



**AMC MACHINERY**

# OPERATION MANUAL

Automatic Rotary Die Cutter  
Model: **ZM-1628JW**



REV 02/24

Serial: **AMC230825ZM1628JWST**

**US**

English



**AMC MACHINERY**

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# Chapter 1:

## SAFE OPERATION PRACTICE INSTRUCTION

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

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

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

## A) General Rules

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

## B) Basic Requirements of Safe Operation

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

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

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

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

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

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

3. Keep this operation manual in a safe place.

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

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

Please contact us if anything is unclear.

## C) Safety Marks

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

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

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

### Safety Alert Symbols

|                                                                                                    |                                                                                                                           |
|----------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
|  <b>ATTENTION</b> | Marks indicate potential danger, which may result in medium to slight injury or property damage if not paid attention to. |
|  <b>WARNING</b>   | Marks indicate potential danger, which may result in serious injury if not paid attention to.                             |
|  <b>DANGER</b>    | 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 $\pm$ 5%, frequency 50 $\pm$ 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 100 $\Omega$ , and a ground wire with a diameter of  $\geq$ 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.

## H) Safety maintenance.

### 1. Danger

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

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

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

Covers should be closed once maintenance is completed.

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

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

### 2. Attention

Review the maintenance work with the manager.

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

Retain this record for a reasonable period of time.

## I) Safety Examination Items

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

Verify the tightness of the transmission belt.

Inspect the rubber and anilox rolls for any abnormalities.

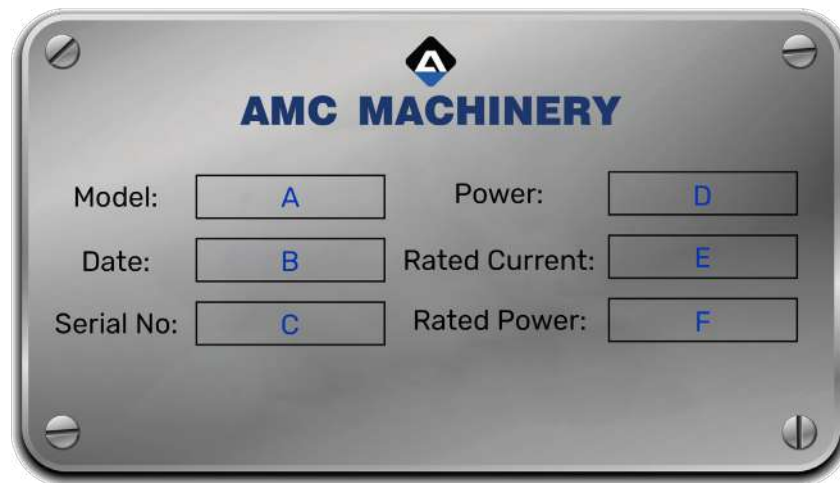
Assess the condition of the air compressor and cylinders.

Confirm there are no foreign objects inside the machine.

# Chapter 2:

## MACHINE IDENTIFICATION

## A) Identification Plate



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

The following data is reported on the name plate:

| Code | Description     |
|------|-----------------|
| A    | Machine Model   |
| B    | Production Date |
| C    | Serial Number   |
| D    | Power           |
| E    | Rated Current   |
| F    | Rated Power     |

# Chapter 3:

## MACHINE DESCRIPTION

## A) Feeder Unit

### I. Leading edge feed system

- 1) Utilizing an advanced world-leading edge feed system (three-row wheel design) and roller front edge feed structure, the machine employs multi-wheel, multi-point suction air to feed paper, ensuring high friction, high speed, and smooth and accurate paper delivery.
- 2) Air suction auxiliary feeding of paper is facilitated by a 5kW high-pressure centrifugal fan. Wind pressure is variably controlled according to the bending degree of the board through frequency modulation, ensuring warp cardboard is transmitted accurately at high speeds.
- 3) Paper lifting and leaving actions are accomplished swiftly and powerfully using cylinders for pushing.
- 4) Electric and computer touch screen adjustments are available for the side baffle (computer settings, numerical value, automatic adjustment), while manual adjustment is possible for the front bezel, and electric adjustment for the rear gearbox.
- 5) The machine is equipped with Taiwan ultra-durable front delivery wheels, ensuring long-lasting wear resistance.
- 6) A seven-inch touch screen is installed, automatically displaying production quantity and speed, with the capability to set production quantity.
- 7) The die-cutting department features interlocking control switches for urgent stop, stoppage, or paper return, along with a whole-machine deceleration button.

### II. Paper feed roller

- 1) Roll diameter: 155mm.
- 2) Constructed from 45# seamless steel tube wrapped with wear-resistant rubber and subjected to computer dynamic balance correction.
- 3) Roller diameter: 155mm, with embossed hard chromium plating and computer dynamic balance correction.
- 4) Manual adjustment of the feed roller clearance dial, with an adjustment range of 0-12mm.
- 5) The front paper rollers (elastic rollers) are equipped for spring lifting and automatic voltage regulation, effectively reducing the strength damage of corrugated board.

### III. Beat device

The machine features a pneumatic beat device for precise horizontal positioning of the cardboard, minimizing waste through computer-controlled beat timing.

## IV. Computer devices

- 1) The main motor utilizes a frequency conversion motor, with the frequency converter employing Taiwan Delta technology to save energy, reducing electricity consumption by up to 30%.
- 2) The fan is equipped with independent frequency converter control, allowing for adjustable air pressure.
- 3) The main screen features a PLC precise control system and a user-friendly man-machine interface.
- 4) A seven-inch color touch screen controls the feeding section, offering production speed options of 30, 60, 90, and 120 with cruise control functionality. Additionally, it includes infrared photoelectric counting and preset order processing quantity settings.
- 5) The entire machine is operated through a combination of light, electricity, and gas control systems, ensuring ease of operation.
- 6) At the rear of the machine, an emergency stop and acceleration/deceleration control device are installed, providing convenient and swift operation.

## B) Die Cutter Unit

### I. Die roll (lower roll)

- 1) A diameter of 487mm was achieved (excluding cutter dies).
- 2) Made of cast steel material, surface ground, and hard chromium plated.
- 3) Computer dynamic balance correction increases operational stability.
- 4) Die fixed with screw holes spaced 100\*100mm apart.
- 5) Applicable height of cutter: 25.4mm.
- 6) Die-cutting thickness: 16-18mm (three laminates), 13-15mm (five laminates).

### II. Rubber pad roller (upper roller)

- 1) A diameter of 434.2mm was achieved.
- 2) Made of cast steel material, surface ground, and hard chromium plated.
- 3) Computer dynamic balance correction increases operational stability.
- 4) Manually adjustable gap between the die and the roller.
- 5) Pad thickness: 8mm, width: 250mm.

### III. Transverse movement and repair device

- 1) The rubber pad adopts Taiwan super-resistant imported material, offering convenient installation and adjustment. The cutting edge is smooth and provides a long service life, with an approximate usage of 12 million times, significantly reducing production costs.
- 2) Mechanical transverse movement of 40mm, equipped with a swimming device and pneumatic control to regulate the movement of the cutter head up and down, thereby prolonging the service life of the rubber pad (controlled by photoelectric sensors).
- 3) The repair employs the electric repair device, enhancing the rubber pad repetition rate, allowing for 3-4 repairs.
- 4) Die-cutting roller pneumatic automatic separation device reduces pad wear, thereby increasing service life.
- 5) Automatic line speed compensation ensures uniform rubber pad wear and is equipped with a rubber pad repair device, enabling repeated use of the rubber pad to ensure consistent sizing for each batch of cartons.
- 6) Die roller phase adjustment utilizes a planetary gear structure, PLC touch screen control, and electric digital 360-degree adjustment.

### C) Stacker Unit

- 1) The height of stack is 1600mm.
- 2) The rise and descending of the machine tool platform is driven by the powerful chain, the rise and descending motor has equipped the brake function, so the machine tool can keep the fixed position to prevent failing down.
- 3) With the paperboard piling to the higher lever, the machine tool platform automatically adjusts the tilling height. The organization or lift the paper by pneumatic motion, the paper receiving tray will automatically open and catch the paperboard while the paperboards are piled to the planned height.
- 4) Setting the save protect device, which was force the platform can not failing down abruptly, can make the worker safety.
- 5) The surface corrugated belt can prevent the sliding of the paperboard.
- 6) Combined application design for chip-removing brush and chip-removing blower can guarantee result of removing chip.

### D) Troubleshooting

#### Feeder Unit

- I. Main machine won't start.

Possible reasons:

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

## **II. Main machine cannot speed up or slow down.**

Possible reasons:

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

## **III. Auto-feeding is not working.**

Possible reasons:

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

## **IV. Fan cannot start.**

Possible reasons:

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

## **V. Side baffle cannot be adjusted.**

Possible reasons:

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

## **VI. The back baffle box cannot be adjusted**

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

## Die-cutting unit

### I. Die Cutting Phase Cannot Be Adjusted

Possible reasons:

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

### II. The Rubber Gasket on the Roller Cannot Move Laterally

Possible reasons:

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

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

Possible reason:

1. There may be equipment experiencing a stuck phenomenon.

# Chapter 4:

## TECHNICAL PARAMETER



## AMC MACHINERY

### Rotary Die Cutter with Stacker No Colors Model ZM-1628JW

| Electrical Requirements |       | Product     | Rotary Die Cutter with Stacker<br>No Colors      |
|-------------------------|-------|-------------|--------------------------------------------------|
| Voltage                 | 480V  | Brand       | AMC                                              |
| Phase                   | 3 PH  | Model       | ZM-1628JW                                        |
| Frequency               | 60 Hz | Origin      | China                                            |
|                         |       | Application | Manufacturing of die-cut boxes without printing. |

| Operation Conditions                     |                        | Overall Dimensions     |          |
|------------------------------------------|------------------------|------------------------|----------|
| Operating Temperature (°C)               | 50°C                   | Length                 | 5000 mm  |
| Maximum Operating Temperature (°C)       | 50°C                   | Wide                   | 2500 mm  |
| Installation Place Room Temperature (°C) | Min 20%<br>Max 80%     | High                   | 2200 mm  |
| Relative Humidity (%)                    | Min 45%<br>Max 75%     | Weight                 | 6500 Kg. |
| Elevation (m)                            | 3 m<br>Above Sea Level | Floor Area Requirement |          |
|                                          |                        | 5200 x 1700 x 2100 mm  |          |

| Technical Specifications |                                                                      |
|--------------------------|----------------------------------------------------------------------|
| Printing Cylinder Width  | 2800 mm                                                              |
| Paper board Thickness    | 3-8 mm<br>3/5/7 layers corrugated cardboard from E flute to A flute. |
| Max. Machine Speed       | 150 pcs/min                                                          |
| Working Speed            | 80-120 pcs/min                                                       |
| Main Motor Power         | 17.5 Kw                                                              |
| Working Power            | 15 Kw                                                                |
| Main Motor Power         | 7.5 Kw                                                               |
| Fan Motor Power          | 7.5 Kw                                                               |

| Feeding Unit                       |                                                                                  |
|------------------------------------|----------------------------------------------------------------------------------|
| Max. Speed                         | 150 pcs/min                                                                      |
| Working Speed                      | 80-120 pcs/min                                                                   |
| Max. Sheet Size                    | 1600 x 2800 mm                                                                   |
| Min. Sheet Size                    | 450 x 450 mm                                                                     |
| Feeding Accuracy                   | ±1 mm                                                                            |
| Feeder Type                        | Lead Edge Feeder with vacuum suction                                             |
| Feeding Roller                     | Top Roller: Nitrile rubber<br>Bottom Roller: Embossing and coated hard chromium. |
| Control System                     | 7" touch screen                                                                  |
| Die Cutter Unit                    |                                                                                  |
| Max. Die Cutting Size              | 1600 x 2700 mm                                                                   |
| Min. Die Cutting Size              | 450 x 450 mm                                                                     |
| Die Cutting Accuracy               | ±1.0 mm                                                                          |
| Anvil Cover Cylinder Specification | 434.2 mm,<br>Thickness 30 mm                                                     |
| Die Cylinder Specification         | 487 mm,<br>Thickness 40 mm                                                       |
| Die Creasing Blade Height          | 22.6 mm                                                                          |
| Wooden Die Thickness               | 13 mm                                                                            |
| Die Cutting Blade Height           | 25.4 mm                                                                          |
| Stacker Unit                       |                                                                                  |
| Height of the Stack                | 1600 mm                                                                          |
| Lifting System                     | Chain Drive                                                                      |

