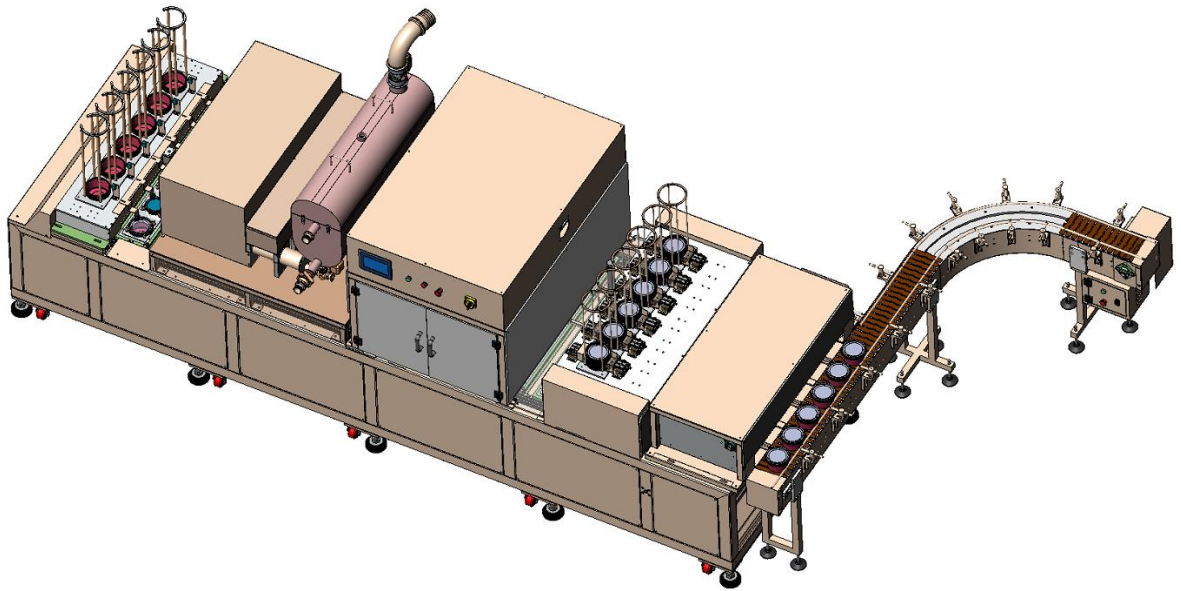


# APTS-5660 AUTOMATIC CUP SEALING SYSTEM SERVICE MANUAL



## **PREFACE**

First of all, thank you for choosing our APTS-5660 linear lower box filling and capping machine. This manual is used to ensure the effective use and operation of the automatic filling and packaging machine. Please read it carefully so that you can thoroughly understand the features, operating procedures and instructions of each function before starting the device.

The design feature of the linear lower box filling and capping machine is to adopt the most advanced man-machine interface to make it easy to operate and maintain. And in the system has added the latest self-diagnosis function, can make you very clear when using the device the running state of this device. We are sure that you will be fully satisfied with the utility, reliability and economic efficiency of the equipment. However, the structure and operation of the equipment will vary according to the characteristics of the various USES and the packaging devices installed to accommodate the contents of the packaging. Please refer to the appendix for a more thorough understanding of the specific differences, as this specification covers the basic functions.

The equipment is designed to operate to a high degree of safety, so that it will not be damaged or malfunction due to careless handling or incorrect pressing of switches. If there are any problems, please read this manual carefully and take the necessary measures to operate the equipment effectively.

Before shipping this machine, all parts of device had been careful inspected and debugged. However, if any mechanical problem happens during shipment, or there is any unclear statement, please contact our company or authorized sale agent of our company.

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# CHAPTER 1 SAFETY PRECAUTION

## 1.1 Safety requirements

### 1.1 Operating personnel safety and compliance matters

Mechanical operation, maintenance, and installation must be performed by the authorized and specially trained personnel. These personnel must have experience of special courses about the machine possible risk. Especially the electric unit operation, must be operated by trained personnel.

Any personnel assigned to operate, maintain and install the machine must read and understand the machine related technical documents. Recommend that all people must have the paper confirmation. For safety, the operation, maintenance, and repair duties must be defined clearly and comply, not allow any unclear region and incompetent.

### 1.2 Operation safety rules and precautions

- 1) Damage results from the improper use of machine can't be the manufacturer's responsibility, and not included in the guarantee. The machine owner should undertake the risk.
- 2) According to the installation, operation, transportation and maintenance instructions provided by the manufacturer to use the machine correctly .
- 3) Avoid using machine in any unsafe methods.
- 4) The machine surrounding should avoid direct sunshine, humid and dusty. Because it will cause the fire hazard and the lethal electric shock.
- 5) Other improper machine operations(such as "on their own willingness using the machine")
- 6) The machine design requirements, the normal starting up the machine should be under the best state of the machine.
- 7) Confirmed that the machine is only used for general goods (excluding poisonous materials, strong acid and alkali items and goods can't be packed). Otherwise, manufacturers and agents will be responsible for nothing.
- 8) Installation, disassembling, moving the equipment should be performed by the professional personnel.
- 9) Only the personnel got professional training can operate the machine.
- 10) The equipment operation could only be in accordance with manufacturer's design purposes, and the unauthorized modification and the not recommended accessories used on the machine may cause fire, electric shock and other injuries.
- 11) Not allow the linen, scraps of paper, dust, metal debris, dirt and other debris go into the electrical equipment.
- 12) Ensure the cables connected to the power supply that have sufficient capacity, use the connector with insulated sleeve.

- 13) After a long time preservation not to use this equipment, which must be checked and tested before normal using.
- 14) When the power supply has been delivered or the machine is running, do not open the electric box. Otherwise, electric shock may happen, cause personal injury. At the same time the arc welding operation is not allowed on the machine surrounding. Otherwise, it will easily cause the machine break down.
- 15) When the electric box has been opened or the wires is uncovered, don't run the machine and its auxiliary facilities. Otherwise, it may cause the lethal electric shock.
- 16) Only when it is necessary to perform the regular inspection or wiring, on the any other time don't open the electrical equipment housing. Otherwise, it may damage the equipment, affect the normal operation of the machine.
- 17) Wiring or regular inspection should be performed after cutting off the input power for at least 10 minutes. Otherwise, electric shock may happen, resulting in personal injury.
- 18) The machines must be reliable grounding, the grounding resistance should be less than 100 ohm for safety. Otherwise, electric shock may happen, resulting in personal injury.
- 19) Never use the cable with scratches, extrusion, over voltage and over load. Otherwise, electric shock may happen, and result in personal injury.
- 20) Don't let the machine contact with water and steam, and wet hands is best not to touch the machine. You had better to operate the machine with dry hands. Otherwise, electric shock may happen, resulting in personal injury.
- 21) While substrate, switch, frequency converter, motor drive circuit wiring, not to test with the high resistance tester. Otherwise, it will damage the machine or cause accident.
- 22) Before using the machine, please clean up the equipment surrounding, should not have dangerous goods etc.. Work clothes you dress should be light to operate and not to obstruct the machine. Especially the cuff of the work clothes must be fastened, cannot be open.
- 23) After the machine powered on, where the housing removed and can reach by hand, existing involved risk.
- 24) When the machine powered on, pay attention to high temperature mark, when touching the heating parts, it may cause burn. Don't hit the protruding shaft or other parts of the machine.
- 25) Even the power supply is switched off , the heating area will not immediately cool down. If your hand touch the heating parts carelessly, very likely to get burned. It will take 30minutes after turning off the power to cool down to room temperature.
- 26) Don't put things on the machine. Don't stack items surround the machine nothing to do with it. Too much stuffs surround the machine may cause an

accident. In addition, if the foreign matter mix with the packed or go into machine parts, it will damage the machine.

