

Fully Automatic One-to-two Flat Mask Production Line NMH-KZAP12



Shenzhen NMH Technology Co.,Ltd

ROUNDSS[®]

Changchun Rongde Optics Co.,Ltd

About ROUNDSS



Changchun Rongde Optics Co., Ltd.(ROUNDSS) is a national high-tech enterprise and little giant science and technology enterprise concerned with R&D, manufacture and sales of industrial encoders and high precision couplings. Founded in 2006, ROUNDSS with registered capital 21.92 million RMB is the only company achieved automatic assembly of encoders in domestic. It is also the main participant in formulating national industry standards.

ROUNDSS optical encoders are widely used in industrial automation, like intelligent manufacturing, robot, CNC machine tools, new energy vehicles, elevators, wind power, aerospace, military industry and servo control. It is the key component of equipment manufacturing industry in industrial upgrading. Among the high precision encoders, the incremental micro solid shaft encoder, through hollow shaft encoder, servo motor encoder, magnetic ring encoder, gear tooth encoder, absolute single-turn encoder and multi-turn encoder could replace the similar foreign products in defense equipment. At the same time, customized design and services are supplied to meet special requirements of different customers.

With independent R&D institutions, professional R&D team and senior technical advisors, ROUNDSS has more than thirty independent intellectual property rights. Automatic assembly production line fills the blank of encoder industry market in domestic. The bearingless centering type encoder won the excellence award in the 5th CHINA Innovation Entrepreneurship Competition. Company executives ISO9001:2015 quality management system standards, fully carries out ERP enterprise resource management, gets the CE and ROHS certification, and reaches consensus on cooperation with several universities and research institutions.

About NMH

Shenzhen NMH Technology Co., LTD is a wholly-owned subsidiary of Changchun Rongde Optical Co., LTD. NMH is committed to building a professional non-standard automation design, manufacturing and after-sales team. After years of research and development, with core technology and rich experiences, the equipments we supplied has been applied into the field of electronics, communications, and medical successfully. The company advocates taking technology as the core, and after years of hard work, it ranks among the advanced level in the industry. The company helps customers build core competitiveness in their professional fields and has won the trust and support of our customers. Following the footsteps of customers, we are always ready to grow with your company! Sincerely hope to work with you to create brilliant!

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1. Introduction of automatic one to two flat mask production line

Automatic one to two flat mask production line is composed of one mask body machine + one transportation allocation machine + two outer earloop welding machines. The advantages of the one-to-two mask machine can realize automatic speed control. When one earloop machine is stopped, the speed of the main body machine is automatically reduced by 50% to adapt to the normal production of the other earloop machine. When the shutdown earloop machine is restarted, the main body machine resumes normal production speed production, and truly fully automatic operation and control. Compared with stand-alone equipment, the advantages are obvious. This production line has added automatic conveyors and connecting machines. This unique design improves production efficiency and reduces labor costs. The whole machine is automatic operation from feeding, nose line insertion, edge sealing and cutting finished products, which only needs one person to operate.



2. Overall performance of face mask production line

- * Equipment type: NMH - KZAP12
- * Ultrasonic welding system: 18 KW 20 KHZ,;
- * Efficiency of mask production : 144000 / day (20 hours)
- * Specifications of mask : 175 mmx96mm;
- * Equipment overall size: 4.5 m (L) x5.5 m (W)x1.5m(H)

3. Face mask body machine

Blank face mask machine is the auto equipment which be used to manufacture the product of disposable face masks, be suitable for the material of non-woven fabric , activated carbon and filter material from 2~4 layers.

The face mask machine will finish all the processing from the feeding to nose-clip fixing, edge sealing, cutting the finished products automatically. Depending on the raw materials used, different standards such as N95 and FFP2 can be achieved.

Combined with the face mask inner ear-loop welding machine, mask outside ear-loop welding machine, tie-on mask machine or mask ear-loop welding machines, you can get products as inner ear-loop masks, outside ear-loop masks, tie-on masks and also other disposable face masks.



4. Performance of face mask body machine

- ❖ Machine Model: NMH-KZAP12-GW
- ❖ Dimension: 3900 (L) *905 (W) *1600 (H) mm
- ❖ Voltage: 220V
- ❖ Production capacity:130-160pcs/min
- ❖ Frequency : 20KHZ
- ❖ Power Consumption: 4KW