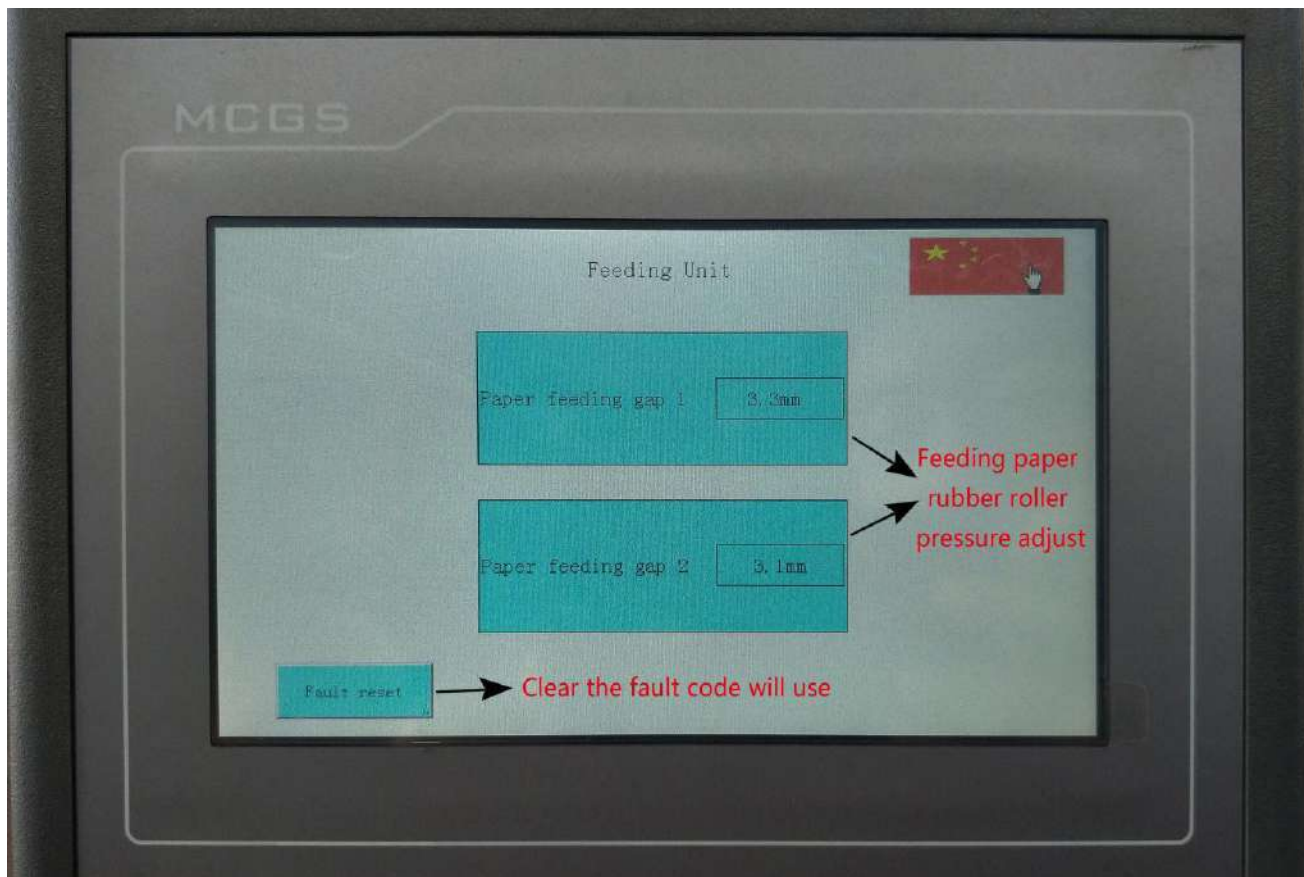
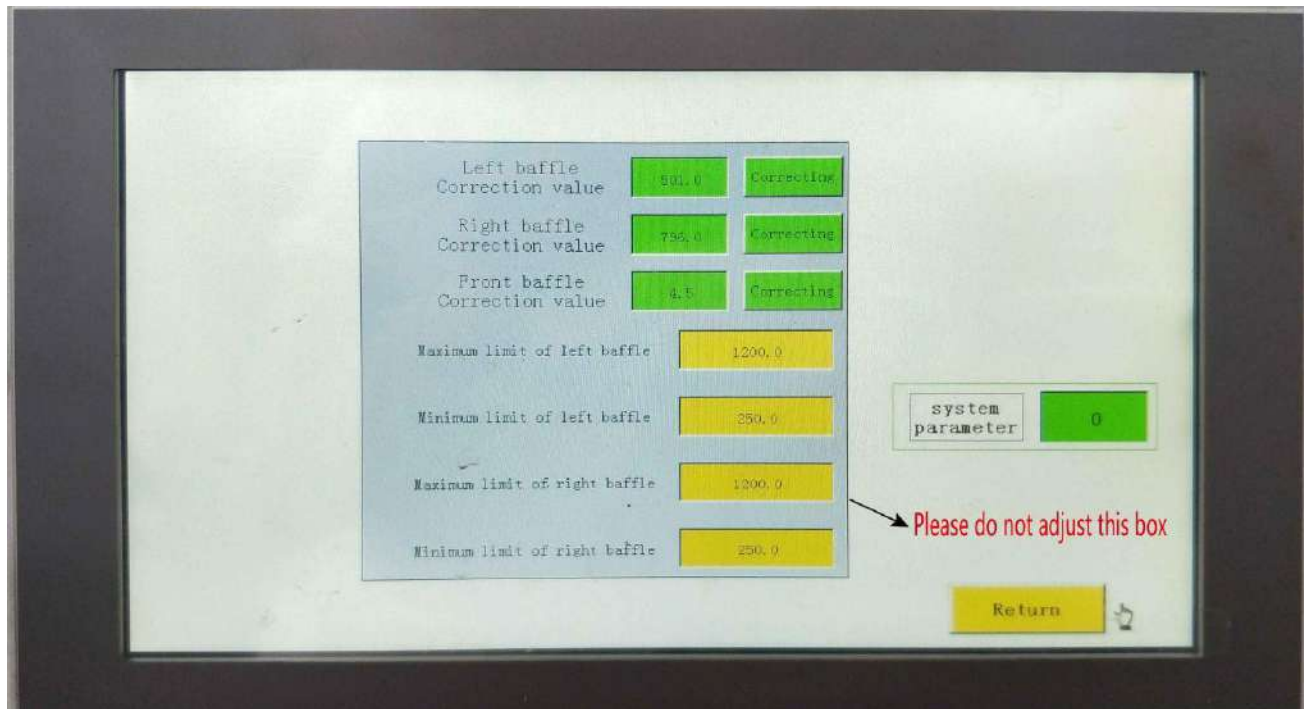
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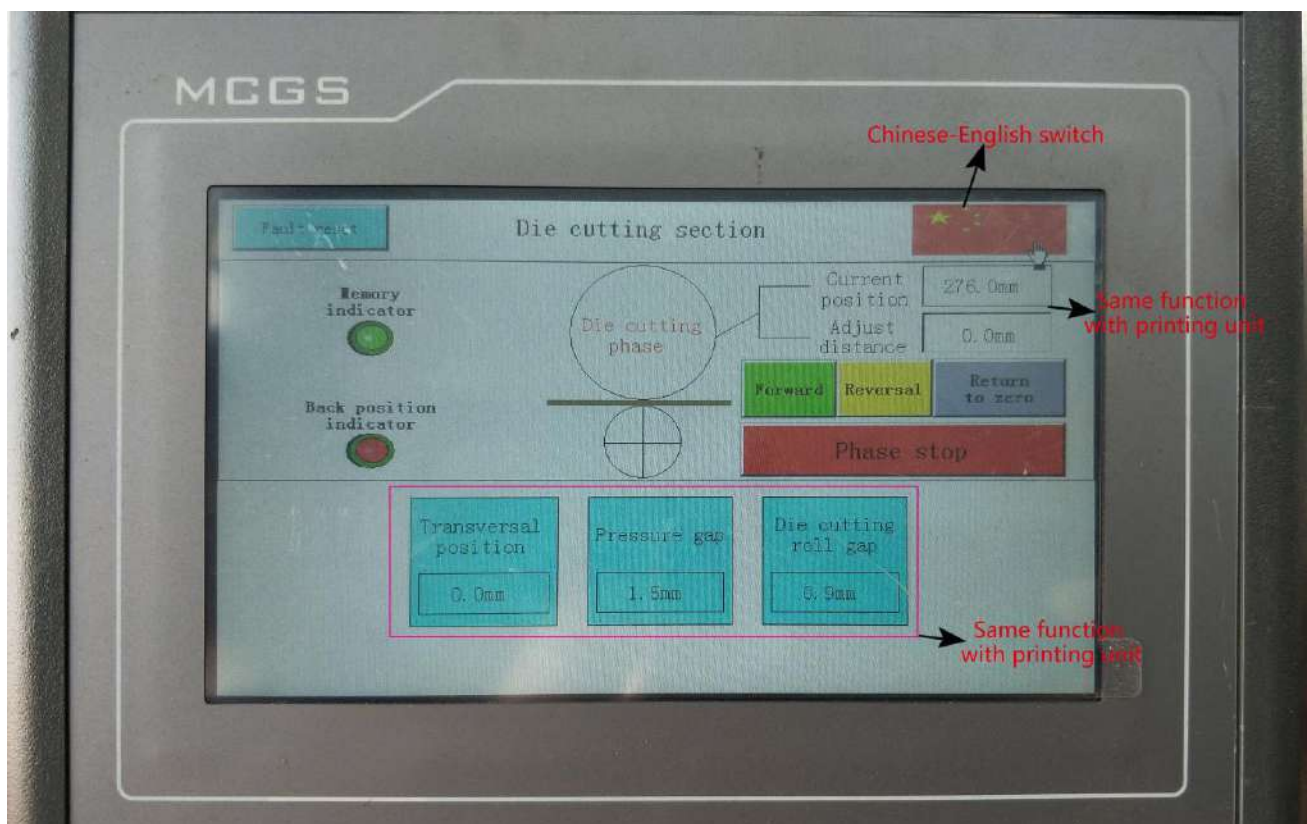
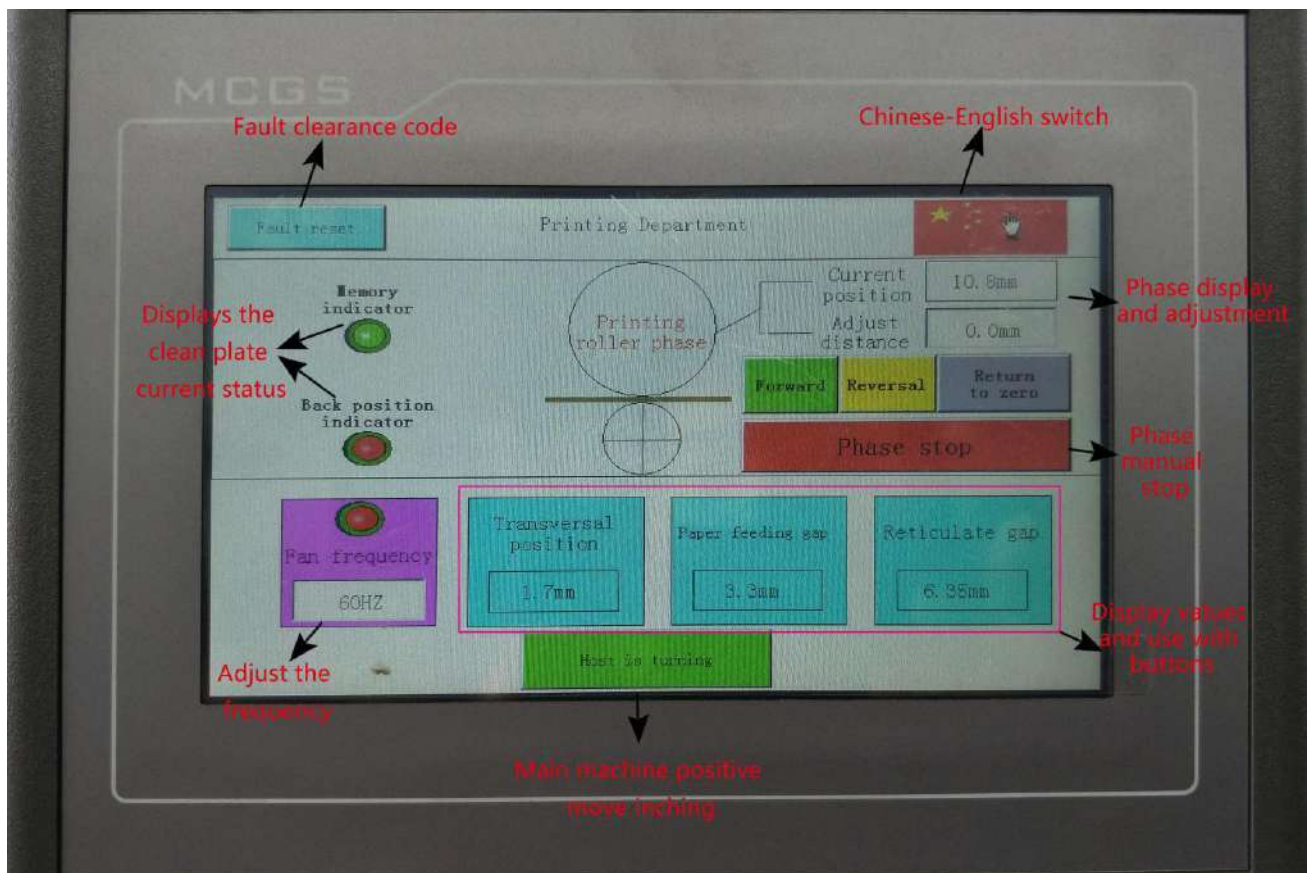
## ELECTRIC EQUIPMENT OPERATION

