



OPERATION MANUAL

Automatic 3C High Speed Flexo Printer Die
Cutter with Stacker and Stripper
Model: **JL-GYM 3200x1600**



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SAFE OPERATION PRACTICE INSTRUCTION

Chapter 1:

The machine adopts leading edge feeding system, can complete the printing, slotting, angle-cutting, slitting, creasing, etc., of corrugated paperboard in one time. Slotting depth of this machine is with **electric adjustment**, and equipped with the scale reading. Slotting phase adjustment is to the planetary gear structure, adopting the **electric computer type 360 degrees adjustment**, and the upper and lower slotting knife disc and creasing wheels can synchronous moving to left or right, (note: some special tool to adjust the movement), it is easy to use and maintenance, compact, which is a professional in view of the small carton printing slotting forming equipment.

This manual is made specially for the **Automatic High Speed Flexo Printing Slotting Die-Cutting Machine**. The machine adopts advanced technology of similar machines of both domestic and abroad. This machine has very high precision and good performance of printing, slotting and die-cutting in making corrugated carton.

Please read this specification manual carefully to understand the operation and maintenance instruction, this is the precondition of ensuring the machine high precision and high reliability. This manual is as detailed as possible about the operation, maintenance and possible problems during production. If you met any other problems in actual operation please contact us freely at any time, and we'll solve the problems one by one for you.

We are going on exploration in carton machine manufacturing and will provide products of high performance, so any requirement and suggestion is welcome to us. Hereby please allow us to express our appreciation and gratefulness for using our products.

A) General Rules

1. Compliance with safety operation instruction of inner factory and of the machine manufacturer.
2. Keep the working area tidy and clean.
3. Examine the machine before it is opened, ensure every protective device is in place, and the safe switch is workable.
4. Wear properly and prepare all appliances for the labor protection.
5. Lacing the hair and clothes to avoid hitched by the running machine and such dangerous thing.
6. Examine the machine to check if it is damaged, if the parts are wear down, let veteran repair and adjust the machine.
7. It's forbidden to use hands or tools to touch running parts of the machine.
8. Power must be off and keys with the operator during maintenance.
9. When machine is turned on or turned off, other people should be kept off from 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

	Marks indicate potential danger, which may result in medium to slight injury or property damage if not paid attention to.
	Marks indicate potential danger, which may result in serious injury if not paid attention to.
	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.

BRIEF Chapter 2: INTRODUCTION OF THE MACHINE

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	Model
B	Max. Cardboard Size
C	Voltage
D	Factory Number
E	Factory Date
F	Manufacturer's Data

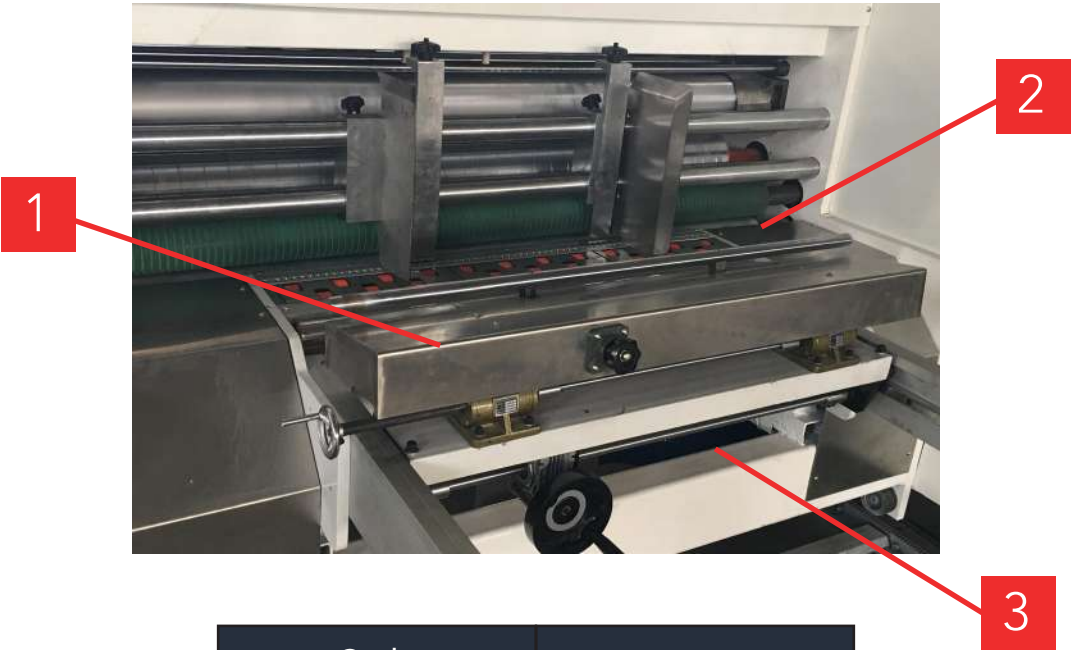
B) Main Technical Parameters

Automatic High Speed 2 Colors Printing Die Cutting Machine With Stacker Model JL-GYM 3200 x 1600			
Electrical Requirements		Product	Automatic 3C High Speed Flexo Printer Die Cutter with Stacker and Stripper
Voltage	440V	Brand	JIALONG
Phase	3 PH	Model	JL-GYM 3200x1600
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	6600 mm
Maximum Operating Temperature (°C)	44°C	Wide	5220 mm
Installation Place Room Temperature (°C)	Min 20% Max 80%	High	2650 mm
Relative Humidity (%)	Min 45% Max 75%	Weight	22000 Kg.
Elevation (m)	1798 m Above Sea Level	Floor Area Requirement	
		12500 x 5220 x 2650 mm	
Technical Specifications			
Max. Design Speed	200 sheets/min		
Max. Working Speed	150 sheets/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. Die Cutting Area	2850 x 1600 mm		
Printing Precision	±0.5 mm		
Die Cutting Accuracy	±1.0 mm		
Feeding Unit			
Max. Speed	250 sheets/min		

Feeder Type	Lead Edge Feeder with vacuum suction
Feeding Roller	Double Roller Feeder Paper Outer diameter: 155 mm, up roller. 45# seamless steel tube. Adjustment ranges from 0 to 12 mm.
Control System	PLC Control 10.4" color touch screen, Storage orders
Printing Units	
Printing Units Number	3 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	2850 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 B. 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) Main Structure And Function Characteristics

- I. Paper feeding roller adopts patterned roller, feeding roller pressure adopts eccentric wheel adjustment with left and right eccentric wheels, can adjust the pressure synchronously.
- II. Leading edge feeding department adopts vacuum adsorption device, make the feeding more smoothly, to avoid the slotting error to make upper paperboard misplace when feed paperboard, can fit to each kinds of paperboard with different quality, and sending paper stable and accurate.
- III. Slotting knife discs adopt full steel processed, slotting knives adopt sawtooth arc-shaped semicircle knives to slot and remove the waste, paperboard get into slitting roller after slotting, slitting knives cut both sides of the paperboard neatly. (Note: pressing wheel and slitting knives are installed in same roller, convenient to adjust.)
- IV. Paperboard is sent out by six transmission shafts after slotting, corner-cutting, creasing and slitting. This machine power is equipped with the frequency speed controller (speed is adjustable freely), adopting JTE frequency converter.
- V. This machine adopts electric planetary gear phase adjustment to adjust the paperboard size, can adjust without stopping.



Code	Description
1	Side Baffle
2	Back Baffle
3	Front Frame

D) 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 piecwise 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.

E) 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:

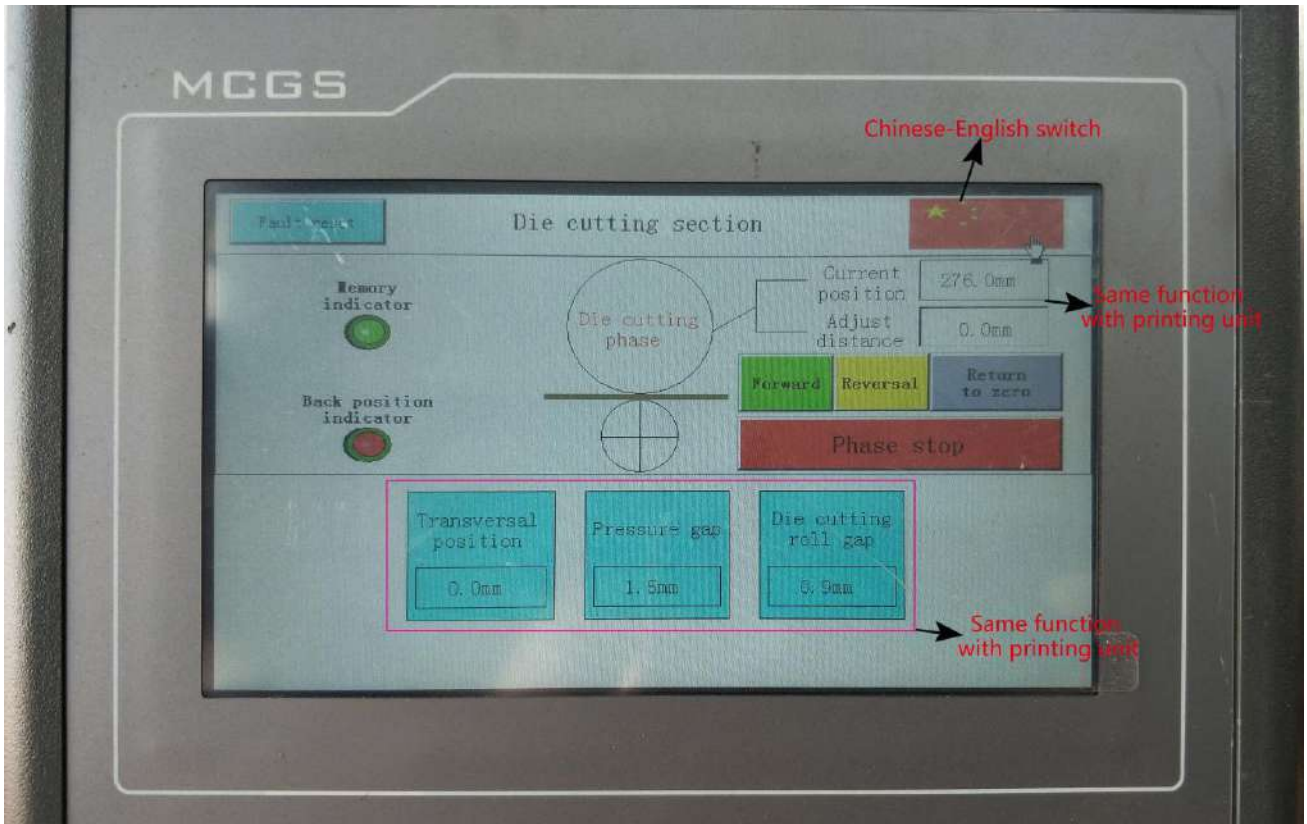
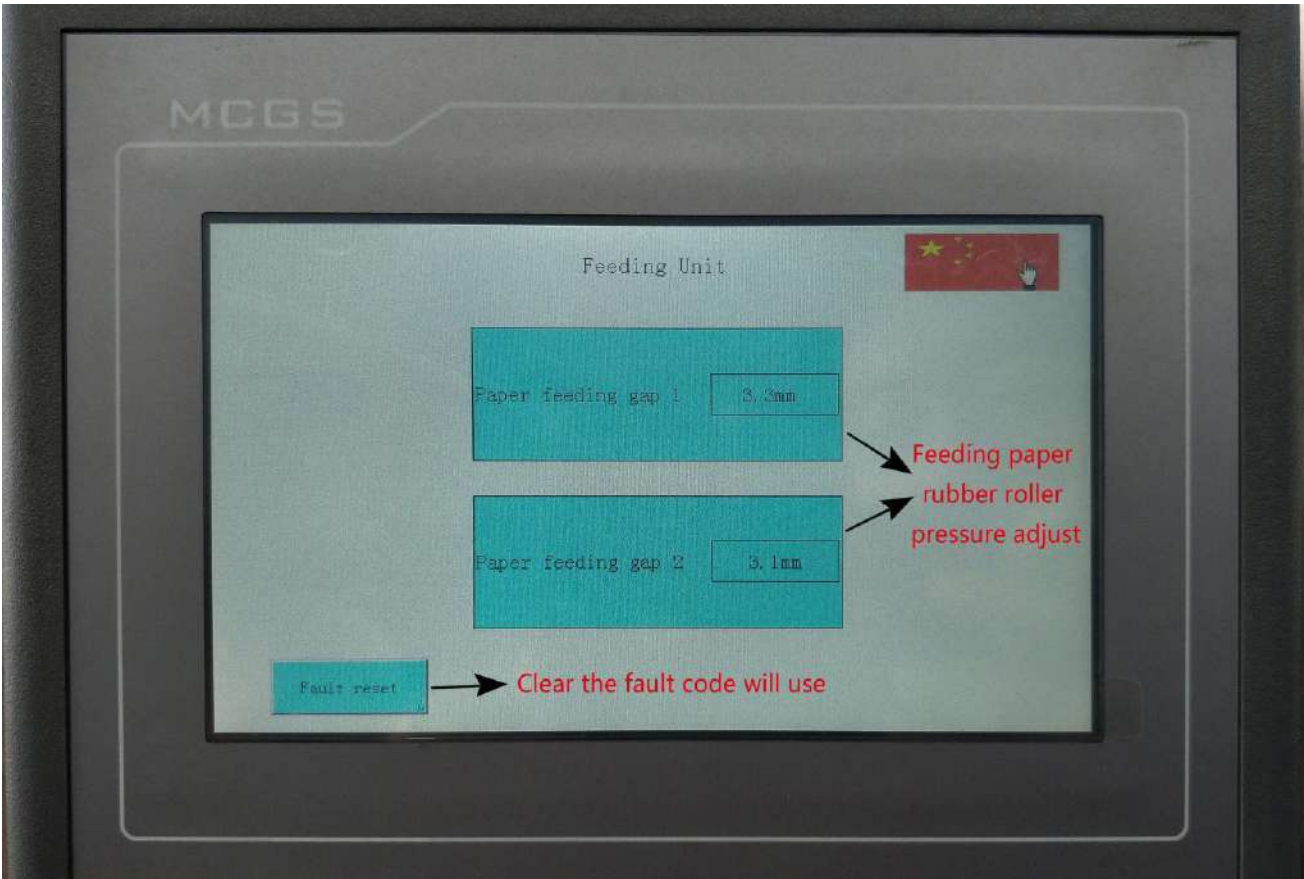
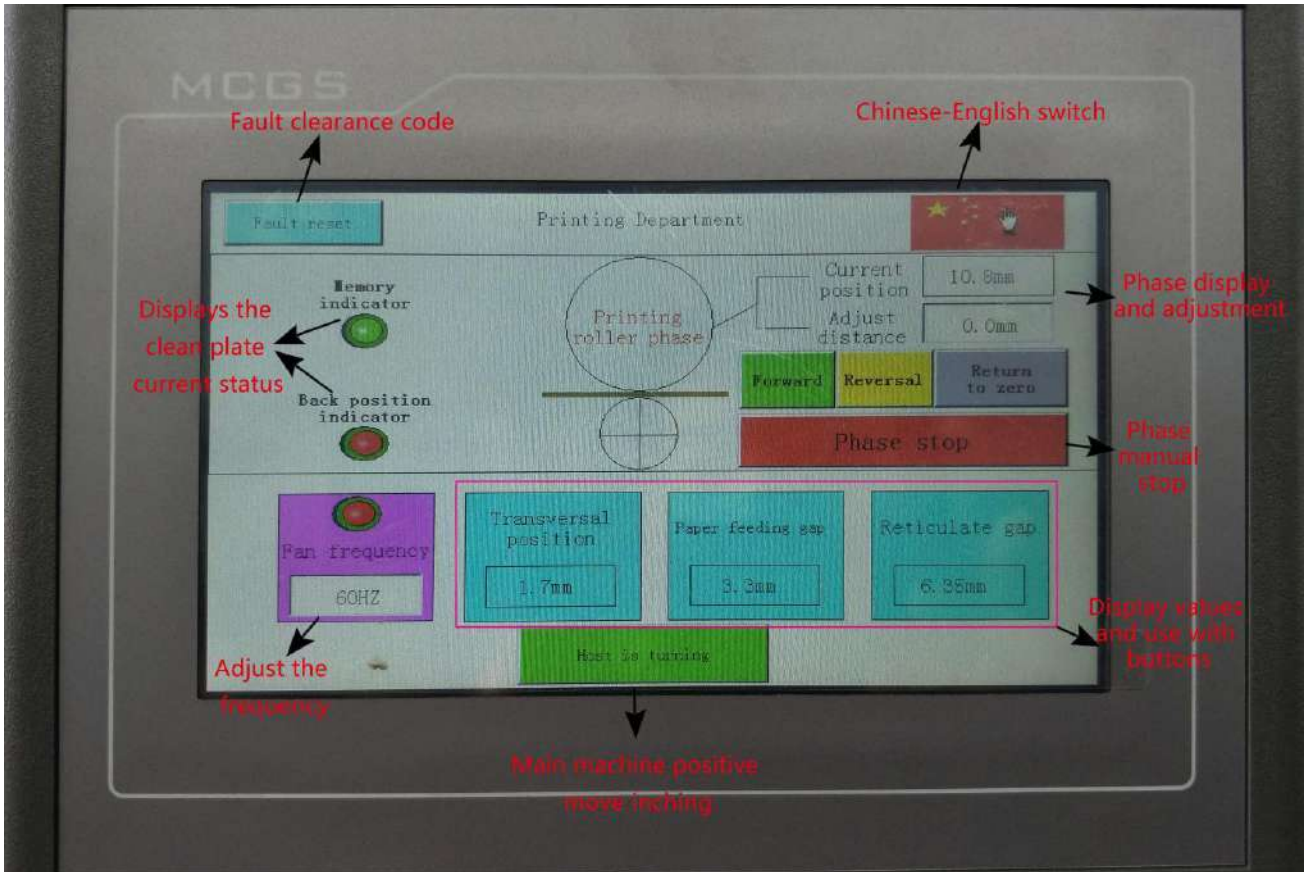
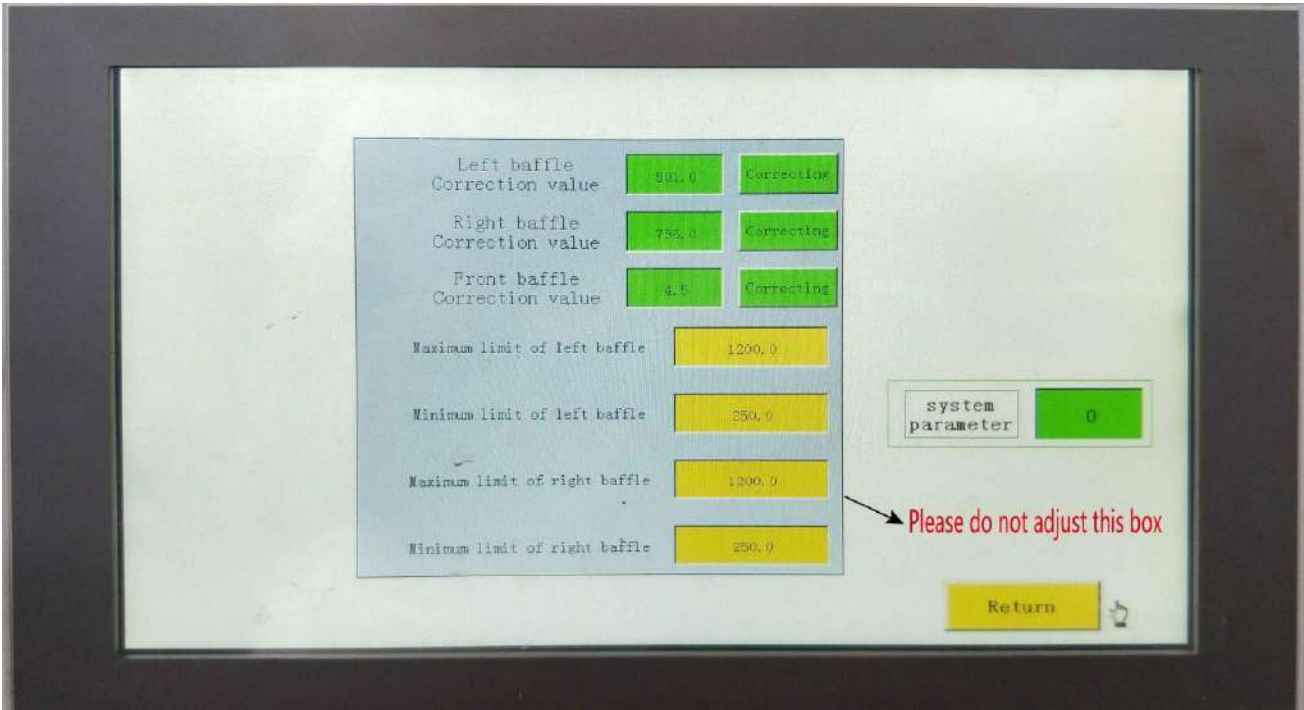
1. There may be equipment experiencing a stuck phenomenon.

