



VPK-150A Full automatic shrink packaging machine

Instruction manual (Common button version)

Zhangjiagang V Pack Machinery Co., Ltd.

Address: Jiangfeng Road , Yanjiang Economic Develop Zone, Zhangjiagang City, China

Tel / Fax : 0086-512-58665822 Mobile:0086-15851613439 (whatsapp)

www.vpackmachinery.com Email:vpackmachinery@163.com

Table of contents

I . Use and features of the machine.....	2
II . Main technical parameters.....	2
III. Working principle and technological flow.....	3
IV. Main structures and functions.....	4
V . Hoisting and transport.....	11
VI. Installation and commissioning.....	12
VII. Lubrication.....	13
VIII. Malfunction analysis and solution.....	13
IX. Notice and maintenance.....	15
X . Notice for type change.....	16
XI. Accessories and easily damaged parts.....	16
XII. Attached drawing.....	17

Note: Please read this instruction manual carefully before operating the machine.

I . Use and features of the machine

1. Use of machine

VPK-150A full automatic shrink packaging machine can not only be solely used, but used simultaneously with other equipment to form packaging production line. It can automatically array, aggregate and align PET beverage bottle or other similar articles, then package it with shrinking film, finally produce finished products after shrinking by heating, cooling and forming. The packaged product is firmly bound with excellent appearance, which can be opened conveniently. Therefore, it is widely used in industries such as foodstuff, medicine, chemical and other light industrial products.

2. Features of machine

- 1) The temperature can be controlled automatically and changed as required.
- 2) Isothermal sealing cutter
- 3) Original guide bar cylinder with steady operation
- 4) Programmable logic controller (PLC) control
- 5) Non bottom support packaging, suitable for package with different bottle diameters and different combinations
- 6) Simple operation and easy repair.

II . Main technical parameters

1. Operating voltage: three phase five line system 380V/50~60Hz
2. Working pressure: 0.6~0.8Mpa
3. Shrinking room: $L \times W \times H = 1800 \times 650 \times 450$ (mm)
4. Package efficiency: 0~12 packs per min

5. Sealing and cutting temperature: 140°C ~160°C

6. Shrinking temperature: 200°C ~280°C

7. Package material: PE

Film roll width: $\leq 580\text{mm}$

Film thickness: 0.06~0.12mm

Film diameter: $\leq 400\text{mm}$

8. Working noise: $\leq 65\text{dB}$

9. Total power: 22KW

1) Product conveying motor: YS6334 1400r/min 370W 2pcs

2) Motor for conveying finished product: YS6334 1400r/min 370W 1pc

3) Roll-laying motor for upper and lower film: YS5624-RV30 1400r/min 90W

2pcs

4) Cooling motor: 200FZY2-D 1400r/min 65W 6pcs

5) Drying oven motor: YSJ8012 1400r/min 750W 2pcs

6) Heating pipe for sealing and cutting: 700W 1pcs

7) Heating pipe for drying oven: Max:21kw/220V 1.8kw/pc

Normal working:15kw/220V 1.8ke/pc

11. Total weight: 1500kg

12. Boundary dimensions: $L \times W \times H = 5500 \times 3200 \times 2100(\text{mm})$

III. Working principle and technological flow

1. Working principle

VPK-150A full automatic shrink packaging machine utilizes photoelectric switch sensor to conduct online detection with collected signal being concentratedly

processed by PLC (programmable logic controller) program, and uses cylinder as actuating element so as to achieve the whole processes, from conveying product to feeding material, packaging film, laying film, sealing and cutting, shrinking by heating, cooling and forming, and to finished product.

2. Technological flow (see Figure 1)

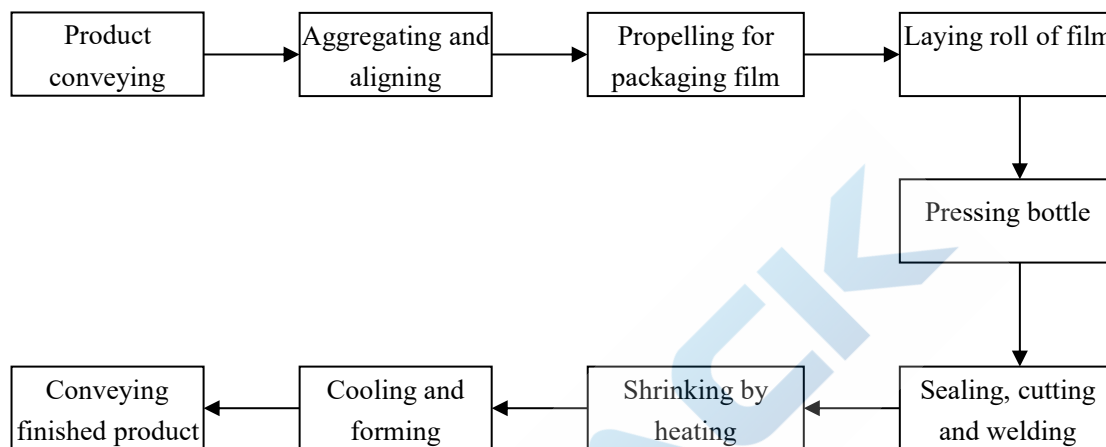


Figure 1 Technological flow chart

IV. Main structures and functions

VPK-150A full automatic shrink packaging machine mainly consists of mechanical devices for product conveying, aggregating and aligning, propelling for packaging film, film roll laying, bottle pressing device, heating seal, shrinking by heating, cooling and forming, pneumatic control system as well as electrical control system. All these are combined to achieve the whole technological processes, from conveying product to feeding material, packaging film, laying film, sealing and cutting, shrinking by heating, and to cooling and forming (see Figure 2).

1. Product conveying

Product conveying is to array single row or multiple rows and convey them to

aggregating and aligning device.(See Figure 3)

It mainly uses motor as power source to drive plate shape conveying belt to roll and convey the package forward by making use of friction force. Stepless speed regulation can be achieved for the motor with frequency converter. Stop lever and baffle plate are set on both sides and in the middle of conveying belt. According to different sizes of packages and package requirements, first unscrew fastening screw to adjust the distances between stop lever and baffle plate, baffle plate and baffle plate so that the package can pass through smoothly (generally, the distances between stop lever and baffle plate, baffle plate and baffle plate should be 2mm bigger than bottle diameter). Secure the stop lever and baffle plate after adjustment.

2. Aggregating and aligning

Aggregating and aligning is to aggregate and align products as required by package requirement so as to achieve propelling for packaging film.

When product touches the upper limit (see Figure 4) photoelectric switch, the cylinder in the device for bottle stopping device (see Figure 5) pushes downward from initial position to stop the subsequent package outside bunker, at the same time, the lower limit (see Figure 6) cylinder moves downward from initial position with baffle plate lowering underneath the work bench. Till now one aggregating and aligning process is completed.

According to different sizes of package and package requirements, separately adjust the positions of upper limit, lower limit and bottle stopping device in order for the bunker dimensions to meet package requirements. Secure them after adjustment.

3. Propelling for packaging film

Propelling for packaging film is to propel the aggregated and aligned package forward and package them with film. (See Figure 7)

When the aggregated and aligned package touches photoelectric switch, the signal generated is sent to PLC, the PLC gives instructions as set by program to control cylinder in/out by controlling the solenoid valve, thus achieving the purpose of propelling for packaging film.

4. Film roll laying

Film roll laying, composed of upper film roll laying (see Figure 8) and lower film roll laying (see Figure 9), is to feed film during the process of propelling for packaging film. They consist of supporting roller, guide roller, floating roller, and speed reducing motor, etc.. When packaging film, film begins to tension, the floating roller is lifted up by the film, and the position of detection block in linkage with floating roller relative to proximity switch changes. When the proximity switch is triggered, the speed reducing motor starts to run, which drives supporting roller and film roll to rotate to release film. At this time, the floating roller starts to lower back, photoelectric switch is set, and the speed reducing motor stops running. One film roll laying process is completed. Film position should according to the size of packing combination and the center of film must be superposition with packing combination center. The roller of limit must keep 2-3mm distance from film.

5. Pressing bottle (see Figure 10)

Pressing bottle is to press the package being packaged to prevent package

from tilting during heating seal process. According to the heights of package, properly adjust the position of bottle pressing cylinder so that the bottle can be firmly pressed without deformation when it passes normally.

6. Heating seal (see Figure 11)

Heating seal is to heat and seal the two pieces of film used for packaging. The propelling cylinder returns back rapidly when it pushes the package into position. At the same time, upper sealing cutter starts to lower down to work bench and press the two pieces of film firm. At this moment, lower sealing cutter lift up to contact the upper sealing cutter and heating seal the two pieces of films and cut them. Sealing and cutting temperature is generally $140^{\circ}\text{C} \sim 160^{\circ}\text{C}$ and sealing and cutting time is generally 1~2s.

7. Shrinking by heating (see Figure 12)

Shrinking by heating is to heat the package that becomes bag shaped after sealing and cutting and to make them shrink. The film will shrink evenly on high temperature conditions on the package surface so as to package them tightly, thus achieving desired package purpose. It utilizes heating pipes for heating that are located on both sides of box body, and spiral blower at the top of it for mixing, to allow high temperature air blow film directly to make it shrink by heating. Shrinking temperature is generally $220^{\circ}\text{C} \sim 260^{\circ}\text{C}$.

8. Cooling and forming

Cooling and forming is to quickly cool the film on the surface of package after shrinking by heating so as to make it in high strength status quickly for the convenience of handling.

9. Finished product conveying (see Figure 13)

It mainly uses motor as power source to drive Teflon mesh belt to rotate and convey the package by making use of friction force. Stepless speed regulation can be achieved for the motor with frequency converter, thus achieving adjustable shrinking speed. Adjusting screws are set on both ends of finished product entry and exit ports to adjust the tension and balance of the mesh belt. Note, however, that when adjusting mesh belt tension, tensile force should not be overly big to prevent mesh belt from damaging; when adjusting mesh belt balance for prevention of deflective travel, it is simply necessary to adjust screw on either single side to achieve the purpose.

10. Pneumatic control (see Figure 14)

- 1) Pneumatic source pressure is not less than 0.8Mpa.
- 2) Always lubricate the atomized lubricator with lubricant ISO VG32 or the same grade oil.
- 3) Always drain the filter to prevent water from entering into pneumatic pipeline.