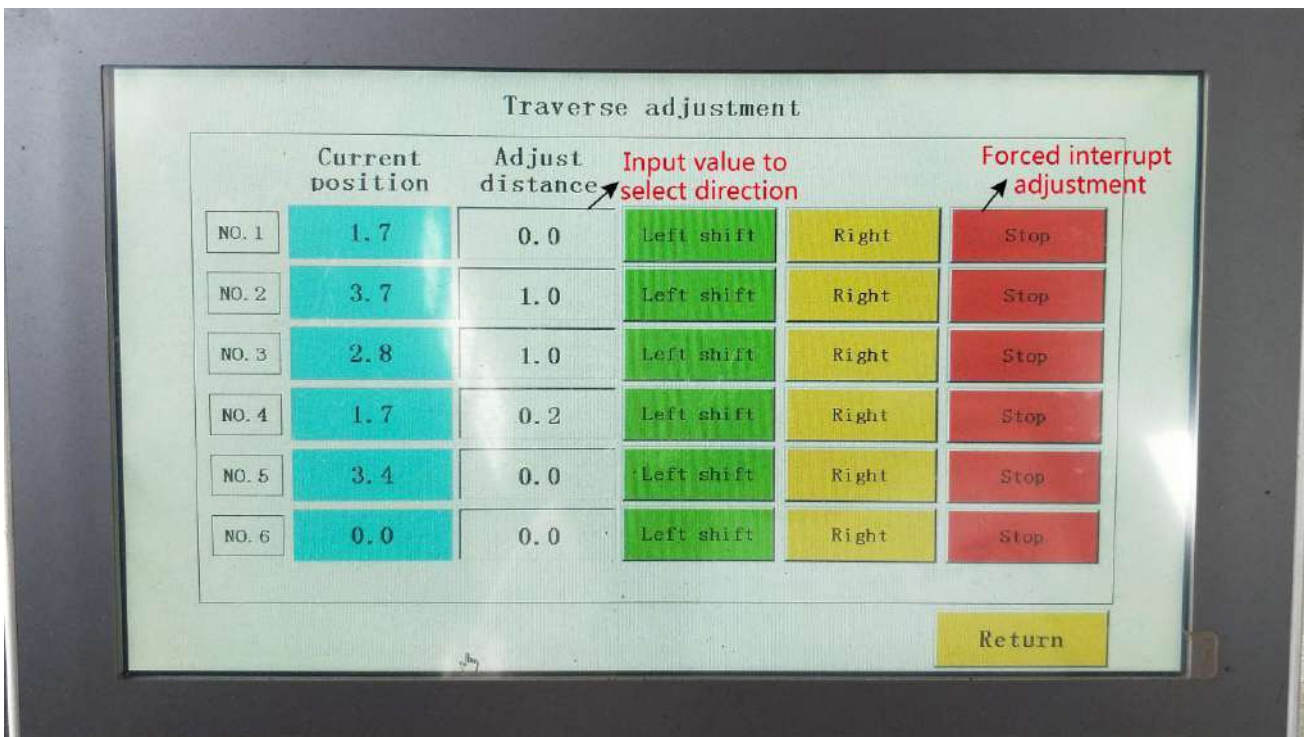
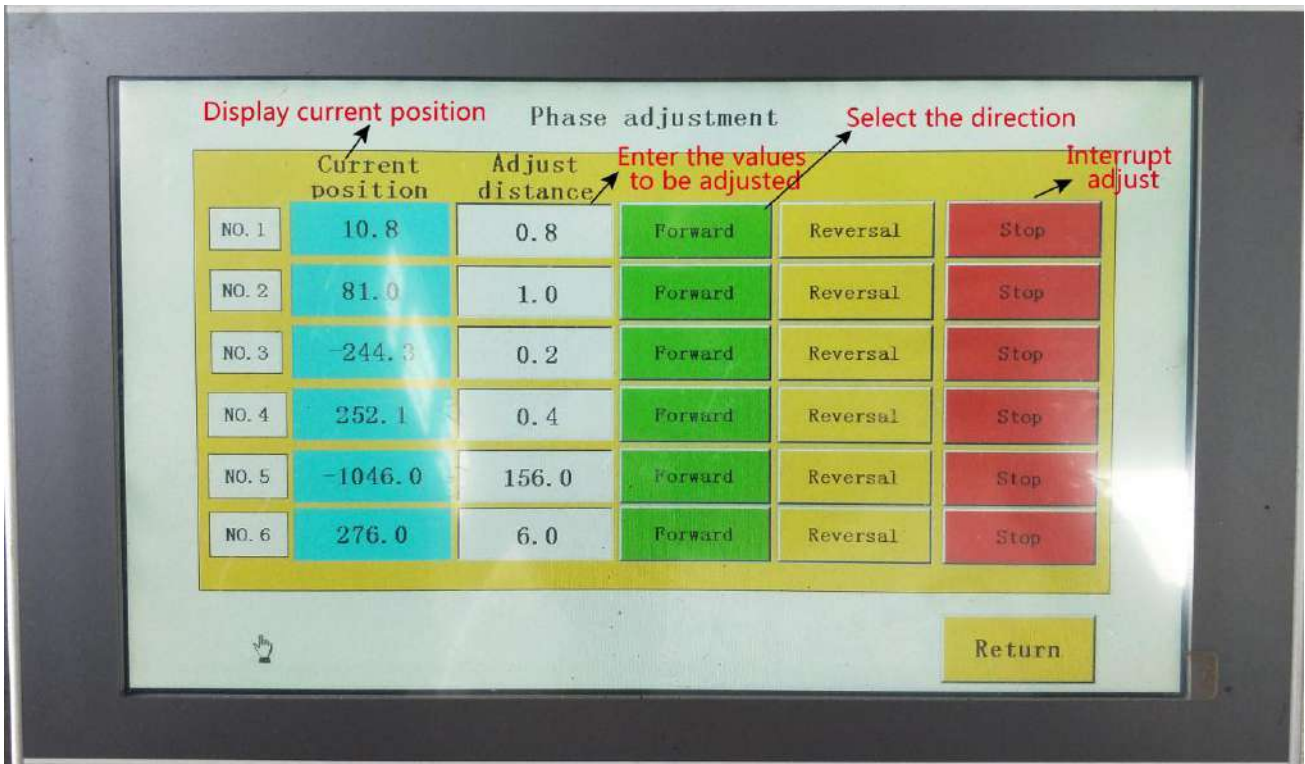
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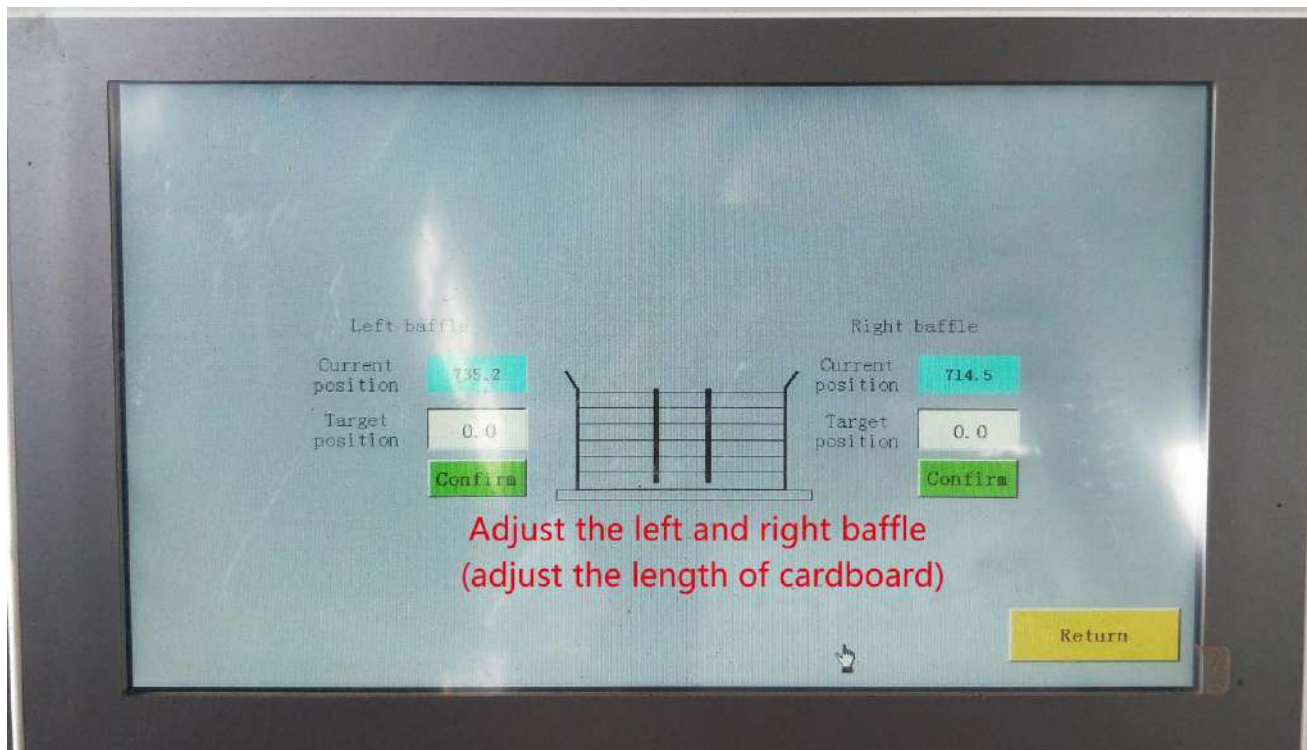
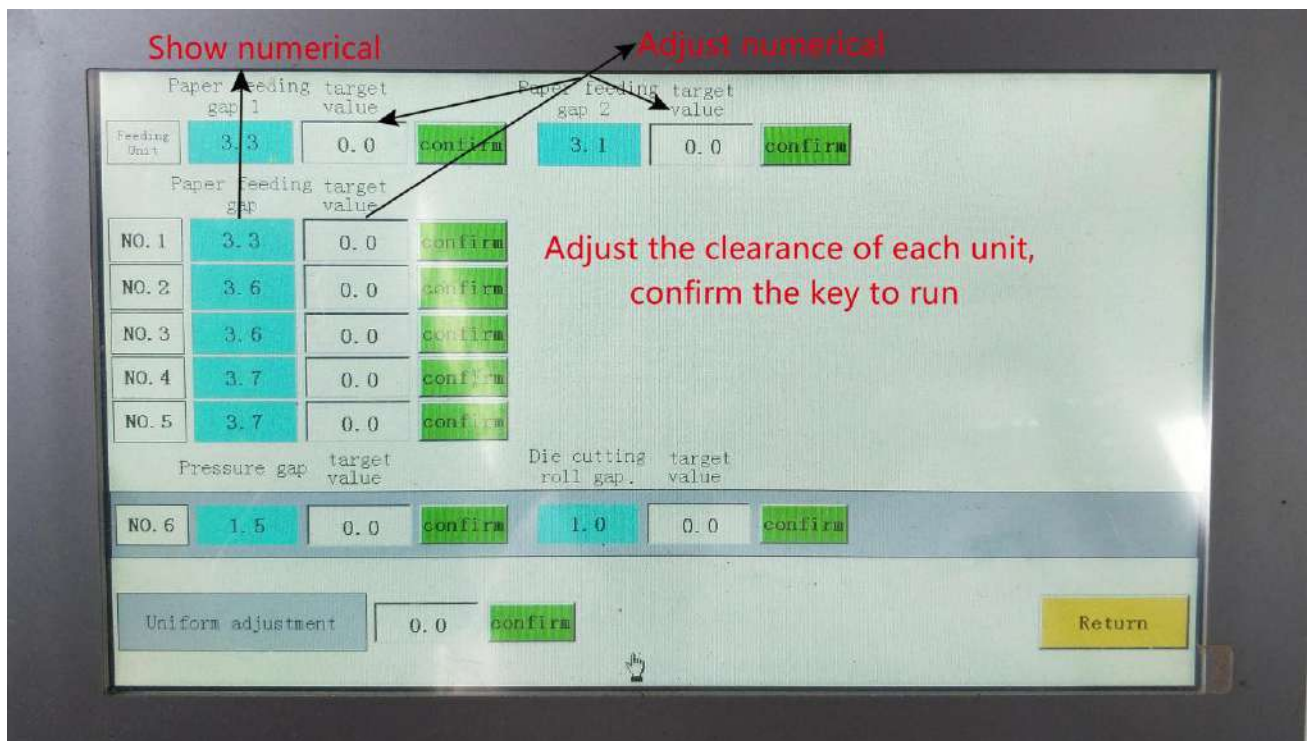
## A) Machine Operation and Reminder

