OPERATION MANUAL

YRJ1200 CI FLEXO PRESS

XI'AN AEROSPACE-HUAYANG
PRINTING & PACKAGING MACHINERY CO., LTD

www.huayang-ppm.com

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PART 1

YRJ1200 CI Flexo Press

Operation Manual

Dear customers，

Thank you for selecting the YRJ1200 CI Flexo Press manufactured by Xi'an Aerospace-Huayang Printing & Packaging Machinery Co., Ltd..The press with high performance, high accuracy, high speed and has character of aerospace fashioning, high-level hardware, stably running software. As the price satisfies the customers, these characters represent a new level of this field. The machine become a new generation which is highly effective and reliable. Unwind/Rewind use double-station, automatic splice without stopping machine, which provide convenient operation and more productive efficiency.

For operating the machine conveniently, we provide this manual. The book include the followings: Device layout, Device operation, Troubleshooting, Maintenance and everything important in the operation. If you have better advice about this manual, please contact us. We appreciate for your support.

Operators of the system must maintain the electric circuit. When maintaining the electric system, authorized employees must wear the essential protection and detection equipments. When maintain the electric circuit, the power of the circuit should be shut down. When maintain the machine, make sure all the power be shut down.

Read this manual first before installing, debugging, operating and maintaining the electric system. Laypeople or unauthorized employees are forbidden to install, debug, operate and maintain the electric system. Otherwise it may course injury or even death.

CHAPTER 1 Foreword

YRJ1200 CI flexo press is designed accordding to the effective technical standards and safety regulations.Nevertheless, any machine could be dangerous to operators when the informal use, incorrect operation and insufficient maitainence happen. Realize the importance of the safety, do as the process says, then the production efficience enhance and injury would be reduced.

As the manager of the factory, you are responsible to operate the line under the requirement of the safety, remain the safety protection system comanied with the machine and supply the fully safe equipment. Every operator must know well about the details in the manual. Customers have to order the employees follow the operation commands and rules.

1.1 General

The structure of the machine involves following subjects:

- Unwinding Unit
- Unwinding Driven Unit
- Printing Unit
- Drying Unit
- Rewinding Driven Unit
- Rewinding Unit
- Control System and Operating Platform.

The applied printing material is plastic films about 25-250μm. The other materials such as metal plates are not allowed. The width and thickness of the films must be in the range of the general value which the specification shows. The ink must be similar to the ones used for the reel film printing (e.g. waterbased ink, ethanol-based or solvent-based ink).

Operate the printing machine and the subsidiary devices only in the perfect technical conditions. Make sure the safety device of the machine and workplace are ready. Take care of the storage of the materials, inks and solvents. Take care of the fire, exploder and environment.

Without permission in writing, it's forbidden to reform the machine, modify the data, programme the electric control system and use the other wires.

Disclaimer

Follow the effective laws, regulations of labor protection, environmental protection and machine operation. Any operation not accord with relevant laws and regulations is abnormal. If the machine cannot be used in according to normal use, manufacturers do not assume any responsibility. All responsibility should be responsible by the owners themselves.

1.2 Operation Condition

- Altitude: Not more than 1000 meters;
- Environment temperature 5 ;℃~40℃
- Working space must be clean and draughty without sunlight. Medium around machine must be without dust, corrosive gas, inflammable gas, oil mist, steam, water-drop and vibration. Aviod the enviroment with much sault.
- Relative humidity：30% - 80% (reference temperature 20 ℃)
- Positions of motors must have the space to maintain good ventilation.
- Rated voltage of motors is 380V±10％(220V±10％), frequency is 50Hz±1％.
- Foundation conform to the drawing in the attachment.
- Electrical heating, steam heating, hot oil heating and gas heating system must meet the relevant safety regulation, in order to avoid the harm for the machine.
- Machine cannot be installed on the swaying surface.
- Machine cannot be placed in potential hazards, such as without lifting operation on it. Aware flood, rain.

1.3 Warning & Caution

Before installing, running, maintainance and lockout/tagout, do read this user manual and operate the machine correctly. Please know the relevant knowledge, safety regulation and other precautions before use the machine. The safety precautions are classified as **[WARNING]** and **[CAUTION]** in this manual.

When an error occurs, there will be a risk of death or serious injury by the operator.

- Please take safety measures before the predictable hazards.
- Please do not operate in the inflammable gas, otherwise it will cause burning or explosion.

When an error occurs, there will be a risk of serious injury or machine damage.

- ❖ Please do not operate the machine out of regular range, or it will cause abnormal heating, fume.
- ❖ Please do not remove or reform the machine, or it will cause electrocution.
- ❖ Do not touch the terminals when power is switch on, or there will be electrocution hazards.

◆ Wire Connection

WARNING

- ❖ Make sure the power is switched off before wire connection. Ignoring the warning may cause electric shock or fire hazard.
- ❖ Only authorized employees can connect the wire. Ignoring the warning may cause electric shock or fire hazard.
- ❖ Make check the wire of E-Stop circuit carefully before running the machine. Ignoring the warning may cause operator injury.
- ❖ Make sure all the earth wire connect the terminal with PE mark in the electric control box. Ignoring the warning may cause electric shock or fire hazard.
- ❖ Three-phase five-wire system. Make sure the null line connect the earth. Ignoring the warning may cause electric shock or fire hazard.

CAUTION

- ❖ Make sure the wire connect is in accordance with the electrical drawings. Ignoring the warning may cause equipment error, damage or cause fire hazard.
- ❖ Do not test the high-voltage insulation. This test could destroy the elements.
- ❖ Make sure the terminal of the main circuit and control circuit have been fastened. Ignoring the warning may cause equipment error, damage or cause fire hazard.
- ❖ Do not connect or disconnect the wire into connection box when power is not switch off. Ignoring the warning may cause personal injured.
- ❖ Do not change the semaphores when system runs, otherwise machine or system could be damaged.

◆ Operation

WARNING

- ❖ Do not touch the keyboards when your hands are wet. Ignoring this warning may cause electric shock.
- ❖ Do not touch the metal heating block UNTIL the power is switch off for 30 minutes. Ignoring this waning may cause empyrosis.

CAUTION

- ❖ Do not press the keyboard purposeless when the system is running. Or the system cannot run normally.
- ❖ Do not change the signal when machine is running. Otherwise the machine or system could be damaged.

◆ Maintainance

WARNING

- ❖ Do not test the high-voltage insulation.
- ❖ Only authorized employees are allowed to maintain or replace the parts.
- ❖ Do not touch the high-voltage terminal. Ignoring this warning may cause electric shock.
- ❖ Do not maintain the equipment until the power has been cut for 30 minutes.
- ❖ The metal heating has high temperature, please be careful.

CAUTION

- ❖ CMOS chips for computer main board. Do not touch the CMOS elements.
- ❖ The elements are easily damaged by electrostatics.
- ❖ Do not connect or cut the wires, connector or cooling fan when power is on.
- ❖ Ignoring this warning may cause personal injury.

◆ **Others**

 **WARNING**
❖ Do not modification the machine. ❖ Ignoring this warning may cause electric shock or personal injury. And the warranty period lose efficacy.

1.4 Safety Statement

1.4.1 Before Using

Before using the machine, make sure you are familiar with all the function. And confirm you know the dangerous area of the machine.

❖ Specification

Relevant person has to know about the specification files when operate the machine. The relevant person has to throw a blanket of secrecy over the specification files. Follow the correct machine using and specifications at any time.

❖ Employees

Confirm only authorized employees are allowed to operate the action about the machine (such as transport of machine, use of instrument, operation, maintain, and monitor.)

Clear the responsibilities of the operators.

Workers must be trained, guided by experts while installing the machine.

The operators around the machine must be authorized. The “authorized employees” means they are responsible for the workers' safety during working. Because they are trained well about the standards, regulation etc.. They will avoid the potential hazards.

❖ Personal Safety Devices

Wear personal protective equipment. Such as safety shoes, labor suit, etc.. Especially when worker is close to the change material, avoid wearing tie, loose clothes, jewelry and long hair. When machine is running, it is forbidden to touch the roller.

❖ First-aid

Even the experts may be wrong when operating, so it is necessary to know about the local service of emergency. Make sure there is no one alone to do the potential hazard job. First-aid kit should be prepared all the time.

- Safety and Protection System

  The machine is able to run only with the protector and safety device. The safety system include: main switch, stop button safety interlock and other protective circuit. All the protective devices must be installed firmly.

- Pneumatic Equipment

  Before install the machine, check all the joints and pipes. Make sure the surface is not broken. Check all the pipes and joints at regular intervals. Close the air channel before maintain the pneumatic system.

- Bolt Joint

  All the bolts must be fastened tightly, meeting the specified requirement. They will be removed or changed regularly.

- Electrical Equipment

  Detect the electrical equipment are regular intervals. Make sure there is no wire loose or burned. Check up on the damage of bare wire, cable and insulating layer. Protect the cable with high temperature as prescribed. All the wires should be fastened with the appointed terminals.

  When replace or add electrical equipment, confirm the wires are in good condition. Replace the terminals or wire joints immediately when they are broken.

- Ventilation

  Ensure the ventilation is good around machine. Exhaust all the steam and dusts because they are unhealthful. Circulating air for printing unit: 13660m³/h，Pressure: 1019pa.

  Treatment of harmful dust should meet the national relevant specification.

- Temperature and Moisture

  All the elements especially the electrical devices, should be protected from moist. Cut the power when elements are found in the water.

- Workspace and Danger-zone

  Workspace and danger-zone must be marked with colored belts, marks or other clear signs. Do not stay in the danger-zone when machine is running except the employee who is well trained.

- Hydraumatic and Pneumatic Device

  Check all the steel and plastic pipes before installing machine. Replace any parts if it's broken.

  Check for leakage in the pipes joints and screwed joints.

  Replace hydraulic hose at regular intervals even there is no danger.

  Splash of oil may cause injury or fire disaster.

  Reduce pressure and open the pressure pipe before maintenance.

Do not install the hydraumatic and pneumatic pipes in the wrong place. Length and quality of the pipes must meet the standards.

❖ Clear and Clean

Keep the work space tidy and clear. Oil leak, dust will cause hazards. Lifting hooks around container, work piece and machine components will be dangerous as well.

Clean before maintain the machine, especially the oil between the joints and screwed parts. Do not use the detergent excessively, clean material: linen cloth.

❖ Spare parts

Spare parts must meet the specification of the manufacturer that will ensure the machine is stable.

Only the spare parts Huayang recommended are allowed. Spare parts without testing could be harmful for the machine and operators. Warranty period lose efficacy at the same time.

1.4.2 Machine Using

Before use the machine, ensure you're familiar to all the function and character. Confirm the active area and danger-zone. Most important thing is you must know the dangerous place on the machine. Such as:

- Transport devices
- Rotating motor, roller, belt wheel.
- Tools
- Clamping devices.
- Pressure point between moving parts and fixed parts.
- Isolation
- Control system
- Guidance devices
- Transport devices

Be familiar with the safety device. Please check the followings:

- Position and function of operation and E-stop buttons.
- Clearly distinguish workplace from danger-zone.
- No forbidden operation.

Follow the regulations at any time to avoid the accident. Follow all the safety regulations and warnings. Ensure the warning marks and safety commands on the machine intact and clear.

Only operators are allowed to stay around the machine when it’s running. Check the followings before power on:

- All the people stay away from the danger-zones. Irrelevant people stay away from the machine.
- All the parts have been fastened, position in the right place.
- Protection and safety device are ready. Use the safety tools supplied. Make sure all the people have left before close the safety zone.
- All the belts and drive device are tensioned and not aging.
- All the electric equipments are in good conditions.
- Do not rotate faster than regulation.
- Do not work overload.
- No leak of the pressure air pipes, lubricating oil pipes and hydraumatic chambers. It is dangerous that the joints of pipes are loose.
- All the cables must insulated and unbroken.
- It's not allowed maintain when power is on. Cut off all the power before maintain the machine and wait for at least 30 minutes. Metal heating blocks are very hot, take care of it when you touch them. Break resistors have storage energy after cut off the frequency converter.
- Check the main voltage before switch on.
- Do not touch the high-voltage terminals.
- Ensure you understand the principle of the machine when you’re working on it.
- All the components especially the electrical devices, must be prevented from moisture.
- If the requirements above are not meet the demand, operators have duty to report the conditions to the employer and refuse to start , maintain the machine.
- Be not close to the rotating or motorial parts of the machine. Start the machine with low-speed until the operators adapt to the machine.

1.4.3 Remanent Danger

Mechanical safety cases and electrical control buttons are installed according to the necessary for the safety of the press (such as switch box, etc.). The safety system include: Machine cover, motor cover, platform, guardrail, door of switch box and E-STOP button.

These devices protect your safety. Only authorized employees are allowed to debug, maintain them. Reinstall the devices correctly after the maintainance.

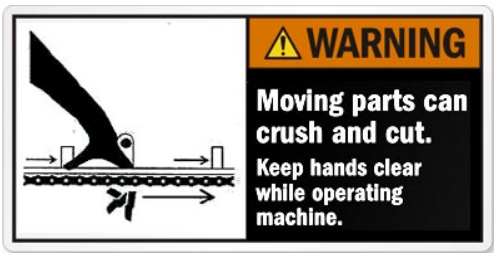
The machine is designed by the effective technical standards and safety regulation. But there may still be some remanent danger when the machine is running. Follow the manual, reduce the accident.

If there is emergency, press E-STOP button to stop the machine!

For your safety, please follow the warnings strictly.
The bell ringing means the machine start running, stay back to the safe location.

Press "E-stop" button when meet emergency.

1.4.4 Safety Signs

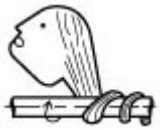


1.4.5 Safety Notice

The following state the dangerous area.

Source of danger	Rank	Announcements	Marks
When changing reels, rotating frame of unwind/rewind, high-velocity motion of cutting knife and pressure roller are easily cause danger.		Pinch point	
		Low clearance by rotating parts.	
		Electric shock hazard	

		Cut hazard To prevent squeezing.	 
Follow the procces strictly. When clean the safe bar's positon, plate cylinder, anilox roller, you must stop the machine. When running the machine, hands must stay away from the dangerous area. Do not open the ovens when printing. And pay attention to the followings.		Pinch point Electric shock hazard. Cut hazard. Hot surface.	   
Hazards when thread the web.		Trip hazard. Fallen hazard.	 

		Pinch point	
		Low clearance.	
		Electric shock hazard	
		Entanglement hazard.	

1.5 User's Responsibility

The manual must be placed the area where it is easily got by operators.
All the relevant operators and servicemen must read the operation manual and safety regulations.
Avoid any dangerous operations.

Operators Requirement

- Be authorized
- Can maintain the easy operation
- Be trained through FUMA or customer’s own training.
- No drugs and no drunk.

Servicemen must accord with the followings:

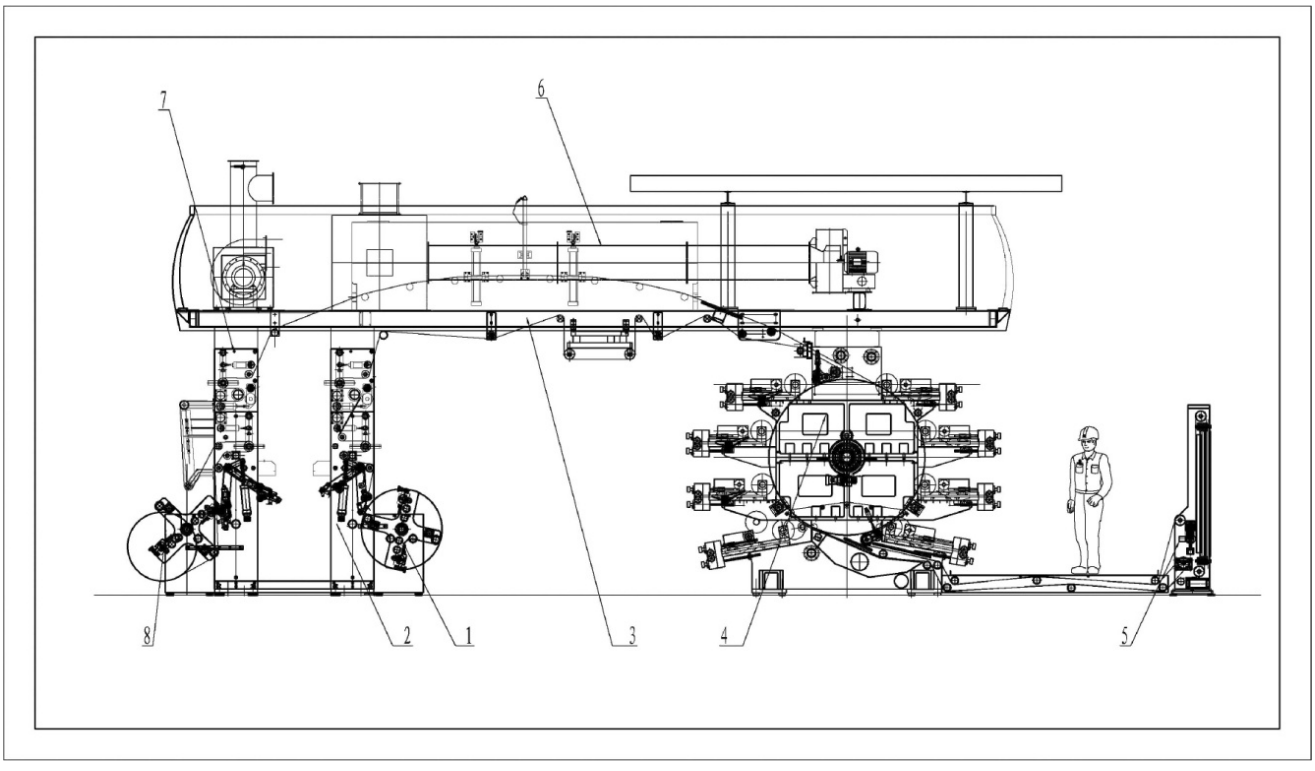
- Authorized employees
- Allowed to technically maintain, repair and adjust the machine.
- No drugs and no drunk.
- Be trained through FUMA.

CHAPTER 2 Machine Technical Specification Parameter

2.1 General Description

The machine is composed of seven parts to realize unwind, print, oven and rewind function. As follows:

1. Unwind unit
2. Unwind driven unit
3. Over bridge
4. Print unit
5. Turn bar unit
6. Oven unit
7. Rewind driven unit
8. Rewind unit



And you can find the parts describe in the specification.

2.2 Parameter

- Model: YRJ1200-8
- Max. printing width:1230mm
- Printing repeat length(plate cylinder perimeter): 350-800mm(φ111-φ254)
- Max. machine speed:250m/min
  practice speed is effected by following：
  - printing layout perimeter
  - printing material
  - ink and solvent
  - printing layout and printing quality
- Colophony plate and double side adhesive belt: 1.7+0.5mm
- Printing material: film25-200μm
- Test ink: ink and solvent
- Printing No.: 8 colors
- Max. unwind: 800mm
- Max. rewind: 800mm
- Electric standard: international standard IP50
- Max. noise: lower than 85dBa(1m from the machine)
- Total power: 80KW
- Machine size(L×W×H): 12.0m×4.5m×5.0m
- Compression air: No lubrication，drying and wipe off humidity with filter; Air pressure：6Bar; Dew point：+20C.

2.3 Machine Structure and Function

The machine composed of unwind unit, unwind driven unit, print unit, turn bar unit, oven unit, rewind driven unit, rewind unit. Following is detail describe of each unit.

2.3.1 Unwind Unit

External double workstation rack, automatic reel-change.

Adopt air shaft load, install the web on the air shaft from web width, and set web in the middle with air shaft rulers. Then gas charging air shaft to fix web and leak air when the web is finished to reload.

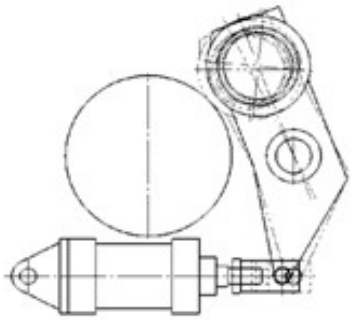
Adopt initiatives unwind, variable frequency motor control air shaft, match with dancer roller all closed-loop tension system, precision pressure-regulation valve set tension and low friction cylinder execution.

2.3.2 Unwind / Rewind Driven Unit

Consist of steel roller and rubber roller.

Steel roller is driven by vector frequency motor, running with main machine.

Clutch pneumatic of rubber roller, both sides pressure can be adjusted.



Steel Roller and Rubber Roller

Tension control: dancing roller check and potentiometer feedback automatic tension control system. Low friction cylinder control tension, and pressure regulating valve adjust.

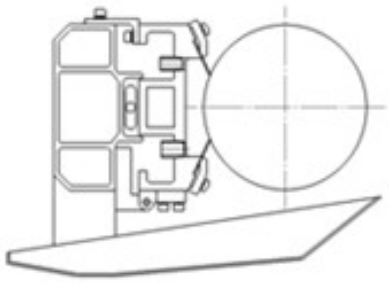
2.3.3 Printing Unit

- **Central Impression Drum**

  Double structure of central impression with cooling water to ensure surface temperature is constant, driven by variable frequency motor. The big gear drive plate cylinder and anilox roller. Central impression drum, plate cylinder, anilox roller bears all with centralized lubrication.

- **Doctor Blade**

  Aluminum alloy doctor blade cavity, ink enclosed to reduce the solvent evaporation and maintain the ink viscosity and cleanliness.
  Blades installed in cavity on both sides, reverse blade for sealing, positive blade for ink scraping.
  Pneumatic pressure doctor blade, the overall compression pressure evenly, and can manually adjust through regulating valve.



Close Chamber Doctor Blade

- **Ink Supply System**

  Central ink supply station, each color unit with double-way ink pumps.

- **Longitude register**

  Longitude register is adjusted by hand, worm shaft and worm wheel reducer drive plate cylinder bevel wheel axial move on the big drum bevel wheel. adjustment volume can adjusted by hand wheel. Max. adjustment range: ±10mm.

❖ **Horizontal register**

Horizontal register is adjusted by hand，worm shaft and worm wheel reducer drive plate cylinder. Max. adjustment range:±15mm。

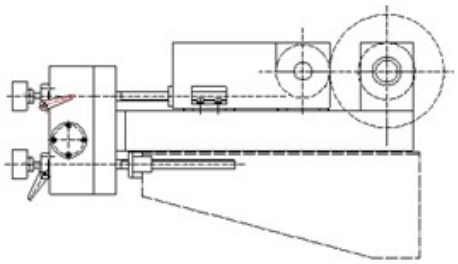
❖ **Pressure adjustment**

High intensity alloy cast iron, twice treatment.

High precision screw bar drive plate and anilox roller, the high precision infeed adjustment structure, manual adjust load.

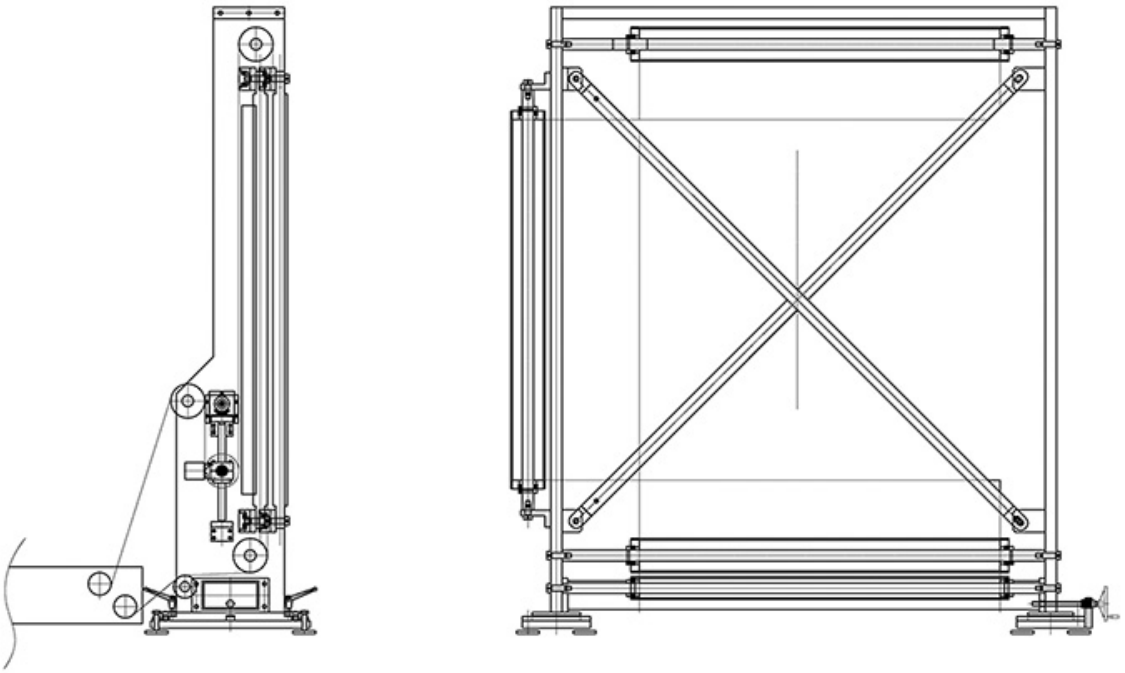
Cylinder base and anilox roller base slip on high precision rail.

Pneumatic micro displacement drive plate cylinder and anilox roller clutch.



Printing Moving Unit

2.3.4 Turn Bar Unit



Turn bar

This unit is used to turn over the web when reverse printing is required.

When a printing job requires 4 colors (or less) front printing and 4 colors (or less) reverse printing, firstly, switch on the air cylinder to inflate turn bar; secondly, use the web threading system to thread the web from the front printing unit to the turn bar, and then use the threading system to thread the web from the turn bar to the central impressure drum. During web threading, ensure that the center line of web is aligned with that of guide roller. After the web is centered, web threading is completed.

When the press start printing, check the tolerance between front printing and reverse printing. If the tolerance is around 10-20mm, slow down the press to about 40m/min. As to the longitudinal tolerance, operator can use the main operation panel to adjust the position of compensating roller for the purpose of adjusting the phase difference between the front and reverse printing. As to the lateral tolerance, adjust the plate cylinder laterally to make sure the tolerance is minimized. After these adjustment, speed up the press. If there is still some longitudinal tolerance, operator can adjust the phase between the reverse printing cylinder gear and central drum to reduce the tolerance. Then use the compensating roller to have micro adjustment.

If the web wrinkles or deviate on the turn bar, chech if the web center line is alighed with that of web guide roller or the air flow/air pressure mab be insufficient. If the wrinkles or deviation still exists, the turn bar precision need to be adjusted.

2.3.5 Drying System

The machine use hot air drying system, heating control: electrical heating. Temperature range: room temperature to 100℃. Oven length: 4m.

The machine include two hot air recycle systems.

(1) Printing unit drying;

(2) Whole drying.

Heating box is hot air channel. Each inlet and outlet pipe with air regulator, and each recycle system main hot air can adjust.

Through blower speed up/down button to control air speed. Heating temperature can be set with temperature control meter on panel and displayed current temperature for user-friendly operation.

2.3.6 Rewind unit

Inner double workstation rack, automatic reel-change.

Adopt air shaft load, install the web on the air shaft from web width, and set web position in the middle with air shaft rulers. Gas charging airshaft to fix web and leak air when the web is finished to reload.

Adopt initiatives unwind, variable frequency motor control air shaft, match with dancer roller all closed-loop tension system, precision pressure-regulation valve set tension and low friction cylinder execution.

2.4 Tension Compensation and Principle

Through control speed to control tension.

Tension divide four zone: unwind tension, unwind driven tension, rewind driven tension and rewind tension.

Closed-loop tension control: motor start, presser roller throw-on, dancer roller check and potentiometer tension feed back to automatic control. Low friction cylinder control tension, and pressure regulating valve adjust.

2.4.1 Tension Set

Through 4 pressure regulating valve set low friction cylinder presser on 4 dancer rollers and realize 4 zone tension set.

CHAPTER 3 Machine Operation

3.1 Safety Instructions

- The operator must be neatly dressed, T-shirt and cuff buttons be buttoned, and the female workers and those with long hair must with hats.
- Forbidden trample, climb the machine.
- You must be careful during gear and central drum running to avoid operator and high precision parts breakdown.
- Don't clean the central drum surface when running.
- During pressure adjustment keep both sides move at the same time, to avoid damage plate and rollers.
- During install or clean doctor blade to avoid scratch the operator.
- To prevent the anilox roller surface knocking injuries.
- During stopping you should check the plate cylinder throw-on/off to prevent the resin version deform.
- All the operators must be professional.

The safety of personnel and equipment to be sure to do as follows

3.2 Preparation Before Start-up

During plate making, make detection and register area on both sides, along plate direction add 15mm each side, which can add corss mark and horizontal cutter.

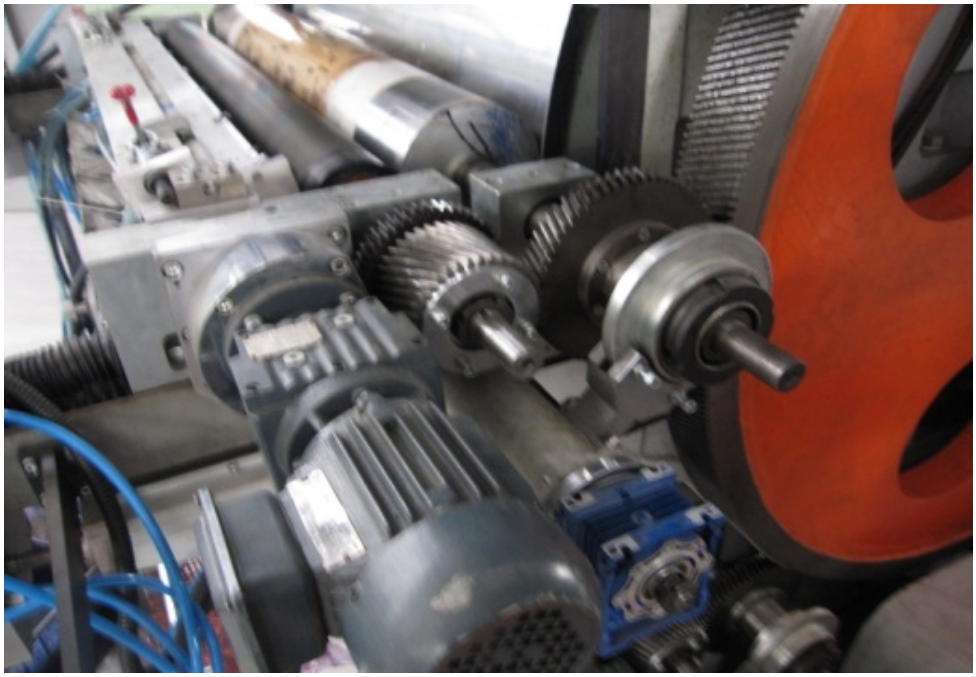
3.2.1 Plate Mounting

- Study design: study the every picture distribution, distinguish blank and easy printing area, make the double-face tape width. In horizontal: in the connection joints should avoid the important subtle graphical, to ensure it is not on the graphical edge and not overlapping with the plate cylinder groove. In circumferential direction, the connection joints can’ t be in one line. Choose different hardness tape with the graphical. And the double-face tape width＞plate width (each side 10mm)
- Lift the plate cylinder roller on the plate mounting, make alcohol clean colophony plate, plate mounting and plate cylinder roller surface. After that the operator wash hands with alcohol.
- Taping: make on the plate mounting. In horizontal the tape connection joints<1mm. In circumferential direction the connection joints is 0 (edge to edge). And the head and end without dislocation, distortion and bubble. Keep the tape protection paper clean(the tape will be used for several times). In

horizontal the tape should be placed in the middle to ensure the connect joints demand.

