

Fully Automatic Cylindrical Lithium Battery Winding Machine

Item Number: YZ03



Introduction

Fully automatic cylindrical lithium battery winding machine delivers servo indexed positioning dual half pin winding automatic tension control edge correction short circuit testing defect rejection and gentle cell transfer for consistent high efficiency cylindrical cell production across laboratory and industrial workflows.

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Application	Description	Key Benefit
Cylindrical lithium-ion cell fabrication	Wind positive electrode, negative electrode, and separator materials into cylindrical battery cores before downstream cell finishing and assembly.	Integrates critical winding and inspection steps into a repeatable automatic workflow.
Battery R&D laboratories	Evaluate winding parameters, electrode entry order, tension profiles, separator handling, and termination processes during cell development.	Parameter-based setup supports process experimentation without requiring extensive mechanical modification.
Pilot-scale battery production	Produce development or pre-production cylindrical cells using automatic material handling and controlled station indexing.	Reduces operator dependence while maintaining a practical scale for engineering validation.
Electrode process verification	Use controlled unwinding, edge correction, and segmented tension adjustment to assess whether coated and slit electrodes meet winding requirements.	Helps identify material and alignment issues before they affect larger production runs.
Advanced materials research	Fabricate cylindrical test cells for new electrode formulations, separator structures, and battery materials studies.	Provides consistent winding conditions for more reliable comparison between experimental batches.
Battery manufacturing quality control	Apply integrated short-circuit testing, discharge, defective-cell rejection, and qualified-cell conveyance after winding.	Establishes an automated screening point before cells enter subsequent operations.
Cell production line integration	Connect the belt discharge path with a downstream process while keeping the electrical cabinet positioned beside the winding machine.	Supports orderly material flow and minimizes interference with downstream equipment connections.

Parameter	Specification
Model	YZ03
Primary function	Automatic winding of cylindrical lithium-ion battery cells
Process configuration	Positive electrode, negative electrode, and separator active unwinding; tension control; dust removal; edge correction; separator static elimination; winding; termination tape application; reaming; automatic unloading; short-circuit testing; defective-cell rejection; qualified-cell collection
Supported cylindrical cell diameter	φ16 to φ28
Applicable material width	50 to 60 mm, subject to suitable take-out clamp replacement and parameter adjustment
Electrode entry order	Positive electrode first or negative electrode first, freely selected by parameter adjustment
Positive electrode inner diameter	φ76.2 mm
Positive electrode outer diameter	≤φ400 mm
Positive electrode width	40 to 66 mm

Parameter	Specification
Positive electrode thickness	0.1 to 0.2 mm
Negative electrode inner diameter	φ76.2 mm
Negative electrode outer diameter	≤φ400 mm
Negative electrode width	42 to 68 mm
Negative electrode thickness	0.1 to 0.2 mm
Separator inner diameter	φ76.2 mm
Separator outer diameter	≤φ300 mm
Separator width	44 to 70 mm
Separator thickness	0.015 to 0.030 mm
Termination tape inner diameter	φ76.2 mm
Termination tape outer diameter	≤φ150 mm
Termination tape width	20 to 60 mm
Termination tape thickness	0.02 to 0.05 mm
Maximum tabs per individual electrode	≤2
Recommended tab welding process	Through-welding process
Recommended exposed tab length	Less than 25 mm
Electrode coating requirement	Uniform coating with controlled length and position
Electrode calendaring wave	Less than 1 mm
Electrode serpentine bend	Less than 0.3 mm/1000 mm, subject to not affecting winding accuracy
Electrode slitting width error	Less than ±0.05 mm
Electrode roll telescoping	Not more than ±1 mm
Electrode roll winding tension	Uniform
Tab condition	Tabs should be flat; bending should be avoided as far as possible to prevent misjudgment
Post-welding thickness condition	Tab welding must not affect the original electrode thickness
Termination tape roll condition	Uniform winding without obvious telescoping, wrinkles, or warping
Electrode defect marking	Spliced sections, missing tabs, bright spots, and other defects should be identified with color marks for manual detection
Unwinding control	Automatic unwinding for positive electrode, negative electrode, and separator
Tension adjustment	Proportional-valve control with segmented tension adjustment
Edge correction method	Edge-seeking correction based on material-edge detection
Pre-winding correction	Included
Winding-pin structure	Dual half-pin, single-side withdrawal
Winding-pin replacement time	Approximately five minutes to replace and resume normal production
Winding component construction	Slide-rail structure with controlled clearance fit

Parameter	Specification
Termination tape application	Rolling application
Unloading method	Mechanical-hand unloading
Cell transfer method	Belt conveyor to collection table or downstream process
Short-circuit inspection	Short-circuit testing mechanism with testing and discharge completed in one operation
Short-circuit protection	Protective cover included
Human-machine interface	Sliding-type interface for more convenient and safer material replacement and operation
Electrical cabinet position	Right side of the winding machine
Downstream connection	Unloading area designed to avoid affecting connection with the next process
Equipment dimensions	Approximately 2400L × 1500W × 2100H mm, excluding conveyor connection extension
Power supply	Single-phase AC220V 50HZ
Power consumption	Approximately 10 KW
Equipment weight	Approximately 3000 kg
Required air supply	5~7 kgf/cm ² , approximately 100 l/min
Gas and liquid restrictions	No corrosive gas, corrosive liquid, or explosive gas
Pneumatic arrangement	Blow-air section and air-source triplex unit separated
Noise requirement	Must comply with TJ36-79 Industrial Enterprise Design Health Standards
Noise limit reference	Noise must not exceed 80dB (A), national standard GB3096-82
Noise measurement condition	Measured at a distance of 1 m from the equipment
Noise during idle operation	Not more than 75dB
Noise during cutting and loaded operation	Not more than 85dB
Interface and maintenance	User-friendly interface, simple operation, and straightforward maintenance