- 27) Open or close the safety doors, be careful not to hurt hands or fingers.
- 28) Install film reel carefully, not slide from your hands, will injure your feet.
- 29) Put hand into the gap between the bag and feeding conveyor, will be easy to injury.
- 30) To change the blade carefully, it is easy to hurt your fingers.

### **Warning!**

The operator can't change the structure and mode of production or modify the machine. In this case, the manufacturer does not take any responsibility for the damage caused.

### **Emergency shutdown**

When error occurs, the operating personnel must judge with their experience whether immediately they perform the emergency shutdown or take other steps (firstly stop the controller).

### **Use the main power to shut down**

When the error occurs, if not improve in a short period of time, the serviceman or maintenance personnel can use the main power supply to shut down the machine.

## **1.2 Danger Warnings and instructions**



Please notice all of the security information on the device!

### **1.2.1 [danger zone]**

According to (EN ISO 12100-1) definition, [danger zone] refers to the region and surrounding the machine is placed in, where may lead to safety or health hazards to any person.



- 1) DANGER! DO NOT OPEN THIS DOOR!
- 2) DANGER! HIGH TEMPERATURE!
- 3) DANGER! ROLLING KEEP CLEAR!
- 4) ELECTRIC SHOCK! DANGER!

### 1.2.2 [Warning]



- 1) DANGER! DO NOT OPEN THIS DOOR!

If the front Gate, back door, side door open during operation, emergency stop limiting device will start, the machine will stop.



- 2) DANGER! HIGH TEMPERATURE!

With this warning labels of parts (the sealing parts) will become very hot in the machine during the operation. Be especially careful, in case of burns while checking and adjusting during operation.



- 3) DANGER! ROLLING KEEP CLEAR!

With this warning labels of parts(the feeding part) control automatically, be especially careful while testing, debugging or cleaning guide bag device.



- 4) WARNING! ELECTRIC SHOCK! DANGER!

With this warning labels of parts (part of the control box) contain electrical components, in case of finger touching during operation, cause electrical accidents.

#### **Caution!**

- 1) Prepare the necessary grounding facilities for the user, to prevent electric shock or any other accidents.
- 2) To avoid any electrical or mechanical failure, not to put any water, liquid or metal materials inside the electric box.
- 3) When booting the machine, the control box door must be close, in case of finger carelessly touching during operation, cause electrical accidents.

### **1.3 Health and environmental requirements**

- 1) Environmental Hygiene requirements: The equipment is for food packaging, and the environment of the equipment, needs to be anti-dust and anti-bacterium.
- 2) Machine operators and maintenance personnel hygiene requirements: The equipment is for food packaging, and all person directly contact to the equipment, must wear masks, hats, anti-dust and anti-bacterium clothes.
- 3) The PPE used during the operation must be anti-bacterium.

#### **1.4 The standard basis of the machine design and manufacturing**

- 1) EN ISO12100-1:2003 Machine Safety The basic concept of design, general principle The first part: The basic terminology, methodology
- 2) EN ISO12100-2:2002 Machine Safety The basic concept of design, general principle The second part: technical principles
- 3) EN 415-3:1999 Packaging Machinery safety Part third: forming, filling and sealing machine
- 4) EN 60204-1:1997 Machine Safety Machinery electrical devices Part first: General technical conditions.

#### **1.5 Machine installation, packing and shipping instructions**

##### **1.5.1 The first time installation**

- 1) Open the packing box, according to the packing list contents, check that all thing complete, if not please contact the company or agent.
- 2) The equipment installed in horizontal ground where lighting is good, ventilation is good, ground is firm. Use the spirit level to adjust the machine feet height, reaching the level of requirement. Check the machine parts loose or not during the transportation. Before using the machine, use the anhydrous alcohol to clean the equipment parts directly contacted to food carefully.
- 3) The equipment is with 25A current above and 220VAC power supply (three live wires, one neutral wire, one ground wire), the sectional area of the power wire mustn't be less than 2.5 square millimeter.
- 4) While the supply voltage is incorrect, please use the transformer (and other accessories). For personal safety and protection of the machine, must ground the machine.
- 5) Even if there is a slight electric leakage, the computer of the machine will not work properly.  
Please avoid direct sunlight. The installation environment temperature range 0~40 °C, relative humidity range 35~85%, there should be no quick temperature and humidity change.
- 6) Before the machine power supply cables connected to the electric box, check whether main power switch on the operation panel side is in the 'OFF' state or not, if not, please turn to 'OFF' state to avoid accidental injury.

#### **Caution!**

Corrosion objects can damage the machine, should not contact.

##### **1.5.2 Packaging**

If the equipment for a long time not in use, must use sterile membrane package the equipment, and store in a cool dry place.

##### **1.5.3 Transportation**



If the equipment need to be transported in long distance, it must be packaged by the wooden cases with the desiccant inside. If the device need to be shipped by navigation, the wooden packaged material must be the sailing wood material required, and perform good anti-corrosion on the machine surface before shipment.

**General preventive means**

- 1) According the standard operation procedure to operate this machine.
- 2) Please read this manual carefully, and to know each function property and procedure completely before operating this machine.
- 3) Follow the instructions, pay attention to safety, all that information, to ensure proper operation and use all the special function correctly.
- 4) The manual shall be stored in a convenient place, in order to reference at any time.

**CHAPTER 2 MAINTENANCE**

- 2.1 Timing to fill lubricate the gear, all the oiling holes with engine oil.
- 2.2 The operation to gear reducer is strictly prohibited without oil, the first time 40 hours of operation, need to replace the lubricating oil, after that every three months the oil need to be replaced.

Oils recommendation:

Ambient temperature	Oil selection
-5℃--50℃	gear oil HL-20 or machine oil HL-50
-40℃	gear oil HL-30 or machine oil HL-50

- 2.3 Every shift the machine need to be cleaned up in time, cleaning the remaining material inside the metering disk and the machine, in case of moist, influence the next shift work.
- 2.4 Regularly check all parts of the fastening screws, ensure the reliable operation.
- 2.5 Regularly clean the photoelectric head.
- 2.6 Electrical parts should avoid moist, dust.
- 2.7 Should clean the machine after every day operation.

1) Filling device cleaning

Take apart the parts of the the filling device carefully which contacts directly to the material, then use the cleaning clothes with water free alcohol to sweep the parts. Re-install the parts back to the filling device.

