

SMART WASP STANDARD WRAPPING MACHINE

S300 Installation Manual

(Please read carefully before operation)



Smart Wasp Intelligent Technology Co., Ltd

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Safety Attentions

- The personnel who operate and maintain the machine should read this manual carefully before using the machine !
- The operation of the machine must be in charge of special personnel, and the operator should have a comprehensive understanding of the characteristics and performance of the machine !
- All electrical equipment of the machine should not be fed with water.
- When the machine is running, it must be well grounded to prevent electricity leakage !
- Before starting the machine, all tools and sundries should not be placed on the machine !
- Do not approach the moving range of the machine when it is working. It is strictly prohibited to extend body into the movement mechanism !
- When the machine with pneumatic device, the operator must ensure that the pressure in the mechanism has been fully unloaded before maintenance to prevent the body injury caused by accidental action !
- Make sure the machine is in the stop state and cut off the power supply when maintenance and adjustment of the machine and replacement of parts or wearing parts !
- Each moving part of the machine must be lubricated regularly by selecting suitable grease according to the maintenance schedule !
- All fasteners in the machine must be checked and fastened regularly !
Electrical control equipment shall not be installed, debugged or maintained by non-professionals !

1. Overview

Automatic intelligent online wrapping machine is a kind of mechanical equipment in the field of packaging machinery. It is used to wrapping film on the surface of products in the production line. Automatic intelligent online wrapping machine includes turntable, column, rope film carriage, automatic film cutting and clamping device and other mechanisms.

Machine workflow:

1.The cargo enters the in-line turntable horizontally.

The articles are connected to the online chassis through the assembly line, and the pallet moves horizontally in a straight line on the conveying frame.

2.Pallet arrives in position.

The pallet photoelectric switch senses the pallet to reach the target position.

3.Motor start-up

Start the turntable rotating motor for circular motion.

(1) At the same time, the column motor drives the film carriage to do vertical movement.

(2) The film carriage motor starts to release the film.

4. The clamp film device loose the clip

When the set time is reached, the gripper will be released automatically.

5. Automatic clamping film

The turntable, the column and the film carriage work at the same time. After finishing working, the turntable stops at a fixed position under the operation of the induction switch. The gripper clamps the wrapping film.

6. Automatic cutting film

The film holding brush moves in a semicircle with the heating wire. The film is broken first and the film is completely disconnected after a few seconds of delay. The

brush continues to move and sticks the broken film tail tightly to the cargo.

7. Removal of the goods

When the film brush is reset, the conveying function makes the pallet move in a straight line, so that the pallet drives away from the online turntable and enter the next round of wrapping mode.

2. Equipment parameters and configuration

MODEL	S300 Roller/Chain Type	Feature	Rotary support chassis
Brand	SMART WASP	Automatic film cutting device	Have
Performance	Auto-cut & Clamp Film	Intelligent sensor	Standard
Maximum packing speed	30~40 Pallet/Hour	Film width	500mm
The diagonal line of pallet	Flexible (1650~3000)	Release film	Standard
Maximum wrapping height	2160mm	Standard pre-stretch ratio	300%
Max wrapping weight	2000Kg	Wrapping force	Variable (electric adjustable)
Main configuration	SIEMENS	Film capacity	250mm/Film roll diameter
Photoelectric switch	Germany SICK	Film conveying system	Dynamic pretension ratio
PLC	SIEMENS	Roping system	Standard
Inverter	SIEMENS	Weighing integration	Optional
Motor	SMARTWASP	Weight and dimensions	Standard
Touch Screen	SIEMENS	Weight	790Kg
Contactors	SIEMENS	Size	3020X1844X3170
Turntable system	Chain Driver	Operation requirements	Indoor use
Rotary speed (adjustable)	0~12RPM	Pneumatic	Need

Turntable size	Diameter 1650mm	Special power	220V AC 16A
Table drive	1PH	Pressure device	Without

Note: The suitable film for the equipment is pre-stretch PE film.

3. Equipment mechanism and working principle

This equipment mainly cooperates with the production line to wrap the product, the purpose is to improve the efficiency of the product, reduce the production cost.

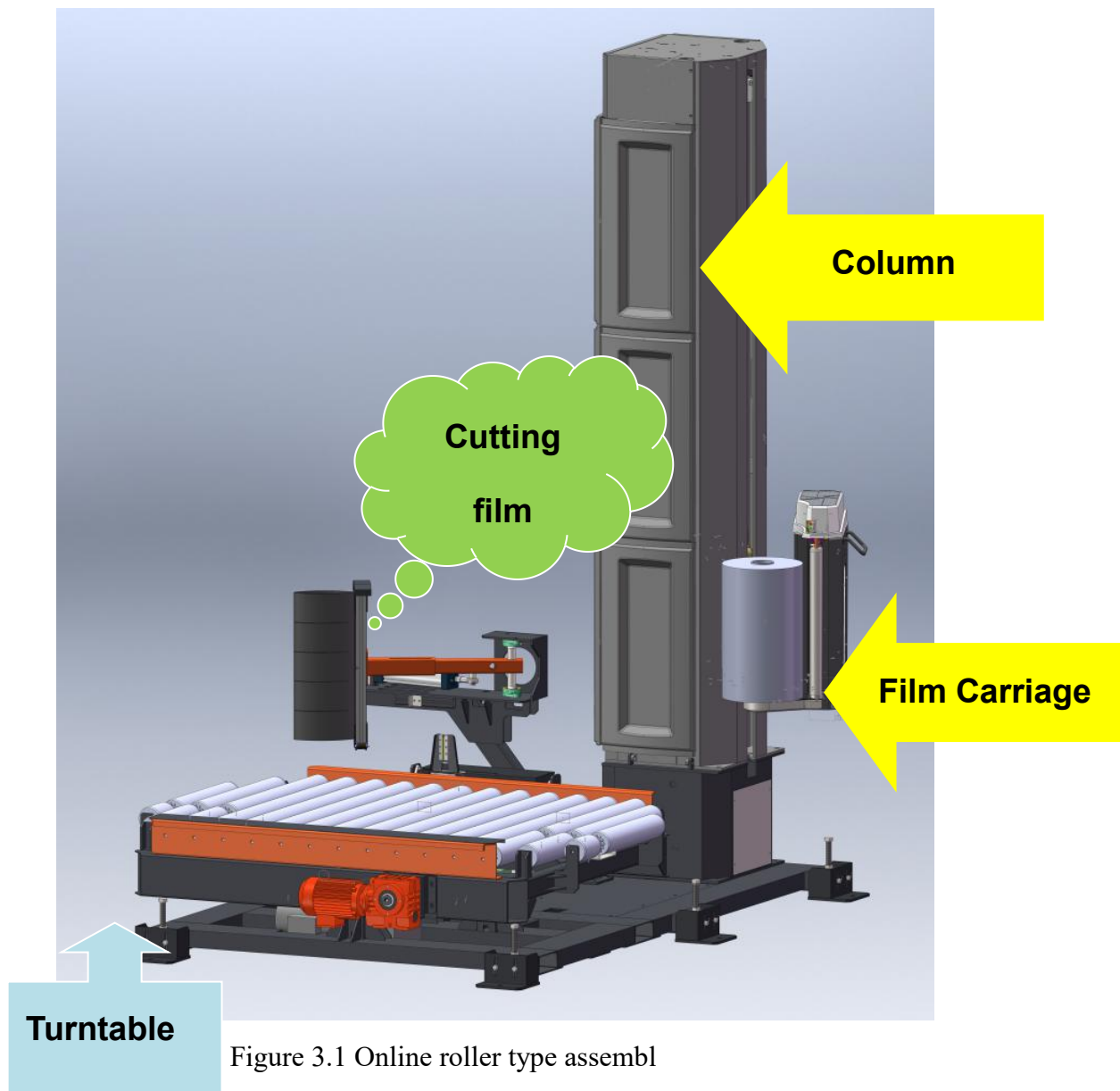


Figure 3.1 Online roller type assembly

Working Principles:

① The use of turntable rotary support stable rotation function; ② The column motor drives the film carriage to do vertical movement. The film carriage motor starts to release the film; ③ The large cylinder pushes the film breaking mechanism to move, and the heating wire automatically breaks the film; ④ The gear and rack have a simple and stable bidirectional movement under the action of the cylinder to ensure that the clip and release film freely.

3.1 Standard wrapping machine film carriage

The film carriage mainly includes the main frame, film carriage door body, film carriage top cover, film carriage transmission device, rope making device and safety touch device (anti-drop system). (Figure 3.1.1)



- 1.The main frame adopts carbon steel welding structure, strong rigidity, simple structure.
- 2.The top cover of the film carriage is made of injection molding parts with beautiful shape.
- 3.Film carriage door body mainly includes handle, door body, micro dynamic frame, no power guide roller, acrylic observation plate, proximity switch and other components.Pass the film through the guide roller along the specified route and gently push to close the door of the film seat. Easy to replace the film. The film is attached to the film pulling roller, which is driven by a pair of sprockets to stretch the film in a certain proportion. The non-dynamic film guide roll contacts with the proximity switch under the action of film tension and gives feedback signal to PLC. PLC through the compensation algorithm, control the motor to adjust the film release speed, so as to improve the product around the winding film contraction force, ultimately improve the quality and efficiency of packaging. (Figure 3.1.2)

