PACKAGING LINE FOR COIL

Shanghai Fhope Machinery Co.,Ltd

Add: No.1428 North road shipu fengshou, Qiandeng Town, Kunshan City, Jiangsu Province China.

Tel: 0086-21-57871869 Fax: 0086-21-51571281

Website:https://www.fhopepack.com E-mail:info@fhopepack.com

Manual & Operation

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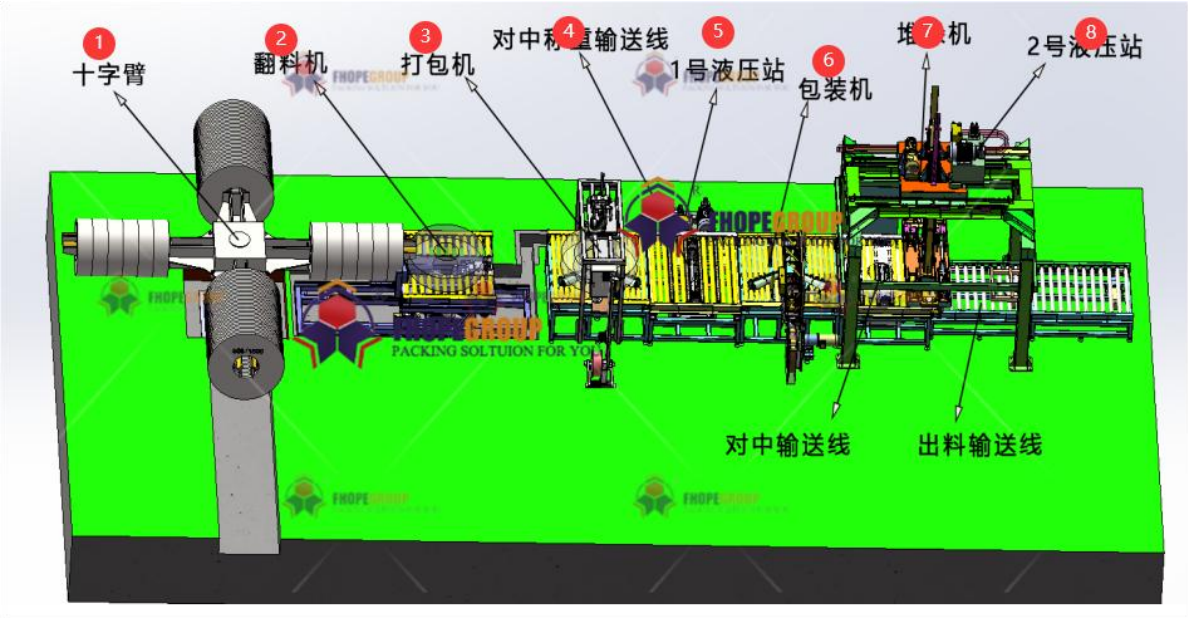
I. Machine Application

The horizontal packaging line is mainly used for wrapping of relatively narrow products. It is mainly divided into three types: horizontal roller conveying, horizontal heavy-duty and horizontal light. It is mainly suitable for the wrapping of various relatively narrow ring products, like copper, steel, aluminum, alloy strip, copper, steel, aluminum wire, copper, aluminum coil, iron wire, plastic coil, hose, hose, steel strand, tire, etc. The packaged objects are relatively sealed, not only the product is beautiful and elegant, but also has the functions of waterproof, dustproof, rust-proof and anti-wear.



Picture 1-1

Picture 1-1 shows the appearance of the packaging line,

① Cross arm

② Upender

③ Strapping machine

④ Centering and weighing conveyor

⑤ No. 1 hydraulic station

⑥ Wrapping machine

⑦ Stacking machine

⑧ Feed-out conveyor

II Important Warning

1. Operation against rules will cause serious consequences.

2. Be sure to use grounding.

3. When the unit fails, be sure to turn off the power and air supply first, and then carry out relevant troubleshooting after confirming safety.

4. Do not change the control program and relevant parameter settings of the machine without authorization.

5. Please do not tear off all kinds of marks on the fuselage.

6. Do not open the electrical box when the machine is working.

7. No one is allowed to stand within the rotating range of the cross arm.

8. No one is allowed to stand in the moving area of moving parts such as picking-up mechanism and stacking mechanism.

9. Do not climb over the equipment safety barrier without permission.

10. It is an automatic packaging unit, which must be operated by trained personnel.

11. During maintenance and repair of the machine, the power and air supply must be cut off in advance, and the unit can only be entered after confirmation of safety.

12. During maintenance and repair, attention should also be paid to the isolation of potential energy.

13. Safety helmet must be worn when entering the site. When operating the machine, it is strictly forbidden to wear long hair with a long robe or overhanging long tie, so as not to be twisted in.

14. Do not put your hands, feet and other human parts into contact with the drive, cutter and moving parts of the machine.

15. Do not pack copper strip coils that do not conform to this packaging line.

16. Do not allow two or more people to operate the unit at the same time.

17. The forklift must be limited when using it.

III Technical Parameter

Product OD	1000-1500mm
Product ID	508mm
Product width	50-300mm
Product weight	Max. 2500 Kg
Ring sped	App.60r/min
Strapping material	PET strip
Strip size	Thickness0.8mm, width 16mm
Strapping speed	15sec/cycle
Strip feeding speed	2m/s
Strip tension speed	3-6 m/min
Strip tension	200-3000N
Strip roll size	Width 160 mm, ID 210mm, OD 400-500mm
Wrapping material	PE stretch film, woven belt/foil
PE film roll size	ID 55mm, OD 100-150mm, width 100mm
Woven belt size	ID 55mm, OD 100-500mm, width 100mm
Stacking size	Max. Height 1000mm, max. Weight 6000kg, wooden strip height>35mm
Capacity	31kw
Air supply	5-8kgf/cm²
Power	415V/50Hz, 3P

IV Machine Installation

1. The unit is mainly composed of cross arm (provided by the Buyer), upender, PET strapper, centering conveyor, No. 1 hydraulic station, wrapper, centering conveyor, stacker, feeding-out conveyor, No. 2 hydraulic station, electrical cabinet, touch screen operation box, button operation box, etc.

2. The above main components shall be installed in place one by one according to the general assembly drawing, and then some small accessories shall be installed. The installation work must ensure the relative position requirements such as the level and center line required by the drawing.

3. After the mechanical structure of the whole machine is installed, install the relevant lines.

4. During the whole installation process, all kinds of accidents such as smashing, crushing, squeezing and bumping shall be strictly prevented.

5. Since the machine has been transported and moved, it is necessary to check all moving parts manually.

6. The whole installation process must be completed under the condition that the power supply and air supply are disconnected.

7. The machine must be placed on a flat and hard ground, and the ground load must be greater than 3 tons/m2

8. Non professionals are not allowed to enter the installation site.

9. The next process can be started only after the installation is completed.

10. The machine shall be placed in a dry and dust-free environment.

11. Please refer to the following pictures shown for some pieces.

In the disassembly picture of A1-B2-C3-D4, it just needs to place the parts as shown in the picture, and tighten the screws.

As shown in the disassembly picture of E1-E2-E3-E4, it just makes E1 into E1 righ postion and tighten the screws.

As shown in the picture, the box Q1 is placed on the column Q1 and tighten the screw.

As shown in the picture, V1 and V1 is placed.

As shown in the picture, W1 and W1 is placed.

V Machine Operation

5.1 Instruction of switch and button

5.1.1 Upender

Taking start: Start the picking-up mechanism to automatically run the taking action.

Taking Stop: stop the ongoing picking-up action.

Taking in/out: the upender can be moved forward/backward as required.

Taking conveying forward/backward: the convey roller on the upender can rotate forward or reverse.

Hydraulic forward/backward: hydraulic overturning refers to that the upender can overturn forward/backward.

Lifter forward/backward: refers to the lifter on the upender. The extended hook can be extended to move the product or retracted.

Lifter up/down: refers to the lifter on the upender, which can lift the coils up or down.

5.1.2 PET strapping

Strapping auto/manual: the switch to control the operation mode of the strapping machine. Auto means under normal conditions, the machine is automatically strapping. Manual mode is generally used for checking, adjusting the machine, troubleshooting and other specific conditions.

Centering clamp/release: When the coil arrives at the strapping position, it will be centered to the middle through the signal. The signal light will be on when centering, and the light will be off after centering. The centering is released after the strapping is finished.

Taper roll FWD/REV: The taper roll rotation can be forward or reversed. The forward rotation can be used for normal strapping as required. If the strapping is not done, the taper roll can be used for reverse rotation, and then the packaging can be done again.

Taper roll lifting: When the coil reaches the middle part of PET strapping, the taper roller will rise to lift the coil, and after packaging, the taper roller will fall to level the coil, so that the coil is going to the next process.

5.1.3 Weighing

①**Clamp**: When the coil reaches the centering and weighing position, it will be lifted and clamped again.

②**Centering/release**: The coil will be released after a few seconds of centering.

③**Weighing up/down**: The hydraulic pressure rises to lift the coil for weighing, and the weighing is ready after staying for a few seconds. The hydraulic pressure drops, and the coil is placed on the level.

5.1.4 Wrapping

MAIN POWER SWITCH: control the main power supply of the machine.