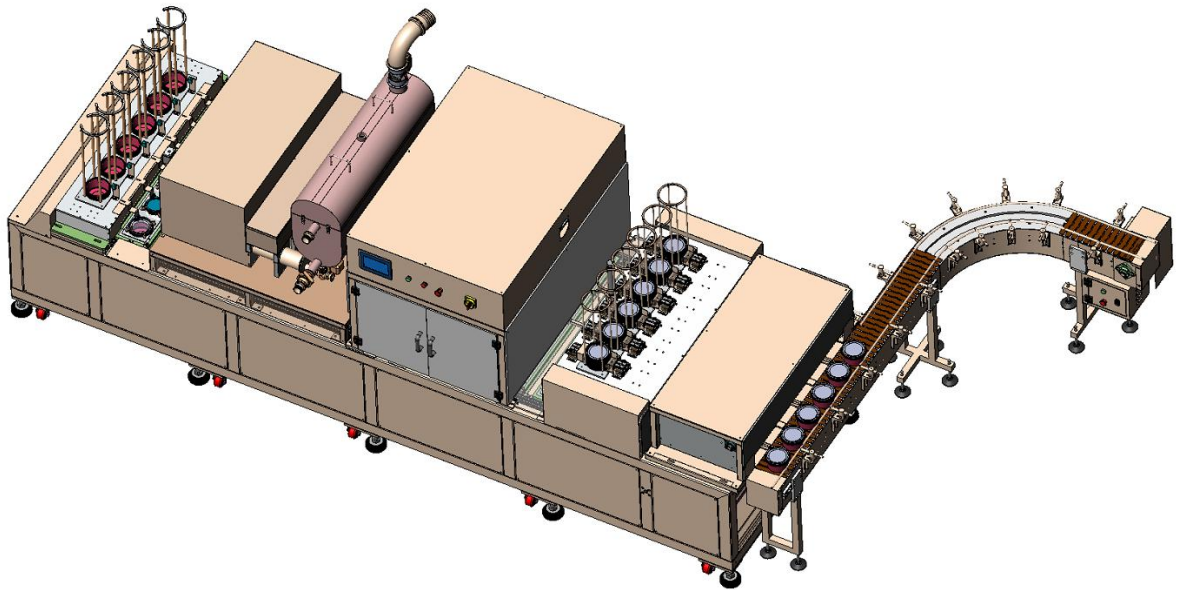
2) Clean the surface of the machine

Use the cleaning clothes with water to sweep the surface of the machine, don't let water go or drop inside the electrical control box or the electrical parts.

### **Caution!**

**Must choose the OEM components to replace the damaged ones, if you couldn't find the components, please contact the manufacturer or the machine agent.**

## **CHAPTER 3 GENERAL DESCRIPTION**



### **3.1 General description:**

The linear lower box filling and capping machine is a kind of high quality and high performance automatic packaging machine, which is produced by our company by introducing foreign advanced technology and improving it. It has a series of automatic functions, such as automatic cup dropping, automatic filling, automatic cap taking, automatic cup taking and finished product output. PLC process control, advanced touch man-machine interface, photoelectric automatic positioning and tracking, make the operation of the whole machine more simple and perfect, is the food packaging industry to improve production efficiency, reduce labor intensity, improve the packaging grade of the preferred equipment.

### **3.2 Specifications**

- 1) Filling content: Paste soap
- 2) Packing speed: 30-80 cups/min
- 3) Supply voltage: 220V 3PH, 60Hz
- 4) Power: 8KW
- 5) Air pressure: 0.5-0.7Mpa

## CHAPTER 4 OPERATION STEPS

- 1 .Turn on the power switch
  2. Set operating parameters (refer to Parameter setting in Section 2 of Chapter 5)
  - 3 .Pack the packing materials well
  4. Empty bag operation (refer to the function setting in Section 2 of Chapter 5, turn off the filling function, and then press the start/stop button to carry out the empty bag operation.).
  - 5 .Filling operation (refer to the function setting in Section 2 of Chapter 5, turn on the filling function, and then press the start/stop button to carry out the filling operation.).
- Before starting the machine, check the following items:
- ☆ Have all the safety items been completed?If the emergency stop switch is pressed, the safety device starts and the machine is impossible to start.
  - ☆ Are the operation functions of the machine set correctly?

## CHAPTER 5 CONTROL PANEL OPERATION

### 5.1 Control panel operation instructions:



#### 1) Power switch

When you turn the power switch 90°clockwise, the machine will power on, at this time the panel parameter can be set and machine can be moved, the

temperature controller working, when you turn the power switch 90° counter clockwise, the machine will power off.



## 2) Emergency switch

If the malfunction or emergency occurs when the machine moving, press the emergency switch, the machine will stop immediately. And the touch screen will display “Emergency Stop!!” Unlock the switch (press the emergency switch and turn right), the machine will start again, at that time “Emergency Stop!!” will disappear.

### WARNING

**Make sure the operation conditions are safe, before unlocking the switch.**



## 3) Start switch

Press this button when you need to start the device



## 4) Stop switch

Press this button when you need to stop the device



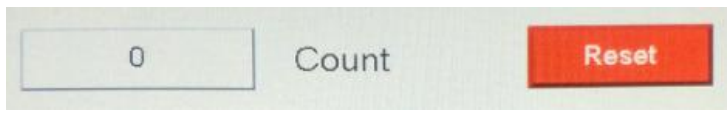
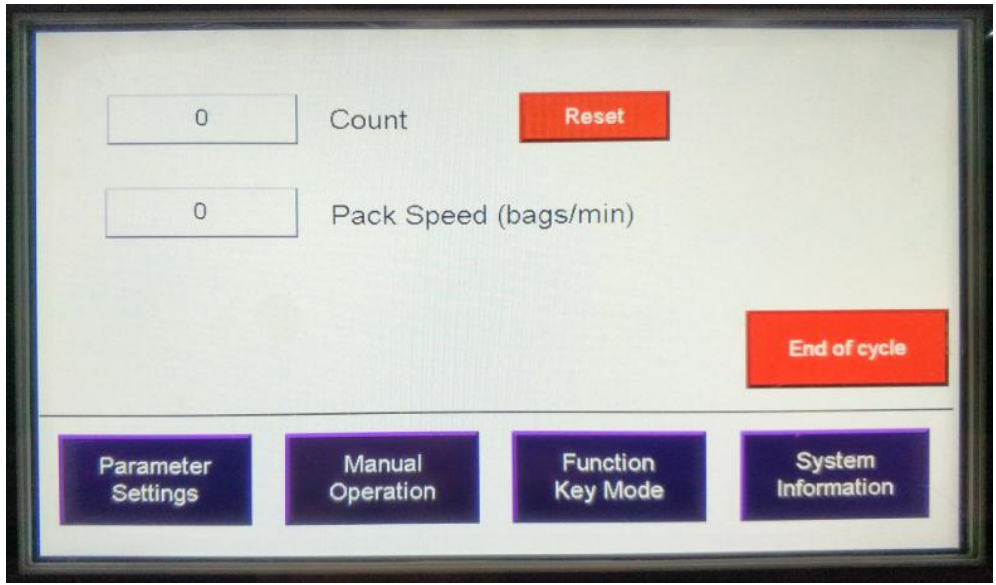
## 5) Reset button

1. When the machine is in the state of emergency stop and the security staff alarms, it means that the machine is in the state of stop protection and cannot be started at this time. Unlock the alarm state. Press this button (the touch screen alarm disappears) to remove the stop protection state.


2. Long press this key, the device will automatically return to the original position. If the device is not in the original position, it cannot start normally.

