

M3-12 Triple Spindle + 12-Tool Magazine Automatic Tool Changer Engraving Machine Configuration Sheet

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1. Product image display



II. Description of the technical features of the equipment

- 1. The equipment is equipped with three independently operating spindles, which can be switched arbitrarily via cylinder control, requiring no manual intervention.*
- 2. The automatic switching function of the three spindles enables seamless connection between different processes. It is particularly suitable for processing multiple workpieces simultaneously. This design allows a single three-head machine to handle tasks that previously required three single-head machines, saving on equipment purchase costs and reducing factory space occupation and power consumption.*
- 3. Speed increased by 30%: (idle speed 60-80 m/min; processing speed 8-25 m/min) Larger drive motor and driver: (smoother operation; more powerful)*
- 4. Revolutionary improvement in circuitry: (reduced welding steps, European standard architecture; clear and easy-to-use markings) Automatic loading and unloading. Optional (increased efficiency, enabling one person to operate multiple machines);*
- 5. Adopts Taiwan Syntec control system, compatible with various CAD/CAM design and manufacturing software. It can control and complete multi-layer 3D processing, enabling fast and smooth 3D engraving and cutting.*
- 6. The cutting machine is equipped with automatic loading and unloading functions. The lifting platform is equipped with infrared sensors for automatic raising, facilitating plate loading and saving labor costs. A belt conveyor, combined with a pusher plate for unloading, facilitates line operation and improves automation.*
- 7. The automatic tool changer uses pneumatic spindle switching technology and a 12-tool linear tool magazine. It automatically changes and positions tools according to the set program, enabling cutting, drilling, grooving, engraving, and other fine processes with seamless workflow. The tool changing process is automatically controlled by the program, requiring no manual intervention. It is also equipped with an automatic tool setter, further simplifying the tool setting process.*

III. Configuration Parameters

Product Name	Model Number	Tool Magazine Quantity	Remarks
Automatic Tool Changer and Unloading Machine	Mingdiao M3-12	Follow-up Straight-Line Tool Changer (12 tools)	One-year machine warranty, lifetime maintenance (excluding consumables)
Product Accessories			
Processing Dimensions	X1280mm*Y2800mm*Z200mm		
Motor	New Generation AC Servo Bus Absolute Value X/Y Axis 1100W; Z Axis 1000W (with brake)		
Drive Method	Syntec AC Servo Bus Absolute Value X/Y Axis 1100W; Z Axis 1000W (with brake)		
Guide Rail	Original Taiwan Square Guide Rail (3-axis 30#)		
Spindle	Mingdiao Customized 9.0KW Automatic Knife Changing*3	Air-cooled	Speed: 24000 rpm/min
Tool holder/clamp	Can clamp ϕ 3.175-12.7M		
Frequency converter	Fuling 11KW/380V		
Power transmission method	X/Y axis: Gear and rack (Taiwan (Mingdiao Custom) high-precision helical rack; ground gear); Z axis: TBI 2510 lead screw; X/Y adopts Taiwan (Mingdiao Custom) high-precision new type reducer (precision three-arc division)		
Cable	Imported drag chain cable		
Backing positioning	Standard positioning cylinder (thickened ϕ 30)		
Bed	Thickened steel structure	Tempering and aging treatment of steel structure (bed)	
Control system	New generation FC-60CB; 22 inch LCD display; Wireless keyboard and mouse		
Tool diameter	3.175/4/6/12.7/16		
Power supply	380V/220V	Three-phase dry-type isolation transformer	50HZ
Cabinet	Computer control integrated cabinet		
Tabletop	Vacuum adsorption table is made of engineering PVC board with a thickness of 28mm.		
Additional	Water-cooled 7.5KW*1 unit (250 cubic meters)	5.5KW vacuum cleaner*1 unit	New dust collector
All switches, buttons, AC contactors (imported from Honeywell, USA), air switches, etc. of this product are imported products			
The machine weighs approximately 3 tons. The above configuration is the acceptance standard.			

IV. Features of main parts of equipment and pictures



1. Spindle:

- Brand: Mingdiao Customized Tool Replacement Spindle
 - Power: 9.0KW*3
 - Spindle speed, up to 24000RPM, variable frequency speed regulation;
 - Pulling tool spindle, ISO automatic tool change
- Automatic tool change is achieved through cylinder switching, and machining is achieved by enlarging holes for larger diameters to meet production process requirements.



2. Knife magazine:

- Directly arrange 12 knife magazines
- ISO30 ER32 tool holder, can hold ϕ 3.175-20MM



3. Automatic lifting platform:

- The lifting platform is equipped with infrared sensing, and the equipment system controls it uniformly according to the thickness changes of the stacked boards, automatically raising and lowering the height



4. Conveyor belt conveyor:

- The equipment pushing platform can automatically push the finished products onto the belt conveyor, and the belt conveyor automatically drives them to stop at a fixed position, making it convenient for subsequent stacking



5. Positioning Cylinders:

---Standard positioning cylinders (thickened $\phi 30$) Positioning cylinders: three on the Y-axis and two on the X-axis, forming a right angle. All five positioning cylinders are adjusted with a dial indicator to ensure secondary positioning accuracy during front and back machining. Additional side vanes ensure the pushed-out sheet does not fall off.