RING JOG: This button can make the rotary ring run freely and stop at any time. It is usually used for manual debugging; For example, in the case of manual operation, check whether the ring can operate normally, and test the electric button to see whether the ring can jog normally.

WRAPPING START: to make the ring, carrier roller run.

RING RESET: To reset the ring, convenient for the product in and out. Normally, after the film roll is replaced or paused, the ring is at random position. Operate this button to make the ring at zero position, then restart the machine for automatic packaging.

CARRIER ROLLER FWD/REV: control the carrier roller to rotate clockwise. This button can be started for automatic packaging only when it is in the middle position. It's no need manual operation under the automatic mode.

CUTTER JOG: to make the foil cutter action.

WRAPPING STOP: To end the normal running of the machine.

GUARD ROLL FWD/REV: to control the forward or reverse direction of guard roll. Usually, when manually debugging or manually sticking the tail, rotate the carrier roller to cooperate with manual operation.

FILM JOG: It is used to break the film for easy film loading or unloading. When replacing the film roll, it needs to manually press the button for the first time to clamp the film head to complete automatic adjustment.

5.1.5 Centering conveyor

Centering clamp/release: When the product arrives at the centering conveyor, it is lifted and centered first.

Centering hydraulic up/down: When the product arrives at the centering position, the hydraulic pressure is to lift the product, and then the hydraulic pressure is lowered after centering, and the centering is loosened.

Pallet signal: Confirm the pallet to see whether it is on the feeding-out conveyor; Wait for stacking products.

5.1.6 Stacking

Stacking emergency stop: In case of emergency during operation, press this button, and the whole machine will not work.

Stacking start: Start automatic stacking action.

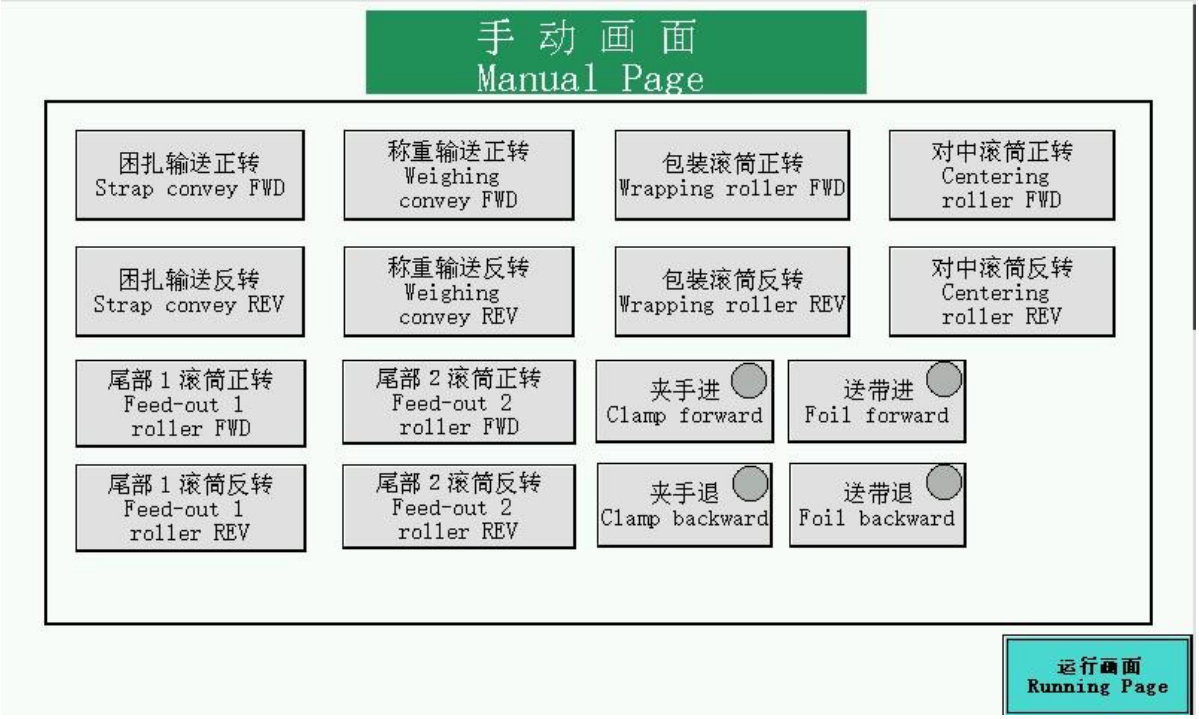
Stacking stop: Stop automatic stacking action.

Stacking hydraulic up/down: Control the rise and fall of hydraulic pressure to facilitate the movement of clamped coils to the feeding-out conveyor to lay down products.

Trolley forward/backward: When stacking products, the stacking trolley can move forward to the centering conveyor to clamp the coil and then move backward to the feeding-out conveyor to place the products on the pallet.

Stacking clamper cylinder: It is used to control two grippers of the stacker, which is convenient for centering and clamping coils.

- Above are buttons on control panel for manual mode. There are manual buttons in touch screen too.



Strap convey FWD: to control the strapping convey roller rotation direction, FWD for going forwards.

Strap convey REV: the roller of strapping station will rotate anticlockwise to make the coil go backward.

Weighing convey FWD: the roller of weighing station will rotate clockwise to make the coil go forward.

Weighing convey REV: the roller of weighing station will rotate anticlockwise to make the coil go backward.

Wrapping roller FWD: the roller of wrapping station will rotate clockwise to make the coil go forward.

Wrapping roller REV: the roller of wrapping station will rotate anticlockwise to make the coil go backward.

Centering roller FWD: the roller of centering station will rotate clockwise to make the coil go forward.

Centering roller REV: the roller of centering station will rotate anticlockwise to make the

coil go backward.

Feed-out roller 1 FWD: the roller of feeding-out conveyor 1 will rotate anticlockwise to make the coil go forward.

Feed-out roller 1 REV: the roller of feeding-out conveyor 1 will rotate anticlockwise to make the coil go backward.

Feed-out roller 2 FWD: the roller of feeding-out conveyor 2 will rotate anticlockwise to make the coil go forward.

Feed-out roller 2 REV: the roller of feeding-out conveyor 2 will rotate anticlockwise to make the coil go backward.

(Note: Feed-out rollers 1 and 2 are both part of the feeding-out conveyor, and there are two sections, driven independently).

Clamp forward: for wrapping, the manipulator forwards to the cutter side.

Clamp backward: after wrapping, the manipulator backwards to the origin.

Foil forward: foil feeding-in forwards to packing station.

Foil backward: foil feeding-in backward to the origin.

5.2 Requirement before automatic produce

(1) Connect the external power supply and air supply according to the Technical Parameters.

(2) Confirm that the equipment at each station of the whole line is in the clear and reset state.

(3) Confirm whether the packaging materials of wrapping machine, PET strapping and other equipment are good.

(4) Confirm that each single machine is on and in standby state.

(5) Confirm the size of packing materials and the coil and the relevant setting parameters.

(6) Confirm whether the machine control panel has been switched to the automatic state.

(7) Confirm that there are no other irrelevant personnel within the scope of operation of this packaging line unit.

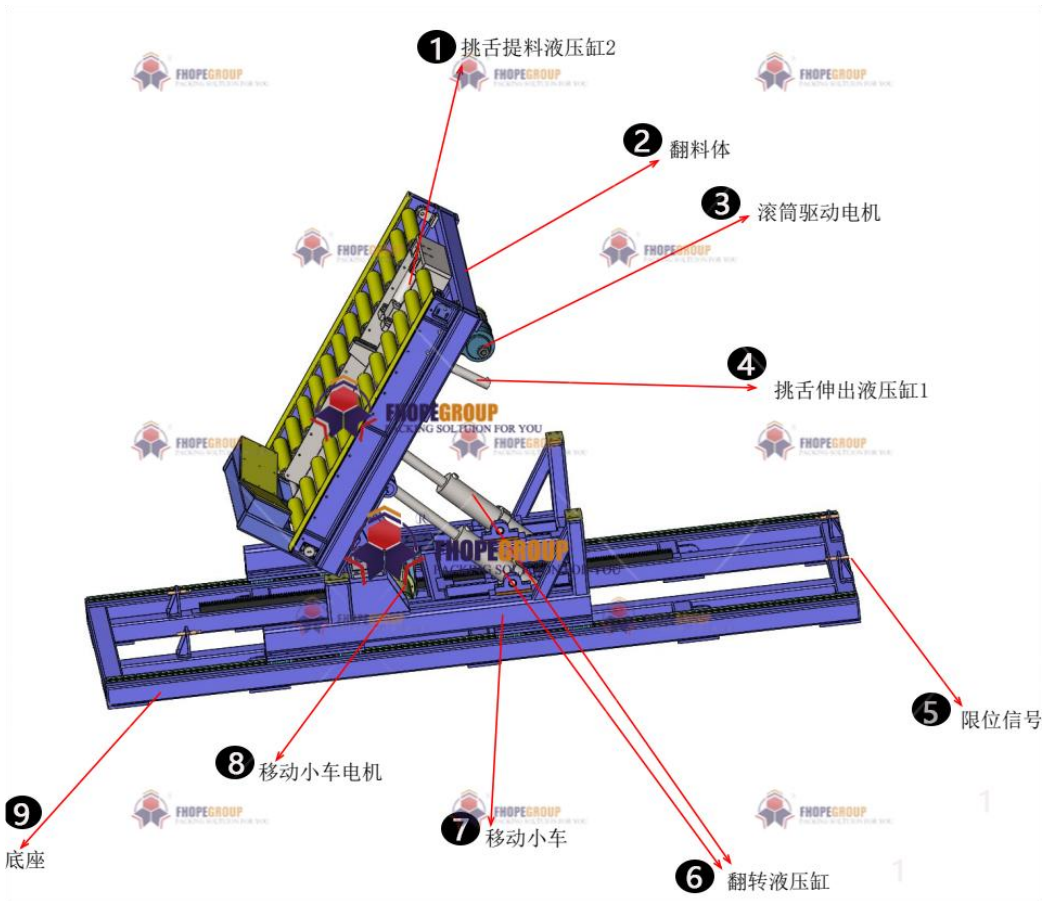
(8) Please first use the sample for trial run to learn how to use the machine until operators are proficient in using it before large-scale automatic production.