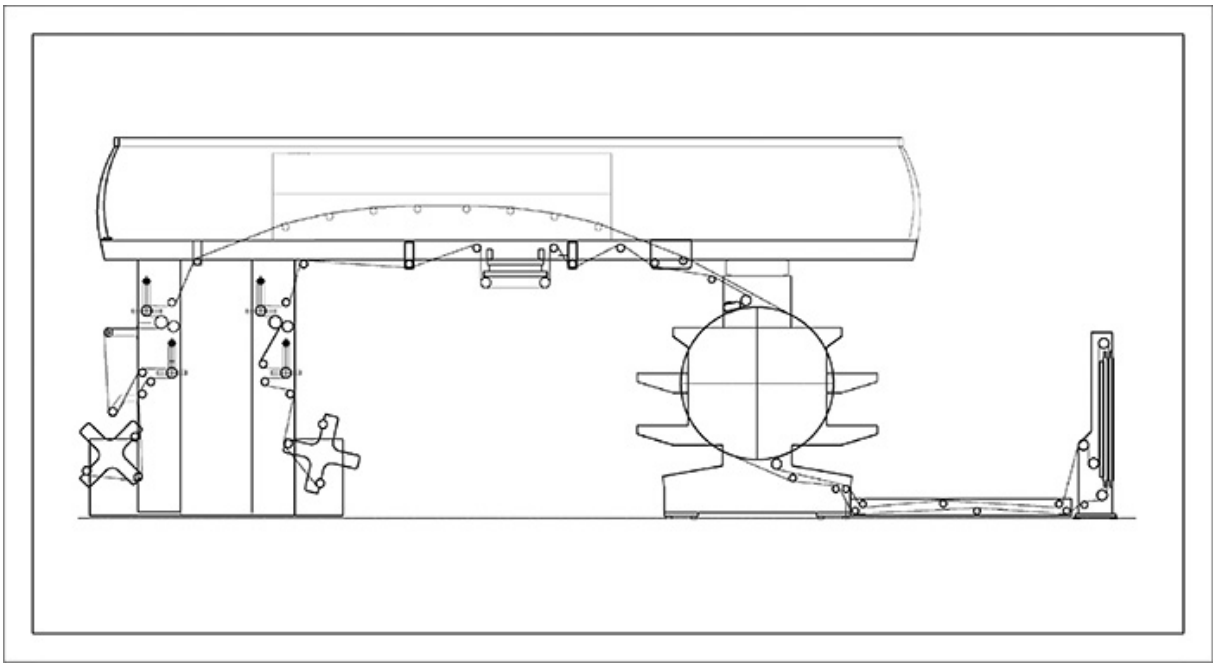
- Plate mounting: on the plate mounting to ensure crossline head and end without dislocation, you can repeat until success. In order to get to the effectiveness, you must correct use the groove on the plate cylinder and plate mounting. After that you should check the corssline precision, and each color offset must be in same direction and displacement. When taping different colors in horizontal must keep the corssline and cylinder groove at same position.

3.2.2 Plate Cylinder and Anilox Roller Installation



Choose anilox roller lines(confirm when plate making), put plate cylinder and anilox roller on frame, install bearing, gear and register system.
Position plate cylinder and anilox roller by electric hoist, install bearing cover(pour grease).
Install register, remove the gap between bearing and dial.
Adjust the distance between big drum and plate cylinder to 5-6mm(be parallel).
Now gear not mesh, adjust the distance between plate cylinder and anilox roller is about 2mm(be parallel).
Detect or change doctor blade (blade width 30mm).
Inking: detect the parallel between one side of doctor blade and anilox roller, and adjust parallel.

3.2.3 Threading (attach: drawing)



Threading: fix web on unwind frame, "unwind switch" OFF, rotate unwind by hand and thread with drawing.

3.3 Machine Start

3.3.1 Machine airing, electricity, load and make prepare for start

Turn off 380V main power switch, turn on 220V power, main power indicator lights, control indicator lights, then make sure the used motors and control switch turn on, confirm the power, set dancer roller pressure 0.2-0.4MPa, presser roller within 0.3MPa. The main machine airing, electricity, load and make prepare for start.

3.3.2 Parameter set before start

Set printing unit , rewind/unwind shaft and start diameter on HMI, chose printing unit. Detail information in chart 4.2 HMI instruction .

3.3.3 Machine Running

- **Anilox self running**

  Anilox self running before ready to ensure ink roller not dry.

- **Doctor blade pressure**

  Click every pressure button and every doctor blade presser ON.

- **Heating turn on**

  Before main machine running, turn on "hot air" heating switch.

- **Start**

  Press "start" , alarming operations for seconds, "start" lamp lighter, the machine begin running.

- **Speed up**
  When start and finished tension set, rewind/unwind dancer roller is in middle, press "speed up", it continue speed up to demand speed. The running speed can display on HMI or digital meter.
- **Speed down**
  After start, press "speed down", it continue speed down to demand speed. During adjust speed by hand, you can observe at the same time.
- **Plate cylinder roller press ON**
  Click every press ON button to operate plate cylinder, ink roller press ON.
- **Main machine stop**
  When stop during running, press "stop" it begins to speed down to Min. speed (can set), anilox roller and plate cylinder press throw-off, it continue speed down to 0.
- **Inch**
  Press "inch", machine will running at 5m/min. Observe running, and continue follow step if turn flexibly.
- **E-stop**
  For urgent during running, press "E-stop", and machine stop, all press rollers detached. After troubleshooting, repeat above operator.
- **Rewind/unwind reel-change**
  When need rewind and reel-change, click reel-change prepare button (near to rewind), the rewind frame overturn. When it gets to set position, click reel-change button, the cutting knife automatic cut, it will load to new web. Cut knife automatic return. When an incident occurs, the operator press "splice cancel" immediately to stop splice to avoid hurt.

3.3.4 Notice

Turn on the main control panel power, and pressure roller ON, then make tension control.
During running, the dancer roller is in middle position, and if it swing and tension unstable, check the fault and maintenance.

CHAPTER 4 Electric Operating Instructions

4.1 Operation Panel

Include main operation panel, heating panel and rewind/unwind panel.

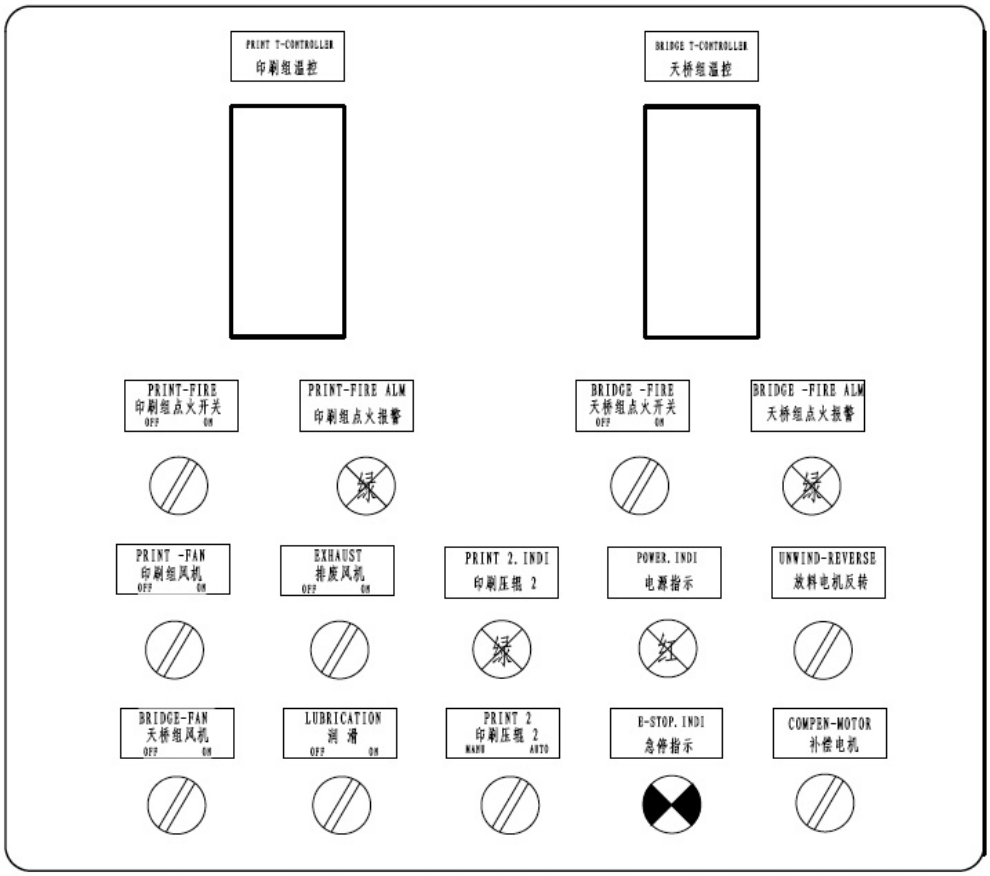
4.1.1 Main Operation Panel

Main operation panel include three parts, compression roller and hot-blast air area on the left, pressure adjustment area in the middle, control area on the right. Operating function and announcements will be introduced in the followings.

Warnings of the key station

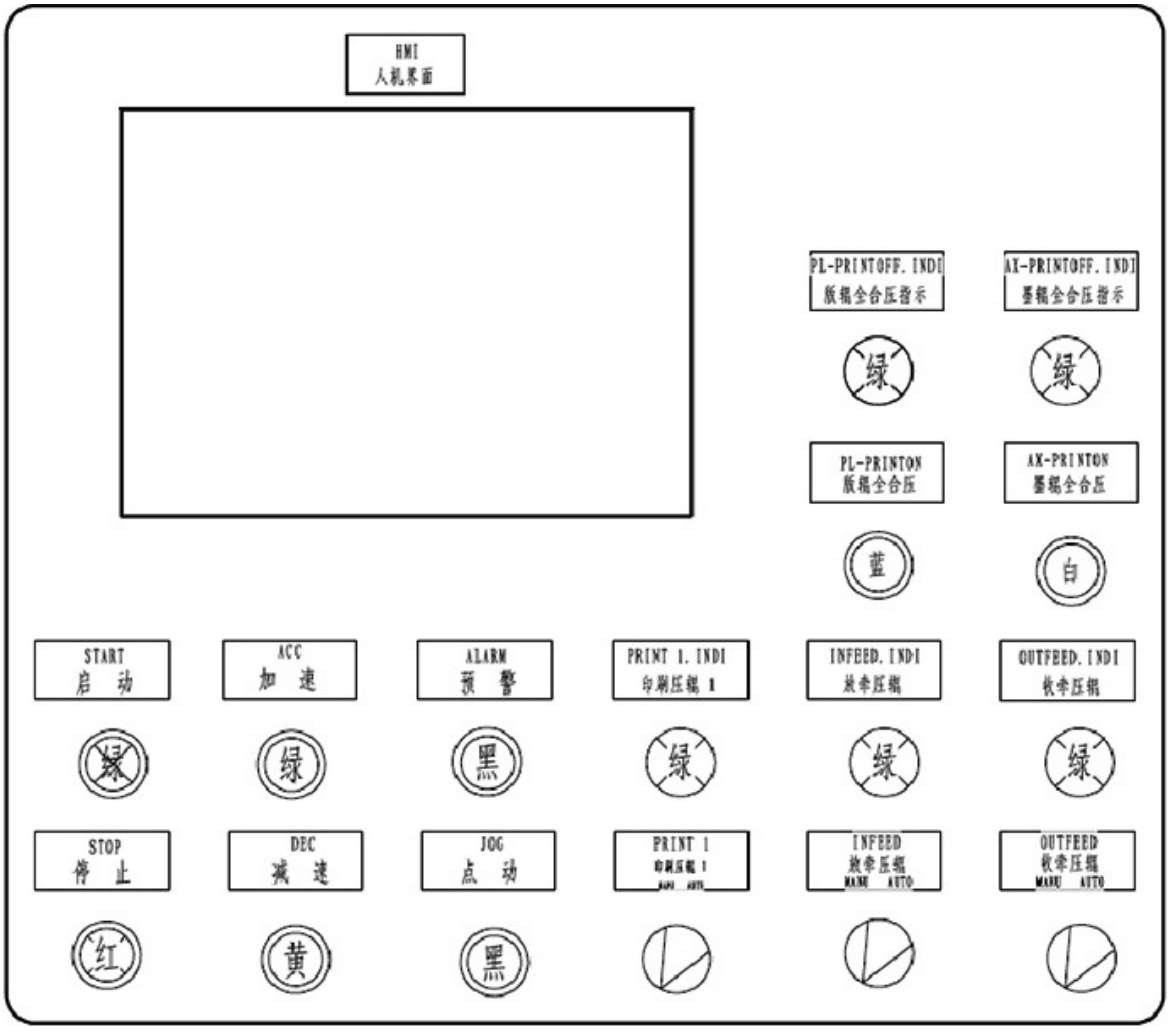
Touch screen and button on the main operation panel are strictly prohibited from excessive force for using or being knocked by sharp tools.
Strictly prohibit untrained person operates.
Keep the key station both internal and outside dry. Water is strictly prohibited.

❖ **Hot Air and Heating**



Power supply indicator: lamp lighter means machine turn on, any operation will make corresponding move, so don't press any button freely.
Lubrication switch: turn on centralization lubrication, central drum lubrication device begin to running.
Exhaust motor: exhaust fan switch.
Printing fan: printing fan turn on/off.
Bridge fan: bridge turn on/off.
Bridge hot air increase: bridge fan speed up.
Bridge hot air decrease: bridge fan speed down.
Ink roller switch self running / inch: knob at rotation when ink roller selfrunning.
Emergency stop: press emergency stop, buzzer ring.

❖ **Main Machine Start**



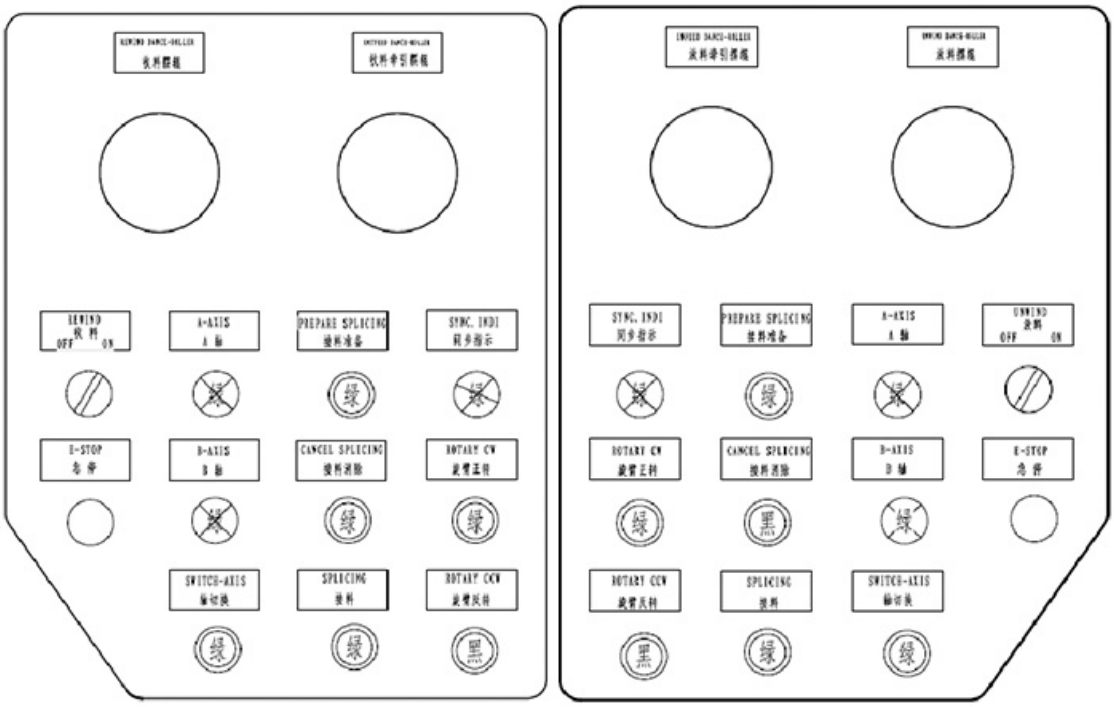
ALARM: Pressure the button, then alarm box works. It is used before starting or emergency warning.
START： Be sure no abnormal and press 'START', then alarm box works. The machine start to work after the alarm stops and the indicator light on.

STOP: when stop machine during running, press "Stop", main machine speed down to 0 and stop, plate cylinder, ink roller automatic throw-off.
ACC: Speed-up button. When main machine start press “ACC” button, the machine goes up to the rated speed then stop increase. The current speed can be read out from HMI or linear speed.
DEC: Decelerate button. When the machine get to set speed, press "DEC" button. The main machine will slowly fall to zero, then stop slowing down. The current speed can be read out from HMI or linear speed.
Inch: press inch button, alarming, 2 second later main machine inch moving. Central drum running with set speed (speed set refer main machine set on touch screen). Detect if machine running well. When threading, chose 'Inching' button.
Unwind feed presser roller manual/automatic: at manual, presser roller underdraught, in-feed strain. At automatic, main machine running, presser roller underdraught and in-feed strain. When stop it automatic return.
Rewind feed presser roller manual/automatic: at manual, presser roller underdraught, out-feed strain. At automatic, main machine running, presser roller underdraught and out-feed strain. When stop it automatic return.
Printing presser roller manual/automatic: at manual, presser roller underdraught. When automatic, main machine start, presser roller automatic underdraught, when stop, it automatic return.
INFEED—INDI: presser roller depress， indicator on.
OUTFEED—INDI: presser roller depress， indicator on.
PRINT—INDI: presser roller depress， indicator on.
Ink roller throw-off: press the button, all the chosen unit ink roller throw-off.
Plate cylinder throw-off: press the button, all the chosen unit plate cylinder throw-off.
E-stop: when meet emergency during running, press "E-STOP" button， then machine stop running quickly. The main circuit , control circuit power turn off.

4.1.2 Presser ON-OFF Panel

4.1.3 Rewind / Unwind Panel

Rewind/unwind panel as figure, turn on rewind switch begin to strain.
Rewind/unwind switch: turn on unwind switch, unwind shaft will get into unwinding state.
ESTOP: emergency stop, the same function as the machine start zone.
SWITH-AXIS: To switch the working axis between A axis and B axis.
A-AXIS: unwind working axis is A when the light is on.
B-AXIS: unwind working axis is B when the light is on.

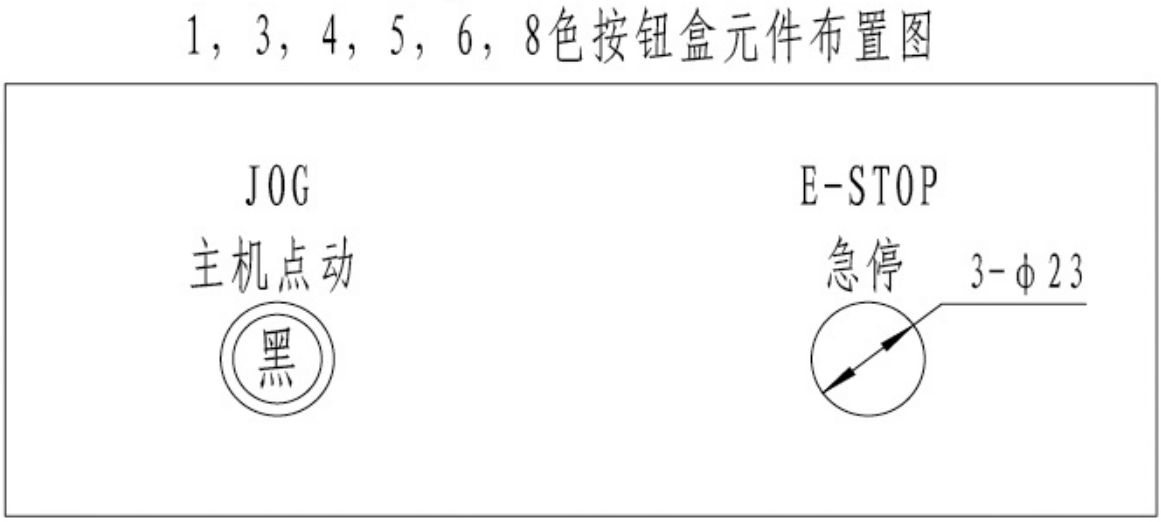


PREPARE SPLICING: Splice prepare. Press the button and then unwind unit start working, the cantilever rotate to make the working axis into splice station. The pre-splice shaft start to drive to working speed, the SYNC-INDI on.
CANCEL SPLICING: Press the cancel button if there is wrong operation to cancel splice, the arm return.
SPLICING: Press the button cut-off knife roller will quickly crop and return after cutting. The working axis has a successful switchover and starts unwinding.
SYNC-INDI: Linear speed of the working axis is same as the pre-drive axis.
ROTARY-CW: Cantilever starts rotating clockwise.
ROTARY-CCW: Cantilever starts rotating anticlockwise.

Attn The angle of **photoelectrical eye**, limit frame, swing arm and cut-off knife are setted in advance and do not alter it at will.

4.1.4 Print Unit Operation Button

Match with every unit button box at driven side of central drum. when clean plate, inch move or emergency to stop machine, operate the button.



Main machine, ink roller inching, emergency button function same as main operation panel.

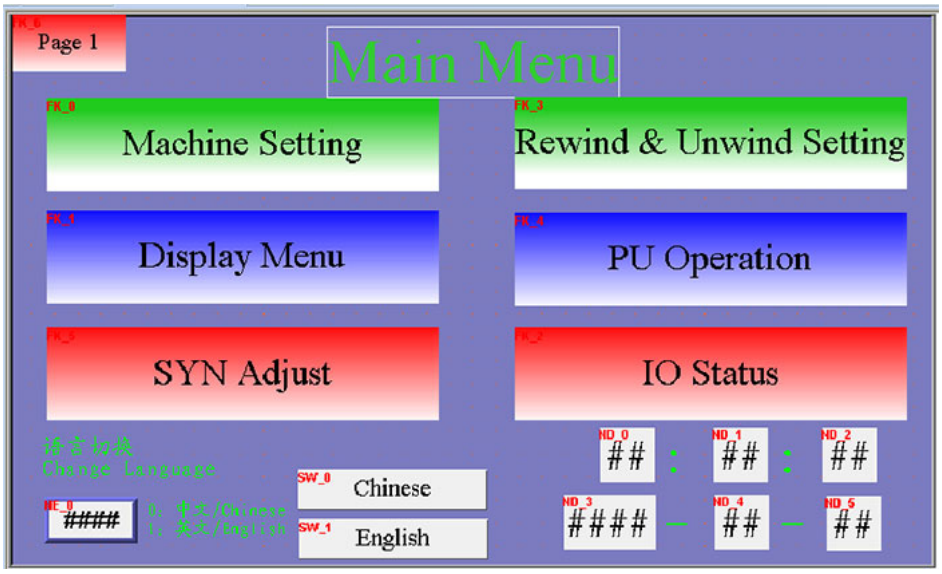
4.2 HMI Operating Instructions

4.2.1 Main Touch Screen

- **First menu**

  After power on,touch screen display as figure 3. press any key enter main menu as figure 4.

❖ Main Menu



With demand enter main menu.

"main machine display" button, check main parameter.

"main machine set" button, set main machine parameter.

"rewind/unwind set" button, can change the parameter on rewind/unwind.

"every unit operation" button: can set every unit state.

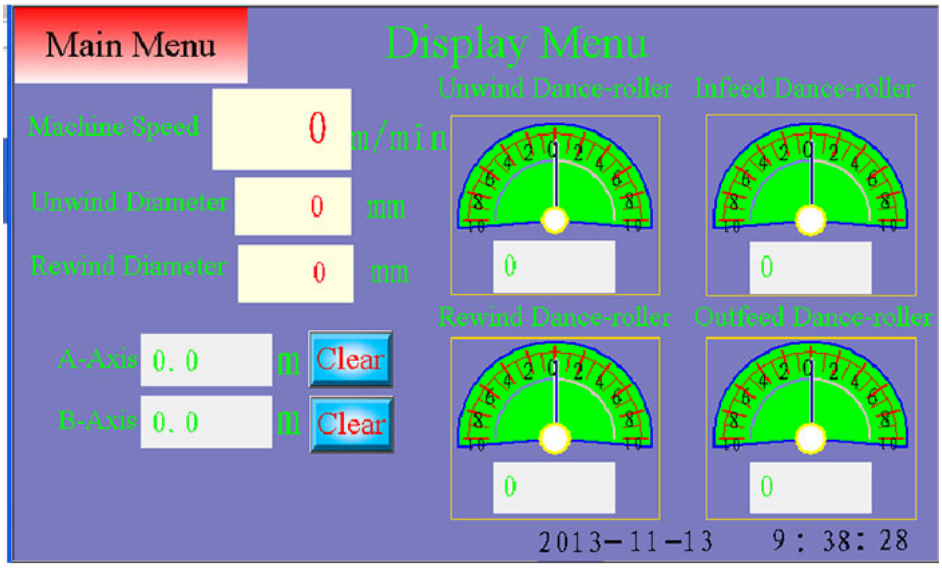
"PI adjust", "synchronization adjustment" button, just for professional staff and with password, users can't adjust.

"Special menu", just for professional staff and not for users.

Click top left corner "first page" button, return to first page.

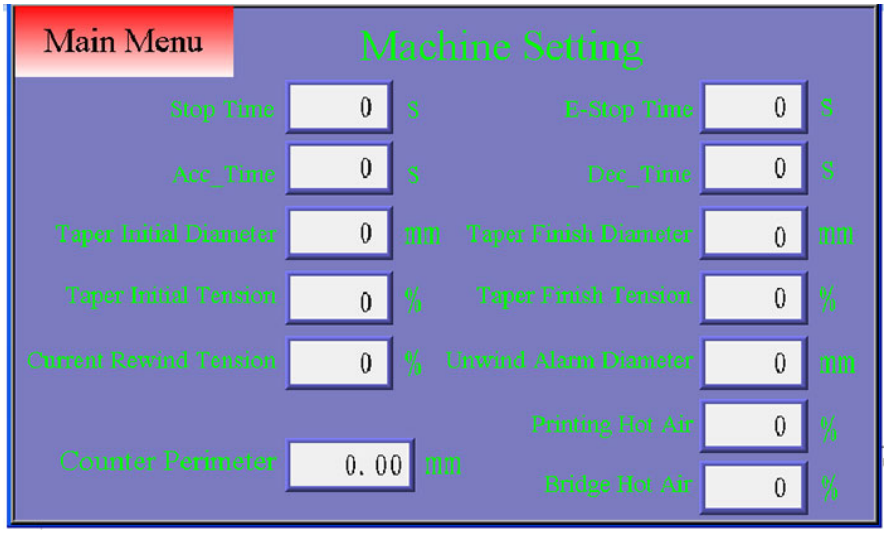
Figure and character just for display date and time, which is automatic display, without button and needn't operate.

❖ Main Machine Display



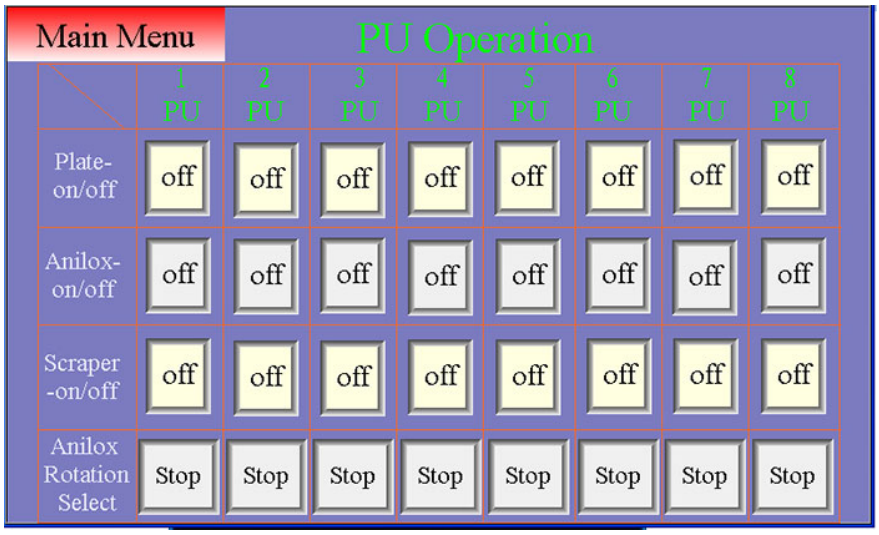
From this can check current in-feed, unwind, rewind and rewind dancer roller position;
From this can check current rewind/unwind diameter and main machine speed;
The picture just for check and can't rectify.
Click top left corner "menu" button return to main menu.

❖ **Main Machine Set Screen**



Stop time: set range: 5-60s, means the time from Max. speed decrease to zero.
Emergency stop time: set range: 1-30s,means the time from Max. speed quickly decrease to zero.
Accelerate time: set range:5-60s. the time from 0 to Max. speed.
Decelerate time: set range: 5-60s. the time from Max. speed to 0.
Rest web alarm diameter: set range:90-200. When the rest web diameter is less than set diameter, alarming.
Servo ink roller presser-off speed: set range:0-30, during stop ink roller presser-off speed.