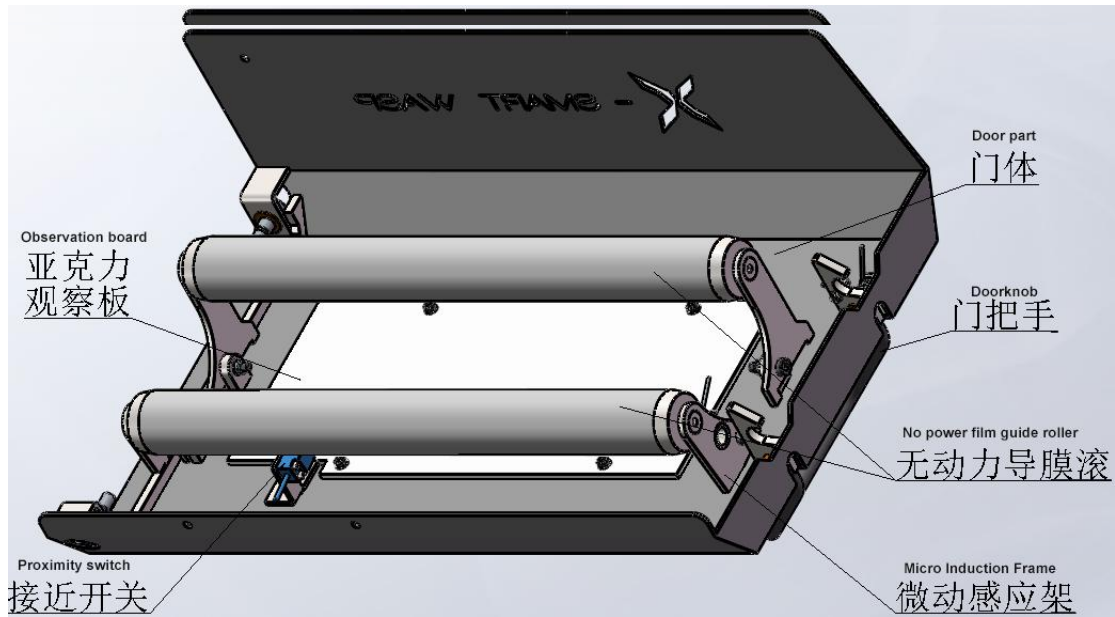


Figure 3.1.2 Door of film carriage

4.The film carriage transmission device mainly includes the active sprocket, the passive sprocket, the transition sprocket, the tension sprocket, the film roller and so on.The membrane seat passes through the membrane seat motor on the lifting car, under the action of the external sprocket, the driving force is transferred to the transition transmission device. The transmission device drives two film pulling rollers through the sprocket, and the film is pre-stretched into a certain proportion of the state. (Figure 3.1.3)

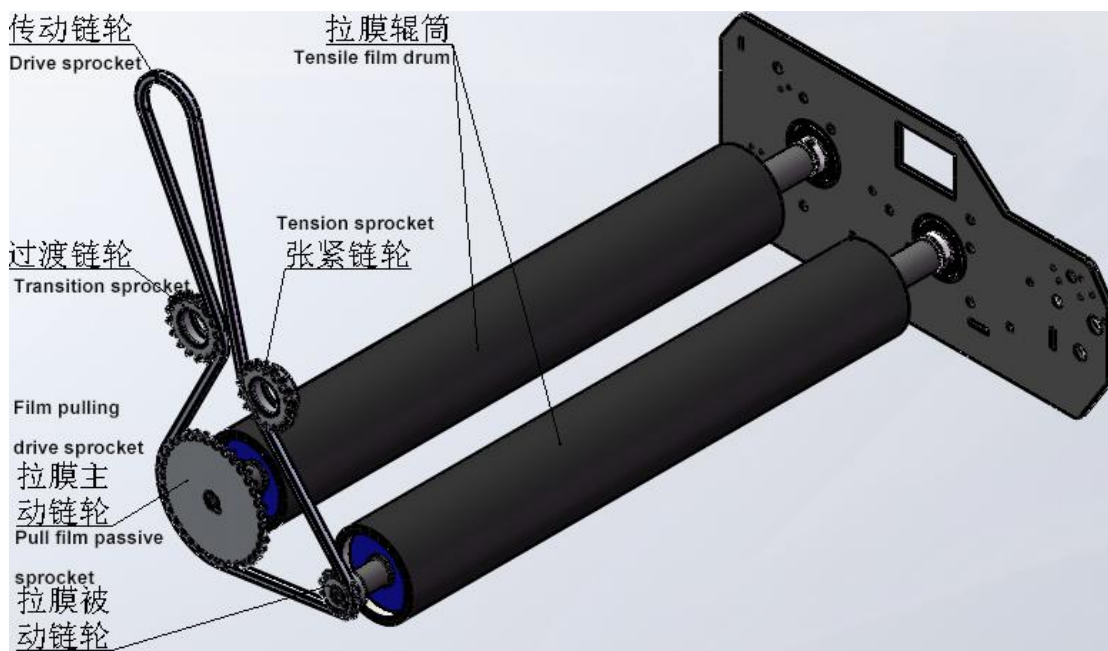


Figure 3.1.3 Film carriage transmission device

5.The rope making and anti-drop system is located in the bottom of film carriage, the rope making system with automatic cutting film under the guidance of the CAM follow-up to make the rope, to ensure that the film wrapped goods closely and cutting of the film smoothly. (Figure 3.1.4)。

6.Anti-drop system: In the process of film carriage’s falling, if the bottom of film carriage is touched, the film carriage will immediately stop falling movement to protect the safety of the operator (Figure 3.1.4)

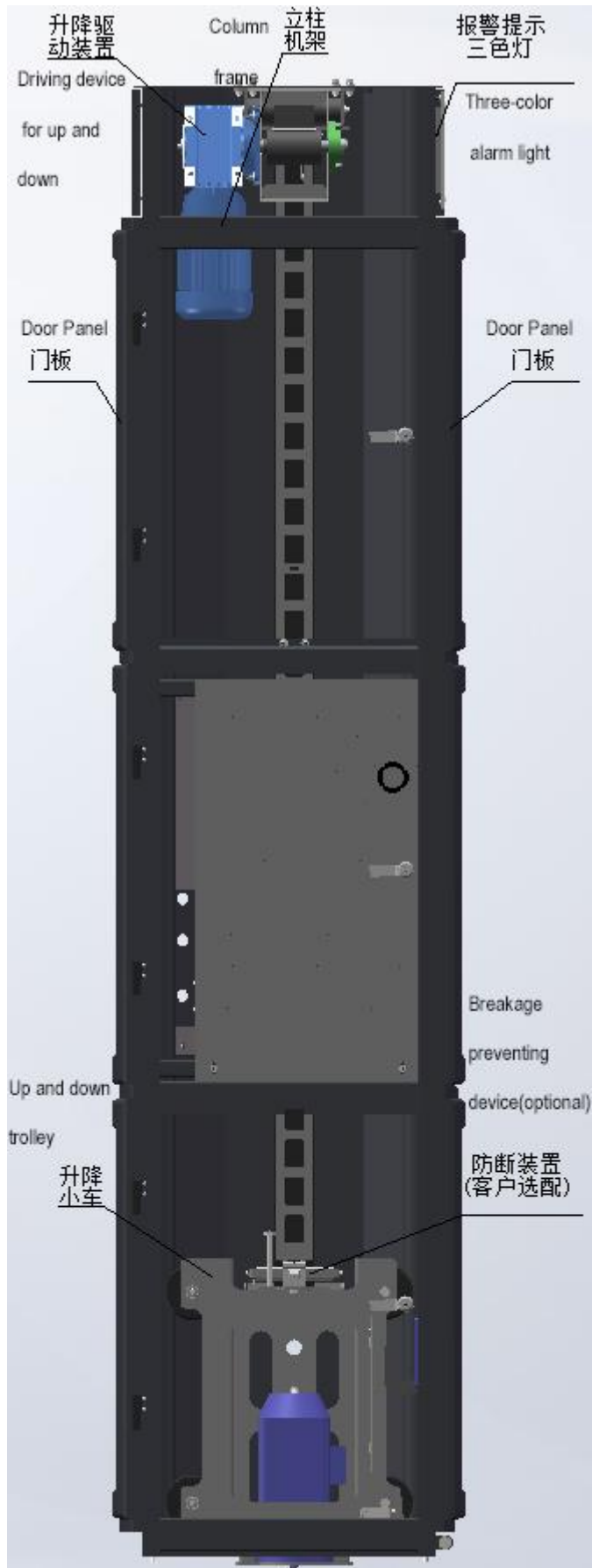


Figure 3.1.4 Anti-drop and rope system

3.2 Online wrapping machine column

The column mainly includes the lifting drive device, the column frame, the lifting trolley, the integrated intelligent interface, the electrical installation integrated block, the cloth belt break-proof device (process optional), the three-color lamp alarm system, the injection door lamp.

(Figure 3.2.1) Lifting device adopts the way of motor drive cloth belt wheel, cloth belt pull lifting trolley to do upward and downward movement, lifting trolley is equipped with a guide wheel and membrane motor, guide wheel along the column guide rod sliding up and down, the mechanism is equipped with upper and lower limit device, safe and reliable. The cloth belt breakproof device is selected according to the customer's products and processes. Once the cloth belt is broken, the breakproof slider in the breakproof device is quickly stuck in the bayonet, so as to brake the lifting trolley; The integrated human-computer interface is composed of Siemens touch screen and supporting system, with beautiful appearance; The three-color light alarm system displays blue light in standby state, yellow light in operation state, and red light in alarm state with voice prompt function.



Intelligent Operation Touch Screen

Figure 3.2.1 Column

3.3 Online wrapping machine turntable

The turntable of the online wrapping machine (Figure 3.3.1) mainly consists of a driving device, a transmission device, a turntable, a turntable count switch and a photoelectric switch, etc. The turntable count switch and photoelectric switch guarantee the origin position, film release position, film breaking position and winding coil number of the turntable.

Automatic film breaking and cutting device (Figure 3.3.2) mainly includes film breaking frame, swing arm welding, telescopic arm welding, upper and lower fixing seats of heating wire and heating wire, etc. The film breaking swing arm rotates under the coordination of the cylinder to drive the heating wire to complete the film breaking and reset action.

Automatic clamping mechanism is mainly composed of main body welding, gear, rack, cylinder, linear slide rail. It has the characteristics of simple and stable work.