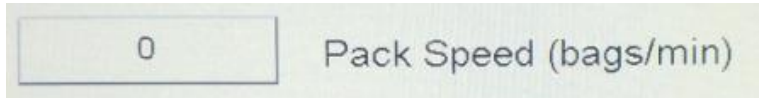
## 5.2 Introduction of the HMI

5.2.1 Turn on the power and enter the main operation screen. The screen is shown as follows:



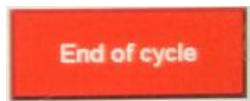
, : Finished product counter,

click  to reset the counter.

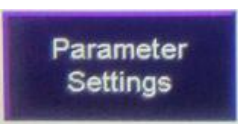


, : When machine is

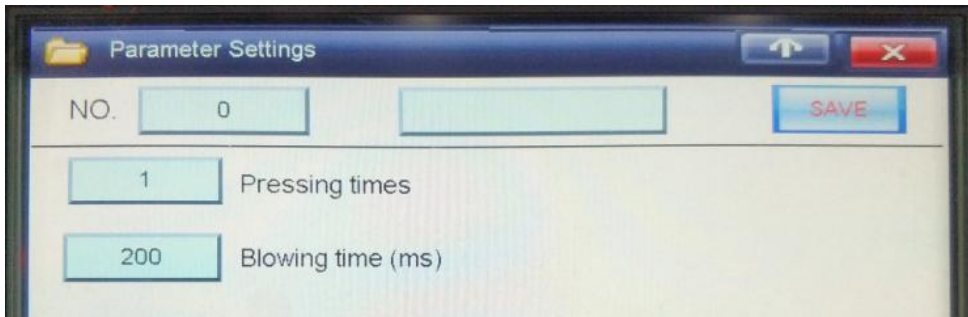
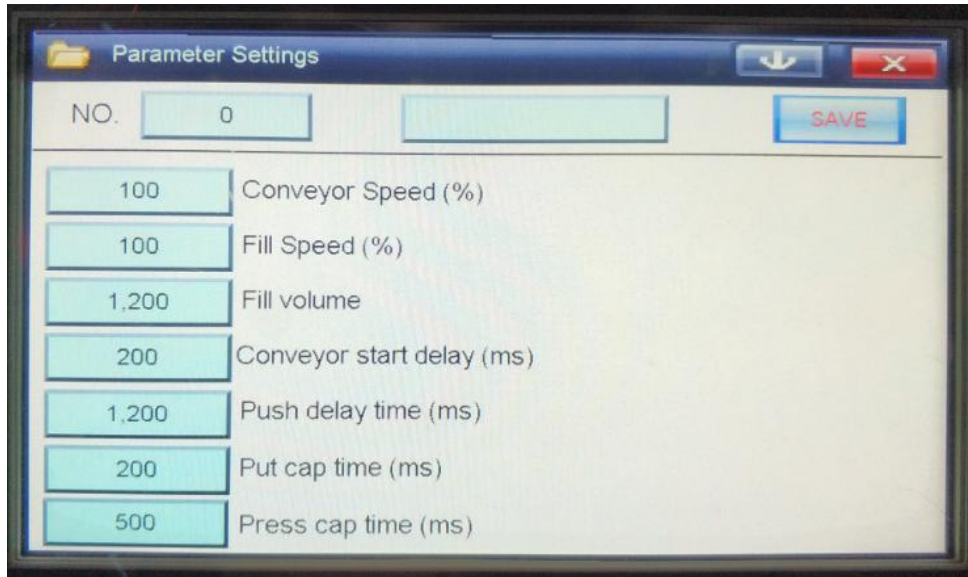
running, it will display the proportion of the current Sealing box speed in the max packing speed.



, : Is the button to complete the cycle; Press this button, the device will automatically empty the cup on the conveyor belt and stop




5.3 Click  to set the parameters



Click  Go to the next page for parameter Settings

Click  Returns parameter Settings from previous page

Click  To close the window.

Conveyor speed (  Conveyor Speed (%) ) :

This parameter is to set the running speed of the conveyor.

Fill speed (  Fill Speed (%) ) :

This parameter is to set the filling speed of material.

Fill volume (  Fill volume ) :

This parameter is to set the filling amount;The larger the set value is, the larger the filling quantity is. Please adjust the size of this parameter according to the actual filling effect.

Conveyor start delay. (  Conveyor start delay (ms) ) :

This parameter is to set the delay time of starting conveyor; Calculate the delay time after the end of loading, and run the conveyor again after reaching the set time.

Push delay time (  Push delay time (ms) ) :

This parameter is to set the time of delayed start feeding; Calculate the delay time after the cup is jacked up, and start pushing when the set time is reached.

Put cap time (  Put cap time (ms) ) :

This parameter is the time to set the lower cover; Please set this parameter according to the effect of the lower cover.

Press cap time (  Press cap time (ms) ) :


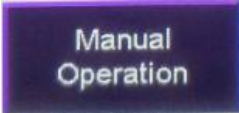
This parameter is the time to set the gland; Please set this parameter according to the effect of the gland.

Pressing time (  Pressing times ) :

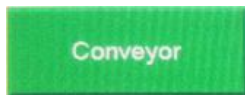
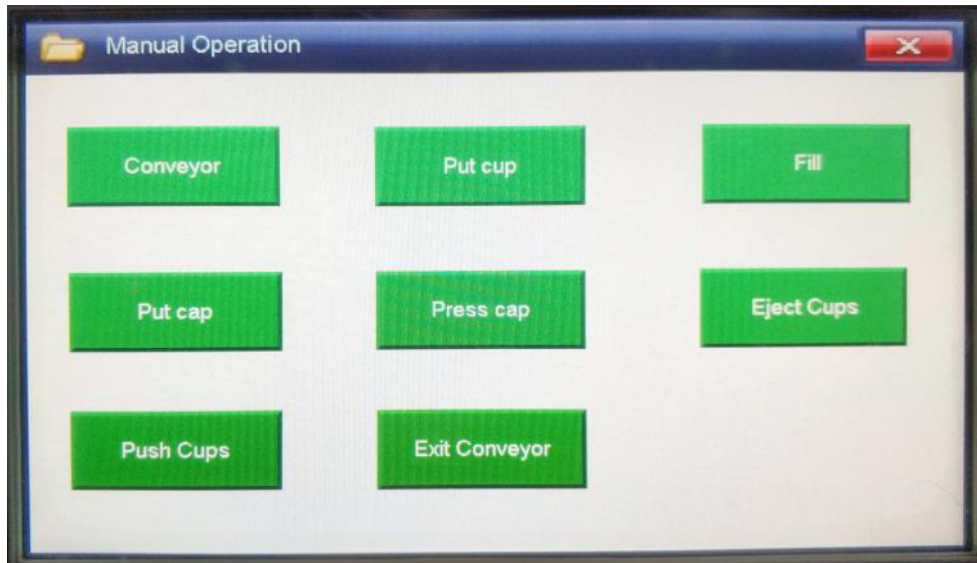
This parameter is the number of times the gland is set.

Blowing time (  Blowing time (ms) ) :

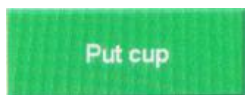
This parameter is to set the blowing time; Blowing helps to fill the fall of the material.

Press  to close the window. Press  to enter Manual Operation screen.





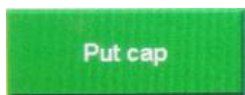
: Manual conveyor runs one station.



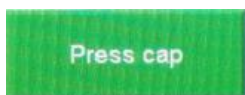
: Manual put cup once.