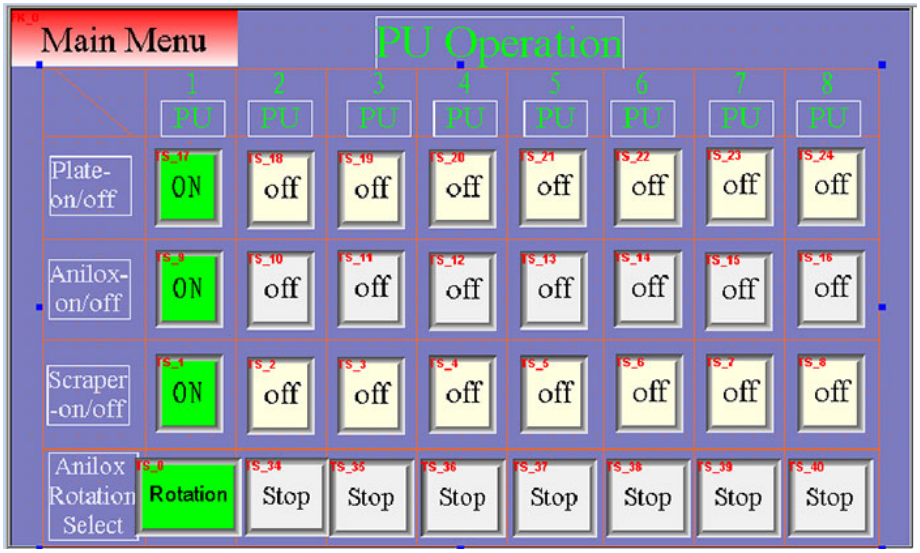
❖ **Print Unit Operation Menu**



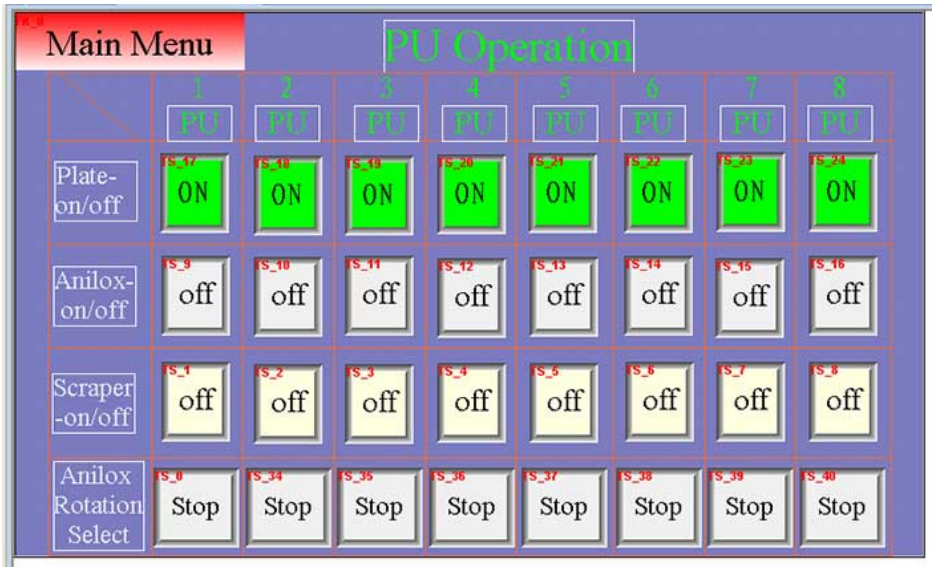
In the menu, you can set plate cylinder, ink roller and doctor blade on-off, every ink roller self running and all plate cylinder on-off.

For example: No.1 plate cylinder throw on-off, if menu is "OFF", plate cylinder is presser-off, click "Off", it shows "On", plate cylinder is presser-on. All plate cylinder, ink roller and doctor blade on-off are same as it. And ink roller self running similar, click "No.1" button, it shows black " √ ", then black self running.

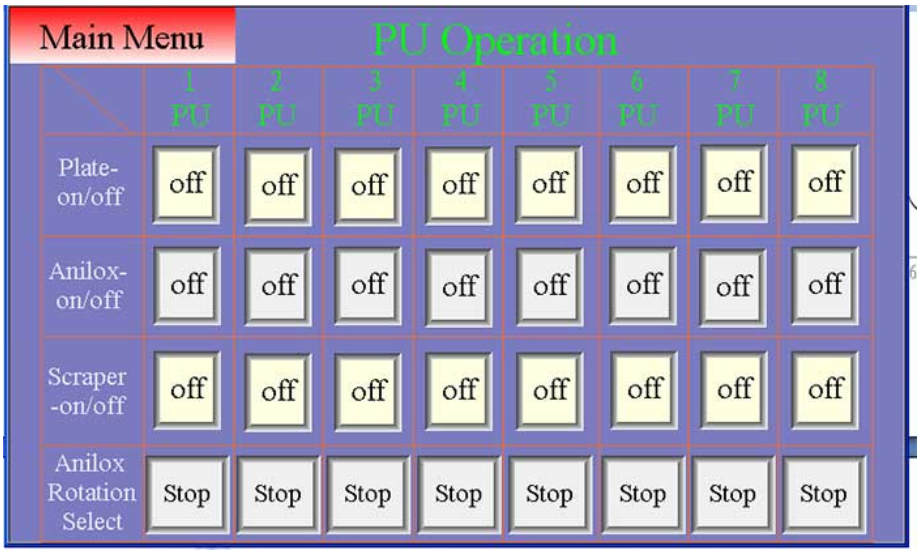
As follows:



All plate cylinders press-on: click "plate-on" button, as follows:

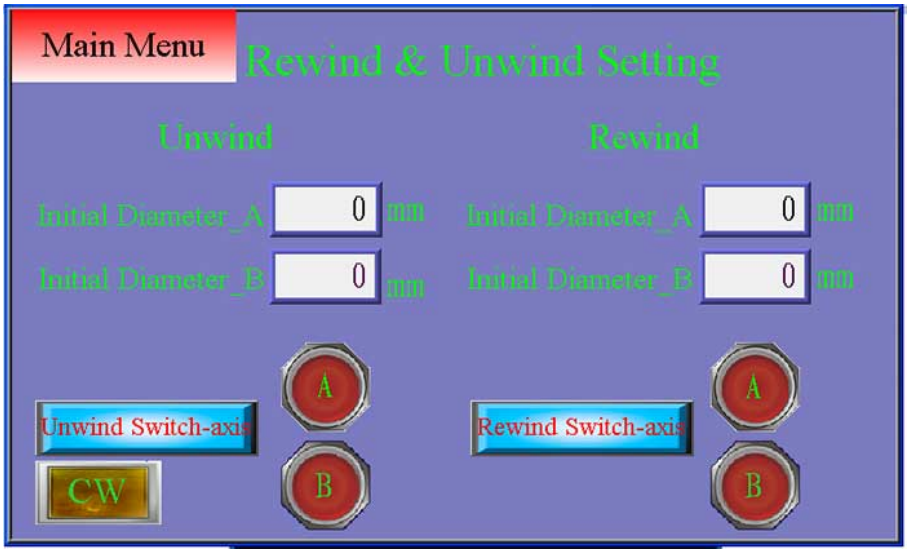


It shows all plates press-on, click "plate-on" again, as follows:



It shows all plate press-off, all ink rollers press on-off similar as this.
Click "Menu" on top left corner return to "Main Menu".
The menu just show. If it shows "running", the machine is running, click to switch button then enter "debug", the machine stop for debug.

❖ **Rewind/Unwind Menu**



Shaft A initial diameter: set range:92-800mm, shaft A with new web diameter.
Shaft B initial diameter: set range:92-800mm, shaft B with new web diameter.
Unwind shaft switch over: unwind shaft A, B switch over.
Rewind shaft switch over: rewind shaft A, B switch over.

❖ **Safeguard system**

The light sensor on the doors to realize safeguard, every unit install one set light sensor. Each door install with magnetic lock, if close magnetic lock

switch, it will sucked, then the door close, the light sensor running. During the machine is running, when the light sensor is covered, it will stop and make safeguard.

The HMI touch screen with safeguard button. For example: press the button as "unit 1,2,3,4, the photoelectric protection take effect", then unit 1,2,3,4 are take effect to the light sensor. Otherwise it is not effect. Unit 5,6,7,8 just similar as this.

4.3 Operation Manual and Other Instructions

Component instruction please see manual.

CHAPTER 5 Faults and Solution

When startup, please cnfirm the machine with aeration before electrified.

5.1 Printing Faults and Solution

No.	Fault	Cause	Solution
1	Horizontal out of register	1. Machine with poor precision 2. In-feed adjustment is too large 3. longitudinal adjustment mechanism gap is too large 4. Horizontal adjustment mechanism is poor position 5. Side of bus bar error is too large 6. Guide roller out of oven with large gap and oscillation 7. Unwind tension is too small	1. Adjust precision 2. Adjust plate cylinder feed size, adjust gear box and machine side of bus bar 3. Restore longitudinal adjustment mechanism gap 4. Change horizontal support sleeve 5. Reinstall and position 6. Adjust bearing gap, change cushion disk 7. Increase enwind tension
2	Longitude out of register	1. Driven tension set not accurate 2. Ink deterioration and friction properties Changed 3. Gear box get stuck 4. Flexible connector broken. 5. Frame with poor precision	1. Set tension with material 2. Change ink 3. Check , repair and change gear box 4. Change flexible connector 5. Adjust frame precision
3	Drying not enough	1. Inlet air speed low 2. Temperature low 3. Temperature can’t reach demand one 4. New air disproportion 5. Heat preservation poor	1. Open inlet air switch 2. Turn on temperature valve 3. Open air recycle valve 4. Adjust new and recycle air proportion 5. Increase heat preservation

4	Others	1. Rub dirty 2. blind print 3. White leakage 4. Presser decrease when speed up 5. Printing pressure unstable, plate cylinder and anilox roller vibrate	1. Check, clean oven exit foreign matter 2. Change, repair back up rubber roller 3. Adhesive tape deform for extrusion, adjust plate mounting 4. Increase presser after speed up 5. Web thickness not uniform, ink viscosity not match

5.2 Rewind/Unwind Faults and Solution

No.	Fault	Cause	Solution
1	Splice failure	1. New web tension is too large 2. No tape 3. Rubber roller abrasive wear and can't compress tightly 4. Cylinder don't work 5. Air shaft, rubber roller with poor precision 6. Air shaft jammed 7. Web is dirty 8. Air shaft skid while splice	1. Set accurate new web diameter 2. Make tape 3. Repair or change rubber roller 4. Adjust presser, change solenoid valve 5. Adjust and repair 6. Repair driven system 7. Clean web dust 8. Confirm air shaft is gas filled
2	Web broken	1. Web broken or loosen 2. Splice deflection 3. Rubber roller deform 4. Bearing on driven rubber roller broken 5. Adhesive viscosity is poor 6. Web broken	1. Set rewind / unwind initial diameter is same as practice diameter 2. Adjust web load 3. Adjust web and presser roller 4. Change rubber roller bearing 5. Change adhesive 6. Change web, reduce unwind tension
3	Crinkle	1. Frame deflection 2. Guide roller deform, with foreign matter 3. Guide roller support bearing broken 4. Driven roller dirty, with foreign matter 5. Guide roller with poor precision	1. Adjust frame precision 2. Repair, clean or change guide roller 3. Change bearing 4. Clean driven roller surface 5. Adjust frame precision

5.3 Tension System Faults and Solution

No.	Fault	Cause	Solution
1	Tension unstable	1. Rubber roller bearing broken 2. Tension control dancer roller potentiometer not return to zero 3. Chain drive loosen 4. Driven roller with poor dynamic balance 5. Program is failure 6. Driven motor impulsive motion 7. Servo speed reducer fastening is loosen, broken	1. Change rubber roller bearing 2. Adjust potentiometer to zero when dancer roller is in middle 3. Tight tension 4. Repair, change driven roller 5. Revise program 6. Repair motor encoder and PG 7. Tighten, repair speed reducer
2	Dancer roller vibrate	1. Transducer alarm 2. Web deformed, unwind tension is too big 3. Encoder broken, connecting lead, bonding broken 4. Gap between encoder gear is too big	1. Solute with alarm 2. Reload, change 3. Change, repair 4. Adjust inspection gear gap(should be no gap mesh)

CHAPTER 6 Machine Maintenance

6.1 Wear Spare Parts List

No.	Model	Description
1	6002-2Z	Bearing
2	6004-2Z	Bearing
3	6005-2Z	Bearing
4	6006-2Z	Bearing
5	6008-2Z	Bearing
6	6012-2Z	Bearing
7	6015-2Z	Bearing
8	61906-2Z	Bearing
9	6202-2Z	Bearing
10	6203-2Z	Bearing
11	6205-2RZ	Bearing
12	6206-2Z	Bearing
13	6207-2Z	Bearing
14	6208-2Z	Bearing
15	6210-2Z	Bearing
16	6212-2Z	Bearing
17	7003AC	Ball bearing
18	7004AC	Ball bearing
19	7006AC	Ball bearing
20	7010AC	Ball bearing
21	7014AC	Ball bearing
22	87.5x5.30 (GB/T3452.1-1992)	O-shape seal ring
23	92.5x3.55 (GB/T3452.1-1992)	O-shape seal ring
24	B3042 (GB13871-1992)	Lip-shape seal ring
25	HTD-1008-8M-35	Synchronous belt
26	HTD-1104-8M-35	Synchronous belt
27	HTD-736-8M-35	Synchronous belt
28	2208TNI	self-aligning ball bearing

6.2 Machine Maintenance

6.2.1 Main drive

- Main motor: electrical current check/day
- Main motor: fan check/day
- Gear engagement: lubrication check/day

6.2.2 Drive system

- Synchronous belt: check whether loose or not/day
- Drive gear: check the gear engagement/day

6.2.3 Air supply

- Air pipe: leakage check/day
- Pressure meter: operation check/day
- Air filter: drainage check/week
- Steam manifold: drainage check/week

Check the oil level. Open the air cap if any.

Operation of electrical components should be subject to it' manual and user must read and understand the content of the manual before use it.

If plug needs to be pulled out before maintenance, it must be placed at the sight of operator.

Maintenance work should be carried out by personnel who is specialised in electrical work and familiar with the machine. Electrical work regulation must be followed for maintenance work. All operators must stop operation and stay at the safe area before maintenance work starts.

Maintenance work	Maintenance interval			
	Every day	Every week	Every month	Every year
1. Tension check		●		
2. Fume cleaning in heating oven				●
3. Wire check for heating oven fan and electrical heating pipe.		●		
4. Linear guide base lubrication	●			
5. Gear lubrication		●		
6. Replace machine oil for reducer fan			●	
7. Main motor---electrical current check	●			

8. Main motor---fan check	●			
9. Gearbox—lubrication check		●		
10. Pipe---leakage check			●	
11. Pressure meter---operation check	●			
12. Air filter---drainage		●		
13. Steam manifold---drainage		●		
14. Compressor		●		
15. Leakage check for chiller roller fountain.	●			

Pay attention to the follows during lubrication work:

- ❖ Lubricate components in sequence in case of missing any one.
- ❖ Lubricate before machine starts. Be careful while lubricating during machine running.
- ❖ Ensure that the lubrication oil must match the components.
- ❖ Check the lubrication points and keep the area clean and smooth.
- ❖ Pay much attention to the gears of main motor. Check if gears are getting heated while machine is running.
- ❖ Observe if the oil changes in colour.

Remarks:
Guide rail lubricating oil: L-AN46 GB7324-94
Bearing lubricating oil: Energchease LS.2
Gear box lubricating oil: L-CKC100~L-CKC220 GB/T5903 EP industry gear oil

Reducer Installation and Precaution

- ❖ While installing the reducer, make sure that central line of drive parts is centred. The tolerance must be less than the compensation amount of coupler. The best centring would prolong the service life of reducer and achieve the best driving efficiency.
- ❖ While installing driving parts to the output shaft, operator is not allowed to use hammer to hit on it because this operation may damage the inner parts of reducer. Operator can use the assembling jig and bolt to press the driving parts inside. It is not recommended to use steel coupler because improper installation of coupler may incur overloading and thus the bearing may be damaged and output shaft is broken.
- ❖ Reducer should be fixed to a level foundation or base with oil discharge groove

and smooth cooling air circulation. If the foundation or base is not strong, the reducer would cause vibration and noise during running and may also cause damage to the bearings and gears. When there are some driving connection parts stretching out or sprocket driving system is used, these parts must be installed with protection devices. If the output shaft undertakes larger load in radial direction, it must be the heavy duty type.

- The reducer installation must make the operator easy access to the oil leveller, ventilation plug, and oil drain plug. After the installation is complete, check in sequence whether each part is installed properly, fastening is reliable, and moving parts can move freely. Reducer is lubricated via oil splash pool. Before the reducer starts running, operator needs to replace the plug screw of air vent with ventilation plug. Then open the oil level plug to check the oil level. Add oil to the position of oil level plug until oil overflows from the oil level screw hole. Then put the oil level plug and start idle running of the reducer. The reducer must run at least 2 hours. During running of reducer, the reducer must be stable without vibration, noise and oil leakage. If there is anything abnormal, the problem must be eliminated timely.

  The oil level must be checked regularly and there should be no oil leakage. If the surrounding temperature is too high or too low, the brand of lubricating oil must be changed.

Maintenance of Reducer

Before the reducer is dispatched out of factory, it has been infused with L-CKC100~L-CKC220 GB/T5903 EP industry gear oil. After the reducer is running for about 200 to 300 hours, its' oil must be replaced. It is also a must to check the oil quality regularly and oil with foreign matters or deteriorated oil must be replaced timely.

Generally, oil needs to be replaced every 5000 hours or every year. For the reducer which stays idle for long period, it must be added with new oil which is the same brand with the original. It is not allowed to mix the oil of different brands. Oil of same brand but different viscosity can be mixed.

Oil should be added when reducer cools down without any risk of flame. The oil should be tepid because the oil viscosity would increase once oil cools down totally and it would be difficult to add oil.

If the oil temperature exceeds 80℃ or oil pool temperature exceeds 100℃ or there is abnormal noise, the reducer must be stopped for check. The reducer can be restarted only when problem is solved and oil is replaced.

It is suggested that user should have operation regulations for reducer and take record of any problems when reducer is running or checked.

Maintenance of Motor

Observe the motor when it starts or is running. Check whether the electrical current, noise vibration, or exhausting is proper. If any problem is found, the motor must be stopped for check.

When the motor is running, there should be no scorched flavour, abnormal noise or overheating.

When the motor stop for a period and restarts, insulation resistance of the motor must be checked and other items also needs to be checked.

The motor spindle head must be with anti-rust coating.

The motor must be complete in appearance and its ventilation should not be blocked.

When load of motor needs to be replaced, its' spindle head must be protected from hitting. The frequency converter should work properly.

The surroundings of motor must be to the operating regulation.

Maintenance of Fan

The surroundings of fan must be tidy and the fan surface must be clean. The air inlet and outlet should be free from foreign matters. The fan and duct must be cleaned regularly.

Fan can be started only when it is in good condition. Mean time, the power supply should be sufficient and voltage is stable. It is allowed to run the fan with missing phase. The power supply must be through the dedicated line.

Fan must be stopped for checking once it is found with abnormal noise, overheating, shell with electricity, switch trip, failure in start. It is not allowed to repair the fan when it is running. After maintenance, run the fan for five minutes. The fan can be started for normal running while there is no abnormality.

Bearing should be added with lubricating grease now and then. The closed bearing of motor does not require replacing of lubricating grease during its' service life. To ensure the fan work properly, the closed bearings and motor bearings requires lubrication once per 1000 hours. 2/3 of bearing inner and outer part should be lubricated with ZL-3 Energchease. It is not allowed to run the fan when the lubrication oil is insufficient.

Most Common Problems List

Faults	Causes	Solutions
Bearing temperature too high	A. Too much lubrication oil in bearings B. Lubrication oil is not with good quality C. Insufficient lubrication oil in bearings	A. Use proper amount of lubrication oil and check the oil valve if any B. Remove and wash the bearing. Then lubricate it with proper oil C. Use proper amount of lubrication oil

	D. Bearing radial clearance is too small E. The drive belt is loose F. Cooling turn plate is not installed G. Exhausted air temperature is high H. Surrounding temperature is over 40℃	D. Adjust the radial clearance E. Tighten the belt. F. Install the cooling turn plate to the shaft G. Check the operation condition and recover to the normal temperature H. When the bearing temperature increase by 15℃, the interval for lubrication should be half of the original
Too much noise in bearings	A. Insufficient or improper lubrication oil B. Bearing abraded. C. Foreign matters in bearing box D. Bearing with damages during installation; running components with mark, groove or abrading	A. Use the proper amount and type of lubrication oil B. Replace bearing C. Remove foreign matters and wash and check bearing. Replace bearing and lubrication oil if necessary. D. Replace bearings
Fan vibration	A. Fan blade with dust B. Wear-resistance belt strips C. Impeller is corroded D. The impeller or shaft distorts due to overheating E. Coupler or belt drive center line is not centred F. Drive belt is not tightened properly G. Bearing bolts are loose. H. Air flow is surging	A. Clean the blade B. Check if the wear-resistance belt needs to be replaced C. Balance treatment or replace the corroded impeller D. Center the coupler or belt E. Tighten the drive belt centred F. Tighten the bearing bolts -check if centre line is in middle G. Screw up bolts with set torque H. Adjust the air flow to the setting value until the vibration is acceptable
Abnormal noise of fan	A. Foreign matters inside of the fan B. Inner abrasion C. Outside abrasion	A. Check the fan by moving it manually B. Move the fan by hand to check the space between impeller and air inlet horn cap, and the shaft C. Move the fan by hand to check the protection shield and fixing

Bearing is over abraded.	A. Severe vibration B. Improper vibration C. Fan is hit by external vibration when it stops D. No anti-corrosion treatment when fan is not in use	A. Check and repair it according to the cause of vibrations B. Check and rectify lubrication C. Separate the fan from other vibrating machine D. Anti-corrosion treatment or run the fan regularly if the fan is not in use
Failure in startup or take long time to start	A. Rotor stuck B. Low voltage in wire connection to motor C. Motor is unable to drive D. Motor rated power supply is insufficient E. The startup program is not correct F. Over consumption of power supply when machine starts	A. Move the fan by hand to check the cause of stuck (abrading or anything block) B. Check the power supply wire C. Check the setting value D. Replace the motor E. Adjust the startup program F. Check if the air flow control system is switched off when machine startup

6.3 Statement of Maintenance

The warranty period for this machine is 1 year. If any faults occurs and confirmed by Huayang, Huayang would help for troubleshooting. However, the follows are included in the free maintenance:

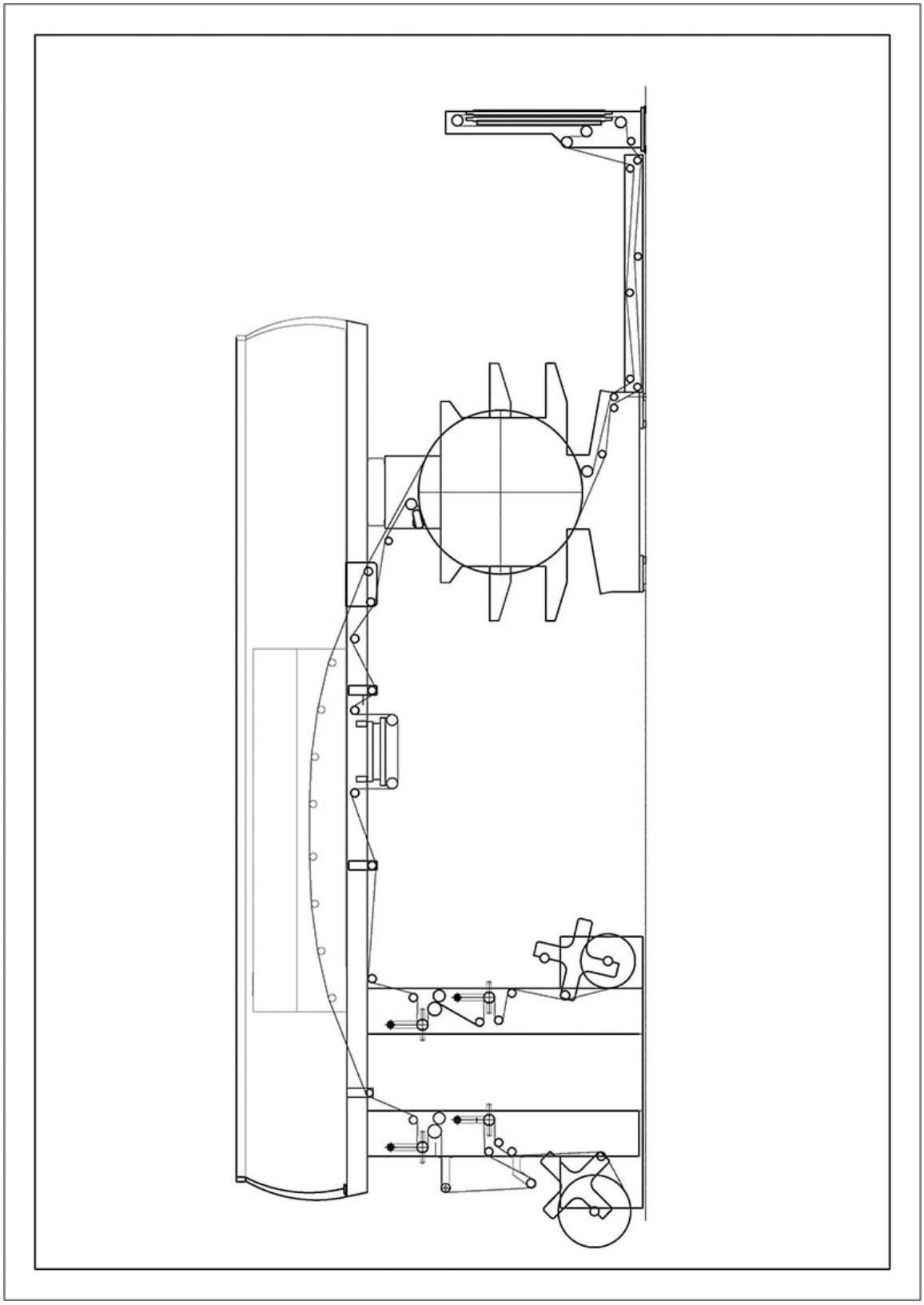
- Damages caused by improper operation.
- Man-made damages.
- System damaged caused by user who disassemble the machine, mechanical parts, and electrical components without the consent of Huayang.
- Damages caused by user who operate the machine out of the normal operation range.
- Damages caused by force majeure, such as flood, fire, etc.

Remark: Wearing parts, such as sealing parts, electrical switch, are not included in the free repair or replacement.