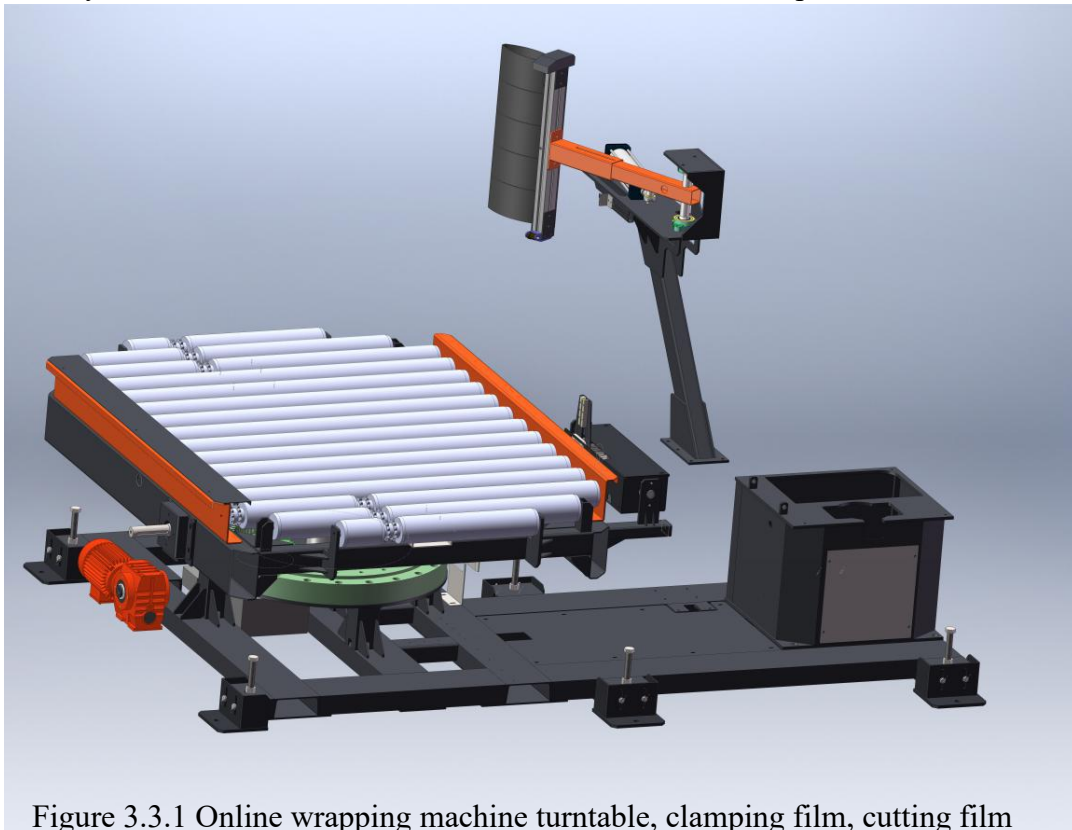


Figure 3.3.1 Online wrapping machine turntable, clamping film, cutting film

3.4 Online wrapping machine clamping film and cutting film

Automatically film cutting and clamping device (Figure 3.3.2) mainly includes film breaking frame, swing arm welding, telescopic arm welding, upper and lower fixing seats of heating wire and heating wire, etc. The cutting film swing arm rotates under the coordination of the cylinder to drive the heating wire to complete the film breaking and reset action.



Figure 3.4.1 automatically film cutting and clamping device

The clamping film is mainly combined with automatic film cutting to complete the cutting and clamping action. The main structure diagram is shown as below (3.4.2).

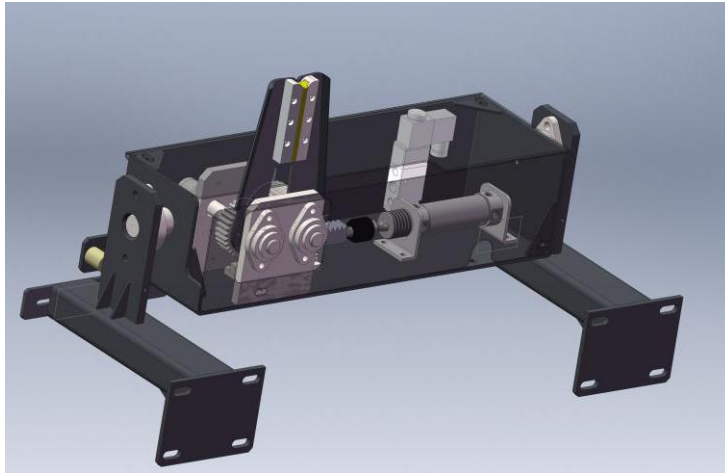



Figure 3.4.2 Online film

4. Installation And Debugging

4.1 Preparation before installation

 Read the entire installation instructions section before you begin, and then follow the instructions step by step.

Note:

- (1) Completely finish one step before moving on to the next!
- (2) If you encounter problems during installation, see "Common Troubleshooting" for help and to find a fix.
- (3) The equipment has safety protection measures in many places, according to the correct way of operation, can ensure the safety of operation. Please observe all safety signs. Do not switch on the power until the installation is complete.

4.1.1 Area preparation before installation

The installation area of the equipment shall meet the following space requirements:

- (1) The distance between the film carriage side and the wall is recommended to be no less than 600mm;
- (2) The distance between the rear part of the column and the wall is recommended to be no less than 300mm;
- (3) Please refer to Table 2.1 for the size of the equipment. The installation area should be larger than the size of the equipment;

4.1.2 Confirmation of ground bearing

The ground must be able to withstand the weight of the equipment plus the maximum load of the equipment and its impact force, that is, requirements:

Ground bearing capacity \geq (total weight of equipment + weight of goods) $\times 1.5$.

4.1.3 Electrical confirmation

The system requires a dedicated single-phase grounding power supply.

220V/AC; 10A; 50/60Hz; 1PH

Note: Refer to equipment identification label or electrical drawing for specific electrical requirements.



Be careful!

- (1) The use of extension cords or any other changes may cause circuit damage or affect equipment performance and may void the warranty. If you need to change, please call after-sales service.
- (2) To avoid damage to the equipment, check the voltage in the electrical drawing before starting the equipment.

4.1.4 Equipment, tools and personnel requirements

- A. One standard wrapping machine
- B. A set of tools (equipped), a forklift
- C. One or two mechanical/electrical technicians and one user

4.1.5 Equipment loading, unloading and handling

- (1) Partial loading and unloading and handling of machine (turntable and column) :
Equipment used for loading, unloading and handling of the machine: forklift.
Operation method: remove it by forklift truck and transport it to the installation place to put it straight.
- (2) Other parts:
Before handling the loading and unloading main parts, other spare parts and components need to be handled manually.

4.1.6 Fastening torque reference for general hardware

The torque and performance specifications of the fasteners provided and proposed for this product are shown in Table 3.1.

Table 3.1

Metric fastener torque comparison table		
Nominal dimensions of fasteners	Performance level	Torque (Nm)
M6	8.8	14
M8	8.8	24
M10	8.8	54
M12	10.9	102

4.1.7 Conditions of installation and service

Humidity $\leq 98\%$ Temperature 0-40°C

4.2 Installation

Preparation:

- (1) Move the equipment to the installation area with a forklift, remove the outer packaging, binding materials and objects for the fixed equipment.
- (2) Take out the tools, check if there is something missing, and put them neatly.
- (3) Ensure that the trolley is locked on the column frame rib plate, in order to prevent the lifting body and the base bump against the damage of parts in the process of column erection. As shown in Figure 4.1 .

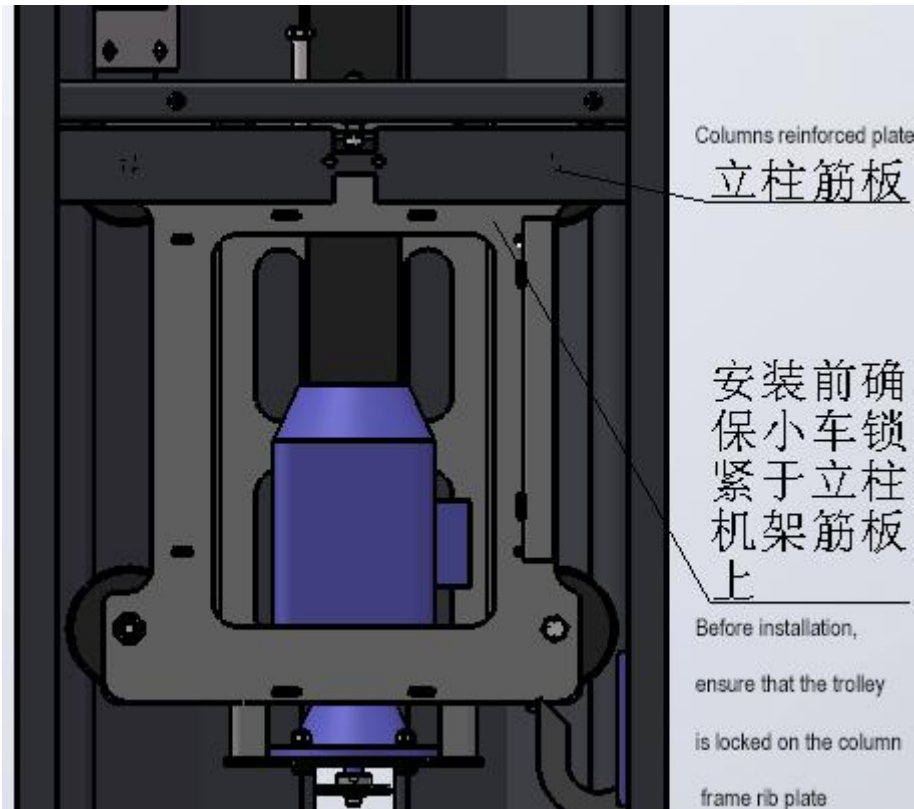


Figure 4.1

4.2.1 Column mouting

(1) Set up the column and pay attention to safety during operation.

