

JIALONG

OPERATION MANUAL

Automatic High Speed 2 Colors Printing Die
Cutting Machine With Stacker
Model: **JL-GYM 3200 x 1600**

REV 01/24

Serial: **JL20230927**

US

English

JIALONG

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Chapter 1:

SAFE OPERATION PRACTICE INSTRUCTION

This manual is specifically designed for the **Automatic high speed Flexo Printing Slotting Die-cutting Machine**. The machine incorporates advanced technology from similar machines both domestically and internationally. It boasts high precision and excellent performance in printing, slotting, and die-cutting for corrugated carton production.

Please carefully read this specification manual to understand the operation and maintenance instructions, as this is essential for ensuring the machine's high precision and reliability. This manual provides detailed information on operation, maintenance, and potential production issues. If you encounter any problems during actual operation, please feel free to contact us at any time, and we will address them promptly.

We are continuously exploring advancements in carton machine manufacturing and are committed to providing high-performance products. Therefore, we welcome any requirements and suggestions. We would like to express our appreciation and gratitude for choosing our products.

A) General Rules

1. Compliance with safety operation instructions within the factory and those provided by the machine manufacturer.
2. Keep the working area tidy and clean.
3. Inspect the machine before opening it to ensure that every protective device is in place and that the safety switch is operational.
4. Properly wear and prepare all safety equipment.
5. Tie back hair and clothing to avoid being caught by moving machine parts or other hazards.
6. Inspect the machine for damage and worn-out parts; have experienced personnel repair and adjust the machine as needed.
7. It is prohibited to use hands or tools to touch moving parts of the machine.
8. Power must be turned off, and the keys kept with the operator during maintenance.
9. When the machine is being turned on or off, other people should stay clear of the working area.

B) Basic Requirements of Safe Operation

Please adhere to the following basic methods to ensure safe and correct operation of this machine.

1. Please read this manual carefully and confirm that you understand all its contents. Note that text in black indicates warnings. Confirm that you have understood the contents and refrain from attempting any operation not listed in this manual. Before installation, usage, maintenance, repair, examination, and adjustment, carefully read this manual, as well as the data for control and electrical equipment attached to the machine, and relevant machine manuals (e.g., air compressor). Only use this machine after thoroughly understanding safety information and points to be aware of, and possessing the ability to operate it correctly.

Our company is not responsible for any direct or indirect injuries caused by individuals who operate the machine in ways beyond those described in this manual.

2. Only trained and authorized operators may use this machine.

Operators must be trained and authorized by the safety administrator. They must comply with all regulations, especially during maintenance and operation. Operators must first pass the electrical safety verification program.

Operators who are not familiar with the machine must not be allowed to operate it.

3. Keep this operation manual in a safe place.

Assign a specific person to keep the manual and store it in a designated location near the machine for easy access and reference.

4. All operators and relevant personnel must know the location of the emergency button and main power switch. They should also know how to use them. Anyone can press the emergency button or turn off the power switch in case of a dangerous situation.

Please contact us if anything is unclear.

C) Safety Marks

This manual provides the following safety marks to indicate danger signs. Please pay close attention to these marks and attach sufficient importance to potential dangers.

Even **WARNING** and **ATTENTION** notices can lead to serious consequences.

DANGER, **WARNING** or **ATTENTION** notices are all important; please adhere to them.

Safety Alert Symbols

 ATTENTION	Marks indicate potential danger, which may result in medium to slight injury or property damage if not paid attention to.
 WARNING	Marks indicate potential danger, which may result in serious injury if not paid attention to.
 DANGER	Marks indicate the most dangerous area, which may result in death if not paid attention to.

D) Preconditions for Safe Operation

1. Installation Site Requirements

- I. Avoid exposure to direct sunlight or other heat sources, as it may cause partial temperature elevation.
- II. Ensure the machine is placed away from other equipment that may splash water or oil.
- III. Do not place the machine in hostile environments such as dusty, foggy, saline, or corrosive gas environments.
- IV. Sufficient space should be allocated for maintenance activities, such as door opening, changing anilox rollers, rubber rollers, and other components.
- V. Ensure there is ample space around the machine for paper feeding and the exit of finished paper, without any obstacles.
- VI. The foundation must be strong and accurately installed to prevent tilting or collapse.
- VII. The recommended operating environment temperature is between 0 and 40°C, with a relative humidity of less than 60%.

2. Machine Installation and Transportation Requirements.

- I. Utilize appropriate cranes for assembling or disassembling the machine.
- II. Use suitable steel wire ropes or dedicated ropes for hoisting the machine.
- III. Only qualified personnel should operate the crane or hoist.

3. Power and Ground Connection.

- I. Only qualified electricians should handle the wiring.
- II. Ensure stable voltage supply (three-phase 415V±5%, frequency 50±1Hz), and use cables with sufficient cross-sectional area (the specifications may vary depending on the country's voltage standards).
- III. Keep the machine away from sources of electromagnetic interference, such as electric welders or high-frequency machines.
- IV. Adhere to the electrical equipment regulations and standards of your organization.
- V. Avoid using the same ground wire as sources of interference, such as electric welders or high-frequency machines.
- VI. The resistance of the ground wire should be less than 100Ω, and a ground wire with a diameter of ≥14mm should be used.

4. Lubrication and Cooling Oil Requirements.

- I.** Do not use mixed oils.
- II.** Ensure to add sufficient lubrication oil before starting the machine after a prolonged period of disuse (e.g., after a holiday).

5. Machine Environment Requirements.

- I.** Ensure that aisles, inner machine parts, and workbenches are clear of debris, as it may obstruct machine operation and maintenance.
- II.** Keep the floor free of water and oil.
- III.** Sufficient lighting should be provided in the work area.
- IV.** Prevent objects from falling into moving parts of the machine, as it may cause collisions or damage.
- V.** Ensure the availability of firefighting equipment and adequately trained operators who can act as firefighters.
- VI.** Provide water washing devices for cleaning ink and other substances.

6. Operator Dress Code Requirements.

- I.** Avoid wearing gloves, necklaces, wristwatches, or loose clothing, as they may become entangled in the machine.
- II.** Operators with long hair must tie it back and wear a safety helmet to prevent it from getting caught in the machine.
- III.** Operating the machine after consuming alcohol is prohibited.
- IV.** Secure clothing buttons to prevent them from getting caught in the machine.

7. Safety Administration System.

- I.** Designate a dedicated individual to administer the operation manual.
- II.** Place the manual in an easily accessible location for consultation.
- III.** Appoint an administrator to oversee safety protocols during production.

E) General Safety Operation Instruction

1. Danger

The main electric motor, main control station, operation panel, electric motor, and frequency changer all contain high voltage, which may be life-threatening. Therefore, do not allow inexperienced persons to open or touch the wires.

Do not move or alter panels, buttons, or protective doors without permission.

Avoid touching buttons with dirty or wet hands.

2. Warning

Double-check the buttons.

Ensure that all employees are aware of the location and function of the emergency switch and main power switch.

Keep the floor free from water and oil.

Maintain clean aisles and workbenches free from debris.

Avoid direct contact with ink using bare hands, and keep ink away from eyes and mouth. If ink gets into your eyes, rinse them thoroughly with clean water multiple times and seek medical attention.

Do not operate the machine while wearing gloves, except when handling tools, removing paper scraps, or cleaning the machine.

3. Attention

Use only one brand of oil.

For quick-wear parts, always select the same model of replacement parts; do not change them arbitrarily.

Turn off the main power during power outages.

When stacking paperboard, ensure it is stacked in a location where collapse is unlikely. Stack paperboard vertically and orderly to prevent toppling and falling.

Do not relocate warning signs or allow them to become stained or rusted.

F) Installation and Start Safety Guide

1. Danger

To prevent electric leakage or unstable voltage, please inspect the cable before turning on the power. If the cable is damaged or not connected, report this condition to the manager immediately.

2. Warning

Follow these steps to turn on the power: First, activate the general power supply of the factory, then switch on the machine's power.

Follow these steps to turn off the power: Turn off the machine's power first, then deactivate the general power supply of the factory.

Close the door of the electrical equipment box to prevent water, paper scraps, and dust from entering.

Ensure that the power line and control line do not cross.

Regularly check that the protective device is functioning properly and is not damaged.

3. Warning

After the installation of the air source, electric power, and water source, perform the following checks:

Ensure that the air source pressure is normal.

Check that the electric motor and gears are running without abnormal noise.

Conduct regular inspections as outlined in the manual.

G) Safety Guide of Machine Operation

1. Danger

Do not move safety devices. Do not expose high-voltage electrical connectors.

Do not relocate protective devices for the sake of convenience in the moment.

2. Warning

While the machine is running, keep away from moving parts and the paper feeding area.

Do not touch moving parts directly or indirectly.

Please wear gloves to clean paper scraps and use a brush for this task; do not perform it without gloves.

During machine operation, ensure there are no people or obstacles obstructing its operation.

During automatic operation, if the machine suddenly stops, do not continue working until the reason for the failure has been identified.

While the machine is running, it is forbidden to open doors or covers.

Do not place tools or measuring devices on the control table or on top of the machine cover during operation.

Do not touch buttons and switches during automatic operation.

Pay attention to the following points to prevent operators from being caught in the machine: Tie back long hair and wear a safety helmet. Tie the bottom of trousers and keep away from the machine if wearing loose clothing. If any abnormal phenomenon occurs, stop the machine immediately and report it to the manager.

3. Warning

Stop all parts of the machine and turn off the main power before washing it, except when washing ink.

H) Safety maintenance.

1. Danger

Turn off the main power before performing maintenance. To prevent other workers from inadvertently opening or touching the buttons on the panel, please place warning boards in well-marked positions in every operational area. These boards should read "Maintenance! Do not touch!"

Only qualified electrical engineers are permitted to perform maintenance on electrical parts.

When maintenance work is carried out at a height, operators should wear protective shoes and safety helmets.

Covers should be closed once maintenance is completed.

After completing maintenance, clean the work site, remove obstacles from aisles or floors, wipe up any oil or water spills on the ground, and maintain a safe working environment.

Conduct maintenance operations according to the manual; if you have any questions, please contact our company immediately.

2. Attention

Review the maintenance work with the manager.

Document the contents and results of the maintenance work; the manager will retain the record.

Retain this record for a reasonable period of time.

I) Safety Examination Items

Ensure all electrical equipment control switches, valves, and buttons are functioning properly.

Verify the tightness of the transmission belt.

Inspect the rubber and anilox rolls for any abnormalities.

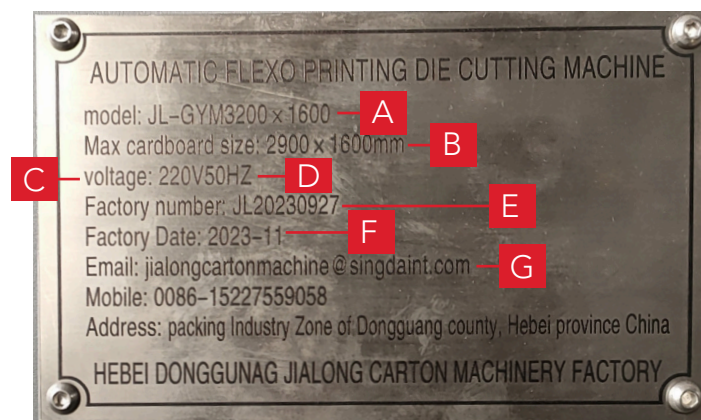
Assess the condition of the air compressor and cylinders.

Confirm there are no foreign objects inside the machine.

Chapter 2: INTRODUCTION OF THE MACHINE

BRIEF

A) Identification Plate



Here, after taking note of the name plate attached to our machines. Which is generally placed on the top, on the left or right side, it can be consulted by customers each time it is necessary.

The following data is reported on the name plate:

Code	Description
A	Machine Model
B	Size
C	Voltage
D	Hertz
E	Serial Number
F	Date
G	Manufacturer's Data

B) Main Technical Parameters

Automatic High Speed 2 Colors Printing Die Cutting Machine With Stacker Model JL-GYM 3200 x 1600			
Electrical Requirements		Product	Automatic High Speed 2 Colors Printing Die Cutting Machine with stacker.
Voltage	220/230V	Brand	JIALONG
Phase	3 PH	Model	JL-GYM 3200 x 1600
Frequency	60 Hz	Origin	China
		Application	Manufacturing of die-cut boxes with printing and stacking.
Operation Conditions		Overall Dimensions	
Operating Temperature (°C)	25°C	Length	4800 mm
Maximum Operating Temperature (°C)	44°C	Wide	5000 mm
Installation Place Room Temperature (°C)	Min 20% Max 80%	High	2000 mm
Relative Humidity (%)	Min 45% Max 75%	Weight	18000 Kg.
Elevation (m)	1798 m Above Sea Level	Floor Area Requirement	
		5100 x 5300 mm	
Technical Specifications			
Max. Design Speed	200 pcs/min		
Max. Working Speed	150 pcs/min		
Max. Sheet Size	2900 x 1600 mm		
Max. Skip Feeder Size	2900 x 1800 mm		
Min. Sheet Size	500 x 600 mm		
Max. Printing Size	2800 x 1600 mm		
Max. Slotting Size	2850 x 1600 mm		
Printing Precision	±0.5 mm		
Die Cutting Accuracy	±1.0 mm		
Feeding Unit			
Max. Speed	250 pcs/min		

Feeder Type	Lead Edge Feeder with vacuum suction
Feeding Roller	Double Roller Feeder Paper Outer diameter: 55 mm, up roller. 45# seamless steel tube. Adjustment range from 0 to 12 mm.
Control System	10.4" color touch screen Storage orders.
Printing Units	
Printing Units Number	2 Units.
Printing Precision	±0.5 mm
Printing Roller Outside Diameter	515.6 mm
Anilox Roller	200 mm Steel surface coating ceramic grinding, laser engraving anilox. Mesh Number from 180-300.
Rubble Roller	200 mm Hardness 60-65 degrees.
Ink System	Pneumatic diaphragm pump.
Die Cutter Unit	
Max. Die Cutting Size	2800 x 1600 mm
Min. Die Cutting Size	450 x 550 mm (Regular boxes) Any size smaller than 300 x 400 mm (Die Cutting boxes).
Die Cutting Accuracy	±1.0 mm
Die Cutting Thickness	16-18 mm (Single Wall) 13-15 mm (Double Wall) 19 mm (Triple Wall), Flute AAC.
Anvil Cover Cylinder Specification	434.2 mm. Thickness 8 mm
Die Cylinder Specification	487 mm (not including cutting die). Die Cutting Height 25.4 mm Holes positions to be approved, see ANNEX A. Inner holes with cooper sleeves for long lasting life.
Die Cutting Type	Slotting Section integrated with 4 slotter rings.
Stacker Unit	
Height of the Stack	1600 mm
Lifting System	Chain Drive

C) Instruction for Structure and Performance

I. Paper Feeding Unit

Item	Instruction
1. Front Edge Paper Feeding System	1. It adopts Germany rexroth servo to control the paper feeding mechanism with light pressure, which is featured with fast response speed, high positioning accuracy, good system stability and long service life.Using Gently pressure on the leading edge paper-feeding mechanism, the domestic advanced technology, its characteristic protection cardboard original strength, avoid collapse and thinning. Conducive to the smooth line pressing board after input, the system is stable, paper accurate, fast and suitable for all kinds of corrugated board. 2. The suction assist feeder paper ,11 kw high pressure centrifugal fan,According to the cardboard bending degree of frequency conversion control air pressure ,to ensure warping board, thin board high-speed transmission. 3. lift paperboard,drop paperboard adopt cylinder push, move quick and powerful. 4. Side baffle is electrical adjustment(adopt the PLC touch screen and electrical digital modulation), front baffle is for manual synchronous adjustment , back baffle is for electrical adjustment. 5. Feeder wheel is from Taiwan MaxDura brand, Durable Wear Resistant. 6. Skip feeding paper device,(can choose according to need continuous or skip feeder paper).To ensure a large cardboard can also processing. 7. 10.4 -inch color touch screen control paper department, printing department, die cutting return zero, storage orders, memory reset, production speed of 60, 90, 120, cruise control, infrared photoelectric counting, can preset orders of production. 8. Die cutting department is equipped with interlocking control switch, emergency stop, stop or resume feeding (the other is equipped with the machine deceleration button), and phase control in each group and each group of roll horizontally shifting control switch.(10.4-inch color touch screen for integrated control).
2. Separation and Combination of Machine and Workbench	1. The machine clutch electric control with alarm, moving last warning bell ring, Ensure workers safety. 2. Pneumatic interlocking device 3. The main motor adopts frequency conversion motor, frequency conversion controller, energy saving, stable starting, attached to the motor start protection device. 4. Main engine self-locking function: the unit didn't completely locking state, the main engine cannot be started, ensure the safety of the operator and machine; Host under normal working condition, the on-off function is automatically locked, avoid the wrong operation of the machine and personnel injury.
3. Dust Removal Device	1. Paper brush dust removal device, and is equipped with strong negative pressure suction fan, can remove the board by a lot of dust on the surface of the printing, paper scraps, etc., sundry, improve the quality of printing.
4. Feeder Paper Roller (Double Roller Feeder Paper)	1. Outer diameter: 155 mm, up roller. 2. 45 # seamless steel tube, parcel wear-resisting rubber, and do dynamic balance correction. 3. Down roller,external diameter 155 mm, embossing and hard chromium plating , and do dynamic balance correction. 4. Feeder Paper roller gap dial manual adjustment, adjustment range 0-12 mm.