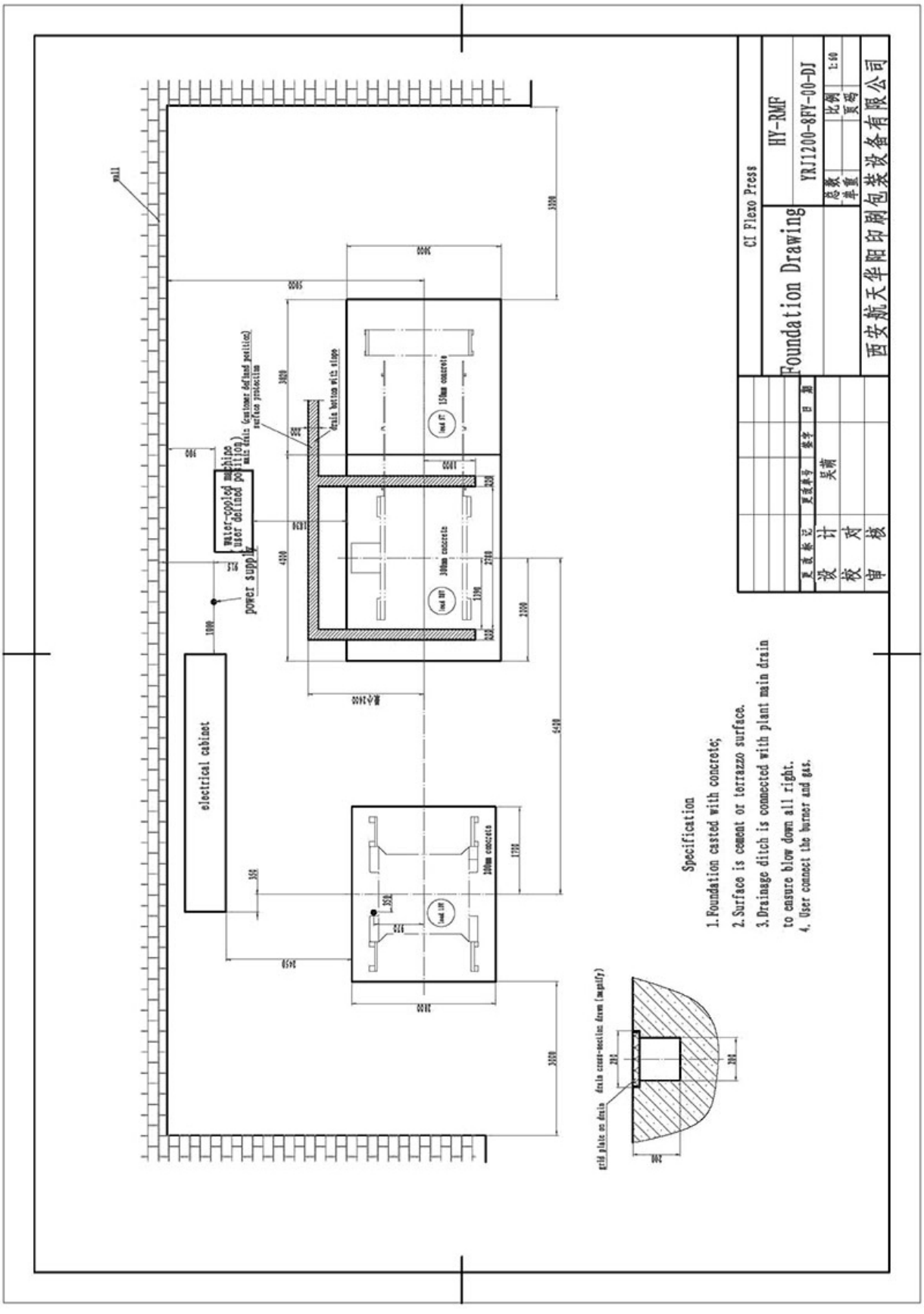
CHAPTER 7 Attached Drawing

7.1 Drawing

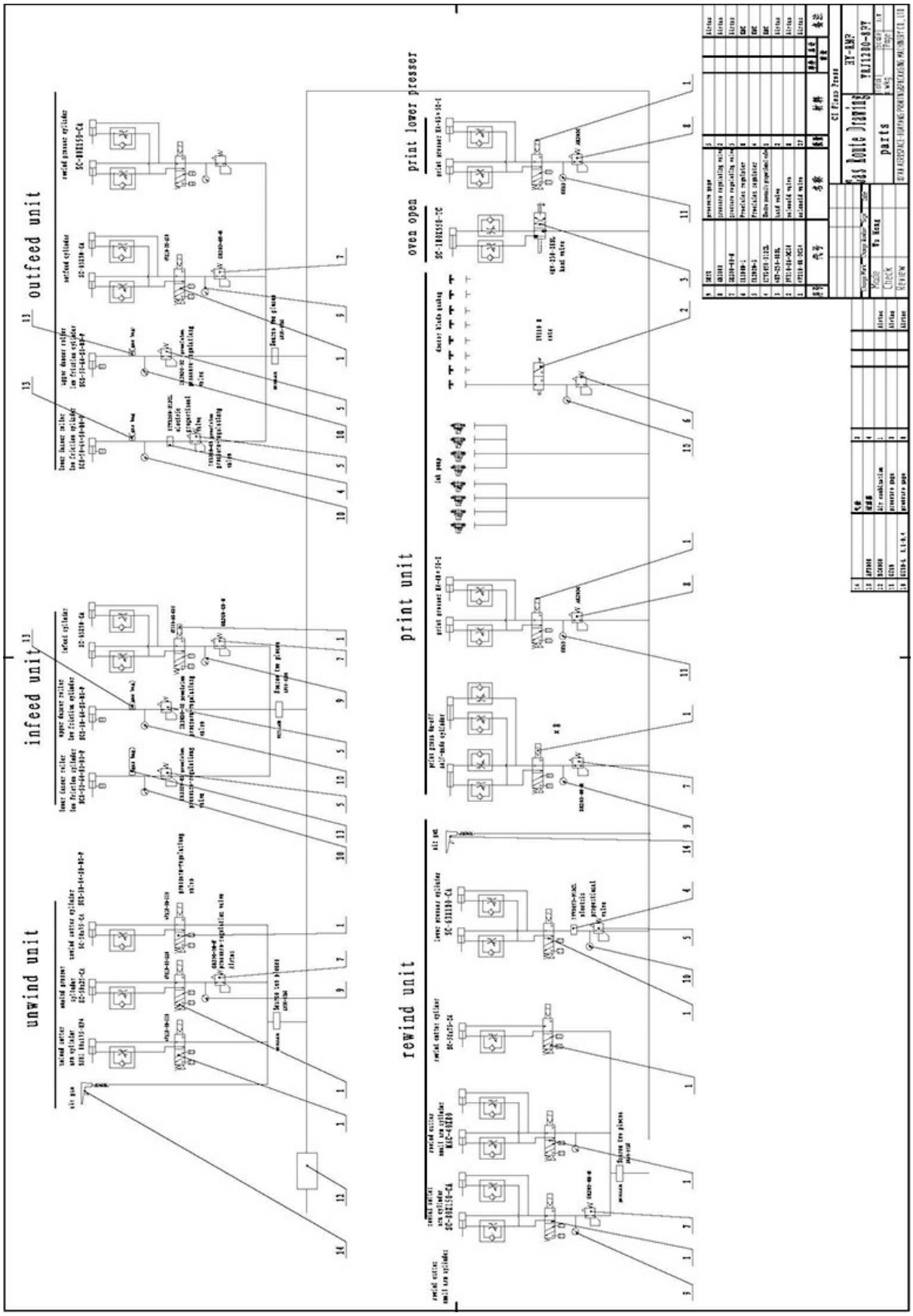
- **Web Route Drawing**



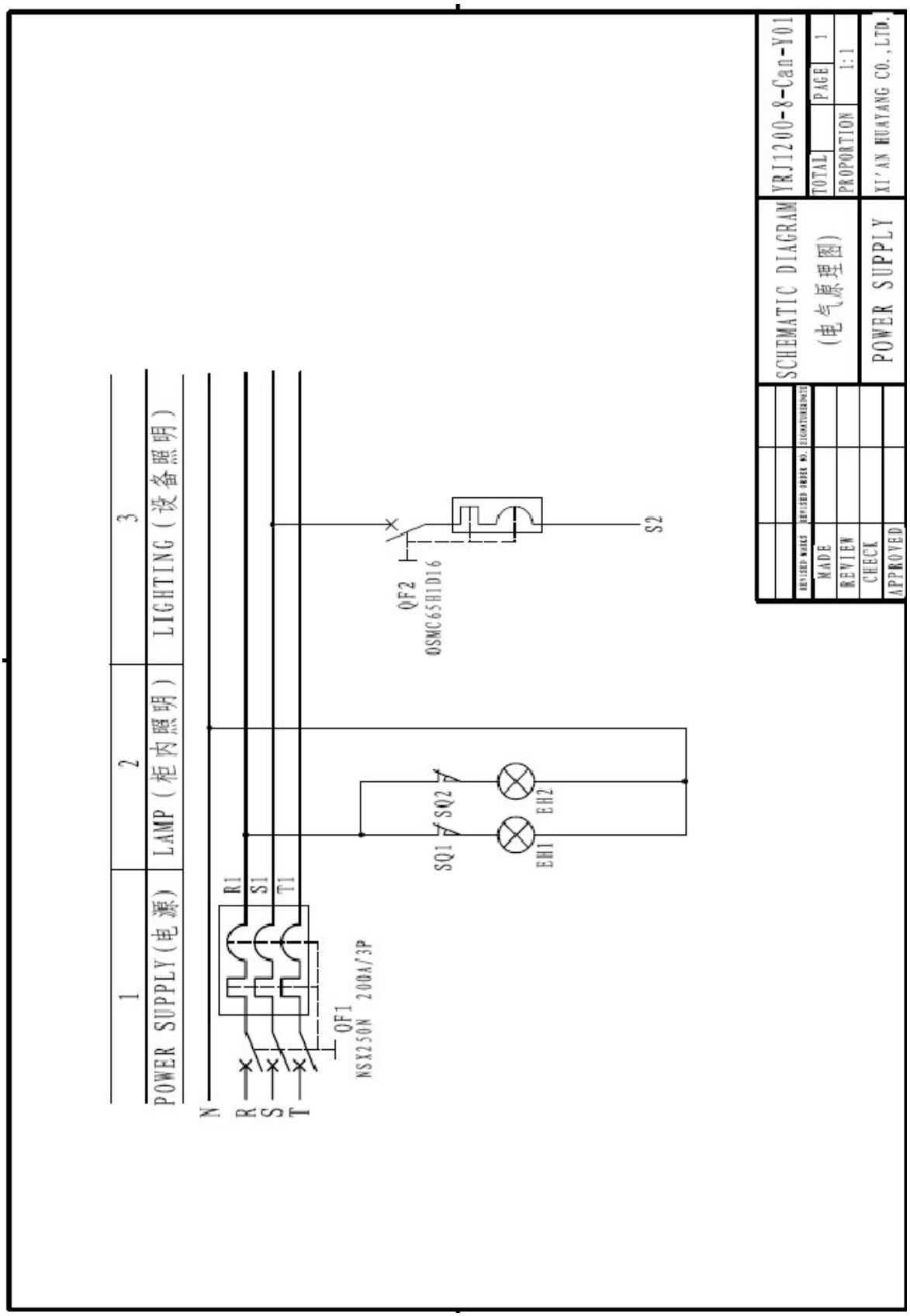
❖ Foundation Drawing

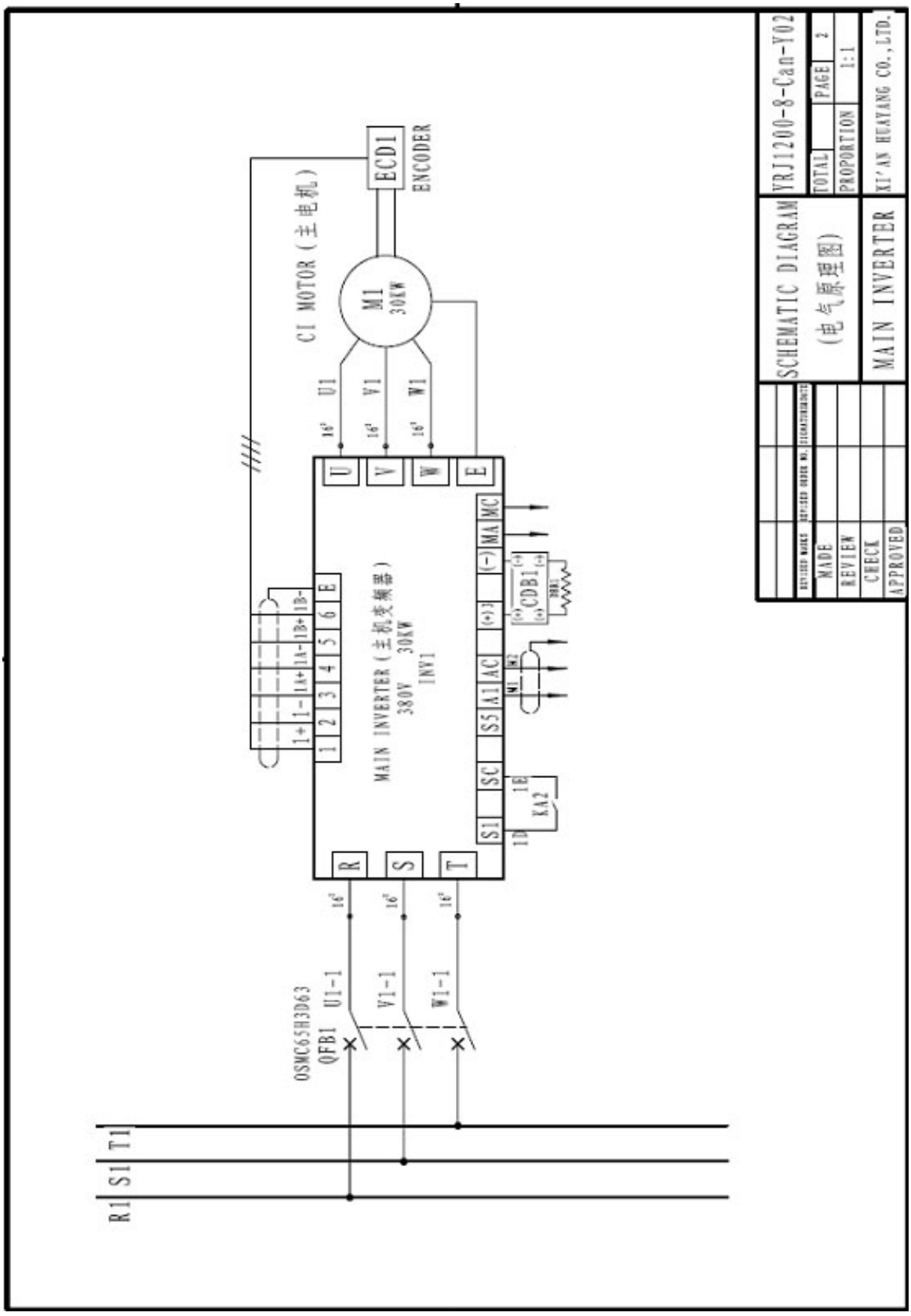


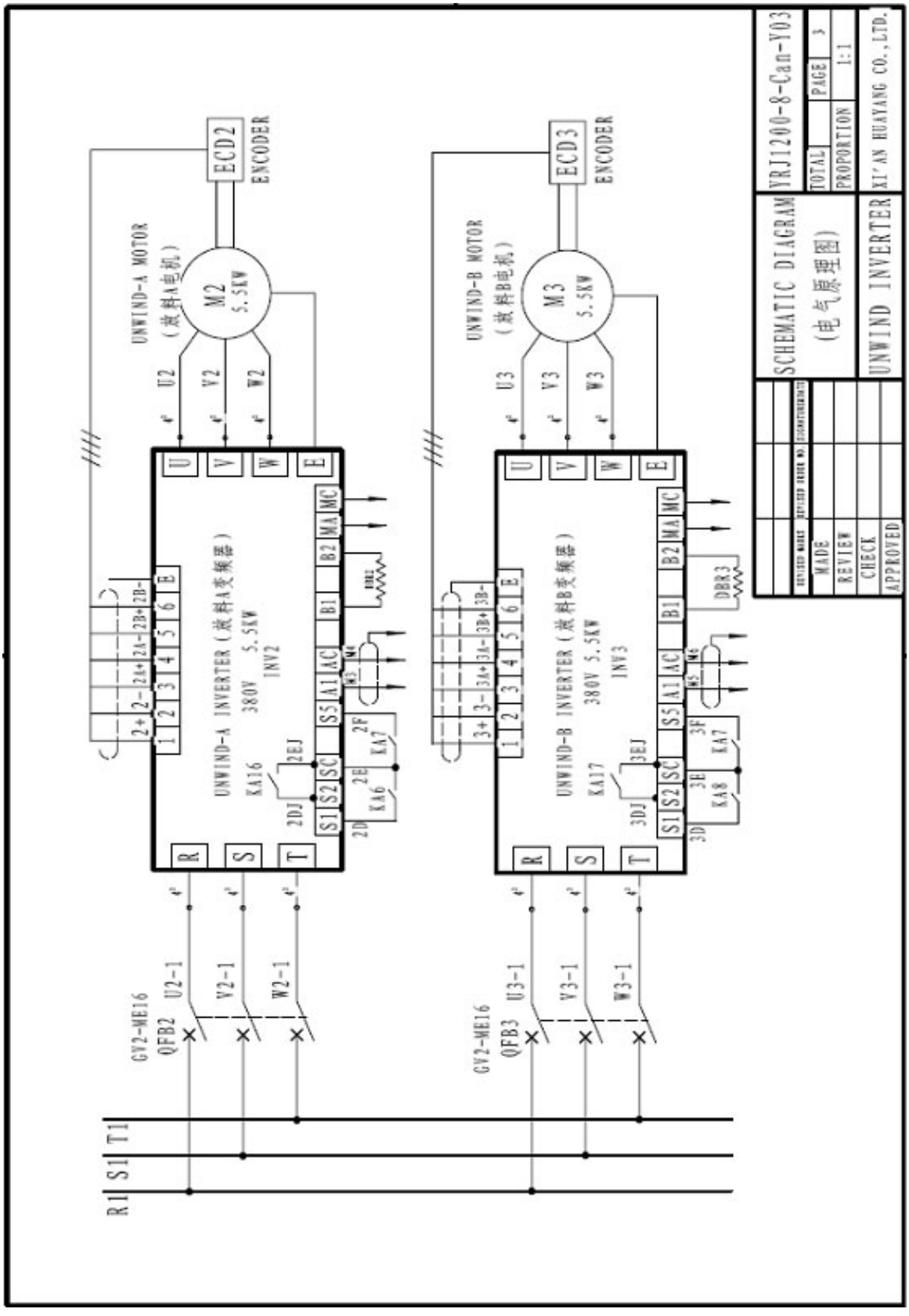
❖ Gas Route Drawing

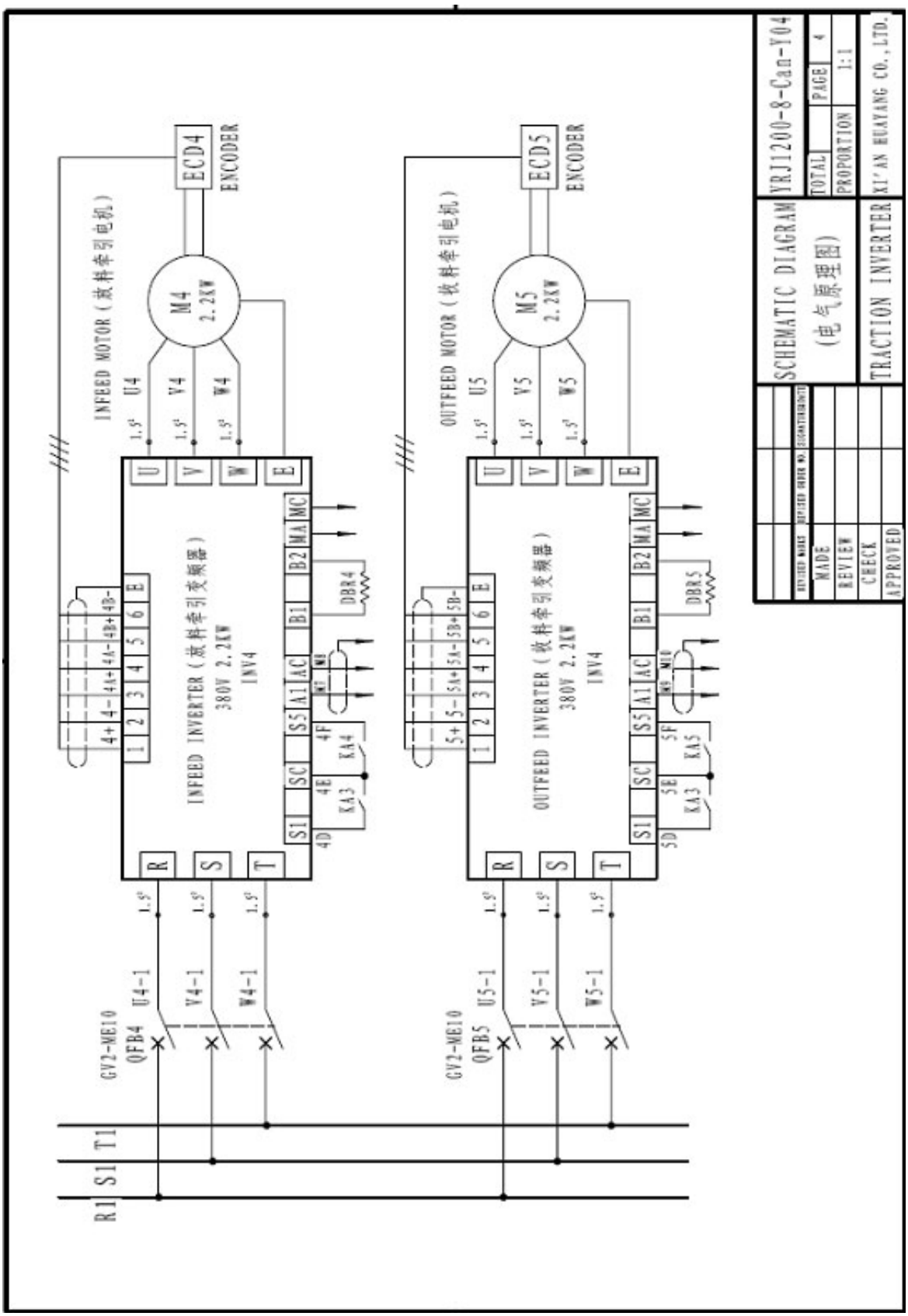


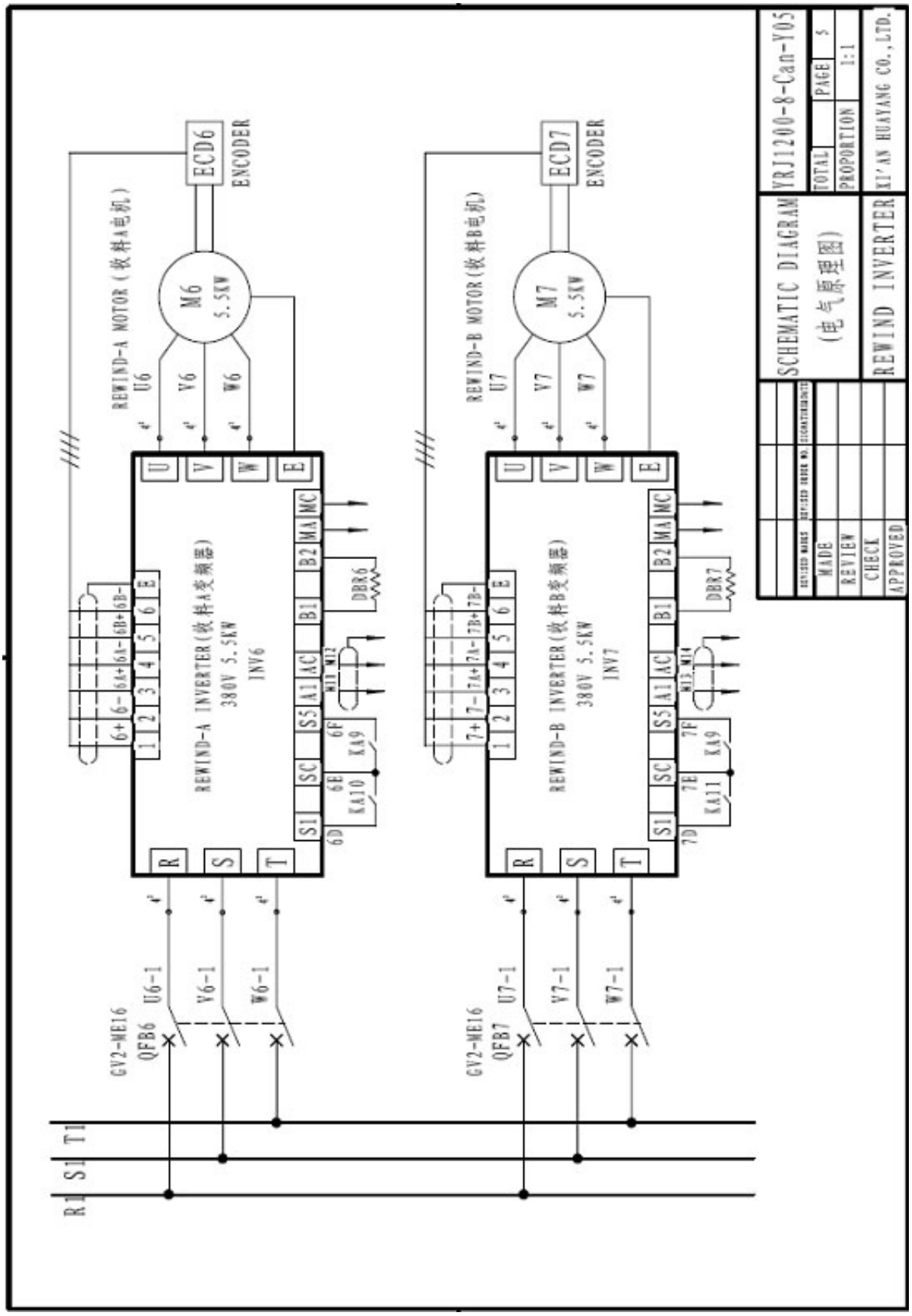
7.2 Electrical Drawing

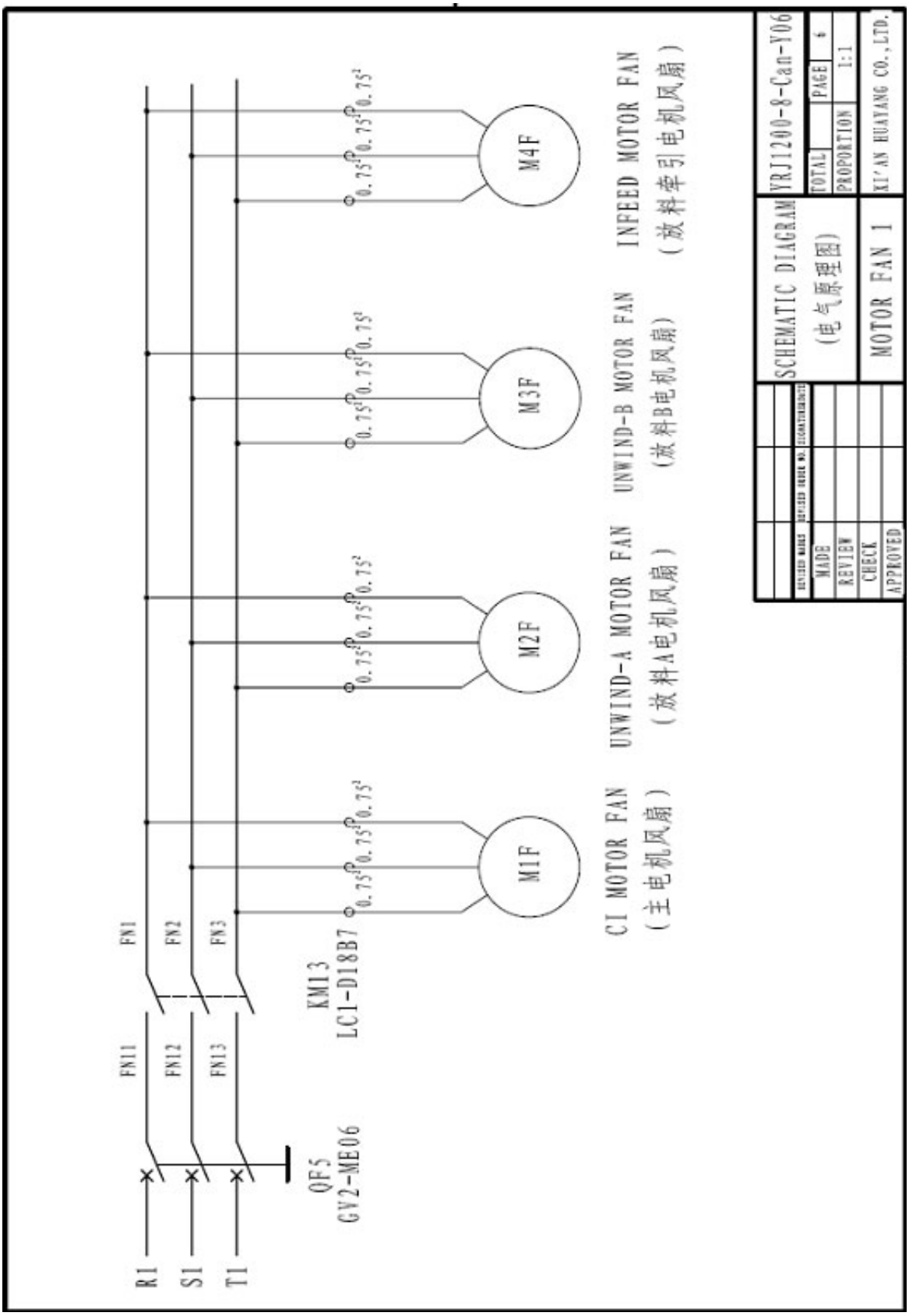


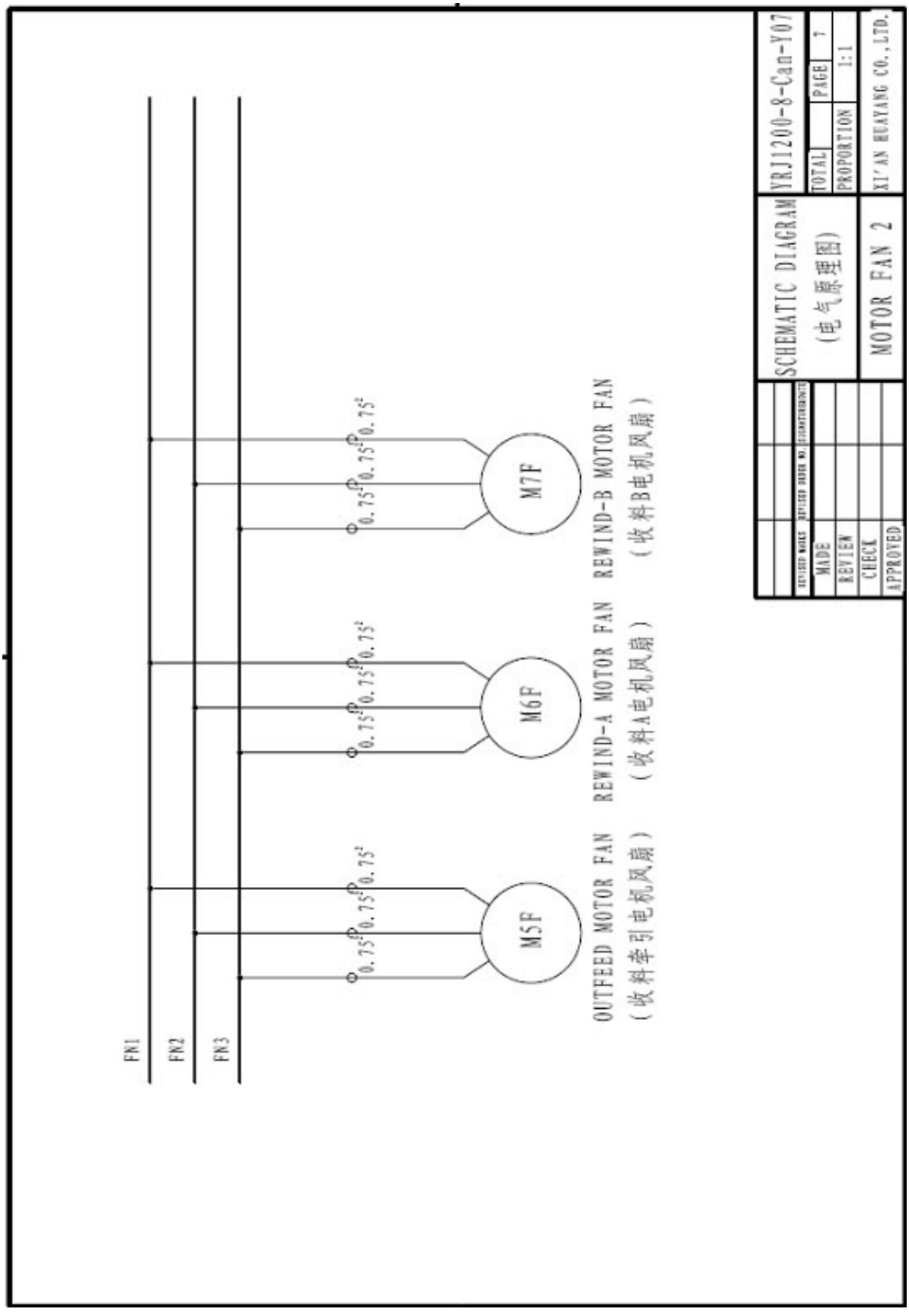

YRJ1200-8-Can-Y02
SCHEMATIC DIAGRAM
(电气原理图)
MAIN INVERTER
XI'AN HUATANG CO., LTD.
TOTAL
PAGE 2
PROPORTION 1:1
MADE
REVIEW
CHECK
APPROVED
CI MOTOR (主电机)
ECD1
ENCODER
M1
30KW
U1
V1
W1
MAIN INVERTER (主机变频器)
380V 30KW
INV1
CDB1
KA2
KA1
OSMC65H3D63
QFB1
U1-1
V1-1
W1-1
R1
S1
T1