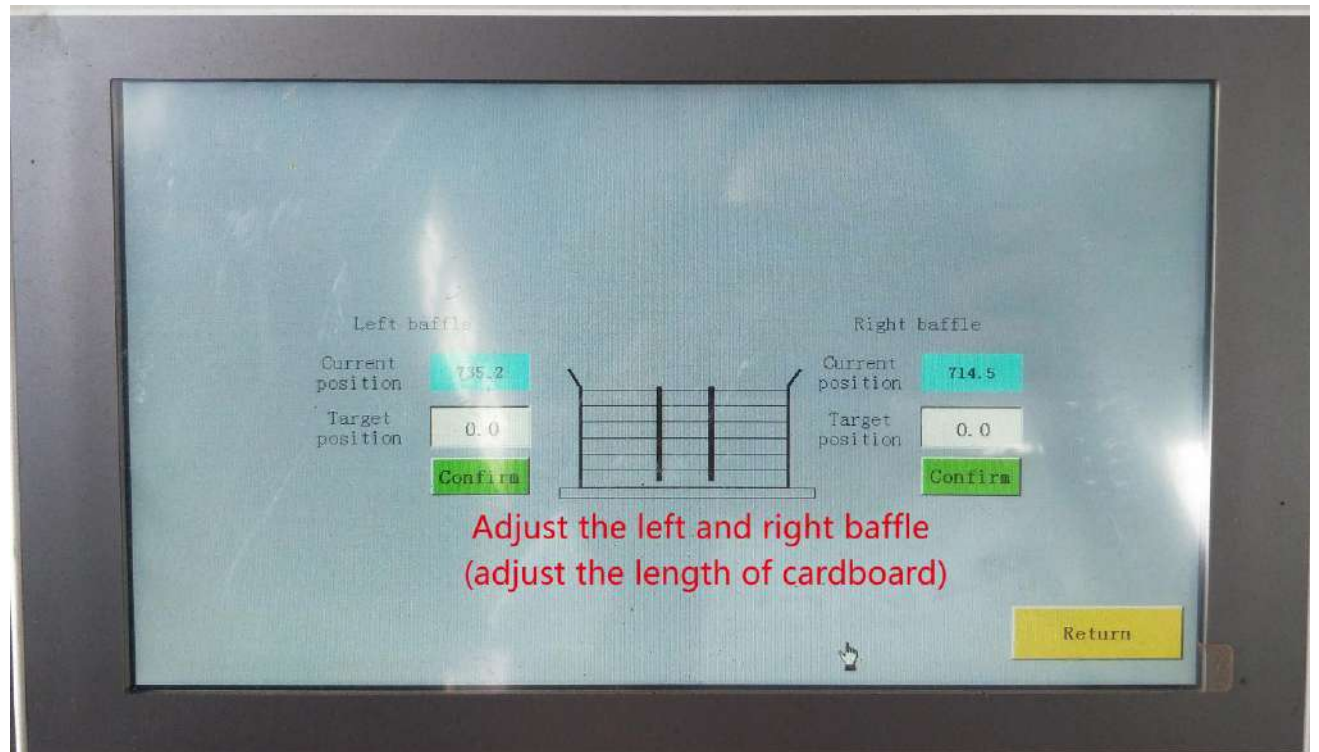
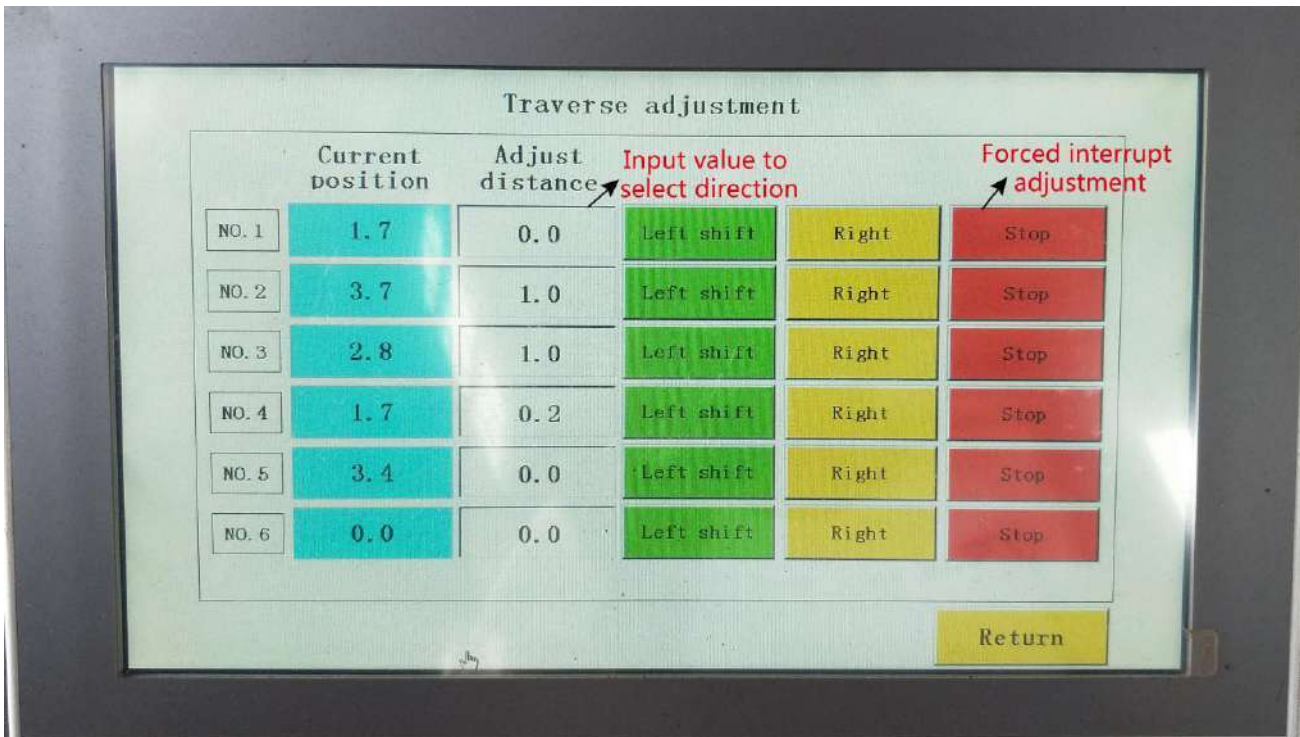
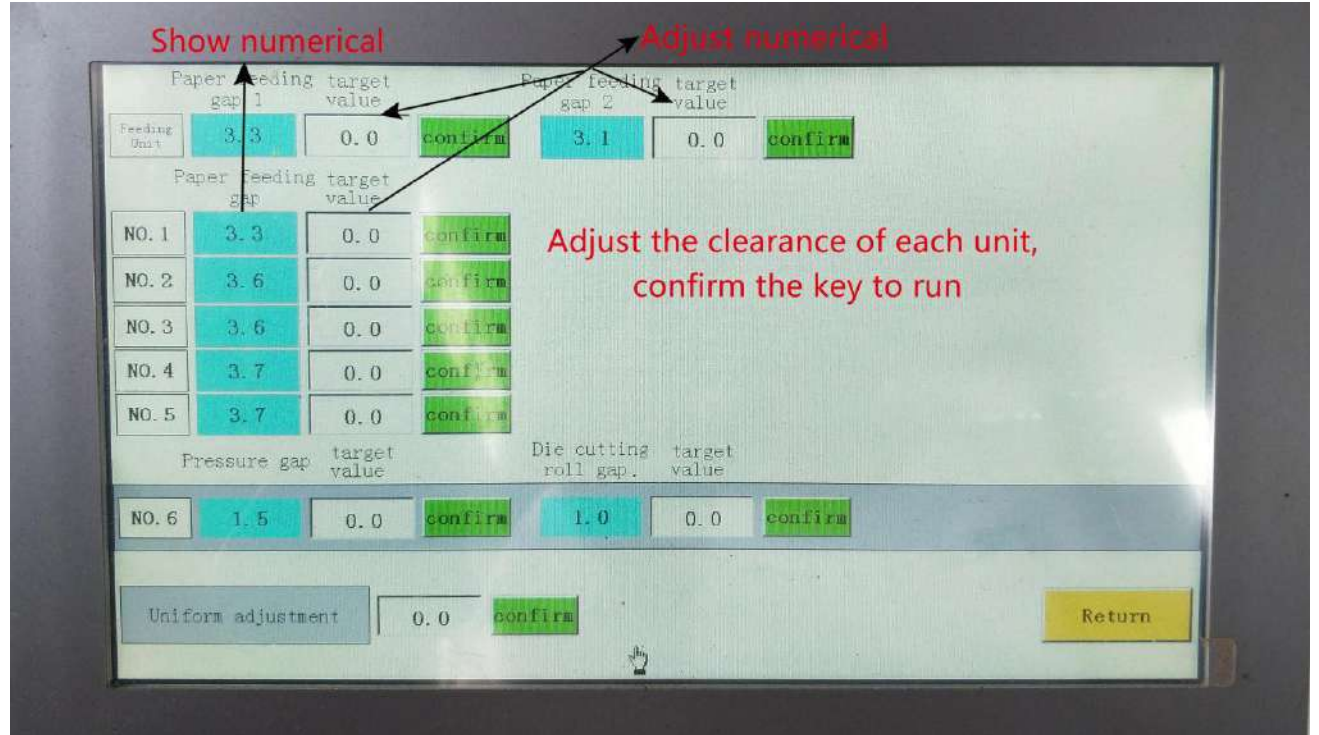
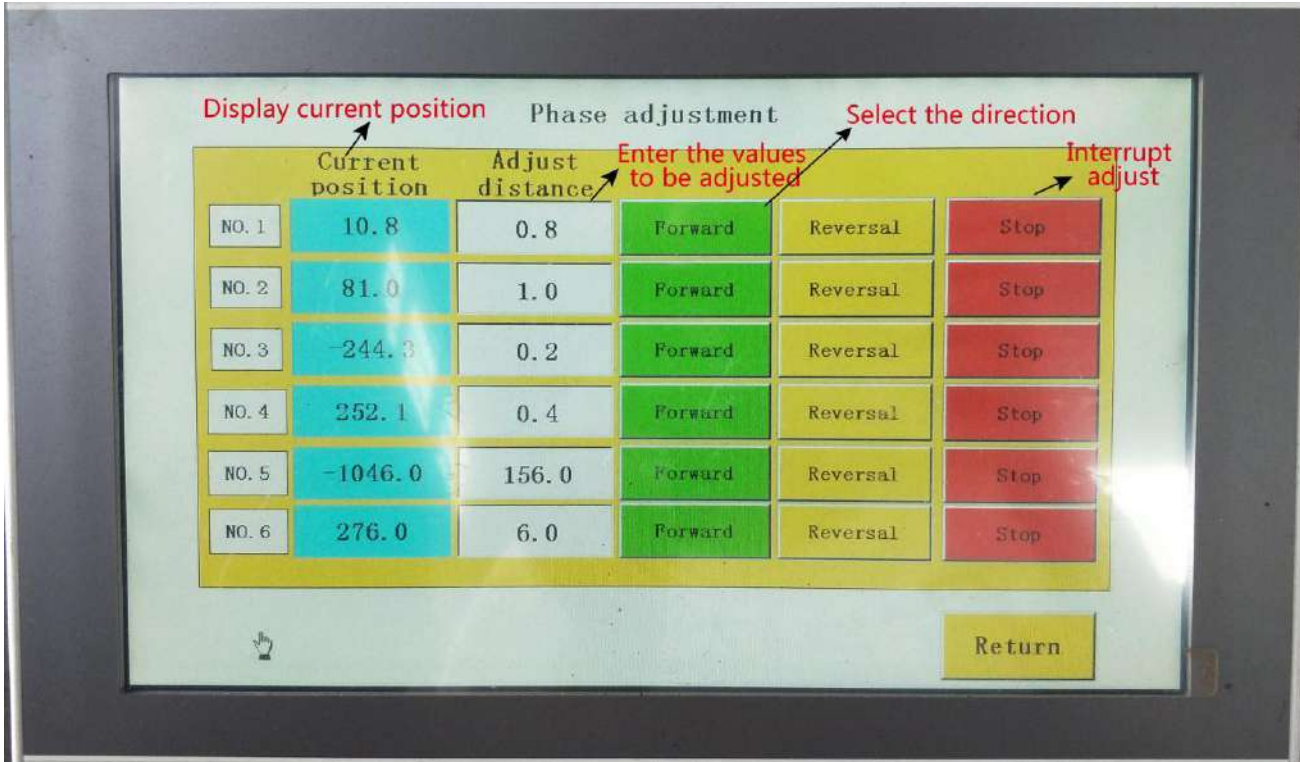
ELECTRIC EQUIPMENT OPERATION

Chapter 3:

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.

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.

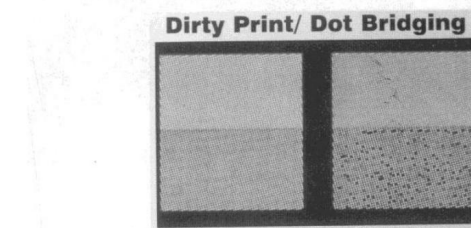
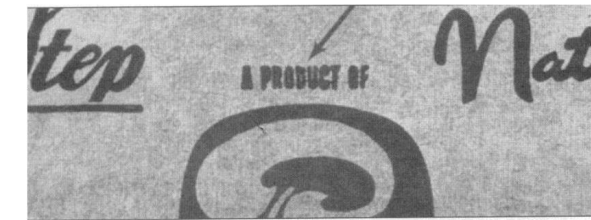
4) Ink scraper: On the front panel with a knob screw to feed, check if the pressure gauge is at a normal pressure, then turn the knob screw to apply ink.

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.

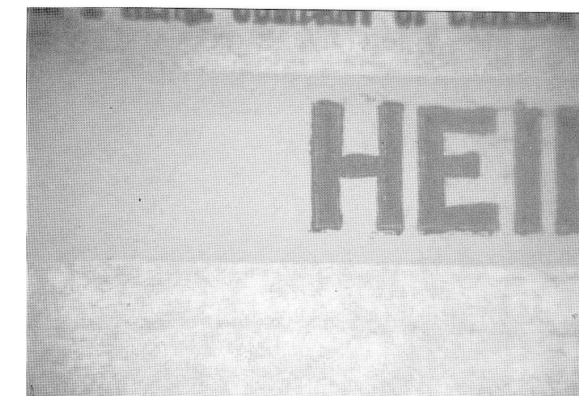
I) FAQ of Printing Department

I.I) The outline of the printed word is fuzzy



- a) Uneven thickness of printing plate
——Replace defective plates
- b) Too much printing pressure
——Adjust the gap between the adsorption bellows and the printing roller
- c) Too much ink
——Adjust the gap between anilox roll and printing roll
- d) There are scraps of paper on the printing plate
——Remove the paper scraps from the plate
- e) Ink concentration too low
——Mix the ink and adjust the ink concentration

I.II) A distorted print or image



- a) Too much printing pressure
——Adjust the gap between the adsorption bellows and the printing roller
- b) The plate does not take into account the tensile deformation when changing from a plane to an arc, especially when precise coordinates or circles are required
——According to the diameter of the printing roller and the calculation of the plate drawing rate, a qualified plate is made
- c) The plate thickness is less than 7.2mm, and the linear speed is inconsistent
——Add printing pad or use 7.2mm plate directly
- d) There is dirt on the surface of driving roller and wheel, which makes the diameter change
——Clean the drive roller and wheel regularly

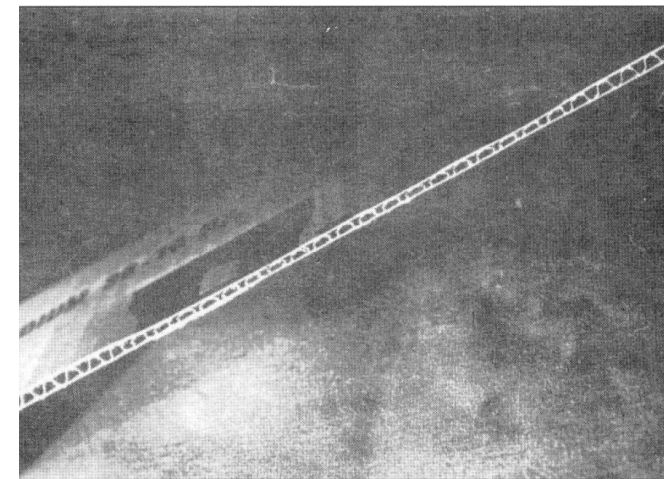
I.III) Overprint is not allowed.