### I. Feeder Unit:











### Automatic Memory Function for Machine Return

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

### Order Storage Procedure

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

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

After completing the version, proceed with paper printing.

# Chapter 6:

## MACHINE OPERATION

**Note:** All interval manual adjustment position are required to pull out 30 mm before adjusting, reset after adjustment, automatic self lock.

## A) Operation of Feeding Unit

- 1) Adjust front door: should be fixed in a proper place (about the place of 70% of width of paperboard) the interval of front door should be adjusted to 1.3 times of the thickness of paperboard.
- 2) Adjustment of back baffle and feeding pushing board. When paperboard is on its place on the workbench, the interval between front door and back baffle is 1-2mm bigger than paperboard, this paperboard could be conveyed smoothly. Too big interval will cause too much impulsion after paperboard fall down on feeding pushing board and make paperboard offside and cause feeding error.
- 3) Side baffle: Adjust side baffle to make it align at the two sides of paperboard.
- 4) Feeding roller: lower feeding roller is steel decorative pattern roller, upper roller is rubber roller, adjust interval between feeding rollers to make paperboard to be sent smoothly to printing unit.
- 5) Adjustment of induced draft. In order to send paperboard smoothly into printing unit, this machine has installed induced draft device, proper wind force adsorb paperboard on the workbench, then paperboard is pushed into feeding roller by pushing-board. Blowing rate is adjusted by ventilation door and should be adjusted according to the thickness, size and quality.

## B) Operation of Printing Unit

- 1) Paper feeding press roller: The lower roller is decorative pattern steel roller, upper feeding roller is pressure wheel with decorative pattern, adjust the intervals between them, to make it have the function of feeding. Printing carrier roller adjusted the gap between printing plate and pressure roller to get appropriate interval, in order to achieve satisfactory printing effect. Usually adjustment the intervals of pressure rollers to be about 0.3 mm less than the thickness of cardboard, in addition, as the superposition of every color printing, pressure of the next color is 0.05mm bigger than the one of former color.
- 2) Cylinder movement which is controlled by electromagnetic valve, can make anilox roller contact or separate with printing plate.
- 3) Hang plate: Press the printing edge by press layer into hang plate groove, pay attention to the axial position of the design in the printing roller to see if the position is up to the standard, and if the direction of plate is correct, generally it should take the center of printing roller as standard, then rotate the printing roller counter-clockwise for one circle, press the other side of printing roller by the other end of press block into the groove of ratchet shaft, then use a spanner to screw hexagon head of ratchet wheel mechanism clockwise.
- 4) On ink scraper: On the front panel with knob screw to feed, see if pressure gauge at normal pressure, then the knob screw to ink.
- 5) Wash ink: Stop on the ink, and then screw the knob to the leakage of ink, then open the cleaning knob. Open the ink pump discharge waste water. Clean finished open the bag, the cleaning scraper is clean.

6) The trimming of printing rollers: The trimming of printing rollers should be controlled within 4 mm in diameter, detailed refer to appendix C printing unit rubber roller.

## C) Operation of Slotting Unit

1) Function: this machine could operate creasing line, slotting, corner cutting, overlapping.

2) Electric tool setting:

1. The knife into the groove can be horizontal blade adjustment (can automatically adjust the knife, you can manually adjustable knife).
2. Cases of high adjustment (automatically adjustable high box, can be manually adjusted).
3. Line pressing can adjust, and tool setting transverse one time.

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

4) Adjustment of lower cutter: The intervals between upper and lower cutter is different for 3 ply and 5 ply, the interval of 3 ply is smaller than the one of 5 ply, the reason is die cutter stand have the function of cutting and feeding paperboard as well. Interval adjustment could be realized by manual eccentric gear and marked. Please pay attention to the position of corner cutter, if it needs trimming or add cushion, be sure to keep in mind that don't strike the surface of cutter stand.

5) Adjustment of paper feeding creasing wheel: There are two creasing wheel between creasing and slotting to make it convenient to feeding paperboard, intervals is manual 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 dedicated spanner, the upper and lower cutting stand of slotting and corner cutting will be linkage adjusted at the same time with creasing cutting stand, when slotting upper cutter into slotting lower cutter.

## D) Operation of Die-Cutting Unit

1) Function: The function die cutting department is to cut the corrugated paperboard according to requirement by the cutter which is fixed in the die-plate, in order to get required form and transformed paperboard to next process of stacking.

2) The choice of the thickness of the template: The thickness of the cardboard beside the thickness of template. The general situation is: 3-ply cardboard with 13 mm wooden template; 5 or 7 ply cardboard with 16 mm wooden template.