11. Electrical control (see Figure 15)

- 1) Operation description of operation panel of host machine (see Figure 16)

a. Emergency stop switch

Emergency stop switch is used to stop the machine urgently when malfunction occurs at automatic status. After that, each cylinder returns to its initial position to avoid machine damage and personnel injury. After malfunction being recovered, turn the emergency stop switch to the right to switch on power supply.

b. Change over switch

Change over switch is used to change between automatic mode and manual mode, with three gear positions: “manual”, “0” and “auto”. When change over switch is turned to “0” position, manual and auto operation are not actuated.

When change over switch is turned from “0” to “manual”, you can separately actuate the buttons such as: *baffle plate*, *pushing bottle*, *pressing bottle*, *upper cutter*, *lower cutter*, *conveying* for debugging single action. In which:

Baffle plate is used to debug limit bottle stopper.

Pushing bottle is used to debug propelling for packaging film.

Pressing bottle is used to debug pressing bottle.

Upper cutter is used to debug upper sealing cutter.

Lower cutter is used to debug lower sealing cutter.

Conveying is used to debug product conveying.

On the contrary, *baffle plate*, *pushing bottle*, *pressing bottle*, *upper cutter*, *lower cutter* and *conveying* button must be reset before turning change over switch from “manual” to “0” position.

When the change over switch is turned from “0” to “auto” position, the machine is in automatic and continuous production mode as set in technological flow and program.

On the contrary, the change over switch can only be turned from “auto” to “0” position after heating seal is completed and during the process when the cylinder for upper cutter is recovering.

c. Rear conveying belt

Rear conveying belt is used to start and stop the rear conveying belt. (The control exists only in the product conveying machine with double sections.)

d. Control position is used for three rows packaging. Press this button down for three rows packaging.

e. Sealing and cutting temperature

Sealing and cutting temperature is used to set and adjust the temperature of lower cutter for heating seal. For details of specific adjustment steps and methods, see the accompanying Instruction manual for temperature control meter.

f. Sealing and cutting time

Sealing and cutting time is used to adjust heating seal time. The length of sealing and cutting time is depending on sealing and cutting effect.

g. Speed regulation by frequency variation

Speed regulation by frequency variation is used to adjust the speed of product conveying belt. The speed of conveying belt is controlled by increasing or decreasing the frequency of frequency converter adjusting the knob on its operation panel. For the detail of steps and methods for adjusting frequency converter, see its accompanying Instruction manual.

2) Operation description of operation panel of shrinker (see Figure 17)

a. Power switch

Power switch is used to control the heating of drying oven. Just place this switch to “ON” position when heating is needed.

Note: always switch off this switch before stopping the machine, and switch off

other control switches after the temperature in drying oven cools down below 80°C.

b. Heating switch

Heating switch is used to control temperature control meter on/off.

c. Blower switch

Blower switch is used to control on/off of centrifugal blower that produces circular air.

d. Temperature

Temperature is used to set and adjust the temperature in the drying oven. For details of specific adjustment steps and methods, see the accompanying Instruction manual for temperature control meter.

e. Speed

Speed is used for adjustment of shrinking speed by heating. The speed of conveying belt is controlled by increasing or decreasing the frequency of frequency converter adjusting the knob on its operation panel. For the detail of steps and methods for adjusting frequency converter, see its accompanying Instruction manual.

V. Hoisting and transport

1. Hoisting

The machine can be disassembled into several separate units. And film packaging device, shrinking oven and electric cabinet are equipped with truckle. Therefore, each unit can be lifted and moved horizontally with fork-lift truck, but take care to keep balance. In addition, film packaging device, shrinking oven and electric cabinet can be moved horizontally by making use of truckle.

2. Transport

- 1) All doors should be locked with moving parts secured firmly.
- 2) The carbon-steel parts with surface treatment should be lubricated to prevent moisture and rust.
- 3) The machine and package should be secured firmly.
- 4) The machine should be prevented from contacting water or other corrosive substance.
- 5) Tilting, violent bumping and impact are prohibited during transport process.

VI. Installation and commissioning

1. Installation (see Figure 18)

- 1) Three phase five line system of 380 voltages and compressed air of over 0.8Mpa are imperative for installation.
- 2) The room for installation should have the good temperature, humidity and ventilation conditions.
- 3) The ground for installation should have the intensity sufficient to support the weight of the machine itself
- 4) There should be 1.5m space preserved around the machine for debugging and servicing
- 5) The machine itself should be leveled, and the force bearing on the legs at the bottom of the machine should be in balance.

2. Debugging

- 1) Generally, we will dispatch after-sales service personnel to the site to debug machine and provide guide for operating personnel.

2) After switching on power supply and connecting compressed air, check that the machine is powered and that working pressure reaches technical requirements.

3) After the machine is powered, check for creepage using meter.

4) After turning change over switch to “Manual” position, start the conveying machine and blower respectively to run idle to check for interference.

5) Start respectively *baffle plate*, *pushing bottle*, *pressing bottle*, *upper cutter* and *lower cutter* button to check whether each action works and its flexibility.

6) After turning change over switch to “Auto” position, trigger the photoelectric switch in aggregating and aligning device to check that the baffle plate, pushing bottle, pressing bottle, upper cutter and lower cutter action work in coordination without interference.

7) After adjusting the limit position according to different package, check that the baffle plate, pushing bottle, pressing bottle, upper cutter and lower cutter action work in

8) Only after completing all the foresaid works, can the machine load the packaging material for continuous production.

VII. Lubrication (see Figure 19)

Lubricate manually as shown in lubricating figure.

VIII. Malfunction analysis and solution

Phenomenon of malfunction	Malfunction analysis	Solution
Machine cannot be powered	1. Open circuit of power supply 2. Short circuit	1. Switch on power supply 2. Check circuit

Transferring motor halts	<ol style="list-style-type: none"> 1. Motor damaged 2. Frequency converter has no output 3. Contactor damaged 4. Intermediate relay damaged 5. 24DVC power supply damaged 	<ol style="list-style-type: none"> 1. Replace motor 2. Adjust frequency converter to make it provide output 3. Replace contactor 4. Replace intermediate relay 5. Replace 24DVC power supply
Film cannot be laid	<ol style="list-style-type: none"> 1. Roll laying motor damaged 2. Proximity switch has no signal 3. Contactor damaged 4. Intermediate relay damaged 5. 24DVC power supply damaged 6. microswitch 	<ol style="list-style-type: none"> 1. Replace motor 2. Replace proximity switch or circuit and adjust proximity switch position 3. Replace contactor 4. Replace intermediate relay 5. Replace 24DVC power supply 6. diaphragm
Cylinder acts improperly	<ol style="list-style-type: none"> 1. Cylinder damaged 2. Low working pressure 3. PLC damaged 4. Solenoid valve or joint damaged 5. Magnetic switch damaged or improper position 	<ol style="list-style-type: none"> 1. Replace cylinder 2. Adjust working pressure 3. Replace PLC 4. Replace solenoid valve or joint 5. Replace magnetic switch or adjust switch position
Film cracks when shrinking	<ol style="list-style-type: none"> 1. Sealing not firmly 2. Low sealing strength 3. Overly high shrinking temperature or overly long shrinking time 4. Poor quality of shrinking film 	<ol style="list-style-type: none"> 1. Increase sealing temperature or lengthen sealing and cutting time 2. Decrease sealing temperature or shorten sealing and cutting time 3. Decrease shrinking temperature or step up shrinking speed 4. Replace shrinking film of good quality
Sealing port not firmly welded	<ol style="list-style-type: none"> 1. Overly high sealing and cutting temperature or overly long sealing and cutting time 2. Pressing rubber damaged 3. Lower cutter tilted 	<ol style="list-style-type: none"> 1. Adjust sealing and cutting temperature or time 2. Replace pressing rubber 3. Adjust lower cutter position
Film intertwined back	<ol style="list-style-type: none"> 1. Liquid on film supporting roller or film surface 2. Balance weight of floating lever is too light 	<ol style="list-style-type: none"> 1. Clean and dry it 2. Adjust balance weight of floating lever

Temperature raise obviously too slow	<ol style="list-style-type: none"> 1. Heating pipe damaged 2. Solid state relay damaged or AC contactor damaged 3. Malfunction of power supply system 	<ol style="list-style-type: none"> 1. Replace heating pipe 2. Replace solid state relay or AC contactor 3. Check and repair power supply system
Temperature control meter displays "Sb"	<ol style="list-style-type: none"> 1. Poor connection of thermocouple or damaged 	<ol style="list-style-type: none"> 1. Check circuit or replace thermocouple
Film cannot be cut off	<ol style="list-style-type: none"> 1. Too low cutting temperature or too short period of time for sealing 2. Pressing rubber damaged 3. Upper cutter not in correct position 4. Lower cutter not in correct position 	<ol style="list-style-type: none"> 1. Adjust sealing and cutting temperature or time 2. Replace pressing rubber 3. Adjust upper cutter position 4. Adjust lower cutter position
Film shrinks loosely	<ol style="list-style-type: none"> 1. Overly low shrinkage temperature or overly Short shrinking time 2. Poor quality of shrink film 3. Improper size of shrinking film 	<ol style="list-style-type: none"> 1. Increase shrinking temperature or decrease shrinking speed 2. Replace shrinking film of good quality 3. Select proper size of shrinking film

IX. Notice and maintenance

1. Always connect ground cable or set leakage circuit protection when connecting machine to power supply.
2. Never touch drying oven, sealing cutter and other places at discretion when the machine is running so as to avoid burns or injury.
3. Always stop the machine before operation when malfunction occurs.
4. Never place at discretion tools or other articles on conveying, sealing and cutting, aggregating and aligning positions when debugging machine so as to avoid damaging machine when it runs.
5. Always power off the machine after the temperature in drying oven cools down

below 80°C when stopping machine.

