

Semi Automatic Cylindrical Lithium Battery Winding Machine

Item Number: YZ02



Introduction

Precision semi-automatic cylindrical lithium battery winding machine for consistent cell assembly, adjustable winding speed, controlled diaphragm tension, accurate alignment, reliable tape application, automatic needle exchange, and efficient unloading across battery research and advanced materials manufacturing workflows with repeatable results.

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Application	Description	Key Benefit
Cylindrical Lithium-Ion Cell R&D	Wind positive electrode, negative electrode, and separator materials into cylindrical test cells for formulation and process development.	Provides repeatable winding conditions for comparing electrode and separator designs.
Battery Pilot Production	Support small-batch or pilot-scale cylindrical cell fabrication before high-volume manufacturing.	Combines manual material introduction with automated critical process steps.
Electrode Process Validation	Evaluate the effects of electrode dimensions, winding speed, and separator tension on cell quality.	Enables controlled adjustment of key winding variables.
University and Institute Research	Fabricate experimental cylindrical cells for electrochemical, materials, and energy-storage research.	Offers flexible specification changes for diverse research programs.
Battery Manufacturing Training	Demonstrate electrode feeding, separator wrapping, winding, termination taping, and unloading in a practical production workflow.	Makes the complete cylindrical winding sequence accessible for technical training.
Advanced Materials Research	Process electrode and separator materials during evaluation of new chemistries and cell architectures.	Supports material trials while maintaining defined alignment and tension control.
Small-Batch Custom Cells	Produce cylindrical cells across the applicable ϕ 15 mm to ϕ 35 mm outer-diameter range, subject to material and tooling specifications.	Supports multiple cell formats without requiring a dedicated high-volume line.

Parameter	Specification
Product Item Number	YZ02
Equipment function	Precision winding of cylindrical lithium-ion battery cells
Operating mode	Manual electrode introduction with automatic winding, needle exchange, termination taping, and unloading
Winding process standard	Separator completely wraps the negative electrode; negative electrode wraps the positive electrode
Process sequence	Separator pre-winding; negative electrode introduction; positive electrode introduction; winding; station transfer; separator cutting; termination tape application; unloading
Separator pre-winding method	Gear-knife process to reduce the required pre-winding separator length
Separator supply	Two separator rolls with active unwinding
Separator tension control	Proximity-switch control technology with automatic smooth tension adjustment during winding
Termination tape direction	Horizontal application, perpendicular to the electrode tabs
Separator finishing	Separator outer-wrap finishing
Applicable finished cell outer diameter	ϕ 15 mm to ϕ 35 mm

Parameter	Specification
Production capacity	5 to 10 PCS/min, depending on electrode length and width
Qualified rate	≥98%, excluding factors unrelated to the equipment

Performance Item	Requirement or Result
Electrode width error for stated accuracy	Less than ± 0.2 mm
Electrode S-bending error for stated accuracy	Less than ± 1 mm/500 mm
Separator roll telescoping error for stated accuracy	Less than ± 0.2 mm
Separator alignment error	Less than ± 0.5 mm when incoming materials meet the specified conditions
Electrode alignment error	Less than ± 0.5 mm when incoming materials meet the specified conditions
Negative-electrode and positive-electrode relationship	Negative electrode wraps positive electrode
Separator and negative-electrode relationship	Separator wraps negative electrode
Finished cut-face alignment	± 0.5 mm
Winding defect control	No cell damage, core pulling, or electrode misalignment under suitable material conditions
Winding speed	Adjustable

Material	Length	Width	Thickness	Inner Diameter	Outer Diameter
Positive electrode sheet	150 to 1000 mm	28 to 73 mm	0.1 to 0.2 mm	Not specified	Not specified
Negative electrode sheet	150 to 1000 mm	28 to 73 mm	0.1 to 0.2 mm	Not specified	Not specified
Separator roll	Roll material	30 to 75 mm	0.012 to 0.045 mm	76.2 mm	250 mm
Termination tape roll	Roll material	8 to 60 mm	0.01 to 0.035 mm	76.2 mm	150 mm

Parameter	Specification
Separator width	25 to 70 mm
Electrode width	24 to 69 mm
Winding needle specification	φ2.5 to φ8 mm, custom-made according to customer requirements
Basic supplied winding needle specification	φ1.8 to φ6 mm
Winding needle delivery	One set supplied; configuration available according to customer requirements
Input power	AC220V, 1.5KVA, 50HZ
Compressed-air source	0.4 to 0.6 MPa

Assembly or System	Quantity or Specification
Frame and mounting plate	1 set
Winding needle assembly	1 set
Electrode supply device	2 sets
Separator supply device	2 sets
Adhesive application device	1 set
Equipment dimensions	1450 mm × 1100 mm × 1150 mm, length × width × height
Dimension measurement note	Does not include the extending length of the electrode material trough; unit: mm
Equipment weight	Approximately 500 kg

System	Specification
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PLC	PANASONIC; 松下 AFRX-HC60T
Touchscreen	MCGS/IGERLON, 7-inch true-color display
Winding motor	PANASONIC/YANKONG servo motor
Tension motor	Shenzhen Yankong/Shenzhen Lisan stepper motor
Sensors	PANASONIC/JYC/DFC
Pneumatic components	AIRTAC/XINGZHEN/气源
Alarm system	Fault stop and fault indication
Program functions	Built-in fault prompts and one-button reset
Operating manual	One set
Spare parts	One set, according to the delivery list