3) The rubber cushion roller axial movement: The cutting board roller left and right moving is controlled by hydraulic cylinder, left and right moving limit  $\pm 30$  mm, in order to effectively prevent the rubber cushion being damaged soon, cutting board will axial move about 0.1 mm or so for one rotate one cycle.

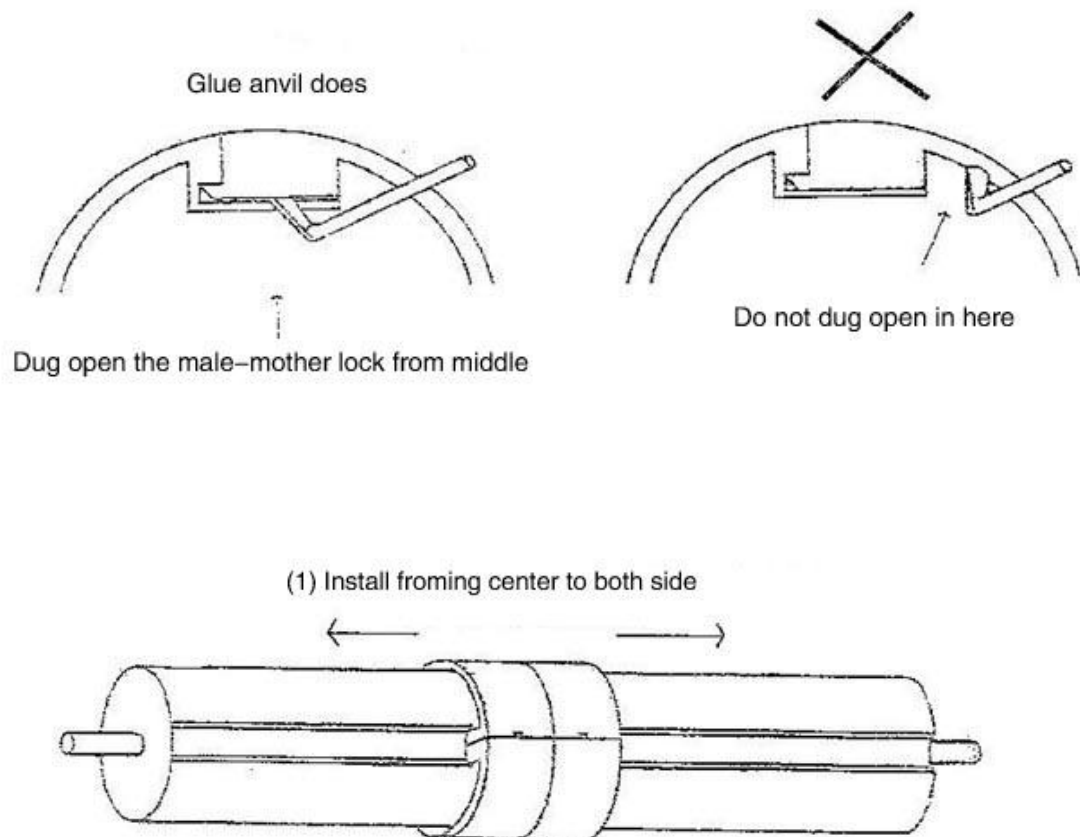
4) The wood formwork making and installation

Please refer to Appendix Die cutter die roller chart when making wood formwork, and should also take crosswise and axial movement  $\pm 7\text{mm}$  of machine in consideration. If the slotting unit is used at the same time, the crosswise movement of slotting cutter and the position of left and right baffle of front feeding should be both taken into consideration.

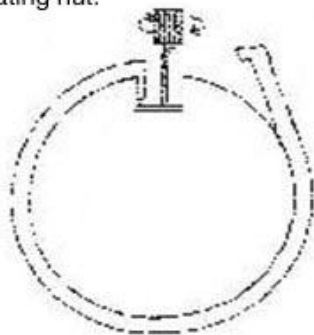
The formwork used in die-cutting unit is more precise, generally provide design and carton sample to specialized manufacturer and buy formwork there, so the technology will not be explained here.

The first requirement is the mounting holes of wood formwork should be coordinate with the screw holes position of cutting die roller, put the center line of formwork aim at the center line of rotary drum, and install the formwork through screws onto cutting die roller. Crosswise moving mechanism driven by electric motor to adjust the axial movement of cutting die to coordinate with printing unit.

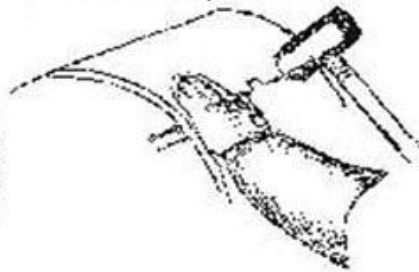
5) Installment of rubber cushion: Installment of rubber cushion is very simple, just operate according to the following drawings.



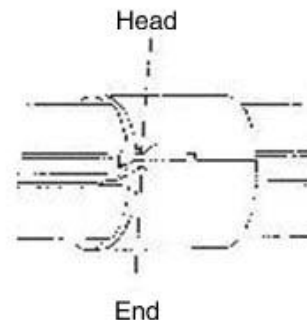
(2). Do not use too vigorously rotating nut.



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

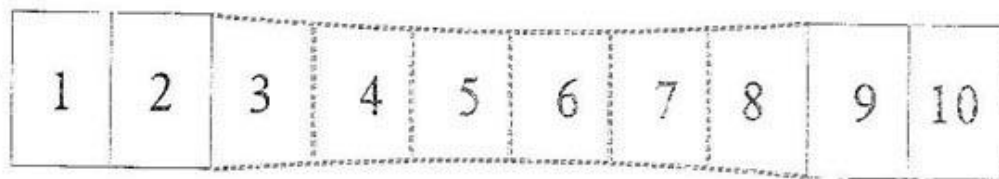


(4) Check horizontal from the side a relatively

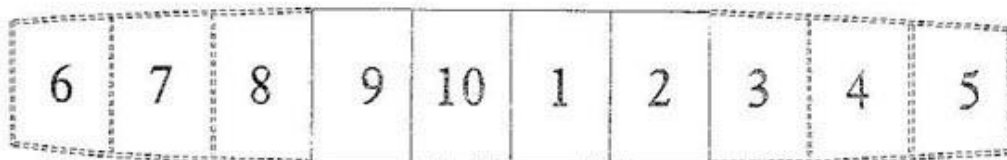


Adjustment of rubber cushion could be operated as the following drawings. (Because the number of cutters are different on different cutting dies, it should be decided by the operating engineer on when it will be changed for a new one. According to reference data, it could be changed on the base of situation and used more than 100,000 times.)

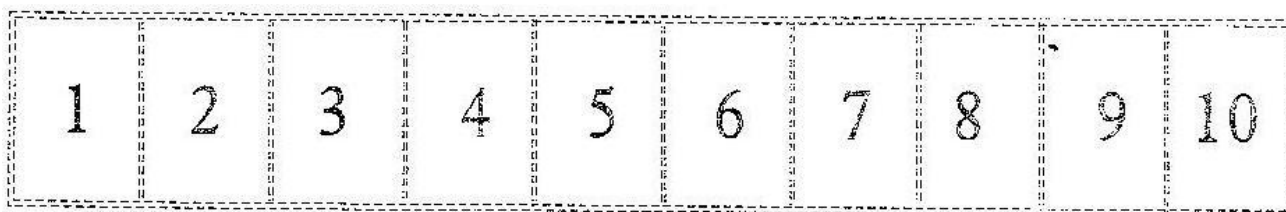
1. Exchange 3 4 5 6 7 8 all the surface into feltfinsh



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



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



Rubber cushion is made from synthetic rubber, die cutter cut into for 1.5mm or so when it's working is proper, the deeper it cut into, the shorter life of rubber cushion. When new rubber cushion is installed, be sure to keep in mind to adjust the intervals of cutting.

# Chapter 7:

## MAINTENANCE OF MACHINE

The machine is always working in automatic control status, if there is not enough maintenance and inspection, the precision of machine will be affected and result in printing quality reduction, also shorten the service life. Requirement of maintenance and inspection is as follow:

### A) General Rules of Maintenance

#### **Danger**

When the machine is under maintenance, in order to prevent other operator mis-open the power switch or carelessly touch the buttons on panel and cause unnecessary injure, please put a notice board and write clearly " Machine maintenance! Don't touch!"

Don't move photoelectric switch, transducer and such device unless get approval of our company.

#### **Alarm**

Only eligible electric maintenance personnel is allowed to maintain the electric parts of this machine. Common and consumable parts, e.g. fuse tube and the spare parts provided by our company should be changed timely.

When maintaining machine is operated in a high site, please pay attention to wear a protective shoes and helmet.

When maintenance is finished, please close the cover as before. Clean the working site, move the notice board away, move away the obstacles on the aisle or floor, wipe the water or oil on the floor, keep a clean and safe working environment.

Do maintenance according to operation manual, please contact our company if there is any question.

#### **Notice**

Inspect the machine status after maintenance with the person in charge.

Record the content and result of this maintenance, report to the person in charge and keep properly the record after get approval of person in charge. This record will be one of the basic of analysis and looking up the reason of accident afterward.

#### **Danger**

Safety regulations when operate maintenance: The operator must comply with the operation regulations when doing maintenance. Special remind: avoid touching the running parts of machine with hand directly. Press the emergency stop self-lock switch before go into machine. Pay attention to your hand to avoid being jammed. When standing on the machine please pay attention to not sliding.

Analyze the record at fixed period, and look up for the accident potential.

## **B) Routine Maintenance**

Every equipment is composed of thousands of parts including many running parts, e.g. bearings, gears, racks, chains, sliding rails, feather, lead screw, sliding bearings and so on. In order to make these parts working regularly and prolong their service life, they must keep good status of clean and lubrication. Doing maintenance well is the main guarantee of high production efficiency and producing quality product, reduce the cost of repairing and production as well, reduce downtime and increase use ratio. The cleaning status of machine concerns company's figure and the spiritual outlook of machine operators. So doing the machine maintenance well is the duty of every operator.

### **I. Refuel kinds of machine**

Please add 68# machine oil to all kinds of gear box, reducer box, racks and guide rails, 3# calcium base oil to all kinds of bearings with lubricating nipple, different compressor oil to air compressor according to local climate and seasonal variation.

### **II. Tools used in machine maintenance**

1. Oiler
2. Fuel truck nozzle
3. Long handle hairbrush
4. Cloth
5. Plain end scraper knife
6. Besom
7. Other dedicated tools, and so on.

### **III. Cleaning agent used in maintenance**

Cleanser essence could be used for ink recycle system, diluted alkali liquor ( concentration: 5%) for stainless steel plate, machine oil and cleanser essence for all kinds of axles as well as the paint surface of machine, do not apply alkali solution to axles and paint surface.