5.3 Instruction of each equipment

5.3.1 Operation of cross arm. (Provided by the Buyer and coordinated with Buyer's production)

5.3.1.1 Operation of the upender

5.3.1.2 Structure of the upender (Overall drawing↓)



① No. 2 hydraulic station of lifter

② Upender body

③ Roller drive motor

④ No. 1 hydraulic station

⑤ Limit signal

⑥ Upender hydraulic station

⑦ Move car

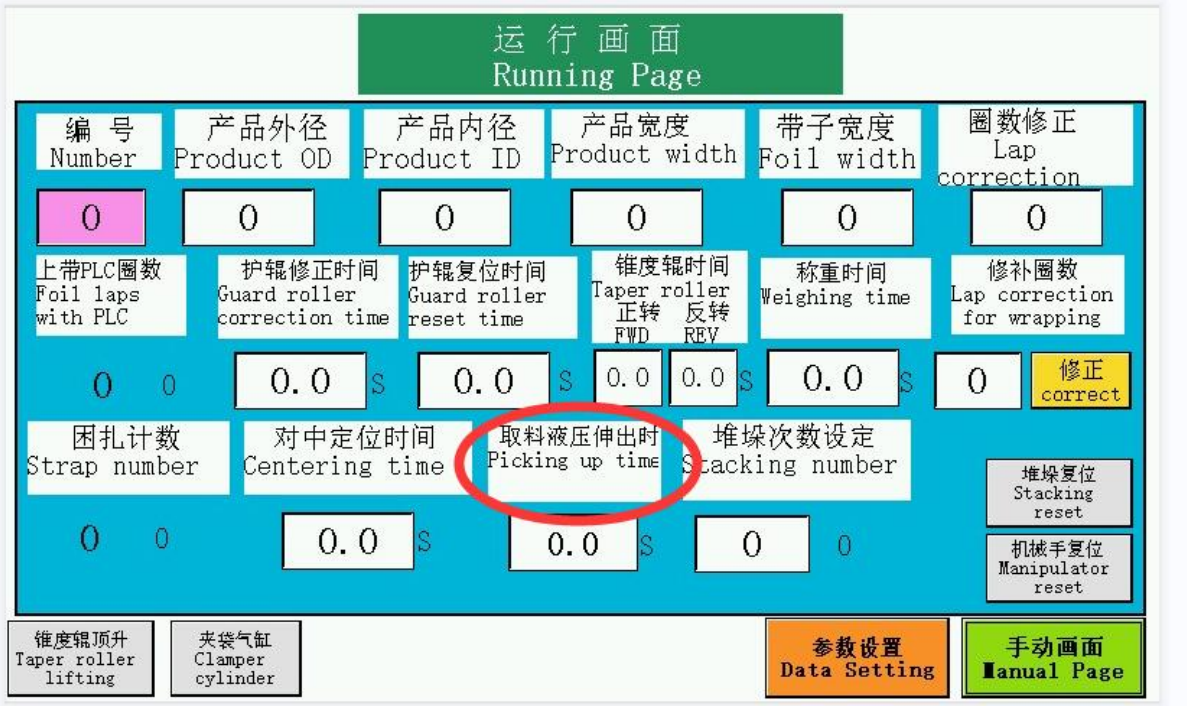
⑧ Move car motor

⑨ Base

✧ Real image of lifter↓

5.3.1.3 Operation of the upender

It's the parameter setting of the upender in Running Page of touch screen.↓



Picking-up time: the time of the upender hydraulic stretching out to taking the coil.

a. Set the "inner diameter, outer diameter and width" of the product in the Running Page of the touch screen. Set the Picking-up time according to the width of the product, and the wide coil is very important for the operation of the upender. The set value shall not be greater than the actual size of the product.

b. Press the "Automatic taking" button on the panel switch of the upender and the product will automatically flip, extend and rise the lifter. After the product has been hung on the lifter, the turner will automatically return to the conveying position, reset automatically and automatically return the lifter to the origin station. Until the product is horizontally placed on the conveyor and waits for the next automatic process.

c. If the "Automatic taking" button on the master console is pressed in the automatic mode, and the equipment does not operate automatically, check whether the signal is in place in the signal screen, including the limit of the conveyor position of the upender, the signal of

the upender's lifter dropping, and the signal of the conveyor surface of the upender.

d. The setting parameters of the taking operation of the upender can also be called through the formula (the formula parameters are entered one by one in advance↓).

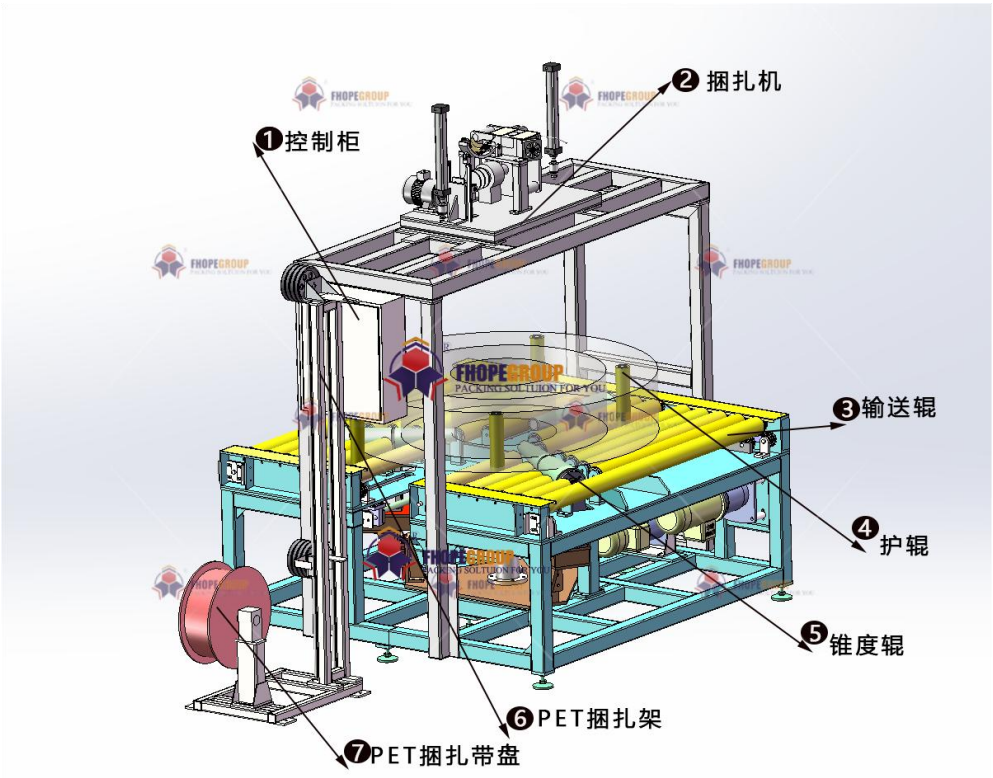
液 压 参 数 设 定
Hydraulic Station Setting

编号 No.	产品外径 Coil OD	产品内径 Coil ID	液压伸出取料时间 Picking up time
1	0	0	0.00
2	0	0	0.00
3	0	0	0.00
4	0	0	0.00
5	0	0	0.00
6	0	0	0.00
7	0	0	0.00
8	0	0	0.00
9	0	0	0.00
10	0	0	0.00