- a) Inaccurate pressure of adsorption bellows in multicolor printing
——Because the thickness of the paperboard will change slightly when the paperboard is overprinted, the pressure of the adsorption bellows should be slightly tighter than that of the previous group, so as to make the pressure applied on all colors equal
- b) Unstable or worn transmission power
——Check the tightness or replacement of the synchronous belt for power transmission of each unit
——Check the tightness or replacement of the synchronous belt transmitted by the bellows
- c) Printing machinery in poor condition (such as gear, keyway, bearing, etc.)
——Repair properly and replace damaged parts
- d) The suction of the suction bellows is too small, and the cardboard slips in the machine
——Adjust the frequency of adsorption fan to increase the friction between paper feeding wheel and paperboard
——Adjust the damper of the adsorption air box to a proper position to avoid air leakage
- e) Serious warpage of cardboard
——If possible, flatten the cardboard before production

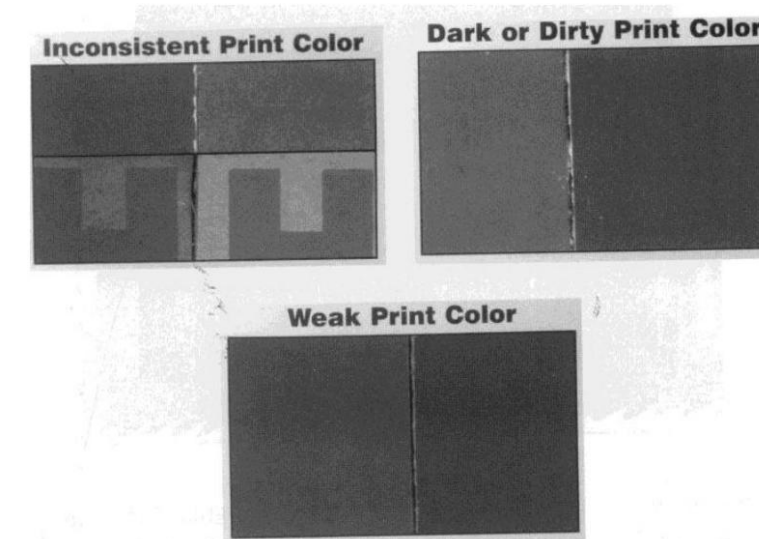
- f) Too fast
——Reduce the machine speed properly
- g) The plate is loose on the printing roller
——Hang the plate again or adjust the tightness of the plate
- h) The printing plate itself is not firmly bonded
——Re gluing plates

I.IV) The corrugated board is collapsed during printing



- a) Pressure of adsorption air box is too high
——Adjust the bellows pressure
- b) Uneven wear of plates
——Replace with a new plate

I.V) The ink concentration and brightness are not standard



- a) Insufficient ink concentration, insufficient mixing, or improper formulation
——Check the ink concentration once every half an hour and adjust the ink

concentration

——Stir the ink for 3-5 minutes before printing

——Consult ink supplier about ink formula

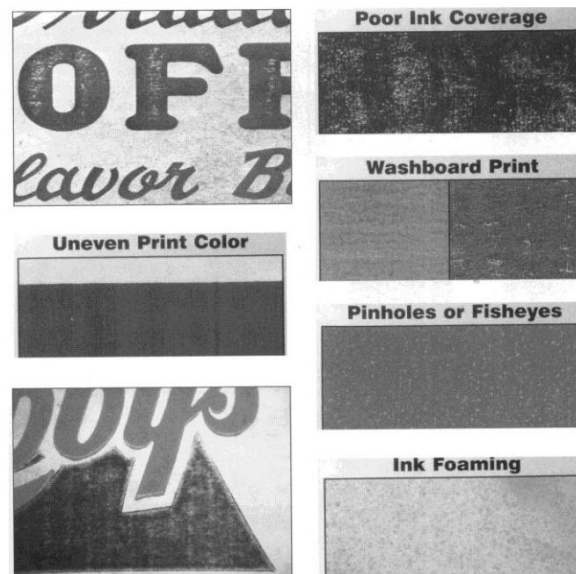
b) The inking system was not thoroughly cleaned after the last use

——Deep cleaning inking system with special cleaning agent for anilox roll

c) Ink concentration too low

——Add new ink or replace another bucket of ink

I.VI) Uneven board printing coverage



a) Improper adjustment of scraper

——Reinstall the scraper correctly

b) Gap of mesh roller is not parallel

——Adjust the position of the two ends of the screen roller to keep consistent with the gap between the printing roller

c) Rubber roller or scraper severely worn

——Replace the rubber roller or scraper blade with a new one

d) Anilox roll severely worn

——Replace new anilox roll

e) The mesh cavity of anilox roller is blocked or dirty

——Deep cleaning of anilox roll with anilox roll cleaner or special wire brush

——Remove the dirt from the roller

f) Paper board surface paper leakage

——Adjust the gap between the adsorption bellows and the printing roller

——Replacing corrugated board

g) Printing plate surface is not clean

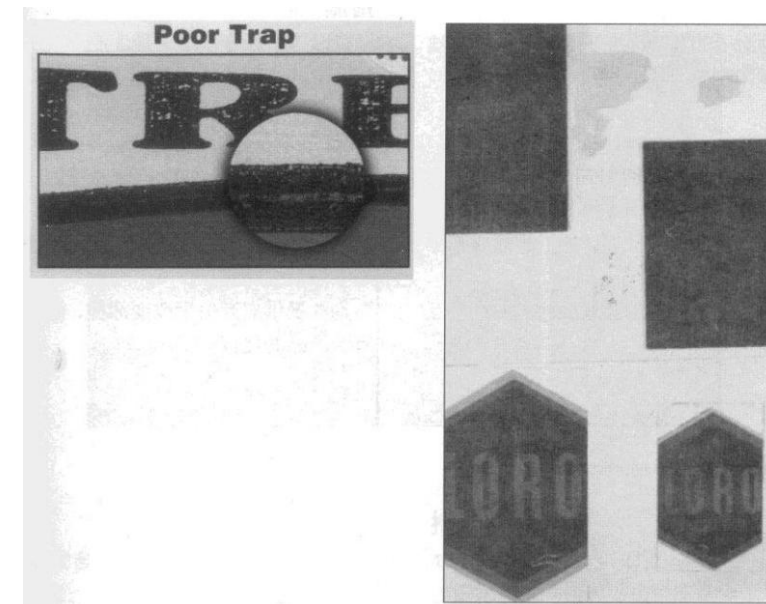
——Turn on the vacuum function of the paper feeding Department

——Clear the dirt on the surface of the printing plate or replace it with a new one

h) The pressure of plate and paperboard is too small

——Adjust the gap between the adsorption bellows and the printing roller

I.VII) Poor overprint and overprint quality



a) The ink arrangement is not accurate when printing

——Change the ink order, and cover the light color with dark color as much as possible

b) The ratio of the number of lines in the printing plate to that in the anilox roll

——Re plate making to meet printing requirements

c) The ink printed first is not dry

——Change ink formula to speed up drying (fast drying agent)

——Reduce the ink viscosity of pre printing

——Increase the viscosity of the second color ink to make it higher than that of the first color

——Reduce the running speed of the machine

d) Poor printing when the field and outlets are on one printing plate at the same time

——Properly pad up the field part (paper, double-sided tape)

e) Poor printing when the field area is large

——Choose a hard plate

——Properly increase the gap between the adsorption bellows and the printing plate

f) Second color ink and first color ink are not compatible

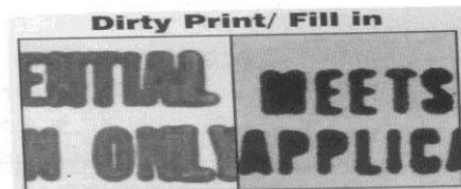
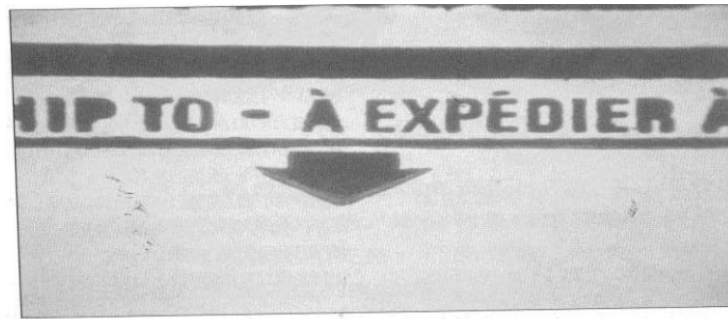
——Consult with ink supplier for suggestions on changing ink, additives or related products

g) Ink drying speed of second color printing is too fast to be printed on board

——Add solvent (slow drying agent) to reduce the drying speed of ink

——Increase the speed of printing machine

I.VIII) To fill with ink between printed words or patterns

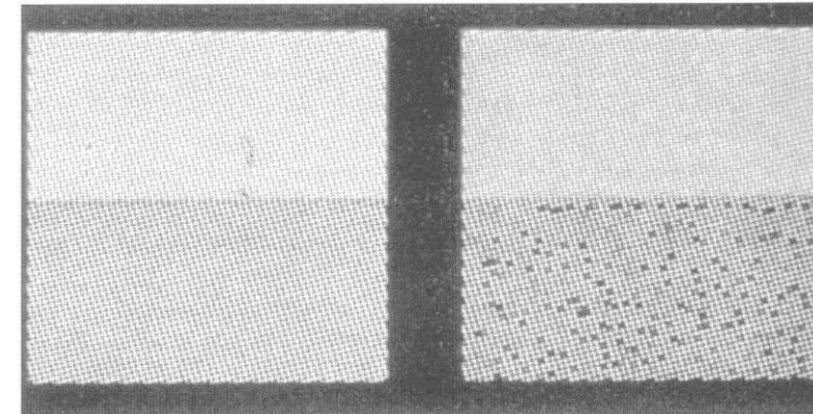


- a) Ink viscosity too high
——Reduce ink viscosity
- b) There is dirt on the printing plate
——Cleaning the printing plate
- c) The printing plate is not level, worn and sunken
——Change plate
- d) Cardboard pressure too tight
——Adjust the gap between the adsorption bellows and the printing plate
- e) Impurities in ink
——Filter or replace the ink
- f) Oil paper scraps or dust on cardboard
——Turn on the vacuum function of the paper feeding Department
- g) Printing plate too soft
——Replace the hard plate

I.IX) Blistering of ink

- a) Too much water for ink
——Add fresh ink to increase ink concentration
——Add defoamer
- b) Ink formula problems
——Ask for ink supplier's suggestions

I.X) Printing dot connection (paste dot)



- a) Plate pressure is too high
——Reduce the gap between the adsorption bellows and the printing roller
- b) PH value of ink is not standard
——Adjust the pH value of the ink to meet the value range recommended by the ink supplier or replace the ink
- c) Too much pressure on anilox roll and plate
——Adjust and reduce the pressure between the screen roller and the plate, and check the level of the screen roller
- d) The ratio of the number of lines in the printing plate to that in the anilox roll
——Re plate making to meet printing requirements
- e) The mesh cavity of anilox roller is blocked or dirty
——Deep cleaning of anilox roll with anilox roll cleaner or special wire brush
——Remove the dirt from the roller
- f) Ink viscosity is too high
——Reduce ink viscosity
- g) Ink drying speed is too fast
——Adding slow dissolving solvent to reduce the drying speed of ink
- h) Printing plate is too soft
——Replace the hard plate
- i) Impurities in ink
——Filter or replace the ink

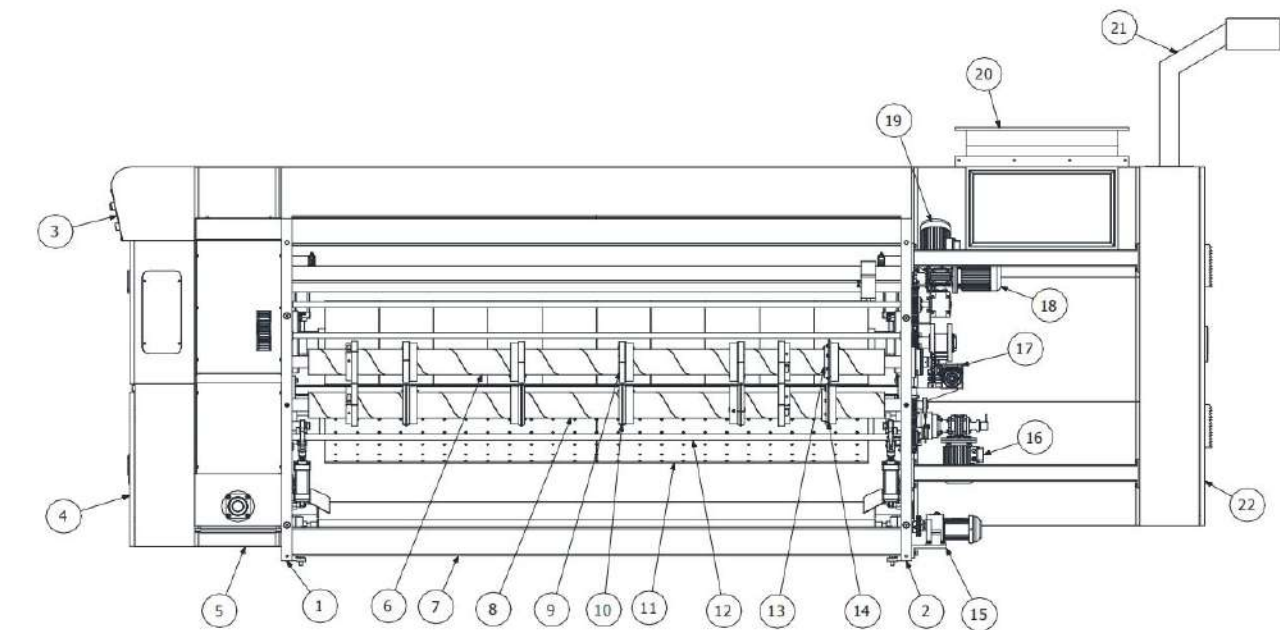
C) Operation of Slotting Unit

- 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

The die-cutting part refers to the unit that can cut edge, cut, press line, punch, buckle and other functions or make special-shaped cartons for the printed cardboard according to the rotation of knife die and rubber pad roll fixed on the die-cutting roller.