### **IV. What's the proper volume of refuel?**

When adding machine oil, fill the grease cup full. Add oil to the level between the upper and lower bound of oil immersion lens of gear box and reducer. The standard of adding oil for sliding rails is the oil should not overflow.

When adding grease, if the bearing could be seen, add grease until it has been pressed out of the bearing; if the bearings could not be seen, use fuel truck nozzle to shoot 15 times.

## **V. Period of refuel**

Machine oil should be added two times(one time in the morning and one time on the noon). Check the oil volume in reducer box, add oil when it's not enough and should be changed completely every six month. Add grease every two weeks.

## **VI. How to use pneumatic system correctly?**

Barometric switch of air compressor should be adjusted to 0.9Mpa, general pressure regulating valve should be adjusted to 0.5-0.6Mpa. Open the bottom valve of air compressor to drain off water every day, open gas-water separator to drain off water, check if there is machine oil in oil sprayer, add oil when it's not enough. Check at all times if the air compressing pipeline, valve, cylinder have leakage( apply soap water to see), if there is any problem, repair in time and record on the equipment operation notebook. Check if the oil in the crank case of air compressor is enough everyday, add compressor oil when the oil is not enough. Clean air filter of compressor every month.

## **VII. Usage of screw**

Pay attention to choose proper length of screw. Too long screw will cause not locking parts to the end, serious condition will cause screw slippage or cracking parts. Too short screw have not enough locking force will cause screw loosen and result in danger. It's better to use solid wrench to screw hexnut, you must make sure the size is proper when use adjustable spanner to avoid slippage. When screw inner hexagonal screw, please clear out the dirty things in the inner hexagon firstly and don't use abraded screw driver.

## **VIII. It's forbidden to adjust size through knocking by force by hard object.**

Wooden or rubber mallet could be used when necessary.

## **IX. About electric motor**

Could not be covered by sundries or it will effect heat dissipation.

## **X. All kinds of electric buttons**

All kinds of electric buttons must be press or turn lightly, all electrified parts could not be wet by water or machine oil to avoid short circuit and danger.

## **XI. Changing parts**

Please pay attention to the original position of the parts which will be changed, don't install oppositely or have too much error. Install surface should be dry, choose proper length of screw, don't overexert when fasten the screw.

## **XII. Company general inspection, operation, shift notebook of each machine should record the operation state everyday.**

## C) Maintenance of Each Unit

### Maintenance of Feeding Unit

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

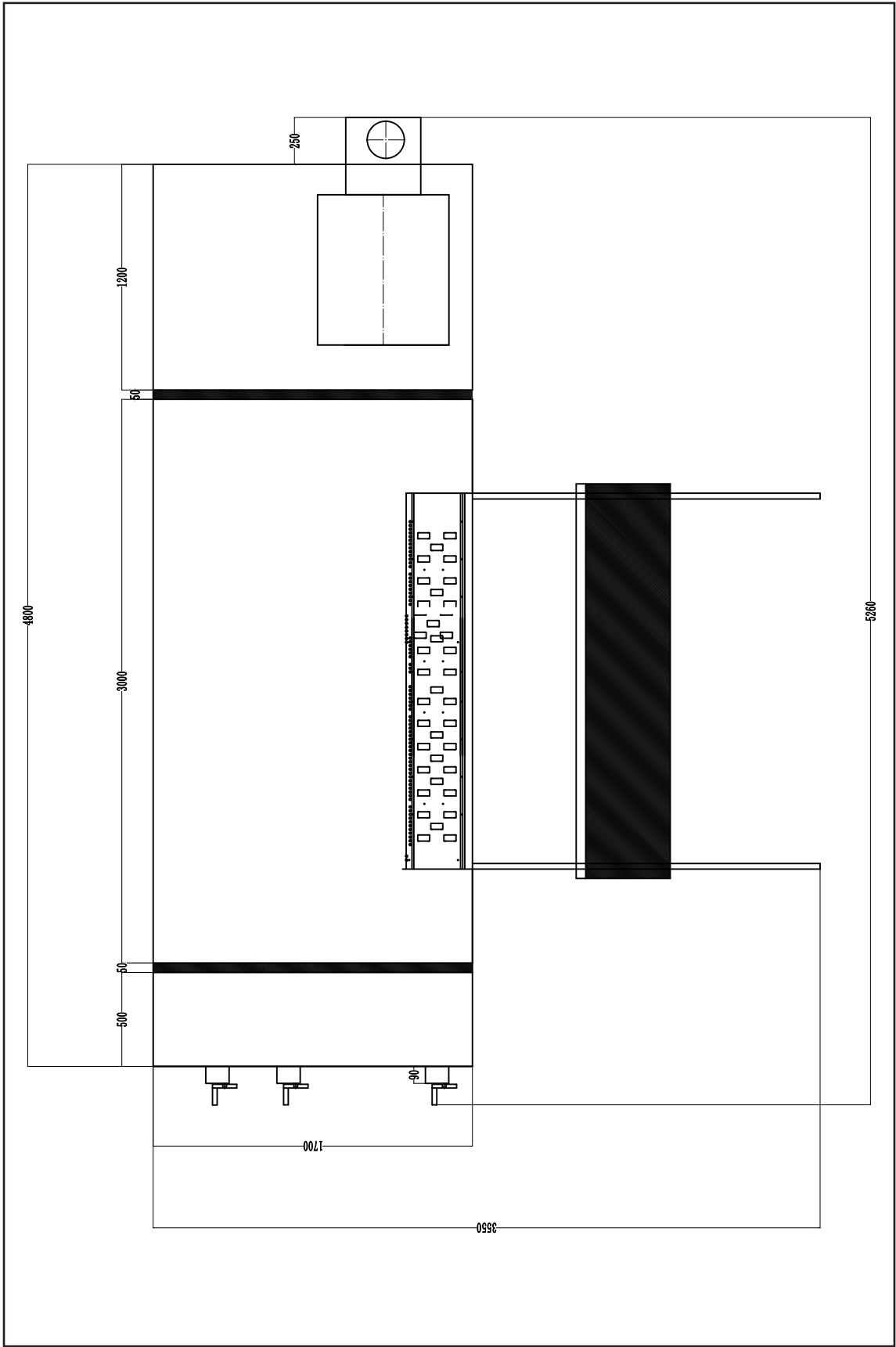
### Maintenance of Printing Unit

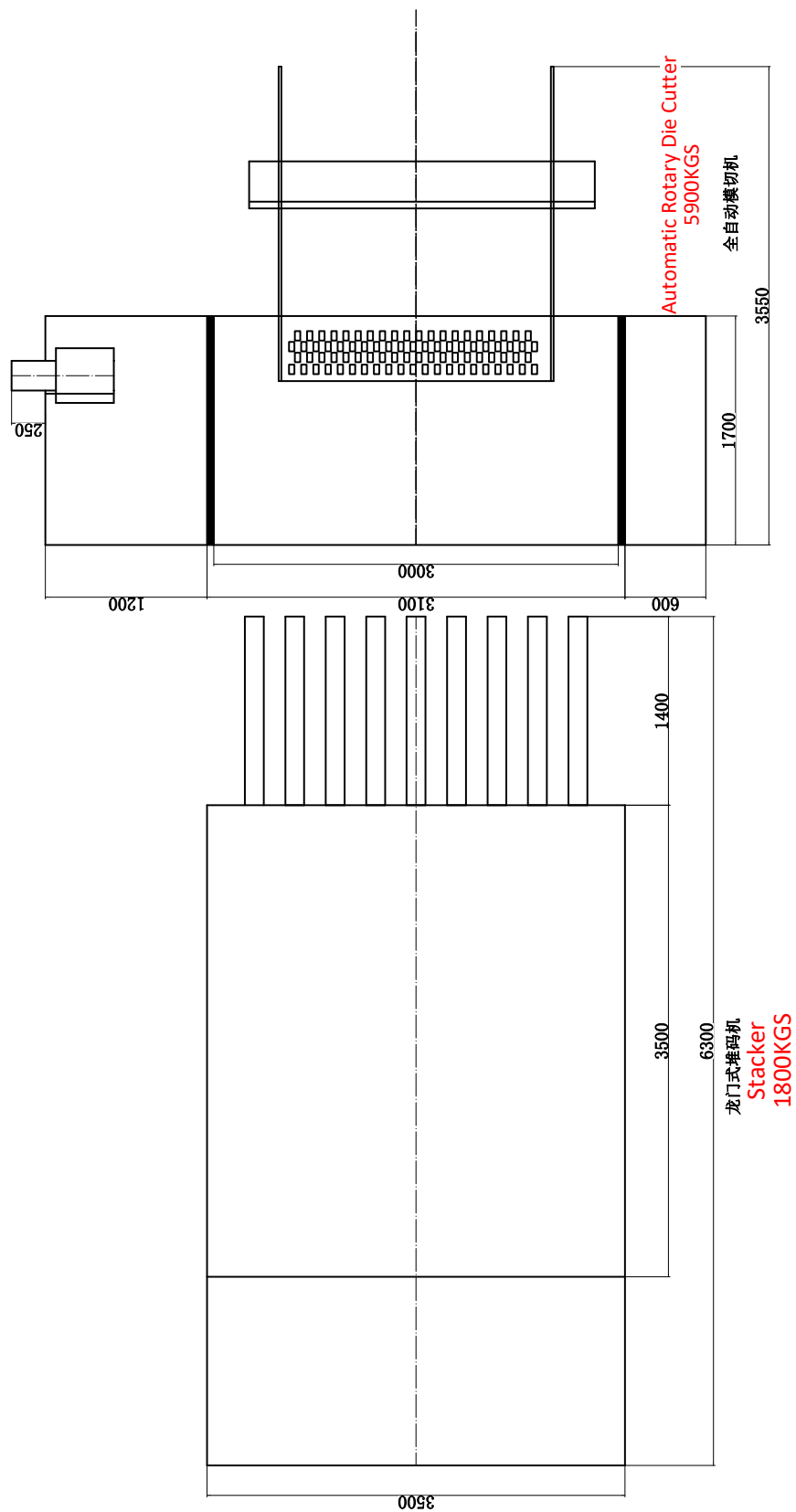
| Name of Part                                    | Handling Method                                                                                                                                                                                                                                                                                          |
|-------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Printing roller and each spindle nose at end | Clear away viscose paper, ink and greasy dirt                                                                                                                                                                                                                                                            |
| 2. Anilox roller                                | Use stainless soft steel brush to clean, pay attention to not scratch the surface of anilox roller, or it will bring serious economic losses. In addition, don't use ammonia water as cleaning agent, because ammonia water will corrode the copper contained matrix, and bring damage to anilox roller. |
| 3. Ink backflow pipeline                        | Remove for washing and cleaning every two month                                                                                                                                                                                                                                                          |
| 4. Paper feeding wheel, press printing roller   | Clear dirt                                                                                                                                                                                                                                                                                               |
| 5. Machine bottom                               | Clear paper scrap and ink                                                                                                                                                                                                                                                                                |
| 6. Lubricating nipple of each bearing           | Wipe greasy dirt on the surface, add grease                                                                                                                                                                                                                                                              |
| 7. Interlocking mechanism of machine            | Add machine oil                                                                                                                                                                                                                                                                                          |
| 8. Pneumatic system                             | Check if there is any air leakage on pneumatic components of joint.                                                                                                                                                                                                                                      |
| 9. Ink filter                                   | Wash the inner strainer after usage every time                                                                                                                                                                                                                                                           |
| 10. Printing plate                              | Put it in a dry and well-ventilated place, don't fold, scratch and contact with corrosive object.                                                                                                                                                                                                        |
| 11. Gear box                                    | Add oil if it's not enough when checking. Change completely every six months.                                                                                                                                                                                                                            |

