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Fully Automatic Slitting Machine

TC-750



1. Introduction of Equipment

Introduction to the function and theory of the Equipment:

To achieve right size / spec and quality from continuing splitting into battery pole piece.

2. Principle and Technological Process of the Equipment

Applying with magnetic powder feeding system, automatic deviation correction, automatic tension control, so that the pole piece would be automatically cut into the required specifications, then removing dusts and rolling up automatically.

3. Main structure of equipment

- Unwinding : unwinding device is independent, unwinding in the center of single axis. Fix the coil stock by inflatable shaft, brake is controlled by ZKB Mitsubishi magnetic powder automatic constant tension. (Automatic tension detection, automatic control, tension control range is 0-250N).
- Auto rectification system: The auto rectification system adopts photoelectric detection and servo motor drive, the whole rolling part moves when rectifying is running, and correct deviation automatically, to ensure the position accuracy of the pole piece into the cutting system (rectify deviation: ± 60 mm, Rectification precision ± 0.1 mm).
- Tape splicing: set a tape splicing platform, cylinder press material tightly, then bond the material manually.



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> Slitter

- Using on the splitting of positive (+) and negative (-) electrode, with seamless straight line cutting method floating roller. The cutting width can be adjusted by changing the width of the upper and lower sections, and the minimum cutting width is 32mm. Machine is using servo motor, in order to make the driving shaft of the main traction roller, the lower slitter and upper and lower slitter shaft drive by synchronous belt.
- The transition roller around slitter has a manual balancing mechanism to ensure that fits different requirements of materials.
- The whole machine is equipped with 2 sets of tool carrier (one is online another is spare), including the tool carriage, the slitter mold, the blade.
- The whole machine is equipped with 2 sets of separate sleeves > (the specific specifications and the size are based on requirements and set by separate sleeves).
- Blade: Equipped with high precision disc blade, blade materials is imported hard alloy. Blade diameter : $\varnothing 130\text{mm}$ ° Upper blade thickness: 1mm, blade edge: 30°, down blade thickness: 3mm, blade edge: 90°.
- Blade adapter hydraulic trolley: 2sets/machine. Blade adapter can be adjusted up and down.
- Dust removing and collecting device: there are 4 separated rolling brushes for dust removal on the both side of material after cutting, each brush speed is controlled individually, and rolling brush speed is at 115r/min. The roller brush is provided with a vacuum cleaner device to carry out dust. (Vacuum source is provided by customers).
- The configuration has enough transitional idler rollers, drive roller, flat roller, roller adjustment.
- With two 3" slip type differential air shafts axis on the upper and lower, single friction rolling method.
- This Mitsubishi variable frequency drive, the upper and lower axis adopts the synchronous belt transmission, the winding (reeling) tension is controlled by differential air via SMC electronic control converter, the purpose of automatic control is achieved by entering initial rolling tension and initial rolling taper.



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- Winding rewinding parts is equipped with a pressing roller base on the cutting width, the pressing roller can move horizontally according to the roll position, and has horizontal positioning device which facilitate winding rewinding neatly.
- Edge scrap handling: pinch roll is driven by motor which makes output of edge of scrap tight, Independent pinch roll device to move the edge scrap after slitting. The tension of edge scrap can be manually adjusted, scrap edge width 3-5 mm (coating site).
- Control system:
 - The Drive Motor Frequency Converter is Mitsubishi from Japan, and the central controller is Mitsubishi PLC.
 - The settings of operating speed, rewinding tension control and the tool management data are realized by HMI, the HMI panel is arranged on the input of the roll. HMI is concentrated and contains running status display, Meter measurement, a total measurement of meters, the rewinding tension fine tuning, the life of cutter and etc.
 - The start and stop of the equipment is completed controlled by operating buttons. Equipped with equipment status (shutdown, operating , fault) display devices (three-color indicator).
 - Key positions rewinding, unwinding and slitting part are equipped with emergency stop switch and operation buttons.

4. Supplied materials and product specification

- Thickness of the copper foil: 8-40 μm , electrode thickness: 80-250 μm .
- Thickness of aluminum foil: 8-40 μm , electrode thickness: 80-250 μm .
- The maximum strip width: 730 mm (Width of coating : max. 650 mm), max. rewinding and unwinding diameter: $\phi 600$ mm.
- Slitting width: 32-730 mm \cdot Max. rewinding diameter: $\phi 600$ mm.
- Unwinding drum diameter: 3 inch (76.2mm), Winding drum diameter: 3 inch.



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- The specifications of the steels: decided by the width of on-blocking coating and required striping.
- Maximum weight of unwinding: 250 Kg, Maximum weight of winding: 150 Kg.
- Small width cut off on both side(coating site) : min 2-3 mm.

5. Technical Parameter

- Speed of the equipment: the maximum slitting speed 50m / min, the usage speed is normally 5-45m/min continuously variable (CV).
- Equipment failure rate (fault is caused by the equipment) $\leq 1\%$.
- Activation / Utilization Rate $\geq 98\%$.
- Slitting accuracy: ± 0.05 mm.
- The transverse longitudinal edge burr size after slitting ≤ 10 μm .
- Straightness (Offset serpentine) < 0.05 mm/m, No choppy grade, No visible deformation of electrode edge.
- Deviation rectification: ± 60 mm, can be automatic / manual control.
- Rectification precision ± 0.1 mm.
- Blade adapter can be adjusted up and down.
- Rewinding regularity: ± 0.5 mm.
- Repeatability and reproducibility of equipment: Can work more than 20 hours a day.
- Equipment noise : less than 60dB.
- Power supply : AC 380 V, 50 Hz, 3 phase 4 wire system, power 6 KW.
- Compressed air: 0.6 Mpa.
- Weight (about): 350 kg.
- Dimensions: about 2400L; 1700W;
2150H mm.