MATAN JetSet™

2.5i 3.2i

Service Manual

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Chapter 1 Outline

1.1 Main Characteristics

- The *JetSet Printer* uses long-life piezoelectric HITACHI E1 Print heads fixed on the aluminum metal base. The printer is highly causticity-resistant and controls the ink point exactly, enabling it to correctly adjust the fine color of the picture. The JetSet can produce high quality images with brilliant and standards-conformant colors.

- The automatic cleaning system keeps the Print heads in the best possible working condition, preventing the heads from drying. The cleaning system starts automatically from the software window. Automatic cleaning greatly extends the life of Print heads and avoids the inconvenience caused by unpacking and washing the Print heads frequently. The process is safe, efficient and convenient, and requires no human intervention.

- The automatic cleaning system is liquid-protected.

- The feeding system with tension control on the materials ensures smooth feeding, avoiding destruction of the picture by sticking to the printer mechanism.

- LM (Linear Motion) carriage rail effectively eliminates carriage-shaking to the print precision lead, increasing the print quality noticeably.

- Auto-alarming sensor systems supervise the ink level in both the first and second ink tanks constantly, avoiding waste due to shortage of ink.

- Inner warm-up and drying system insure quick dissolution of the ink in the medium. These both increase the image's outdoor durability and extend the application scope of substrates.

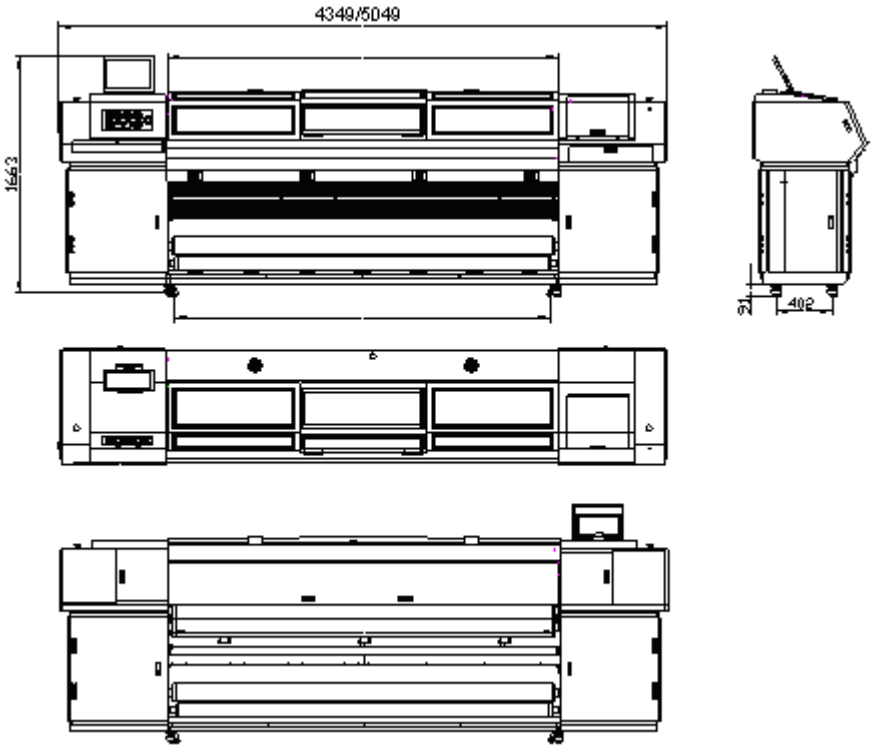
1.2 Quality and Safety Insurance

- ISO9001: 2000 certified, insuring the product's quality.

- *JetSet Printer* has the CE safety certificate issued by TÜV Rhineland.