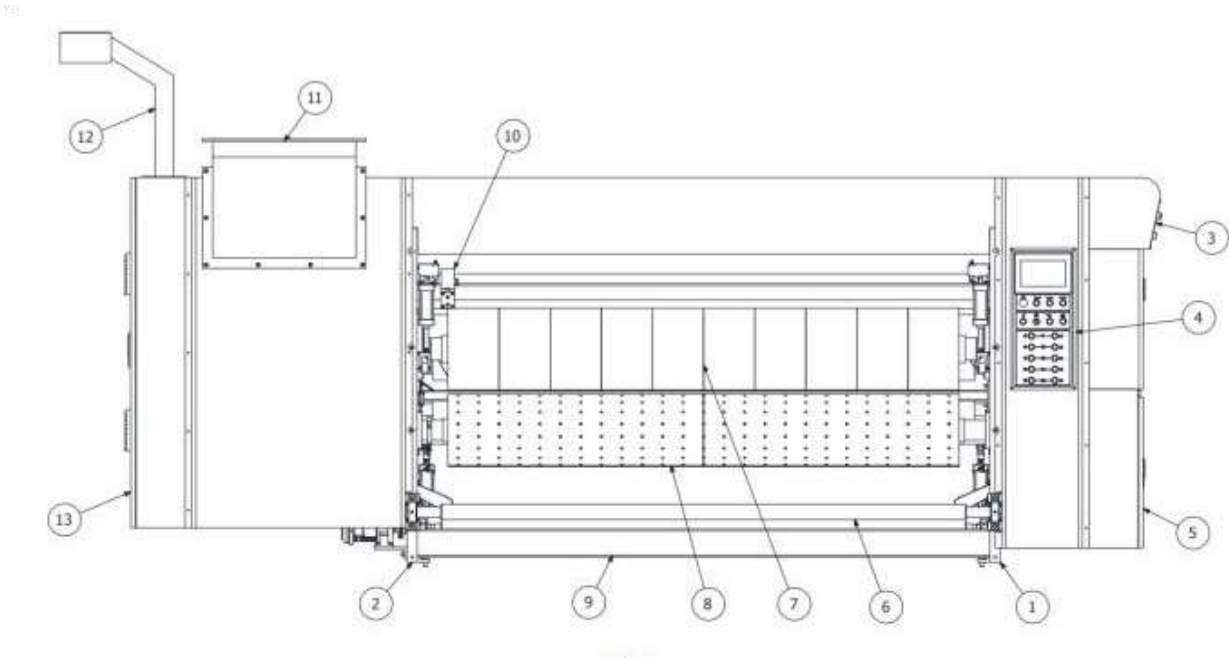
1) Main components of die cutting part front view



Code	Description
1	Operation side wall panel
2	Drive side wall panel
3	Operation panel
4	storage box
5	gearbox
6	Upper shaft of pressing line
7	Support beam
8	Pressing the offline shaft
9	Upper pressing wheel
10	Lower wire pressing wheel

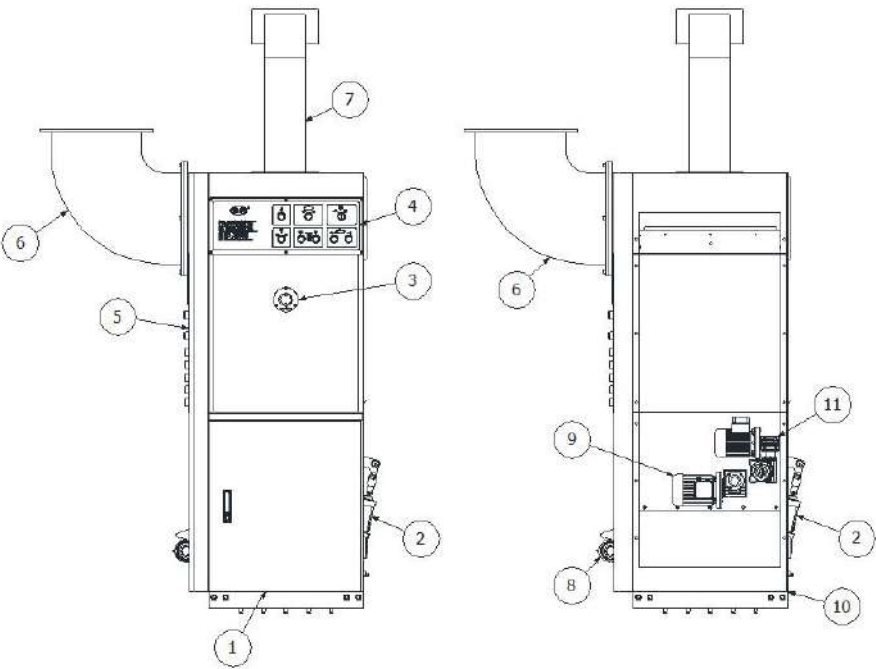
Code	Description
11	Die cutter shaft
12	Thread pressing clearance adjustment shaft
13	Upper trimming knife
14	Lower trimming knife
15	Waste paper conveying reduction motor
16	Cutter roll traverse reduction motor
17	Rubber pad roll traverse reducer
18	Die cutting clearance adjustment reduction motor
19	Grinding reduction motor
20	Air outlet
21	Trunking support
22	Electrical cabinet

2) Main components of die cutting part rear view



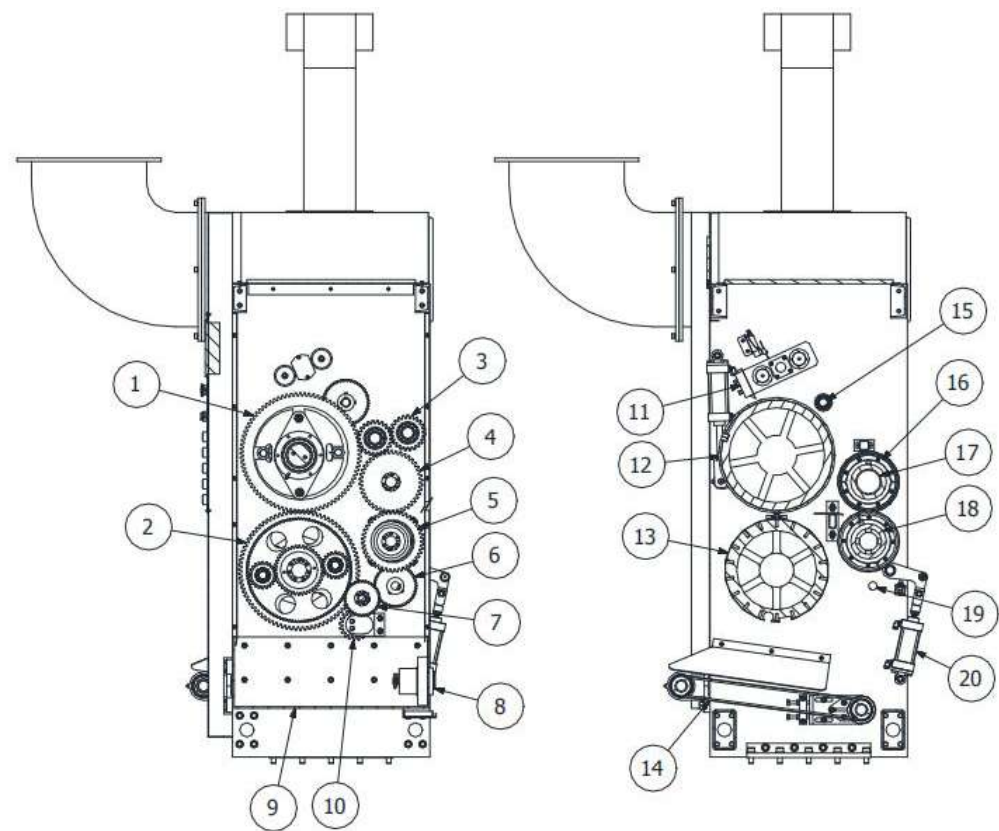
Code	Description
1	Operation side wall panel
2	Drive side wall panel
3	Operation panel
4	Operation panel
5	storage box
6	conveyor belt
7	Upper die-cutting rubber pad roll
8	Lower die cutter roll
9	beams
10	Grinding device
11	Air outlet
12	Trunking support
13	Electrical cabinet

3) Main components of die cutting part operation side view



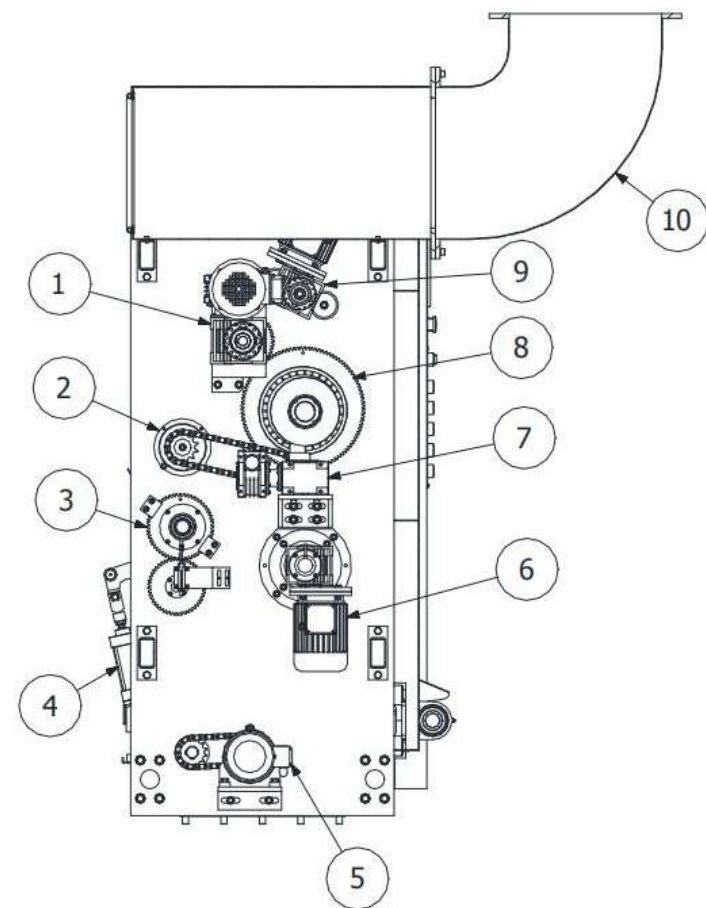
Code	Description
1	storage box
2	Lock the cylinder
3	Lubricating oil flow window
4	Operation panel
5	Operation panel
6	Air outlet
7	Trunking support
8	Waste paper conveyor belt
9	Phase adjustment reduction motor
10	Gear oil tank
11	Adjust the deceleration motor for pressing line gap

4) Main components of die cutting part - middle section view



Code	Description
1	Die cutting rubber cushion roll transmission gear
2	Die cutter shaft transmission gear
3	Transmission intermediate wheel
4	Upper pressure line transmission gear
5	Lower transmission gear
6	Adjusting shaft of lower pressing line clearance
7	Phase adjustment
8	Oil level balancer
9	Gear oil tank
10	Oil pump gear
11	Grinding device
12	Die cutting rubber pad roll
13	Die cutter shaft
14	Waste paper conveyor belt
15	Die cutting clearance adjustment shaft
16	Upper trimming knife
17	Upper pressing spool
18	Press down spool
19	Thread pressing clearance adjustment shaft
20	Lock cylinder