6. Always keep machine surface clean.

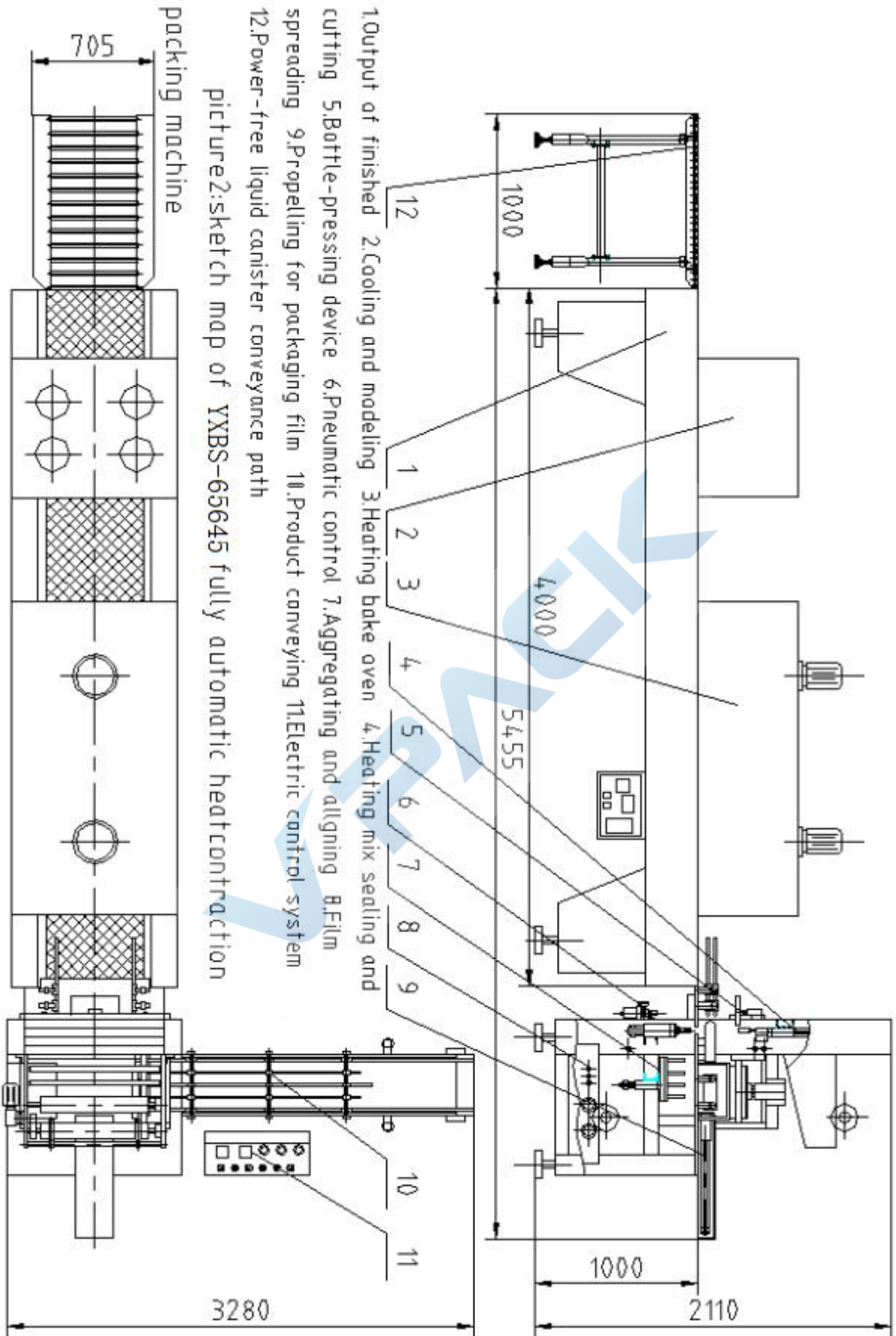
7. Always lubricate guide bar, bearing, chain and other lubricating points.

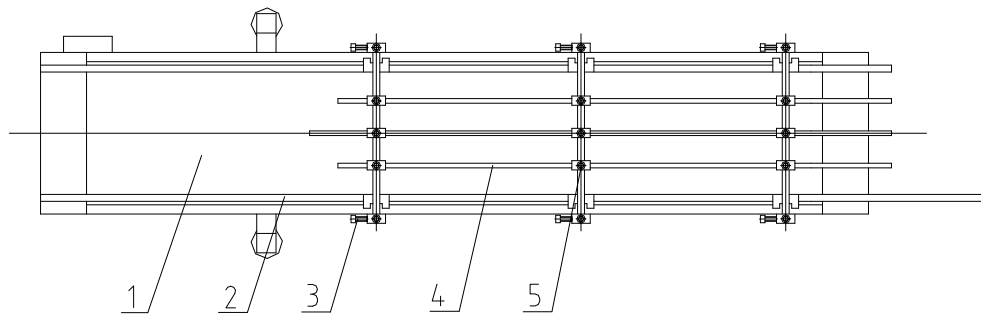
X. Notice for type change

Technical Advisory shall be sought from our company as the size, packaging form and quantity of articles are to be changed, so that you will be informed whether baffle plate adjustment and template replacement shall be done.

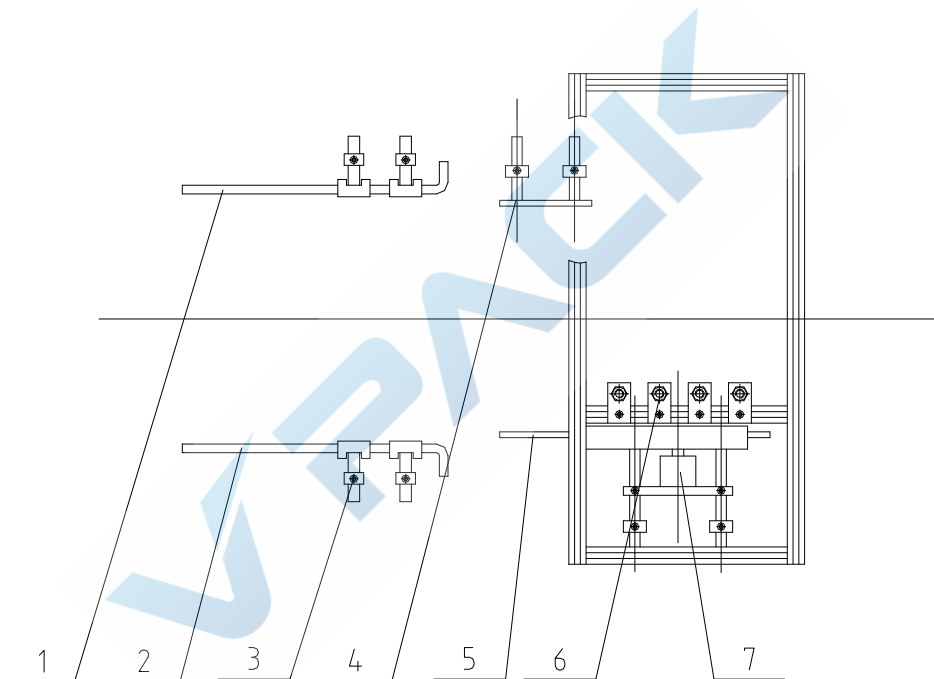
XI. Accessories and easily damaged parts

Item	Name	Quantity	Remarks
1	Conveying chain plate	10pcs	Easily damaged part
2	Pressing rubber	1 sets	
3	Inner hexagonal wrench	1 set	
4	Adjusting wrench	1 nos	
5	Heating pipe for sealing cutter	1 nos	Easily damaged part
6	Heating pipe for shrinking oven	2 nos	Easily damaged part
7	Film for machine testing operation	2 rolls	
8	Instructions	1 copy	
9	Guarantee repair list	1 copy	
10	Certificate of conformity	1 copy	
11	5m detecting head	1 nos	
12	Instructions of frequency converter	1 copy	
13	Instructions of temperature control meter	1 copy	
14	Rear conveying rack	1 nos	Specification is subject to contract



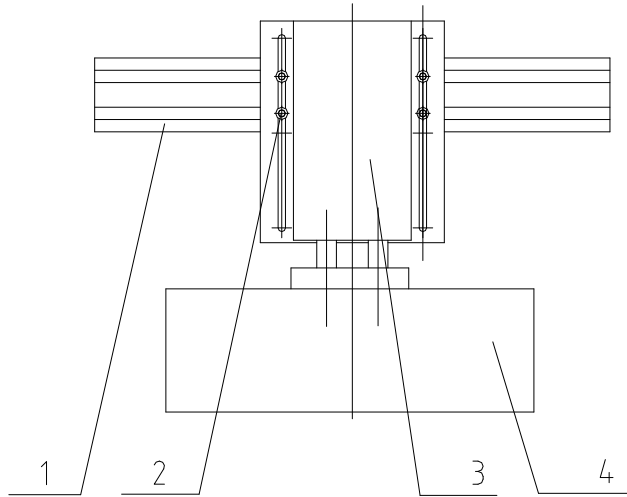


1.Conveying belt 2.Stop lever 3.Serew4.Baffie plate 5.Serew
 Picture3:Schematic diagram for product conveying and adjustment



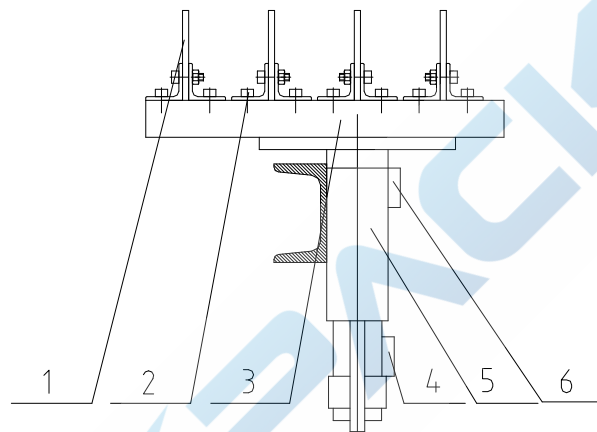
1.Rear bar 2.Front bar 3.Trip bolt 4.Rear spacing board
 5.Front spacing board 6.Photoelectric switch 7.Bounce cylinder

Picture4: Sketch map of Upper limiting device



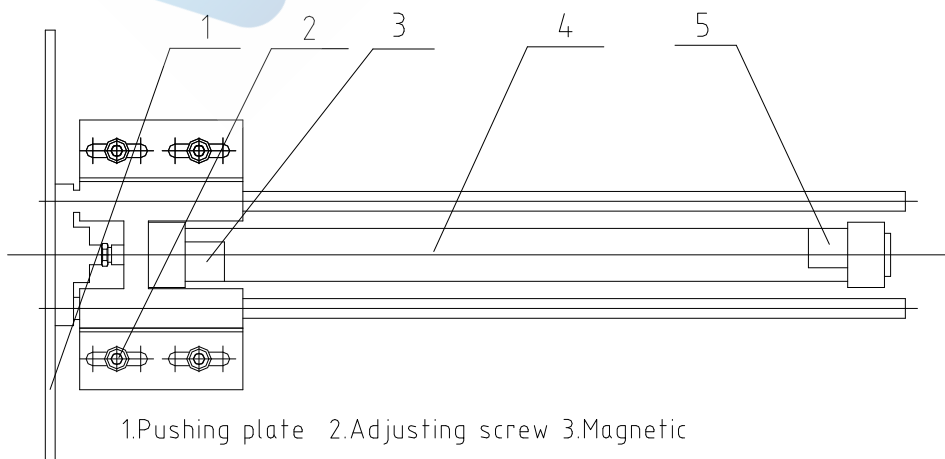
1.Slide rail 2.Screw 3.Cylinder 4.Baffle plate