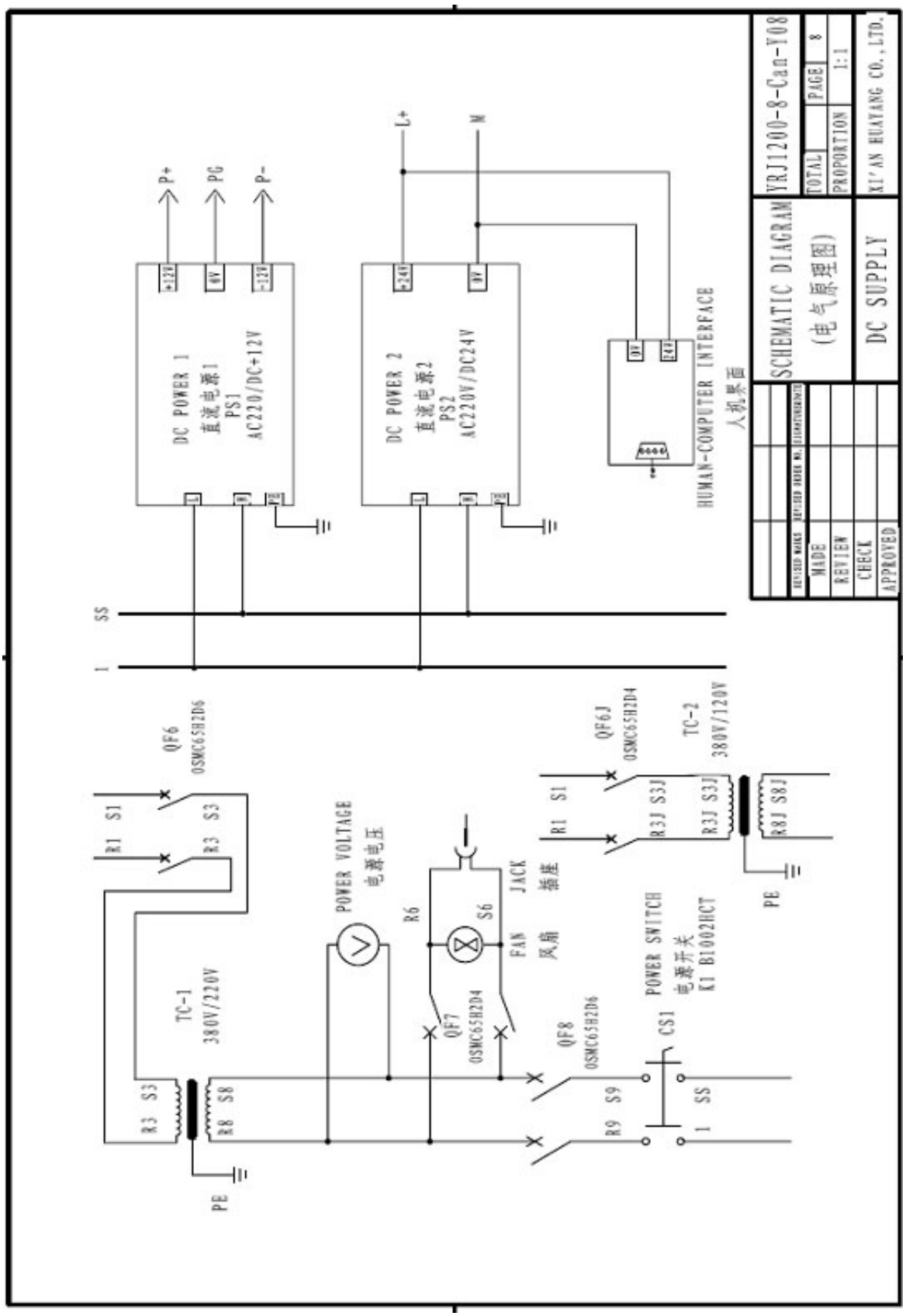

UNWIND-A MOTOR
（放料A电机）
M2
5.5KW
ECD2
ENCODER
U2
V2
W2
UNWIND-A INVERTER（放料A变频器）
KA16
380V 5.5KW
INV2
2DJ
2EJ
2E
KA6
2F
KA7
2D
DBR2
UNWIND-B MOTOR
（放料B电机）
M3
5.5KW
ECD3
ENCODER
U3
V3
W3
UNWIND-B INVERTER（放料B变频器）
KA17
380V 5.5KW
INV3
3DJ
3EJ
3E
KA8
3F
KA7
3D
DBR3
GV2-ME16
QFB2
U2-1
V2-1
W2-1
GV2-ME16
QFB3
U3-1
V3-1
W3-1
R1 S1 T1
SCHEMATIC DIAGRAM
（电气原理图）
YRJ1200-8-Can-Y03
UNWIND INVERTER
XI'AN HUAYANG CO.,LTD.
MADE
REVIEW
CHECK
APPROVED
TOTAL
PAGE 3
PROPORTION 1:1

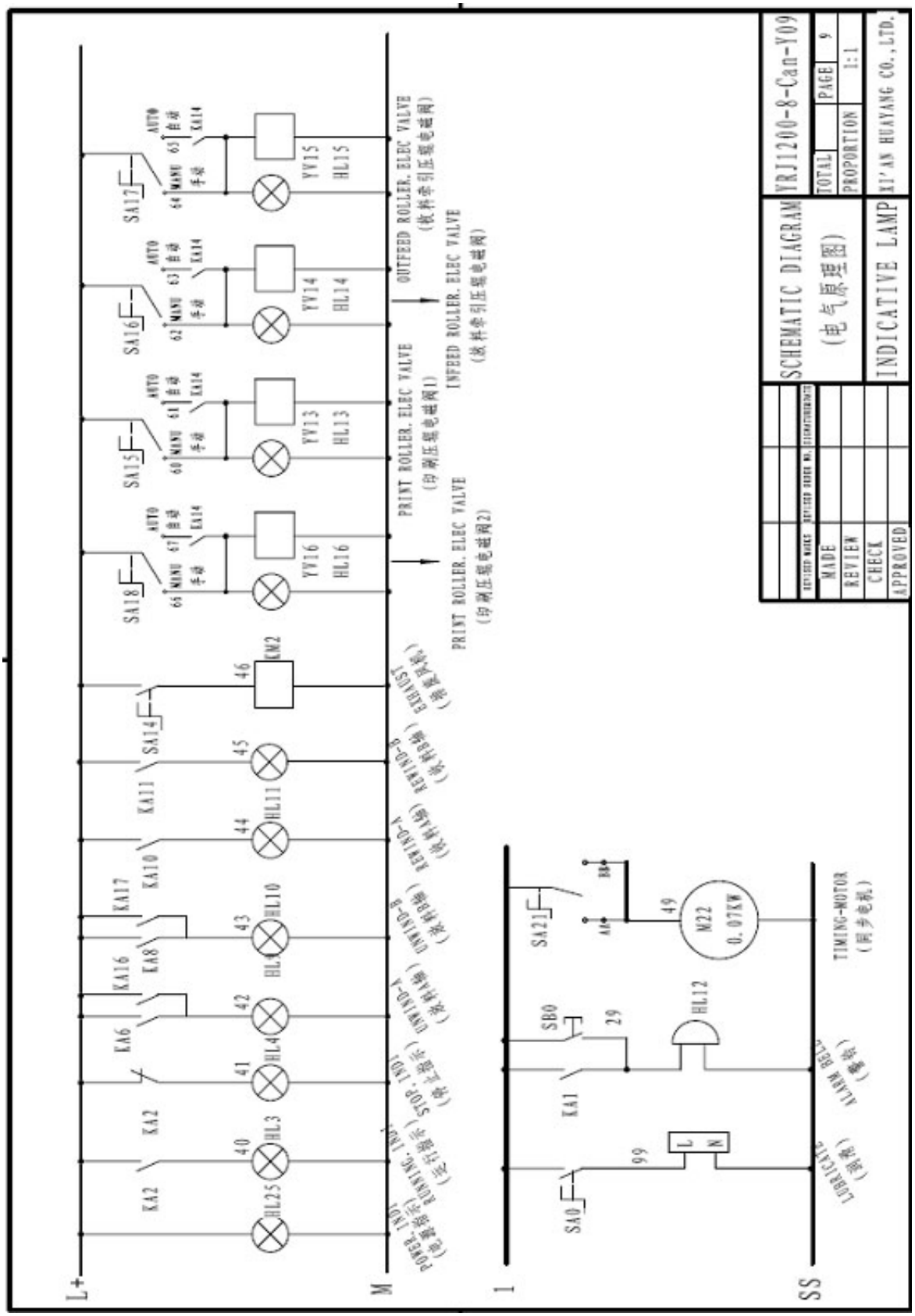

INFEED MOTOR (放料牵引电机)
ECD4
ENCODER
M4
2.2KW
U4
V4
W4
INFEED INVERTER (放料牵引变频器)
380V 2.2KW
INV4
OUTFEED MOTOR (收料牵引电机)
ECD5
ENCODER
M5
2.2KW
U5
V5
W5
OUTFEED INVERTER (收料牵引变频器)
380V 2.2KW
INV4
GV2-ME10
QFB4
GV2-ME10
QFB5
R1
S1
T1
DBR4
DBR5
KA3
KA4
KA5
SCHEMATIC DIAGRAM
(电气原理图)
YRJ1200-8-Can-Y04
TRACTION INVERTER
XI'AN HUAYANG CO.,LTD.
MADE
REVIEW
CHECK
APPROVED

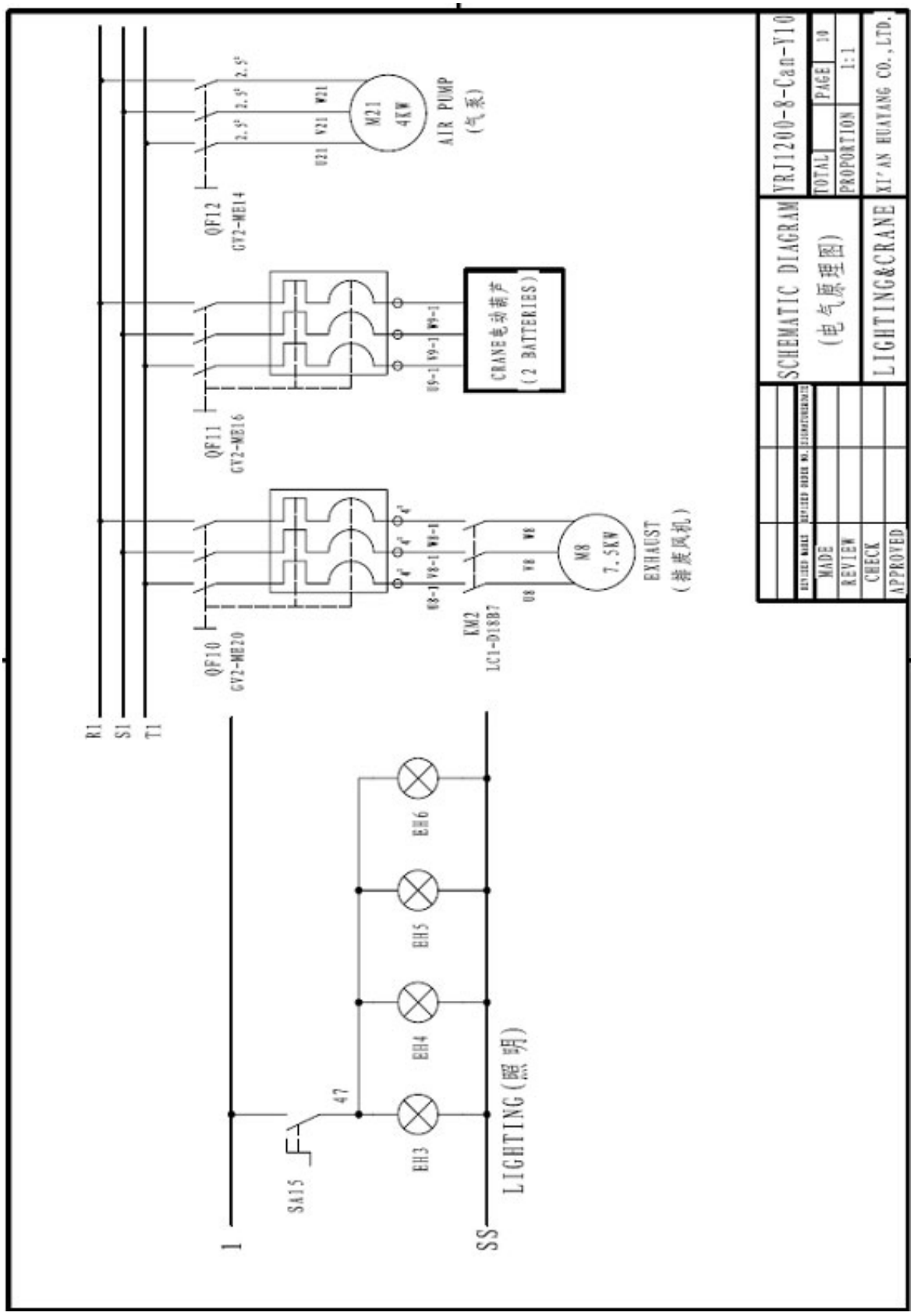

REWIND-A MOTOR (收料A电机)
U6
V6
W6
M6
5.5KW
ECD6
ENCODER
REWIND-A INVERTER(收料A变频器)
380V 5.5KW
INV6
REWIND-B MOTOR(收料B电机)
U7
V7
W7
M7
5.5KW
ECD7
ENCODER
REWIND-B INVERTER(收料B变频器)
380V 5.5KW
INV7
GV2-ME16
QFB6
QFB7
KA9
KA10
KA11
DBR6
DBR7
R1
S1
T1
SCHEMATIC DIAGRAM
(电气原理图)
YRJ1200-8-Can-Y05
REWIND INVERTER
KI'AN HUAYANG CO.,LTD.

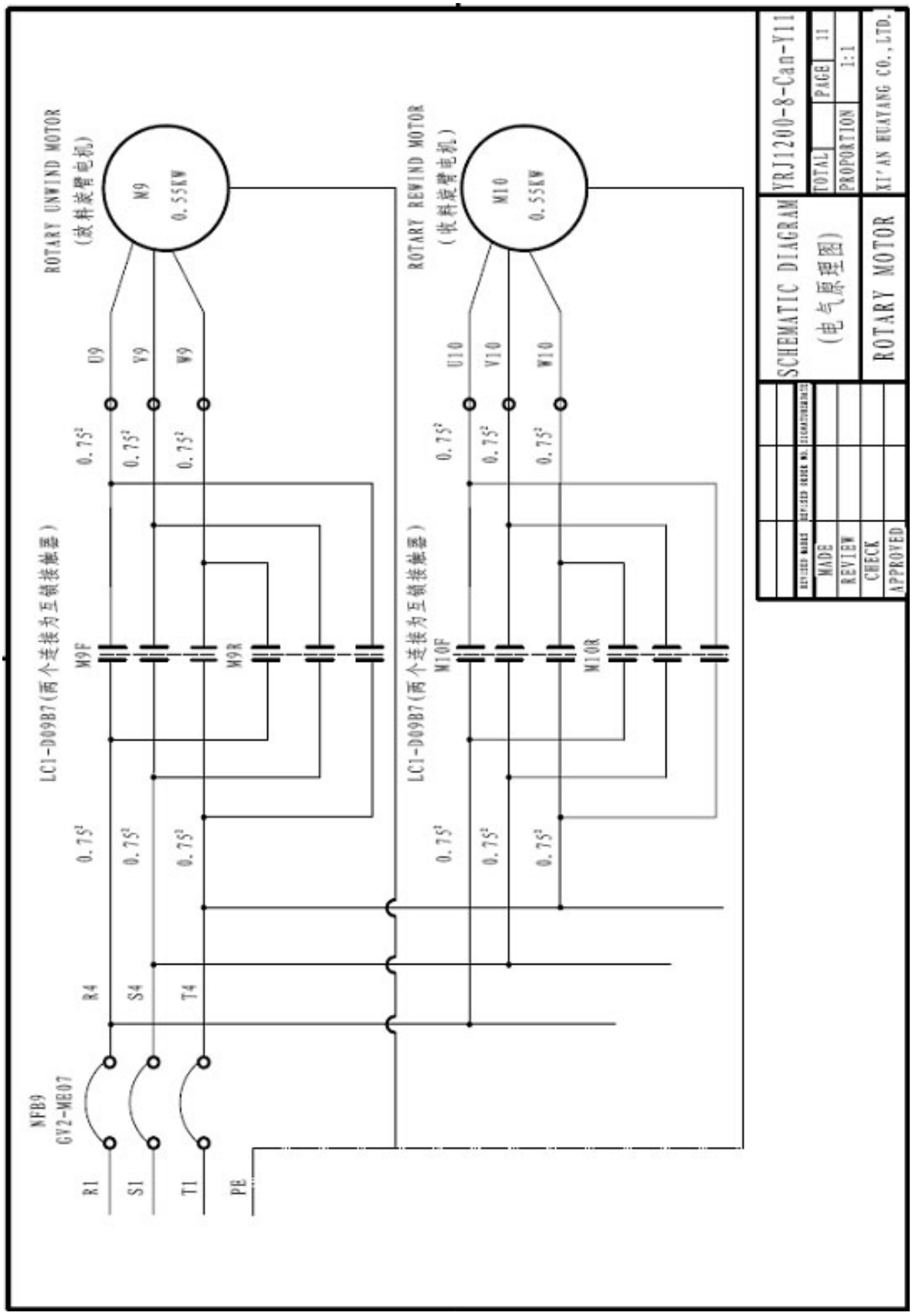

R1
S1
T1
QF5
GV2-ME06
FN11
FN12
FN13
FN1
FN2
FN3
KM13
LC1-D18B7
0.75²
0.75³
M1F
M2F
M3F
M4F
CI MOTOR FAN
(主电机风扇)
UNWIND-A MOTOR FAN
(放料A电机风扇)
UNWIND-B MOTOR FAN
(放料B电机风扇)
INFEED MOTOR FAN
(放料牵引电机风扇)
SCHEMATIC DIAGRAM
(电气原理图)
YRJ1200-8-Can-Y06
TOTAL
PAGE
PROPORTION
1:1
MOTOR FAN 1
KI'AN HUAYANG CO.,LTD.
MADE
REVIEW
CHECK
APPROVED

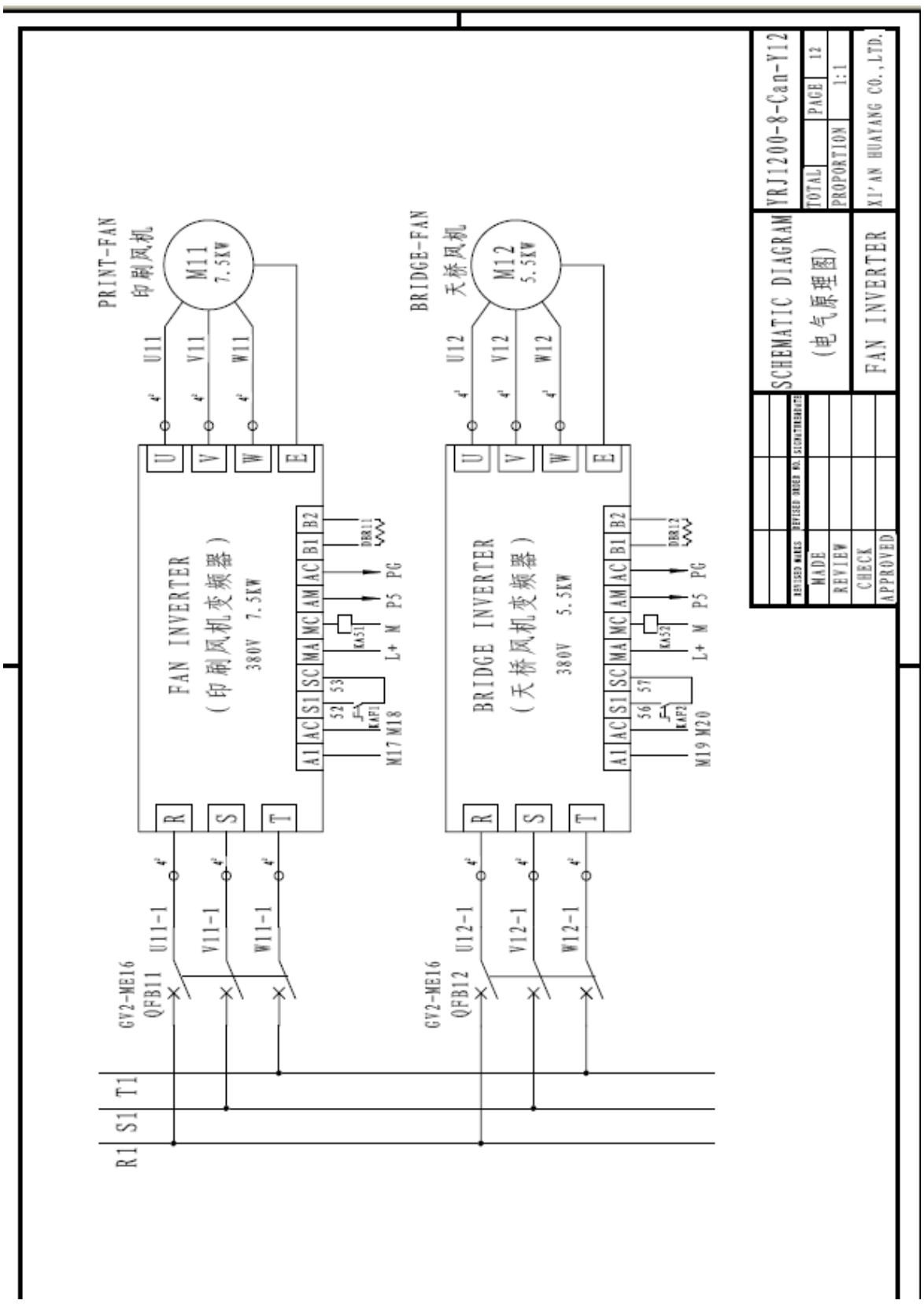

FN1
FN2
FN3
0.75² 0.75² 0.75²
M5F
OUTFEED MOTOR FAN
(收料牵引电机风扇)
0.75² 0.75² 0.75²
M6F
REWIND-A MOTOR FAN
(收料A电机风扇)
0.75² 0.75² 0.75²
M7F
REWIND-B MOTOR FAN
(收料B电机风扇)
SCHEMATIC DIAGRAM
(电气原理图)
YRJ1200-8-Can-Y07
MOTOR FAN 2
XI'AN HUAYANG CO.,LTD.
MADE
REVIEW
CHECK
APPROVED
TOTAL
PAGE 1
PROPORTION 1:1

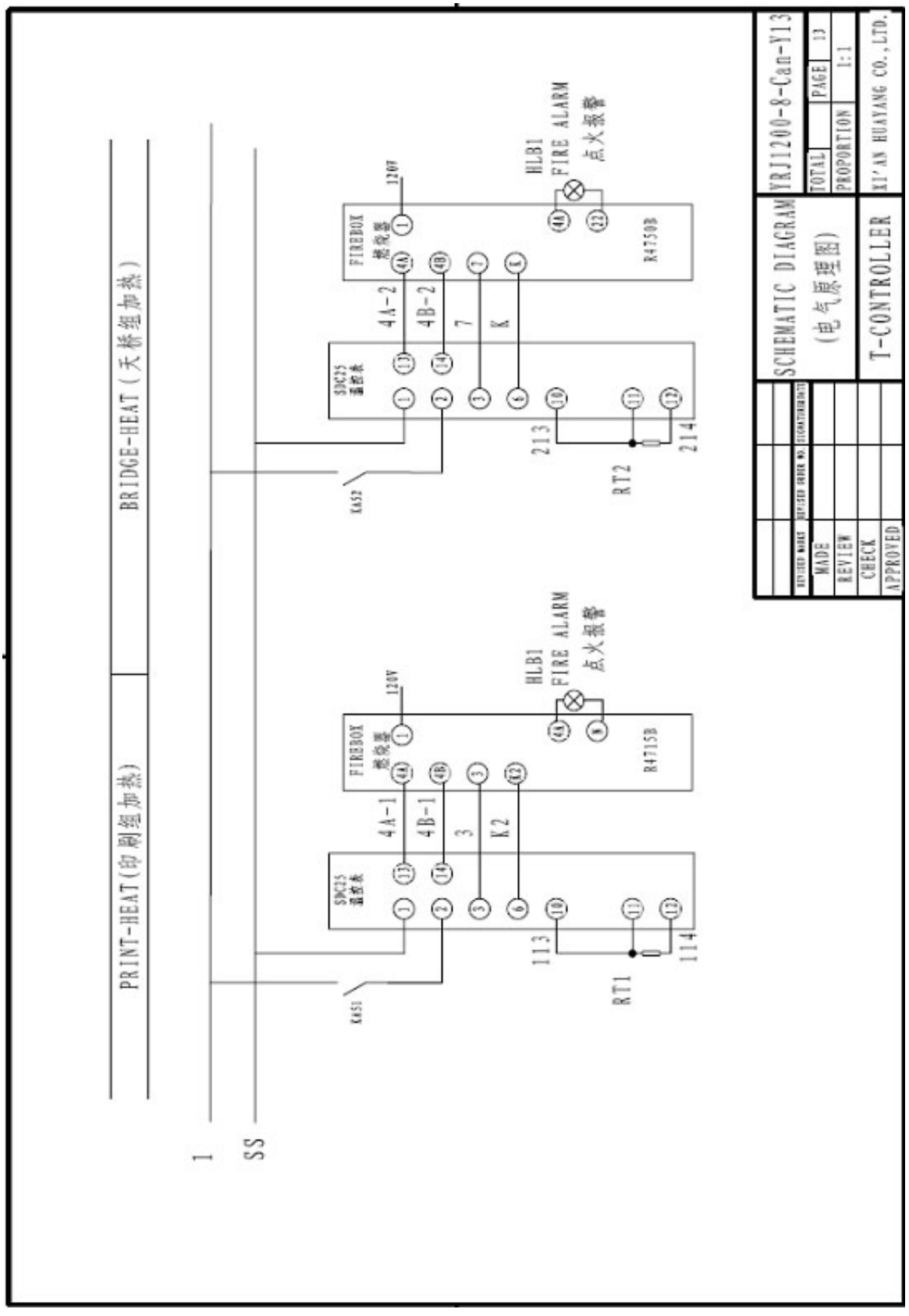

DC POWER 1
直流电源1
PS1
AC220/DC+12V
DC POWER 2
直流电源2
PS2
AC220V/DC24V
HUMAN-COMPUTER INTERFACE
人机界面
P+
PG
P-
L+
M
SS
1
QF6
OSMC65H2D6
QF6J
OSMC65H2D4
TC-2
380V/120V
TC-1
380V/220V
POWER VOLTAGE
电源电压
R6
S6
FAN
风扇
JACK
插座
QF7
OSMC65H2D4
QF8
OSMC65H2D6
POWER SWITCH
电源开关
K1 B1002HCT
CS1
PE
SCHEMATIC DIAGRAM
(电气原理图)
YRJ1200-8-Can-T08
DC SUPPLY
XI'AN HUATANG CO.,LTD.
MADE
REVIEW
CHECK
APPROVED

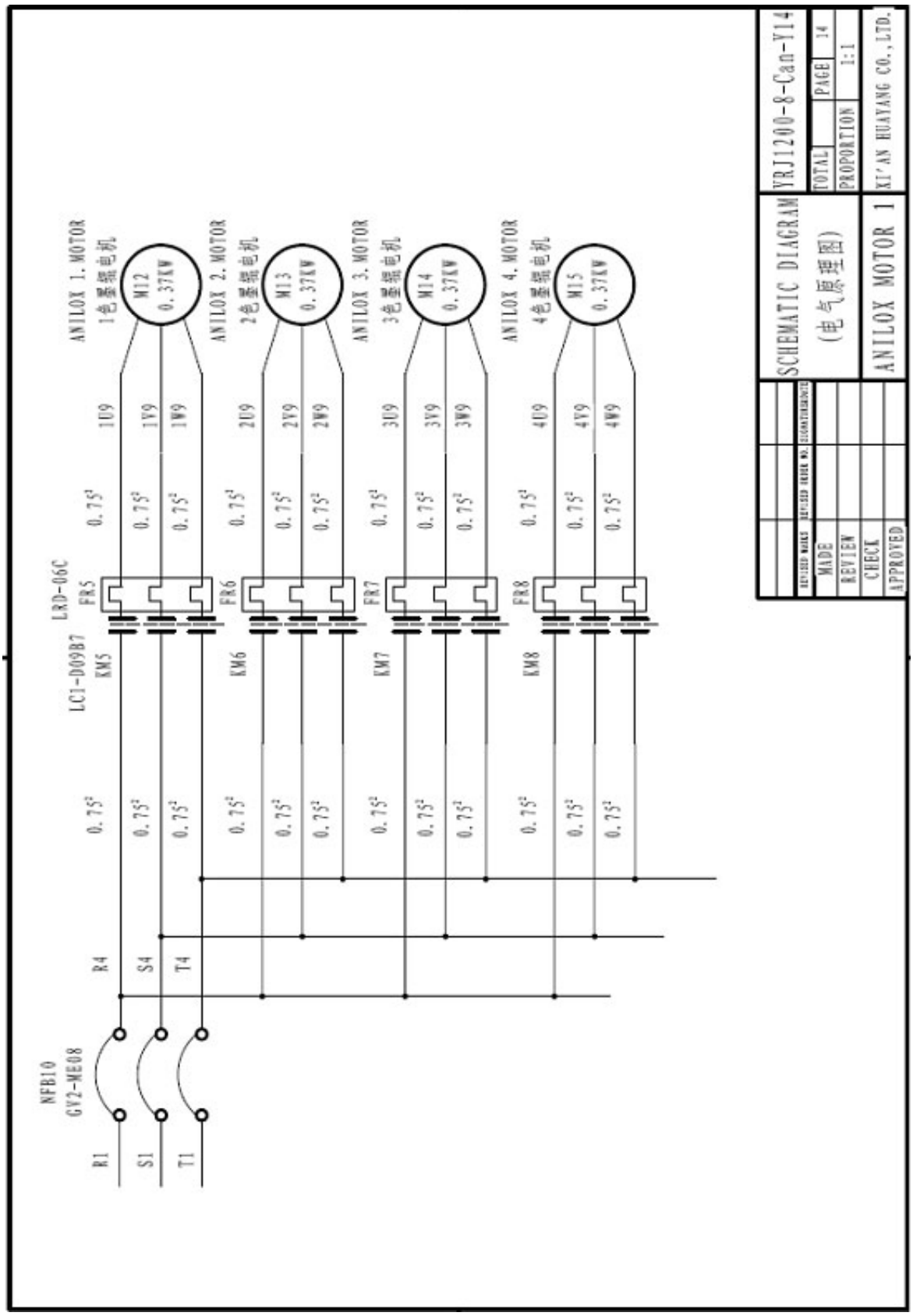

SCHEMATIC DIAGRAM
(电气原理图)
YRJ1200-8-Can-Y09
INDICATIVE LAMP
KI'AN HUAYANG CO.,LTD.
TOTAL
PAGE 9
PROPORTION 1:1
MADE
REVIEW
CHECK
APPROVED
L+
M
1
SS
OUTFEED ROLLER. ELEC VALVE
(收料牵引压辊电磁阀)
INFEED ROLLER. ELEC VALVE
(送料牵引压辊电磁阀)
PRINT ROLLER. ELEC VALVE
(印刷压辊电磁阀1)
PRINT ROLLER. ELEC VALVE
(印刷压辊电磁阀2)
TIMING-MOTOR
(同步电机)
ALARM BELL
(警铃)
LUBRICATE
(润滑)
M22
0.07KW