6. Material Pushing:

---Automatic feeding function: After reprocessing, the system automatically pushes out the sheet metal while performing secondary dust removal during the process.



7. Bed steel:

---The bed is made of Q235B/H rectangular tubing with a wall thickness of 8mm according to national standards. Q235B/H steel is low-carbon steel with good weldability, and the sawing and welding of the tooling achieves a seamless connection of the bed.



8. Bed tempering and aging treatment:

---After 48 hours of high-temperature tempering treatment and quenching treatment, the hardness of the bed is increased to 36-40HRC, avoiding the occurrence of cracking during the length of the bed or during loading and use.

After more than 10 days of self ignition aging treatment, the bed body is guaranteed to be used for many years without deformation.



9. Body features:

---The bed adopts a large five axis gantry milling machine, which can complete the milling of the guide rail surface, rack surface, and other required installation hole positions in one go.

The reinforcing ribs on the bed are relatively dense, which increases the strength of the bed and ensures that the bottom plate does not deform. plus Workbench dimensions: X1280mm*Y2800mm*Z200mm;



10. Bed grinding, spraying, baking treatment

---After careful manual polishing, Aksu powder is used for spraying. Aksu is one of the world's largest suppliers of plastic powder, characterized by strong adhesion, high temperature resistance, high gloss, and strong artistic three-dimensional sense.



11. Guide rail:

----Taiwan original square track;
---X/Z axis 30#;Y axis 30#

Square guide rails have advantageous characteristics suitable for specific applications, meeting high stiffness and high load applications. The maximum load of the 30 # square rail can reach 32KN.

During high-speed machining, it can better ensure operational stability.



12. Rack:

----Taiwan original high-precision helical gear rack with precision of three arc minutes;
---Grade 7 precision precision milling oblique tooth mold 2 quenched and tempered gear rack with 20-26 degrees, tooth surface smoothness of 3.2.



13. Gearbox:

--- Taiwan Fordesy Precision Reducer AL-090-5-K3-19
High precision, good rigidity, large bearing capacity, high efficiency, long service life, low noise

Timely control start stop and speed change. Increasing the torque through the reducer is equivalent to increasing the input power, which can reduce the power required by the input motor (in situations where speed regulation is needed)



14. Motor drive:

--- Taiwan Shin-Dae motor, AC servo bus absolute value X/Y axis 1100W; Z axis 1000W (with holding brake)

Large drive motor: (smoother operation; more powerful)

The machinery adopts a new generation motor, with a speed increase of 30%: (idle speed of 60-80 meters/minute; processing speed of 8-25 meters/minute)

drive

system



15. Control system:

---Original Taiwan Syntec 60CB
It is compatible with various CAD/CAM design and manufacturing software; it can control and complete multi-layer 3D machining.



16. Tabletop:

---Vacuum adsorption table thickness is 28mm
Quality complies with GB/T4454-1996, with good chemical stability, corrosion resistance, high hardness, high strength, UV resistant (aging resistant), fire retardant (self-extinguishing), reliable insulation performance, smooth and flat surface, non-absorbent, and non-deformable.



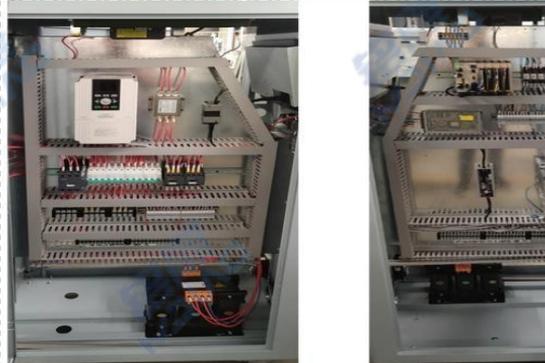
17. Cable&drag chain:

---Shanghai Deruo Cable
The cable adopts high flexibility shielded wire, which has a longer service life. In the field of industrial manufacturing equipment, we focus on high flexibility cables that are resistant to oil and bending
---Adopting a new type of drag chain, divided into four compartments, the signal and power lines are distinguished according to specifications to better defend against signal interference, while also eliminating the twisting of cables together during operation.



18. Automatic fuel box:

---This system can deliver lubricating oil to key friction pairs such as guide rails and screws in a timed, quantitative, and precise manner, forming a stable oil film, effectively reducing wear and heat, preventing "dry friction" and corrosion, thereby significantly reducing failure rates and extending the service life of core components and the entire machine.



19. Electrical control cabinet

---The electrical control cabinet separates strong and weak electricity, with a more reasonable layout, which can effectively reduce interference between electrical appliances. The larger space can effectively increase heat dissipation capacity!



20. Electrical components:

---Switches, buttons, AC contactors, air switches, etc. are imported products (imported from Honeywell, USA)



21. Vacuum pump:

---Thousand amniotic fluid pump 7.5KW;

----Curve number 121V; Product model 2BV5 121

----Drainage capacity: 4.66 m³/min ; 250m³ /h mbar(MPa)
33mbar(-0.098MPa)

Motor protection level IP54; Pump speed (rpm) 1440

Noise dB(A) 69; Weight KG 149



22. Exit the machine

---Each machine needs to undergo various precision checks before leaving the factory, and the accuracy of each processing area on the entire table must be tested separately to ensure that there are no blind spots in the machine's processing.