	5. The former feeder paper rubber roller (elastic rubber roller) for dynamic lift and fall, Automatically adjust the pressure, can reduce the strength fracture of the corrugated board.
5. Pat to Orderliness Device	The machine have pneumatic Pat to orderliness device, Cardboard transverse positioning more accurate, avoid waste. (Computer control Pat to orderliness time).
6. Computer Device	1. The main motor adopts frequency conversion motor, frequency converter adopt Delta from Taiwan, energy saving and save electricity can reach 30%. 2. Fan adopts independent inverter control, wind pressure is adjustable. 3. Home screen adopt PLC control, human-machine interface. 4. Printing department, die cutting department is equipped with automatic zero set device, (general carton using automatic zero device, testing-run two pieces cardboard can be adjusted to the correct position). 5. Automatic lift and down printing plate device, printing anilox roller lift and down in order also (computer delay), avoid printing plate dip in ink for many times. 6. There is lack of ink alarm device, the real-time monitoring for the ink system working state, avoid no ink work.

II. Printing Unit

Item	Instruction
1. Printing Roller	1. The outer diameter: 390.6mm, (including the plate of the outer diameter is: 405mm). 2. The steel tube surface grinding, hard chrome plating. Roll horizontal direction and circumferential direction have its benchmark scribed line, convenient to Installation the printing plate. 3. Computer dynamic balancing correction, eliminate the internal stress, grinding machining, hard chromium plating, smooth operation. 4. Ratchet fixed volume edition axis. 5. Full Plate Hanging plate slot, suitable for 9 mm plate of the article 6. Loading and unloading of the print plate, pedal switch of electric control forward and reversing. 7. About printing roller horizontally move by electric adjustment, the maximum amount of mobile for about 10 mm, with a limit switch (PLC touch screen control). 8. Printing and axial adjustment phase, phase structure of planetary gear type, PLC touch screen control and 360 ° electric digital adjustment, (downtime, boot can adjust) frequency conversion motor drive, according to the requirements change version of roller circumferential rotation speed, accurate to 0.1 mm, fast and convenient, printing roller to transverse PLC touch screen and electric digital adjustment, adjustment range, a total of 10 mm. 9. Use vacuum adsorption transport cardboard (the surface of paper feeding wheel is ceramic, increase wear-resisting life), the roller is arranged in many rows and dislocation, strengthen cardboard transmission stability, do not need to use the paper ring can make cardboard through the printing department smoothly.
2. Send Bellows	1. For printing roller diameter 198 mm. Steel tube surface grinding, hard chrome plating. 2. Adopt high-quality seamless tube fine machining, balance correction and smooth operation.

	3. Vacuum adsorption transmission bellows, whole-process roller vacuum transfer (using wear-resistant ceramic roller). 4. The transmission table can be controlled by lifting, and the pressure roller gap is controlled by computer and electronic digital with the control range of 0-12mm.
3. Anilox Roller	1. Outside diameter is: 215 mm. 2. Steel tube surface coating ceramic grinding, laser engraving anilox . 3. The net line number is 300-300 line number is optional). 4. Than steel anilox roll printing meticulously, wear-resisting, long service life. 5. 90-110 line printing can be realized.
4. Rubber Roller (Option)	1. Outer diameter is : 205 mm. 2. Steel pipe surface parcel wear-resisting rubber, and do correction balance. 3. Rubber roller middle high is the special grinding, ink transfer effect is good. Rubber hardness is: 60-65 degrees.
6. Ink System	1. Pneumatic diaphragm pump, ink stability, convenient operation and maintenance. 2. ink filter, filtering impurities. 3. Circulating pneumatic up inking. 4. There is lack of ink alarm device, the real-time monitoring for the ink system working state, avoid no ink work.
7. Phase Adjustment Mechanism	1. Planetary gear structure. 2. Printing phase electric digital 360 degrees adjustment (motion and stop all can be adjusted). 3. Frequency conversion motor drive, according to the requirements change version of roller circumferential rotation speed, accurate to 0.1 mm, fast and convenient, printing roller to transverse PLC touch screen and electric digital adjustment, adjustment range, a total of 10 mm. 4. Intelligent printing roller is reset, fit self-return after locking.
8. Phase Fixed System	1. Cylinder type brake device. 2. When the machine separate adjustment phase, the brake institutions limit the machine running, keeping the original gear fixed point position.
9. Distributing, Fast Cleaning System	1. Totally enclosed double doctor blade system, dust proof, fast back to the ink, scraping effect is better. (optional: scraper distributing system). 2. Airbag scraping and cavity system: ink scraper body cavity using airbags, reduce the scraper and ceramic roller wear and tear, big big saving the cost. 3. Air inlet is equipped with one-way pressure regulating valve, put an end to because of the pressure change scraping precision, pressure can be adjusted in order to achieve the best effect of printing. 4. Ink scraper body cavity with piecewise fine-tuning, apply the same layout good reflect different printing details. 5. Adopt high wear-resistant nylon materials on the ceramic roll shaft end sealing ink cavity, and is equipped with the whole back into the ink tank, put an end to leak ink. 6. Ink cavity spray has "teflon" non-stick coating layer with high ink cavity cleaning device, convenient cleaning and save the time.

III. Slotting Unit

Item	Instruction
1. Slotting Phase Adjustment	1. Slotting phase using PLC and electric digital input type 360 degree adjustment, phase motor inverter control, stop and operation can be adjusted.(also can choose PLC and touch screen to adjust). 2)Single shaft double slot, high adjustment adopts PLC and digital electric box, touch screen control.
2. Creasing Line Wheel	1. After preloading wheel, then line pressing board is not easy to break. 2. Up creasing roller Packages of polyurethane, Will not damage the board, press line clearance adjustment using free wrench self-locking type turbine box, fixed. 3. Lower shaft of creasing wheel, lower shaft of slotting blade both adopted adjustable eccentric nested structure, make the structure compact, positioning precise; intervals between lower shaft of creasing wheel and lower shaft of slotting blade adopt manual adjustment with eccentric gear, and marked on scale.
3. Paper Separating and Slotting Cutter Stand	1. Slotting knife width of 7 mm, alloy material, after heat treatment, grinding, tooth, slotted knife double-plate trimming knife, knife edge sharp, high precision. 2. 9 SiCr high quality alloy steel paper separating cutter of edginess wear-resistance and high precision. 3. Slotting shaft is hollow shaft whose surface is grinded and plated wit hard chromium, move smoothly. 4. Slot cutting and line pressing roller lateral movement adopts synchronous electric adjustment.PLC touch screen adjustment, direct input the carton size, automatic adjustment. 5. Slotting knife box high adjustment collision protection, not damage the machine. 6. Each block has transverse slotted knife collision protection device (electronic).
4. Open Hole	Can match the portable punching mold base

IV. Die-Cutting Unit (Optional)

Item	Instruction
1. The Die Cutter Roller (Down Roller)	1. Outer diameter is: 487mm . (not including die cutting mould) 2. Centrifugal casting steel cylinder, the computer dynamic balancing correction, surface grinding, hard chromium plating, and increase the running stability. 3. Die cutter mould fixed screw holes spacing of 100 * 100 mm 4. Apply to die cutting mould height 25.4 mm 5. Die cutting thickness is :16 to 18 mm (three layer board), 13-15 mm (five layer board). 6. The slotting knives adjustment adopt box height synchronously adjustment ,very convenient and fast.
2. Rubber Gasket Roller (Up Roller)	1. The outer wall is: 388.3 mm 2. Cast steel material, surface grinding, hard chromium plating. 3. Balance correction, increase the running stability.

	4. Manual adjustments with die cutting roller gap. 5. Rubber gasket thickness 10 mm, (outside diameter is: 406 mm), width is 250 mm.
3. Lateral (Horizontal) Movement, Repair Device	1. Mechanical type horizontal 40 mm, move device, die-cutting equalizer automatic compensation linear speed, can make the die cutting rubber gasket uniform wear, prolong service life. 2. Repair adopt electric repair device, improve the rubber gasket repeat utilization rate, can repair 3-4 times. 3. Die cutting roller automatic pneumatic separation device, reduce wear rubber gasket , thus improve the service life.
4. Stripping Belt	1. Stripping belt longitudinal output the scraps of paper, convenient cleaning the scraps of paper.

D) Troubleshooting

Feeder Unit

I. Main machine won't start.

Possible reasons:

1. Feeder switch is in the locked position.
2. Machine switch wire is not properly connected.
3. Check if the relevant air switches are on.
4. Verify if the frequency converter has jumped or garbled (refer to instructions).

II. Main machine cannot speed up or slow down.

Possible reasons:

1. Check if the main machine is started.
2. Ensure the wire of the accelerate and decelerate switch of the main machine is connected properly.
3. Verify if the frequency converter has jumped or garbled (refer to instructions).

III. Auto-feeding is not working.

Possible reasons:

1. Check if the switch wire of the feeding unit and slotting unit is connected.
2. Verify if the feeding electromagnetic valve has electricity or if it's damaged.
3. Ensure the photoelectric sensor is functioning properly and positioned below the paper.

IV. Fan cannot start.

Possible reasons:

1. Ensure the start button of the fan is connected.
2. Check if the air switch of the fan is tripped due to low voltage.
3. Verify if the frequency converter has jumped or garbled (refer to instructions).

V. Side baffle cannot be adjusted.

Possible reasons:

1. Side baffle adjustment issues
 - 1) Check if the switch has electricity.
 - 2) Verify if the motor has electricity.
 - 3) Check if the motor is damaged.
 - 4) Ensure the three-phase voltage is normal.
 - 5) Check for any equipment stuck phenomenon.
2. Side baffle does not stop
 - 1) Check if the encoder is damaged.
 - 2) Verify if the contactor is disconnected.
 - 3) Ensure the proximity switch is not damaged.

VI. The back baffle box cannot be adjusted

1. Check if the button has electricity.
2. Verify if the motor is damaged.
3. Ensure the three-phase voltage is normal.

Printing Unit

I. Printing phase could not be adjusted.

Possible reasons:

1. Printing phase could not be adjusted.
 - 1) If the machine has a blocked or stuck phenomenon.
 - 2) If the three-phase voltage is normal.
 - 3) Whether the frequency converter has jumped or malfunctioned.
 - 4) Whether the motor is damaged.
2. Phase motor does not stop.
 - 1) Whether the encoder is damaged.
 - 2) Whether the inverter is disconnected.
 - 3) Whether the foot switch is damaged.

II. Distributing motor cannot work.

Possible reasons:

1. Whether the input three-phase voltage of the distributing motor is normal.
2. If the machine has a blocked or stuck phenomenon.
3. Whether the motor is damaged.

III. Anilox roller cannot move up and down.

Possible reasons:

1. Whether the electrical valve controlling the up and down movement of the anilox roller ink distribution has voltage or is damaged.
2. Whether the shaft of the cylinder head is broken.
3. Whether the spring is soft or the pressure is insufficient.
4. Whether the electromagnetic valve has electricity.
5. Whether the gas pressure is normal.

IV. Printing drum wheel could not be axially adjusted.

Possible reason:

1. If the machine has a blocked or stuck phenomenon.

V. Plate roller transverse cannot be adjusted.

Possible reasons:

1. Plate roller transverse cannot be adjusted.
 - 1) If there is a stuck phenomenon in the equipment.
 - 2) Whether the motor is damaged.
 - 3) Whether the three-phase voltage is normal.
 - 4) Whether the button is functioning properly.
2. Transverse motor does not stop.

- 1) Whether the contactor is disconnected.
- 2) Whether the encoder is damaged.

Slotting Unit

I. Slotting phase motor cannot be adjusted.

Possible reasons:

1. If there is a stuck phenomenon in the equipment.
2. Whether the three-phase voltage is normal.
3. Whether the servo controller is malfunctioning.
4. Whether the coupling is damaged.

II. The knife dish does not move around.

Possible reasons:

1. The motor has electricity.
2. Whether the three-phase voltage is normal.
3. Whether the equipment is stuck.
4. Whether the proximity switch is damaged.
5. Whether the shaft is damaged (motor shafts).
6. Whether the knife is in the bottom groove.

III. High box cannot move.

Possible reasons:

1. The motor has electricity.
2. Whether the motor is damaged.
3. Whether the three-phase voltage is normal.
4. Whether the equipment is stuck.

IV. Carton box height does not move.

Possible reasons:

1. Whether the contactor is disconnected.
2. Whether the encoder is damaged.

Die-cutting unit

I. Die Cutting Phase Cannot Be Adjusted

Possible reasons:

1. The die-cutting group phase contactor is damaged.
2. The devices are experiencing a jamming phenomenon.
3. The three-phase voltage is normal.
4. The rubber roller's knife template is being obstructed.
5. The die-cutting group phase adjustment might be checked on the server.
6. The cable should be inspected.

II. The Rubber Gasket on the Roller Cannot Move Laterally

Possible reasons:

1. The chain is ruptured.
2. There are issues with the two-stage transmission.
3. The eccentric shaft is fractured.

III. Die cutting knife is stuck in the axial adjustment.

Possible reason:

1. There may be equipment experiencing a stuck phenomenon.

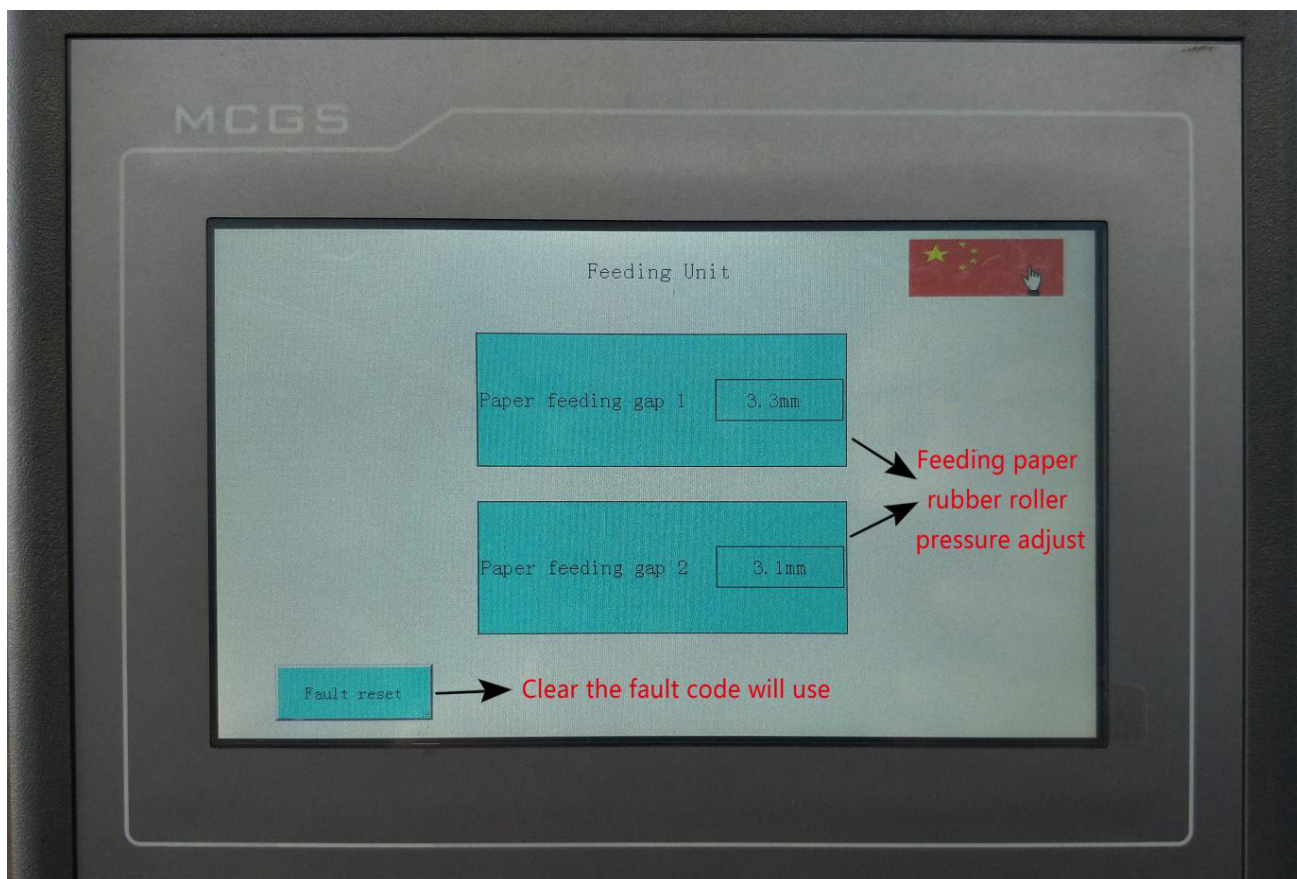
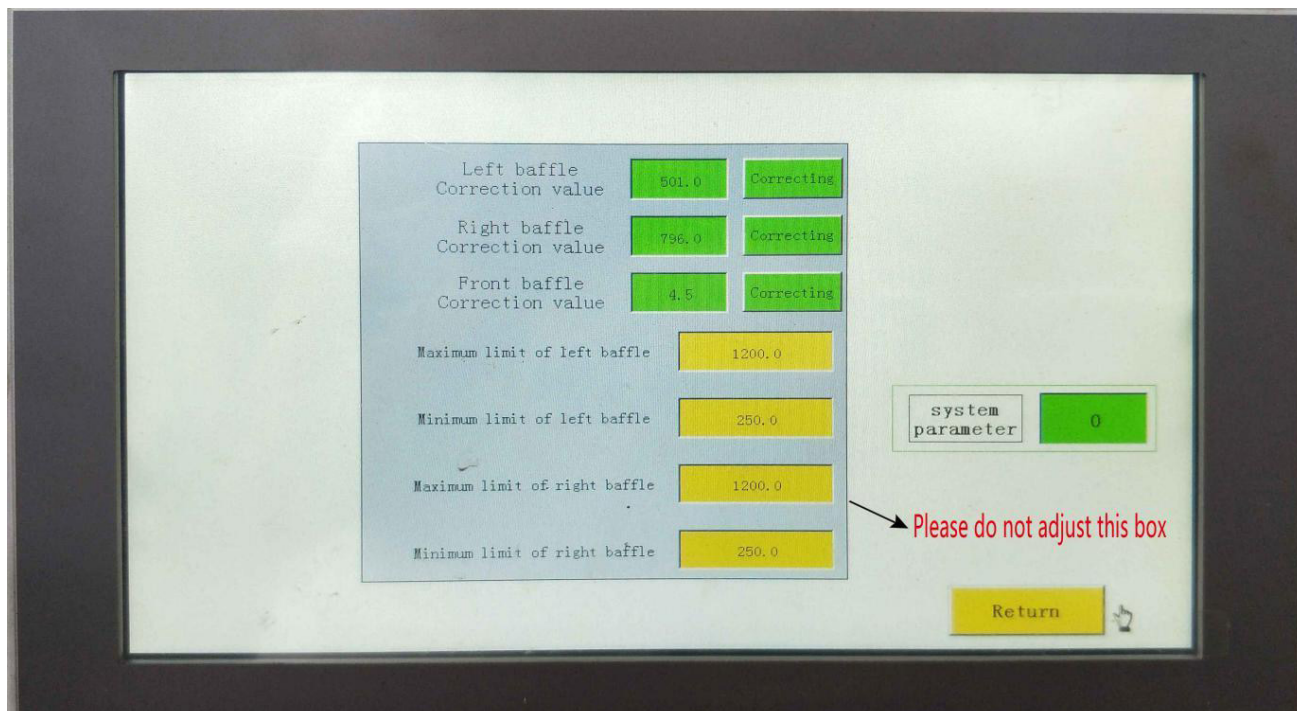
Chapter 3:

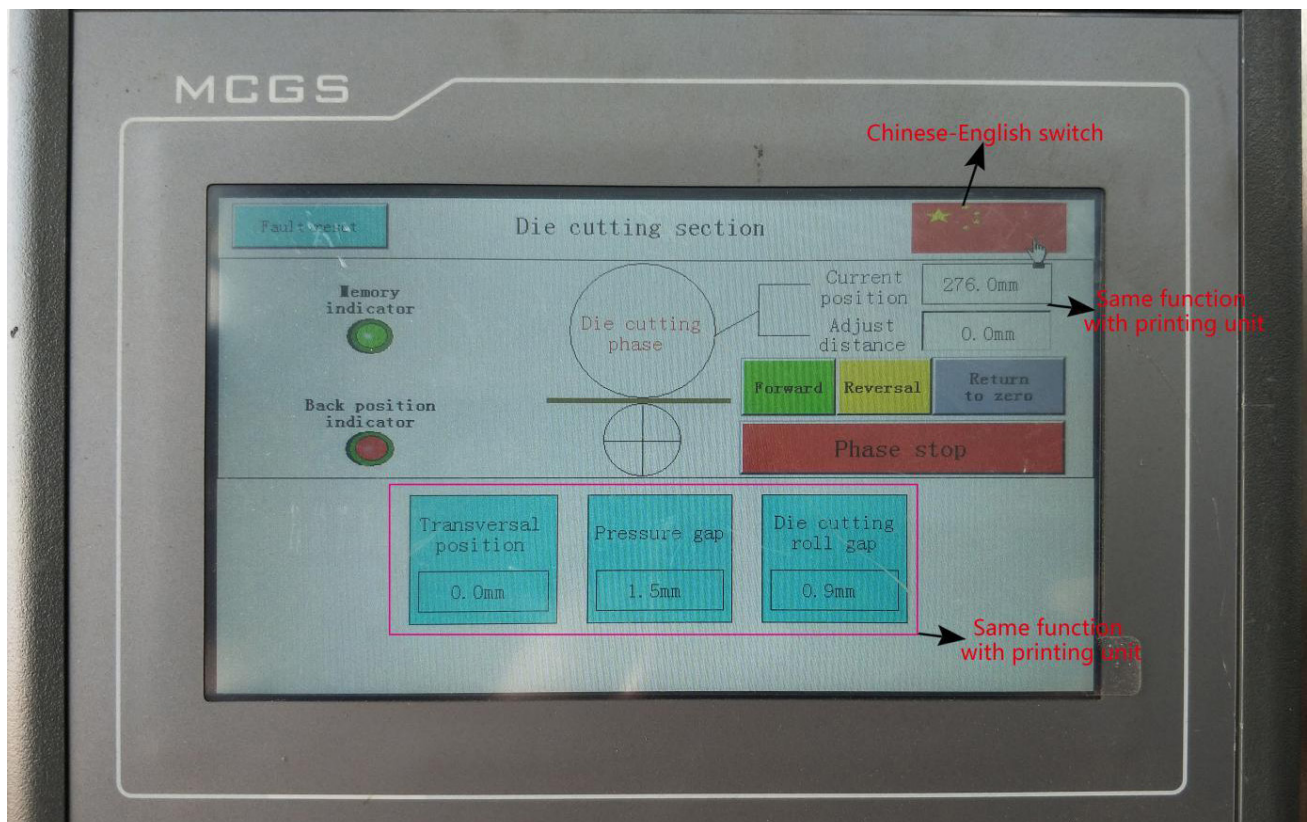
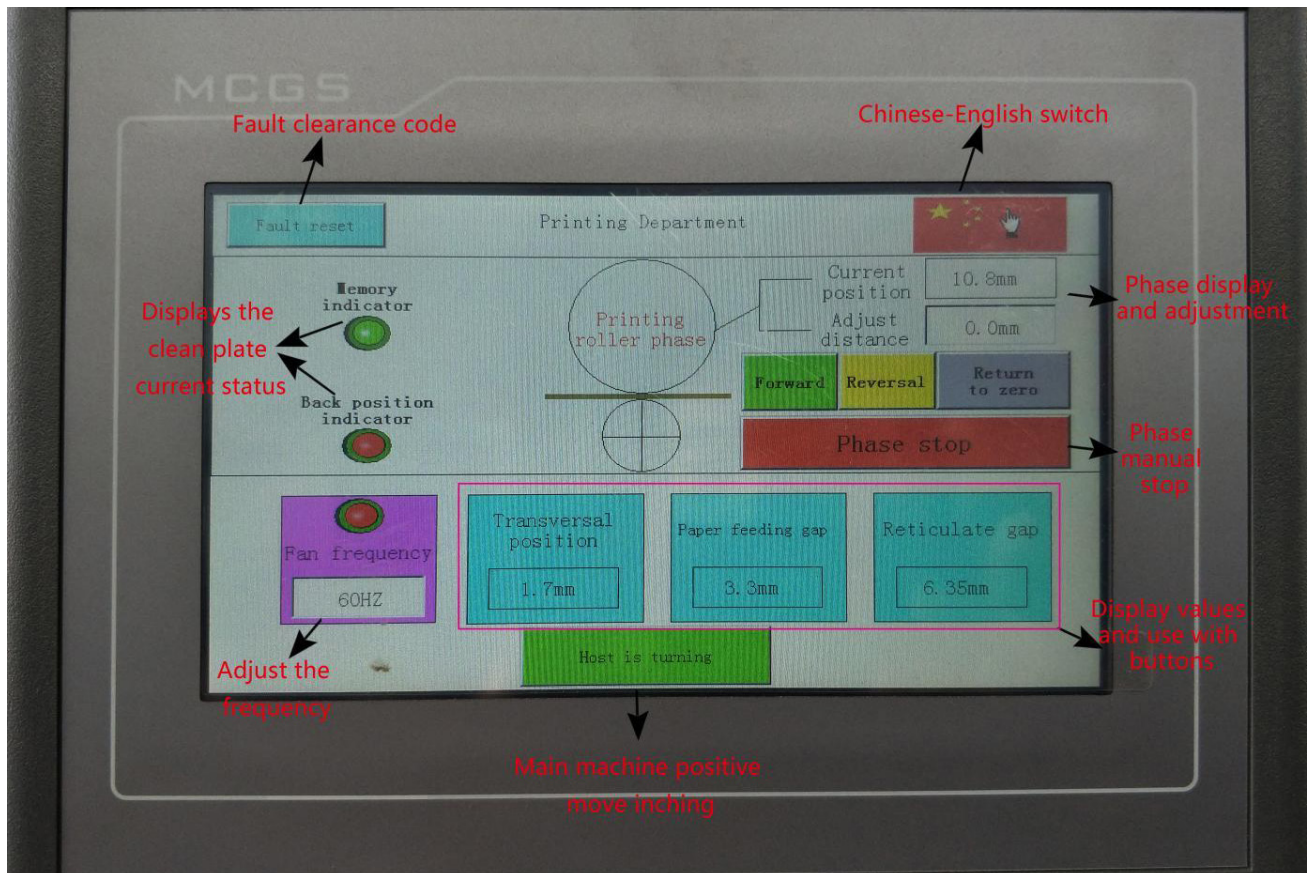
ELECTRIC EQUIPMENT OPERATION

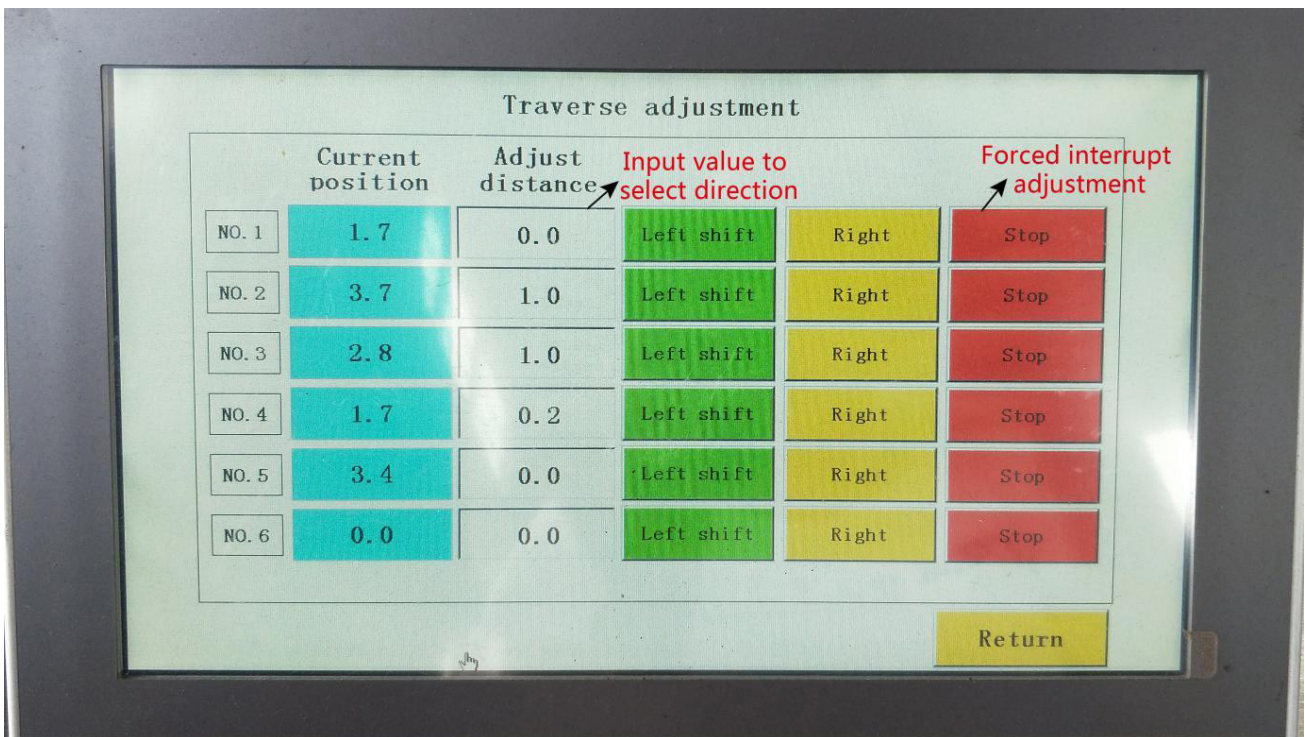
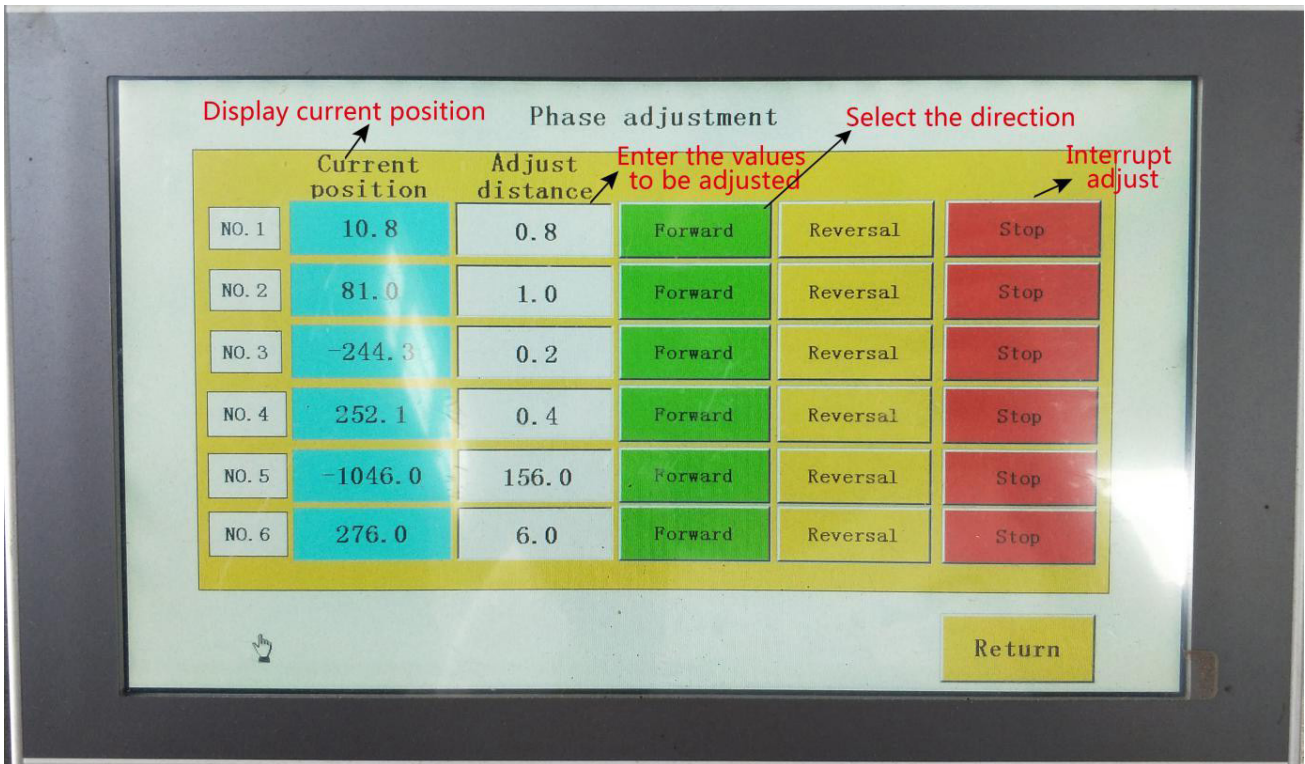
ELECTRIC EQUIPMENT OPERATION