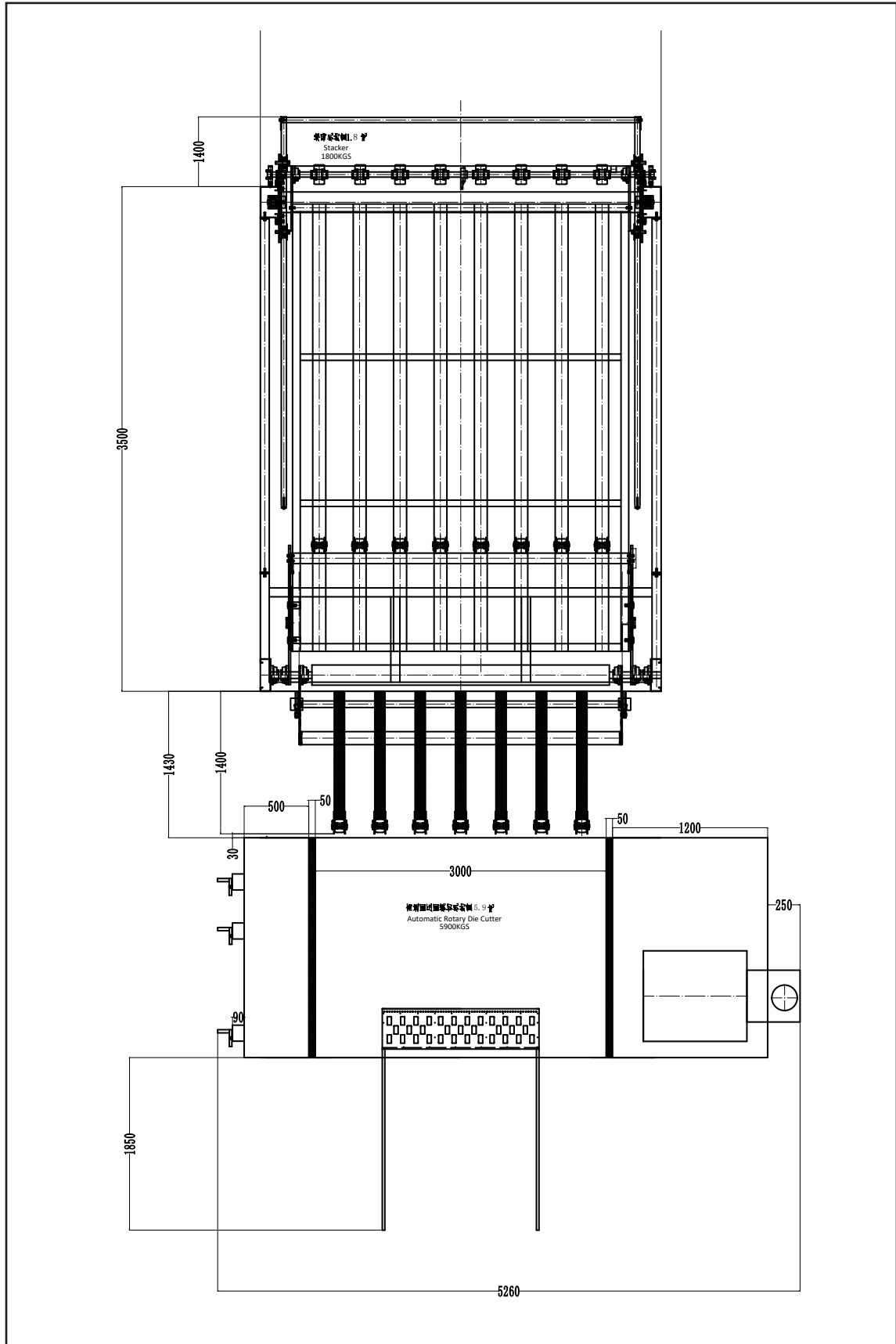
## Maintenance of Die-Cutting Unit

| Name of Part                                             | Handling Method                                                                                                                     |
|----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| 1. Die-cutting plate                                     | Put it in a place people could not come into contact it easily to avoid injuring by blade, or damaging blade, blade formwork.       |
| 2. Rubber cushion                                        | If it is damaged too much, the damaged condition of middle and the two ends of rubber cushion are not the same, could be exchanged. |
| 3. Gear box                                              | Add oil if it's not enough, change completely every six month                                                                       |
| 4. Lubricating nipple of each bearing                    | Wipe the greasy dirt on the surface, and apply oil                                                                                  |
| 5. Rubber cushion movement dirt, eccentric gear assembly | Clear away the sundries, greasy apply machine oil                                                                                   |
| 6. Die-cutting roller axle end crosswise movement screw  | Apply grease                                                                                                                        |
| 7. Die-cutting waste conveyor                            | Do cleaning for each shift                                                                                                          |
| 8. Floor under the machine dirt                          | Clear away sundries and greasy                                                                                                      |
| 9. The surface of two sides of machine                   | Clean the dirt on the surface                                                                                                       |