5) Main components of die cutting part driving side view



Code	Description
1	Die cutting clearance adjustment reduction motor
2	Upper pressing spool
3	Adjustment gear of pressing line clearance
4	Lock the cylinder
5	Waste paper conveying reduction motor
6	Cutter roll traverse reduction motor
7	Rubber pad roll traverse reducer
8	Die cutting clearance adjustment gear
9	Grinding reduction motor
10	Ventilation

6) Die cutting operation panel

- 1. Power**

Power indicator
The indicator lights up to indicate that the machine is powered up
The indicator light is off, indicating that the machine is powered off
- 2. Lighting**

Unit lighting on / off
Off light off
On light on
- 3. Stripping**

Waste paper conveying on and off
Off waste paper delivery off
On waste paper transfer on
- 4. Cutting roller**

Lifting, falling, automatic and control switch of die-cutting rubber pad roll
Manual lowering: the die-cutting rubber pad roller descends, and the rubber pad contacts with the die-cutting knife
Manual lifting: the die-cutting rubber pad roll is lifted, and the rubber pad is separated from the die-cutting knife
Automatic: press the paper feeding button, the die-cutting rubber pad roller will automatically fall down, and the paper feeding will start;
When the paper feeding is stopped, the die-cutting rubber cushion roll is delayed to lift, so as to avoid that the cardboard is not delivered to the die-cutting roll, and the rubber cushion roll is lifted, causing that the cardboard cannot be cut off normally.
This function is mainly related to the paper feeding function when the machine is running, to avoid unnecessary contact between the rubber pad and the die cutter, and to extend the service life of the rubber pad.
Tip: when printing only and not die cutting, turn the change knob to the raised position.
- 5. EMERGENCY STOP**

Emergency stop button
In case of emergency, please press this button. After pressing this button, all parts of the printing machine will stop working. There will be a prompt "press the emergency stop button" on the touch screen of the paper feeding part
Note: when the button needs to be released, make sure it is safe before releasing it!
- 6. Phase "-"**

Phase adjustment
Phase adjustment refers to the size adjustment of the peripheral direction (i.e. forward or backward position) of the die cutting roller, which is divided into phase electric adjustment and automatic adjustment. Both functions can be operated in the machine stop state or the machine running state
"-": Phase adjustment decrease (forward) button
A) hold down the button, and the die cutting phase will be adjusted forward (that is, the position of the die cutter position moves toward the front of the cardboard).

B) Press this button to refer to the data display on the touch screen (the value changes from large to small).

7. Phase "+"

"+": Phase adjustment increase (backward) button

A) hold down the button, and the die cutting phase will be adjusted back (that is, the position of the die cutter moves towards the end of the cardboard). The button will be released and the die cutting phase will remain in the position.

B) Press this button to refer to the data display on the touch screen (the value changes from small to large).

8. Repair left

Left shift switch of rubber pad roller grinding

9. Repair right

Rubber pad roller grinding right switch

7) Die cutting operation panel - 2

1. touch screen

For details, please refer to the touch screen operation instructions.

2. WARNING

Alarm bell

Press the button, the alarm starts to ring, release the button, the alarm stops.

3. EMERGENCY STOP

Emergency stop button

In case of emergency, please press this button. After pressing this button, all parts of the printing machine will stop working.

Note: when the button needs to be released, make sure it is safe before releasing it!

4. Objective point

Press and hold the button, the main electric machine operates in the normal direction at the set speed and low speed, and release the button to stop the main machine.

5. Reverse point

Unit Auto Open button

Press and hold the button, the main electric machine runs in the opposite direction at the set speed, and release the button to stop the main machine.

6. Feed and stop feed

Paper feed on / off button

Normal paper feeding: when the printing machine is running, press this button to start the paper feeding function, and the paper feeding mode set on the touch screen will be: single sheet, continuous sheet or separated sheet.

Stop feeding: when the printing machine is in operation, press the button again, and the air cylinder controls the feeding grid to lift, that is, stop feeding.

This function is the same as the "paper feed" function of the paper feeding section panel, see 1-6.11 operation instructions for details.

7. Power

Power indicator

The indicator lights up to indicate that the machine is powered up

The indicator light is off, indicating that the machine is powered off

8. SPEED UP

Main motor acceleration knob

After the main engine starts, press and hold the button, the main motor will speed up, release the button, and run stably at the current speed. This function is the same as the "speed up" function of the paper feeder panel. See 1-6.8 for details.

9. SPEED DOWN

Main motor reduction knob

When the main motor is rotating, press and hold the button, the main motor will decelerate, release the button, and run stably at the current speed.

This function is the same as the "speed down" function of the paper feeder panel.

10. Print and die-cutting phase inching button, i.e. press the button once to adjust the phase by 0.5mm

11. Phase "-"

"-": Phase adjustment decrease (forward) button

A) For example: press the "-" button of P1, the phase of the first group of printing will be reduced (forward) by 0.5mm;

B) Press this button to refer to the data display on the touch screen (the value is reduced by 0.5).

12. Phase "+"

"+": Phase adjustment increase (backward) button

A) For example: press the "+" button of P1, the phase of the first group of printing will increase (backward) by 0.5mm;

B) Press this button to refer to the data display on the touch screen (the value increases by 0.5).

13. Cutting move

A) Press and hold the left button, the die-cutting cutter roll moves horizontally to the driving side, release the knob, and the die-cutting cutter roll will stop moving and remain in this position.

B) Automatic adjustment of die cutter roll traverse: Please operate the touch screen, traverse adjustment page, and directly input the value for relevant adjustment.

8) Touch screen operating instructions - 1

1. Production speed

Display the current actual production speed, the signal comes from the main motor frequency converter

2. Order quantity

Set the number of production sheets

Set the number of production sheets to be greater than the production quantity

counter, otherwise it cannot be input and the paper feeding cannot be started;
In the production process, when the number of production counter is equal to the set number of sheets, the paper feeding and buzzer will stop ringing;

3. Count zero

A) Press this key, the value after "demand quantity" will be cleared;

4. Quantity of production

Displays the counter of the current actual production quantity, which is used to accumulate the current production quantity.

5. Main start and stop

The function of the button is the same as that of the main motor start / stop button on the paper feeding part panel 1-6.7.

A) After connecting the power supply, press the button once, the indicator light of the button starts to flash, and the buzzer starts to flash. After 3 seconds, the indicator light of the button is always on, indicating that the main motor has been started;

B) Press the button again, the indicator light of the button goes out, and the main motor stops working;

Note: the main motor can only be started when each unit is locked and the main lock is locked.

6. Fan start and stop

Start / stop button of adsorption fan

The function of the button is the same as that of the start / stop button of the adsorption fan on the paper feeding section panel 1-6.7.

A) Press this button once, the adsorption fan starts to run, and the indicator light of this button is green.

B) Press this button again to stop the adsorption fan. The indication of this button is red.

7. Sheet feeding leaflet

Single sheet feeding mode: select this mode, press the paper feeding button, only one sheet of cardboard will be fed to the printer, and then the paper feeding will be stopped;

8. Phase adjustment

Click this button to enter the phase adjustment page:

1. traverse adjustment

A) Current position: displays the current position of the printing or die cutting phase

B) Adjustment distance: indicates the adjustment amount;

The forward forward: indicates a forward adjustment and a smaller value.

The backward reversal: indicates backward adjustment, and the value increases.

Stop means stop adjustment;

Take No.1 phase as an example, enter 75.0 in the adjustment value "adjustment" and press forward, then the "current position" value of No.1 will automatically adjust to the position of - 75.0 and stop when it is in place. If you press backward, then the "current position" value of P1 will automatically adjust to the position of 75.0 and stop when it is in place During the whole process, press "stop" to stop the adjustment;

C) All adjustment: adjust all phases

For example, if you enter 100 in the input box and press forward, the current position of all the above phases will automatically adjust to the position of - 100, and then it will automatically stop when it is in place.

9. Traverse adjustment

Click this button to enter the horizontal adjustment page:

A) Current position: displays the current position of the printing or die-cutting tool axis traverse

B) Adjustment distance: indicates the adjustment amount;

Left shift: it means to adjust to the left, and the value becomes smaller;

Shift right: it means to adjust to the right and increase the value;

Back to middle: back to 0;

Stop means stop adjustment;

Take the No.1 traverse adjustment as an example, enter 5 in the adjustment value "adjustment" and press left shift to the left, then the "adjustment distance" value of No.1 will automatically adjust to the position of - 5, and will automatically stop when it is in place. If you press right to move to the right, then the "current position" value of P1 will automatically adjust to the position of 5, and will automatically stop when it is in place During the whole process, press "stop" to stop the adjustment;

C) The range of traverse adjustment is plus or minus 10 mm.

10. Clearance adjustment

Click this key to enter the gap adjustment page:

A) According to the actual needs, input the parameters to be adjusted in the corresponding position "target value", and press the "confirm" key to execute.

B) Uniform adjustment: adjust all the gaps together

For example, enter 3 in the input box, and then press "confirm" to adjust the decrease or increase of all the above gaps, which will stop automatically when it is in place.

11. Baffle adjustment

Click this button to enter the baffle adjustment page:

A) Left baffle

Automatic adjustment of left baffle:

Actual value current position: display the actual position of the current left baffle plate

Target position: according to the actual order size, directly enter the value in the input box, click confirm, the left baffle starts to move, the actual value will change to the target value, until the actual value is equal to the target value, the left baffle stops moving, and the adjustment ends.

B) Right baffle

Automatic adjustment of right baffle:

Actual value current position: display the actual position of the current right baffl plate

Target position: according to the actual order size, directly enter the value in the input box, click confirm, the right baffle starts to move, the actual value will change to the target value, until the actual value is equal to the target value, the right baffle stops moving, and the adjustment ends.

12. Parameter setting

Click this button to enter the zero alignment page:

In order to do order management and storage, the printing plate must be the same

size:

- 1) For example: calculate the position of the printing plate 100 mm down from the hanging plate bar. Then, all orders in the future must be typeset according to this position when making the printing plate.
- 2) When the whole machine is combined, first press the “paper feeding part zeroing” button, after the machine stops stably, and then single group zeroing, after all zeroing is completed, enter the printing position in the input box corresponding to the “order”, and click the “automatic adjustment for plate” below.
- 3) After the adjustment, you can try to print a piece of cardboard, which can basically align with the printing position of each unit.
- 4) After the production of the order is completed, the order shall be saved. Click “generate storage order”, enter the number in the order number input box, and then press “save by order number” to save.
- 5) Change order: enter the order number to be changed in the input box after the order number, click “read by order number”, at this time, the positions of each phase in the order on the left side have been displayed as the order parameters after the change, the whole machine is combined together, press the paper feeding part to zero, press the “version” button of each unit, after the adjustment of each phase, the change is completed.