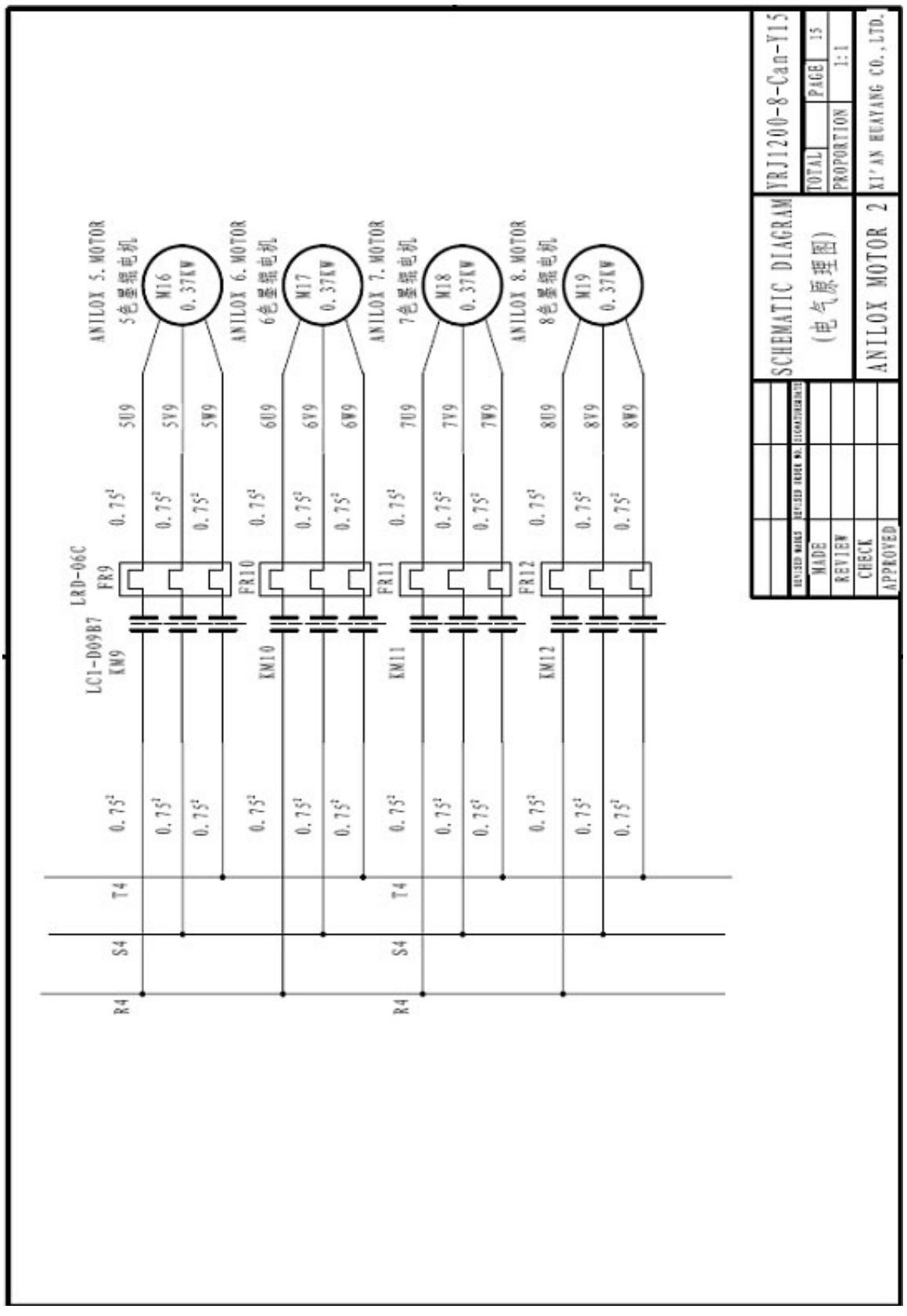

R1
S1
T1
QF12
GV2-ME14
M21
4KW
AIR PUMP
(气泵)
QF11
GV2-ME16
CRANE电动葫芦
(2 BATTERIES)
QF10
GV2-ME20
KM2
LC1-D18B7
M8
7.5KW
EXHAUST
(排废风机)
1
SA15
47
EH3
EH4
EH5
EH6
SS
LIGHTING(照明)
SCHEMATIC DIAGRAM
(电气原理图)
YRJ1200-8-Can-Y10
LIGHTING&CRANE
XI'AN HUAYANG CO.,LTD.
MADE
REVIEW
CHECK
APPROVED
TOTAL
PAGE
PROPORTION
1:1

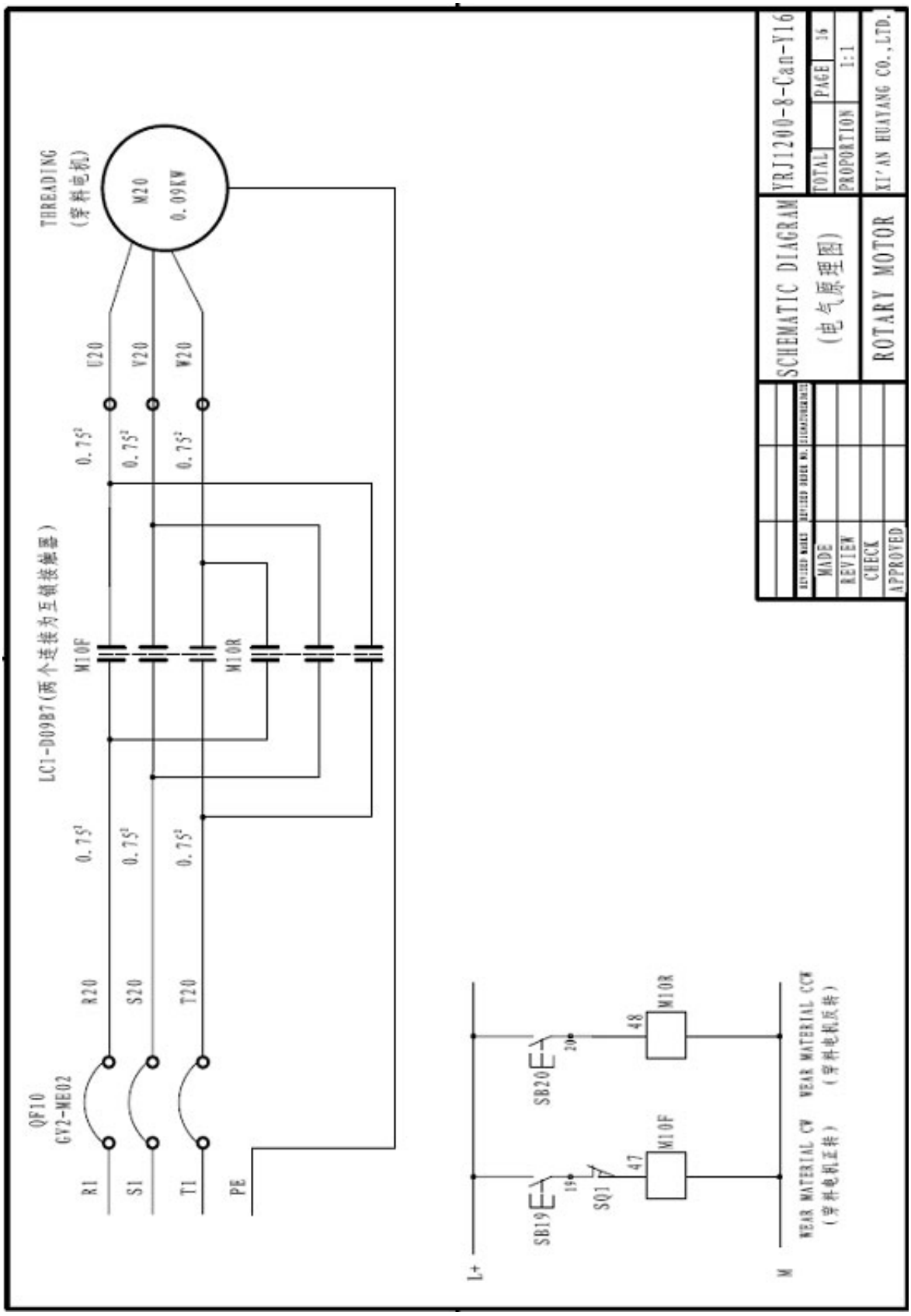

ROTARY UNWIND MOTOR
(放料旋臂电机)
M9
0.55KW
ROTARY REWIND MOTOR
(收料旋臂电机)
M10
0.55KW
LC1-D09B7(两个连接为互锁接触器)
M9F
M9R
M10F
M10R
NFB9
GV2-ME07
R1
S1
T1
PE
R4
S4
T4
U9
V9
W9
U10
V10
W10
0.75²
SCHEMATIC DIAGRAM
(电气原理图)
YRJ1200-8-Can-Y11
TOTAL
PAGE 11
PROPORTION 1:1
ROTARY MOTOR
XI'AN HUATANG CO.,LTD.
MADE
REVIEW
CHECK
APPROVED

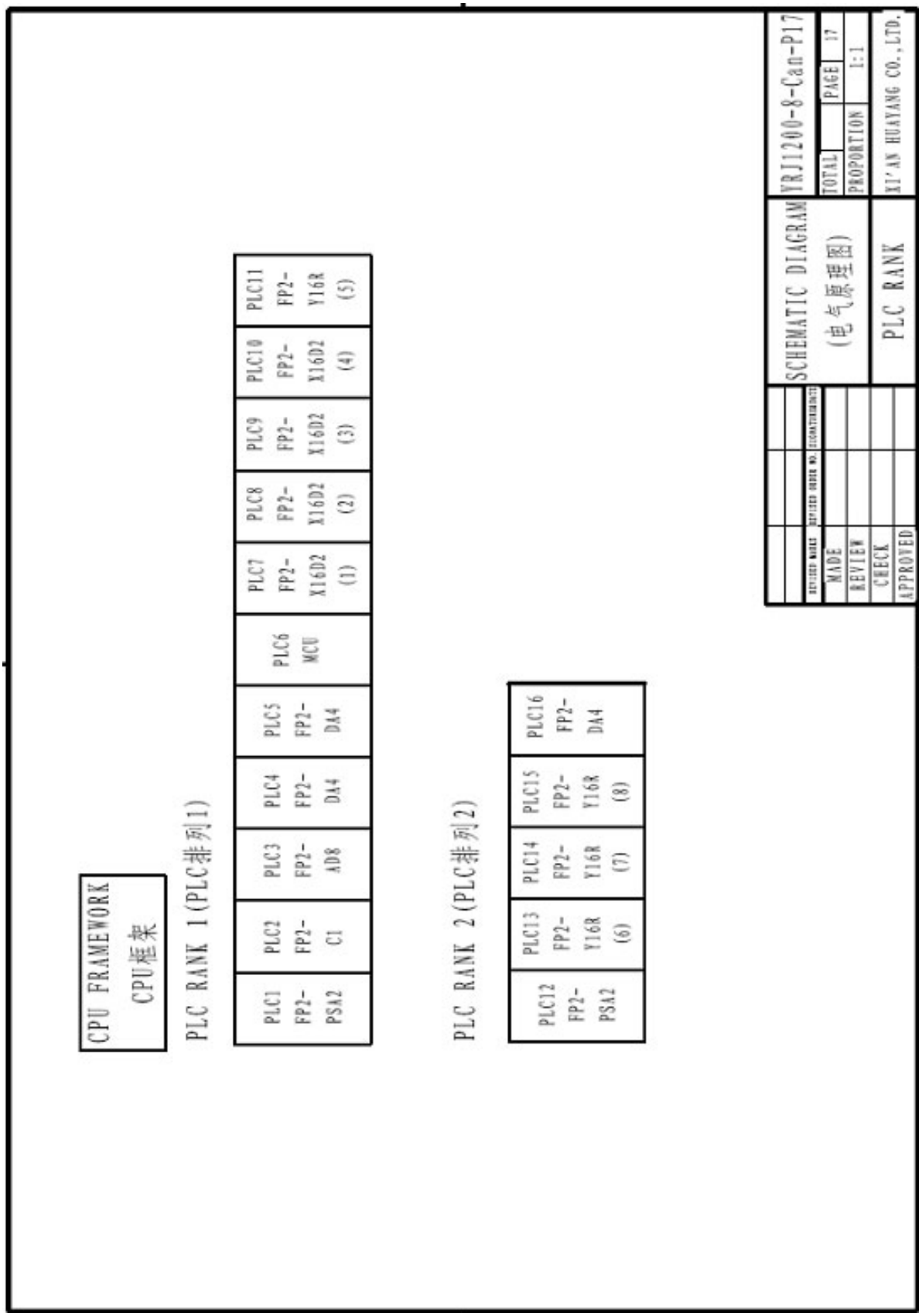

PRINT-FAN
印刷风机
M11
7.5KW
U11
V11
W11
U
V
W
E
FAN INVERTER
(印刷风机变频器)
380V 7.5KW
A1 AC S1 SC MA MC AM AC B1 B2
DBR11
KA51
L+ M P5 PG
M17 M18
R
S
T
GV2-ME16
QFB11
U11-1
V11-1
W11-1
BRIDGE-FAN
天桥风机
M12
5.5KW
U12
V12
W12
BRIDGE INVERTER
(天桥风机变频器)
380V 5.5KW
DBR12
KA52
M19 M20
GV2-ME16
QFB12
U12-1
V12-1
W12-1
R1 S1 T1
SCHEMATIC DIAGRAM
(电气原理图)
YRJ1200-8-Can-Y12
TOTAL
PAGE 12
PROPORTION 1:1
FAN INVERTER
XI'AN HUAYANG CO.,LTD.
MADE
REVIEW
CHECK
APPROVED

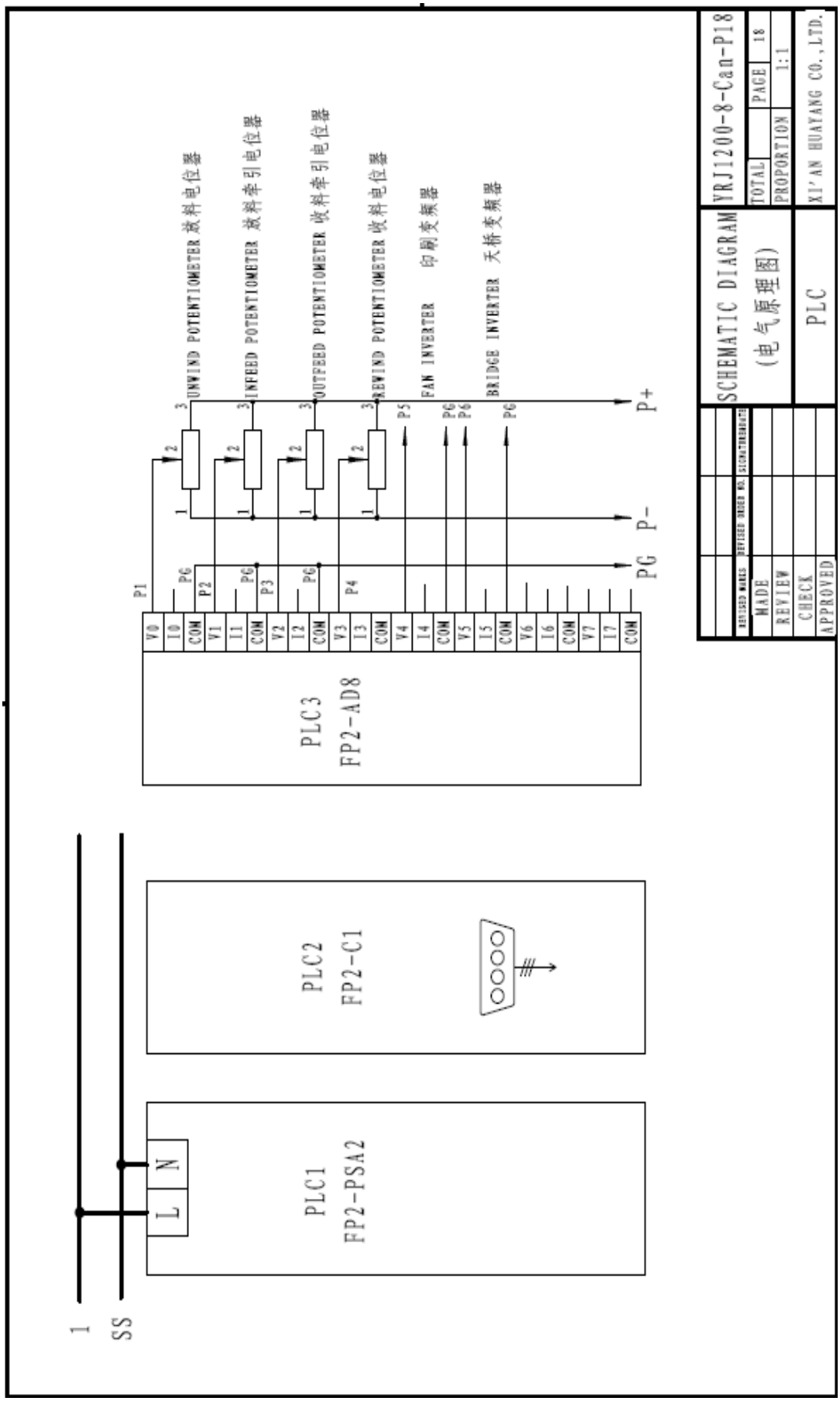

PRINT-HEAT(印刷组加热)
BRIDGE-HEAT(天桥组加热)
1
SS
FIREBOX
燃烧器
120V
HLB1
FIRE ALARM
点火报警
R4715B
R4750B
SMC25
温控表
4A-1
4B-1
3
K2
4A-2
4B-2
7
K
KA51
113
114
213
214
RT1
RT2
SCHEMATIC DIAGRAM
(电气原理图)
YRJ1200-8-Can-Y13
T-CONTROLLER
MADE
REVIEW
CHECK
APPROVED
TOTAL
PAGE
13
PROPORTION
1:1
XI'AN HUAYANG CO., LTD.

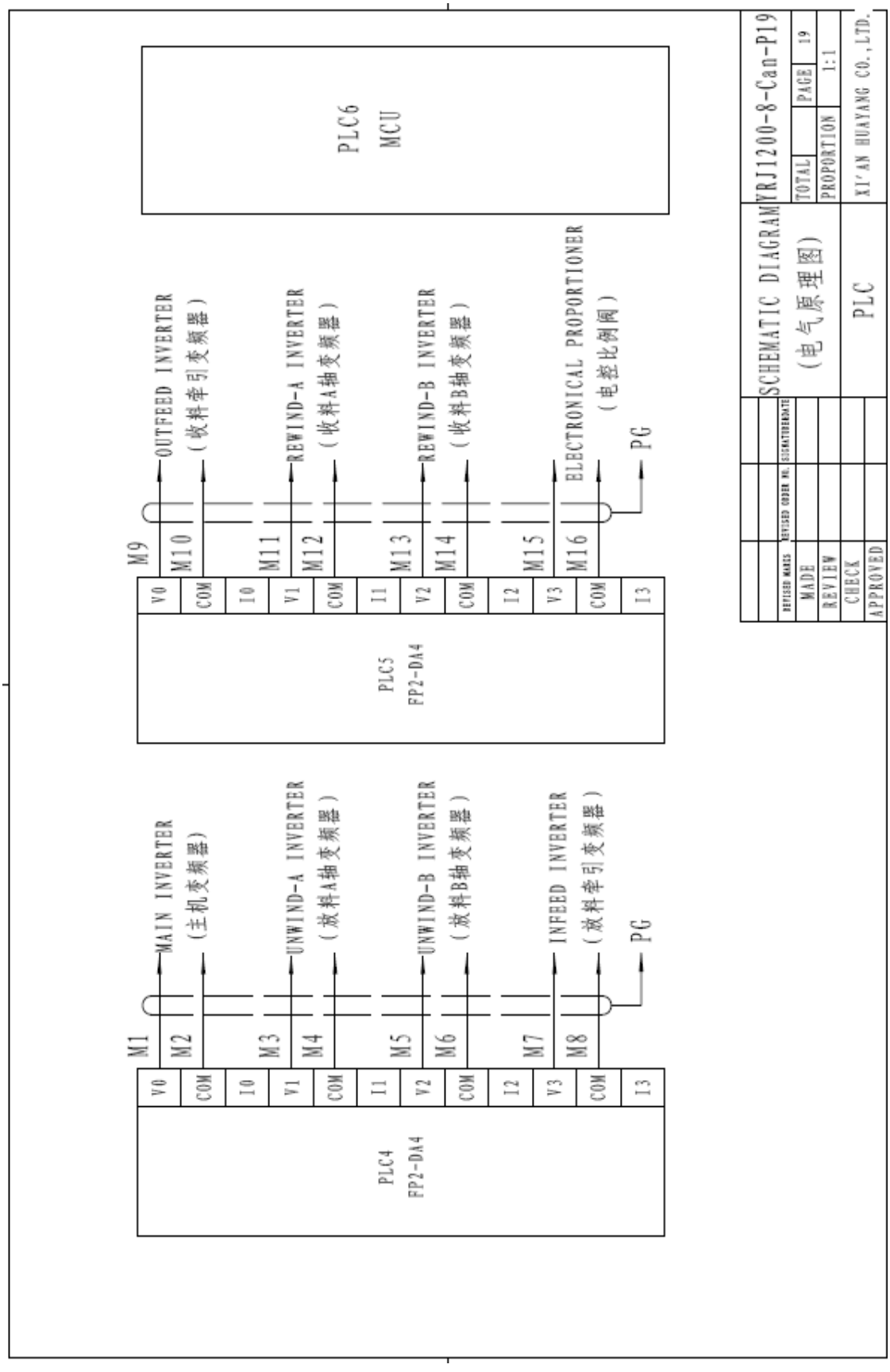

ANILOX 1. MOTOR
1色墨辊电机
M12
0.37KW
ANILOX 2. MOTOR
2色墨辊电机
M13
0.37KW
ANILOX 3. MOTOR
3色墨辊电机
M14
0.37KW
ANILOX 4. MOTOR
4色墨辊电机
M15
0.37KW
1U9
1V9
1W9
2U9
2V9
2W9
3U9
3V9
3W9
4U9
4V9
4W9
0.75²
LRD-06C
FR5
FR6
FR7
FR8
LC1-D09B7
KM5
KM6
KM7
KM8
R4
S4
T4
NFB10
GV2-ME08
R1
S1
T1
SCHEMATIC DIAGRAM
(电气原理图)
YRJ1200-8-Can-Y14
TOTAL
PAGE 14
PROPORTION 1:1
ANILOX MOTOR 1
XI'AN HUAYANG CO.,LTD.
MADE
REVIEW
CHECK
APPROVED

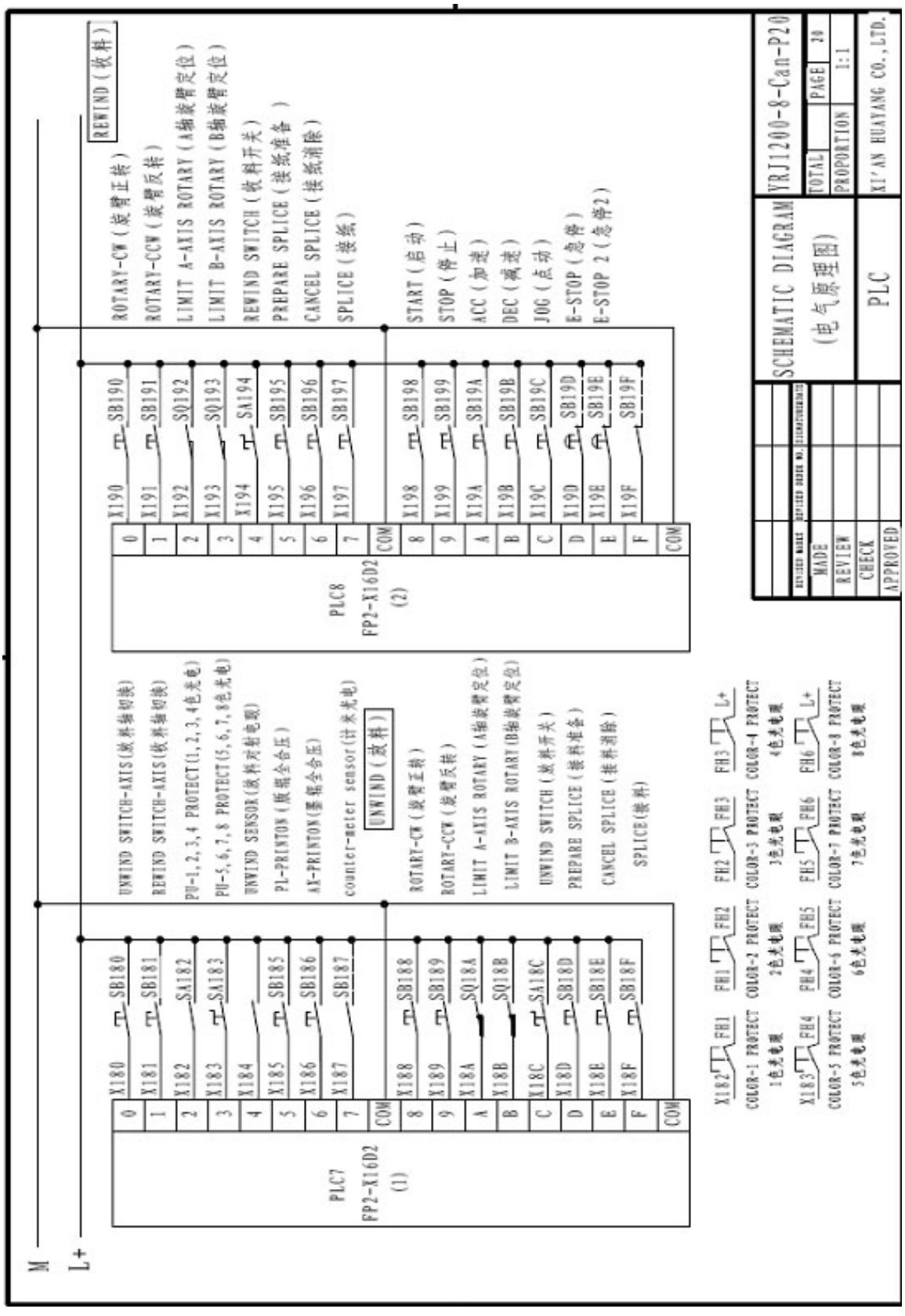

ANILOX 5. MOTOR
5色网辊电机
ANILOX 6. MOTOR
6色网辊电机
ANILOX 7. MOTOR
7色网辊电机
ANILOX 8. MOTOR
8色网辊电机
M16
0.37KW
M17
0.37KW
M18
0.37KW
M19
0.37KW
LRD-06C
FR9
FR10
FR11
FR12
LC1-D09B7
KM9
KM10
KM11
KM12
T4
S4
R4
SCHEMATIC DIAGRAM
(电气原理图)
YRJ1200-8-Can-Y15
ANILOX MOTOR 2
XI'AN HUAYANG CO.,LTD.
MADE
REVIEW
CHECK
APPROVED


THREADING
(穿料电机)
M20
0.09KW
U20
V20
W20
0.75²
LC1-D09B7(两个连接为互锁接触器)
M10F
M10R
0.75²
QF10
GV2-ME02
R20
S20
T20
R1
S1
T1
PE
L+
SB20
SB19
SQ1
48
47
M10R
M10F
M
REAR MATERIAL CCW
(穿料电机正转)
REAR MATERIAL CCW
(穿料电机反转)
SCHEMATIC DIAGRAM
(电气原理图)
YRJ1200-8-Can-Y16
TOTAL
PAGE
16
PROPORTION
1:1
ROTARY MOTOR
XI'AN HUAYANG CO.,LTD.
MADE
REVIEW
CHECK
APPROVED


CPU FRAMEWORK
CPU框架
PLC RANK 1(PLC排列1)
PLC1 FP2-PSA2
PLC2 FP2-C1
PLC3 FP2-AD8
PLC4 FP2-DA4
PLC5 FP2-DA4
PLC6 MCU
PLC7 FP2-X16D2 (1)
PLC8 FP2-X16D2 (2)
PLC9 FP2-X16D2 (3)
PLC10 FP2-X16D2 (4)
PLC11 FP2-Y16R (5)
PLC RANK 2(PLC排列2)
PLC12 FP2-PSA2
PLC13 FP2-Y16R (6)
PLC14 FP2-Y16R (7)
PLC15 FP2-Y16R (8)
PLC16 FP2-DA4
SCHEMATIC DIAGRAM
(电气原理图)
YRJ1200-8-Can-P17
MADE
REVIEW
CHECK
APPROVED
TOTAL
PAGE 17
PROPORTION 1:1
PLC RANK
XI'AN HUAYANG CO.,LTD.