# Chapter 8: LAYOUT

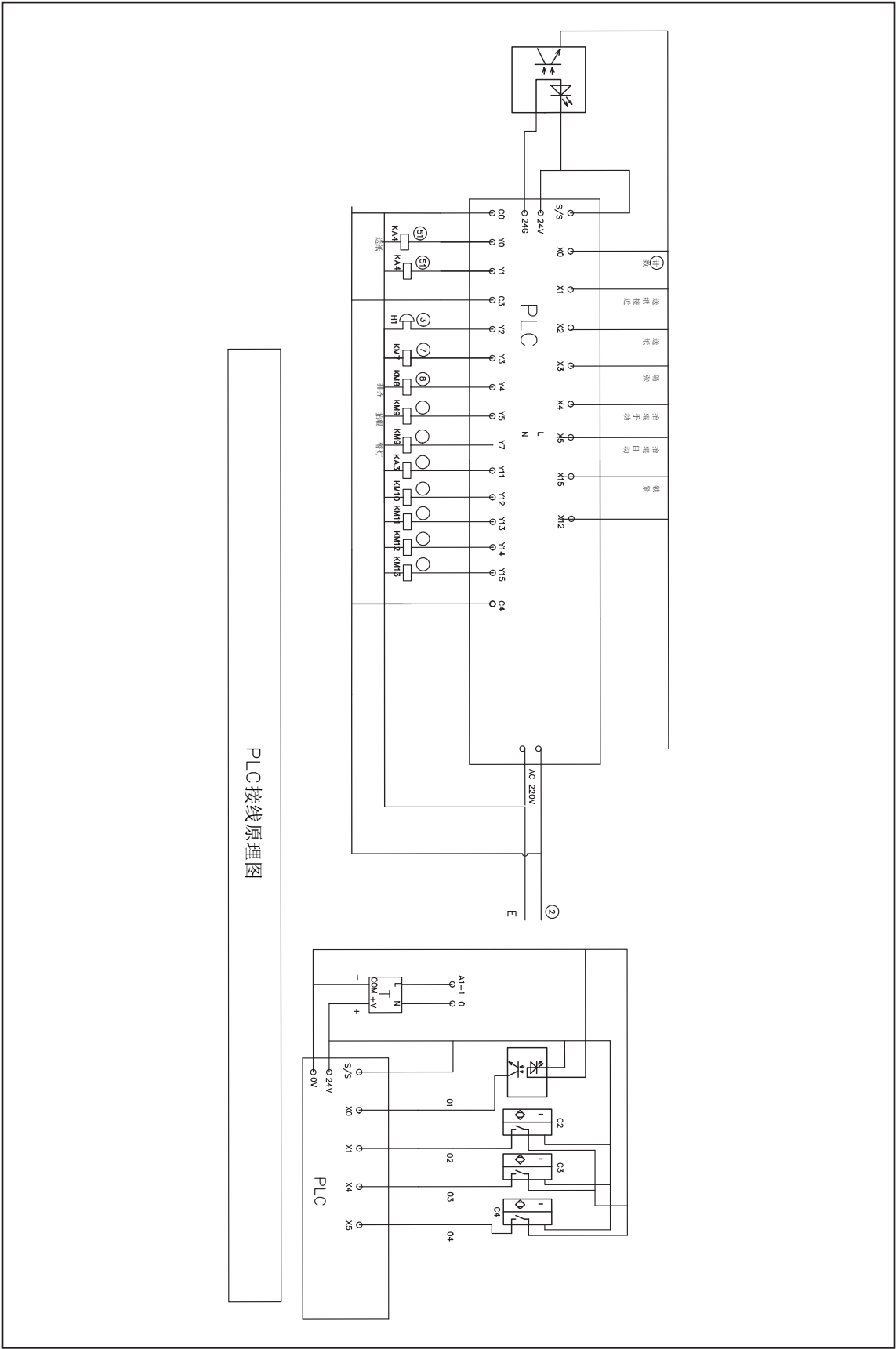


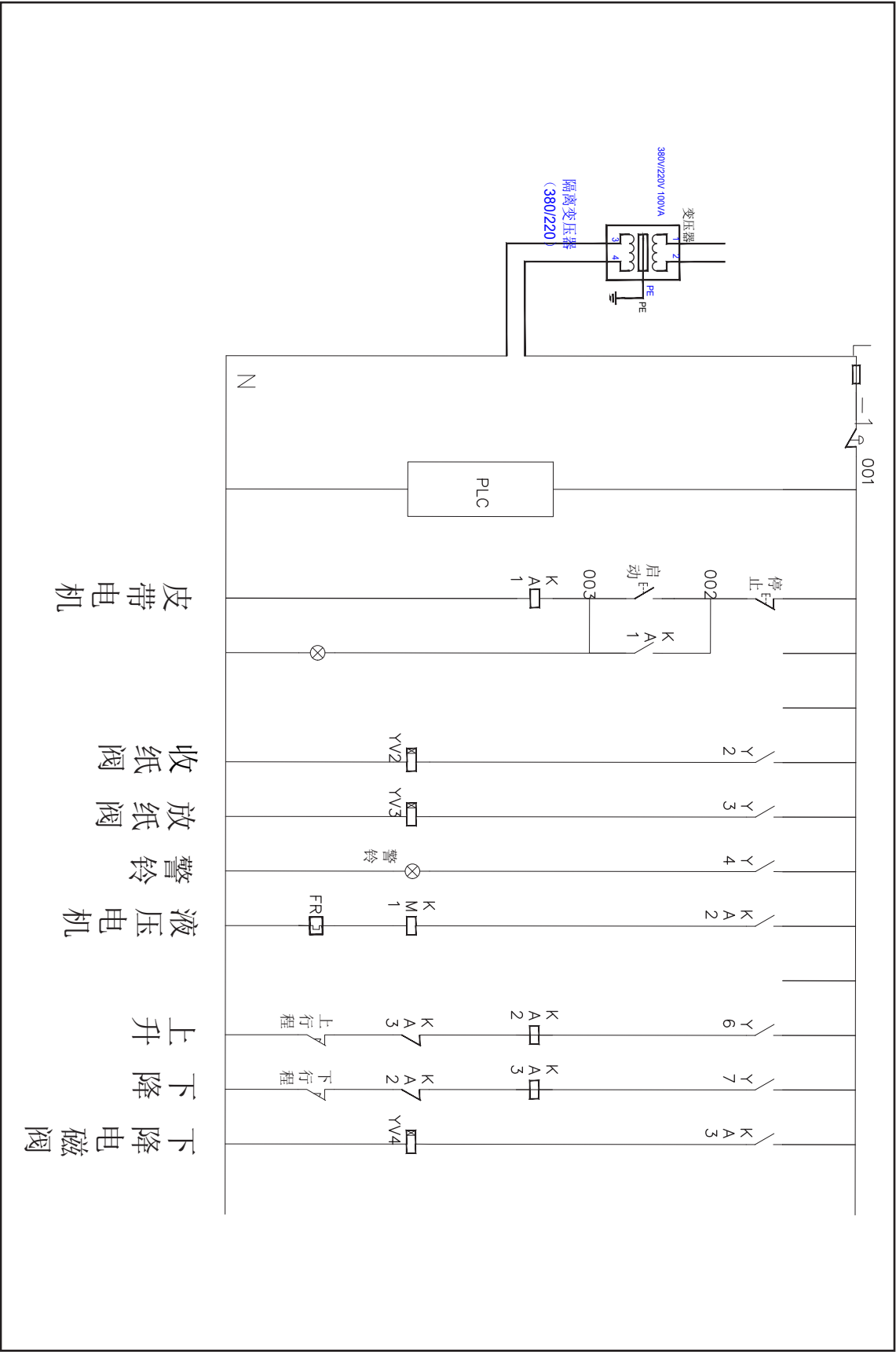




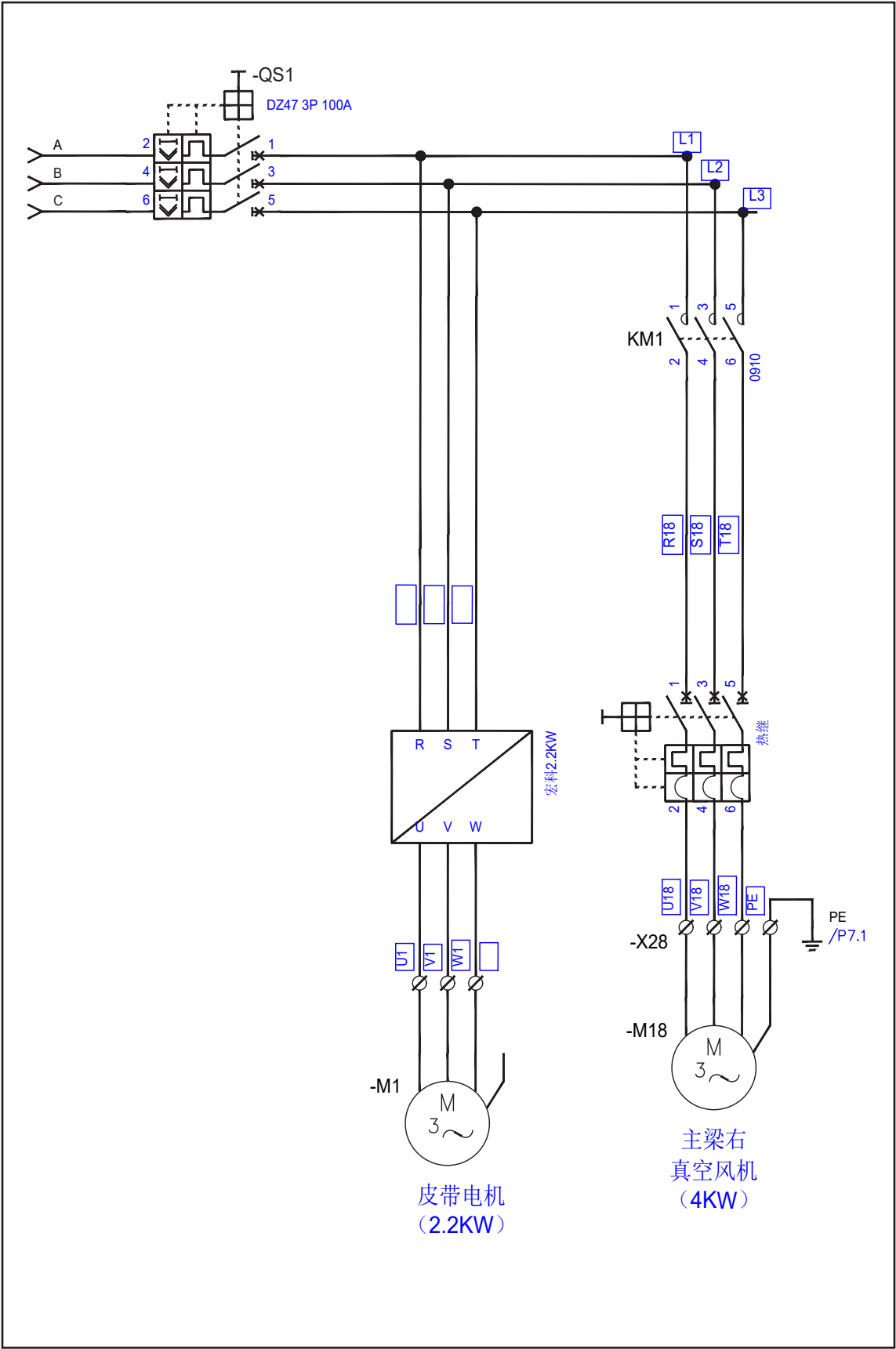
# Chapter 9:

## ELECTRICAL DIAGRAMS

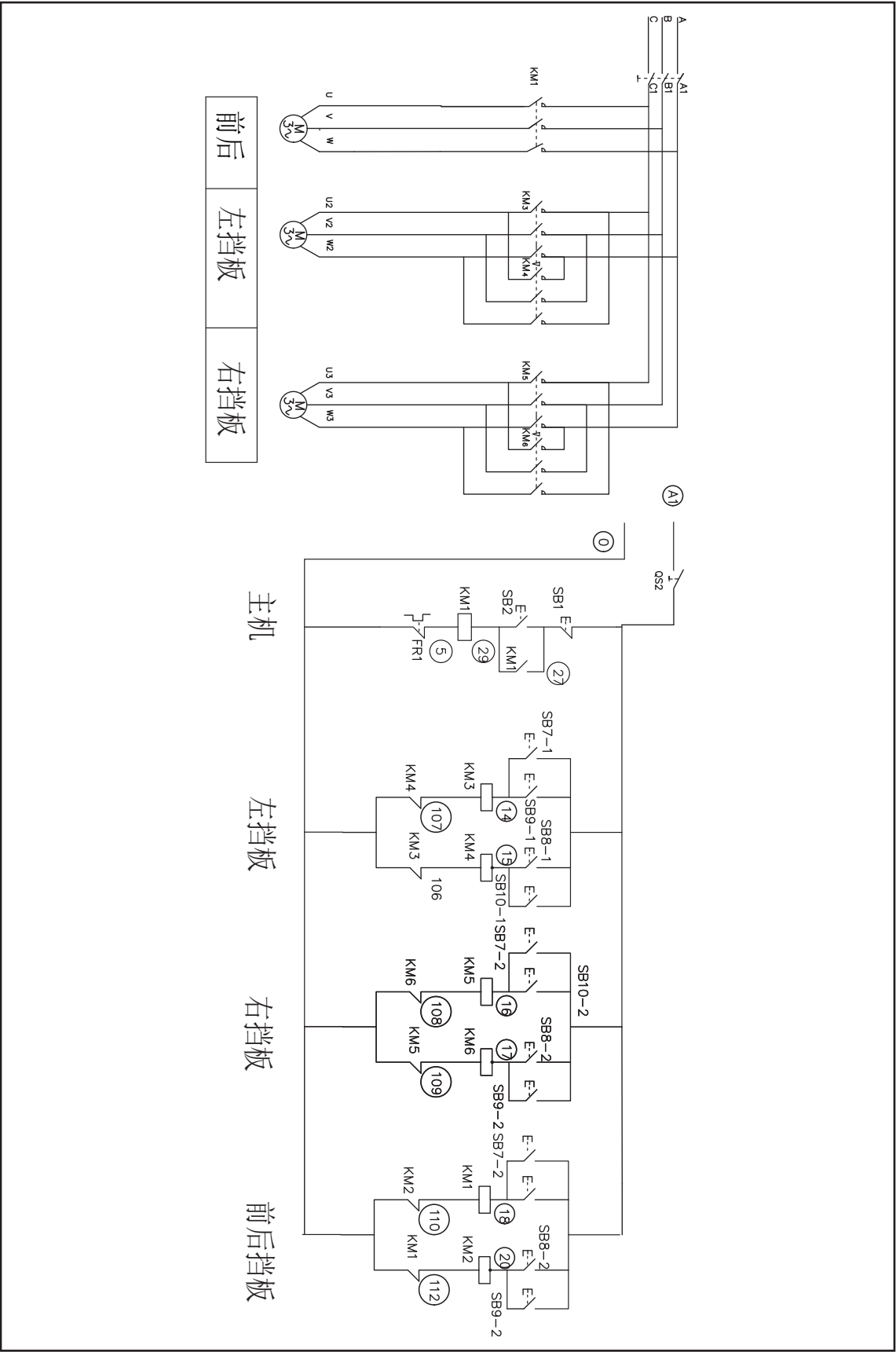




Electrical Diagram #3



Electrical Diagram #4



# Chapter 10:

## WARRANTY CONDITIONS

**1. AMC Industrial Development Company Limited** 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 **AMC Industrial Development Company Limited** were defective at the time of shipment, **AMC Industrial Development Company Limited** 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. AMC Industrial Development Company Limited** has made no representation, warranties, or guarantees, expressed or implied, not expressly set forth on above paragraph. **AMC Industrial Development Company Limited** 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 **AMC Industrial Development Company Limited** has been conferred with any authority to waive, alter, vary or add to the terms of the warranty state herein, without prior authorization in writing executed by an officer of the company.

# Chapter 11:

## CONTACT INFORMATION



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