Picture5: Sketch map of bottle stopping device



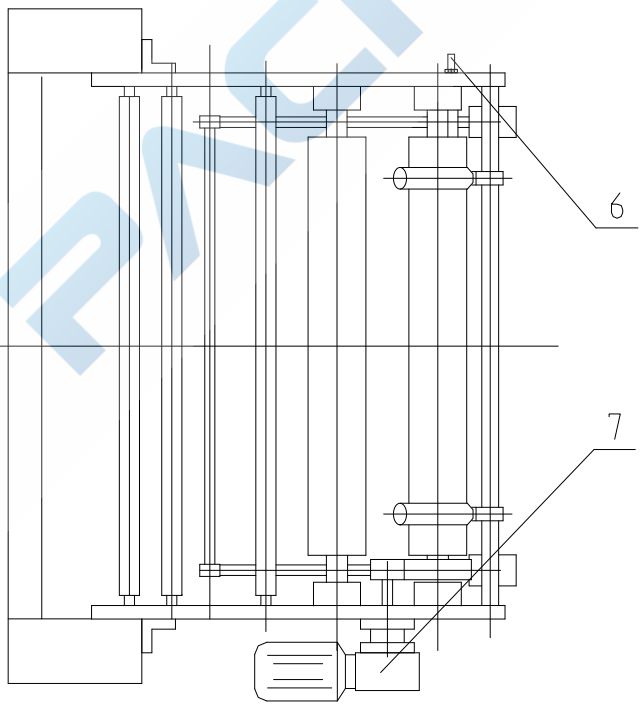
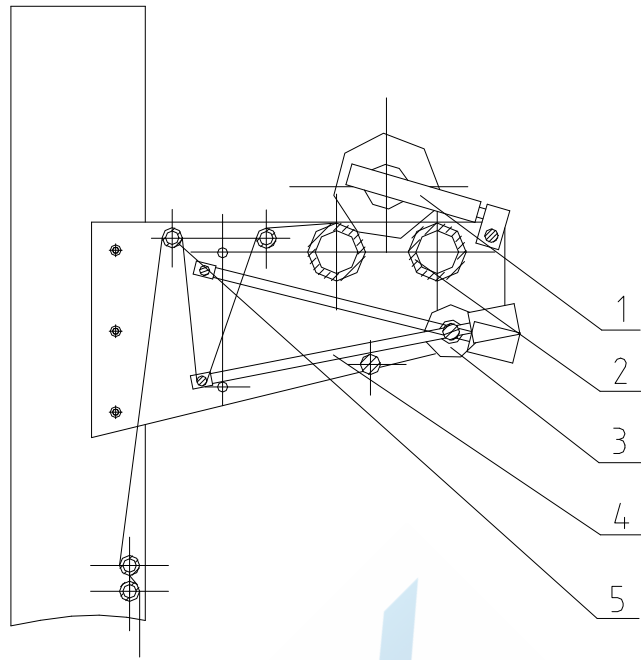
1.Baffle plate 2.Adjusting screw 3.Slide rail 4.Magnetic switchSQ8 5.Cylinder with guide bar 6.Magnetic switchSQ6

Picture6: Sketch map of lower stop device



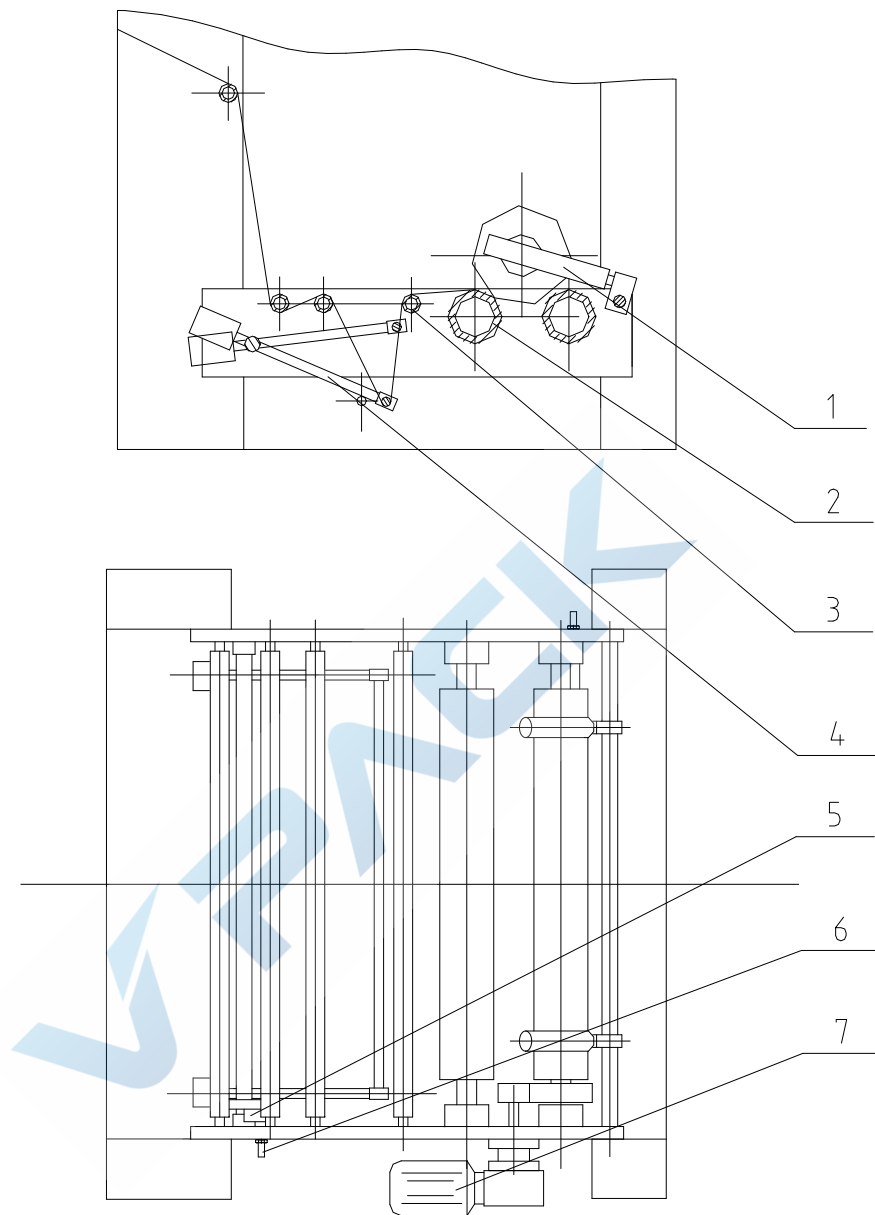
1.Pushing plate 2.Adjusting screw 3.Magnetic switchSQ5 4.Cylinder with 5.Magnetic switchSQ7

Picture7: Sketch map of propelling for packaging film



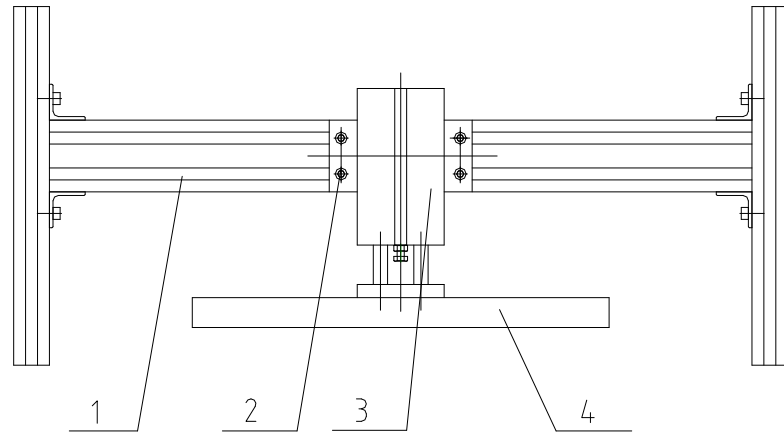
- 1.Film-blocking 2.Idler roller 3.Inspection board
- 4.Release roller 5.Jockey pulley 6.Approach switch
- 7.Film-spreading motor

Picture8:Sketch map of spreading of upper film

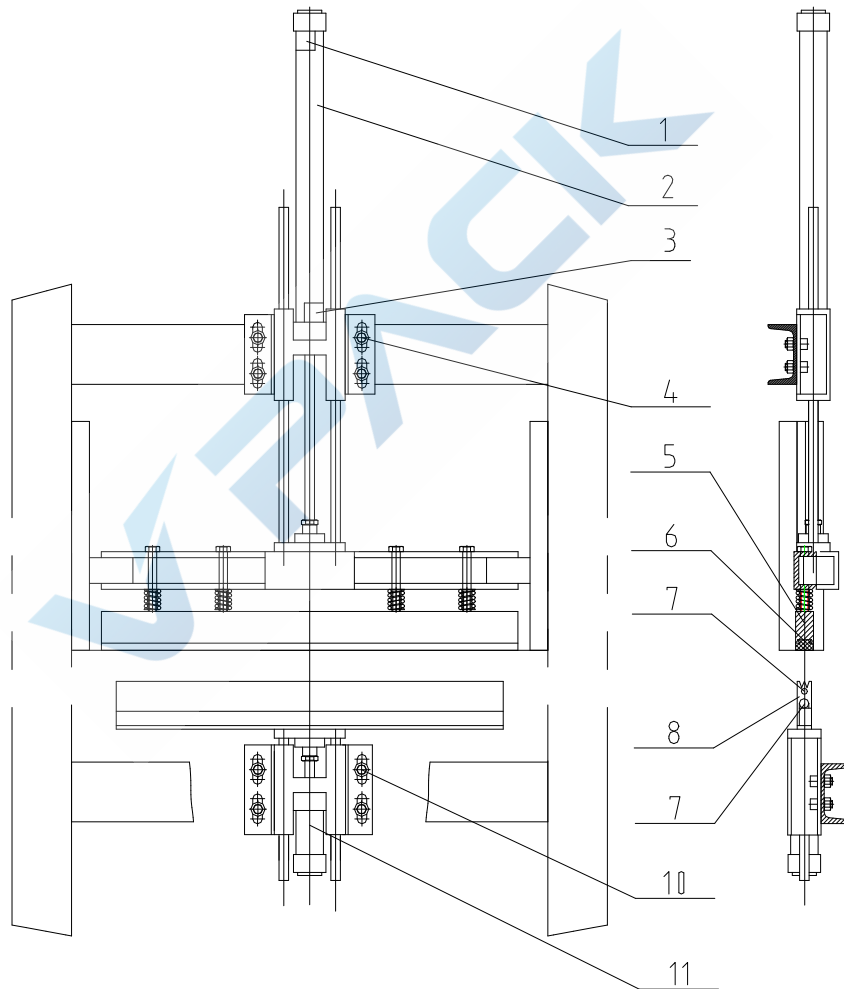


- 1.Film-blocking 2.Idler roller 3.Jockey puller
- 4.Release roller 5.Inspection board 6.Approach switch
- 7.Film-spreading motor