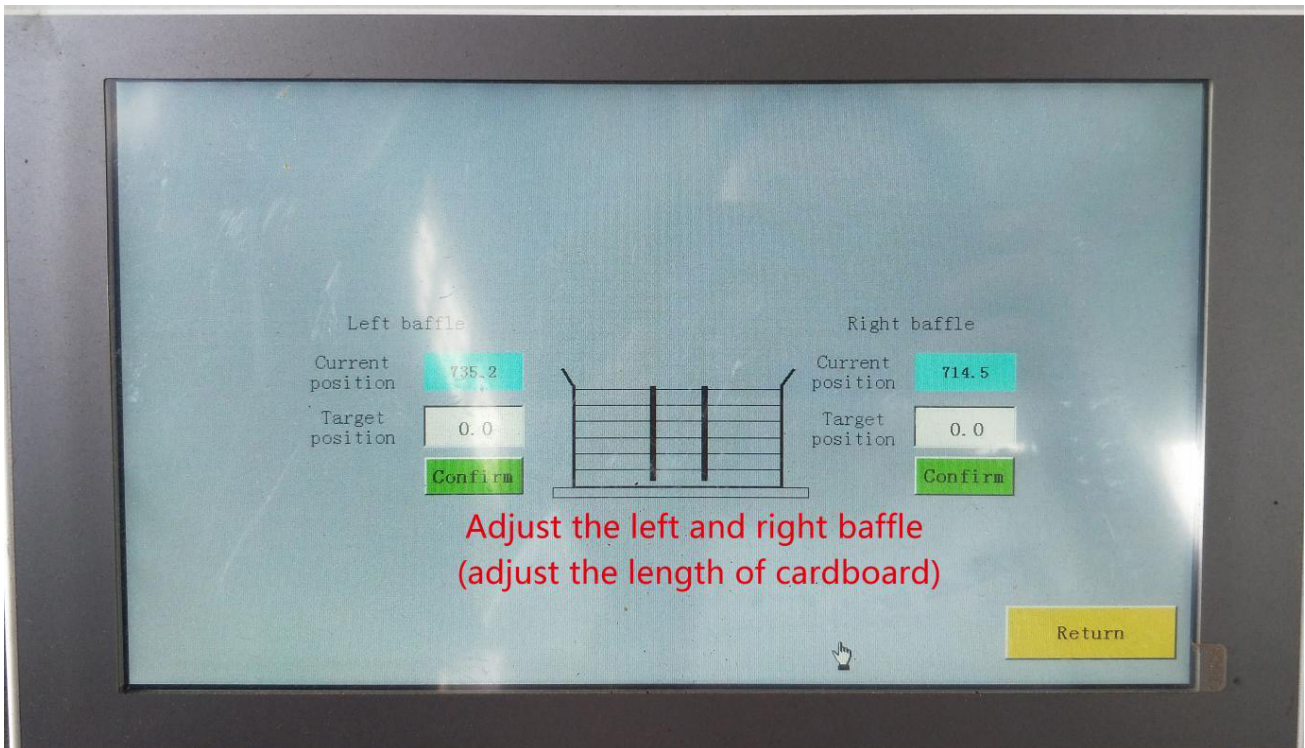
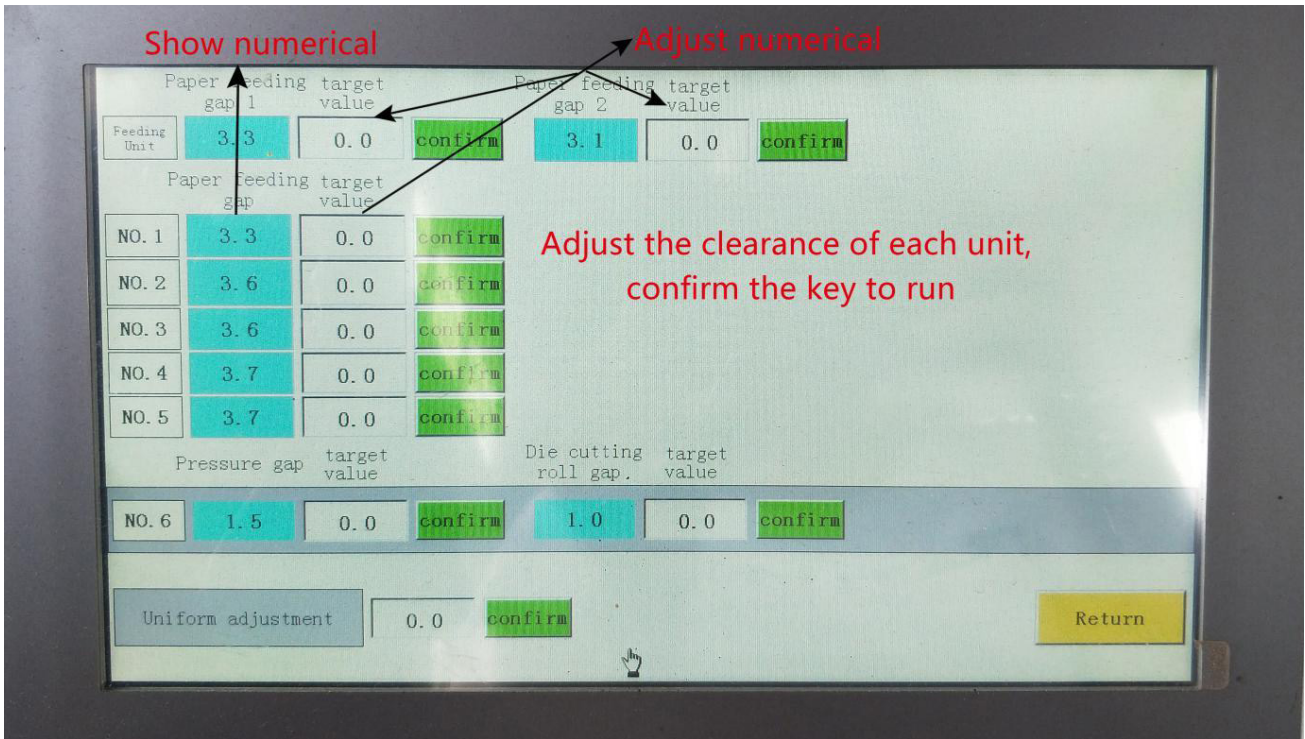
A) Machine Operation and Reminder

I. Feeder Unit:











Automatic Memory Function for Machine Return

The machine automatically memorizes its phase settings. Once the lock switch is loosened, the machine returns to its memorized phase settings after locking.

Order Storage Procedure

After hanging up the version on the machine and folding, adjust the first paper to zero. Stop after setting a single zero, and adjust the phase after stopping. After completing the version, input the order number and press the "Save Order" button to save the order.

When using the version, hang it up on the machine, fold, adjust the first paper to zero, set a single zero, and then stop. Input the order number, press the "Read According to Order Number" button to continue the order, and then press the version buttons.

After completing the version, proceed with paper printing.

Chapter 4:

MACHINE OPERATION

Note: All interval manual adjustment positions are required to be pulled out 30 mm before adjusting, and reset after adjustment to automatically self-lock.

A) Operation of Feeding Unit

- 1) Adjust the front door: It should be fixed in a proper place (approximately 70% of the width of the paperboard). The interval of the front door should be adjusted to 1.3 times the thickness of the paperboard.
- 2) Adjustment of the back baffle and feeding pushing board: When the paperboard is in place on the workbench, the interval between the front door and back baffle should be 1-2 mm larger than the paperboard. This allows the paperboard to be conveyed smoothly. A too large interval will cause excessive impulsion after the paperboard falls down on the feeding pushing board, leading to offside paperboard and feeding errors.
- 3) Side baffle: Adjust the side baffle to align it with the two sides of the paperboard.
- 4) Feeding roller: The lower feeding roller is a steel decorative pattern roller, and the upper roller is a rubber roller. Adjust the interval between the feeding rollers to ensure smooth paperboard delivery to the printing unit.
- 5) Adjustment of induced draft: To smoothly send the paperboard into the printing unit, this machine is equipped with an induced draft device. Proper wind force adsorbs the paperboard on the workbench, after which the paperboard is pushed into the feeding roller by the pushing board. The blowing rate is adjusted by the ventilation door and should be adjusted according to the thickness, size, and quality of the paperboard.

B) Operation of Printing Unit

- 1) Paper feeding press roller: The lower roller is a decorative pattern steel roller, and the upper feeding roller is a pressure wheel with a decorative pattern. Adjust the intervals between them to enable feeding. Adjust the gap between the printing plate and pressure roller of the printing carrier roller to achieve the desired printing effect. Typically, the intervals of pressure rollers should be about 0.3 mm less than the thickness of the cardboard. Additionally, for each color printing superposition, the pressure of the next color should be 0.05 mm greater than that of the former color.
- 2) Cylinder movement, controlled by an electromagnetic valve, can make the anilox roller contact or separate from the printing plate.
- 3) Hang plate: Press the printing edge by the press layer into the hang plate groove. Pay attention to the axial position of the design on the printing roller to ensure it meets the standard and that the plate's direction is correct. Generally, it should take the center of the printing roller as a standard. Then, rotate the printing roller counterclockwise for one circle, press the other side of the printing roller by the other end of the press block into the groove of the ratchet shaft, and then use a spanner to screw the hexagon head of the ratchet wheel mechanism clockwise.
- 4) Ink scraper: On the front panel with a knob screw to feed, check if the pressure gauge is at a normal pressure, then turn the knob screw to apply ink.
- 5) Washing ink: Stop the ink, then screw the knob to release the ink, and open the cleaning knob.

Open the ink pump to discharge waste water. After cleaning, open the bag, and the cleaning scraper will be clean.

6) Trimming of printing rollers: The trimming of printing rollers should be controlled within a 4 mm diameter. For detailed information, refer to Appendix C printing unit rubber roller.

C) Operation of Slotting Unit

1) Function: This machine can operate creasing lines, slotting, corner cutting, and overlapping.

2) Electric tool setting:

1. The knife into the groove can be horizontally blade-adjusted (can be automatically or manually adjusted).
2. Cases of high adjustment (automatic or manual).
3. Line pressing can be adjusted, and tool setting transverse one time.

3) Adjustment of creasing wheel: Positioning of creasing will be finished simultaneously with the adjustment of slotting size. Adjust the depth of creasing through worm gear as a manual adjustment and adjust intervals by eccentric gear and marked.

4) Adjustment of lower cutter: The intervals between the upper and lower cutters differ for 3-ply and 5-ply cardboard. The interval for 3-ply is smaller than that for 5-ply, as the die cutter stand has the function of cutting and feeding paperboard. Interval adjustment can be realized by manual eccentric gear and marked. Pay attention to the position of the corner cutter, and if trimming or adding cushion is necessary, ensure not to strike the surface of the cutter stand.

5) Adjustment of paper feeding creasing wheel: There are two creasing wheels between creasing and slotting to make feeding paperboard convenient. Intervals are manually eccentric adjusted and marked.

6) Linkage adjustment: Loosen the screw of each cutter of slotting and corner cutting, adjust the upper cutter stand of slotting and corner cutting by a dedicated spanner, and the upper and lower cutting stands of slotting and corner cutting will be linkage adjusted simultaneously with the creasing cutting stand when slotting upper cutter into slotting lower cutter.

D) Operation of Die-Cutting Unit

1) Function: The function of the die-cutting department is to cut the corrugated paperboard according to requirements using the cutter fixed in the die-plate, in order to obtain the required form and transform the paperboard for the next stacking process.

2) The choice of the template thickness: The thickness of the cardboard determines the thickness of the template. In general, for 3-ply cardboard, a 13 mm wooden template is used, while for 5 or 7 ply cardboard, a 16 mm wooden template is recommended.

3) The axial movement of the rubber cushion roller: The lateral movement of the cutting board roller is controlled by a hydraulic cylinder, with a lateral movement limit of ± 30 mm. To prevent premature damage to the rubber cushion, the cutting board will move axially about 0.1 mm or so for each rotation of the cycle.

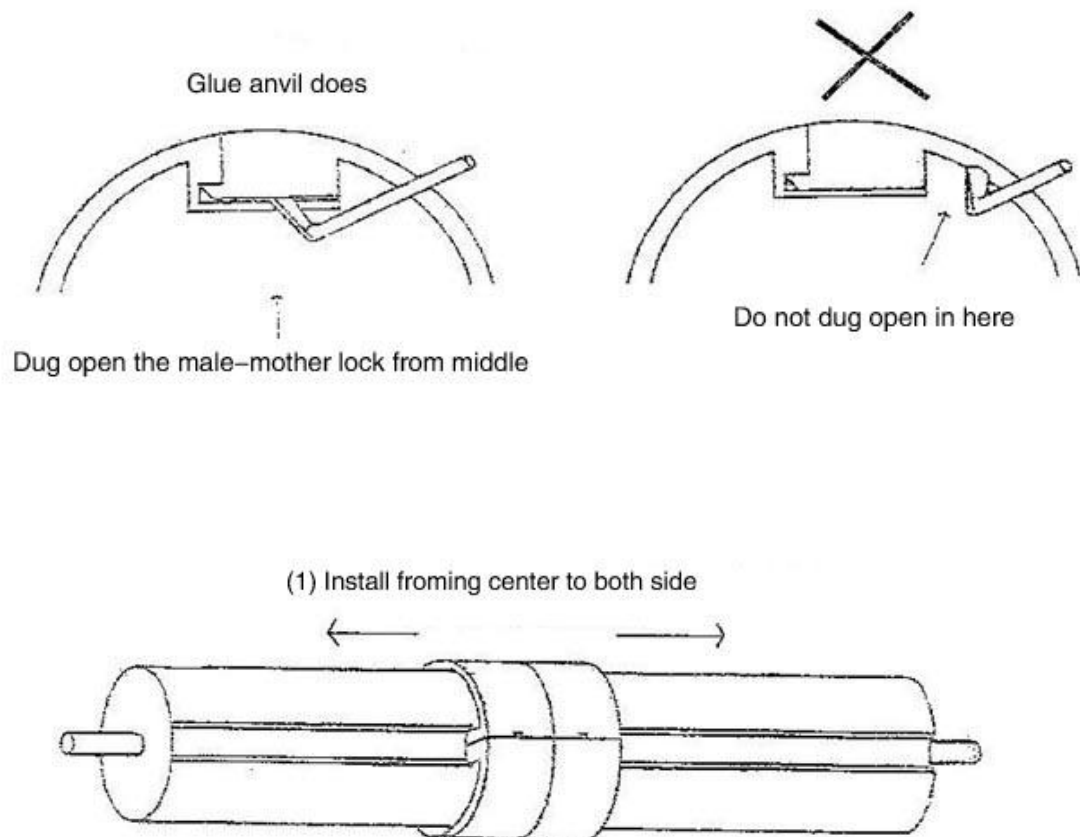
4) Wood formwork making and installation

Please refer to the Appendix Die cutter die roller chart when making wood formwork, and also consider the $\pm 7\text{mm}$ crosswise and axial movement of the machine. If the slotting unit is used simultaneously, take into account the crosswise movement of the slotting cutter and the positioning of the left and right baffles of the front feeding.

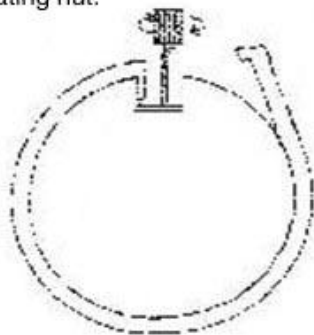
The formwork used in the die-cutting unit is highly precise. Generally, provide the design and carton sample to a specialized manufacturer to purchase the formwork. Therefore, the technology will not be explained here.

The initial requirement is that the mounting holes of the wood formwork should be coordinated with the screw hole positions of the cutting die roller. Align the centerline of the formwork with the centerline of the rotary drum, and then install the formwork onto the cutting die roller using screws. The crosswise moving mechanism, driven by an electric motor, adjusts the axial movement of the cutting die to coordinate with the printing unit.

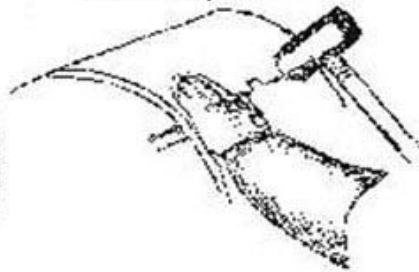
5) Installation of the rubber cushion: The installation of the rubber cushion is straightforward; simply follow the instructions provided in the accompanying drawings



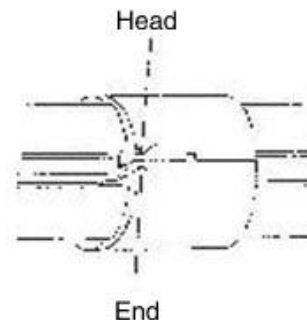
(2). Do not use too vigorously rotating nut.



(3) Tools should be put in the trench with hammer to buckle into the template

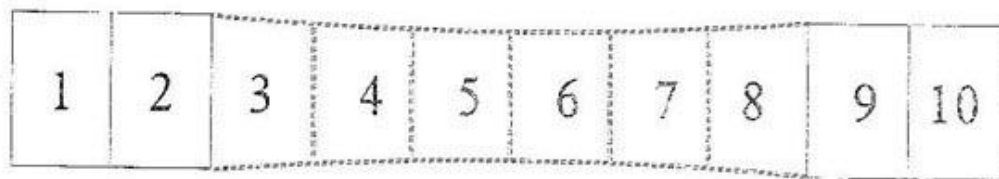


(4) Check horizontal from the side a relatively

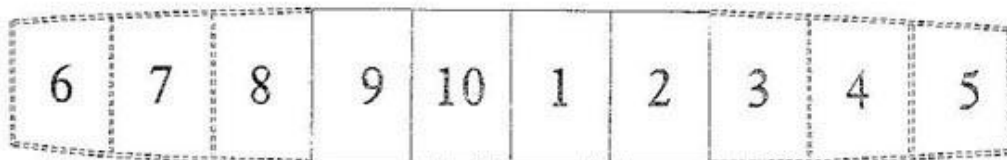


Adjustment of the rubber cushion can be carried out according to the following instructions. (Because the number of cutters varies on different cutting dies, the decision to replace it with a new one should be made by the operating engineer. According to reference data, it can be replaced based on the situation and can be used more than 100,000 times.)

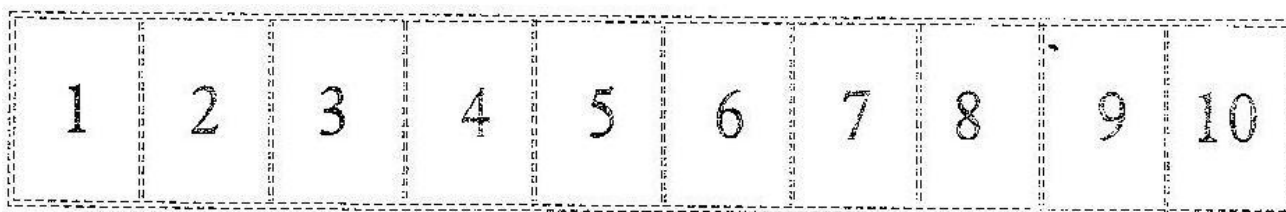
1. Exchange 3 4 5 6 7 8 all the surface into feltfinsh



2. After exchanged all the used glue anvil does install on the both sides of roller, 6 7 8 3 4 5 , 9 10 1 2 are installed in the middle.



Use trimming blade to trim the rubber cushion when the following state appears.



Rubber cushion is made from synthetic rubber, and when the die cutter cuts into it for about 1.5mm, it is proper. The deeper it cuts, the shorter the life of the rubber cushion. When installing a new rubber cushion, be sure to adjust the cutting intervals accordingly.

