

# M12 CNC router + Automatic flipping equipment

## Configuration Sheet

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## 1. Product image display



## **II. Description of the technical features of the equipment**

1. *The engraving machine and flipping machine operate in tandem, with the entire process—from loading, cutting, flipping, to secondary cutting and unloading—uniformly scheduled by the cutting machine's control system. Operators only need to input the processing program for one-button start and full-process monitoring. This not only completely liberates workers from heavy, repetitive manual labor but also reduces quality fluctuations and safety hazards caused by human intervention, laying a solid foundation for 24/7 uninterrupted "lights-out production."*

2. *After completing processing on one side of the sheet, the cutting machine immediately sends a signal; the flipping machine automatically receives the sheet and performs a safe and stable 180-degree flip; then, it precisely returns the unprocessed side to the cutting platform.*

3. *The cutting machine performs repeated positioning with millimeter-level accuracy, ensuring that the sheet's coordinate position relative to the cutting machine after flipping is accurately memorized and compensated by the system. This guarantees extremely high relative positional accuracy of the cutting patterns on both sides of the sheet, perfectly solving the alignment problem of double-sided processing and greatly improving product quality and consistency.*

4. *The flipping machine features a modular design and can be customized or adjusted according to the size, weight, and shape of different workpieces. By changing fixtures or adjusting parameters, a single piece of equipment can often adapt to the production needs of multiple products, demonstrating excellent flexibility and versatility, and reducing equipment investment costs.*

### III. Configuration Parameters

Product Name	Model Number	Tool Magazine Quantity	Remarks
Automatic Tool Changer and Unloading Machine	Mingdiao M12	Follow-up Straight-Line Tool Changer (12 tools)	One-year machine warranty, lifetime maintenance (excluding consumables)
<b>Product Accessories</b>			
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	Air-cooled	Speed: 24000 rpm/min
Tool holder/clamp	Can clamp $\phi$ 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 $\phi$ 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. 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



### 2. 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



### 3. Automatic flipping equipment:

---It can be customized or adjusted according to the size, weight, and shape of different workpieces. By changing the fixtures or adjusting the parameters, a single machine can often adapt to the production needs of multiple products, demonstrating excellent flexibility and versatility, and reducing equipment investment costs.



### 4. Material Pushing:

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



#### 5. 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.



#### 6. 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.



#### 7. 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;



#### 8. 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.



#### 9. 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.



#### 10. 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.



#### 11. 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)



drive



system

#### 12. 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)



#### 13. Spindle:

----Brand: Mingdiao Customized Tool Replacement Spindle  
----Power: 9.0KW  
----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.



**14. 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.



**15. 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.



**16. Knife magazine:**

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



**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 m<sup>3</sup>/min ; 250m<sup>3</sup>/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.