9) Installation of die cutter wooden template

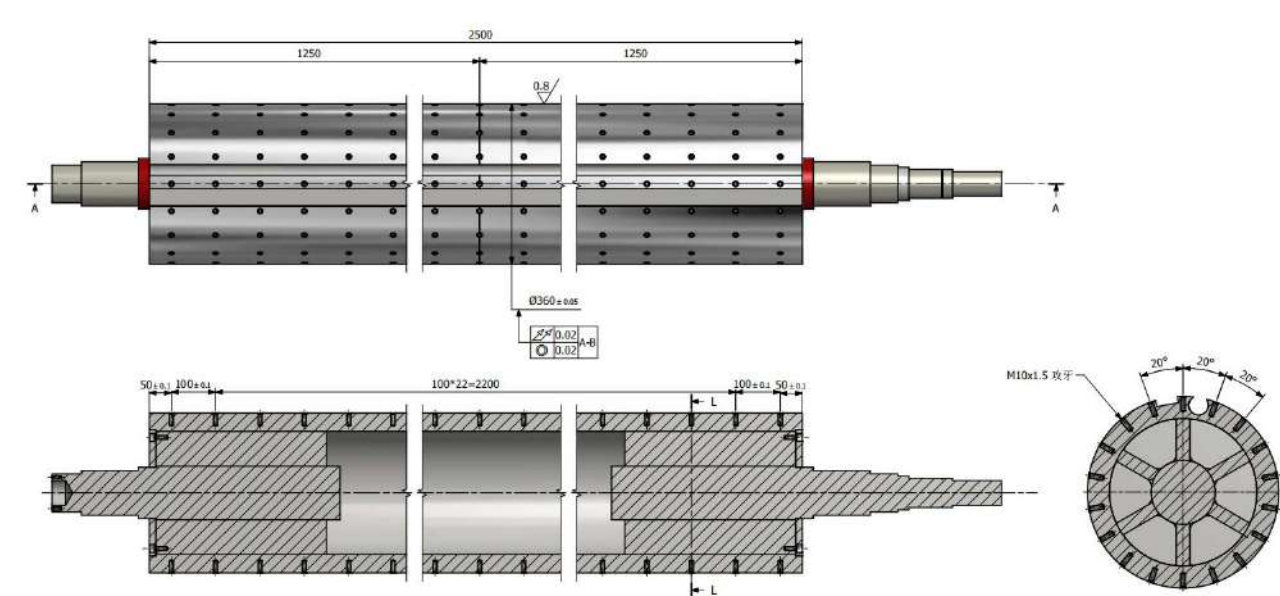


Figure 14

- A) Before installation, first adjust the distance between the die-cutting knife roll and the die-cutting rubber pad roll to the maximum to avoid damaging the rubber pad by the die cutting knife.
- B) During installation, the center line of the die-cutting cutter plate shall coincide with the center of the die-cutting roller surface, make the die-cutting plate close to the roller surface, correct and align the screw holes, adjust the die-cutting phase, and fix all other screws.
- C) If the template consists of two or more pieces, first fix one datum piece or the largest piece, and then fix the rest. When splicing, the gap shall be as small as possible. The

- positioning blade shall be inserted into the gap. The sequence of fixing screws shall start from the butt edge and extend backward, and then check the gap between the template and the roll surface.
- D) After the screw is fixed, check the height of the die cutter, which should be consistent. If there is any unevenness, use a wooden hammer to knock it flat, so that the bottom of the die cutter contacts with the roller surface.
- E) During trial cutting, first reduce the die cutting clearance slowly. When a part of the die cutter cuts the cardboard, stop the machine, check the height of the cutter again, knock down the higher die cutter, and then start the machine. Carefully adjust the die cutting clearance so that the cardboard can be cut completely. The clearance should not be too small, so as not to affect the service life of the rubber pad.
- F) Check the quality of the die-cut cardboard. If the cutter can cut the cardboard, but the indentation is too shallow or too deep, the cutter plate supplier shall continue to see if it is necessary to adjust the indentation line on the cutter plate, not only adjust the die-cut gap to solve the problem of the indentation depth, but also extend the service life of the rubber pad as much as possible.

10) Die cutting gap

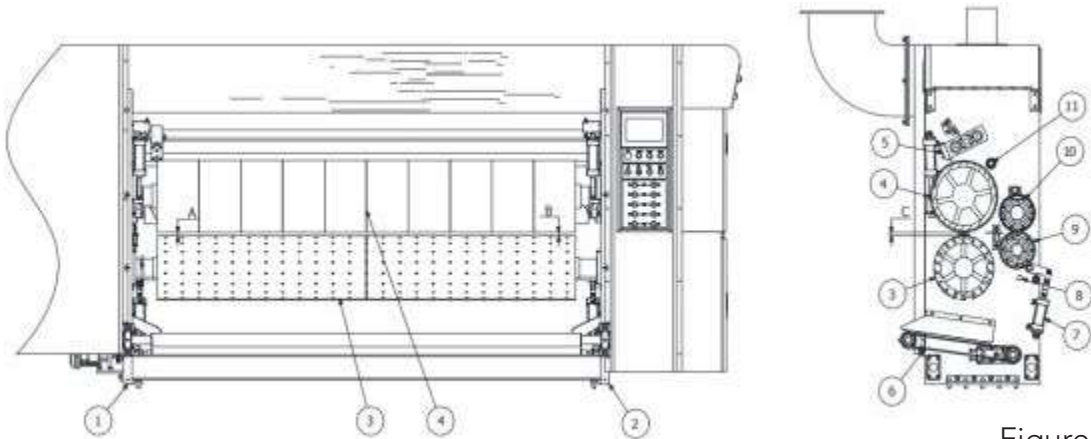


Figure 14

Code	Description
1	Drive side wall panel
2	Operation side wall panel
3	Die cutter shaft
4	Die cutting rubber pad roll
5	Grinding device
6	Waste discharge device
7	Lock the cylinder

Code	Description
8	Thread pressing clearance adjustment shaft
9	lower pressure line
10	Upper pressing line
11	Die cutting clearance adjustment shaft

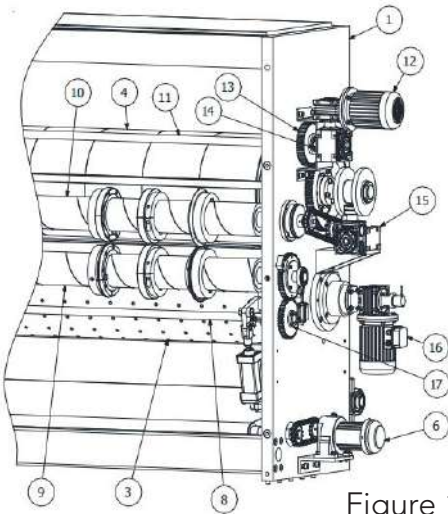


Figure 16

Code	Description
12	Upper die cutting clearance adjustment shaft
13	Die cutting clearance adjustment gear
14	Expansion joint sleeve
15	Rubber pad roll traverse reducer
16	Die cutter roll traverse reduction motor
17	Expansion joint sleeve

1. Parallel adjustment of die cutting clearance

A) When the gap "a, B" in Figure 15 is inconsistent, adjust the "14" expansion sleeve in Figure 16, take the gap "a" as the benchmark, loosen the fastening screw of the expansion sleeve "14", adjust the gap "B" to be consistent with the size of a, and tighten the fastening screw of the expansion sleeve "14" after the adjustment.

2. Electric adjustment of die cutting clearance

- A) See 3-8.10 operation for the electric adjustment method of die cutting clearance.
- B) The adjustment range of die cutting clearance is - 5 to 15mm.
- C) When the actual measurement data of gap "C" in Figure 15 is inconsistent with the display in the touch screen, please correct it according to the touch screen "correction page", and the height of the die-cutting knife should be subtracted 25.4mm as the actual die-cutting gap.

3. Troubleshooting die cutting clearance

A) If the clearance cannot be adjusted normally during use, please check whether the "12" clearance adjustment reduction motor or displacement sensor in Figure 16 is abnormal. If there is any abnormality, please repair or replace it in time.

11) Replacement and grinding of die cutting rubber pad

1. Replacement of die cutting rubber pad

1	2	3	4	5	6	7	8	A
5	6	7	8	1	2	3	4	B
3	4	1	2	7	8	5	6	C
7	8	5	6	3	4	1	2	D

Figure 17

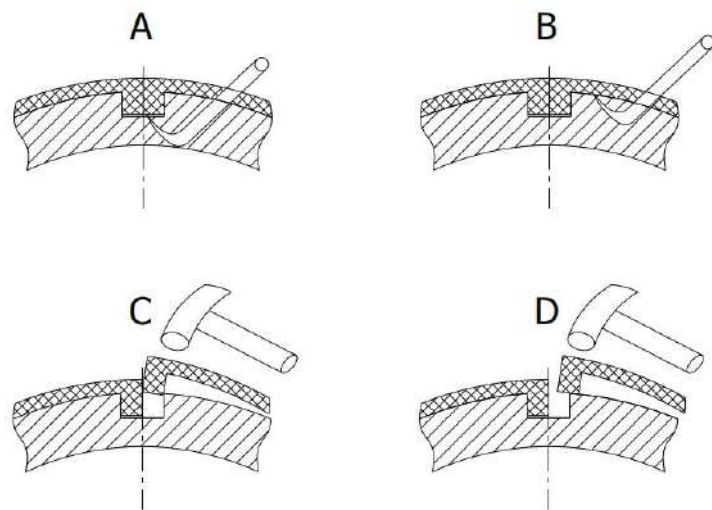


Figure 18

- A)** The initial installation position of the rubber pad is as shown in "a" in Figure 17. After the rubber pad is used for a period of time, several pieces in the middle are vulnerable. In order to extend the service time, replace the side end not worn to the middle, and the middle to the side end for the first time, as shown in "B" in Figure 17.
- B)** According to the use situation, the replacement position of the rubber pad can be made several times to maintain the best condition of the rubber pad, as shown in "C, D" in Figure 17.
- C)** When removing the rubber gasket, use the special disassembly tool to put the rubber gasket in the groove as shown in "a" in Figure 18, and do not lift the rubber gasket at any place outside the groove like "B".
- D)** When installing the rubber pad, one end of the rubber pad shall be placed in the groove as shown in "C" in Figure 18, the other end shall be placed at the edge of the groove, and the rubber pad shall be knocked into the groove with a rubber hammer or a sand hammer, and the other end of the rubber pad shall not be knocked out of the groove with a rubber hammer as shown in "d" view, which will damage the interface of the rubber pad, but the rubber pad can not be installed.

2. Grinding of die cutting rubber pad

In order to reuse the adhesive for many times, the die cutting anvil roll is equipped with an automatic grinding mechanism, which can effectively save the use cost of the felt sleeve.

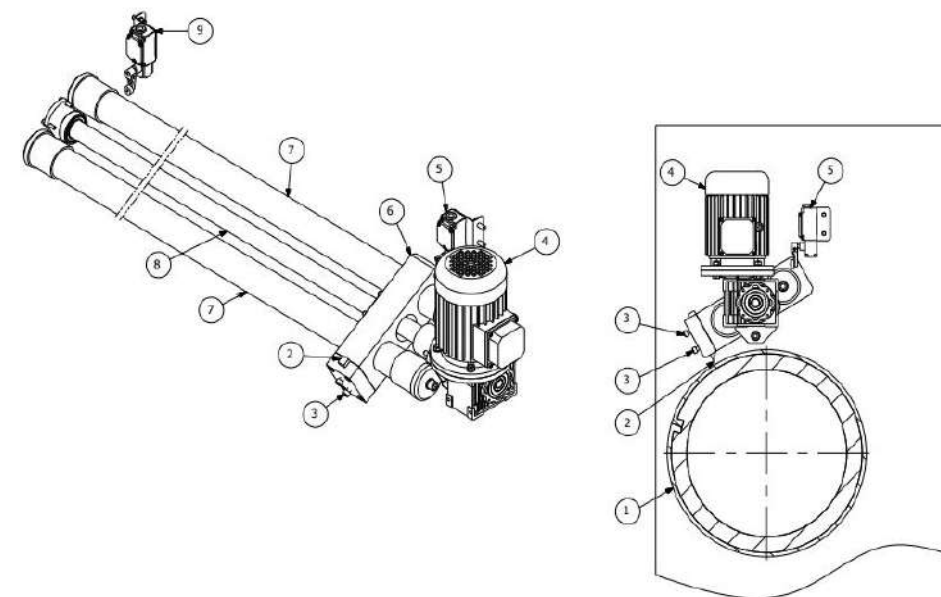


Figure 19

Code	Description
1	Die cutting rubber pad roll
2	turning tool
3	Fastening screw
4	Grinding reduction motor
5	Operation side limit switch
6	fixed seat
7	positioning axis
8	lead screw
9	Drive side limit switch

- A)** When the outer surface of the rubber pad becomes blanket shape and the rubber pad is damaged and uneven, the grinding operation can be carried out.
- B)** Loosen the "3" set screw in Figure 19, and adjust the feed of turning tool.
- C)** Start the main engine at a speed of about 100 pieces / minute, start the grinding motor to run, drive the screw rod and copper bus to move the fixed base, so that the

turning tool can continue to use after the rubber pad is cut flat.