SCHEMATIC DIAGRAM
(电气原理图)
YRJ1200-8-Can-P18
PLC
XI'AN HUAYANG CO.,LTD.
PLC1
FP2-PSA2
PLC2
FP2-C1
PLC3
FP2-AD8
UNWIND POTENTIOMETER 放料电位器
INFEED POTENTIOMETER 放料牵引电位器
OUTFEED POTENTIOMETER 收料牵引电位器
REWIND POTENTIOMETER 收料电位器
FAN INVERTER 印刷变频器
BRIDGE INVERTER 天桥变频器
P+
P-
PG


PLC6
MCU
M9
M10
M11
M12
M13
M14
M15
M16
OUTFEED INVERTER
(收料牵引变频器)
REWIND-A INVERTER
(收料A轴变频器)
REWIND-B INVERTER
(收料B轴变频器)
ELECTRONICAL PROPORTIONER
(电控比例阀)
PG
V0
COM
I0
V1
COM
I1
V2
COM
I2
V3
COM
I3
PLC5
FP2-DA4
M1
M2
M3
M4
M5
M6
M7
M8
MAIN INVERTER
(主机变频器)
UNWIND-A INVERTER
(放料A轴变频器)
UNWIND-B INVERTER
(放料B轴变频器)
INFEED INVERTER
(放料牵引变频器)
PG
PLC4
FP2-DA4
SCHEMATIC DIAGRAM
(电气原理图)
YRJ1200-8-Can-P19
PLC
XI'AN HUAYANG CO.,LTD.
MADE
REVIEW
CHECK
APPROVED
TOTAL
PAGE 19
PROPORTION 1:1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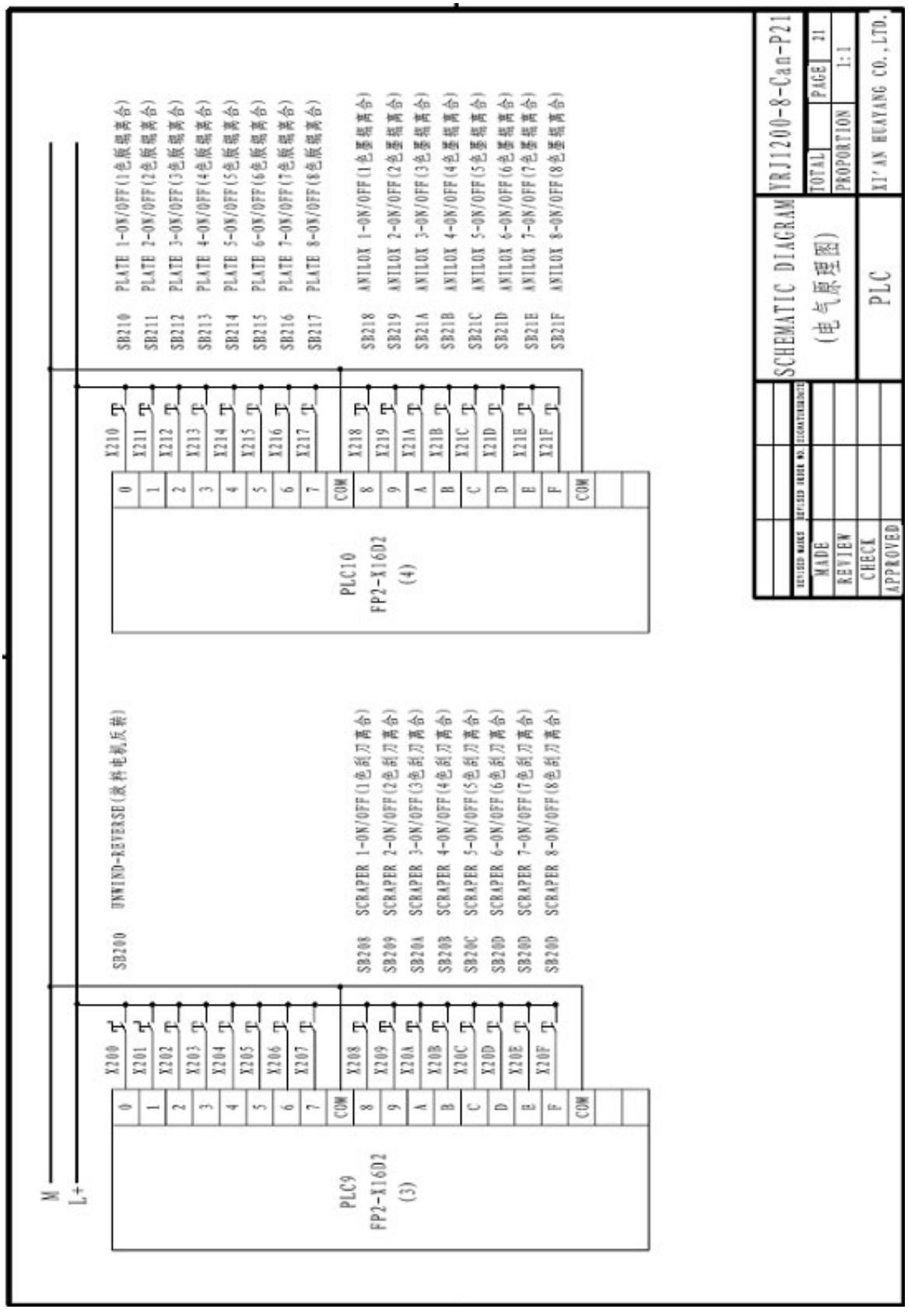
(电气原理图)
VRJ1200-8-Can-P20
PLC
XI'AN HUAYANG CO., LTD.
MADE
REVIEW
CHECK
APPROVED
TOTAL
PAGE
PROPORTION
1:1
REWIND (收料)
UNWIND (放料)
PLC8
FP2-X16D2
(2)
PLC7
FP2-X16D2
(1)
ROTARY-CW (旋臂正转)
ROTARY-CCW (旋臂反转)
LIMIT A-AXIS ROTARY (A轴旋臂定位)
LIMIT B-AXIS ROTARY (B轴旋臂定位)
REWIND SWITCH (收料开关)
PREPARE SPLICE (接纸准备)
CANCEL SPLICE (接纸消除)
SPLICE (接纸)
START (启动)
STOP (停止)
ACC (加速)
DEC (减速)
JOG (点动)
E-STOP (急停)
E-STOP 2 (急停2)
UNWIND SWITCH-AXIS (放料轴切换)
REWIND SWITCH-AXIS (收料轴切换)
PU-1, 2, 3, 4 PROTECT (1, 2, 3, 4色光电)
PU-5, 6, 7, 8 PROTECT (5, 6, 7, 8色光电)
UNWIND SENSOR (放料完毕电眼)
PL-PRINTON (版辊全合压)
AX-PRINTON (墨辊全合压)
counter-meter sensor (计米光电)
UNWIND SWITCH (放料开关)
PREPARE SPLICE (接料准备)
CANCEL SPLICE (接料消除)
SPLICE (接料)
M
L+
COLOR-1 PROTECT 1色光电眼
COLOR-2 PROTECT 2色光电眼
COLOR-3 PROTECT 3色光电眼
COLOR-4 PROTECT 4色光电眼
COLOR-5 PROTECT 5色光电眼
COLOR-6 PROTECT 6色光电眼
COLOR-7 PROTECT 7色光电眼
COLOR-8 PROTECT 8色光电眼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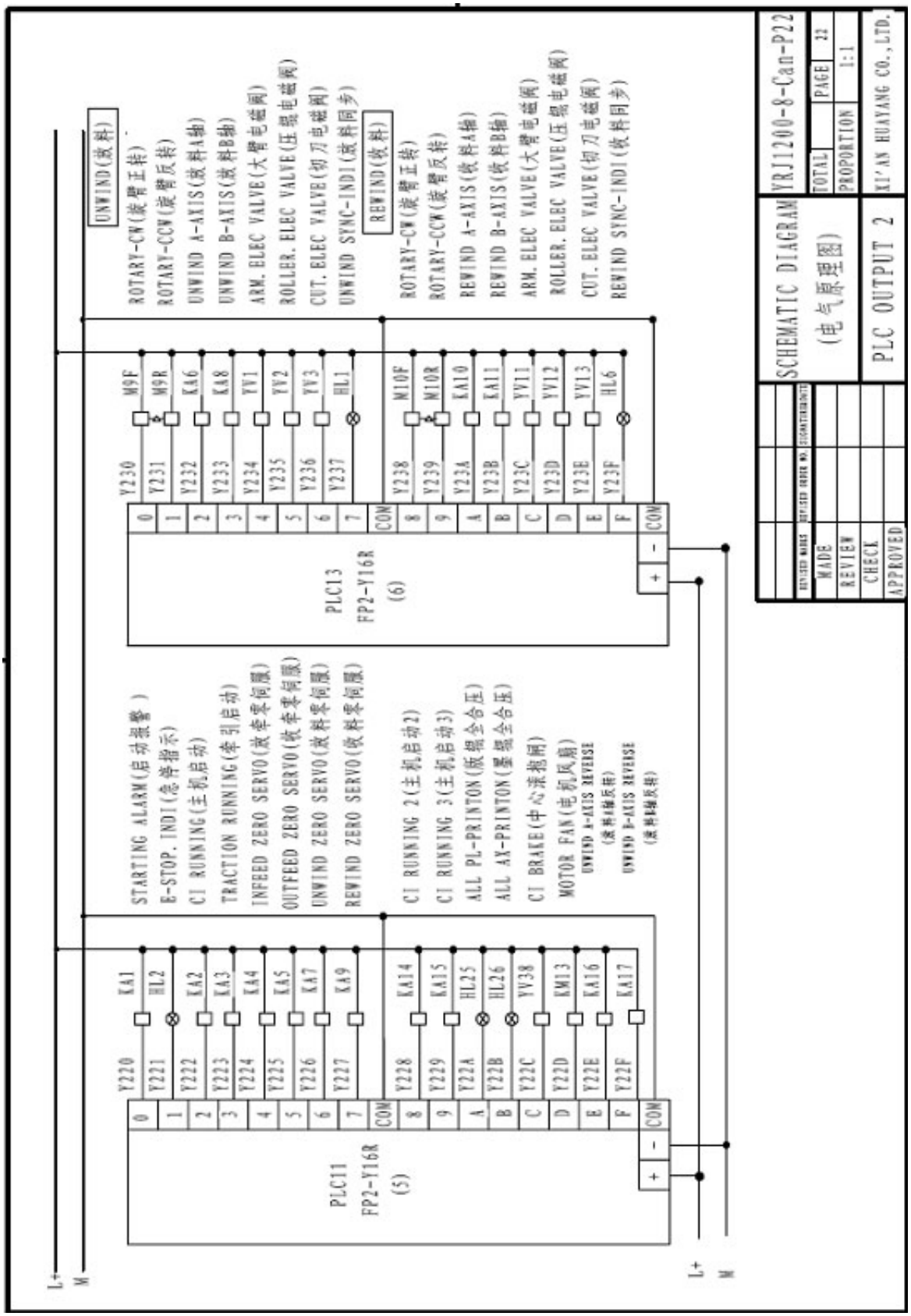
(电气原理图)
YRJ1200-8-Can-P21
PLC
XI'AN HUAYANG CO.,LTD.
MADE
REVIEW
CHECK
APPROVED
TOTAL
PAGE 21
PROPORTION 1:1
PLC9
FP2-X16D2
(3)
PLC10
FP2-X16D2
(4)
M
L+
SB200 UNWIND-REVERSE(放料电机反转)
SB208 SCRAPER 1-ON/OFF(1色刮刀离合)
SB209 SCRAPER 2-ON/OFF(2色刮刀离合)
SB20A SCRAPER 3-ON/OFF(3色刮刀离合)
SB20B SCRAPER 4-ON/OFF(4色刮刀离合)
SB20C SCRAPER 5-ON/OFF(5色刮刀离合)
SB20D SCRAPER 6-ON/OFF(6色刮刀离合)
SB20D SCRAPER 7-ON/OFF(7色刮刀离合)
SB20D SCRAPER 8-ON/OFF(8色刮刀离合)
SB210 PLATE 1-ON/OFF(1色版辊离合)
SB211 PLATE 2-ON/OFF(2色版辊离合)
SB212 PLATE 3-ON/OFF(3色版辊离合)
SB213 PLATE 4-ON/OFF(4色版辊离合)
SB214 PLATE 5-ON/OFF(5色版辊离合)
SB215 PLATE 6-ON/OFF(6色版辊离合)
SB216 PLATE 7-ON/OFF(7色版辊离合)
SB217 PLATE 8-ON/OFF(8色版辊离合)
SB218 ANILOX 1-ON/OFF(1色墨辊离合)
SB219 ANILOX 2-ON/OFF(2色墨辊离合)
SB21A ANILOX 3-ON/OFF(3色墨辊离合)
SB21B ANILOX 4-ON/OFF(4色墨辊离合)
SB21C ANILOX 5-ON/OFF(5色墨辊离合)
SB21D ANILOX 6-ON/OFF(6色墨辊离合)
SB21E ANILOX 7-ON/OFF(7色墨辊离合)
SB21F ANILOX 8-ON/OFF(8色墨辊离合)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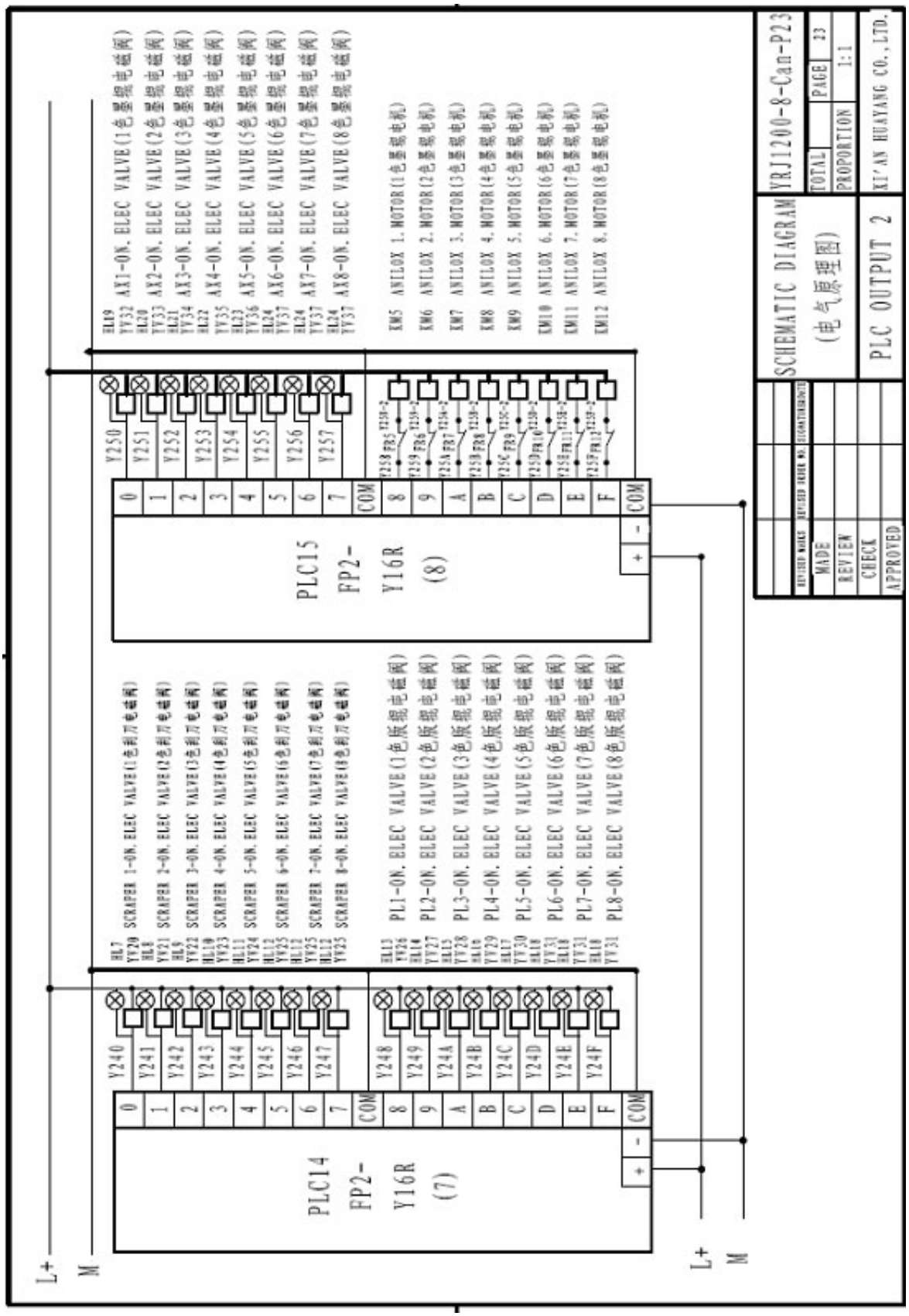
YRJ1200-8-Can-P22
PLC OUTPUT 2
XI'AN HUAYANG CO.,LTD.
PLC11
FP2-Y16R
(5)
PLC13
FP2-Y16R
(6)
UNWIND(放料)
REWIND(收料)
STARTING ALARM(启动报警)
E-STOP. INDI(急停指示)
CI RUNNING(主机启动)
TRACTION RUNNING(牵引启动)
INFEED ZERO SERVO(放卷零伺服)
OUTFEED ZERO SERVO(收卷零伺服)
UNWIND ZERO SERVO(放料零伺服)
REWIND ZERO SERVO(收料零伺服)
CI RUNNING 2(主机启动2)
CI RUNNING 3(主机启动3)
ALL PL-PRINTON(版辊全合压)
ALL AX-PRINTON(墨辊全合压)
CI BRAKE(中心涨刹闸)
MOTOR FAN(电机风扇)
UNWIND A-AXIS REVERSE
(放料A轴反转)
UNWIND B-AXIS REVERSE
(放料B轴反转)
ROTARY-CW(放臂正转)
ROTARY-CCW(放臂反转)
UNWIND A-AXIS(放料A轴)
UNWIND B-AXIS(放料B轴)
ARM. ELEC VALVE(大臂电磁阀)
ROLLER. ELEC VALVE(压辊电磁阀)
CUT. ELEC VALVE(切刀电磁阀)
UNWIND SYNC-INDI(放料同步)
REWIND A-AXIS(收料A轴)
REWIND B-AXIS(收料B轴)
L+
M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(电气原理图)
YRJ1200-8-Can-P23
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XI'AN HUAYANG CO., LTD.
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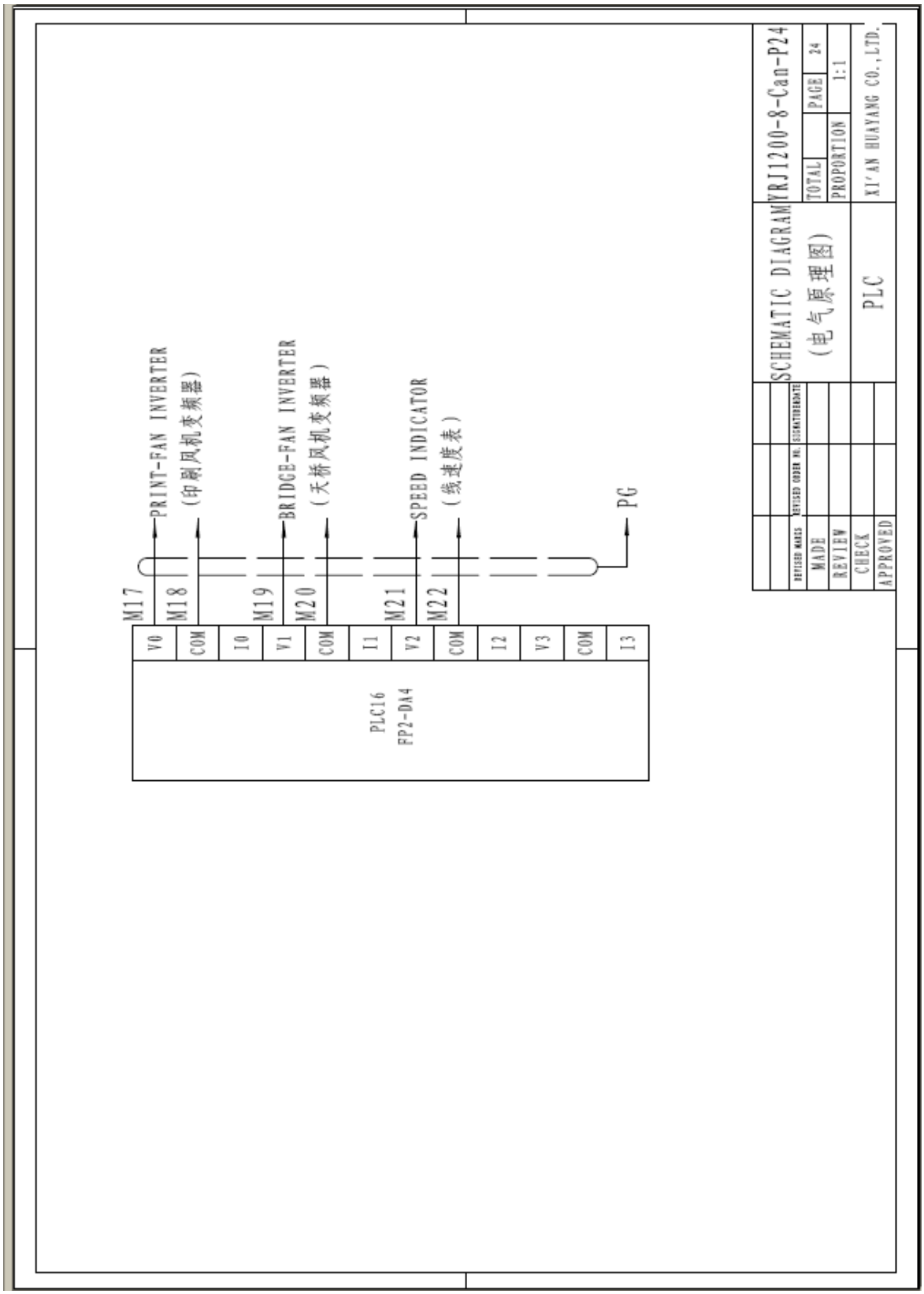
PLC14 FP2- Y16R (7)
L+
M
COM


PRINT-FAN INVERTER
(印刷风机变频器)
BRIDGE-FAN INVERTER
(天桥风机变频器)
SPEED INDICATOR
(线速度表)
PG
M17
M18
M19
M20
M21
M22
V0
COM
I0
V1
COM
I1
V2
COM
I2
V3
COM
I3
PLC16
FP2-DA4
SCHEMATIC DIAGRAM
(电气原理图)
YRJ1200-8-Can-P24
TOTAL
PAGE 24
PROPORTION 1:1
PLC
XI'AN HUAYANG CO.,LTD.
REVISED MARKS
REVISED ORDER NO.
SIGNATUREDATE
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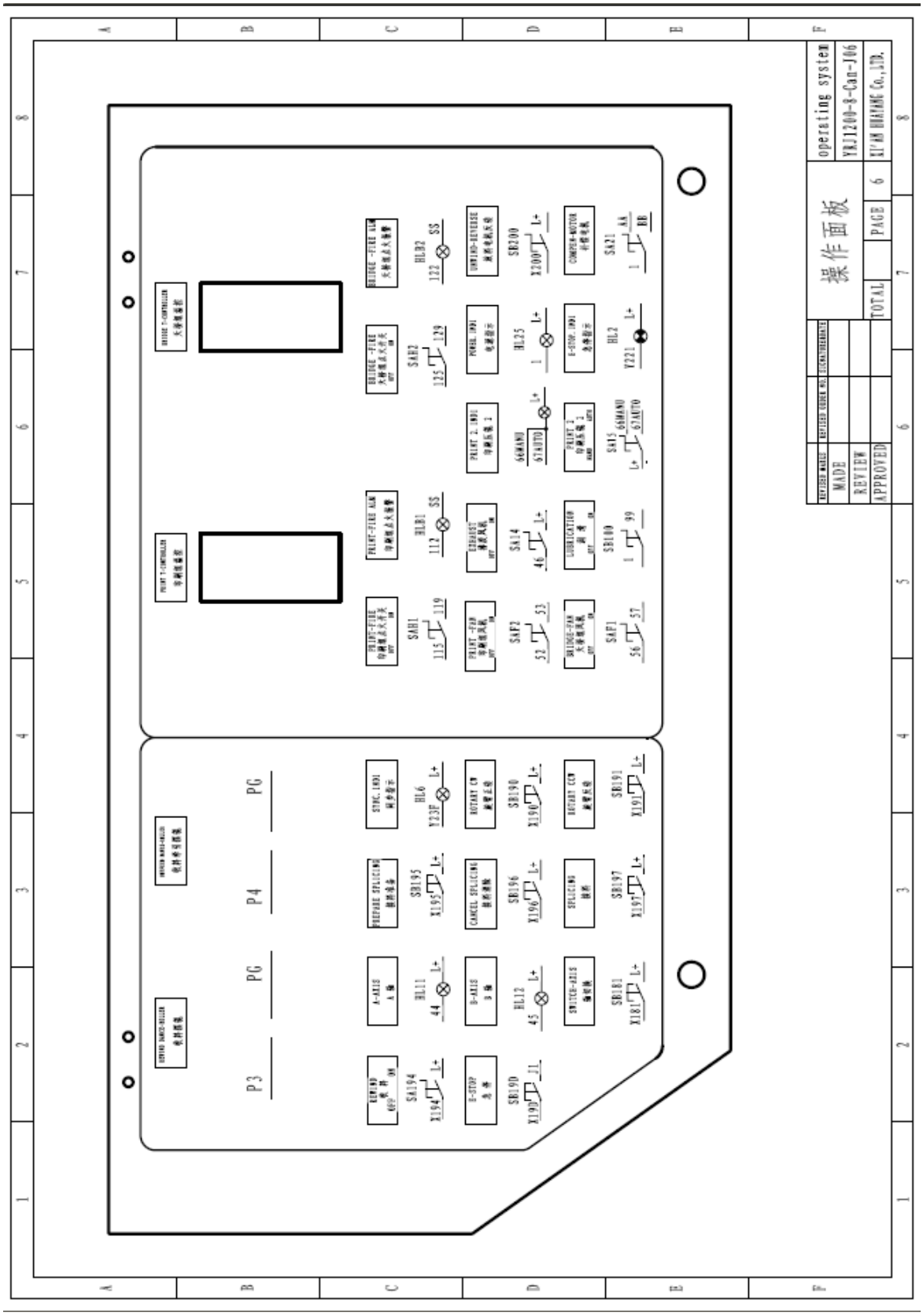
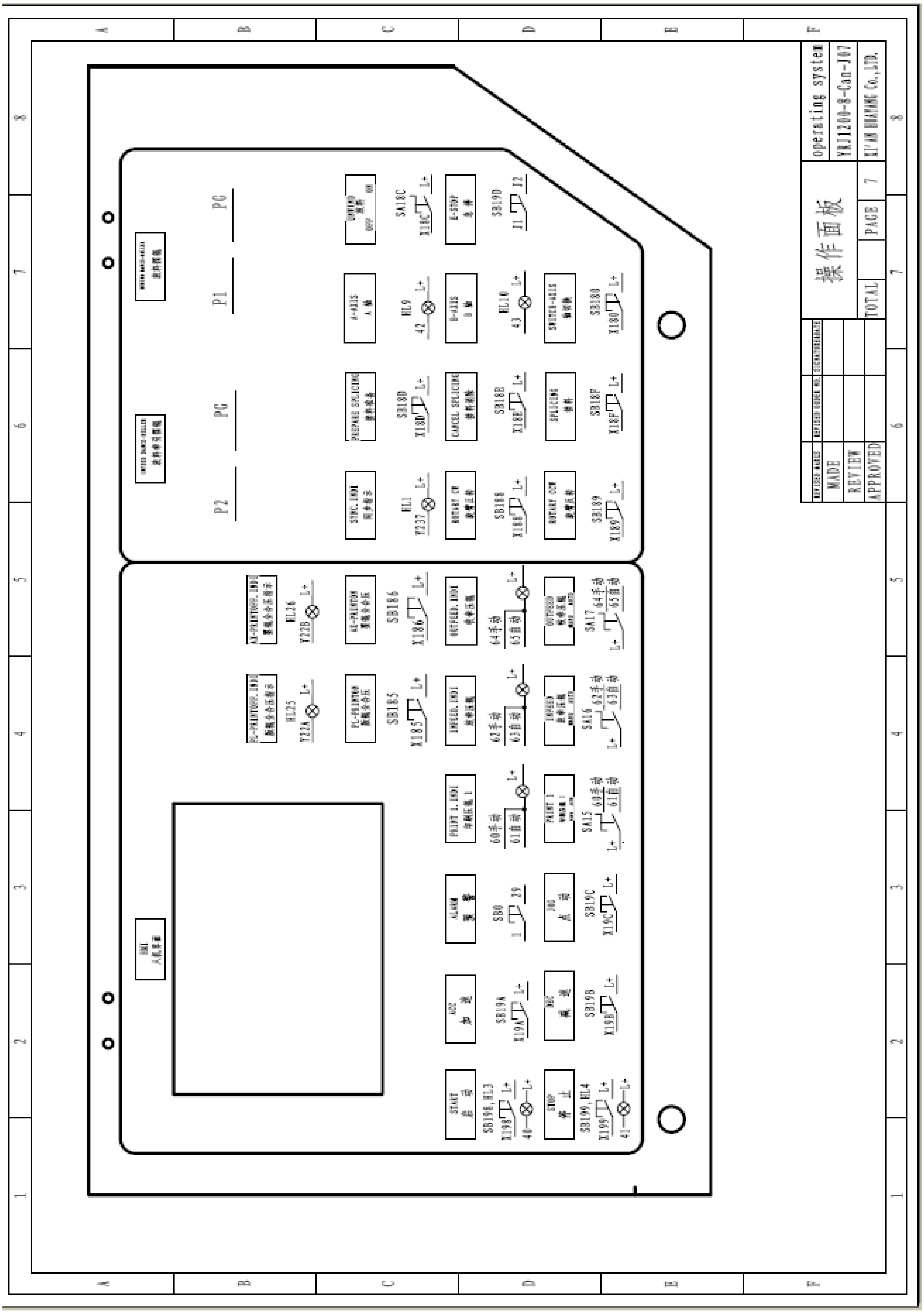
APPROVED