Before installation, the outside base pad of wrapping film or other soft material is placed on the surface of the transition frame, and the column is erected slowly as shown in Figure 4.2. The red line shows that the fixed shaft is used to cross the chassis and the column frame. During the erecting process, pay attention to avoid the bump and collision between the column and the turntable to prevent damage to the parts.

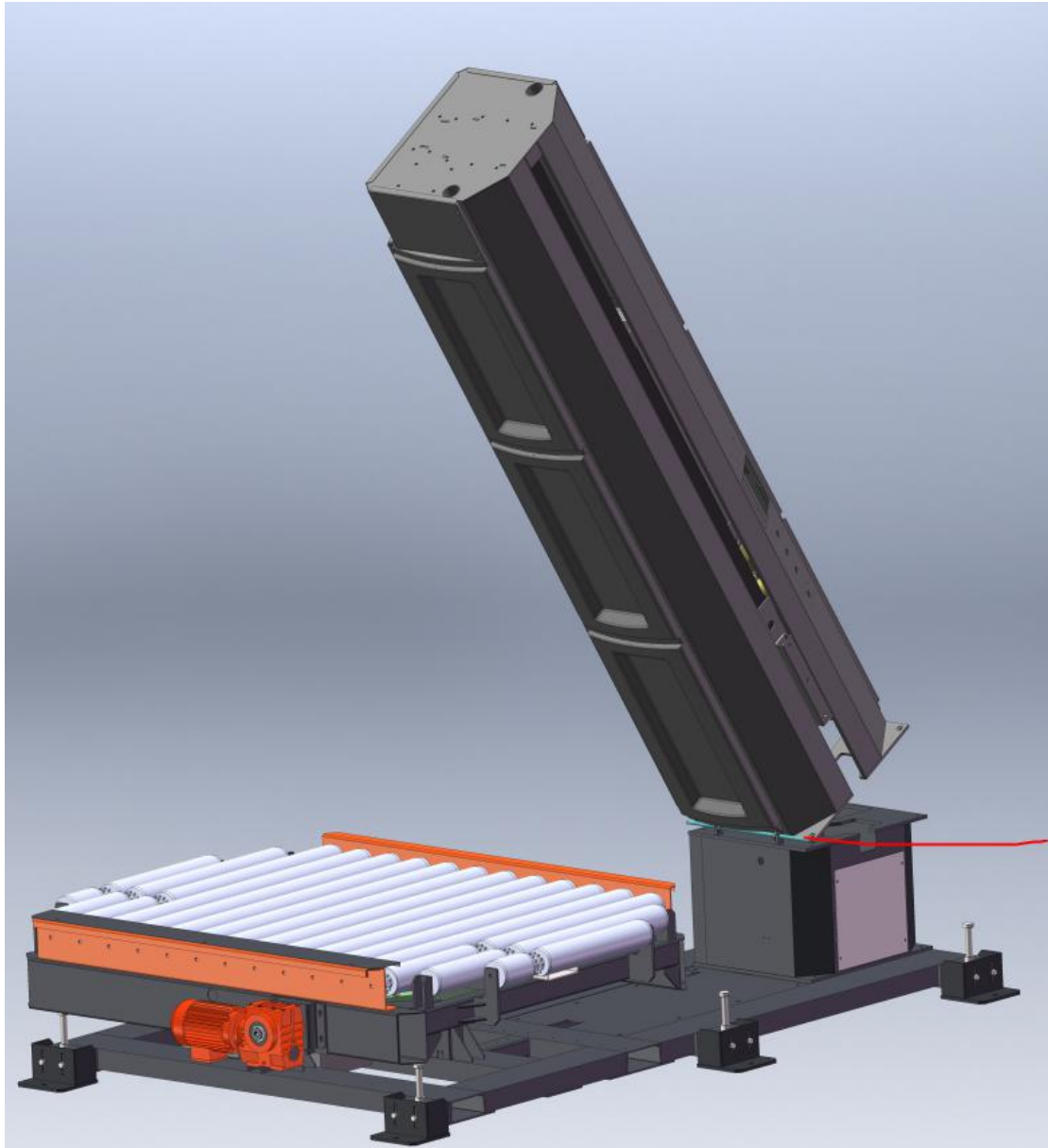


Figure 4.2 Column mouting

- (2) Fix the column on the turntable with tools as shown in Figure 4.4.
Lock the countersunk head screws around.

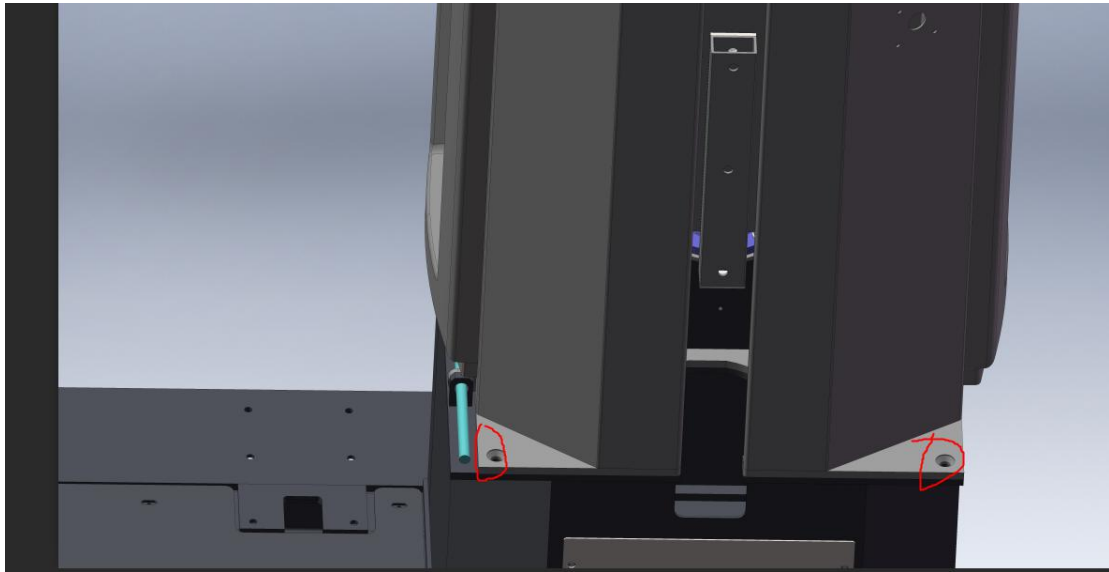


Figure 4.4 Lock the column

(3) The connection between turntable motor wire quick plug and column reserved quick plug is shown in Figure 4.5.



Turntable
motor quick
connection
plug

Figure 4.5 Cable connection of turntable motor

(4) The turntable induction line is connected with the column quick plug.



Turtable quick connection plug

Figure 4.6 Turntable induction wire connection

4.2.2 Film carriage installation

(1) Unlock the trolley from the column reinforcement plate and descend to the lower limit (Figure 4.7)

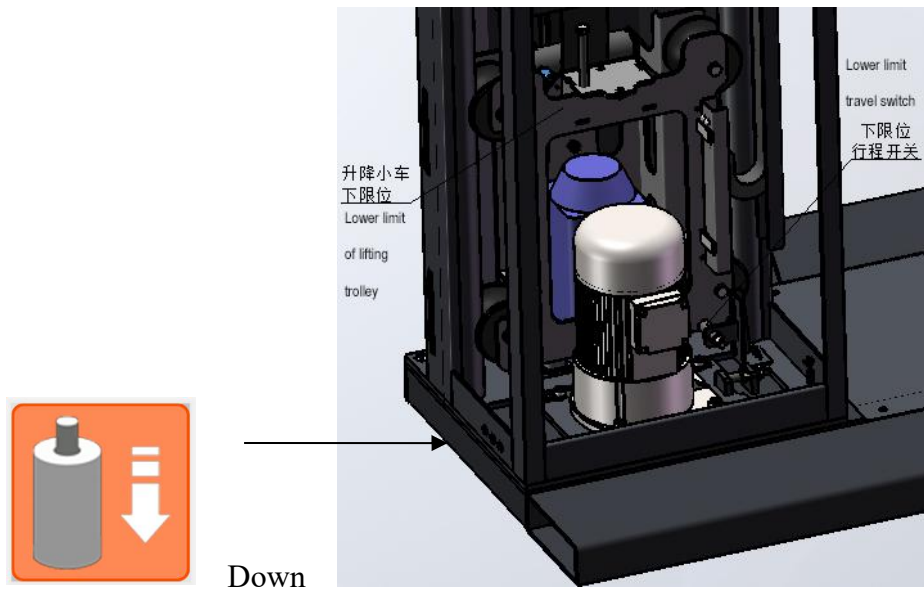


Figure. 4.7 The trolley is reset to the lower limit

(2) Manually hang the film carriage on the trolley from the outside of the column (as shown in the following series of pictures), pay attention to connect the connecting wire to the lifting body through the thread hole below the connecting plate. Lock the film carriage to the trolley with corresponding mounting bolts.

