.

Functions

1. Process Parameter Control

The system precisely controls key parameters such as voltage, current, temperature, and processing time during the electrophoretic coating process. This ensures that coating particles are uniformly deposited under the electric field, forming a high-quality coating. For example, PID temperature control can keep the E-coating bath temperature fluctuation within ±1 °C, guaranteeing stable coating performance.

2. Coordinated Equipment Operation

The electronic control system enables synchronized operation of the E-coating tank, ultrafiltration system, conveyor, and curing oven, ensuring smooth transitions between each process stage. For instance, spray time, curing temperature, and curing duration can be automatically adjusted based on conveyor speed to prevent process conflicts or idle time.

3. Station Identification and Automatic Switching

Through sensors and encoders, the system identifies workpiece positions in real time and automatically switches coating, rinsing, or curing programs according to station requirements. For example, when a workpiece enters the E-coating tank, the system automatically activates the E-coating power supply; once it exits, the process switches to rinsing or curing.

4. Safety Monitoring and Protection

The system continuously monitors operating conditions such as motor load, liquid level, and temperature. If abnormalities occur, it triggers visual and audible alarms or automatically shuts down the equipment to prevent damage or accidents. For example, when the bath liquid level is too low, the system automatically cuts off the E-coating power supply to prevent dry running.

5. Data Recording and Traceability

All key process parameters and production data are recorded for quality traceability and process optimization. Users can review voltage, coating time, and temperature data for specific batches to analyze and resolve coating quality issues.

Advantages

1. Improved Production Efficiency

Automated control reduces manual intervention, shortens production cycles, and improves overall line efficiency. For example, variable frequency drive (VFD) technology optimizes conveyor speed to enable continuous production.

2. Consistent Coating Quality

By precisely controlling process parameters and eliminating human variability, the system ensures consistent coating thickness, adhesion, and corrosion resistance across all batches, significantly reducing defect rates.

3. Energy Saving and Reduced Consumption

Operating parameters are dynamically adjusted according to actual production needs, minimizing energy waste. For example, waste heat recovery from curing ovens can be utilized to reduce overall energy consumption.

4. Easy Maintenance and Management

With built–in self–diagnostic functions, the system quickly identifies faults and reduces maintenance downtime. A user–friendly human — machine interface (HMI) allows easy parameter setting, real–time monitoring, and operational guidance, simplifying daily management.

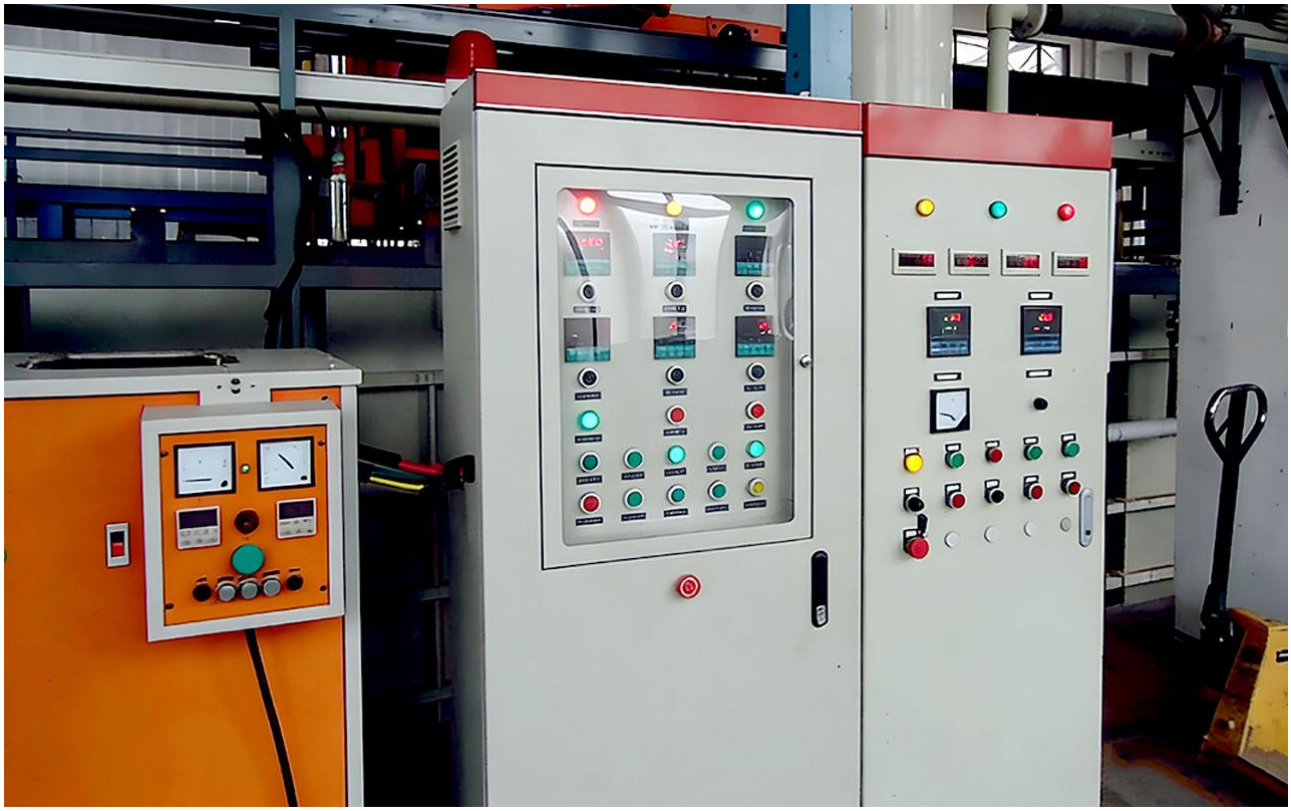
5. High Adaptability and Scalability

The system supports multiple communication protocols and interfaces, enabling integration with MES and ERP systems for unified data management. It can also be flexibly expanded to meet different production scales and process requirements.

With its advanced electronic control systems, ShengTai Painting Equipment delivers reliable, intelligent, and energy–efficient E coating equipment, helping manufacturers build high–performance E coating lines with superior quality and long–term operational

value.

Item	Description
Control Method	PLC + HMI (Touch Screen)
Operation Modes	Automatic / Semi-automatic / Manual
Controlled Units	E-coating tank, power supply, conveyor, temperature control, filtration system
Display	10—15 inch industrial touch screen
Communication	Modbus / Profibus / Ethernet
Power Supply	AC 380V / 220V (customizable)
Protection Grade	IP54 / IP65 (optional)
Installation	Floor-mounted / Wall-mounted



Please provide detailed information so that we can provide you with a more accurate solution:

1. What are the Maxminum and Minimum dimensions of your workpieces (L × W × H)?
2. What is the maximum weight of each workpiece? If available, please also provide product photos.
3. How many workpieces do you plan to coat per day (based on 8 or 16 working hours) or per month?
4. Which heating source do you prefer, such as electric power, diesel, fuel oil, or natural gas?
5. What are the dimensions of your workshop (L × W × H)? If possible, could you share a layout or drawing of the facility?
6. Prior to coating, do you require spray pre–treatment to prepare and clean the product surface?
7. What voltage and frequency standards are used in your country?

Please also share your WhatsApp or another instant messaging contact so we can

communicate more efficiently.

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