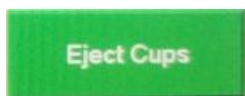
: Manual fill once.



: Manual put cap once.



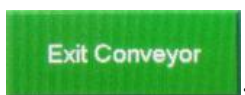
: Manual press cap once.



: Manual eject cups once.

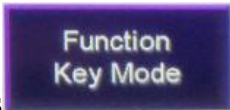


: Manual push cups once.

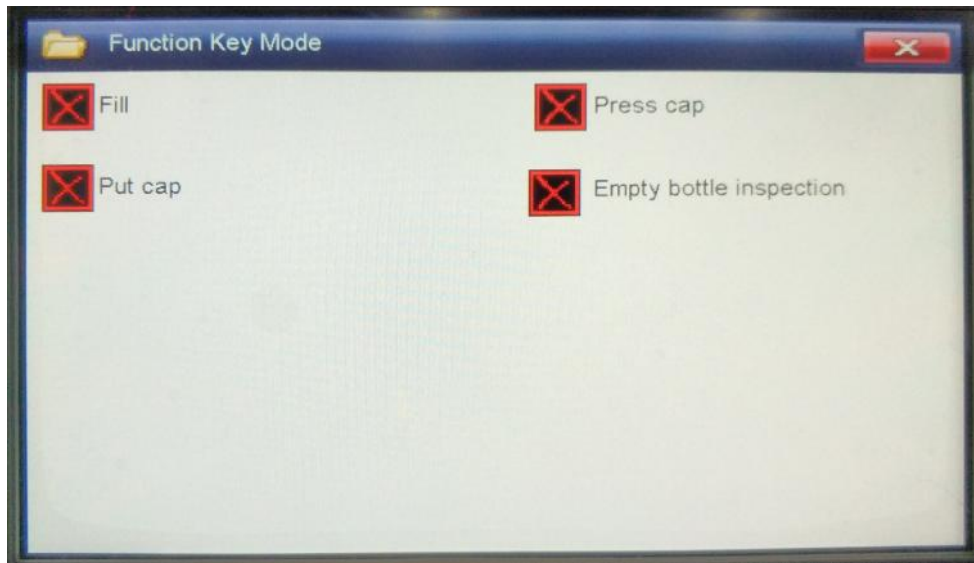


: Manual exit conveyor

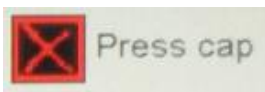
Press  to close the widow.

Press  to enter Function selection screen.

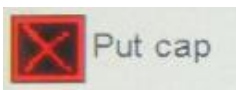




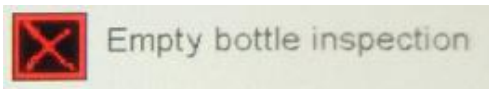
: This function item is whether to turn on the filling function;When filling is needed, press the small box on the right, at this time, the small box will be checked, representing to turn on the filling function, to cancel the filling function, just press the small box again, when the check in the small box disappears, representing to have been cancelled.



: This function item is whether to turn on the capping function;When you need to press the lid, press the small box on the right. At this time, the small box will check, which means to open the gland function. To cancel the gland function, just press the small box again.



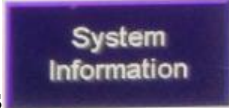
: This function item is whether to open the lower cover function;When the lower cover is needed, press the small box on the right. At this time, the small box will tick, representing the function of opening the lower cover. To cancel the function of opening the lower cover, just press the small box again, and when the tick in the small box disappears, it means that it is cancelled.

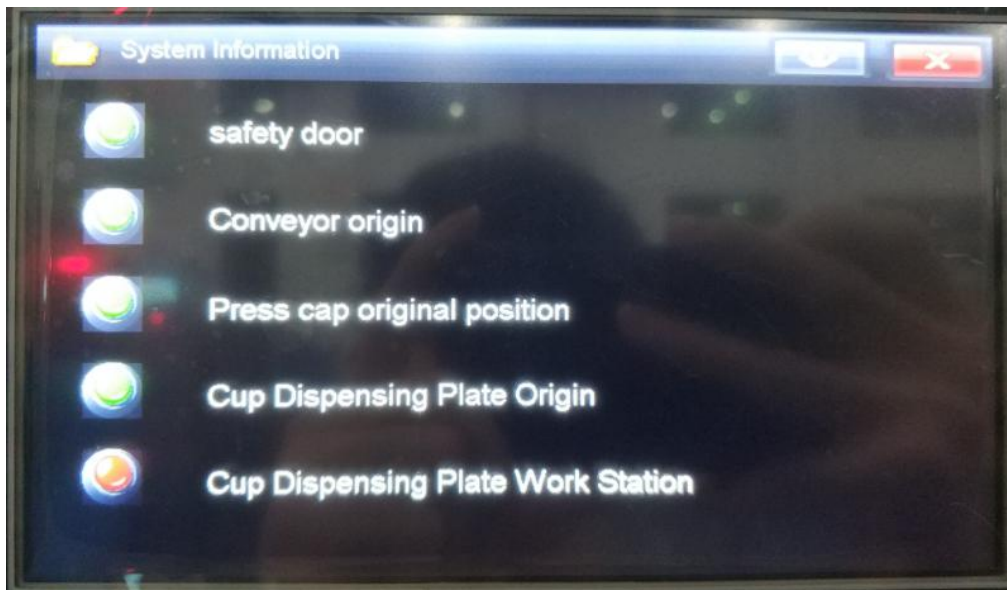



: This function item is whether to turn on the empty cup detection function;Turn on this function. When an empty cup is detected, the device will alarm and stop.Turn this feature off and the device will continue to work when an empty cup is detected.

Click  to close the window.

## System Information

5.4.7 Press , enter the system information and checking interface, in the interface every key input component can be seen working properly or not.



Press  to close the window.

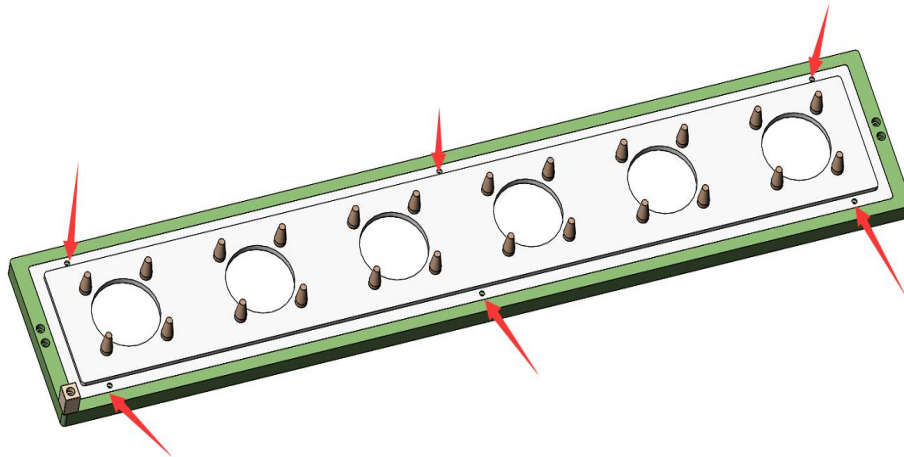
## CHAPTER 6 MOLD ADJUSTMENTS

1. Parts that need to be replaced for different products include main conveyor mould, lower cup part, lower cover part, gland part and supporting cup part. Here we divide the cups into large, medium and small.

