

Cylindrical Battery Semi Automatic Winding Machine For Precision Lithium Ion Cell Assembly

Item Number: JR05



Introduction

Engineered for precision battery fabrication, this semi-automatic cylindrical cell winding machine integrates servo-driven needle rotation, dynamic dual-separator tension regulation, automated transverse termination taping, and integrated dust removal to ensure flawless jelly-roll alignment and high-yield manufacturing.

[Learn More](#)

Application	Description	Key Benefit
Lithium-Ion Cylindrical Cell R&D	Fabrication of experimental cylindrical jelly rolls using novel active cathode/anode formulations, silicon-dominant anodes, and ultra-thin separators.	Provides precise tension and speed control to handle fragile experimental electrode materials without tearing or layer misalignment.
Pilot-Scale Pilot Line Production	Medium-scale manufacturing of commercial cylindrical formats (e.g., 18650, 21700, 26650, and 4680 series) for pre-market qualification.	Bridges the throughput gap between manual winding fixtures and fully automated lines with high consistency and automated taping.
Sodium-Ion Battery Prototyping	Winding of emerging sodium-ion cylindrical cells utilizing thick aluminum current collectors on both positive and negative electrodes.	Robust servo torque and adjustable clamping mechanics accommodate thicker foil substrates without core slippage or deformation.
Solid-State and Hybrid Cell Development	Interleaving and winding of flexible solid composite electrolytes or coated polymer separators with high-capacity electrode strips.	Active smooth tension modulation prevents micro-cracking and stretching in delicate solid electrolyte separator membranes.
Customized Industrial Battery Packs	Small-batch, high-mix assembly of specialized cylindrical cells for medical devices, aerospace instrumentation, and robotics.	Rapid tooling changeover allows flexible transitions between varying cell diameters and needle pin specifications within minutes.

Quality Assurance and Benchmarking	Comparative testing of separator puncture resistance, foil tensile limits, and winding tension thresholds in academic and industrial laboratories.	Transparent control over mechanical parameters enables rigorous validation of raw material performance under repeatable winding dynamics.
------------------------------------	--	---

Category	Parameter	Specification (Item No. JR05)
Basic System Specifications	Input Power Supply	AC 220V ±10%, 1.5 kVA, 50 Hz
	Compressed Air Requirement	0.4 – 0.6 MPa (Clean, dry air supply)
	Total Equipment Weight	Approx. 500 kg
	Overall Dimensions (L x W x H)	1750 mm x 1350 mm x 1570 mm (Excluding electrode feed tray extension)
	Winding Needle Diameter	Φ6.0 mm – Φ10.0 mm (1 custom-matched set included per customer specification)
Mechanical Units & Mechanisms	Machine Frame & Base Plate	1 complete heavy-duty structural steel set with anti-vibration leveling mounts
	Winding Pin Mechanism	1 complete single-needle counter-piercing unit with automatic needle switching
	Electrode Feeding Units	2 independent guide sets (positive and negative electrode channels)
	Separator Supply Units	2 independent active unwinding sets with dynamic tension tracking
	Taping Apparatus	1 complete transverse automatic tape applicator and precision cut-off unit
	Dust Removal Mechanism	Integrated active brush and vacuum/particle collection assembly at feed path

Category	Parameter	Specification (Item No. JR05)
Control & Drive System	Programmable Logic Controller (PLC)	Panasonic AFRX-C60T Industrial Motion Controller
	Human-Machine Interface (HMI)	MCGS 7-Inch True-Color Industrial Touchscreen Display
	Main Winding Actuator	Panasonic Industrial AC Servo Motor & Precision Drive
	Tension Modulation Actuator	Leadshine (Li-San) High-Precision Stepping Motor System
	Detection Sensors	Panasonic / Daochuan High-Response Optical & Proximity Sensors
	Pneumatic Components	AirTAC / Xingzhen Precision Valves, Regulators, and Pneumatic Cylinders
Safety & Diagnostic Systems	Alarm Management	Program-embedded real-time fault detection with automatic emergency stop
	Fault Indication	Visual and audible onscreen diagnostic alerts with step-by-step troubleshooting
	System Reset Function	One-touch operational and alarm reset mechanism
Included Accessories	Documentation	1 complete set of operating, calibration, and maintenance manuals
	Standard Accessories	1 full toolkit and wearable replacement kit (as detailed in packing manifest)