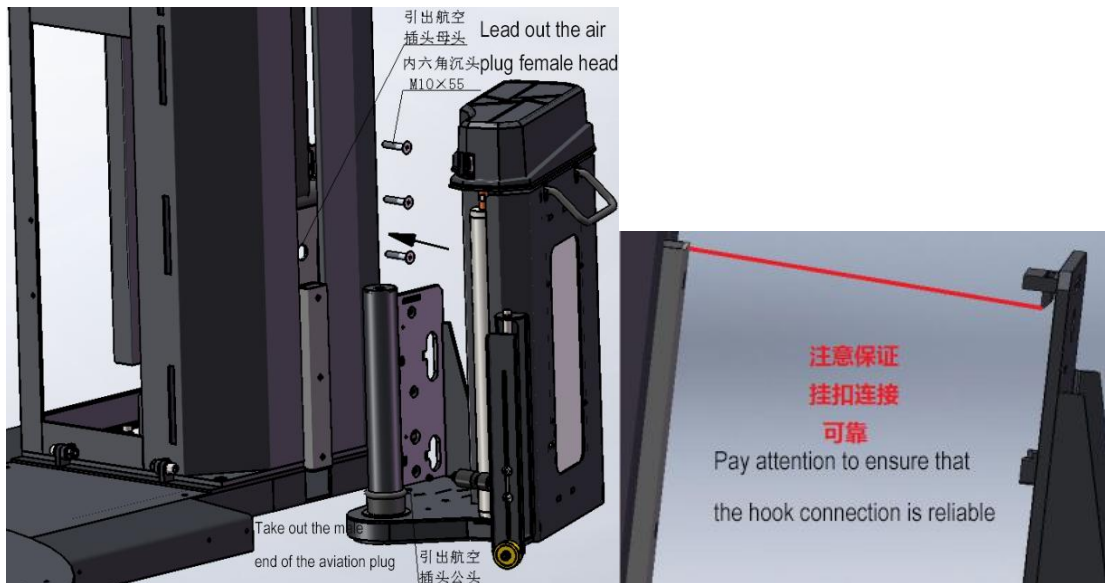


Figure. 4.8 Installation of film carriage



Figure. 4.9 Take the female head of the aviation plug



Figure. 4.10 Take the male head of the aviation plug



Figure. 4.11 Aerial plug connection of film carriage

4.2.3 Film carriage power connection

(1) Check whether all wires of the equipment are connected safely, confirm that they are safe and effectively grounded, connect the power supply of the equipment and turn on the power switch.

(2) After the machine starts, switch to manual screen on the touch screen (see manual screen in "Introduction to Human-Machine Interface"). Click rise button to lift the car together with the membrane base to an appropriate height (about shoulder level to facilitate the installation of the bottom of the membrane base), click rise button again (change of the brightness of the button frame) to stop it and turn off the load switch. See the section of "Operation Instructions" for specific operation methods. (Figure 4.12)



4.12 Turn off the power after the film carriage rises to a suitable height

(3) Rotate the bottom safety plate screw of the film carriage until the safety plate of the film carriage is opened. The screw does not have to be completely unscrewed (Figure 4.13).



Figure 4.14 Open the bottom safety board

(4) Install the film release tensioning sprocket and connect the film base

film release driving chain and tensioning, as shown in the following series of pictures.



Figure. 4.15 Tension sprocket and chain



Figure. 4.16 Installation of tensioning sprocket



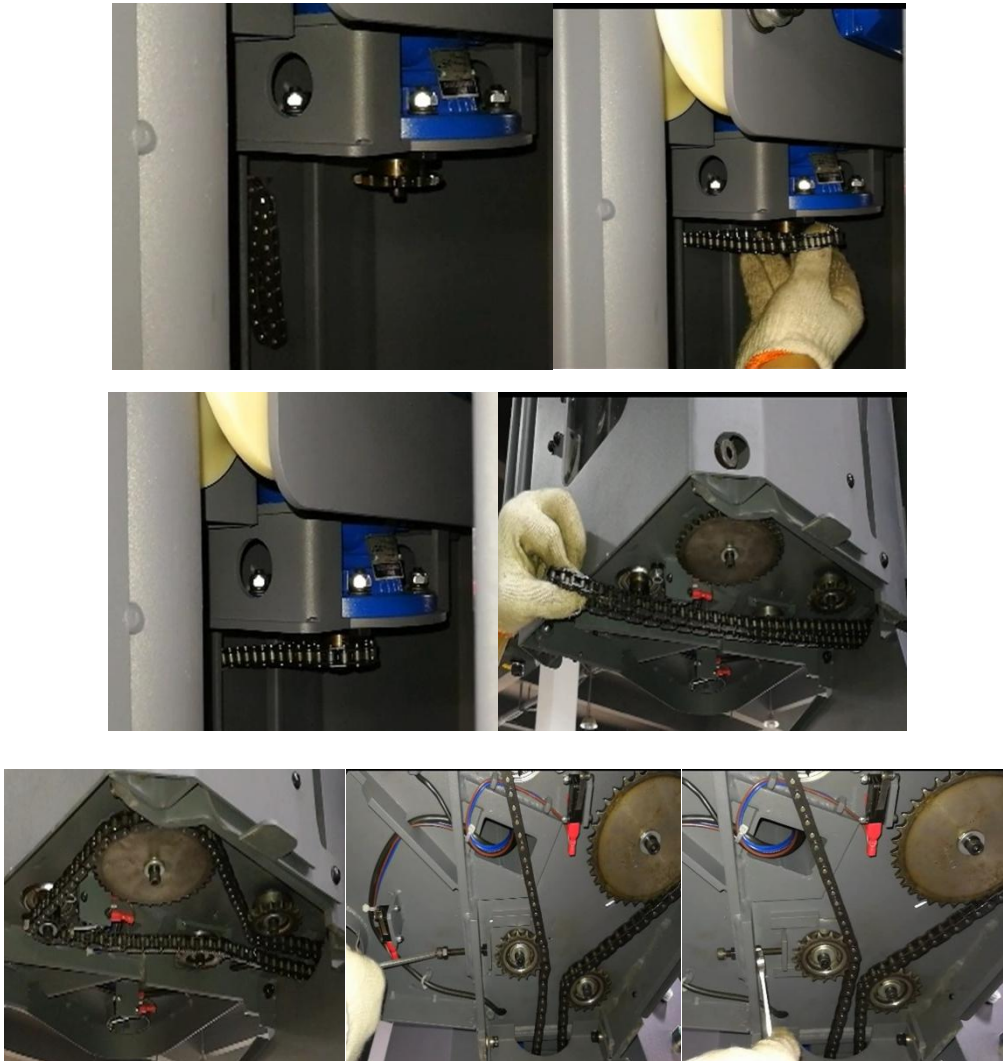


Figure. 4.17 Install and tensify the drive chain

- (5) Close the film carriage safety plate and rotate the film carriage safety plate screw into the long hole.
- (6) Turn on the power to reduce the film carriage to the lower limit manually (the same method as "rise operation") and turn off and disconnect the power of the equipment.

4.2.4 Installation of film breaking device and stopper

- (1) Place the film breaking device vertically on the turntable (handle with

care to avoid scratching or damaging parts). The hole of the mounting block of the film breaking device is aligned with the screw on the turntable to fix the film breaking frame on the turntable.

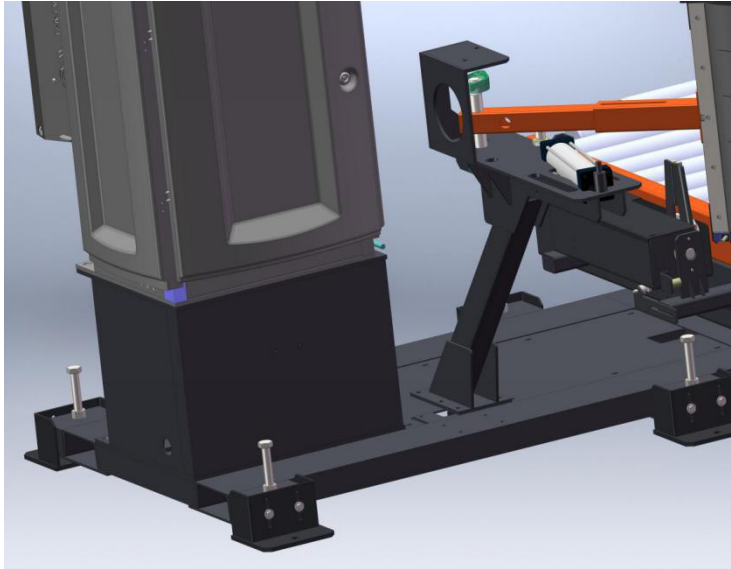
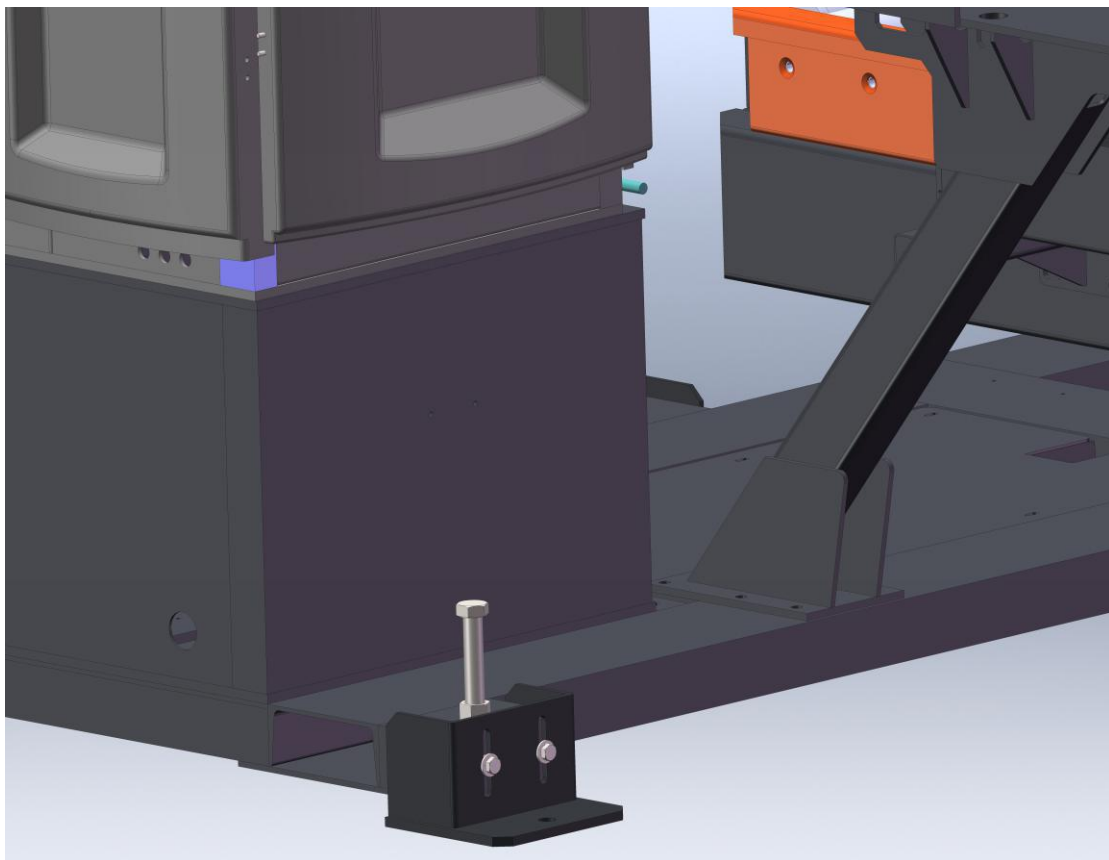


Figure. 4.18 Fixation of cut film device



(3) The clamping film has been tested and installed on the side of the

turntable before leaving the factory.