Picture9:Sketch map of lower film spreading

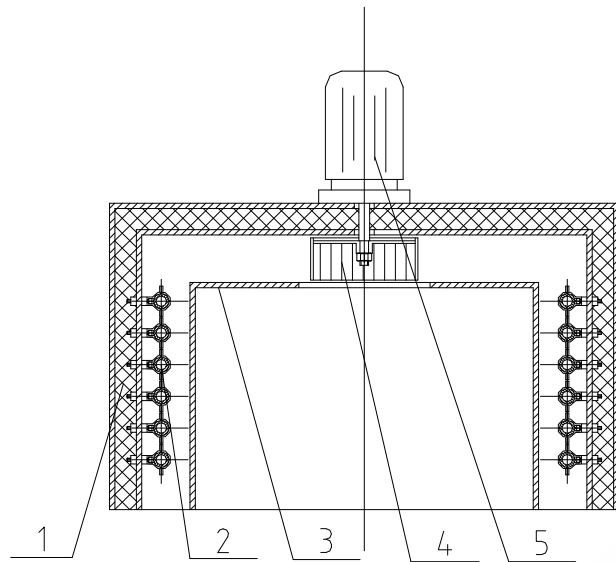


1.Slide rail 2.adjusting 3.Cylinder 4.Pressure pad
 Picture10:Sketch map of Bottle-pressing

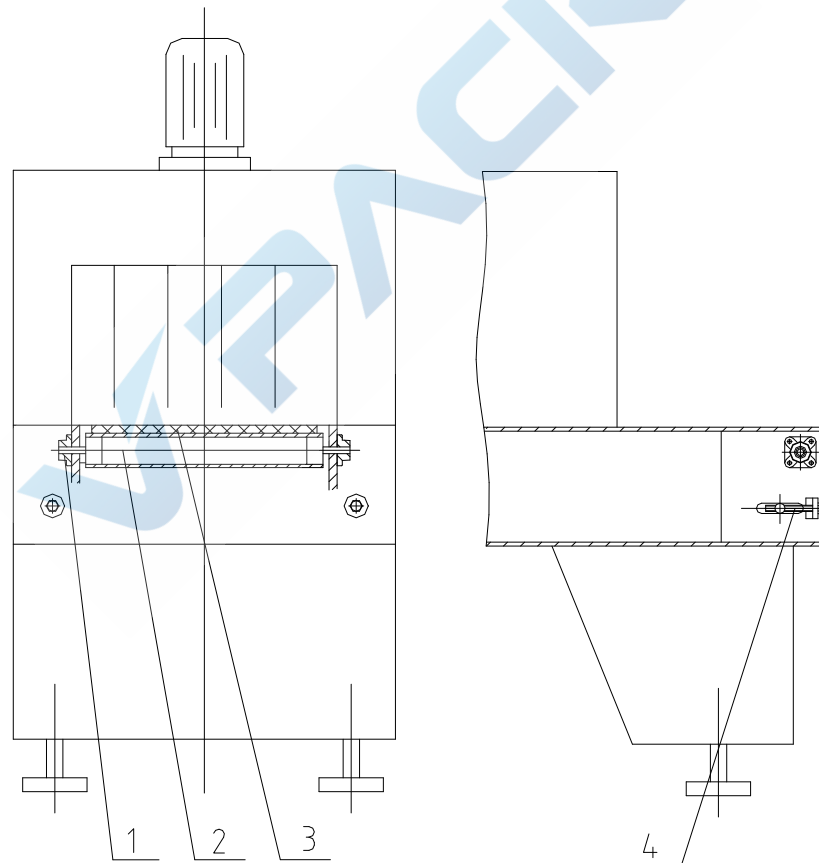


1.Magnetic switchSQ9 2.Upper sealing and cutting cutter cylinder 3.Magnetic switchSQ5 4.Adjusting screw 5.Sealing and cutting cutter 6.Cutter pad 7.Heat coupling 8.Lower sealing and cutting cutter 9.Heating tube 10.Adjusting screw 11.Lower sealing and cutting cutter cylinde

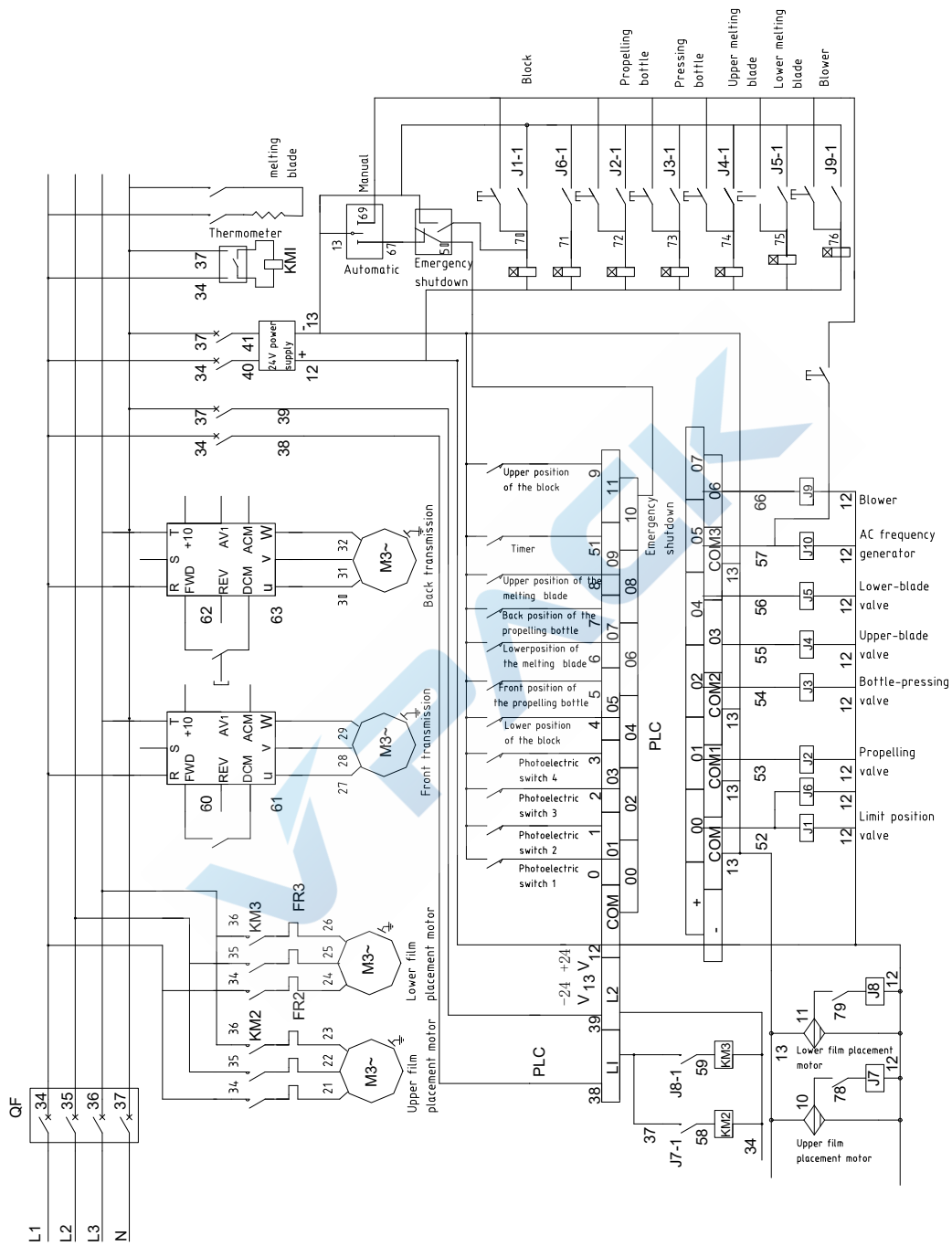
Picture11:Sketch map of heating mix sealing and cutting



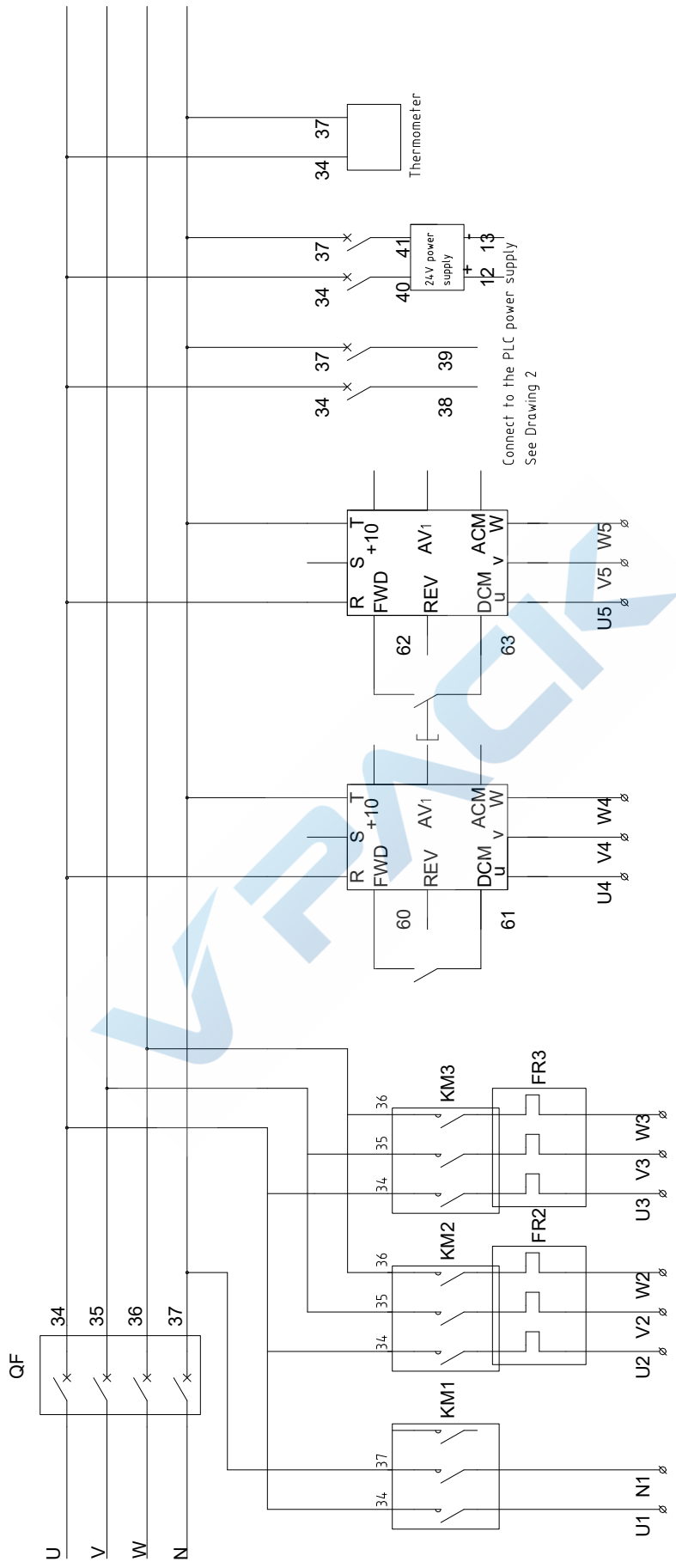
1. Temperature-protecting layer 2. Heating tube
 3. Internal isolating board 4. Fan 5. Electric motor
 Picture12: Sketch map of heating and bake oven