Chapter 5: ADJUSTMENT OF PRINTING MACHINE

A) Power and Compressed Air

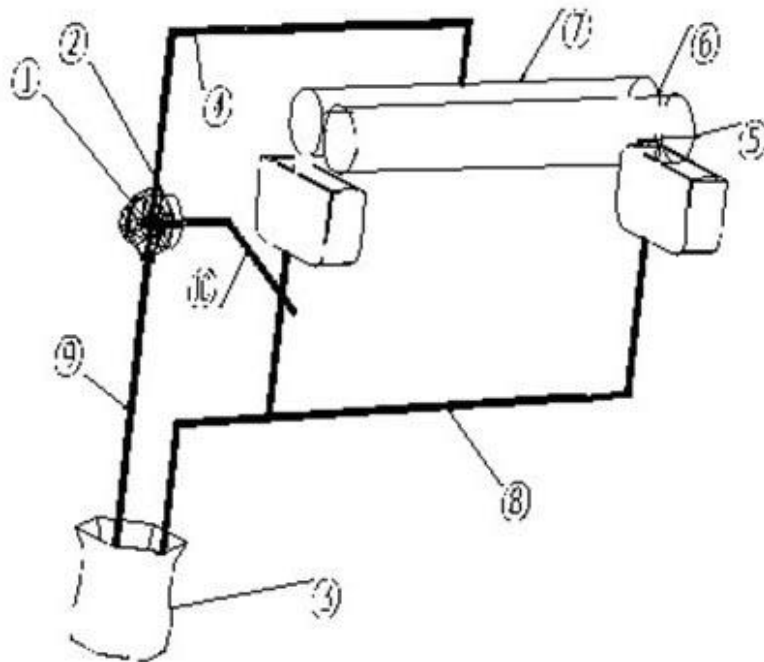
Press the "on" switch on the main operation panel to connect the power (before pressing this button, carefully check if all switches are connected). Open the air compressor switch and let it work for some time to ensure that the pressure in the air storage tank is within the range of 8-10kg/cm², guaranteeing gas supply to each part.

B) The Adjustment of Inking Roller and Ink Squeegee Roller (Rubber)

Prepare quick-drying ink, 8-15kg per color. Stir the ink in the tank thoroughly, then pour it into a prepared barrel. The ink should fill about 80% of the barrel's volume. Place the barrel in the appropriate position of the printing unit and insert a soft pipe into it.

Adjustment of Squeegee (Rubber) Roller: The spacing between the ink (anilox) roller and the squeegee (rubber) roller is adjusted using the squeegee roller adjustment mechanism. The interval between the two rollers should be 0. (Note: When there is no space between the two rollers and there is no ink or water in the machine, do not run the roller or start the machine, as the squeegee roller will be damaged.)

C) Ink Supply System



- 1. Ink Pump
- 2. Ink Regulator
- 3. Ink Box
- 4. Ink ridges
- 5. Inker
- 6. Drum Gap
- 7. Roller
- 8. Return Pipe
- 9. Absorbing Ink Hard Ridge
- 10. Intake-tube

Ink pump is the main component responsible for supplying ink during printing. If the ink pump does not work after being connected to air, please place your finger on the vent of the pump for 2-3 seconds. Repeat this operation 3-4 times, and then the ink pump will start. The volume of ink supply can be adjusted by the control valve (2).

If the throw of the ink pump is too large, the compressed air will not be sufficient, resulting in abnormal operation of other pneumatic parts and the main machine. Therefore, the throw of the

pump should be adjusted to an ideal position

If the ink flowing to the anilox roller and rubber roller is too much, ink will overflow and stain the machine, so the optimal diameter of the ink column flow is 1 - 1.5 cm.

Ink on the Steps

- I. The first exhaust switch is closed, adjusting the pressure valve to the minimum pressure to prevent ink leakage.
- II. Start the diaphragm pump for the ink, initially operating the pump quickly for 30 to 40 minutes, ensuring smooth inking by performing the process every two minutes, approximately 15 to 20 times per minute.
- III. When some ink has accumulated in the scraping cavity, activate the motion of the anilox roll (using the anilox roll delay rotation function, approximately 10 to 20 seconds) to prevent the scraper and the anilox roller from drying out and causing a jam.

Scraping cavity cleaning process

- I. Rapidly recover the ink scraping cavity.
- II. Replace the ink with cleaning fluid, opening the diaphragm pump fully and injecting cleaning fluid into the scraper cavity for about 3-5 minutes.
- III. Switch to clean water as the cleaning fluid, rapidly injecting it into the scraper cavity while simultaneously starting the automatic cleaning system to let the dirty water flow directly into the sewage tank. The hydraulic control of the automatic cleaning system operates at 15 to 25 psi, as excessive pressure can damage the sprinkler head. The water temperature should be maintained between 105-110 degrees Fahrenheit.
- IV. Once the dirty water has completely cleared and the color of the anilox roll has returned to its original state, stop the rotation of the anilox roll as soon as the water flows over its end.
- V. Open the beat exhaust switch and the scraper, wipe any remaining water with a dry cloth to clean the residual ink from the scraper cavity. The entire cleaning process is now complete.

D) The Adjustment of Ink Roller and Preparation of Printing Plate

Check if the interval between the squeegee roller and ink roller is adjusted correctly, and ensure that the ink is evenly distributed on the surface of the ink roller.

While the main machine is running, turn the adjustment axle through the handle of the rotation wheel to bring the ink roller close to the printing plate. Observe carefully to ensure that the ink is evenly distributed onto the printing plate.

E) Test Printing

Test printing can be conducted once each part of the machine is adjusted properly. Print one or two pieces of paper and check the printing chromatograph and slotting position.

F) Continuous Feeding

- I. Stack paperboard on the feeding workbench. The average height of the paperboard stack should be about 400mm. Ensure that the height is not too high, as this may cause feeding

errors.

II. Operate the machine and feed paper for printing according to the above procedure. Please do not speed up or slow down the printing speed; the normal speed will bring the best printing effect.

III. If chromatography or slotting show serious imbalance, this error may be caused by paperboard sliding. Please check the printing plate and the interval of feeding rollers.

G) Operation Speed

I. Accelerate the working speed of the printing machine gradually. Please do not accelerate the working speed abruptly in order to prolong the service life of the machine and enhance the quality of printing.

II. It is better to adopt a proper and balanced printing speed according to paper size, paper quality, and printing situation. This kind of operation will achieve the best printing effect. Sometimes, although the speed is slightly higher than normal, if the conveyor is faulty and the paper is forced to retreat or if the chromatograph is disordered, it can result in decreased production efficiency instead of an increase.

III. Speed of operation and printing concentration: The discharge rate of ink will change along with the printing speed due to the characteristics of quick printing, resulting in the ink on the printing paper appearing darker or lighter. The darkness and lightness of the color of the printing plate are adjusted by adjusting the viscosity of the ink instead of adjusting the quantity of ink.

Chapter 6:

MAINTENANCE OF MACHINE

The machine is always working in automatic control status. If there is not enough maintenance and inspection, the precision of the machine will be affected, resulting in a reduction in printing quality and a shortened service life. The requirements for maintenance and inspection are as follows:

A) General Rules of Maintenance

Danger

During machine maintenance, to prevent other operators from inadvertently turning on the power switch or touching buttons on the panel, which may lead to unnecessary injuries, please display a clear notice board stating "Machine under maintenance! Do not touch!"

Do not move photoelectric switches, transducers, or any other devices without obtaining approval from our company.

Alarm

Only qualified electric maintenance personnel are permitted to work on the electric components of this machine. Commonly used and consumable parts, such as fuse tubes and spare parts provided by our company, should be replaced in a timely manner.

When performing maintenance at elevated locations, ensure to wear protective shoes and helmets.

Upon completion of maintenance, please close the covers as they were before. Clean the work area, remove the notice board, clear any obstacles from the aisle or floor, and wipe any water or oil spills to maintain a clean and safe working environment.

Follow the maintenance procedures outlined in the operation manual. Contact our company if you have any questions.

Notice

Inspect the machine's status after maintenance with the responsible person.

Record the maintenance content and results, report them to the responsible person, and securely store the record after obtaining approval. This record will serve as a basis for analyzing and investigating any accidents that may occur later.

Danger

Safety regulations during maintenance operation: Operators must adhere to operational regulations while conducting maintenance. Special reminder: Avoid direct contact with moving parts of the machine with your hands. Activate the emergency stop self-lock switch before entering the machine. Be mindful of your hands to prevent them from being caught. When standing on the machine, ensure

to prevent any slipping.

Analyze the records at fixed intervals and identify potential accidents.

B) Routine Maintenance

Every piece of equipment is comprised of thousands of parts, including many moving components such as bearings, gears, racks, chains, sliding rails, feathers, lead screws, and sliding bearings. To ensure these parts function properly and extend their service life, they must be kept clean and well-lubricated. Proper maintenance is the primary guarantee of high production efficiency and the production of quality products. It also reduces repair and production costs, minimizes downtime, and increases utilization rates. The cleanliness of the machine reflects the company's image and the professionalism of machine operators. Therefore, performing machine maintenance well is the responsibility of every operator.

I. Refueling various machines

Use 68# machine oil for all types of gearboxes, reducer boxes, racks, and guide rails. Use 3# calcium-based oil for all types of bearings with lubricating nipples. Use different compressor oils for the air compressor according to local climate and seasonal variations.

II. Tools used in machine maintenance

1. Oiler
2. Fuel truck nozzle
3. Long-handled hairbrush
4. Cloth
5. Plain-end scraper knife
6. Besom
7. Other dedicated tools, etc.

III. Cleaning agents used in maintenance

Use cleaning essence for the ink recycling system, diluted alkaline solution (concentration: 5%) for stainless steel plates, machine oil, and cleaning essence for all types of axles, as well as the painted surface of the machine. Avoid applying alkaline solution to axles and painted surfaces.

IV. Proper volume of refueling

When adding machine oil, fill the grease cup completely. Add oil to the level between the upper and lower bounds of the oil immersion lens of the gearbox and reducer. The standard for adding oil to sliding rails is that the oil should not overflow.

When adding grease, if the bearing is visible, add grease until it is forced out of the bearing; if the

bearings are not visible, use the fuel truck nozzle to inject grease 15 times.

V. Refueling Period

Machine oil should be added twice (once in the morning and once at noon). Check the oil level in the reducer box; add oil if it is insufficient and change it completely every six months. Grease should be added every two weeks.

VI. Correct Use of Pneumatic System

Adjust the barometric switch of the air compressor to 0.9 Mpa, and the general pressure regulating valve to 0.5-0.6 Mpa. Open the bottom valve of the air compressor to drain water daily, and open the gas-water separator to drain water. Check the oil level in the oil sprayer; add oil if it is insufficient. Regularly inspect the air compressing pipeline, valves, and cylinders for leaks (apply soapy water to check). Repair any issues promptly and record them in the equipment operation notebook. Check the oil level in the crankcase of the air compressor daily; add compressor oil if necessary. Clean the air filter of the compressor monthly.

VII. Screw Usage

Choose the appropriate length of screw. Using screws that are too long can prevent parts from locking to the end, which may cause screw slippage or part cracking. Screws that are too short may not provide sufficient locking force, leading to loosening and potential danger. Use a solid wrench to tighten hex nuts, ensuring that the size is correct when using an adjustable spanner to prevent slippage. When tightening inner hexagonal screws, ensure that the inner hexagon is free of debris and avoid using a worn screwdriver.

VIII. Adjusting Size

Do not attempt to adjust the size forcefully with hard objects. Use a wooden or rubber mallet when necessary.

IX. Electric Motor

Ensure that the electric motor is not covered by debris, as it will affect heat dissipation.

X. Electric Buttons

Press or turn all electric buttons lightly; ensure that electrified parts are not exposed to water or machine oil to prevent short circuits and potential danger.

XI. Part Replacement

Pay attention to the original orientation of the parts being replaced; do not install them oppositely

or with excessive error. Ensure that the installation surface is dry, choose the appropriate length of screw, and do not over-tighten when fastening the screw.

XII. Record Keeping

The general inspection, operation, and shift notebook of each machine should record the operational status daily.

C) Maintenance of Each Unit

Maintenance of Feeding Unit

Name of Part	Handling Method
1. Rail, Rack	Clear paper scraps, sundries, and grease; keep it clean at all times.
2. Feeding Rubber Wheel	Remove the adhered sundries and add grease to the intermediate bearings.
3. Plenum	Open the machine cover, clear away paper scraps, sundries, and dust.
4. Adjusting screw rod of back clean paper baffle	Clear paper scraps and sundries; keep it clean at all times.
5. Fixing the draft of front and side paper baffle	Wipe it clean.
6. Upper and lower feeding rollers	Remove the adhered sundries; keep it clean at all times.
7. Transmission lead screw	Apply machine oil for lubrication.
8. Adjusting wheel (rod) of feeding roller interval	Apply lubricating oil or machine oil.
9. Main motor and induced draft motor, keep clean	Remove the adhered dirt; keep it clean at all times.

Maintenance of Printing Unit

Name of Part	Handling Method
1. Printing roller and each spindle nose at the end	Clear away viscose paper, ink and greasy dirt
2. Anilox roller	Use a stainless steel brush to clean, paying attention not to scratch the surface of the anilox roller, as it could lead to serious economic losses. In addition, do not use ammonia water as a cleaning agent, as it will corrode the copper contained in the matrix and cause damage to the anilox roller
3. Ink backflow pipeline	Remove for washing and cleaning every two months
4. Paper feeding wheel, press printing roller	Clear dirt
5. Machine bottom	Clear paper scrap and ink
6. Lubricating nipple of each bearing	Wipe away greasy dirt on the surface, and add grease

7. Interlocking mechanism of the machine	Add machine oil
8. Pneumatic system	Check for any air leakage in the pneumatic components of the joint
9. Ink filter	Wash the inner strainer after each use
10. Printing plate	Store it in a dry and well-ventilated place, avoiding folding, scratching, or contact with corrosive objects
11. Gear box	Add oil if it's insufficient during checking. Change completely every six months

Maintenance of Die-Cutting Unit

Name of Part	Handling Method
1. Die-cutting plate	Put it in a place where people cannot easily come into contact with it to avoid injury from the blade or damage to the blade or blade formwork
2. Rubber cushion	If it is too damaged, and the damaged condition in the middle and at the two ends of the rubber cushion are not the same, they can be exchanged
3. Gear box	Add oil if it's not enough, and change it completely every six months
4. Lubricating nipple of each bearing	Wipe the greasy dirt from the surface, and apply oil
5. Dirt on the movement of the rubber cushion, eccentric gear assembly	Clear away the sundries and greasy residue, and apply machine oil
6. Screw for crosswise movement at the end of the die-cutting roller axle	Apply grease
7. Die-cutting waste conveyor	Perform cleaning after each shift
8. Dirt on the floor under the machine	Clear away the sundries and grease
9. The surfaces of both sides of the machine	Clean the dirt from the surface

Chapter 7: INK AND PRINTING APPLICATION OF PLATE

Water-based ink has been applied to corrugated paper printing for a period of time abroad and for several decades in China. Corrugated paper printing has developed from letterpress printing, offset printing flexo format water washable printing to nowadays flexo format water-based printing. Flexo format water-based ink has developed from rosin maleic acid modified rosin series (low end) to Acrylic resin series (top grade). Printing plate material is undergoing a transition from rubber plate to rosin plate, and printing machines have evolved from big roller single color or double color to three-color or four-color high-speed printing machines. The anilox roller has gradually evolved from 150200 mesh metal roller to 180250 mesh ceramic roller. Along with the fast-changing printing technology, the usage skill of water-based ink is rather important. We should firstly understand the characteristics of water-based ink and the relationship and effect of all kinds of factors in printing. For example, plate material factor, paper factor, anilox factor, machine factor, ink factor, operator factor, and so on, before discussing the usage skills of water-based ink.

A) The Characteristics of Water-Based Ink (Corrugated Cardboard Use)

I. Classification of Water-Based Ink

Water-based ink is broadly categorized into two types:

A: Maleic rosin modified resin series

B: Acrylic resin series

II. Characteristics of the Two Types of Water-Based Ink

Varieties of project	Maleic rosin-modified resin series	acrylic resin series
Color	Generally, intensity of medium	Bright, good strength
Luster	good	good
Printing eligibility	Printing eligibility in general, the high demand for fine line design and full version print effect is not ideal.	Printing eligibility in general, the high demand for fine line design and full version print effect is not ideal.
Water resistant antifreeze	Poor (not suitable for freezing packaging and printing)	Strong, suitable for frozen packaging and printing.
Wear resistance	poor	optimal
The stability	Poor (volatile, stimulating odour, caking, foaming and swells)	good
Dry	slower	fast
Water mixing soluble	Flocculant in outdated water will appear	Infinite soluble in water
Chemical	No bacterial growth, the phenomenon such as stunk deterioration or corrosion of the metal cylinder	No bacterial growth, the phenomenon such as stunk deterioration or corrosion of the metal cylinder
Light, heat, drying	general	good
Viscosity (concentration)	high	low

Acidity (PH)	8~9	8~9.5
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B) The Various Factors Influencing the Corrugated Paper Printing

Film factors	- Does net Angle with cooperation - density/ - cable (mesh)/ - does steel point sharpness/ - does film deformation/ - smooth/sand grinding film
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	Plate making	- When plate making equipment - When exposure conditions - When the projection control - The drying temperature and time - Does the postprocessor
	Plate performance	- When hardness - When the depth of the plating - When location - Plating sharpness - When surface fault - Have risen, burst
Printing factors	Printing process	- When machine speed - When ink system - Does cannon rolling pressure - Bubble roll balance - Color printing order - When the viscosity
	Anilox roller	- Does type - When mesh - When ink quantity - Does eye eye shape - When loss - It was not clean condition
	Installed version	Strong degree of balance cushion
	substrates	- Does type - Does the color - It was not smoothness - When surface coating - Does water imbibition - It was not supporting force - Have other properties
Ink painting factors	- Does type - When the intensity of color - When the viscosity - It was not stability - It was not dry - When acid degree - Have other properties	

C) Flexible Version of the Processing Method and Requirement

I. Processing Method

- 1) During the transport and storage of unexposed flexible sheets of raw materials (pack), they should be placed flat on level ground.
- 2) Each stack of flexible plates should not exceed 14 boxes of the same size. It is suggested that every layout of 7 boxes should have plates of the same size.
- 3) In the case of different-sized packages, larger pieces should be placed at the bottom position, and layouts with plates of smaller sizes may be interspersed.
- 4) The temperature for storing the plates should be between 150°C and 200°C, with a humidity of 55%, to prevent exposure to direct sunlight or ultraviolet light.
- 5) Pay attention to not place other materials or debris on the flexible layouts, and particularly avoid sitting on the surface of the boxes.