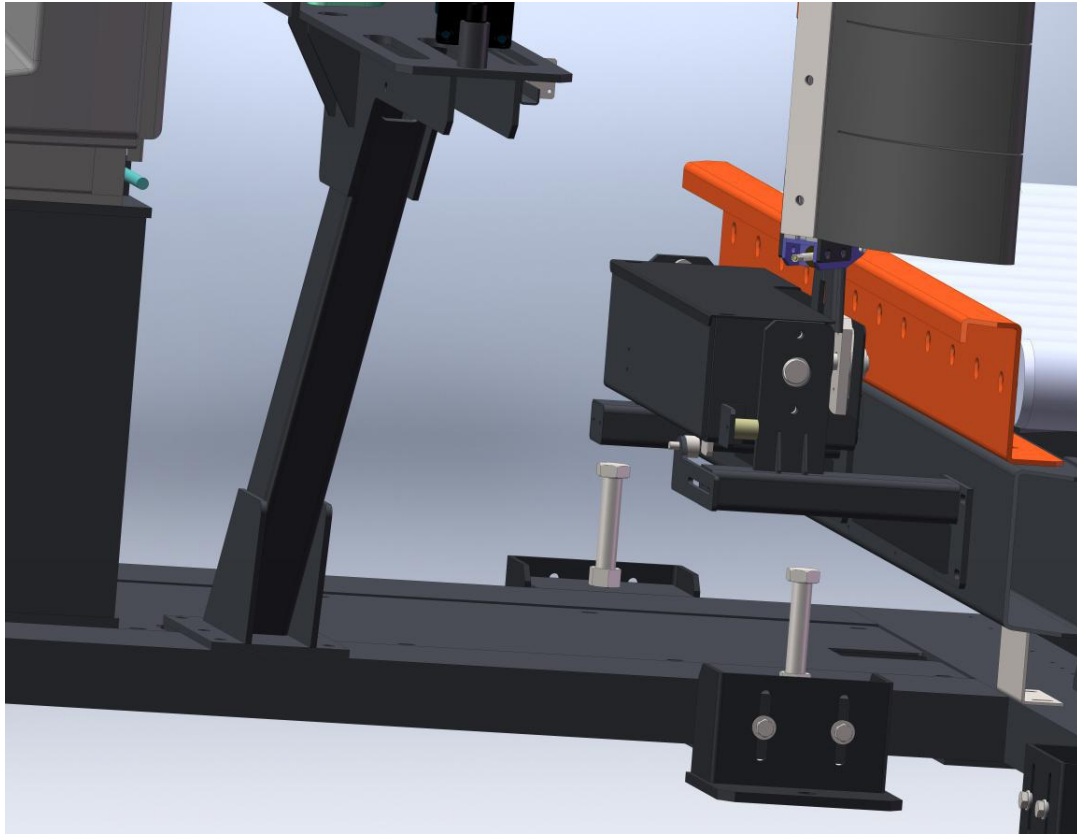


Figure. 4.20 Clamping film device installation

4.2.5 Door panel installation

(1) Right side door panel installation. There are 3 door panels on the right side, which are installed from bottom to top. The three convex edges on the side of the door panel are inserted into the three clamping grooves of the column, and the other side of the door panel is inserted into the vertical plate of the column. The specific installation is shown in Figure 4.21 and 4.22.

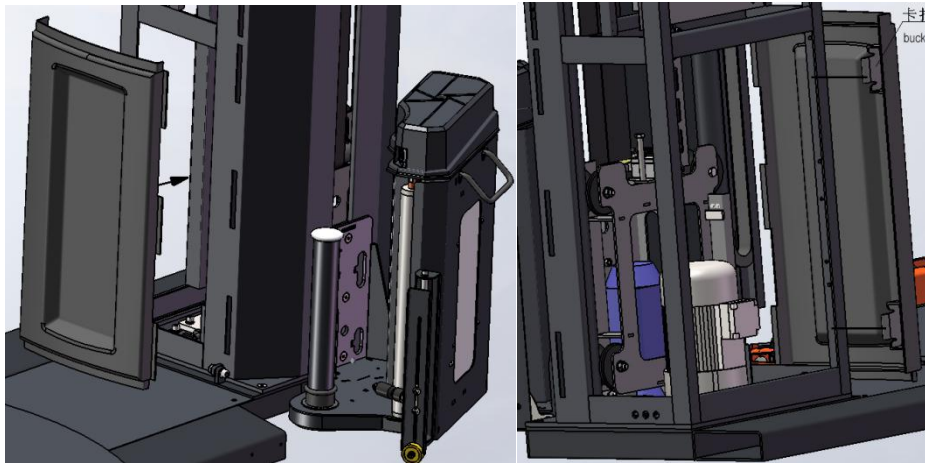


Figure. 4.21 Installation of right door panel

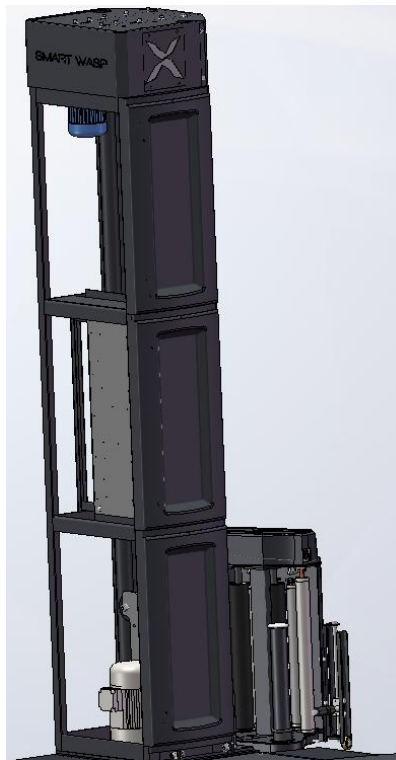


Figure. 4.22 Three right side door panels are installed successively

(2) Left door panel mounting. There are 3 left door panels, which are installed from bottom to top. Three convex edges on the side of the door panel are inserted into the three clamping grooves of the column, and the other side of the door panel is inserted into the vertical plate of the column. The specific installation is shown in Figure 4.23 and 4.24.

4.3 Initial operation of equipment

4.3.1 Attention points

- A. Please confirm the power supply used by the machine and do not plug in the wrong power supply. The machine adopts single-phase AC220V, two-color wire as the ground wire, play a protective connection.
- B. Do not stand on the machine when it is in operation.
- C. The installation of the machine on soft ground is not allowed.
- D. In case of emergency, press the emergency stop switch to disconnect the power supply of the motor and stop the machine in an emergency.
- E. Please clean the machine once after finishing the day's work.
- F. For safety, please do not disassemble the electrical equipment at will.
- G. Only electrical technicians of our company can carry out maintenance on electrical equipment.

4.3.2 Preparations for initial operation of equipment

- (1) Check the electrical connection is correct and make sure the ground wire is safely grounded.
- (2) Check whether the mounting bolts are missing and confirm their tightness.
- (3) Make sure there is no sundries inside the equipment, tools and spare parts have been sorted out.

(4) Verify that the photoelectric direction of the detection height does not exceed the edge of the smallest product.

4.3.3 Equipment testing



Attention:

When performing any of the following operations, the other hand should be placed at the "emergency stop" button, in case of abnormal, you can press the "emergency stop" at the first time, and find the problem (see "common faults and troubleshooting")

(1) Connect the power supply and turn on the power switch, and wait for the system to start up.

(2) Click to enter the "manual screen".