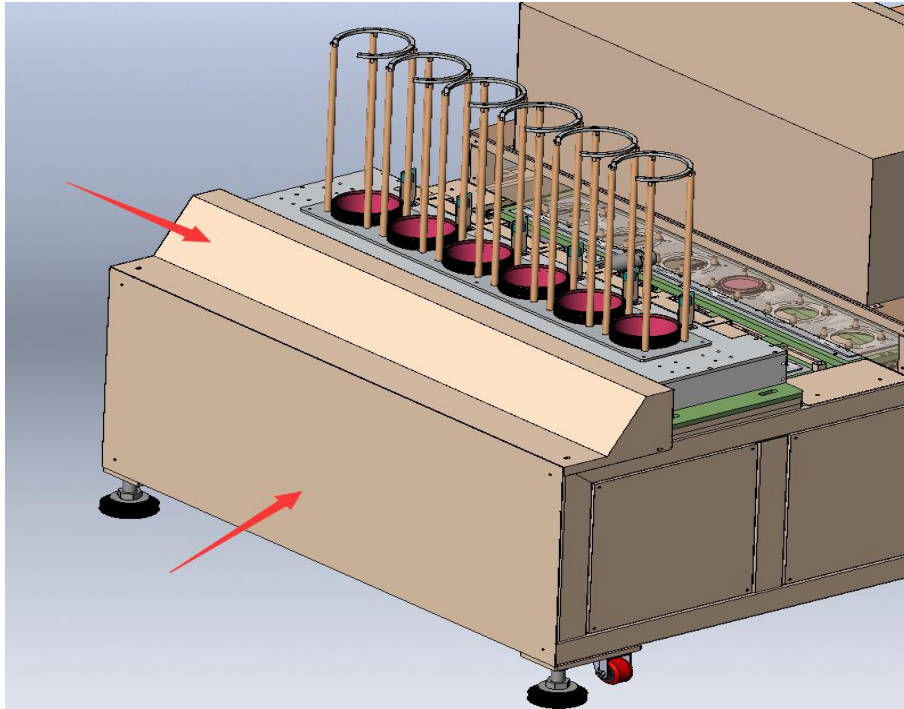
2. Mould replacement of main conveyor

The product mold consists of four parts, namely, the outer mold, the inner mold, the

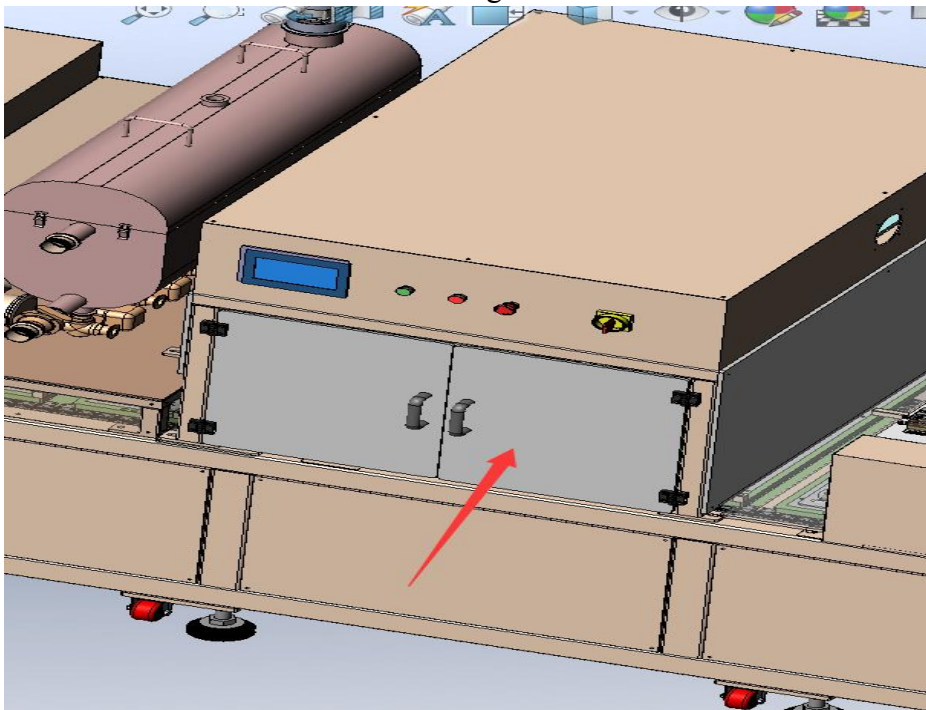
limit screw and the origin square. When the mold is replaced, the outer mold and the origin square shall not be replaced, but shall be fixed on the mounting hole of the double-row chain. Loosen the 6 screws as shown in Figure 1, take out the inner nested mold and the limit screw fixed on the inner mold, replace the inner mold of the corresponding product, and tighten the 6 screws again. There are 34 sets of inner molds for each product of this mold, and each inner mold is equipped with 24 limit screws. In order to facilitate operation, the mold can be replaced by a single person at the bottom of the cup under the conveyor, and the operation can be done by removing the cover (as shown in Figure 2). Double operation can be operated under the electric box (as shown in Figure 3).