参数设置 Data Setting　　主界面 Running Page

5.3.2 Operation of the strapping machine

5.3.2.1 Structure of the strapping machine (Overall drawing↓)



① Control box

② Strapper

③ Convey roller

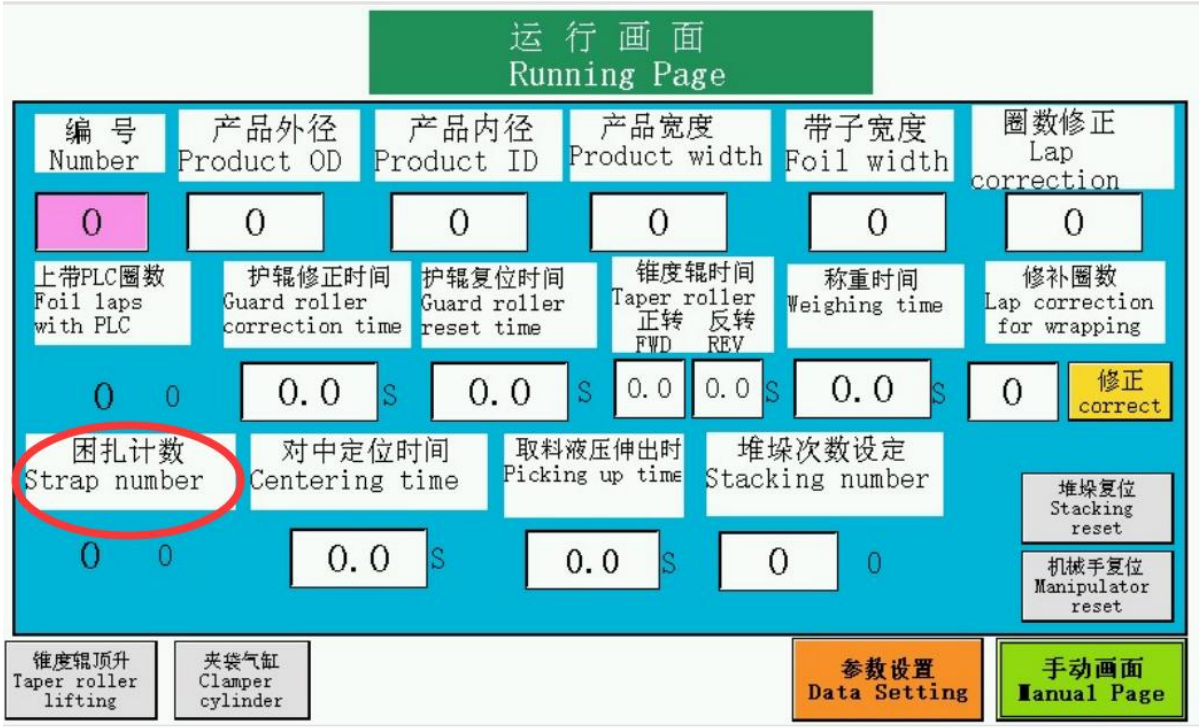
④ Guard roll

⑤ Taper roller

⑥ PET strapping frame

⑦ PET dispenser

5.3.2.2 Operation of the strapping machine



Strap number: to set the strip number of the coil.

a. Strapping is the previous taking has been overturned. Continue to the Running Page setting. This station is automatically start. If the product is already in the strapping position, the strapping process will start directly: the strip cylinder will automatically descend, the carrier roller will automatically rise, and the product will be bound equally according to the set binding quantity.

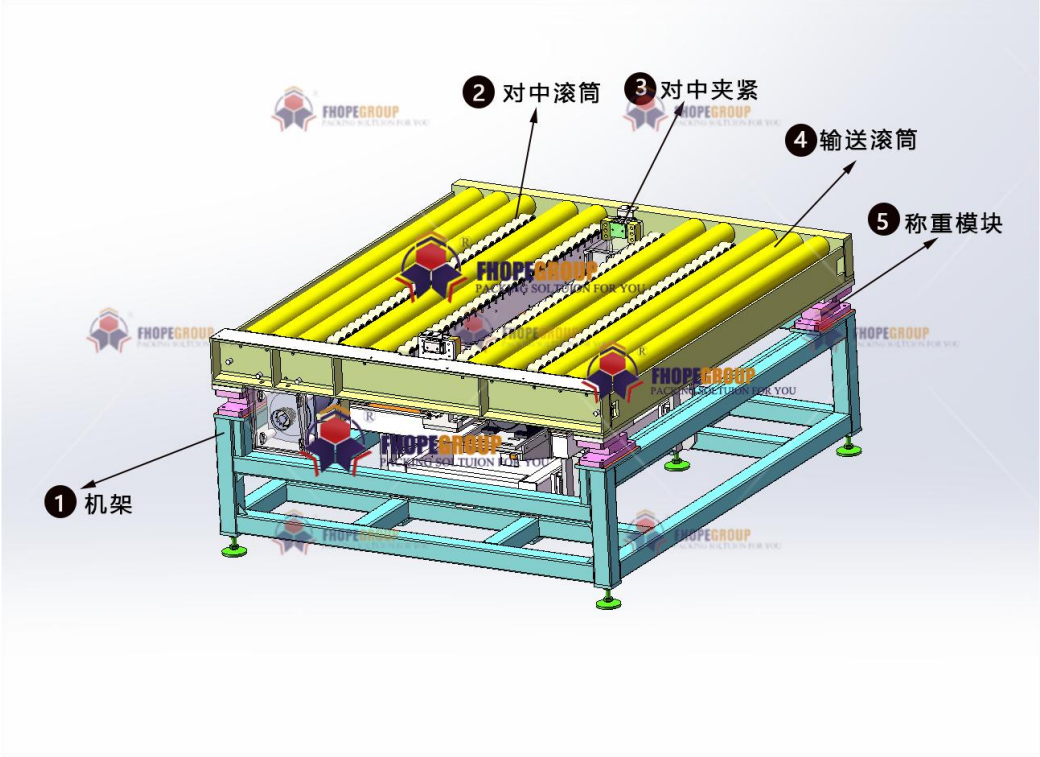
b. After the strapping is completed, the strip air cylinder and carrier roller air cylinder will return to the original place, and the product will wait for the next operation.

c. If there is no response when pressing the "strapping start" button, please check whether the signal is in place: (signal in the middle of the weighing conveyor) (open signal of the strip).

Note: PET strapping parameters can also be used for formula call (formula parameters are entered one by one in advance↓)

5.3.4 Operation of the weighing

5.3.4.1 Structure of the weighing (Overall drawing↓)



① Frame

② Centering roller

③ Centering clamp

④ Conveying roller

⑤ Weighing module

5.3.4.2 Operation of the weighing

Weighing time: to set the coil's weighing time.

a. For the first use, clear the weighing display. Press the "-" 0 "-" button when there is no product on the conveyor line to clear the weighing table. (↓Weighing instrument diagram)

b. This station equipment operates automatically. The product is automatically transported from the upstream PET strapping to the weighing platform signal and automatically stops. At this time, the weighing platform displays the current weighing data.

c. If pressing the "Automatic Weighing" button in the automatic mode has no response, it is necessary to confirm whether the signal is in place on the signal display screen. (Signal in the middle of weighing conveyor).

d. When automatic centering continues to set automatic picking parameters, record the following parameters, and the automatic process of centering mechanism will be automatically executed before packaging operation. (Running Page↓)

Set the "inner diameter, outer diameter and width" of Running Page of the touch screen. Set the centering and positioning time according to different sizes of products.

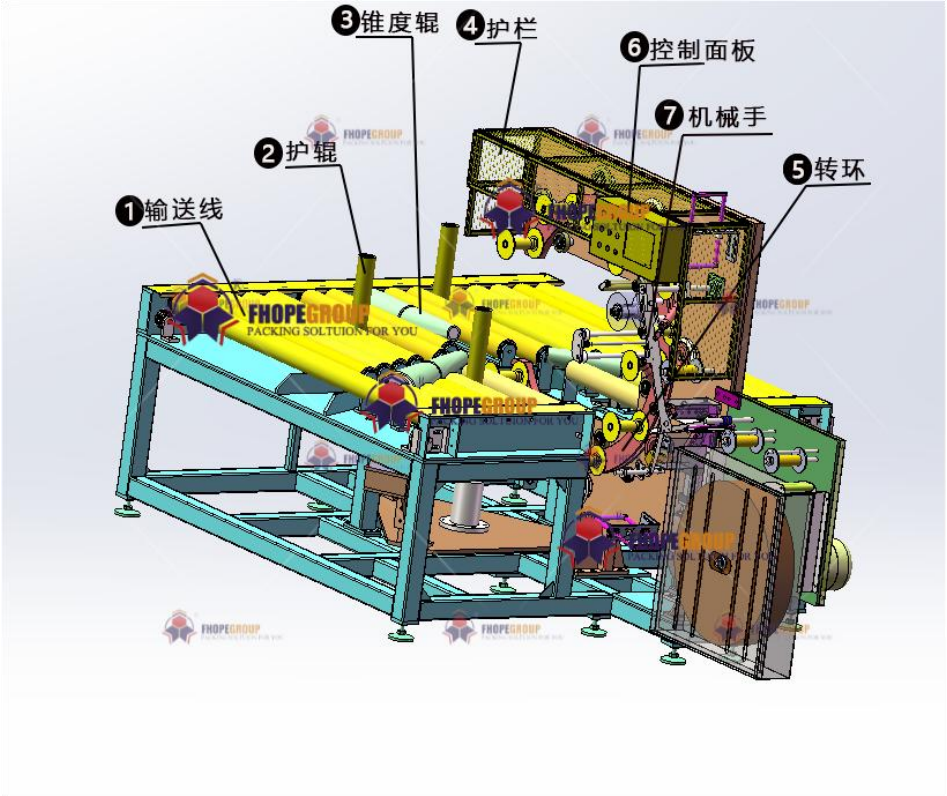
e. There is a signal switch above the conveyor line of the centering mechanism. When the product is automatically positioned

f. When the product is automatically centered, after the two side clamping plates are clamped, an inductive signal is output at the same time to confirm the alignment.