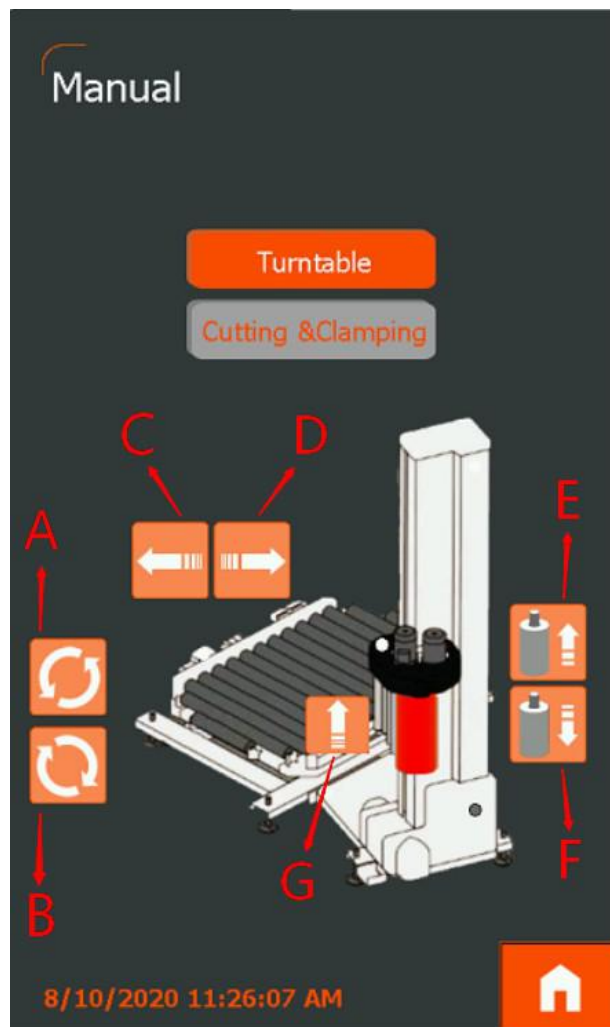
(3) Long press the "turntable" button A or B to try to turn the turntable, confirm that the "turntable" starts easily and there is no abnormal sound, and then release the button to stop it.

(4) Long press the "rise" button E to make the film carriage rise, and when it rises to the highest level, the equipment will automatically stop, and confirm the smooth rise without jam resistance.

(5) Long press the "Down" button F to make the film carriage rise. When it rises to the highest level, the equipment will automatically stop and confirm the smooth descent without jam resistance.

(6) Long press the "conveying" button C or D to make the drum rotate and confirm the smooth conveying without blocking.

Click "Blow" button G to make the air outlet blow, and then click "Stop" again after confirming that the blowing is correct.



(7) Click the Manual Clamping button or J or K on the touch screen to make the air clamping rod act, and confirm the clamping action is correct.

(8) Click the "Swing arm" button L or M to make the air swing arm lever

to make sure the swing arm is correct.

(9) Click the "Manual Heating" button H, and the heating wire will be manually heated for 0.5 seconds to confirm the correct heating action.

Note: After the equipment stops, the trolley should be sure to touch the upper proximity switch (see Figure 4.27).

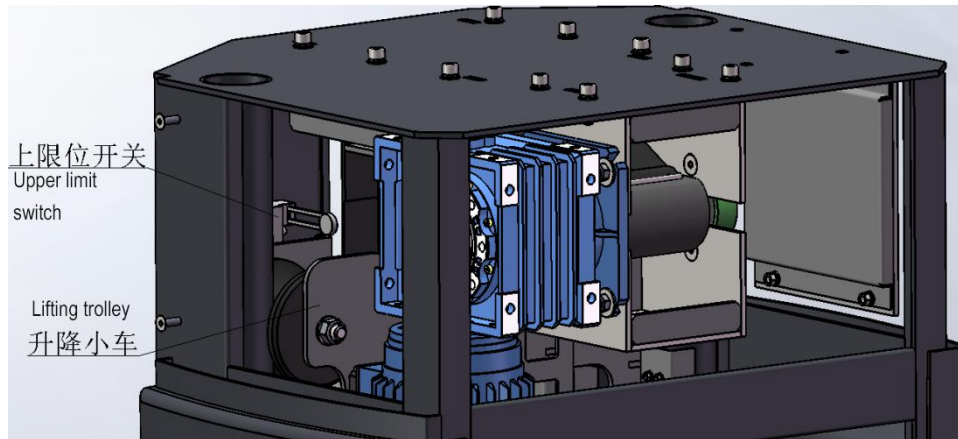


Figure. 4.27 Upper limit position of trolley

Note: After stopping, the car should have touched the proximity switch at the bottom (see Figure 4.28).

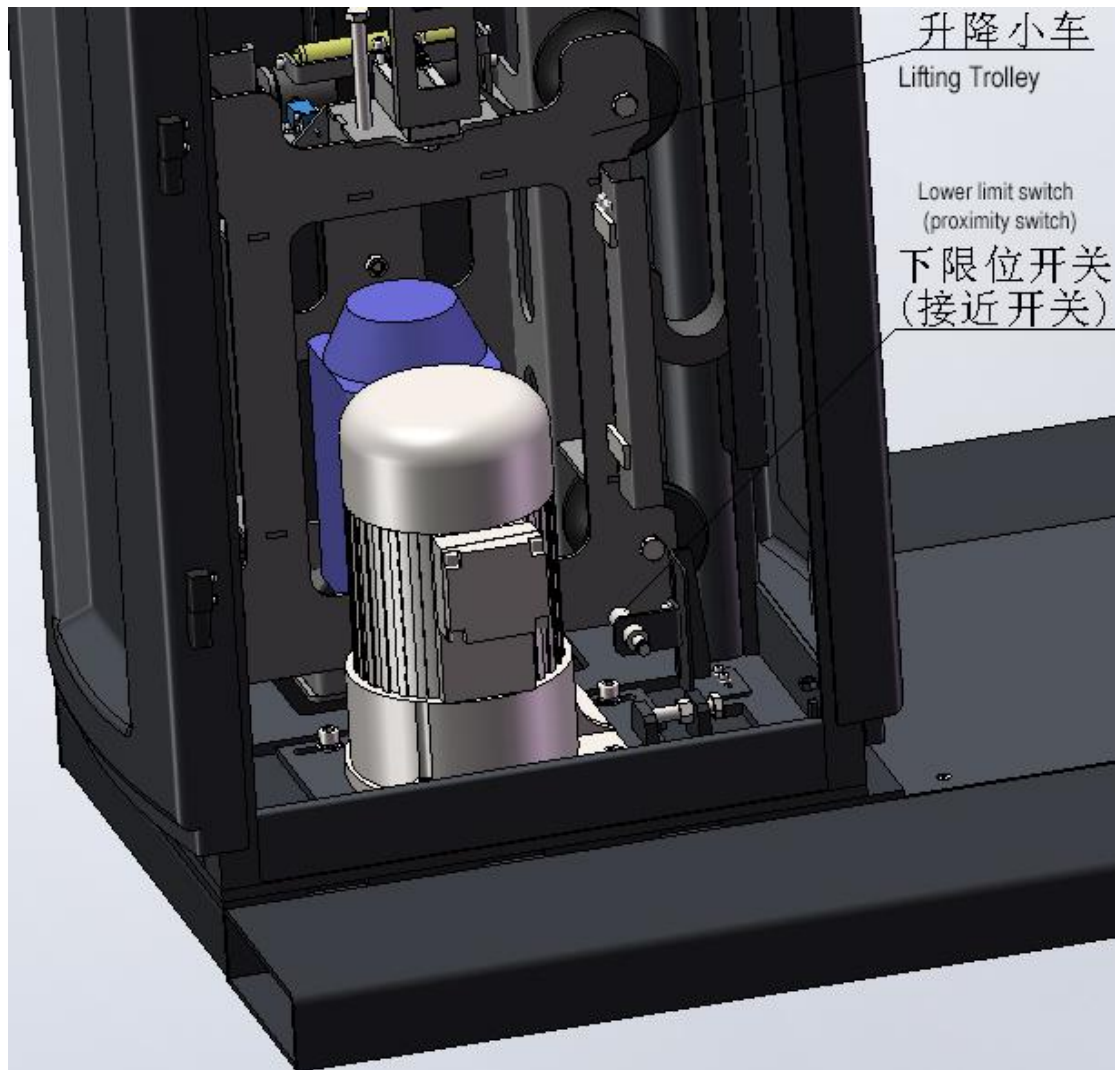
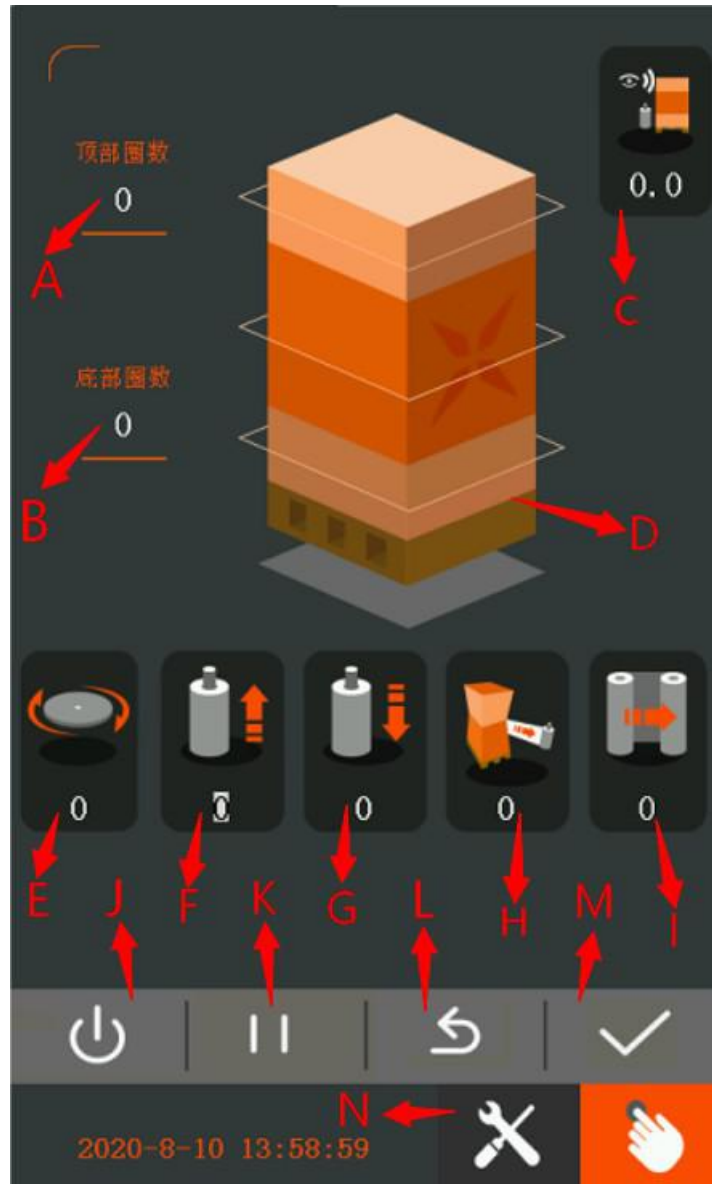


Figure. 4.28 Lower limit of trolley

4.3.4 Automatic debugging

- (1) Click "Automatic Screen" to switch to the automatic interface, and click "Reset" button L to ensure that the device can be automatically reset. After reset to the initial position, the machine will stop, indicating that the device is in the initial position at this time.
- (2) Set the number of turns at the top of the wrapping at A.
- (3) Set the number of turns at the bottom of the wrapping at B.
- (4) Set the time of wrapping turns at C.