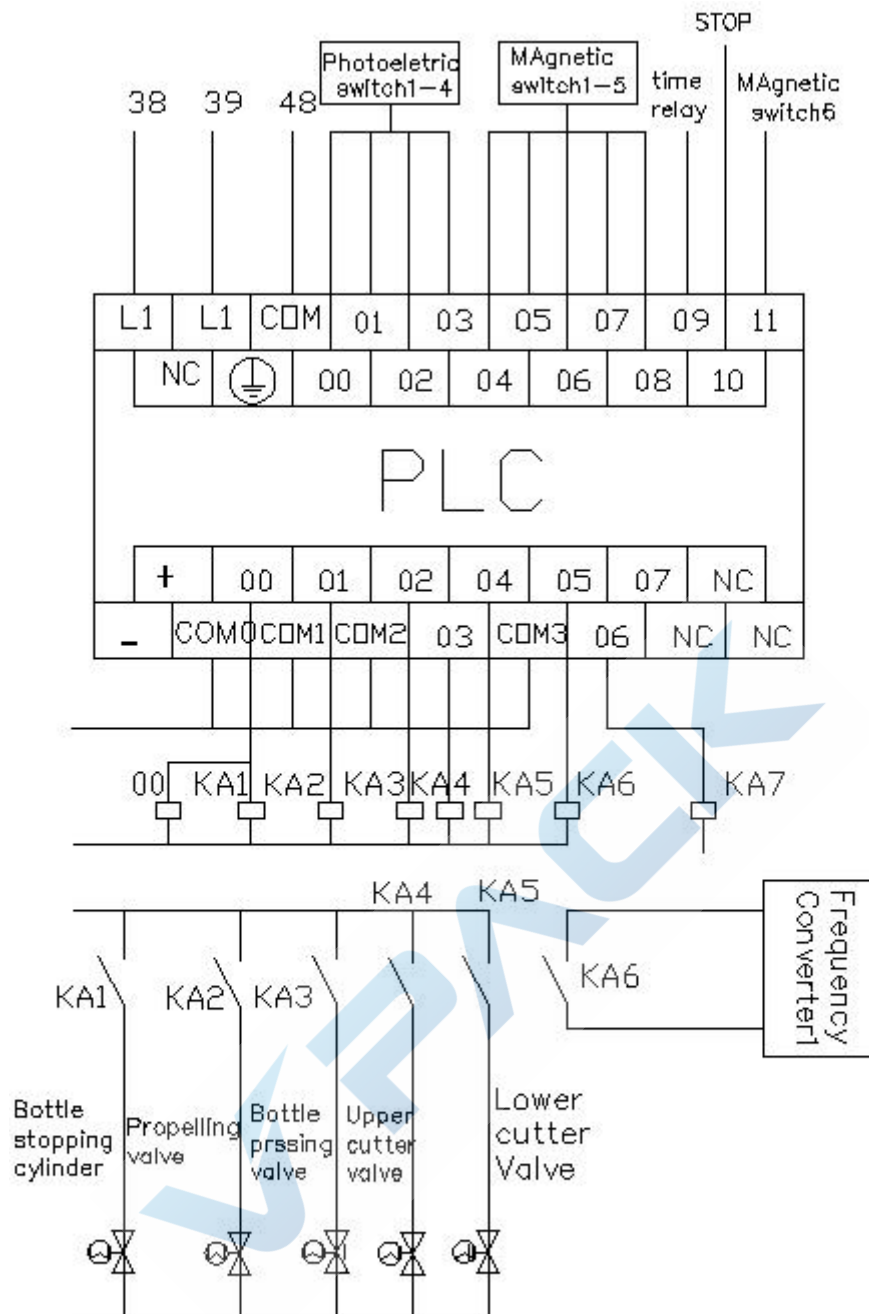
1. Bearing 2. Driven roller 3. Mesh 4. Adjusting screw
 Picture13: Sketch map of output of finished product