Shown figure1

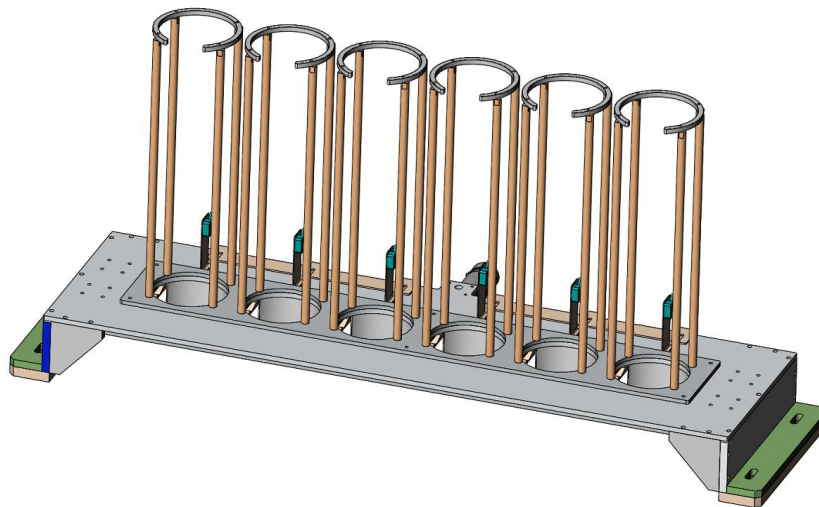


Shown figure 2

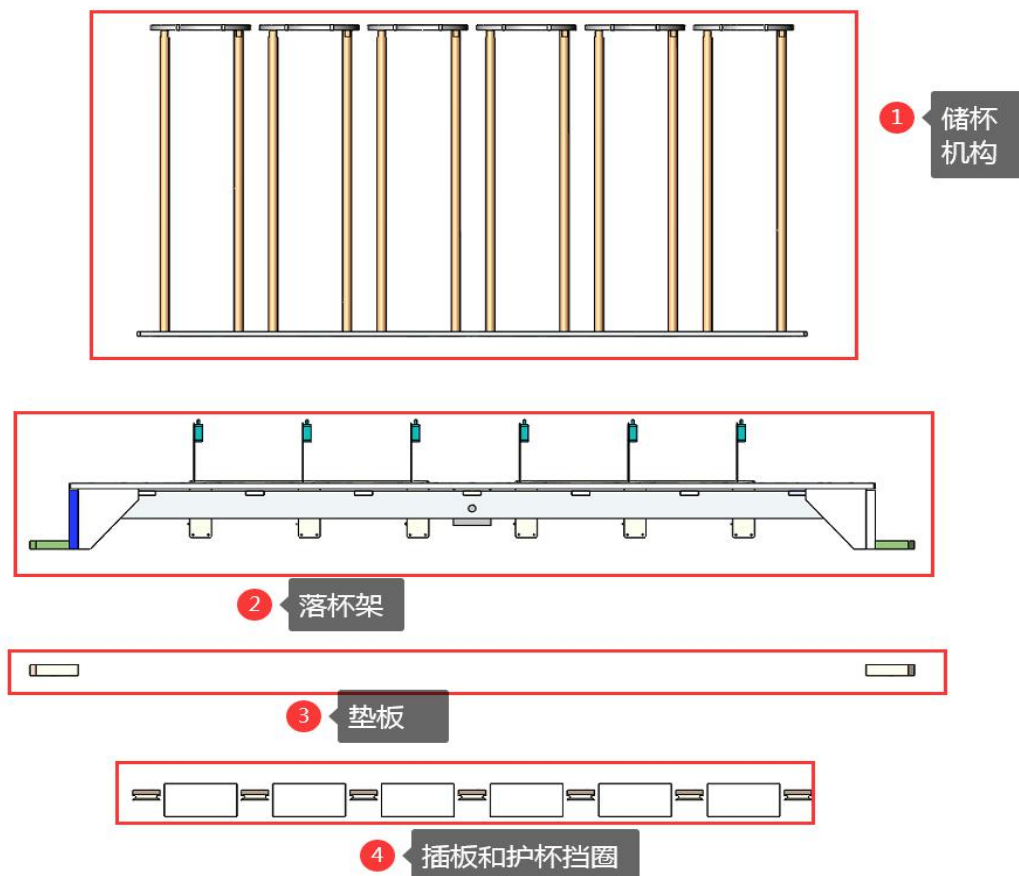


Shown figure 3

1. Replace the lower cup mold



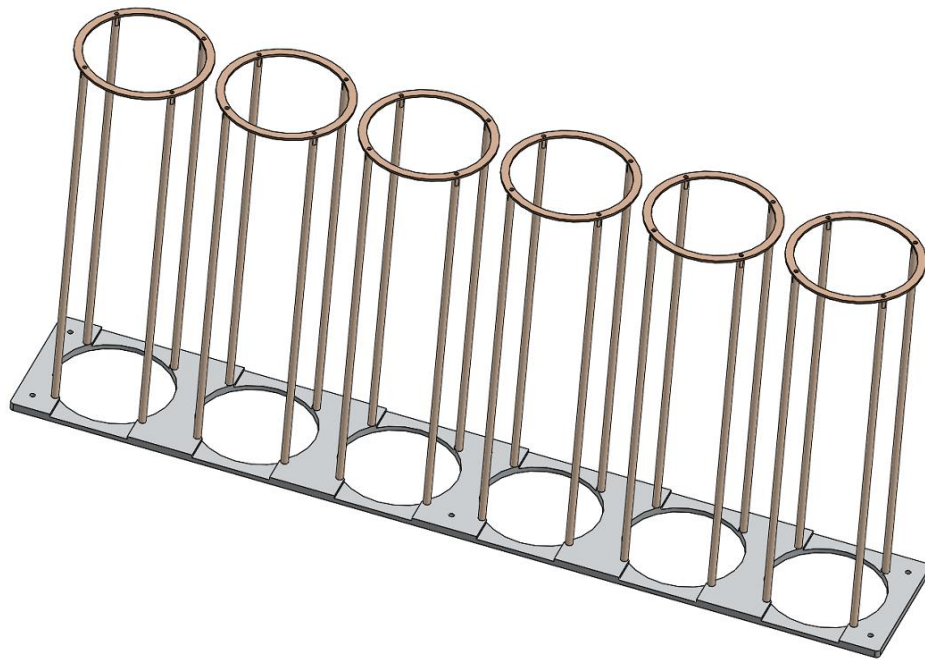
Shown figure 4



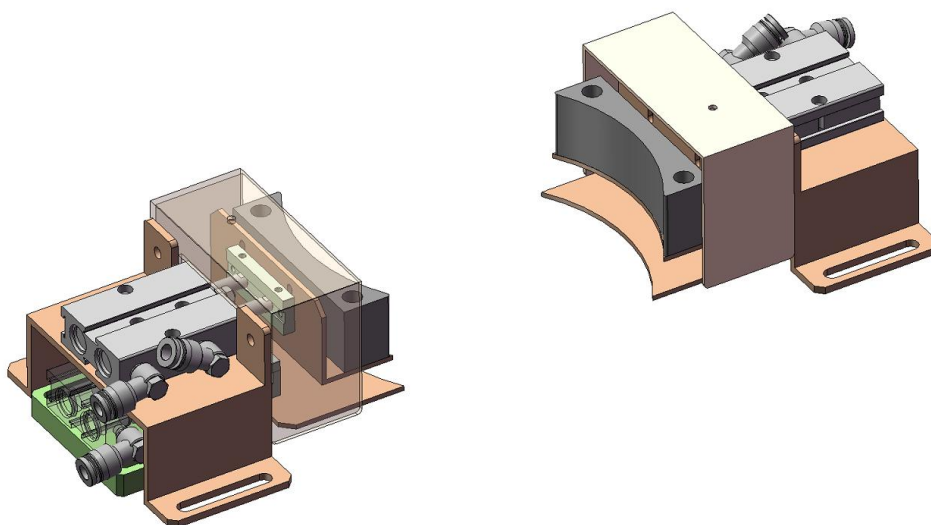
Shown figure 5

The lower cup part is divided into 4 parts, which are cup storage mechanism, cup holder, plate, insert board and cup guard ring respectively. The parts that need to be replaced when replacing products include cup storage mechanism, insert board and cup guard ring, and plate. The plate is only used in the production of large cups. There are three different types of cup storage mechanism, insert board and cup guard ring.