3. Continuous cutting of cardboard

- A) Insufficient die cutting pressure
 - Adjust the pressure to the appropriate range according to the thickness of the paperboard
- B) The design of cutter die is not ideal
 - Make knife mould correctly, for example, select different types of high quality sharp teeth knife, knife height, desquamation sponge, etc
- C) Bad die (such as knife edge passivation, bad interface, etc.).
 - Change the cutter die
- D) Rubber pad is worn or uneven
 - Polish the rubber pad to make it smooth and tidy

4. Indentation and wire burst

- A) Improper indentation height
 - Continuous die supplier, adjust or change the height of indentation line
- B) Indentation protector unreasonable
 - Replace the protective strips on both sides of the indentation line
- C) Excessive die cutting pressure
 - Adjust die cutting clearance
 - Never mix new and old steel knives and steel wires
 - Ensure that the pressure of die cutter and indentation steel wire is even and appropriate
- D) Die deformation
 - Avoid stacking of cutter dies
 - Pay attention to the humidity environment and affect the board
- E) Poor paper quality
 - Replace good quality paper

5. Die cutting moving

- A) Insufficient paper pulling shaft pressure
 - Adjust the paper pulling shaft clearance
- B) The adsorption fan of printing and drying group is not started or the air volume is small
 - Turn on all adsorption fans and adjust the air volume
- C) The paper pulling ring doesn't work
 - Readjust the position of the paper pulling ring according to the width of the paperboard
- D) Insufficient die cutting pressure
 - Adjust the pressure to the appropriate level according to the thickness and quality of the paperboard
- E) Serious warpage of cardboard
 - If possible, flatten the cardboard before production
- F) Too fast
 - Reduce the machine speed properly
- G) The knife plate is loose on the die cutting roller
 - Retighten die cutter plate

Chapter 5: ADJUSTMENT OF PRINTING MACHINE

A) Power and Compressed Air

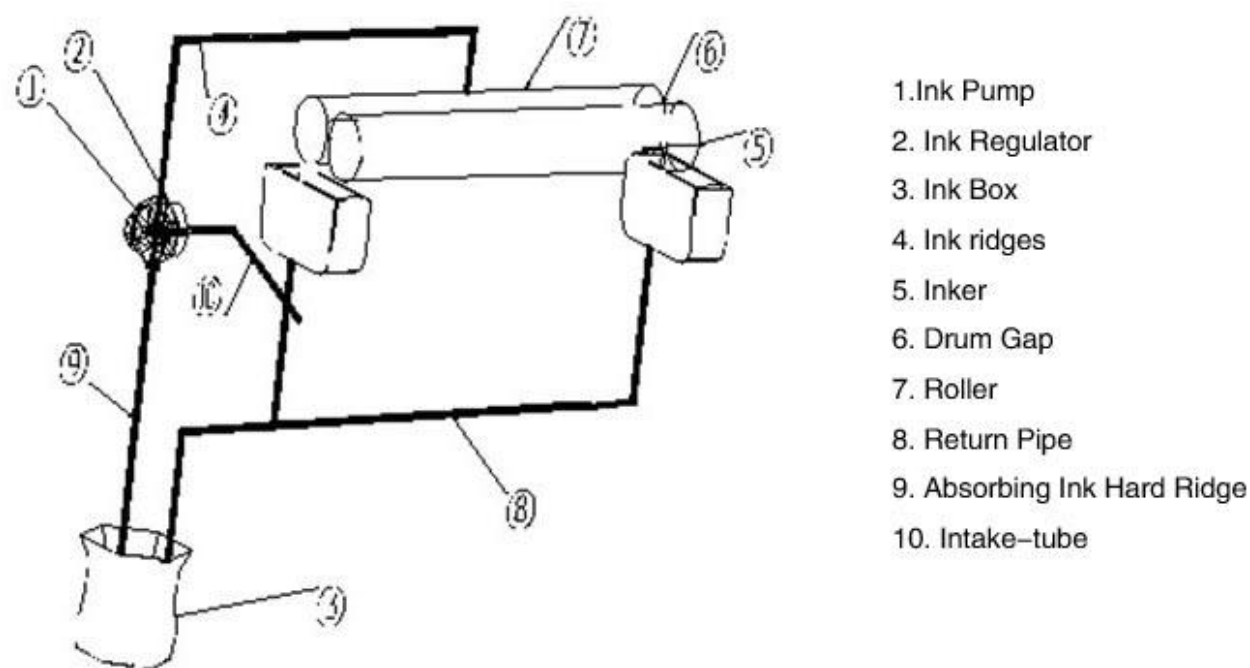
Press the "on" switch on the main operation panel to connect the power (before pressing this button, carefully check if all switches are connected). Open the air compressor switch and let it work for some time to ensure that the pressure in the air storage tank is within the range of 8-10kg/cm², guaranteeing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



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

- The first exhaust switch is closed, adjusting the pressure valve to the minimum pressure to prevent ink leakage.
- 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.
- 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

- Rapidly recover the ink scraping cavity.
- Replace the ink with cleaning fluid, opening the diaphragm pump fully and injecting cleaning fluid into the scraper cavity for about 3-5 minutes.
- 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.
- 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.
- 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

- 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.

MAINTENANCE OF MACHINE

Chapter 6:

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

APPLICATION OF

Chapter 7: INK AND PRINTING

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 phenomen 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 phenomen 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

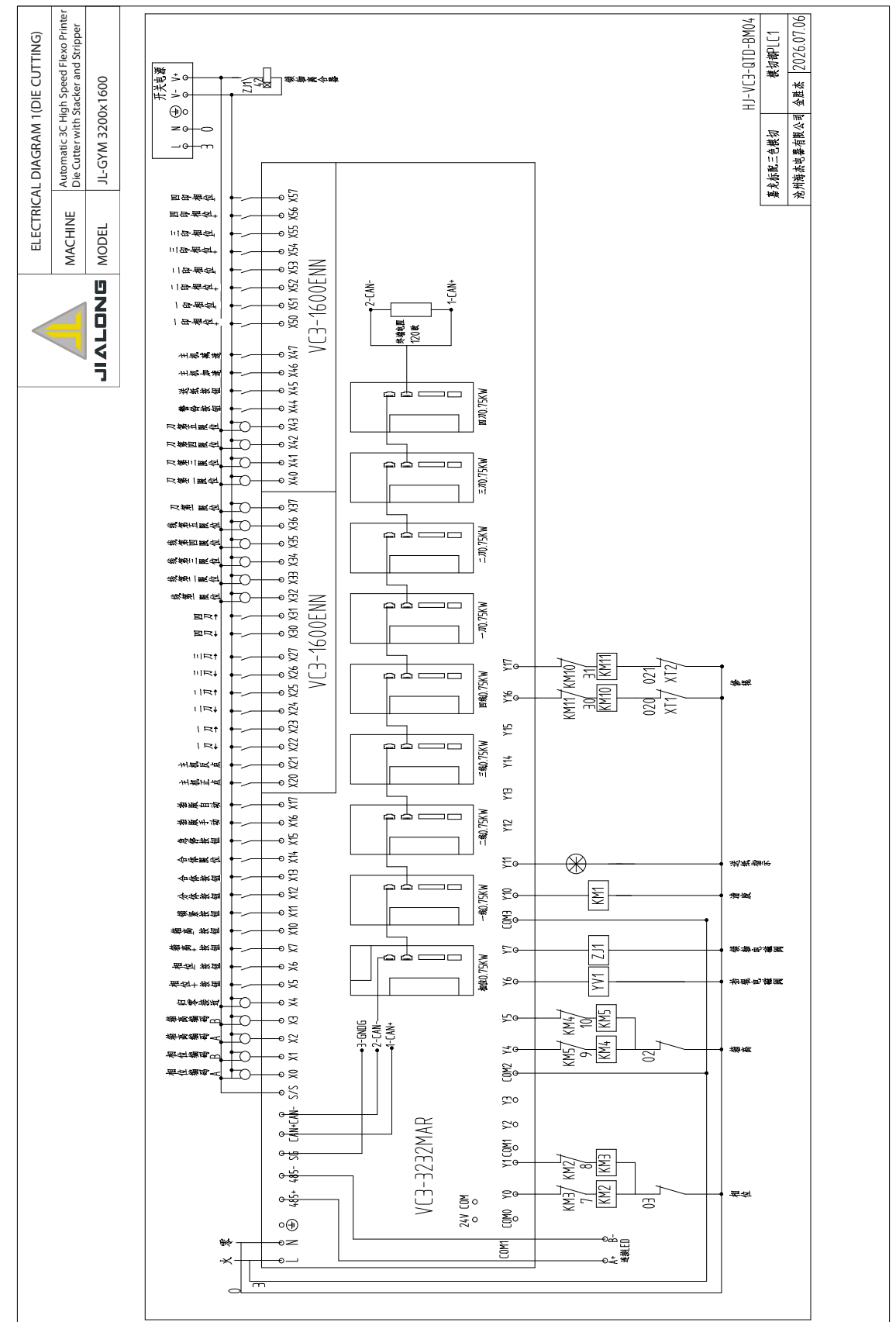
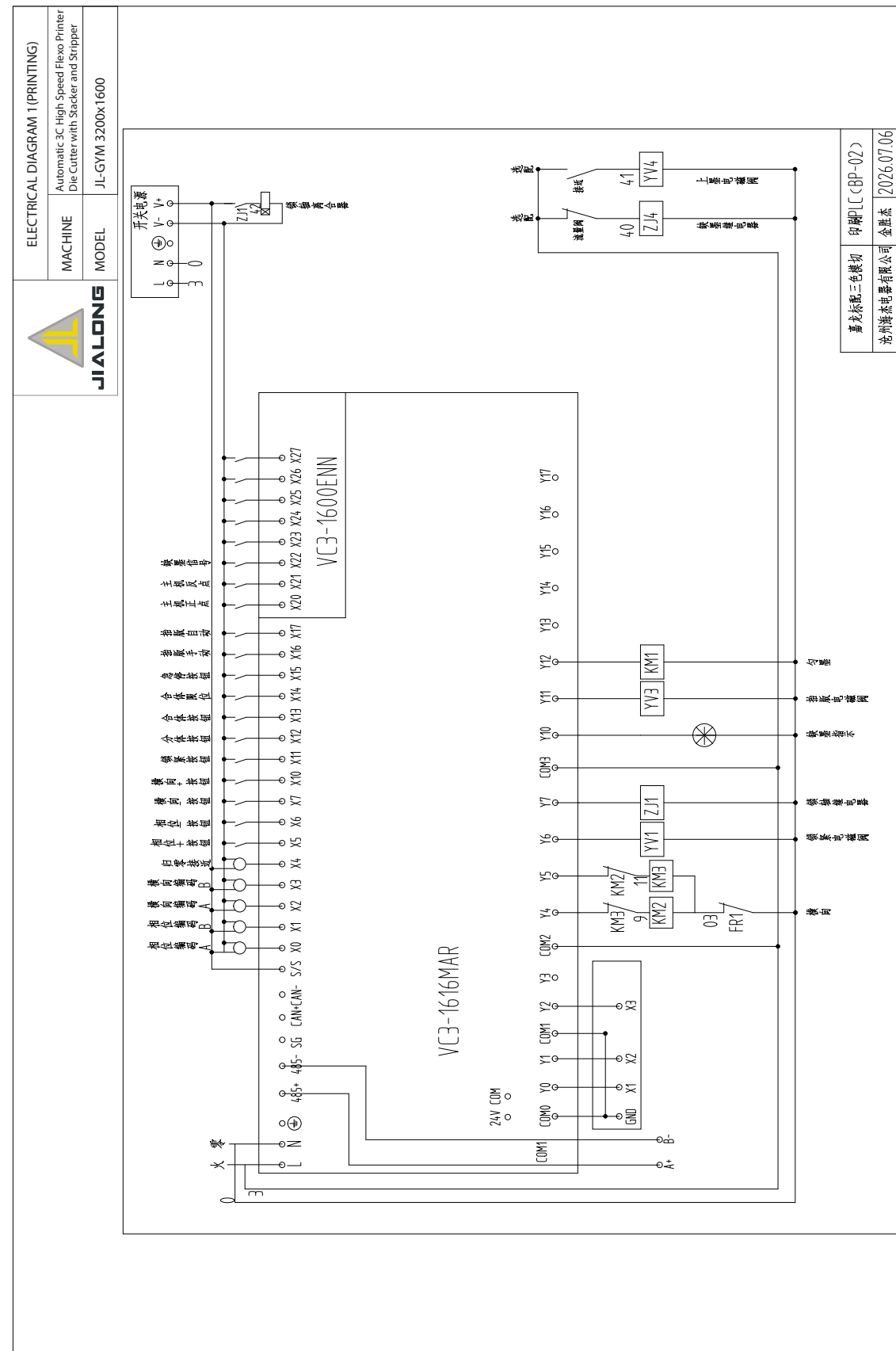
To sum up, the quality of corrugated cardboard printing depends on many factors, with the use of ink and skill being particularly important. With rapid advancements in printing technology and equipment, water-based ink is moving towards higher concentration, lower viscosity, and reduced volatility, while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

LAYOUT



ELECTRICAL DIAGRAMS

Automatic 3C High Speed Flexo Printer Die Cutter with Stacker and Stripper - Model: JL-GYM 3200x1600 / Serial: DX20260224-2



WARRANTY CONDITIONS

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

CONTACT INFORMATION



CORRUGATED BOX EQUIPMENT LLC.
120 Vantis Drive – Suite 300
Aliso Viejo, CA, 92656
USA: +1 949 242 9516
MEX: +52 55 6952 0707
www.corrugatedboxequipment.com
info@corrugatedboxequipment.com

www.corrugatedboxequipment.com