5. Detailed description of the mask body machine

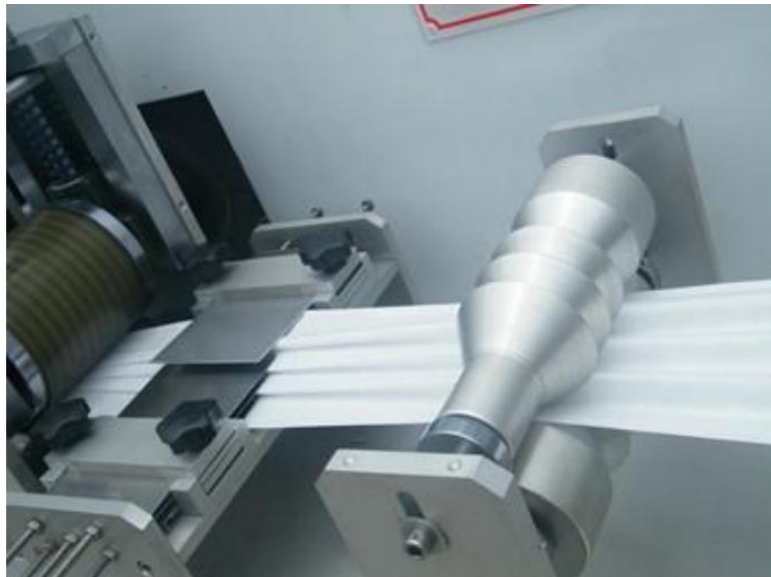
5.1 Fully automatic feeding system

- ❖ Sturdy aluminum alloy frame ensures the accurate size of the finished products;
- ❖ Stainless steel fixture can be adjusted leftwards and rightwards.
- ❖ The tension of the fabric can be adjusted by means of tension wheel to ensure the beauty and flatness of the finished product;
- ❖ Independent nasal line delivery for easy adjustment and maintenance.



5.2 Folding and forming system

1. Insert-type folding device, easy and quick adjustment
2. Large-diameter welding wheel, effectively reducing product deformation.



5.3 Ultrasonic thermal Welding system

5.3.1 When most mask machine manufacturers use aluminum alloys, our company has used titanium alloy molds. Because aluminum alloys are susceptible to oxidation and bursting. They are not suitable for long-term rush operations and short service life. The advantages of titanium alloys are obvious:

- A. Good toughness, suitable for long-term vibration;
- B. Strong thermal / ultrasonic conductivity, which ensures the welding and cutting effect of the product is beautiful;
- C. High hardness, not easy to crack, deform and rust;
- D. Although its cost is about ten times of aluminum alloy, from the perspective of overall production efficiency, titanium alloy molds are selected.



5.3.2. Imported ultrasonic transducer, 20K international frequency standard, output is more powerful and stable; coupled with two sets of ultrasonic system, effectively guarantee the welding quality of the product.

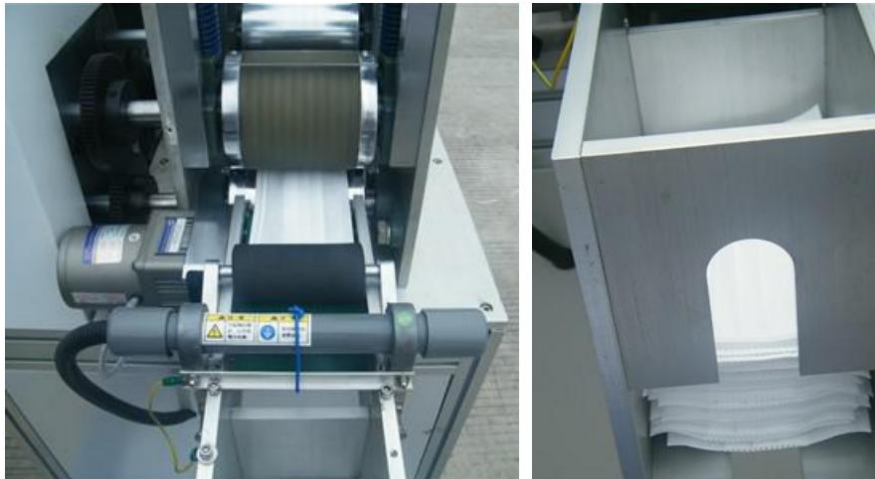
5.3.3.PLC program controls the whole machine to reduce the operation difficulty of personnel.



5.4 Discharging system

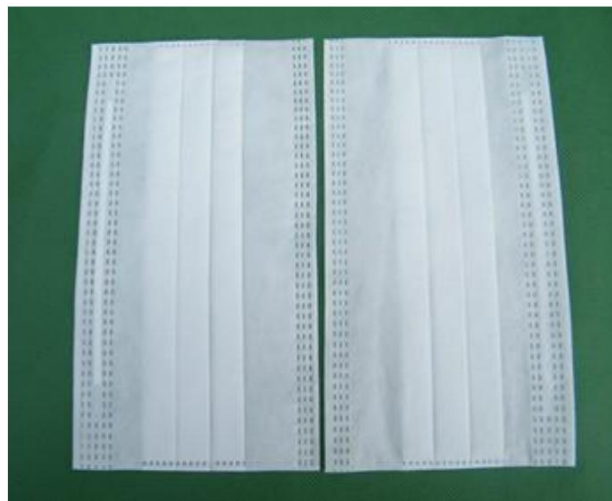
5.4.1. Two-piece products are molded at one time to increase production speed

5.4.2. The molded products are automatically stacked and placed, saving time and effort for the earloop welding in the next process.