## 2. Put cap part

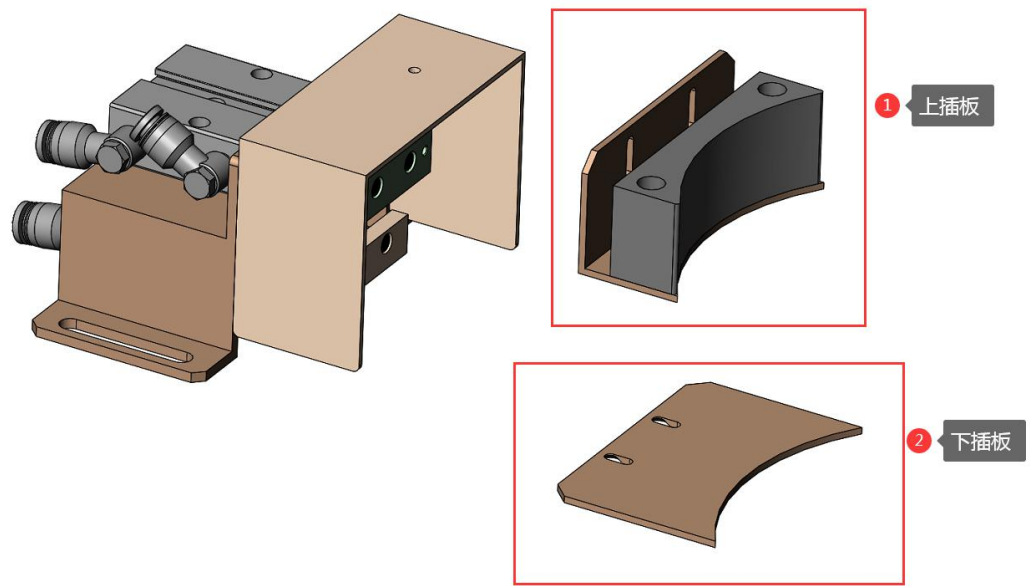


Shown figure 6



Shown figure 7

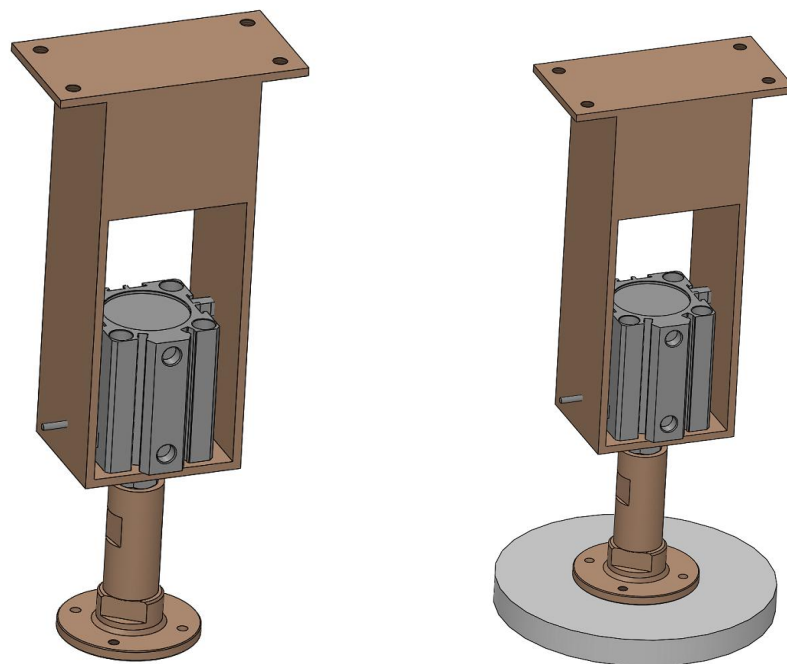




Shown figure 8

The lower cover is divided into storage and cover mechanism (FIG. 6) and cover insert board (FIG. 7). These two mechanisms should be replaced when different products are produced. The upper and lower boards are fixed to the upper and lower cylinders respectively, and the lower cover is realized through the coordinated movement of the upper and lower cylinders and suction cups.

### 3. Press cup part

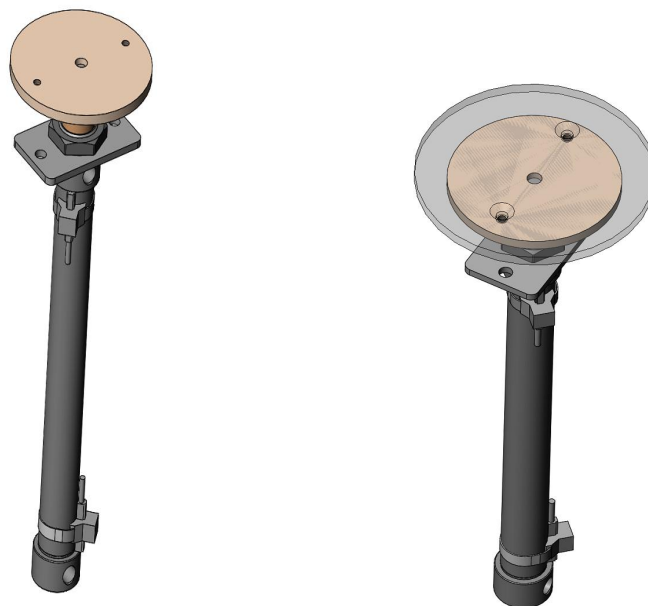


Shown figure 9

On the left is the gland mechanism used for the small lid and the middle lid, and on the right is the gland mechanism used for the large lid. The difference is that

there is one more gland ring on the right than on the left.

4. Cup holder parts



Shown figure 10

The picture on the left shows the cup holding mechanism used for small and medium cups. When producing large cups, a large round tray is needed to be locked on it (as shown in the picture on the right).

## CHAPTER 7 ERRORS AND ELIMINATIONS

Alarm Information	Alarm Reason	Problem Eliminations
The emergency stop switch is pressed	Emergency stop switch on or damaged	<ol style="list-style-type: none"> <li>1. Check whether the emergency stop is turned on.</li> <li>2. Check whether the emergency stop line is damaged.</li> </ol>
Safety door open	<ol style="list-style-type: none"> <li>1. The safety door is not closed</li> <li>2. Line damage</li> </ol>	<ol style="list-style-type: none"> <li>1. Check whether the safety door detection switch is damaged.</li> <li>2. Check whether the circuit corresponding to the safety detection switch is damaged.</li> </ol>
Cylinder original, working position alarm	Magnetic induction switch damage or mechanical abnormality	<ol style="list-style-type: none"> <li>1. Check whether the magnetic induction switch on the filling cylinder is damaged</li> <li>2. Check whether there is any foreign body in the</li> </ol>



		filling, which may lead to impeded operation.
Servo motor anomaly	Servo motor anomaly	<ol style="list-style-type: none"> <li>1. Check whether the circuit between the servo driver and PLC is damaged or abnormal.</li> <li>2. Power off and restart the equipment to check whether the machine is jammed or whether the servo motor is abnormal.</li> </ol>
The power won't turn on	Power plug has not been connected yet.	Connect the plug to the socket.
The machine won't start when the power is on	<ol style="list-style-type: none"> <li>1. The power plug is firmly connected.</li> <li>2. The safety door of the machine is opened</li> <li>3. Is the emergency stop switch on</li> <li>4. Is the air pressure normal</li> </ol>	<ol style="list-style-type: none"> <li>1. Connect the plug to the socket firmly.</li> <li>2. The safety door of the machine should be firmly closed, because if it is not firmly closed, it will start the safety device</li> <li>3. Unlock the emergency stop switch</li> <li>4. Check whether the air pressure switch is on, whether the air pressure pump is damaged, whether the air pressure circuit, circuit is normal.</li> </ol>
Press the stop button to stop the operation of the machine	<ol style="list-style-type: none"> <li>1. Machine program error</li> <li>2. Emergency stop button is damaged</li> </ol>	<ol style="list-style-type: none"> <li>1. Turn off the power and restart the machine</li> <li>2. Check whether the control line is normal</li> </ol>

**CHAPTER 8 ELECTRICAL PARTS LIST(Attachment)**

**CHAPTER 9 EQUIPMENT SCHEMATIC(Attachment)**