Note: The centering positioning time can also be called by the formula (the formula parameters are entered one by one in advance↓)

5.3.5 Operation of the wrapping machine

5.3.5.1 Structure of the wrapping machine (Overall drawing↓)



① Convey roller

② Guard roll

③ Taper roller

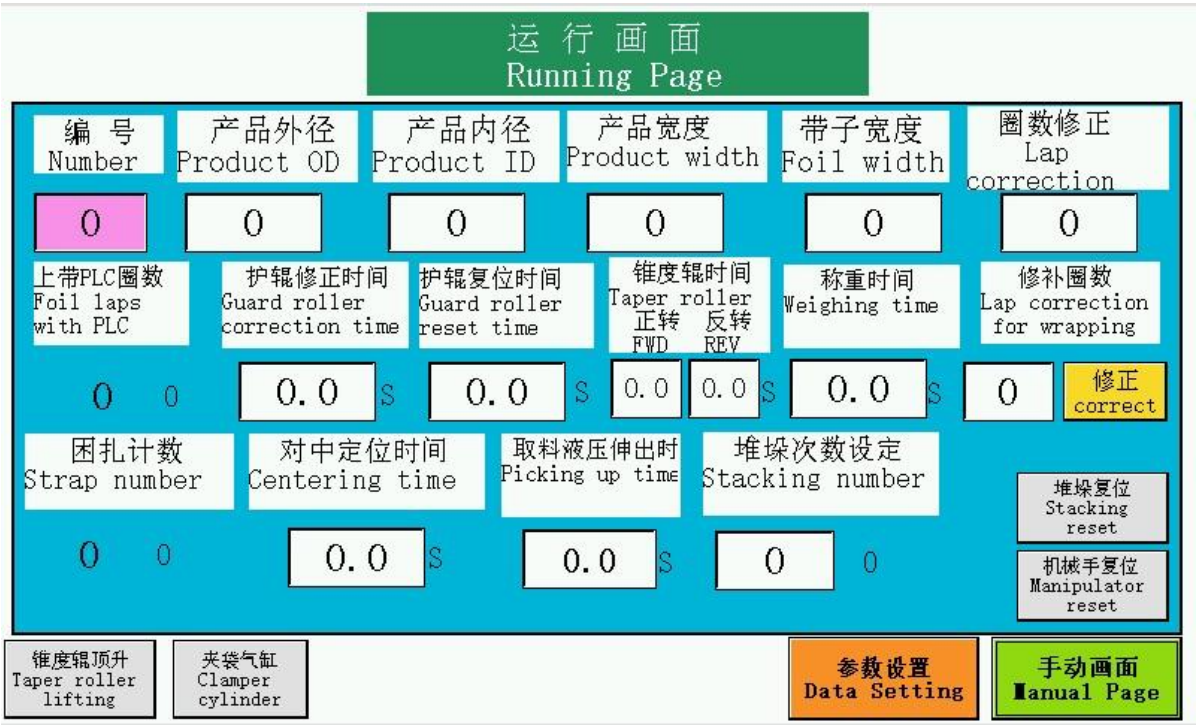
④ Guardrail

⑤ Ring

⑥ Control panel

⑦ Manipulator

5.3.5.2 Operation instruction in touch screen of the wrapping machine (Running Page↓)



Product OD: the outer diameter of the coil. (Unit: mm)

Product ID: the inner diameter of the coil (Unit: mm)

Product width: the width/thickness of the coil (Unit: mm)

Foil width: the width of the foil (Unit: mm)

Lap correction: when the foil's number counted by the system doesn't meet the real wrapping need, it could type the positive/negative number here.

Foil laps with PLC: the number of the foil is counted by the system.

Guard roller correction time: Without human intervention, the time of the guard roll working to it stopping when it reaching the photoelectric signal. For example, 0.1s is the guard roll just reaching the signal, it will stop. The guard roll maybe stop before touching the coil; while 1.0s means it clamps the coil tightly.

Guard roller reset time: the time of guard roll back to original position.

Taper roll time FWD/REV: the time of taper roll to go forward or backward.

Lap correction for wrapping： this button is just used for wrapping station, not the whole packing line. It's just spare function for workshop's special operation. Type the

positive/negative number based on the real need, and then click correction to adjust.

Clamper cylinder: with manual mode, to control the foil clamping cylinder action.

Manipulator reset: the manipulator back to the original position.

Taper roll lifting: with manual mode, to make the taper roller lift.

Note: The parameter setting of the wrapper can also be called by the formula (the formula parameters are entered one by one in advance↓)

In the above parameters, the foil width is a fixed standard value that can be modified. When the packaging tape width is confirmed, this value does not need to be changed.

The set product parameters need to be the same as the actual product parameters, and the actual foil width needs to be the same as the set width. Only when these parameters are set correctly can the calculation of the number of packing foils be accurate.

5.3.5.3 Automatic packing process of the wrapping machine

a. The packaging machine is started from the wrapping machine position.

b. Press the "Packing Start" button on the packaging machine panel, and the product will be transported from the centering and weighing position to the wrapping machine position after automatic centering. And automatically start the wrapping machine.

c. After the wrapping machine is started, the carrier roller will automatically rise, the manipulator will automatically take the foil, and the wrapping will start. During the process,

the foil cutting and tension tensioning will be performed according to the calculated and set data, until the packing foil on the ring is used up.

d. After using the packing foil on the ring, it will automatically stop at the original position. The carrier roller continues to rotate with the head of the packing foil to the manual operation position. Finally, the carrier roller drops and the wrapping and packaging machine part is automatically completed.

e. Manually tidy the tail of the packing foil. Prepare for the next process.

5.3.5.4 Operation note of wrapping station

(1) Adjust the guard roll to the proper position as required. The spacing between guard rollers shall be appropriately greater than the outer diameter of the package.

(2) During the packaging process, if the packaging foil on the dispenser is used up, but the product is not packaged completely. It need to press "Packaging Start" to re-execute the above automatic packaging action after manually installing a new foil roll.

(3) If there is any abnormality during the packaging process, press the packaging stop button on the lower panel to eliminate the abnormality, and press the packaging start button to continue the operation. If there are other faults, it is necessary to press emergency stop, return the product to the upstream station, re-enter, press the packaging machine to start and repack.

(4) If the film is used up during one packaging process, it’s available for pressing the stop button to pause the machine. After reversing the coil to a position good for connecting, re-fix the replaced film to the coil according to the above requirements, and restart the machine until the end of the package.

(5) For convenient to package, the ring should be in an appropriate position. On the one hand, the ring and the film on the ring cannot collide with or rub against each other during operation. On the other hand, the cross-section of the coil should be as close to the center of the ring as possible, so that the film is more evenly wrapped around the

coil.

(6) Pay attention to the safety of the coil during hoisting. After using the machine, turn off the power behind you.

(7) Please jog the foil to a more suitable position by operating the ring jog switch.

(8) When ID, OD and width of the package change, please readjust the distance of the protective rollers and the coil, the height of the ring and the tightness of the film according to actual needs.

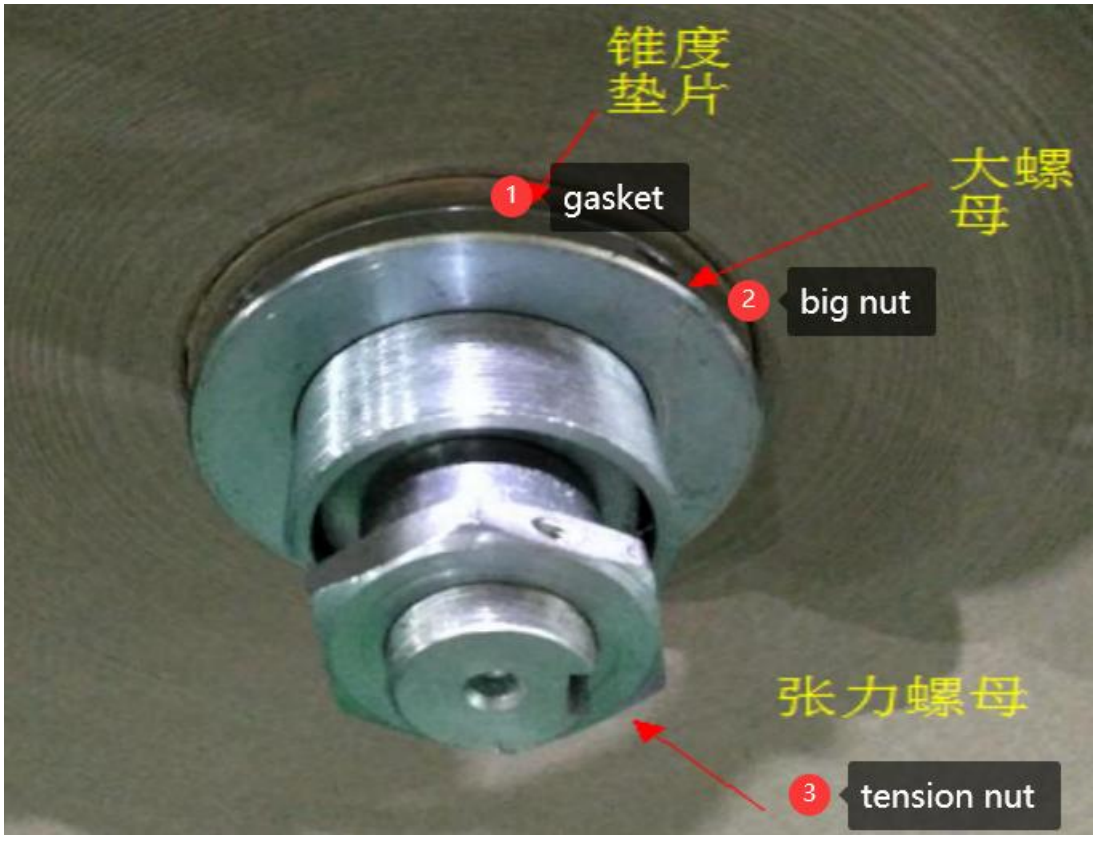
(9) If the coil is with a small inner diameter, please take right film with small outer diameter and narrow.