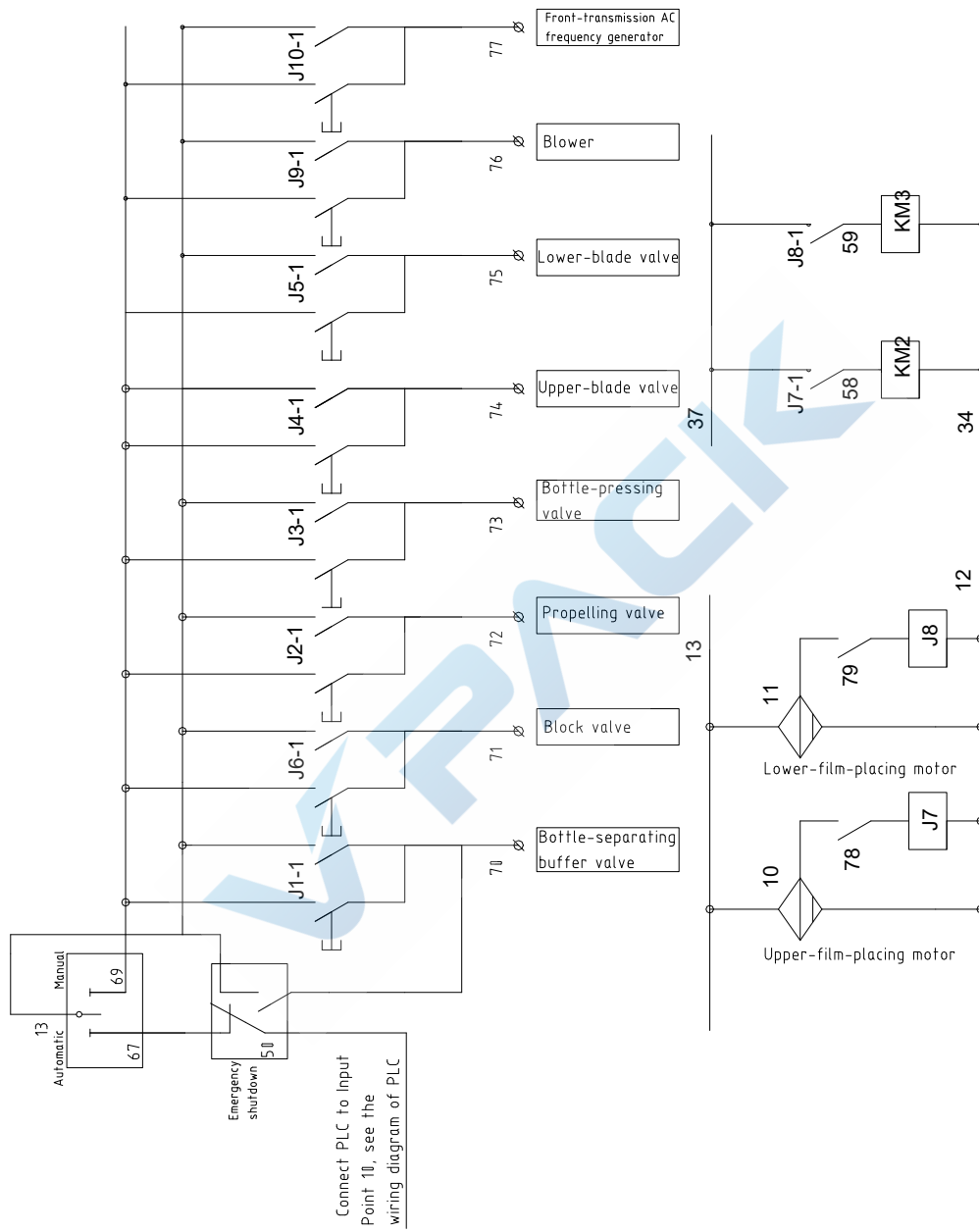
Theoretical diagram



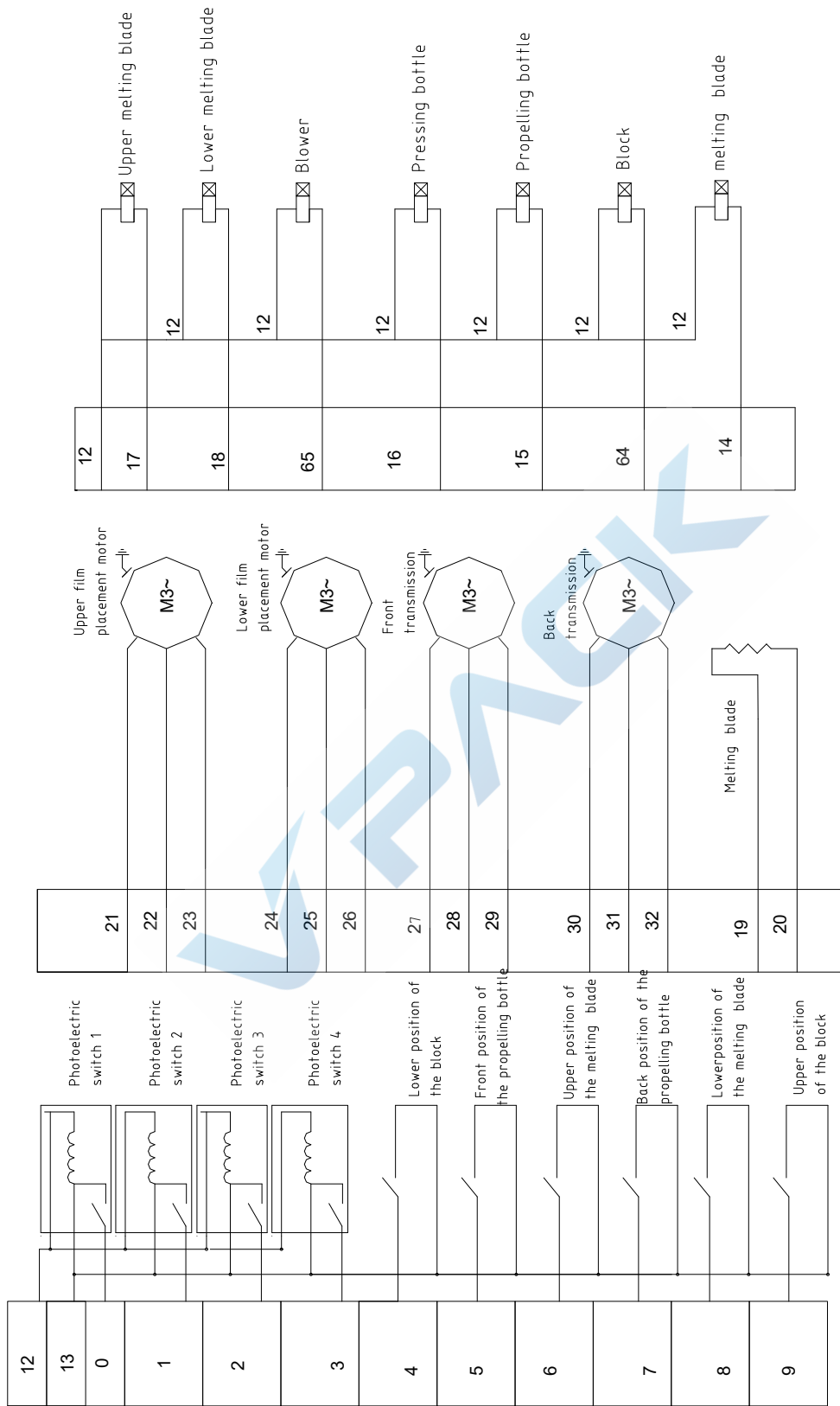
Wiring diagram of the power distribution cabinet



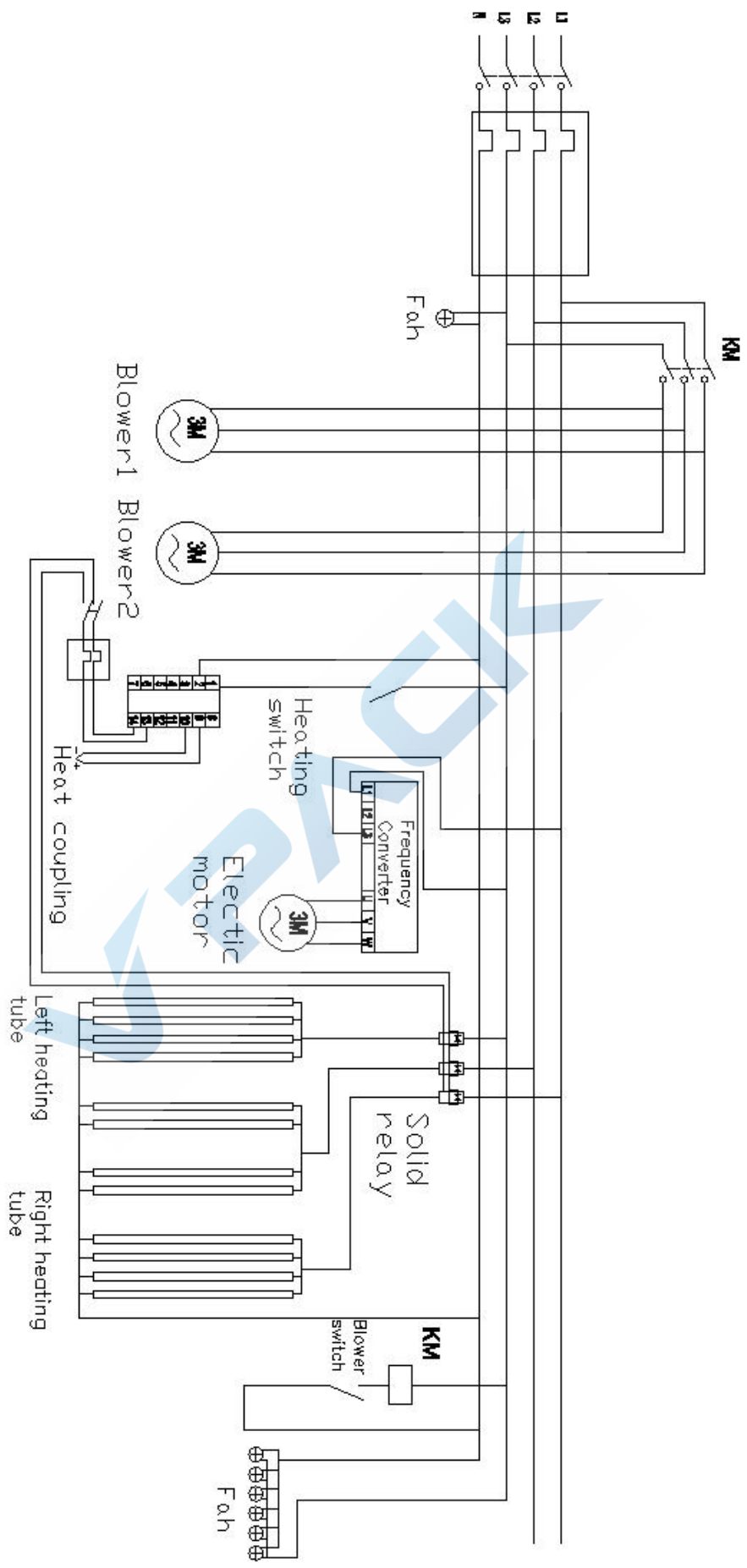
Picture15: YXBS-6545 Connecting diagram of PLC