5.4.3.Stable performance, continuous adjustable production speed, high production efficiency, up to 160 pieces per minute, easy to count

5.5 Body of finished mask



6. Ultrasonic outer earloop welding machine

The working principle of ultrasonic external ear mask machine. The outer earloop mask machine fuses the elastic loops on both sides of the mask body with ultrasonic waves to complete a finished mask. Only one operator is required to put the mask body on the conveyor belt, and the rest of the subsequent actions are automatically operated by the machine. The output of this machine is higher than the other earloop welding machine.

Product alias:

Flat mask machine, fully automatic mask spot welding machine, ultrasonic mask machine, falt mask spot welding machine, disposable mask machine



6.1 Parameters of ultrasonic outer earloop mask machine

- ❖ Product model: nmh-kzap12-um
- ❖ Machine size: 2646(L)*620(W)*1750(H)m/m
- ❖ Voltage: single-phase 220V
- ❖ Output: 45-55pcs/min
- ❖ Air pressure: 6kg/cm²
- ❖ Power consumption: 3KW
- ❖ Mask body size must be fixed

6.2 Features of ultrasonic outer earloop mask machine

- ❖ The machine is compact, small volume; do not occupy the space;
- ❖ PLC program control, high stability, low failure rate;
- ❖ The whole machine adopts aluminum alloy structure, beautiful and sturdy;
- ❖ Photoelectric detection to reduce the error rate.
- ❖ Adjustable welding strength of ear loop.

6.3 Work flow of ultrasonic outer earloop mask machine

Work flow of ultrasonic outer earloop mask machine:

automatic conveyance of masks → automatic feeding of ear loops → cutting of ear loops
→ fusion of ultrasonic ear loops → Finished product output → counting →
finished product stacking → conveyor belt device sends out. As shown below.



6.4 Automatic transmission of mask body

The mask body is transported to the outer earloop welding machine automatically by the conveyor. The conveyor is shown in the photo below:



6.5 Automatic outer earloop welding machine

The process of automatic welding is as follows: automatic feeding of ear loop → automatic welding of ear loop → automatic cutting of ear loop;

The detailed construction of the machine is shown in the photo below.



6.6 Automatic stacking of finished mask

Through the coordination between the flat belt and the conveying fixture of the body, the finished mask can be transported to the finished product collection conveyor belt smoothly.



6.7 Automatic output of finished mask

Automatic output of finished products: according to the size of the mask body, precise position limit can ensure accurate positioning of the mask body in the production process. No deviation, effectively ensure the beauty of the finished product.



7.Troubleshooting of mask machine

(1) Main engine is not working

Display fault contents	Treatment measures
The run button is not pressed	Press or release the corresponding button, and view the I/O
Left/right ear loop proximity switch has a signal	Adjust the position of the iron block on the rotating cylinder corresponding to the proximity switch to ensure that after the rotating cylinder stops rotating the left/right proximity switch has no signal.And check the corresponding I / O display X0, X1

(2) The mainframe works. But It stops working after one or more

Display fault contents	Treatment measures
The magnetic switch on the cylinder is not in the right position	4 Adjust the position of the magnetic switch and view the corresponding I/O display X14
The pressure or distance of the buffer is not adjusted proper	Adjust buffer 13
Display fault contents	Treatment measures
The earloop proximity switch is too far away	Adjust the proximity switch position

The earloop Relay damaged or in bad contact	Replace relay
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(3) Left/right earloop engine is not working

Display fault contents	Treatment measures
Whether the main motor is running	Check the connection, if not run, replace the main motor
Whether the clutch brake is working	Check the connection, if not run, replace the clutch brake
There is clutch brake signal or not	Check the connection, replace replay
There is clutch brake power supply or not 24V	Check the connection, replace switch power supply
The pressure plate is not in the middle of the track	Adjust sprocket position, adjust

(4) Belt not working or stop position is wrong

Display fault contents	Treatment measures
The welding time is too short/long	Reset the welding time
Lack of air pressure	Adjust air pressure
Whether the ultrasonic on the touch screen is turned on or not	Open the ultrasonic

(5) Ultrasonic welding is not firm or hot break

Display fault contents	Treatment measures
Lack of air pressure	Adjust air pressure
Blade is dull	Grind blade

(6) Cutter can not cut properly

Display fault contents	Treatment measures
The counting sensor distance is not appropriate Adjust the distance Sensor connection broken	Adjust the distance Check the attachment Check the attachment

(7) No counts

Display fault contents	Treatment measures
Motor out of operation	Check motor and cable connection
Conveyor belt time set too short	Reset time
Incorrect delivery count	Adjust the conveyor belt delay time

(8) Incorrect counting when conveyor belt is not running/conveyor belt is not running

Note: When doing the above inspection, please check the wiring first. And check the relay secondly. Then troubleshoot according to countermeasures.