- (5) Set the turntable rotation speed (0-100) for automatic operation at E.
- (6) Set the rising speed of the film carriage at F for automatic operation (0-100).
- (7) Set the drum conveying speed (0-100) at I during automatic operation.



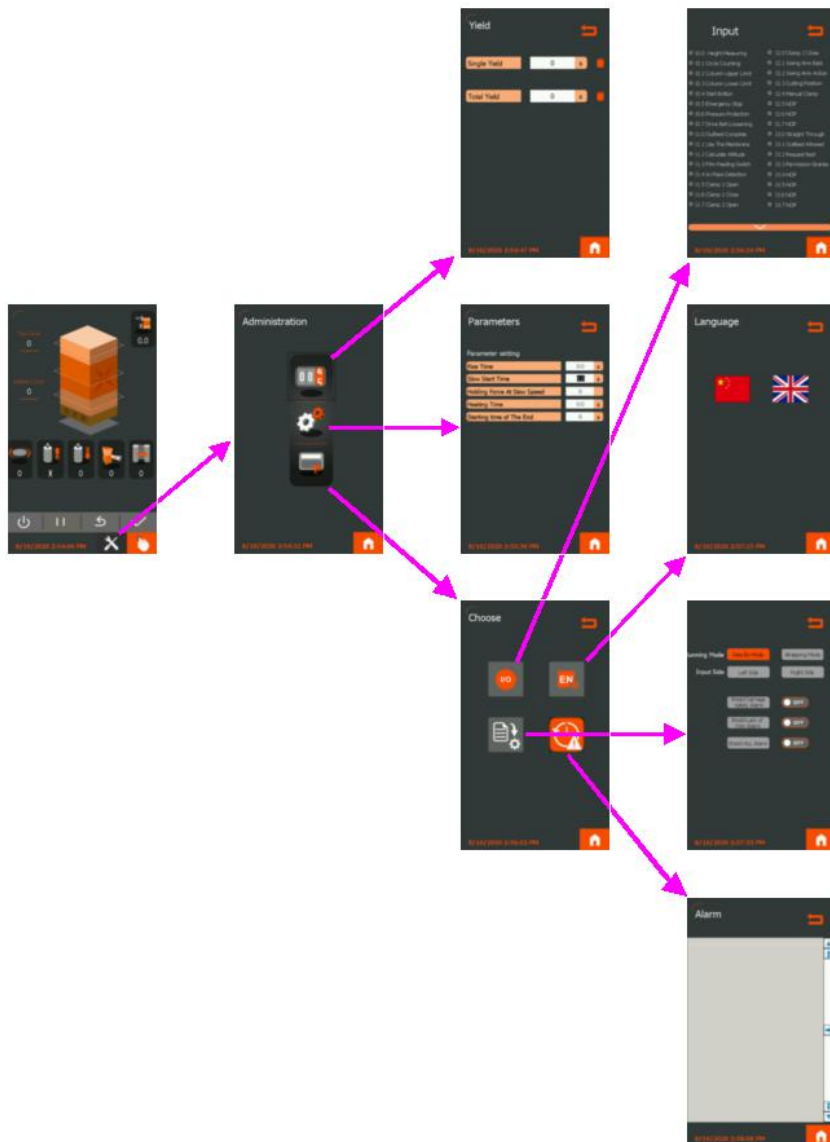
- (1) When the device is in the initial position, click button J to enter the automatic operation state. At this time, the three-color light turns green, the equipment is in standby state, and the output allows feeding signal. When receiving the request feed signal from the butt conveying line, the equipment will automatically run, wrap and cut the film. After wrapping, the equipment will stop and output the request discharge signal. When receiving the discharge signal from the leading line body, the roller moves forward to the next station for discharge. When receiving the discharge completion signal from the line body or 5 seconds after the goods are detached from the transmission detection photoelectric, the swing arm will automatically return to position, and then one wrapping cycle will be complete. The equipment automatically enters the standby state again, and outputs the feed signal to the line.
- (2) In the process of automatic operation, press the pause button K, the rotation and lifting motor will suspend operation, press the start button J and resume, and continue the action before suspension.
- (3) Press the emergency stop button on the column, the device will stop immediately, and the automatic operation signal will be disconnected. It needs to be reset manually and then restart.
- (4) Click M button to clear the current alarm.
- (5) Click N to enter the parameter page (administrator password is required), as shown in the figure. After entering the parameters page, the

action parameters can be changed.




4.3.5 Parameter Settings

After entering the setting page, the selection interface is displayed.



(1) Output information interface: it can display the current wrapping times completed by the equipment.

(2) Click  to clear the current data.

(3) Parameter interface: device operation parameters can be set.

Pre-rise time	The time that the film carriage rises in advance before the wrapping starts spinning.
Slow startup time	The time that the wrapping first runs at a slow speed after it begins to spin.
Wrapping force at slow speed	The wrapping force of the stretch film in slow rotation.
Heating time	The heating time of the heating wire when the film is broken.
Low start time of last turn	At the end of wrapping, it takes time to descend to low speed after passing the origin turntable.

(4) Selection interface: each function page can be displayed.

(5) IO interface: display and monitor all input and output signal points.

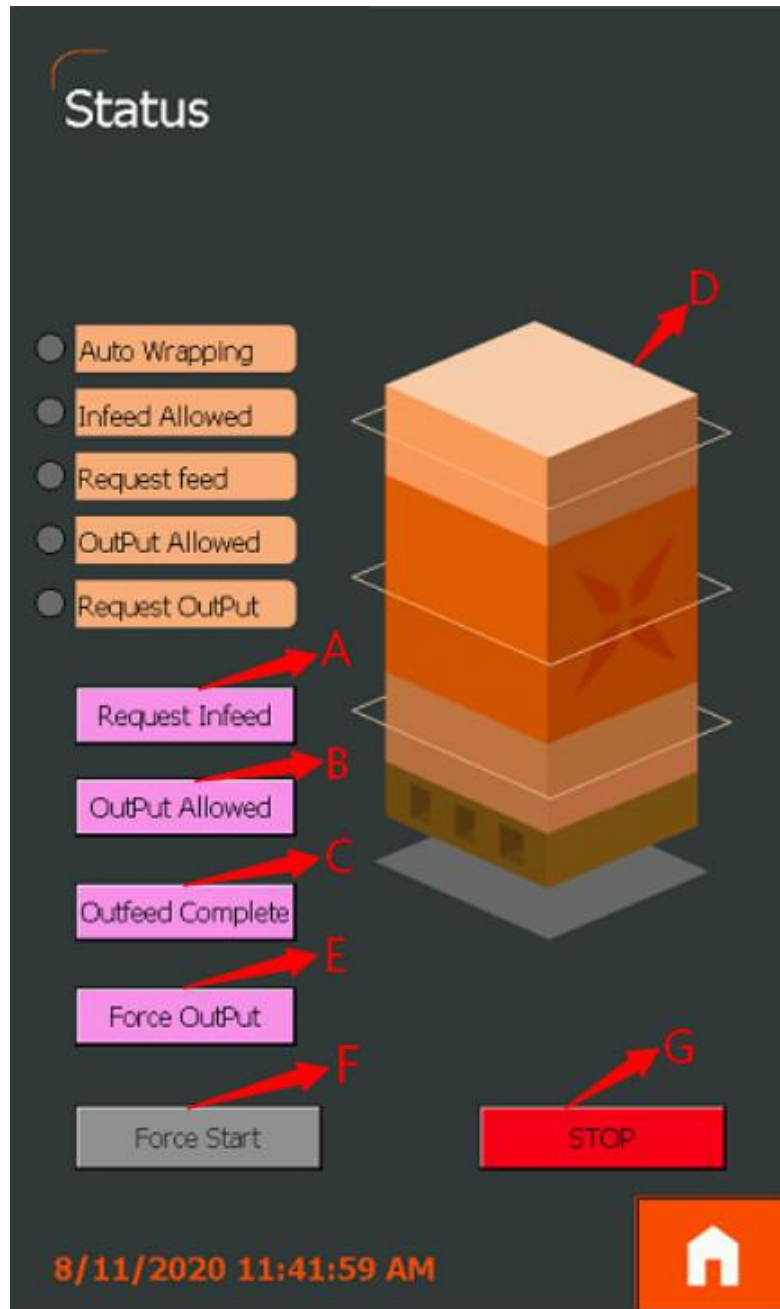
(6) Language interface: Switch system language

(7) Function selection: all functions of the device can be selected, including operation mode and alarm shielding.

(8) Alarm page: display the previous alarm information of the device.

4.3.6 Running state

Click the large icon D on the home page to enter the running status page, and click back again.



(1) Request feed A: Request feed signal is simulated in single machine running state.

(2) Allowable discharging B: Simulate the allowable discharging signal in the single machine running state.

(3) Discharge completion C: Simulation of discharge completion signal in single machine running state.

- (4) Forced discharge E: Forced roller forward under manual state, and output request elimination signal.
- (5) Forced automatic winding F: in manual state, long press F button for 3 seconds to force the device to start.
- (6) Stop automatic G: reset automatic signal.