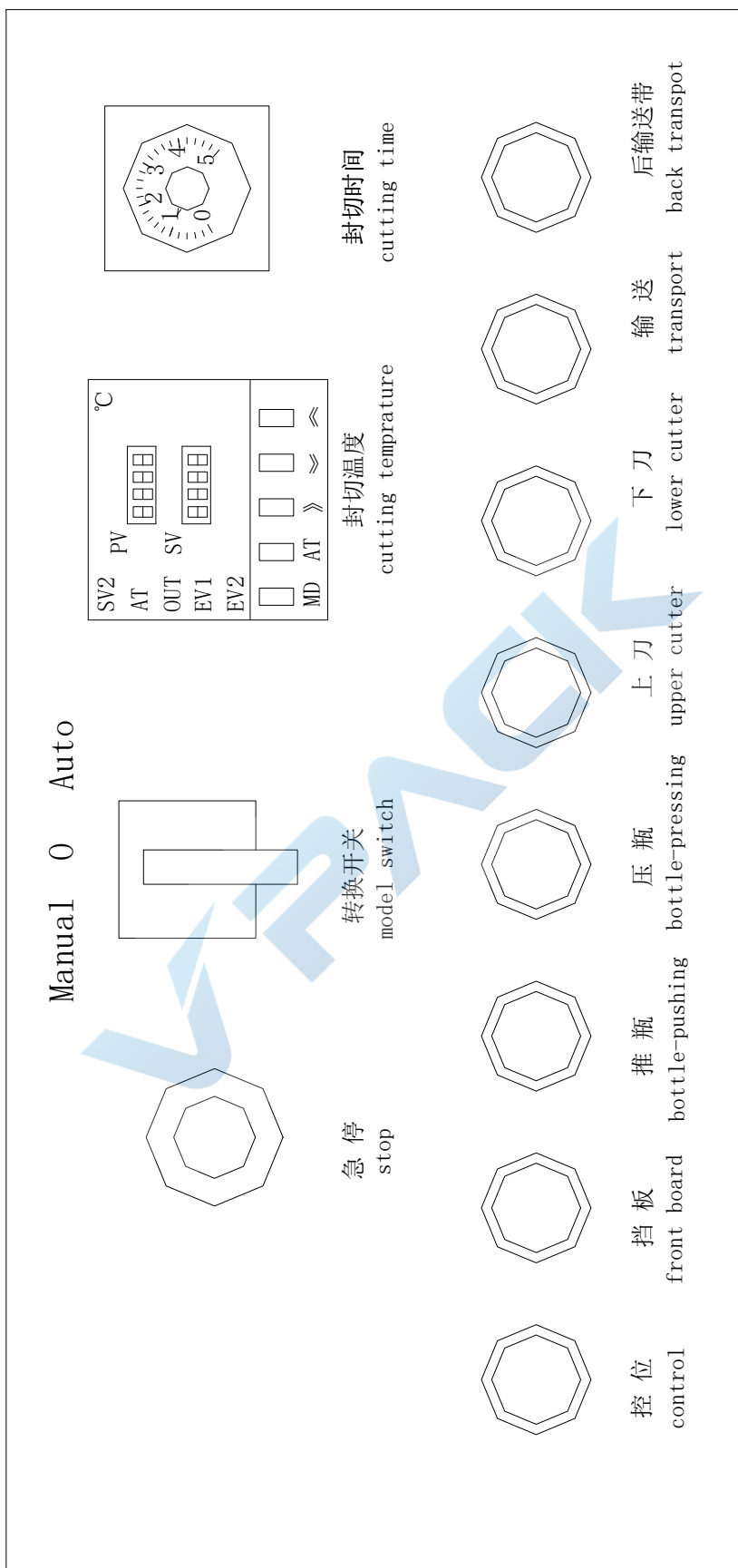
Wiring diagram of contactor and relay



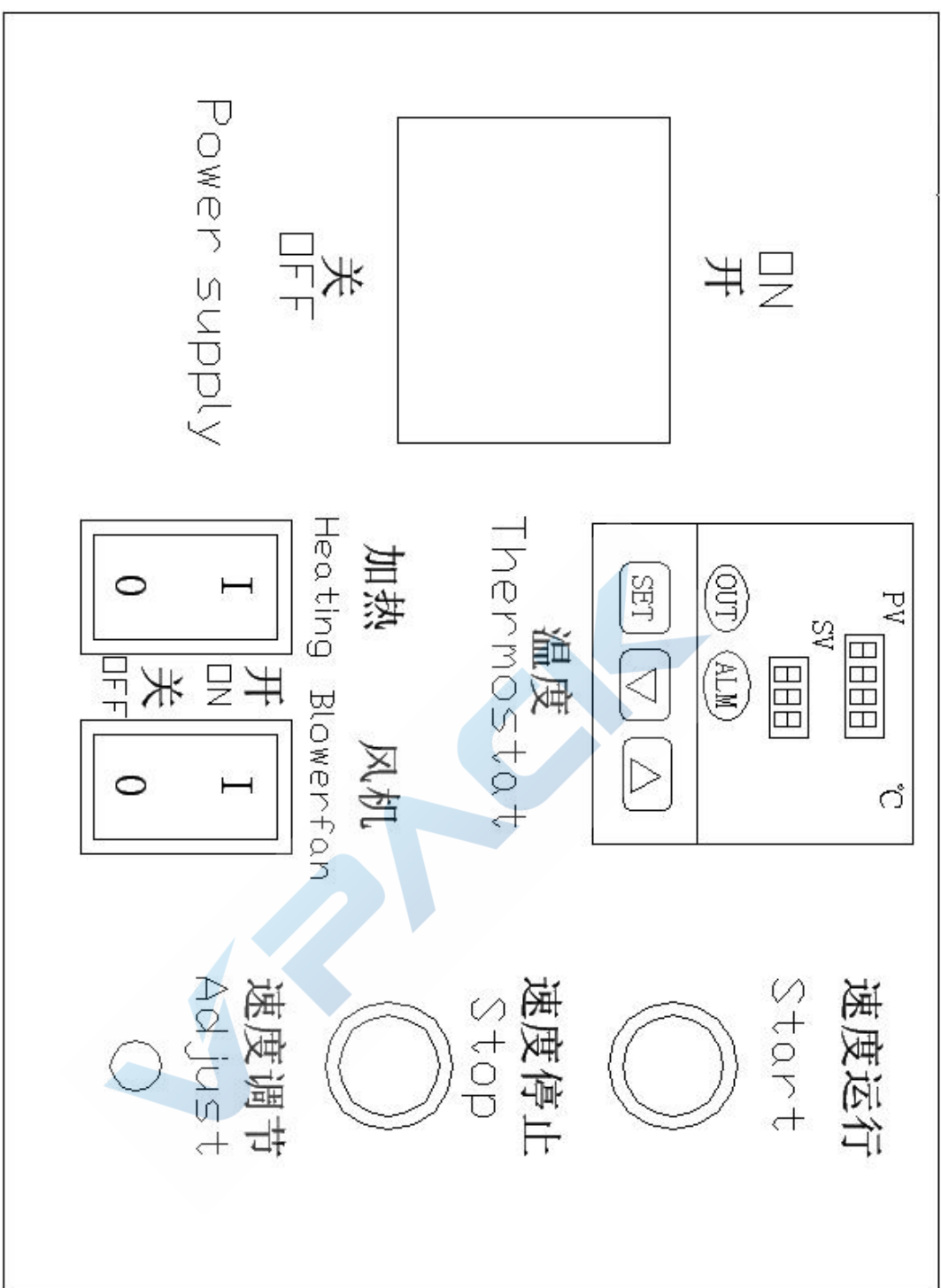
Wiring diagram of motor, sensor and electromagnetic valve



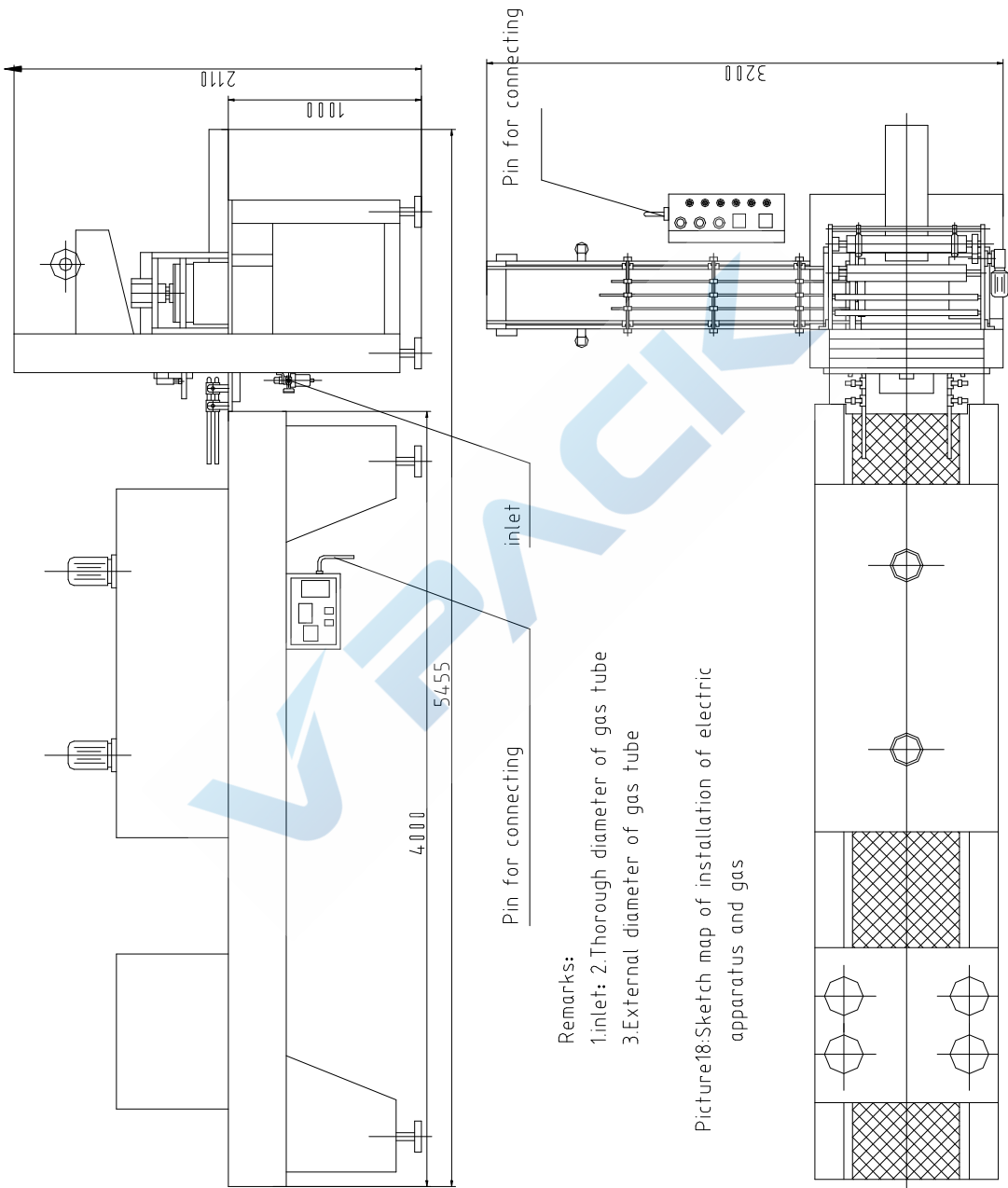
Picture15:Electric diagram of LYBS-6545 contractor



Picture16:Diagram of operation panel of host machine

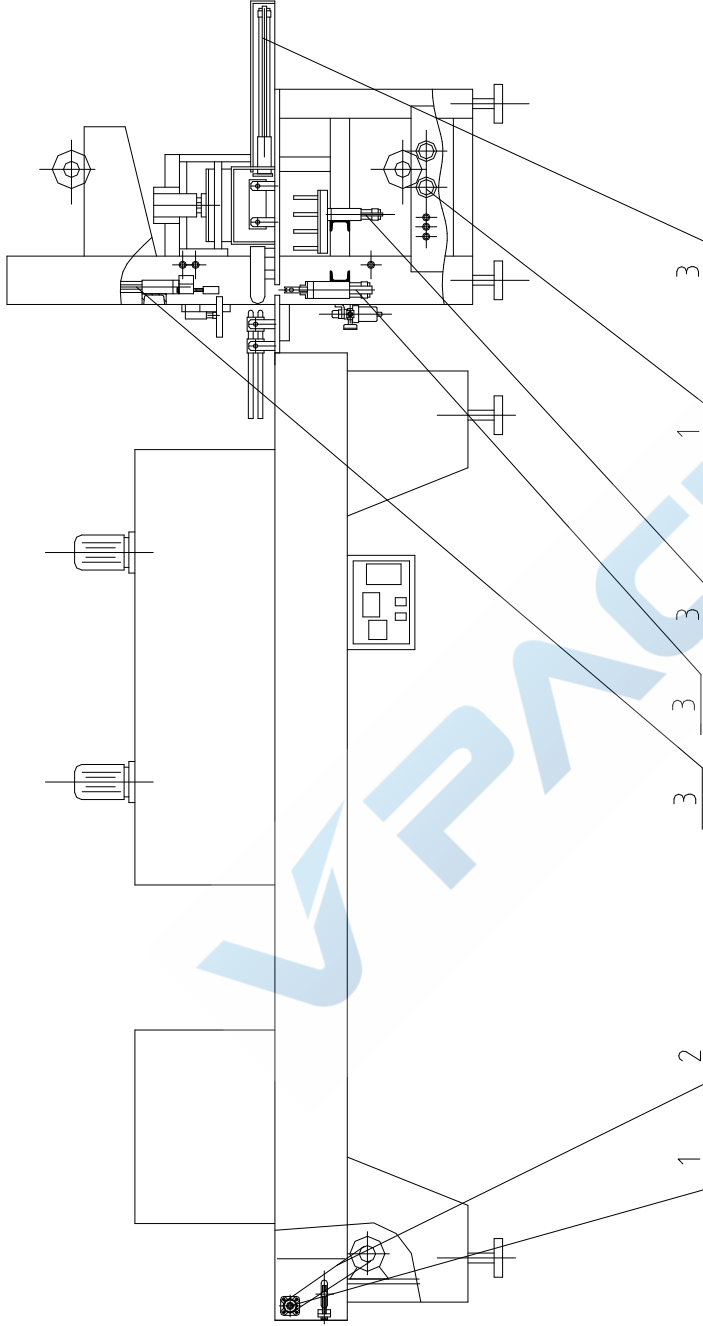


Picture17:Diagram of operation panel contractor



- Remarks:
- 1.inlet: 2.Thorough diameter of gas tube
 - 3.External diameter of gas tube

Picture18:Sketch map of installation of electric apparatus and gas



SN	Lubricating parts	Brand of lubricating oil	Interval
1	Various rolling bearings	Calcium-based lubricating oil	Once a year
2	Various chains	N46 GB443-84	Once a week
3	Cylinder leader	N46 GB443-84	Once a week

Picture19:Sketch map of lubrication