5.3.5.5 Tension adjustment of packing foil dispenser

A.When installing the dispenser, the foil position shall be clockwise. After the tape head is placed, the bottom of the packing tape shall face upward. (↓ refer to the picture)

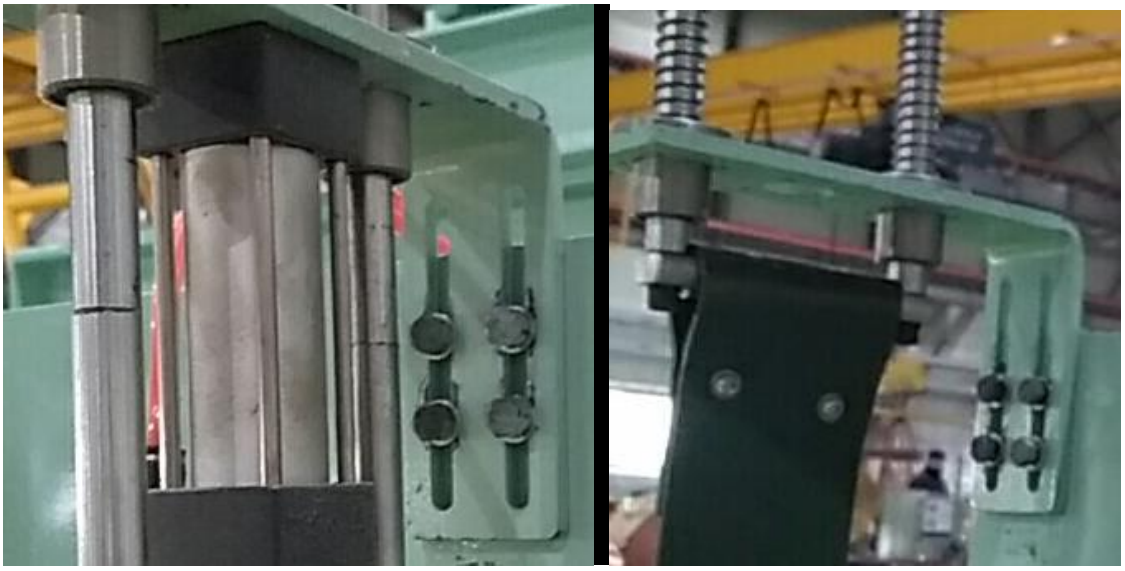
B. The head of the packing foil can be placed beyond the cutter cover. The strap is not tight and may fall off. Too much will wrap around the manipulator, which will make it unable to return. (↓ refer to the picture)

C. When installing the reel, the reel core is first covered with the taper gasket on the film release shaft. There is a set screw on the taper gasket, which needs to be stuck in the groove on the film shaft. After the taper gasket is installed, be sure to tighten the big nut, otherwise it will cause instability of the disk and affect the automatic packaging. (↓ refer to the picture)



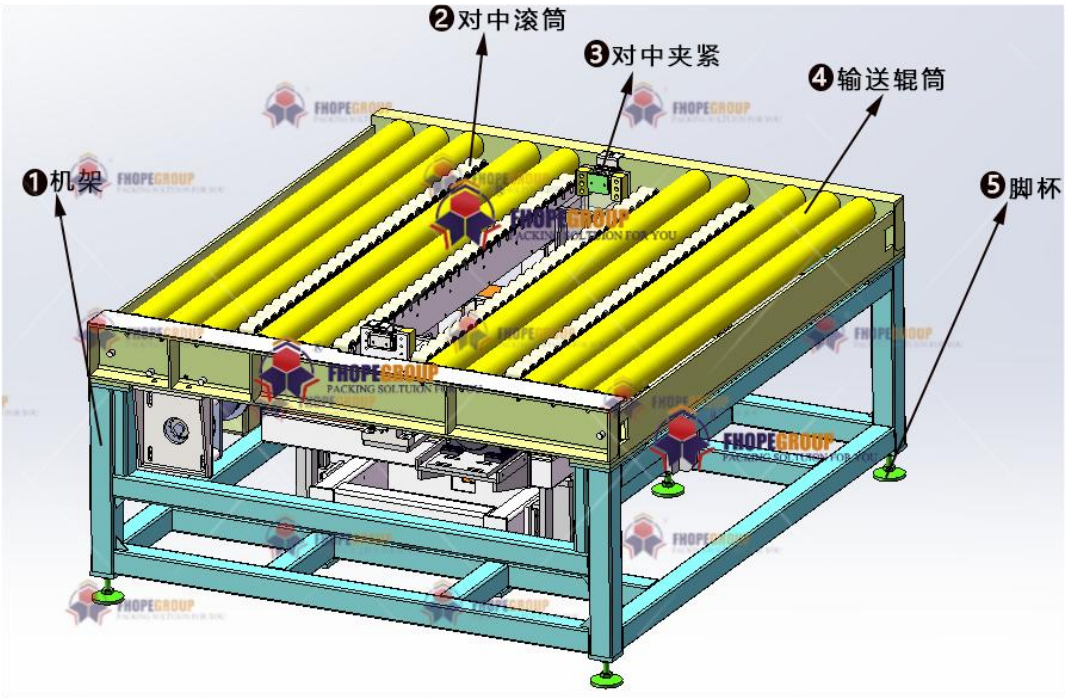
D. The tension screw on the reel mounted film release shaft needs to be adjusted to a proper position. Generally, the film reel can be easily rotated by hand, but it is in a resistance controlled state. If it is too loose, the package will be too loose, or the tape will be carried on the tray, causing abnormality. If it is too tight, it will increase the load of the rotary ring and make it difficult to rotate, or the packing belt will be pulled off, the edge will be broken, and the belt will be turned over.

E. In addition to the film release shaft, the tension belt can also adjust the tension. Loosen the screw of the tension belt seat, and the long hole can be adjusted up and down. (↓ refer to the picture)



5.3.6 Instruction of the centering conveyor

5.3.6.1 Structure of the centering conveyor (↓ Overall drawing)



① Frame

② Centering roller

③ Centering clamp

④ Convey roller

⑤ Leg

5.3.6.2 Operation of the centering conveyor

It’s setting in Running Page of touch screen.(↓ refer to the picture)

Centering time: the time of the coil centering

a. Set the "inner diameter, outer diameter and width" of the product in the Running Page of the touch screen. Set the centering and positioning time according to different sizes of products.

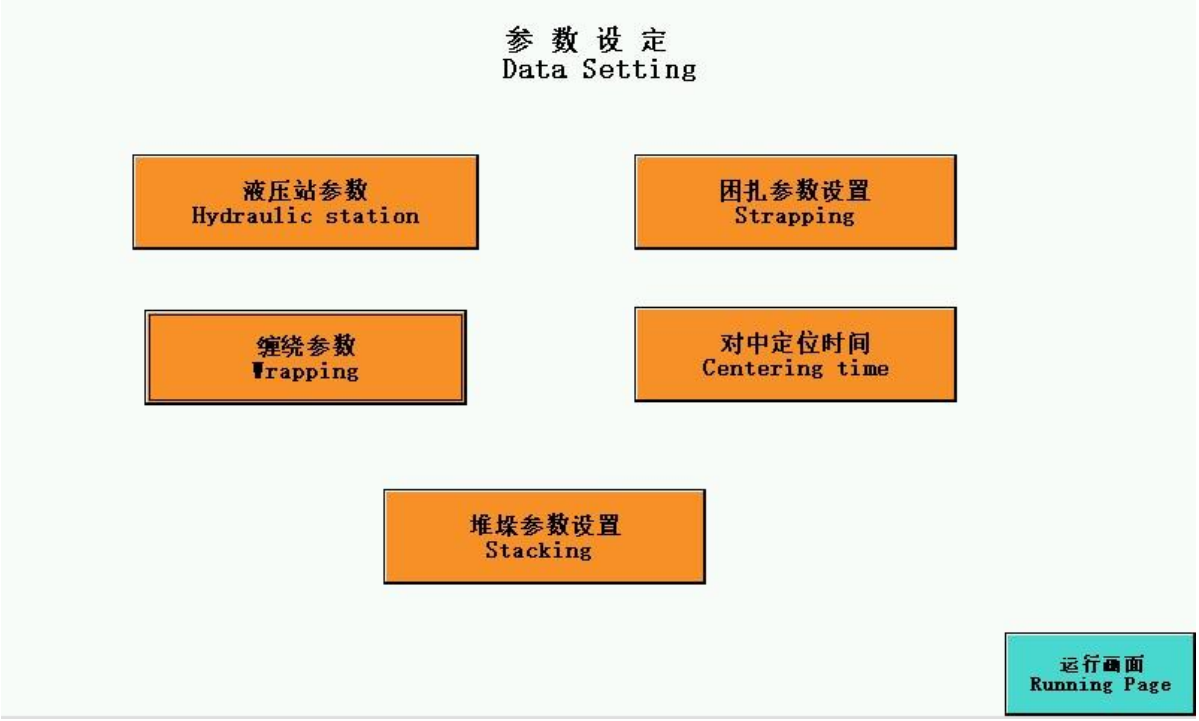
b. There is a signal switch above the conveyor line of the centering mechanism. When the product is automatically positioned

c. When the stacker reclaiming line runs automatically, it will be executed automatically after the rear centering is completed.

d. When the product is automatically positioned on the central conveyor line, it is confirmed by the central signal induction of the conveyor line. If the positioning is confirmed, the jacking mechanism will rise to jack the product to the reclaiming position. And trigger the automatic operation of the stacker.

e. When the product is automatically multi centered, after the two side clamping plates are clamped, an inductive signal is output at the same time to confirm the alignment.