II. Clear requirements of plating, reverse position deep enough

- 1) Clear texture with adequate depth in the reverse position.
- 2) The base should provide stability without being too thick or too thin.

- 3) Good resilience is necessary.
- 4) The hardness should be moderate.
- 5) The dot enlargement rate should be sufficient. The temperature for storing the plates should be between 150°C and 200°C, with a humidity of 55%, to prevent exposure to direct sunlight or ultraviolet light.
- 6) Pay attention to not place other materials or debris on the flexible layouts, and particularly avoid sitting on the surface of the boxes.

D) Requirements for Ink Performance

- I. When stirred after long-term storage and precipitation, ink should easily disperse.
- II. Ink should possess good fluidity and viscosity.
- III. Ink should exhibit good stability during storage.
- IV. Ink should dry quickly and properly.
- V. Ink should not have any adverse effects on the printing plate or machine.
- VI. Ink should not have a strong pungent odor.

E) Water-Based Ink Technical Parameters

- I. Viscosity (20 seconds + 5 seconds), Instruments: RLGOSHA CUP4 system from Japan. Note: Special ink should meet actual demand; the standard deviation should not exceed ± 2 seconds.
- II. Fineness: < 20 microns.
- III. pH Value: 8 ~ 9.5 (optimal range: 8.5 ~ 9.2). DIGITAL PH/MU METER SUNTEX TS - 1.
- IV. Color matching and standard edition approximation. Note: Test samples and standard sheets should show minimal color contrast when viewed through a 120 mesh color meter.
- V. Environmental compliance, meeting global packaging environmental protection standards.

F) Proper Use of Ink

- I. Stir ink thoroughly before use to ensure even distribution of water and ink.
- II. Store the ink balance in a covered and sealed container to prevent dust and drying.
- III. If the balance ink contains impurities, filter it before use with new ink.
- IV. Store ink away from high temperatures and direct sunlight; properly stored ink should remain

usable for up to a year.

V. If the ink density is slightly too high, add water as needed to adjust.

G) Ink Printing Bad Causes and Improving Measures

No.	Bad phenomenon on	reason	Countermeasures
1	Hue bad viscosity cannot achieve	1. ink viscosity is too low 2. printing ink separation and precipitation 3. plate material aging and loss of elasticity 4. ink transfer	1. add oil ink 2. printing ink tank shake well 3. replace the plate 4. check the drum and format
2	Bad viscosity cannot achieve	1. ink roll change color (note 1) 2. bubble 3. solvent evaporation 4. water dilute too much Again after	1. ink loop measurement (note 2) 2. add defoaming agent (note 3) 3. add special solvent 4. adding tackifier (note 4)
3	Molecularly imprinted dry slowly	1. ink viscosity is too high 2. ink layer is too thick 3. the ink dry bath 4. paper, water up too	1. diluted ink 2. decrease the amount of ink 3. adjust the ink dry bath 4. changing with good absorbent paper
4	Burrs produced	1. ink viscosity is too high 2. the ink drying too fast 3. roller and version of the pressure is too strong 4. paper powder mixed infiltration among them	1. to reduce the viscosity of appropriately 2. to join the slow drying agent, adjust the dry degree 3. adjust the exposure 4. with copper mesh filter
5	Poor abrasion resistance	1. the ink layer is too thick 2. printing ink drying too slow 3. paper burrs too much 4. ink film-forming performance is poor 5. ink abrasion resistance is poor	1. reduce the amount of ink 2. fast drying agent, adjust the dry degree 3. replace the paper 4. appropriate increase the film-forming resin content 5. appropriate increase the anti-wear dose
6	Thin shallow and text printing is not clear Version	1. the precision is bad 2. contact pressure is too strong 3. ink viscosity is too high 4. plate material aging and loss of elasticity	1. the correction of the layout is poor 2. adjust the exposure 3. adjust the viscosity 4. replace the plate
7	Board transfer bad	1. the low pressure seal No, bad version 2. the hardness 3. paper, the rise of water is too high 4. the abrasion of roller, and aging	1. increase the printing press 2. check the version of India (note 5) 3. use rise, special ink 4. check the drum (note 6)
8	Poor colour printing	1. the background and printing pressure is too strong 2. the background of the viscosity is too high 3. color ink drying is too slow 4. the background color is a bit deep 5. complexion surface tension is bigger 6, paper, penetration is poor	1, strengthen the coloring of the printing press (note 7) 2. reducing the viscosity of the base (8) 3. color ink dry degree to strengthen 4. the background should be a little shallow than color hue 5. improve complexion surface tension 6. replace good penetration of the paper
9	Bubble of produce	1. ink bubble and foam suppression 2. printing ink lack of circulation 3. printing ink in the tube into the air 4. ink viscosity is too high	1. the additional defoaming agent 2. add ink circulation 3. try to avoid return line in the ink 4. ink viscosity reduced a little
10	The printing surface of the water	1. low viscosity printing, coating is too thick 2. printing ink excessive dilution 3. bad absorbent paper 4. bad liquidity	1. add oil ink 2. adding tackifier or oil ink 3. replace the ink

11	Plug version	1. ink illiquid (note 9) 2. printing ink drying too fast 3. poor stability of ink 4. ink infiltrate paper powder and dust 5. ink viscosity is too high	1. change the ink quality 2. to join the slow drying agent 3. adjust the ink stability 4. ink filter with 100 mesh copper mesh 5. to reduce the viscosity
12	Spots appear	1. defoaming agent to add too much 2. printing ink printing ink film is too thin 3. ink viscosity is too low	1. pay attention to right amount add 2. printing ink to join 3. printing ink to join
13	Dent phenomenon on	1. the layout is uneven 2. paper is too thin, uneven between corrugated 3. plate cylinder bad operation 4. the version, roller and printing pressure is too big 5. ink viscosity is too low	1. to cushion method, fixed format level 2. change the paper, adopting the series heavy paper 3. adjust the plate cylinder 4. strengthening type and roller coincide 5. viscosity increase
14	Gel ink	1. solvent use 2. his brand ink 3. preservation is not appropriate 4. ink quality is bad	1. using special solvents 2. should check before mixing 3. seal preservation 4. replace the ink
15	The poor tolerance of print	1. poor light fastness 2. poor water resistance 3. poor wear resistance	1. select the appropriate ink 2. choose the appropriate printing ink 3. select the appropriate ink
16	Not easy to clean	1. printing ink drying too fast Version 2. into the place too long 3. ink absorption good adhesion	1. using slow drying of printing ink 2. quickly clean 3. the use of MF - cleaning agent
17	High water paper printing	1. ink viscosity is too low 2. printing ink of eligibility is not enough	1. ink viscosity increased 2. to reduce the ink surface tension
18	Pour water on the cardboard printing	1. cardboard water resistance is too strong 2. printing ink viscosity is too low	1. ink viscosity increased 2. add a certain proportion of penetrant in ink 3. to reduce the printing speed

Note:

I. Ink usually loses viscosity when stirred, but allowing it to stand for a period of time will help restore viscosity.

II. Allow the ink tank to circulate for about 5 minutes after determining the loop.

III. Pay attention to dosage, typically 0.2 ~ 0.5% of ink volume.

IV. When adding tackifier, ensure thorough mixing until the desired viscosity is achieved.

V. The hardness of the rubber plate should ideally be within 420 ± 30 when printing width is considered; for finer text or dots, it should be around 600-30.

VI. The aging of the rubber trunk results in the loss of elasticity, while abrasion of the Anilox - Rdler mesh can occur.

VII. Aim to minimize the decrease in printing pressure at the base.

VIII. The viscosity difference between two colors should be at least 5 seconds.

IX. Liquidity refers to the ink's correct pressure and friction velocity.

X. Ink stability is optimal when the pH value falls between 8 and 9.2.

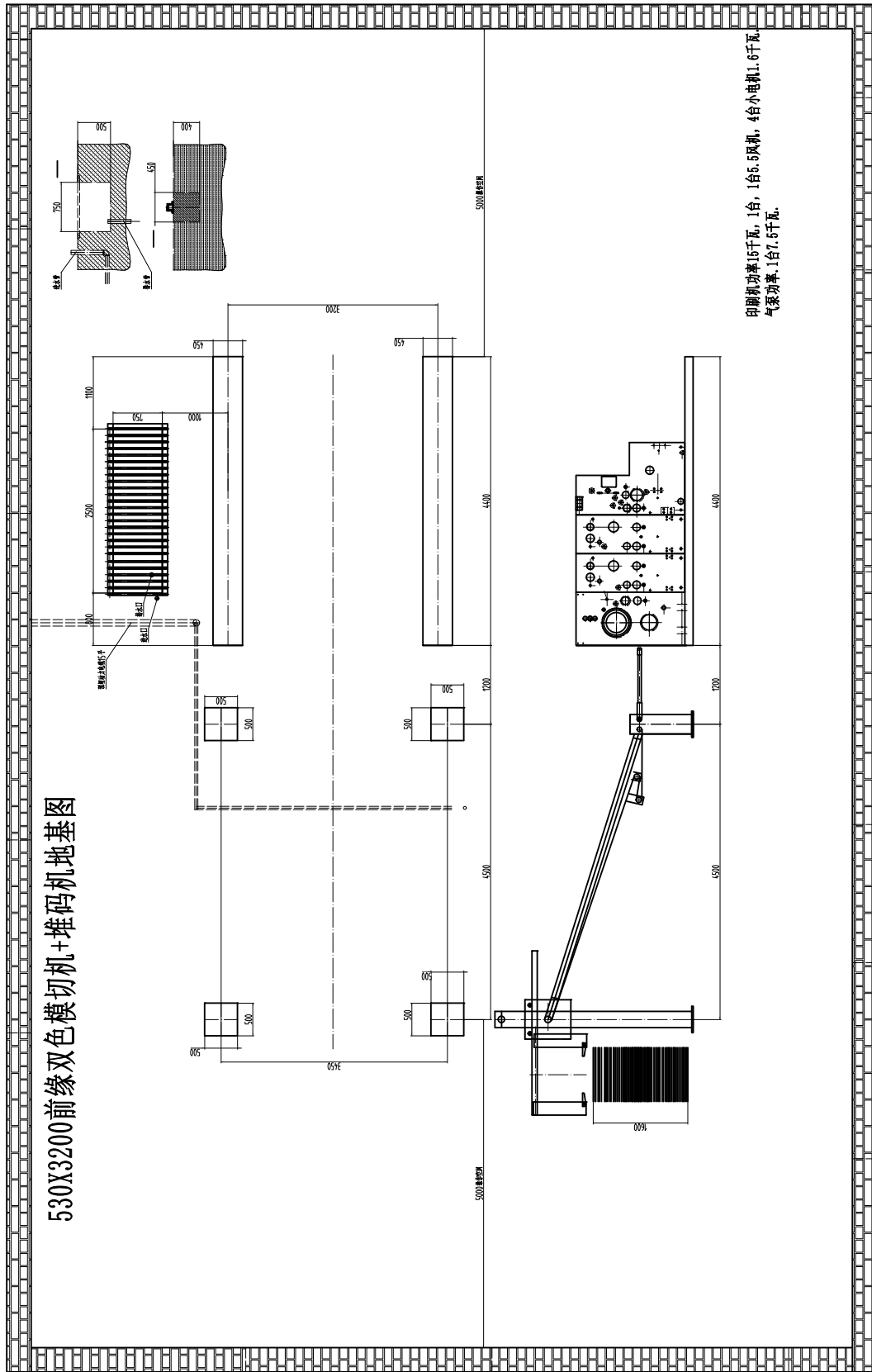
H) Conclusion

To sum up, the quality of corrugated cardboard printing depends on many factors, with the use of ink and skill being particularly important. With rapid advancements in printing technology and equipment, water-based ink is moving towards higher concentration, lower viscosity, and reduced volatility, while also exhibiting strong permeability. The achievement of multi-color overprint with a sense of depth is now within reach.

Chapter 8:

LAYOUT

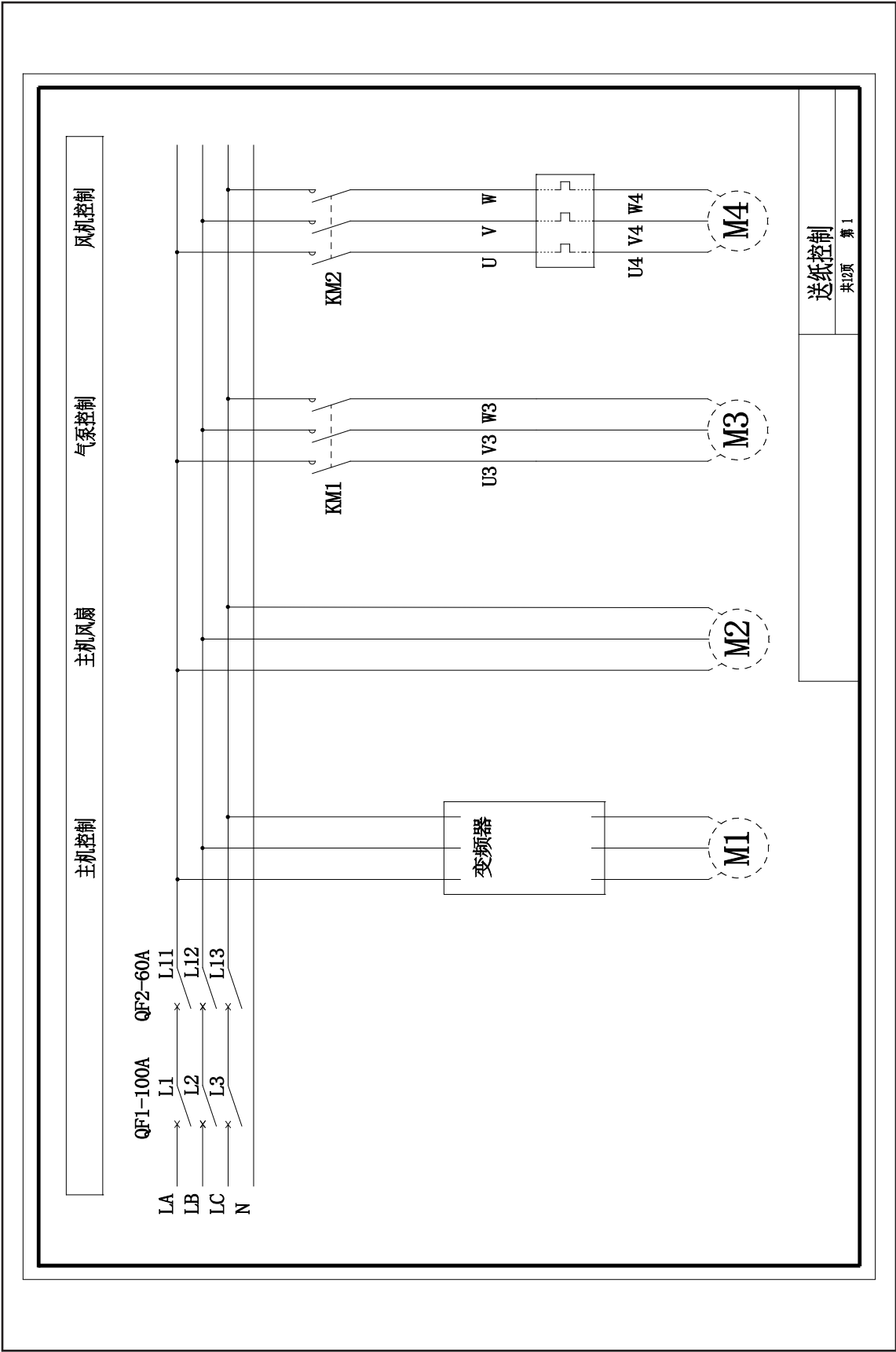
530X3200前缘双色模切机+堆码机地基图

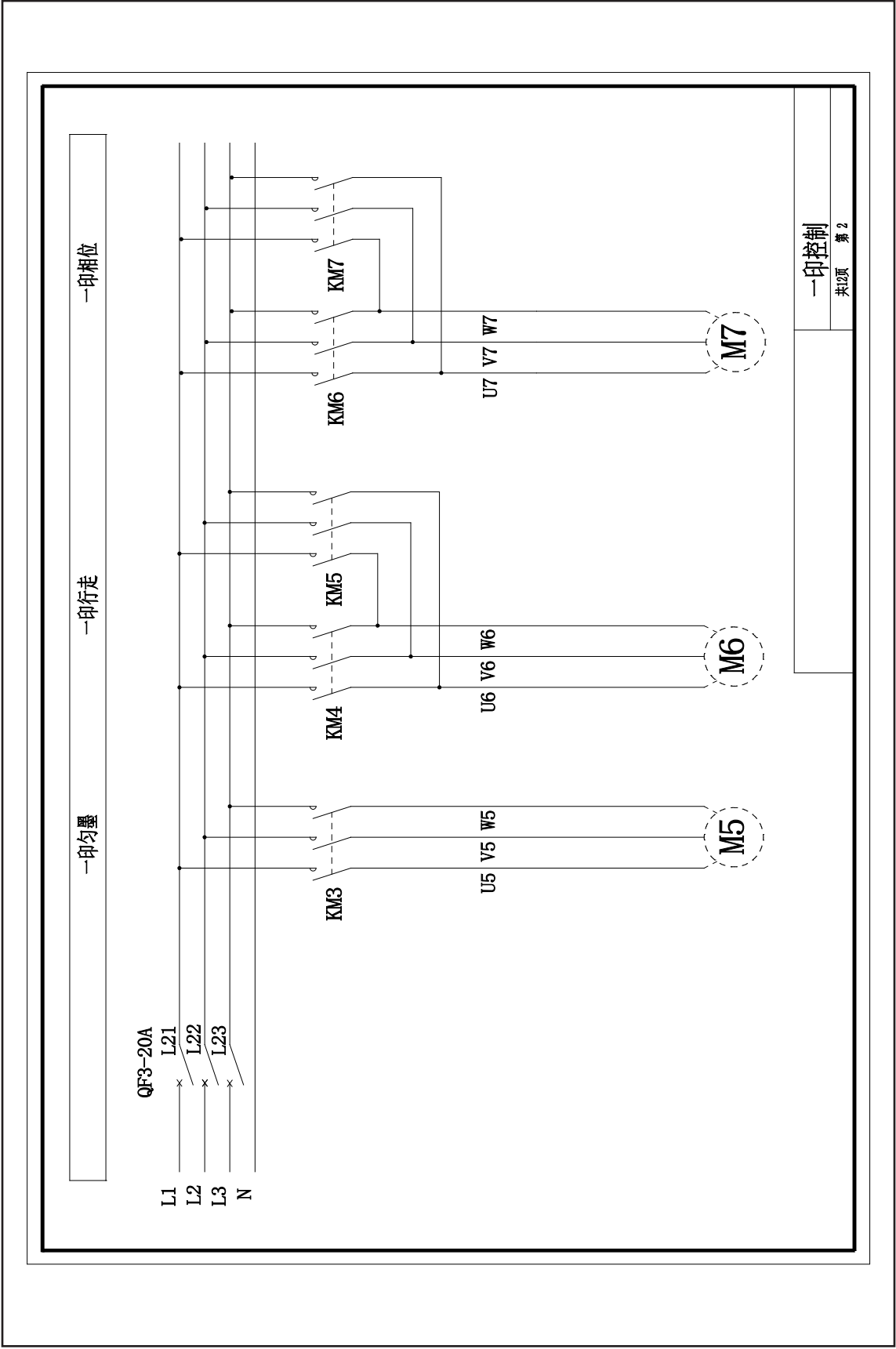


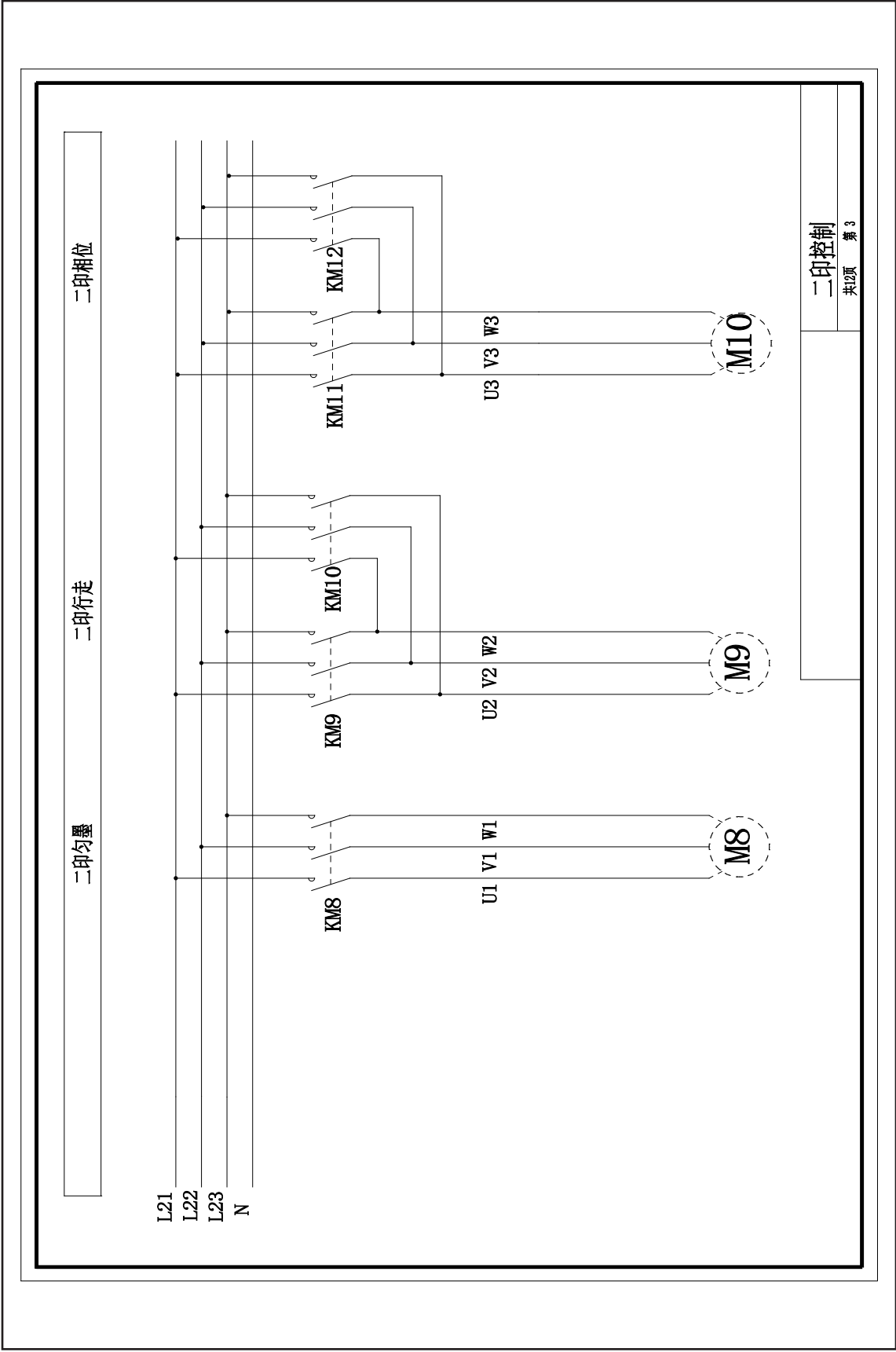
Chapter 9:

ELECTRICAL DIAGRAMS

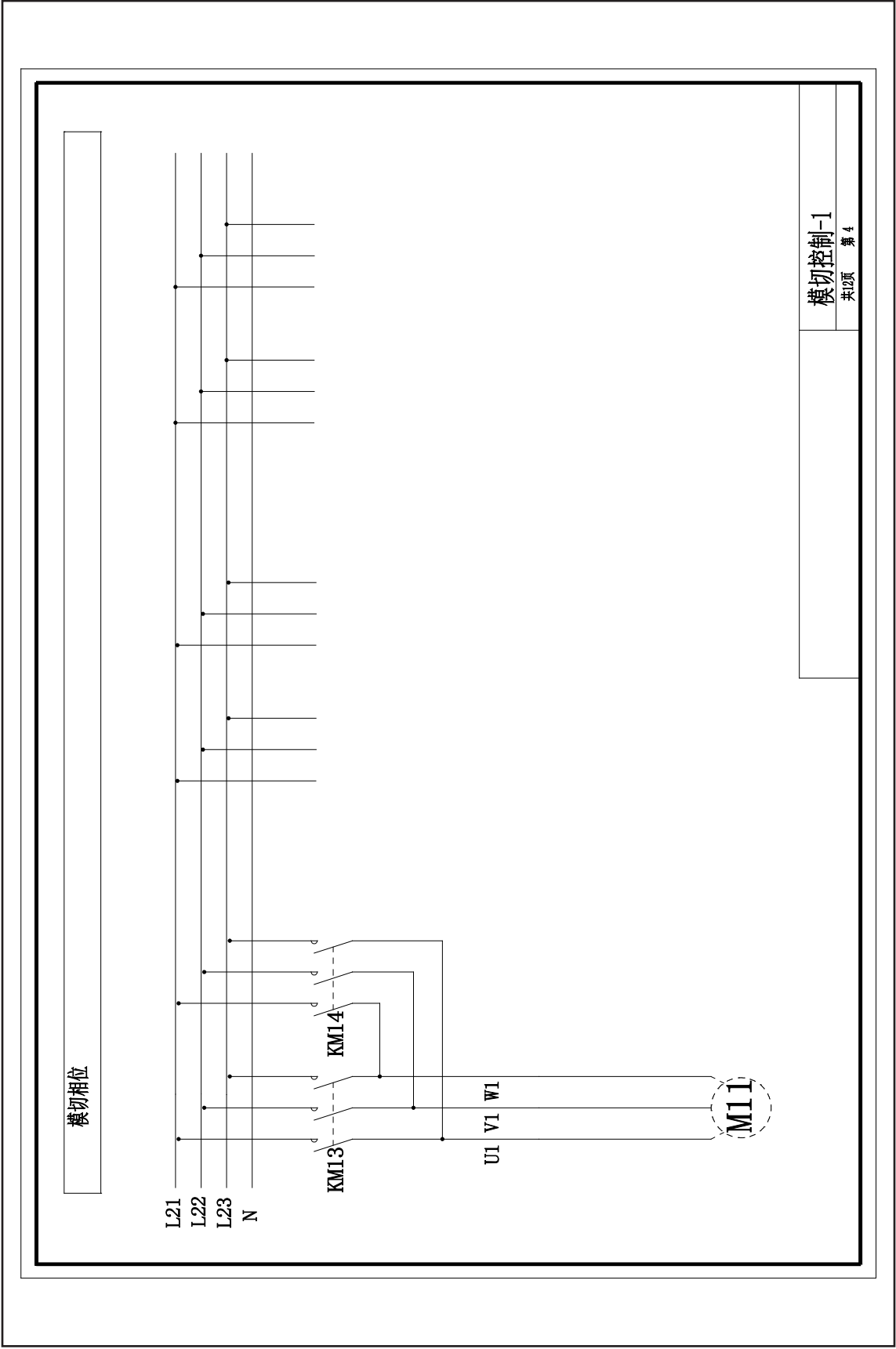
Electrical Diagram #1

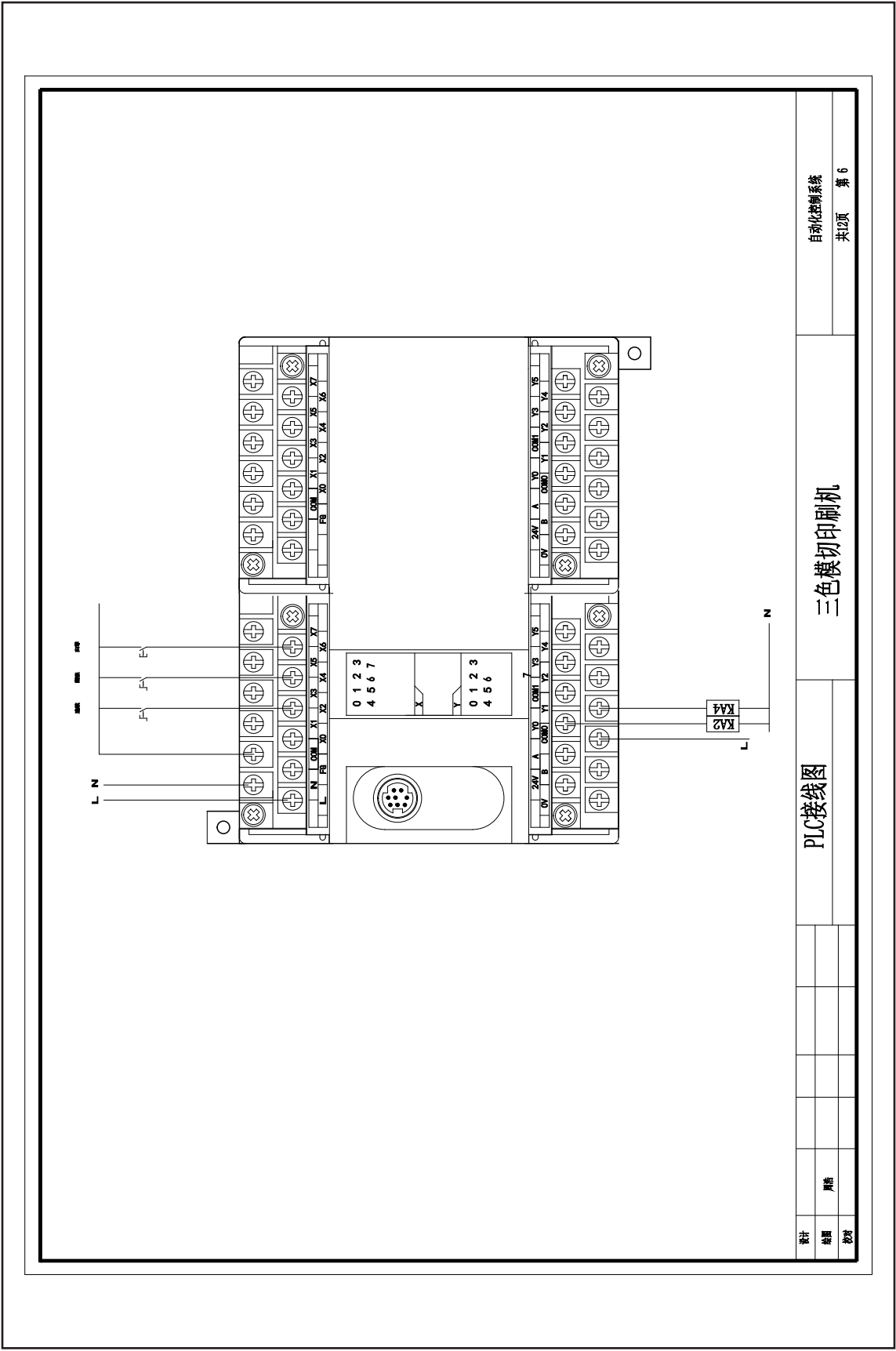


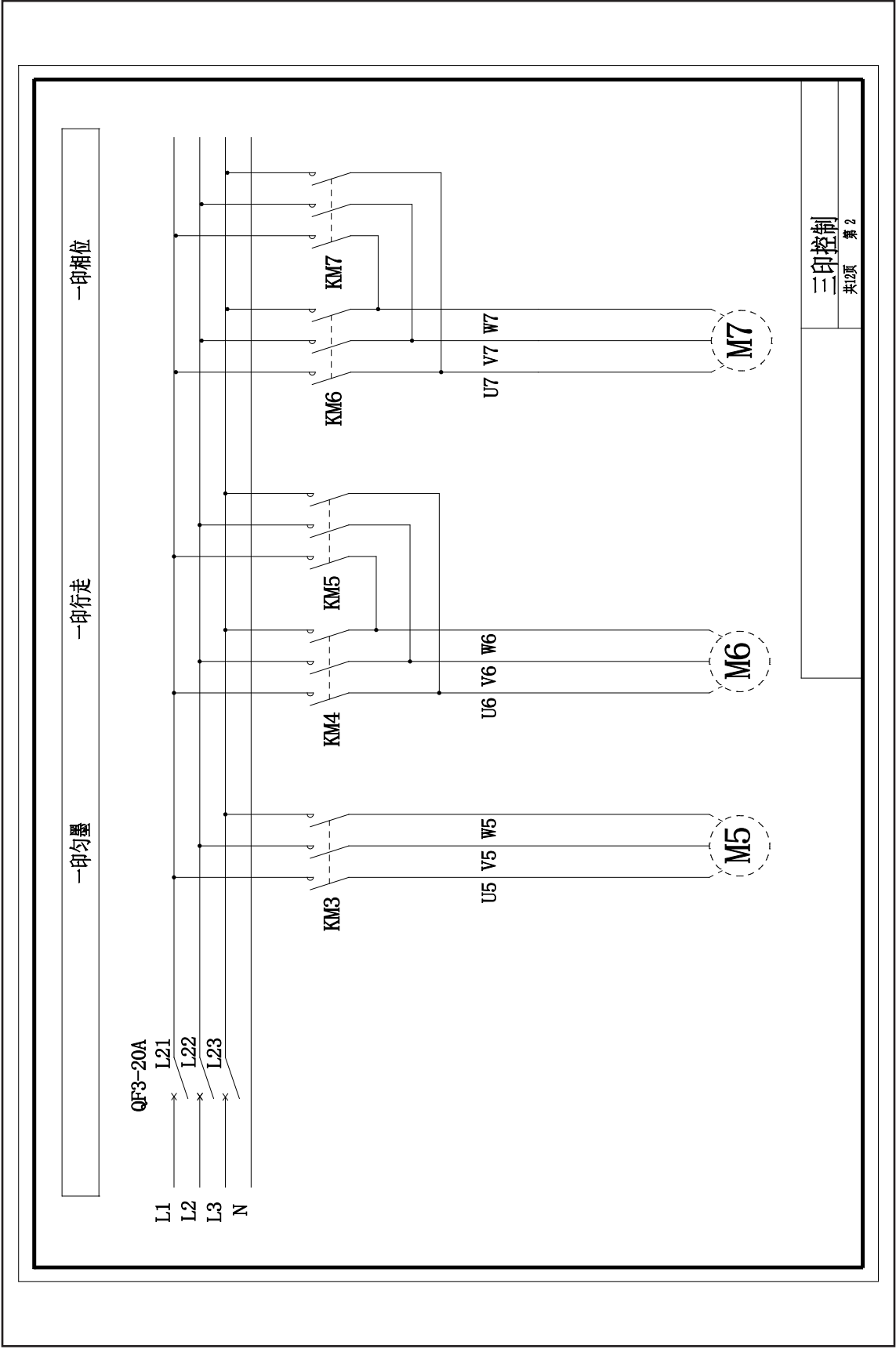


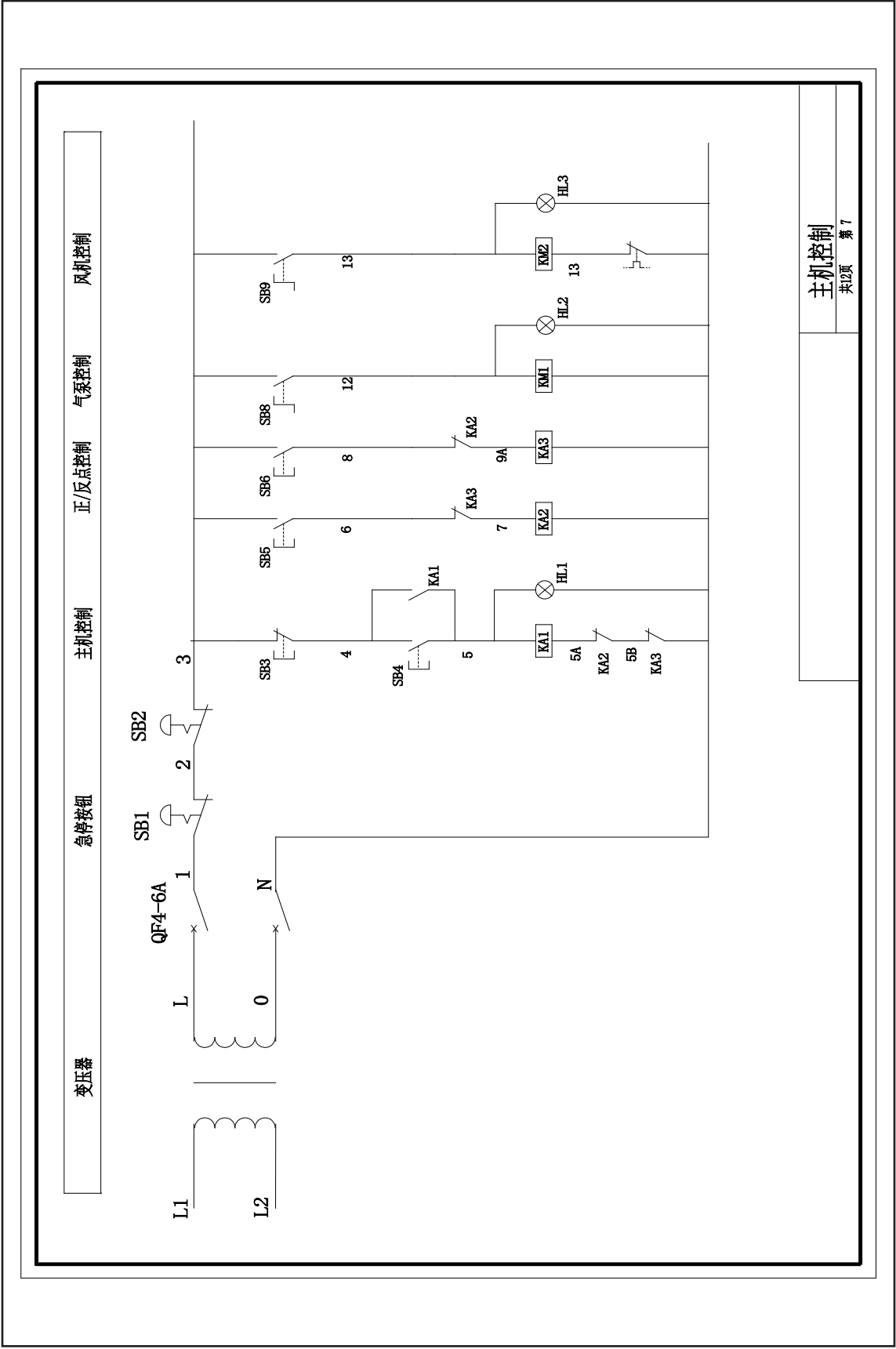


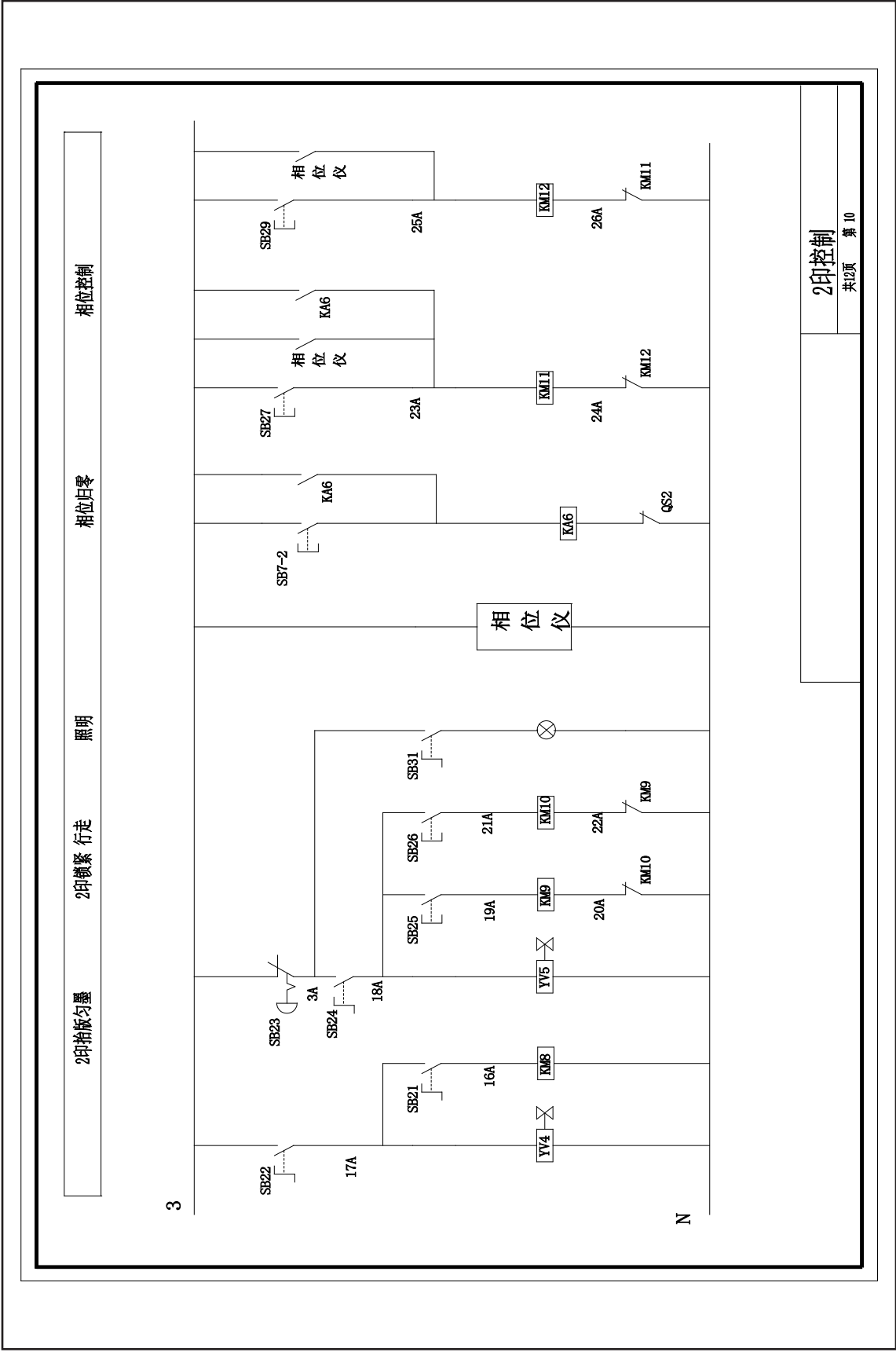
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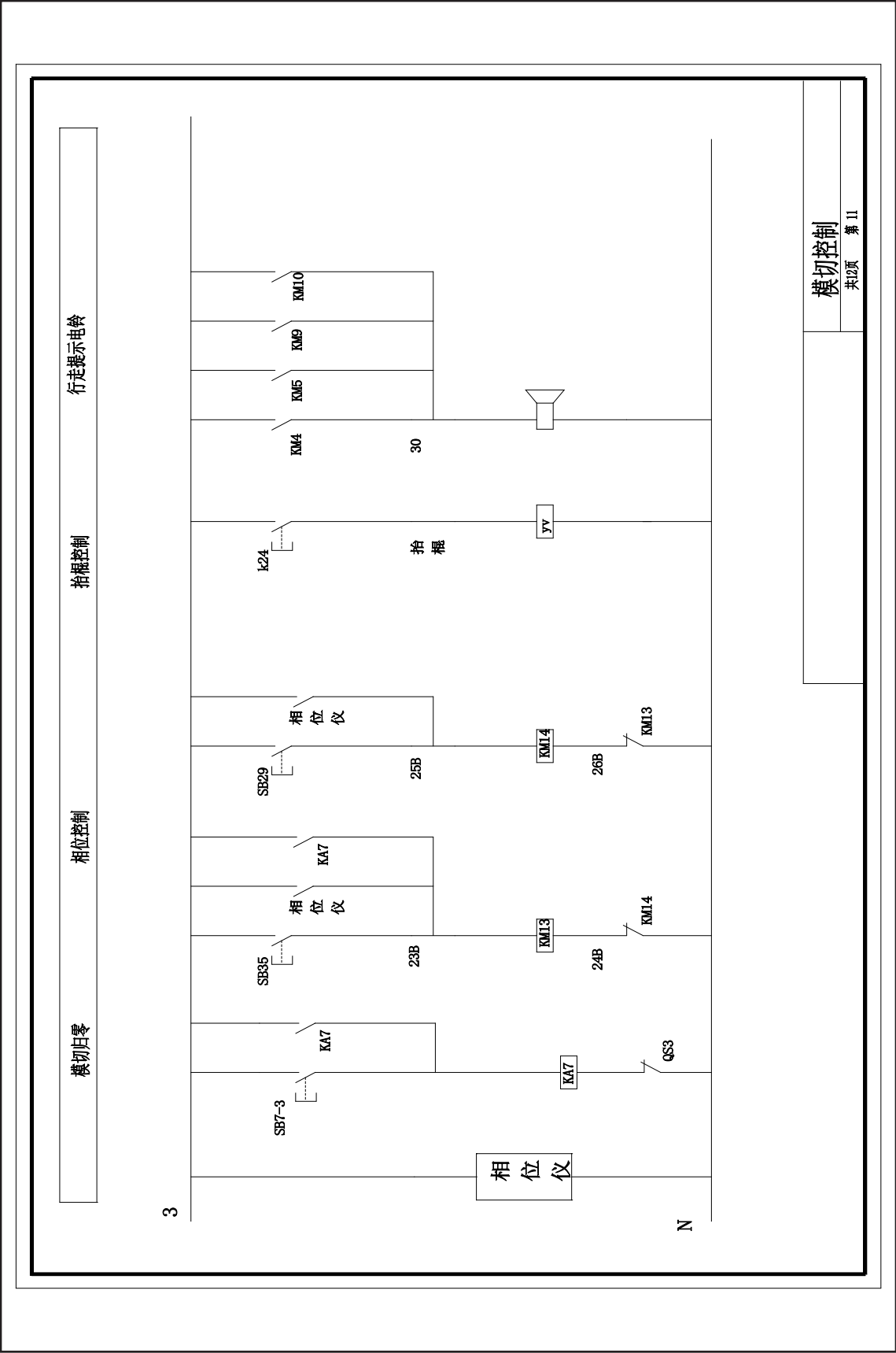




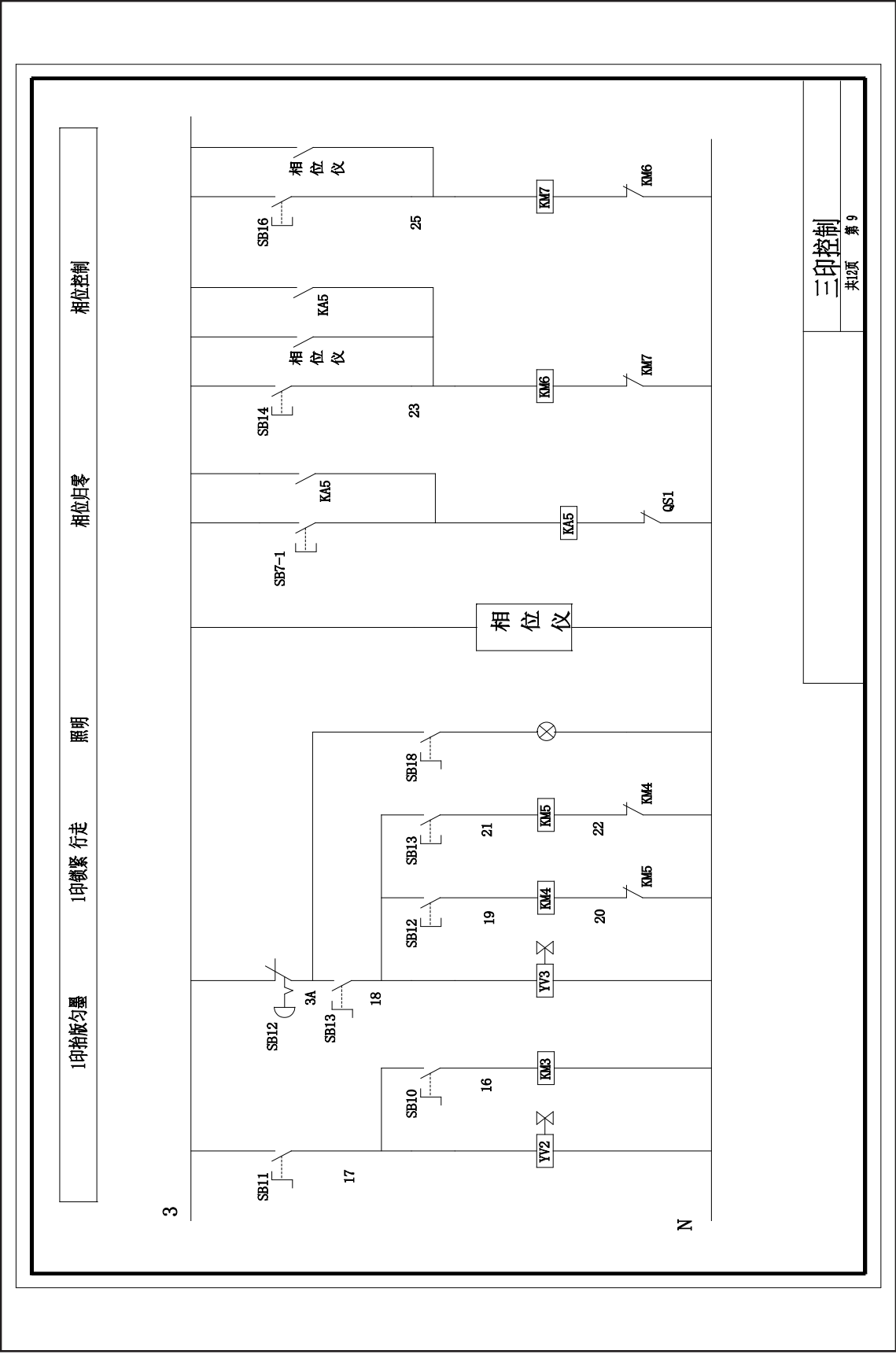








Electrical Diagram #10



Chapter 10:

WARRANTY CONDITIONS

1. JIALONG Carton Machinery warrants that the equipment is guaranteed to be free from defects in material and workmanship at time of shipment. If during the first year of the date of shipment, the buyer establishes to the seller's satisfaction that any parts manufactured by **JIALONG Carton Machinery** were defective at the time of shipment, **JIALONG Carton Machinery** will, at its own expense, repair or replace (but not install) replacement parts.

Sellers liability under this warranty is limited to replacement parts only and the seller will make no allowance for corrective work to be done unless agreed to by the seller in writing. Charges for correction of defects by others will not be acceptable, unless authorized in writing, prior to the work being performed, by an officer of the company.

Damage caused by deterioration due to extraordinary wear, improper maintenance or lubrication and improper storage prior to installation, shall not be taken as manufacturing defects. Failure to install equipment properly shall not be taken as manufacturing defects. Warranty does not cover consumable items. Warranty does not cover adjustment to installation or periodic adjustment that may be required during normal operation.

2. The term of guarantee is equal to 12 (twelve) months from the date when the installation and commissioning of the equipment fulfilled. Within one year from the date of accomplishing the installation and commissioning of the equipment fulfilled (don't guarantee the serving life of the wearing parts).

Within the period of quality guarantee, in case of any defects or malfunctions of mechanical parts, which have been proven to be caused by seller's poor materials and assembly technology, upon receipt of the buyer's information in writing and photos, the seller will post spare parts which were mentioned by the buyer as soon as possible at its own cost and the spare parts should be installed by the buyer. The expense of the spare parts and the freight will be borne by the buyer.

3. The following components are not covered by the warranty;

a. The repair, service and/or installation of any electric component or related replacement part for use with the equipment.

b. The consumables, that are parts that have limited life expectancy and are designed to be replaced.

4. JIALONG Carton Machinery has made no representation, warranties, or guarantees, expressed or implied, not expressly set forth on above paragraph. **JIALONG Carton Machinery** shall not be liable hereunder for any consequential damages, losses of profit, loss of production, or contract, financial, economic or any other indirect loss or consequential damage that in any form could suffer the other party.

5. No representative of **JIALONG Carton Machinery** has been conferred with any authority to waive, alter, vary or add to the terms of the warranty state herein, without prior authorization in writing executed by an officer of the company.

Chapter 11:

CONTACT INFORMATION

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