操作面板
operating system
YRJ1200-8-Can-J06
MADE
REVIEW
APPROVED
TOTAL
PAGE
6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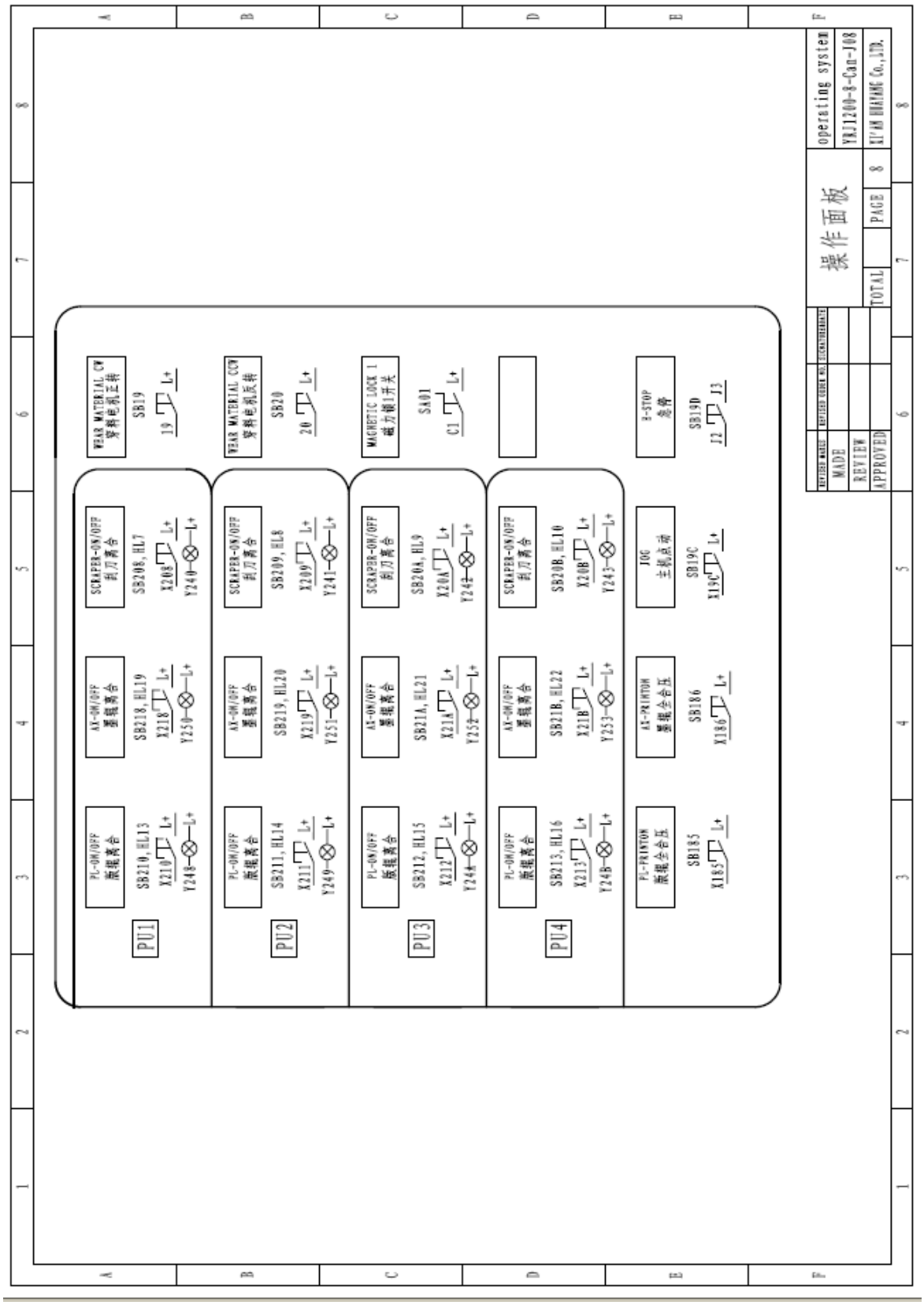
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operating system
YRJ1200-8-Can-J08
KEYUN MACHINE Co.,LTD.
PAGE
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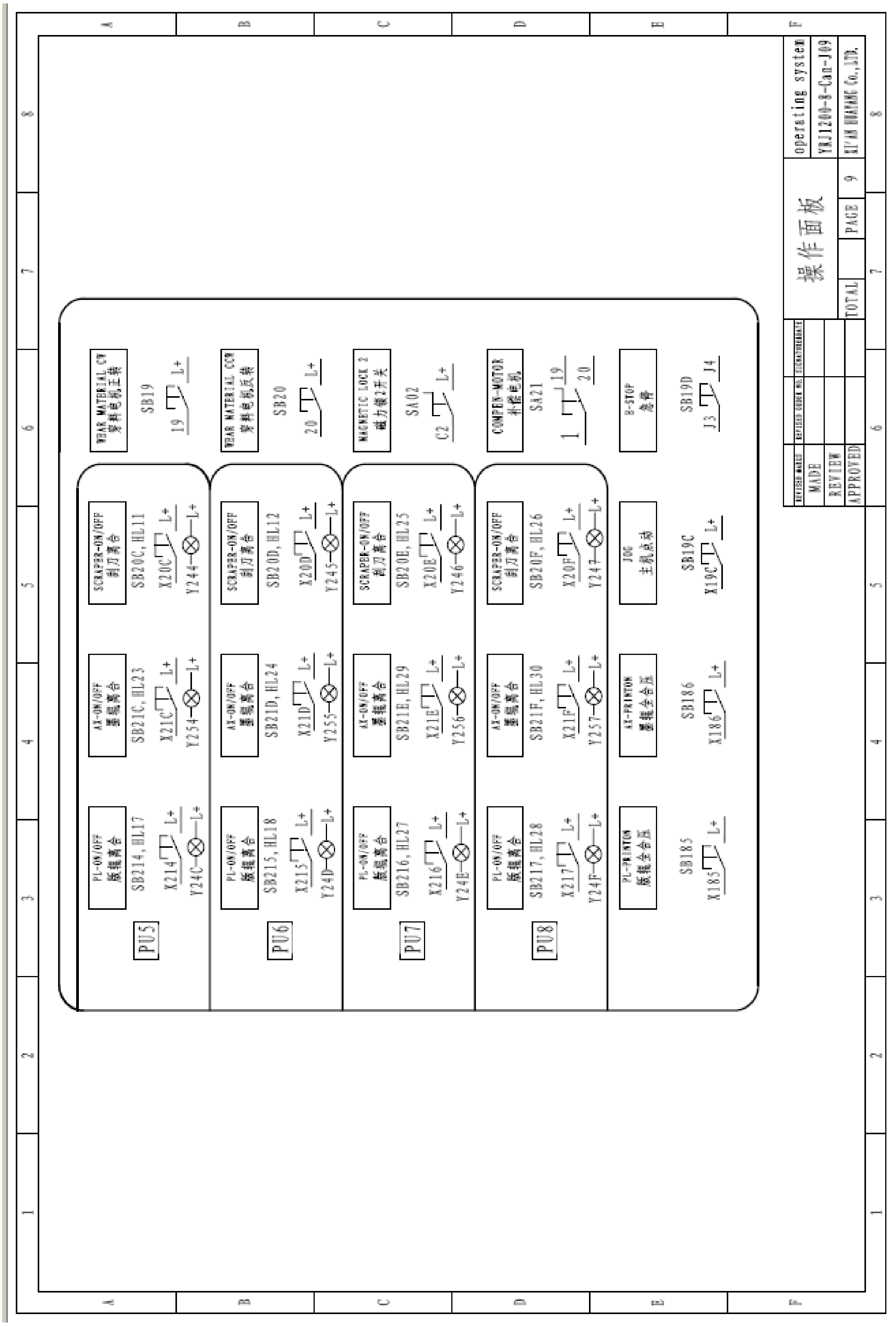
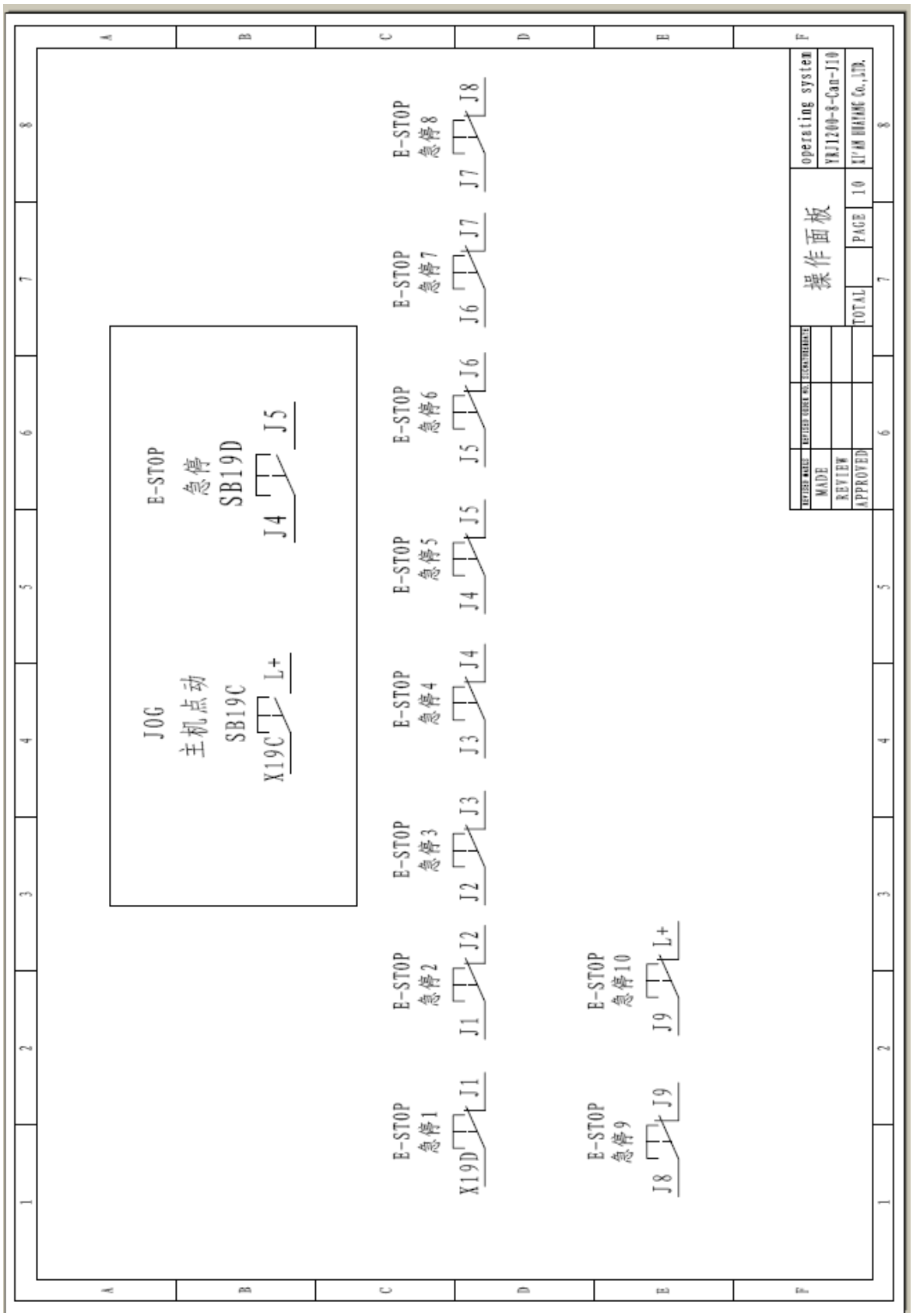
REVIEW
APPROVED
WEAR MATERIAL CW
穿料毛刷正转
WEAR MATERIAL CCW
穿料毛刷反转
MAGNETIC LOCK 1
磁力锁1开关
E-STOP
急停
PU1
PU2
PU3
PU4
PU-ON/OFF
版辊离合
AX-ON/OFF
墨辊离合
SCRAPER-ON/OFF
刮刀离合
AX-PRINTON
墨辊全合压
PU-PRINTON
版辊全合压
JOG
主机点动


PU5
PU6
PU7
PU8
PL-ON/OFF
版辊离合
AX-ON/OFF
墨辊离合
SCRAPER-ON/OFF
刮刀离合
WEAR MATERIAL CW
WEAR MATERIAL CCW
MAGNETIC LOCK 2
COMPEN-MOTOR
补偿电机
E-STOP
急停
JOG
主机点动
PL-PRINTON
AX-PRINTON
SB19
SB20
SA02
SA21
SB19D
SB19C
SB185
SB186
操作面板
operating system
YRJ1200-8-Can-J09
MADE
REVIEW
APPROVED
TOTAL
PAGE


JOG
主机点动
SB19C
X19C
L+
E-STOP
急停
SB19D
J4
J5
E-STOP
急停1
X19D
J1
E-STOP
急停2
J1
J2
E-STOP
急停3
J2
J3
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J3
J4
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E-STOP
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J7
J8
E-STOP
急停9
J8
J9
E-STOP
急停10
J9
L+
操作面板
operating system
YRJ1200-8-Can-J10
TOTAL
PAGE 10
WADE
REVIEW
APPROVED

PART 2

YRJ1200 CI Flexo Press

Safe Operation Guide

CHAPTER 1 Guide to Operation of Plate Cylinder & Ink Roller

1.1 Installation Procedure

Plate cylinder should be installed before installation of anilox roller. However, anilox roller should be uninstalled before uninstalling of plate cylinder.

1.2 Installation & Uninstalling of Plate Cylinder

1.2.1 Installation of Plate Cylinder

After plate is mounted via plate mounter, operators can start installing the plate cylinder to print units in sequence. Operators must be cautious of the follows:

- Plate cylinder and plate must be handled carefully to avoid it from knocking onto other objects.
- Make sure that spare parts in plate cylinder are installed properly and bearings are lubricated.
- Install the plate cylinders in proper position in the required sequence.
- Fix the plate cylinders to hoist device to ensure safety of hoisting.
- Make sure that hoisted plate cylinders move safely to the print unit. During hoisting, the two ends of plate cylinder must move simultaneously. At the same time, operator should be careful of objects surrounding the plate cylinder to avoid knocking each other.
- Make sure that bearings are in proper position. If not, use the hoisting device to adjust to the right position. Then install the bearing cap and fasten the bolt of bearing cap.
- Make sure that the loop bar used during hoisting descends slightly to avoid knocking onto other objects.
- Make sure that loop bar returns to its original position after hoisting is complete.
- Make sure that cap on the plate cylinder, gears, etc are installed and bolt are fastened. Spare parts have proper space between each other to avoid knocking onto each other.

1.2.2 Uninstalling of Plate Cylinder

Before and during uninstalling of plate cylinder, operators must be cautious of the follows:

- Make sure that all plate cylinders exit from the printing position to allow sufficient space for hoisting plate cylinder.

- ❖ Uninstall the bearing cap and put them in the designated position.
- ❖ Use the spanner to remove the bolt on the cap and put it in the designated position.
- ❖ Fix the both ends of plate cylinder to the loop bar and check whether they are fixed reliably to ensure safe hoisting afterwards.
- ❖ Use the electrical hoist device to hold the loop bar of plate cylinder and take it out from the printing unit. Each end of plate cylinder must move simultaneously. At the same time, operator should be careful of objects surrounding the plate cylinder to avoid knocking each other.
- ❖ Place the plate cylinder to the trolley slightly to avoid knocking onto each other.
- ❖ Make sure that the loop bar used during hoisting descends slightly to avoid knocking onto other objects.
- ❖ Make sure that loop bar returns to its original position.

1.3 Installation & Uninstalling of Anilox Roller

1.3.1 Installation of Anilox Roller

During new job changeover, anilox roller will be uninstalled. Before and during the uninstalling of anilox roller, operators must be cautious of the follows:

After all plate cylinders are installed in required sequence, anilox roller should be installed to the required position. Operators must be cautious of the follows:

- ❖ Anilox roller must be handled carefully to avoid it from knocking onto other objects.
- ❖ Make sure that spare parts in anilox roller are installed properly and bearings are lubricated.
- ❖ Based on the lpi specified by production manager, install the anilox roller in proper position in the required sequence.
- ❖ Fix the anilox roller to hoist device to ensure safety of hoisting.
- ❖ Make sure that hoisted anilox rollers move safely to the print unit. During hoisting, the two ends of anilox roller must move simultaneously. At the same time, operator should be careful of objects surrounding the anilox rollers to avoid knocking each other.
- ❖ Make sure that bearings are in proper position. If not, use the hoisting device to adjust to the right position. Then install the bearing cap and fasten the bolt of bearing cap.
- ❖ Make sure that the loop bar used during hoisting descends slightly to avoid knocking onto other objects.
- ❖ Make sure that loop bar returns to its original position after hoisting is complete.

- ❖ Make sure that cap on the anilox, gears, etc are installed and bolt are fastened. Spare parts have proper space between each other to avoid knocking onto each other.

1.3.2 Uninstalling of Anilox Roller

- ❖ Make sure that all anilox rollers exit from the printing position to allow sufficient space for hoisting plate cylinder.
- ❖ Uninstall the bearing cap and put them in the designated position.
- ❖ Use the spanner to remove the bolt on the cap and put it in the designated position.
- ❖ Fix the both ends of anilox roller to the loop bar and check whether they are fixed reliably to ensure safe hoisting afterwards.
- ❖ Use the electrical hoist device to hold the loop bar of anilox roller and take it out from the printing unit. Each end of anilox roller must move simultaneously. At the same time, operator should be careful of objects surrounding the plate cylinder to avoid knocking each other.
- ❖ Place the anilox roller to the trolley slightly to avoid knocking onto each other.
- ❖ Make sure that the loop bar used during hoisting descends slightly to avoid knocking onto other objects.
- ❖ Make sure that loop bar returns to its original position.

Apart from observing above guide, operators must also be very careful during operation to avoid possible mistakes.

CHAPTER 2 Guide to Printing Pressure Adjustment & Register

2.1 Initial Pressure Adjustment

2.1.1 Before starting pressure adjustment, make sure that pointers of each hand wheel are in zero position; anilox roller & plate cylinder, and plate cylinder & central drum are pressed onto each other. The pressure adjustment should start from the first printing unit.

2.1.2 Put a pressure testing sheet (0.5mm thickness plastic sheet) at different points between anilox roller and plate cylinder. Use the testing sheet to test the pressure between anilox roller and plate cylinder and make adjustment until even pressure and stable tension are achieved.

2.1.3 Make a mark in the gears of central drum (point of contact between plate cylinder and central drum).

2.1.4 Make mark in the gears of plate cylinder.

2.1.5 Make the plate cylinder of first printing unit rotate until the mark in the gear of plate cylinder contacts with the mark in the gear of central drum.

2.1.6 Put a pressure testing sheet at different points between plate cylinder and central drum. Use the testing sheet to test the pressure between plate cylinder and central drum and make adjustment until even pressure and stable tension are achieved.

2.1.7 Press the jog button.

2.1.8 Use the above method to adjust printing pressure for the rest printing units. After all adjustment is done, make each part exit from the other.

2.2 Micro Pressure Adjustment

2.2.1 Before supplying ink, supply water to test if there is any leakage. Then turn on the diaphragm pump to supply ink.

2.2.2 Run the printing press at a low speed. Make the anilox roller and plate cylinder press onto each other. Then use the hand wheel to move the plate cylinder and anilox roller forward or backward simultaneously until the ink on the plate is even.

2.2.3 Make the plate cylinder and central drum press onto each other. Then use the hand wheel to move the plate cylinder forward or backward. At the same time, observe the printing image until clear image is printed and no part of image is missing.

2.2.4 Make the anilox roller & plate cylinder, plate cylinder & central drum press

off and then press on respectively. Then check and adjust the pressure slightly in each part. The aim of this operation is to achieve best printing quality with minimum pressure.

2.2.5 Use the above method to adjust printing pressure for the rest printing units.

2.2.6 The rest printing unit can be adjusted in the same way as the first printing unit. Use the hand wheel to adjust longitudinally and laterally to achieve precision register.

CHAPTER 3 Guide to Using Tools

During printing press operation, various manual tools or electrical tools are used. To better use of or avoid any damage or injury, operators should follow the following rules:

- Use the suitable tools that required for specific work.
- Put the tools in right place after using.
- Use exploding-proof tools while operating near ink storage or there is inflammable liquid in machine operating zone.
- Electrical cables are not allowed in the area where solvent-based ink is stored.
- Knife must be put in the specified knife rest when it is not in use.
- Hydraulic trolley and hoisting rod must be put the specified position when they are not in use.

CHAPTER 4 Guide to Operation of Doctor Blade

Operators must pay attention to the follows while installing doctor blade:

- Wear rubber gloves.
- Open the push-pull type clamp of doctor blade and turn it to the limit angle.
- Use a hexagon spanner to release the blade pressing board and put it inside the doctor blade.
- Install the 30mm width blade holder to the doctor blade chamber.
- Install the blade to the blade holder.
- Install the blade pressing board and fasten it with a hexagon spanner.
- Check the blade angle, evenness, and extending length. Make adjustment if necessary.
- Turn the push-pull type clamp to the installation position and make adjustment if necessary.

Usually, blade shall be abraded when it is used for a period. To ensure smooth printing, it is necessary for operators to remove and replace the blade regularly.

Operators must pay attention to the follows while uninstalling doctor blade:

- Wear rubber gloves.
- Open the push-pull type clamp of doctor blade and turn it to the limit angle.
- Use a hexagon spanner to release the blade pressing board and put it inside the doctor blade.
- Remove the blade and put it in the designated place.
- Install the blade pressing board and fasten it with a hexagon spanner.
- Turn the push-pull type clamp to the installation position and make adjustment if necessary.

CHAPTER 5 Guide to Operation of Splice and Thread

Operation of Thread

- Operators must be familiar with the machine structure and know the function of each part.
- Following the thread drawing, thread the web from unwind unit to the last position for threading.
- Check the web and each component.
- Check whether the web route is smooth and there should be no foreign matters that influence the web threading.
- Use the tape to paste the web tail with paper core.

Operation of Splice

- When unwinding is finished on Shaft A, the web is spliced to Shaft B (OR when unwinding is finished on Shaft B, the web is spliced to Shaft A).
- The tape for splice: width to be more than 40mm & length to be slight less than new roll width. At least four pasting points are required for pasting web tail.
- Press the "Splice preparation" button and the unwind frame rotates automatically. When the frame of cutting knife descends, the new roll rotates until reaching the same speed with the machine. When the synchronous indicator is on, press the "Splice" button. The roller press and the cutting knife cut the web. The splice is complete.
- When rewinding is finished on Shaft A, the web is spliced to Shaft B (OR when rewinding is finished on Shaft B, the web is spliced to Shaft A).
- Paste the web tail with the new paper core by using tape in spiral or stripe shape.
- Press the "Splice preparation" button and the rewind frame rotates automatically. When the frame of cutting knife descends, the paper core rotates until reaching the same speed with the machine. When the synchronous indicator is on, press the "Splice" button. The roller press and the cutting knife cut the web. The splice is complete.

CHAPTER 6 Guide to Operation of Machine Startup or Stop

Operation of Machine Startup

Switch on the power supply of air compressor. Then switch on the power supply of the machine when the pressure becomes stable.

- Lubricate the components which require lubrication.
- Check the machine especially the mechanical drive part and printing part.
- Clear the sundries before machine startup. Don't put spanner, tape, oilcan in operation unit, un/rewind unit, or printing unit. After this is done, inform relevant operators that machine is ready for startup.
- Press the "Alarm" button to indicate that machine is ready for startup.
- Turn on the hot air and un/rewind unit.
- Press the "Start" button and machine starts accelerating.
- When machine reaches 20m/min, make the plate cylinder and anilox roller press onto each other.
- Increase the machine speed to printing speed. During the process, observe the readings of meter in the operation panel. The pointer of meter for dance roller must be always centered for successful machine acceleration.

Operation of Machine Stop

When printing is complete, switch off the machine power supply and then switch off the power supply of air compressor.

- Usually, press the "Stop" button for normal machine stop.
- Make the plate cylinder and anilox roller press off each other.
- Press the "E-Stop" for emergency stop.

CHAPTER 7 Guide to Operation of Ink Supply

For supplying ink, pay attention to the follows

- Check whether the ink in the ink barrel is the right one.
- Circulate the ink in the ink pump via flexible pipe and the ink would return to ink pump finally. The purpose of this operation is to remove the air in the system.
- During ink tray installation, prevent it from abrading with any rollers.
- Connect the ink tray with ink barrel by flexible pipe, which must bypass all moving parts. The flexible pipe must be dipped into the ink barrel to a depth that would not produce bubble.
- Make sure that ink pump and ink distribution system is connected properly.
- Supply ink to each printing unit.
- Adjust ink supply volume when necessary.
- When ink is supplied in a period, test the ink viscosity. The parameters of ink supply must match with the printing requirement. If it does not match, check and adjust the ink.
- Check the ink supply on a regular basis.

CHAPTER 8 Guide to Operation of Plate Mounter

Operation of Plate Mounter

The plate cylinder must be cleaned with cloth soaked with alcohol. The purpose of this operation is to ensure that there is no oil residual on the surface of plate cylinder because the oil may influence the adhesiveness of double adhesive tape.

Paste Double Adhesive Tape

The using of double adhesive tape is subject to the printing image requirement. For instance, the solid printing plate requires soft double adhesive tape. Layer printing plate requires hard double adhesive tape. Neutral double adhesive tape may apply to the plate with solid printing and layer printing.

Rotate the plate cylinder slowly and paste the double adhesive tape. There should be no bubble or wrinkle. If there is any bubble, use needle to prick the bubble. Otherwise, the bubble may influence the printing quality.

Mounting the Plate

Remove the protection layer from the double adhesive tape and put the plate cylinder onto the plate mounter.

1. Make sure that the plate is in correct direction and put it on the plate mounter. On the condition that the plate is centered based on the plate cylinder width, hold the register mark with thumb and index finger and observe it via screen. Move and adjust the plate to ensure that register marks displayed on the screen are at the same level. Flatten the plate with hand with even force. Check if the two register marks are at the same level. If not, make adjustment until the two are at the same level. The purpose of this operation is to ensure that image line on the plate is parallel with the line carved on the plate cylinder.
2. Switch on the induced draft & positioning device of plate mounter and make the plate fixed to the plate mounter. Then move the plate again to observe that if the register marks on both sides are at the same level. Otherwise, repeat the operations in 1.
3. Rotate the plate cylinder and flatten the plate with hand with even force. While mounting the plate, observe the register mark again via screen to ensure correct register.
4. After the plate is mounted, observe the screen again to check if the register marks are at the same level. Otherwise, repeat the above operation until correct resister is achieved.
5. Check again if there are bubbles between plate and plate cylinder or pasting is not

firm. Bubble can be eliminated by using rubber roller or needle.

6. After above is complete, use the scotch tape to seal plate joint. This can keep plate firmly fixed and prevent ink or solvent from coming into during printing and washing.
7. Start printing. If there is no dirty and bubble and register is correct, it means that plate is successfully mounted.

CHAPTER 9 Guide to Operation of Printing Press

- Read this manual carefully and know all regulations of safe operation.
- Before machine startup, check if the oil in oil tank is sufficient, air compressor reaches the requirement, and safety devices are reliable. Surroundings of the machine must be clear and it is not allowed to put tools at random.
- Only one operator is allowed to operate the machine when machine starts working.
- Before machine startup, check if any personnel is working on the machine. Use the electro probe to check if there is any electric leakage. If so, inform the maintenance personnel to remedy it.
- Switch off the power supply before conducting works such as repairing, adjustment, refueling, cleaning, or checking.
- It is not allowed to put any part of body inside the machine when it is running.
- It is not allowed to wash the central drum or touch moving parts when machine is running.
- When any incidents occur or anything abnormal happens, stop the machine and inform the maintenance personnel to remedy it.
- Anilox roller can be cleaned only when it is not running. It is not allowed to put finger close to the web feeding points.
- While cleaning the central drum, the palm must be to the direction of inner rotating space and finger must be to the direction of outer rotating space.
- Before machine startup, there should be some other personnel assisting the operator.
- The wash liquid, fountain solution, or varnish solvent should not be put on the printing press, but in the dry place.
- Operator is not allowed to wear jewelry, watch, etc to avoid being entangled to the machine.
- Operator can start operate the machine only when all protection devices are installed and in good condition. The protection devices can be removed only when machine stops.
- Unauthorized personnel are not allowed to operate the machine.
- Operator should not put any items in his pocket in case it falls into the machine.
- It is not allowed to switch off or modify the photo electricity protection device or other protection devices. If any protection devices fail to work, stop the machine and inform the maintenance personnel to remedy it.
- Before operator leave the workshop or operator is not at the site, machine's power supply and air supply must be cut off and surroundings must be clear.

CHAPTER 10 About Flexo Press Operation

As the four major printing methods, flexo printing, offset printing, rotogravure printing, and screen printing have their own characteristics. Nowadays, the printing has been featured with high quality, fine printing, and diversity. Offset printing and rotogravure printing have a large proportion in the printing field while flexo printing starts later than the former. Nevertheless, flexo printing has made much achievement and become more competitive due to application of constant innovations.

Printing machine and printing technology are key factors of flexo printing. This includes printing machine, material selection, product design, and operation skill. Proper operation is the basic requirement on operators.

Operation Procedure

Loading web roll → Feeding web → web guide → selecting anilox roller → loading plate cylinder → adjusting pressure → supplying ink → printing → register → tension control → dry system → die cutting → slitting → rewinding

- **Loading web roll**

  When the web roll is loaded, its' center will be taken as the reference center line for plate mounting, web guide, die cutting, and slitting, etc. Web should be threaded through each guide roller as per the web route drawing. After web threading is complete, start the machine and adjust the tension. Stable tension is key factor to ensure register precision. Then use the web guide to make the web be in the center position of plate cylinder.

- **Adjusting pressure**

  Suitable printing pressure is the key factor to printing quality. The distance between the plate cylinder and central drum should be the same. Use a 2.08mm thickness (1.7mm plate +0.38mm double adhesive tape) feeler gauge to insert into the space between the two. If the resistance force to the feeler gauge is the same, the pressure should be suitable. Usually, operator needs to make micro adjustment to reach the most suitable pressure according his experience.

  When the machine is running at a low speed, make the anilox roller, plate cylinder, and central press onto the other. Firstly, check the ink transfer from the anilox roller to plate cylinder. The ink transfer can be adjusted via the pressure system. Usually, slight pressure will enable the anilox to have a better ink transfer, enhance printing quality, and prevent the plate from damage. Secondly, adjust the pressure between plate cylinder & central drum and observe the printing quality. The printing quality indicates whether the pressure is suitable or not. According

to the normal practice, the printing pressure should not be too much.

- **Tension control system**

  A tension controller is used to ensure stable tension, which is key factor to precision register. Tension control system is very important to printing because the register precision is to great extent subject to the tension control. Tension control system is fitted at the unwind unit. Tension control is important because of existing of resistance force in the printing unit, infeed & outfeed unit, etc, inertia of web roll rotation, and pull force by the printing unit. Tension control is subject to the web thickness and width. The thicker the web is, the more tension there is. It is more difficult to print on thinner web, which is stretchable and likely to deform. Usually, stable tension is recognized by observing the register mark (cross mark). If register mark is stable, the tension is suitable. If not, adjust the tension for unwind and rewind unit. Also tension will be different when machine is running at different speed. In this case, it is suggested that operator should make micro-adjustment to the tension. Therefore, suitable tension is one of the key factors to achieve precision register and high quality printing.

- **Ink PH and viscosity control**

  Ink PH and viscosity control is very important for printing quality.

  The PH for water-based ink is 8.5. For this value, the ink is more stable. However, the PH may change because temperature may increase and ammonia will volatilize during production. This would impact on the ink utilization. To solve this problem, it is suggested to add stabilizer to the ink to stabilize the PH. An amount of 5ml stabilizer should be added to the ink every haft an hour. After stabilizer is added, stir the ink to make it even. This can help ink stable in its performance. However, it is not allowed to add any stabilizer because some stabilizer may cause printing defects.

  The ink viscosity determines the ink transfer capacity, printing firmness, seepage, and gloss. The greater the viscosity is, the darker the color is and the more ink is consumed. Also the drying capacity will be decreased. The color would change and dot is enlarged, impacting the printing quality.

  Ink viscosity is also different for printing layer pate and full plate. Usually, the viscosity is lower for layer plate. Printing speed is another factor that has influence on the ink viscosity. The ink viscosity should be lower when machine is running at a high speed and higher when machine is running at a low speed.

Above is some information for flexo printing. Hope this can be a reference for everyone who is into flexo printing. However, there is no a standard mode to follow. It may require that operator learn more useful experience during the actual practice.

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