Note: The centering positioning time can also be called by the formula (the formula parameters are entered one by one in advance↓)



5.3.7 Instruction of the stacking machine

5.3.7.1 Structure of the stacking machine (↓ Overall drawing)

① Gripper

② Hydraulic lifting device

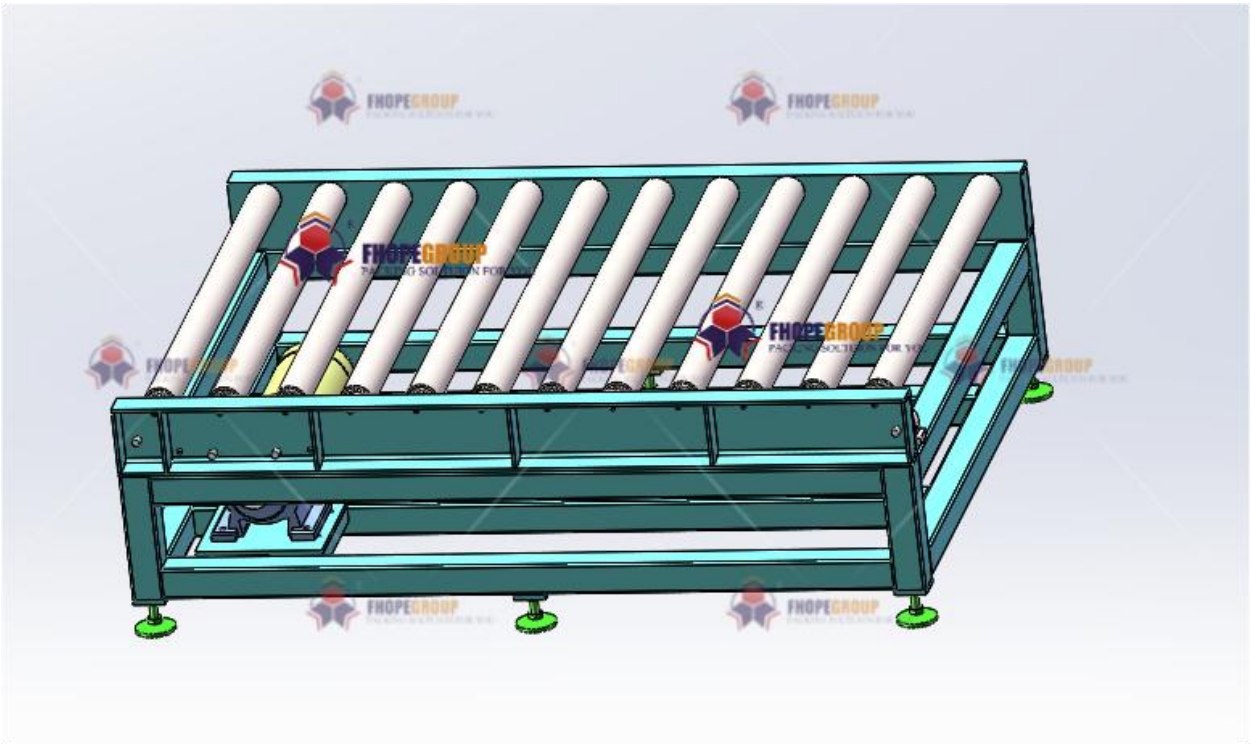
③ Horizontal motor

④ Stand

⑤ Beam

⑥ Clamp cylinder

5.3.7.2 Structure of the feeding-out conveyor



5.3.7.3 Operation of the stacking machine

It's setting in Running Page of touch screen.(↓ refer to the picture)

Stacking number: the number of coil stacking, for example, 2 coils stacking just type

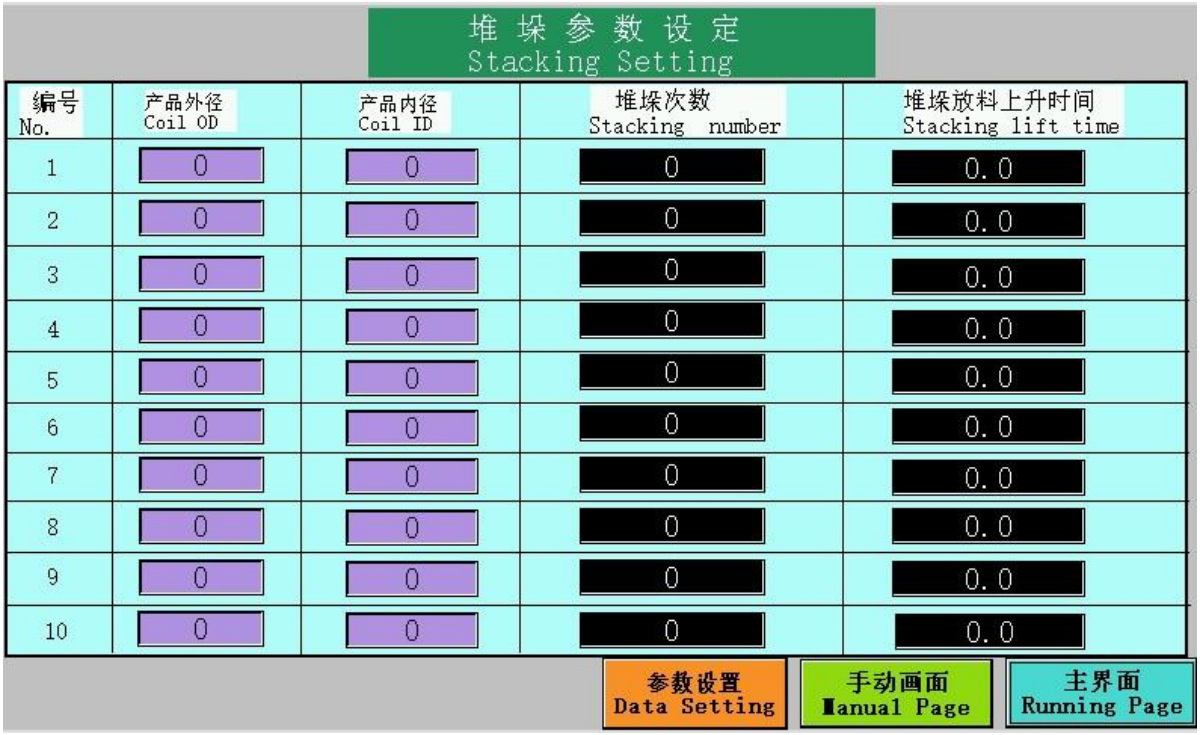
number 2.

Stacking reset: the stacking device back to the original position.

a. Manually place the wooden pallet on the feeding-out conveyor in advance, operate the wooden pallet confirmation button on the feeding-out conveyor, and then press the "Stacking Start" button on the panel switch of the stacker -->Automatic centering of the products waiting in the centering and conveying line -->Centering completion -->Centering plate back to initial position -->The whole stacker lower, gripper lower -->Gripper drops in place -->Gripper hold-->The hydraulic device of the centering conveyor drops -->The product load is transferred to the gripper -->The stacker moves to the stacking platform as a whole -->The stacker moves to the position above the feed-out conveyor -->The stacker's overall platform drops -->The load bearing force of the feed-out conveyor -->The gripper expands -->The product is transferred to the feed-out conveyor -->The stacker rises as a whole ->The stacker moves back above the centering conveyor ->Stacking is completed.

Note: The stacking setting can also be called by the formula (the formula parameters are entered one by one in advance↓)

参 数 设 定
Data Setting
液压站参数
Hydraulic station
困扎参数设置
Strapping
缠绕参数
Wrapping
对中定位时间
Centering time
堆垛参数设置
Stacking
运行画面
Running Page


堆 垛 参 数 设 定
Stacking Setting
编号 No.
产品外径 Coil OD
产品内径 Coil ID
堆垛次数 Stacking number
堆垛放料上升时间 Stacking lift time
1 0 0 0 0.0
2 0 0 0 0.0
3 0 0 0 0.0
4 0 0 0 0.0
5 0 0 0 0.0
6 0 0 0 0.0
7 0 0 0 0.0
8 0 0 0 0.0
9 0 0 0 0.0
10 0 0 0 0.0
参数设置 Data Setting
手动画面 Manual Page
主界面 Running Page

5.4 Equipment working process

(1) Everything is ready, start to press the start button, the material on the cross arm slowly touches the turn-over machine, the turn-over machine turns the hook on the coil, first lift half up, and then drop down (the time adjustable), then lift the coil up, and start to turn it over after lifting well.

(2) Through the signal reaction, the coil is pushed into the strapping process, the product moves to the middle of the taper roller, the guard roller protects the product. And, the flip body is turned up and back to the original position, waiting for the next product to be flipped. The strapping machine starts to work, and it will strap four times (the number of strip adjustable). The guard roller is released after strapped.

(3) The product moves into the centering and weighing conveyor process through signal feedback. After arriving the station, it will automatically stop, and then the coil will be lifted up a little, and then centering. After the coil is weighed for 5 seconds, the weighing is back off, and the centering is turned on, and the product continues to move forward through signal feedback.

(4) The product moves to the center of the packaging machine through signal feedback, the carrier roller rises, and the guard roller slowly clamps the coil to ensure that the ring accurately package the coil well, and the manipulator clamps the foil (not require manual operation), until the wrapping is completed, it will automatically cut off the film; the guard roller moves down, and the product falls to the conveying line and starts to move to the next process after the signal feedback starts.

(5) Through the signal feedback, the product is slowly moved to the center of the centering conveyor line. The centering lifts to make the coil in right center. **The operator should make sure the centering position has the coil on, otherwise the gripper is probable to crash the machine. After centering well, it needs to confirm manually the pallet should be on the roller.** And then, press stacking start button, the stacking device goes down to hold the coil, to move onto the feed-out conveyor and place it stable on the pallet. The stacking device will goes up automatically.

(6) The next coil recycles.

VI Common Troubleshooting

Item	Reason or Solution
The whole machine does not work.	1. Check the external power supply and power switch. 2. Check whether the air switch in the electrical box is turned on. 3. Check whether all communication lines inside the machine are normal. 4. Press the stop button to cancel the last automatic cycle. 5. Whether the PLC is in running mode.
Sudden stop and flashing alarm light.	1. Check the alarm screen in the touch screen to see whether the alarm information appears. If it appears, clear it according to the alarm information shown.
The upender cannot be started.	1. Whether the cross arm is positioned normally. 2. Whether the turnover machine has been reset. 3. Whether the conveying surface of the upender is empty. 4. Whether the lifter has been lowered and returned.
After starting, the picking-up mechanism leans against the product without further action.	1. The sensing signal on the picking-up mechanism is abnormal. 2. The picking-up action is not in place. 3. The bottom moving slide rail is blocked.
After the picking-up mechanism is started, the action is abnormal.	1. Because the last automatic program did not end, after manual operation, a new automatic program was started. It is interrupted accidentally, if it is restarted, the corresponding stop button should be pressed to end the automatic program already being executed. 2. Whether the signal is normal.

The weighing line cannot be started.	1. The picking-up turnover machine is not reset to the original point. 2. There is no product on the turnover and weighing conveyor line.
PET strapping cannot be started automatically.	1. Detection signal in PET strapper is blocked. 2. The signal of the strip cylinder is abnormal. 3. There is no product on the weighing line and strapping conveyor or the signal in the middle of the conveyor line is abnormal.
PET strapping is abnormal.	1. It needs to check the corresponding fault causes in the special instructions for PET strapping.
Abnormal centering and positioning	1. Check whether the inner circle positioning signal is abnormal. 2. The inner circle of the product is irregular or the packing foil falls off.
The wrapping machine is not started automatically.	1. If the product inner circle positioning photoelectric is blocked, it is necessary to confirm whether the product positioning is abnormal or blocked by the head of the packing foil. 2. The ring is not in the original location. 3. The manipulator is not in the original location. 4. Touch screen product parameter setting is in error.
Foil too sparse or too dense when packing.	1. The packing speed setting needs to be adjusted. The rotation speed and carrier speed are matched, so that the visible foil's width on the coil is close to the number setting in the touch screen.
The coil is not completely packaged.	1. The product parameters in the touch screen are not set correctly. 2. The real visible width of the foil is different from the setting one in the touch screen. 3. 2 times packaging mode is selected. 4. The packing foil has been used up and needs to be supplemented.
The coil turns hard or doesn't rotates.	1. Check the wear of friction wheel. If the wear is serious, replace the friction wheel with new one. 2. The friction wheel needs eccentric adjustment.

	3. Check whether there is packing foil or the waste in the friction wheel slide. 4. Motor over-current, inverter automatic protection. 5. The packing foil is too tight and the ring cannot be pulled. 6. The tension belt is too tight and needs to be loosened.
Foil can't release normally.	1. The foil dispenser is not installed correctly. 2. The foil deviation prevention device on the reel is not installed in place. 3. There is no loose nut when installing the foil dispenser. 4. Check whether the tension belt is too tight or too loose. 5. Check whether the film release shaft is too tight. 6. Check whether the threading path of the packing foil is correct.
When packaging, the packaging material is broken.	1. Packaging material quality problem. 2. The packing foil is too tight. 3. The coil's strip has sharp corners. Solution: when the packing foil is broken, manually fix the broken end of the foil onto the ring again, then lift the carrier roller of the wrapping station to automatically "start packaging", and the machine continues to wrap with the packing foil on the ring until it automatically stops.
Stacking doesn't start.	1. The coil is not positioned correctly on the picking-up line. 2. The stacker is not at the origin. 3. There are already coils on the stacker, or the stacker is in the automatic program, so it cannot continue to start.
The stacker operation is abnormal.	1. When the automatic stacking program is executed, the signals are disturbed. 2. The automatic anti-collision protection program starts. 3. The machine is shut down due to faults in other places.

Coils are pressed and damaged during stacking.	1. The pallet is deformed, resulting in abnormal signal sampling. 2. The signal is faulty and needs to be corrected.
The coil stack is eccentric on the pallet.	1. The pallet position is incorrect, and the pallet needs to be aligned with the center point and cross line of the platform.

VII Hydraulic Maintenance

1. Hydraulic oils of different grades cannot be mixed to prevent chemical reactions and performance changes of hydraulic oils. Hydraulic oil that is dark brown, milky white, and smelly is deteriorating oil and cannot be used. The hydraulic oil needs to be replaced in time.

Regularly check and clean the attachments on the filter screen, such as too much metal powder, which often indicates that the oil pump is worn or the oil cylinder is pulled. If it is found that the filter screen is damaged and dirt accumulates, it should be replaced in time, and the oil should be changed at the same time if necessary.

Regular tightening. The tightening screws and gland screws of the hydraulic cylinder, and the piston rod stop adjustment screw of the hydraulic cylinder should be tightened once a month. The tightening force of each screw should be uniform and the corresponding tightening torque should be achieved.

Replace the seals regularly, and it is recommended to replace the seals of the hydraulic cylinder once a year to prevent leakage caused by damage to the sealing elements after long-term use.

2. When the hydraulic oil is lower than the warning line, pay attention to that the hydraulic oil needs to be filtered and filled when filling, and the filling tools should be reliable and clean. Do not remove the filter at the filler neck of the fuel tank in order to increase the rate of refueling. Refueling worker should use clean gloves and overalls to prevent solid and fibrous impurities from falling into the oil. And no water and impurities can enter to ensure the cleanliness of the hydraulic system oil.

3. The working temperature of the hydraulic system should generally be controlled between 30 and 80 °C (dangerous temperature ≥ 100 °C). If the oil temperature of the hydraulic system is too high, the viscosity of the oil will decrease, which will easily cause leakage and reduce the efficiency. In order to avoid excessive temperature: do not overload for a long time; pay attention not to contaminate the radiator fins with oil, which will affect the heat dissipation effect due to the adhesion of dust-proof soil; keep enough oil to facilitate the

circulation of oil to dissipate heat; do not work all day in hot summer. Avoid high noon time. When the oil temperature is too low, the viscosity of the oil is high, the fluidity is poor, the resistance is large, and the work efficiency is low; when the temperature is low in winter, when the oil temperature is lower than 20 ℃, it is necessary to warm up the engine, start the engine, and idle at no load. Run for 3 to 5 minutes.

Summer is a high temperature weather, it is recommended not to work all day, overloading, and timely remove the dust, oil and other obstructions of the cooling device.

Winter is a low temperature weather. It is recommended that each time the machine is turned on, it is recommended to idle for about 5 minutes at no-load, and then work after the oil temperature rises.

4. The oil pipe should be soft and smooth, and should not be bent or stressed.

5. The filter element should be replaced once at 2500h, and overhaul at 37000h and 10000h. Otherwise, the hydraulic pump and motor may be damaged due to disrepair, which is a fatal damage to the hydraulic system, and there will be potential safety hazards during work.)

Contact Our Engineering Team:

WhatsApp/Phone: +86 13951501635

Website: https://www.fhopepack.com/

Email: info@fhopepack.com