Chapter 2 Description of the Machine

2.1 Appearance and Dimensions



Front, Left Side, Look Down and Back View

2.2 Specifications

Printing technology:	Piezo, bi-directional printing
Print head set:	Hitachi, 96 nozzles / head, 12 Print heads (2heads * 6colors)
Color:	6 colors: C, M, Y, K, LC, LM. (4 colors printing is also possible)
Resolution:	600DPI *
Printing size:	
Max printing width:	2.5/3.2 m
Max material width:	2.6/3.4 m
Max material length:	50 m/roll

Material thickness:	0.15-1.0 mm		
Machine description:			
Shape dimension:	1. 69m(H) * 4.35/5.05m(W) * 0.83m(D)		
Weight:	942/1200 Kg		
Feeding system:	Roll to roll with tension control		
Heating system:	Pre-heating, post-heating, cooling fans and carriage-heating		
Ink supply system:	Auto continuous supply and negative pressure		
Material types:	Flexible materials with banner and flex, self-adhesive vinyl, mesh and textiles, etc.		
Printing mode:	Three Pass (3 pass); Normal (6 Pass); Enhanced(8 Pass）; Master (12 Pass); Ultra（16 Pass）		
Production capacity:	Machine/Mode	JetSet 2.5i	JetSet 3.2i
	Three Pass	62 m²/h	73 m²/h
	Normal	32 m²/h	37 m²/h
	Ultra	12 m²/h	14 m²/h
Ink and solvent:	Matan ink The ink and solvent accord with EU & US regulations. For further details refer to MSDS on Matan's web site.		
Software description:			
Image file format:	The system support PostScriptR3™; Accept all available file format, including EPS, TIFF (CMYK mode), JPG (RGB mode) etc.		
RIP operating system:	Scanvec Photo print server Ver. 4.0 (Windows XP)		
Work station configuration:	40GB hard disk, 512MB memory, P4 2.4G CPU, 10/100M Ethernet The above configuration will be changed according to the upgrading of the technology.		
Operating system:	Windows XP		

Environment requirements:	
Power range:	230V AC±10V 50HZ, 15A/23A
Maximum power:	3.5/5.3KW
Operating temperature:	20 - 29 °C
Non-operating temperature:	0 - 50 °C
Operating humidity:	40 - 60% RH (Non condensing)
Non-operating humidity:	10 - 80% RH (Non condensing)
Installation altitude:	2000 m or less
Operating noise:	70dB(A) or less
Safety certifications:	CE Certification. Pass IEC/EN 60204
Guarantee:	According to Matan warranty policy. See warranty documents

2.3 Electrical Structure

The electrical structure of the printer consists of the image processing system, movement servo control system, ink supply control system and heating control system.

The following is simple introduction to the working principle of each part:

Refer to chart 4 of the printer control module diagram for a visual representation.

2.3.1 Image Processing System

The Image Processing System is responsible for all image processing functions. The Image Processing System consists of the computer, image transmission component, and jet control component. The image processing procedure is as follows:

1. The computer processes the image data.
2. The image data is transmitted to the image transmission component
3. The transmitted image is sent to the jet control component
4. The image is printed.

2.3.2 Movement Servo Control System

The Movement Servo Control System is responsible for all carriage movement and materials feeding functions. The Movement Servo Control System consists of the computer, servo card, X-axis servo control system, and Y-axis servo control system. The X-axis servo control system controls carriage movement. The Y-axis servo control system controls the material feeding and collection.

2.3.3 Ink Supply System

The Ink Supply System is responsible for supplying ink to the printing process and monitoring the ink level in the ink tanks. The Ink Supply System consists of the computer, main tank, secondary tank, ink pump, and liquid level sensor. The ink supply level in the ink tank is sent through the level sensor from servo board to the I/O card. The I/O card sends a command to the ink pump to supply ink or stop the ink supply.

2.3.4 Heating Control System

The Heating Control System is responsible for warming the substrate and drying the printed image to ensure the print quality.

Refer to Annex 5: Heating Control System Diagram

2.3.5 Electrical Control and Function Description

Note: SW = Switch

Servo card	Printer movement control
Filter (E1)	Power filter on X-axis servo controller, restrain the electrical- magnetic disturbing on the power wire transmission, and fulfill the needs about electrical magnetic compatibility.
Filter (E2)	Power filter on Y-axis servo controller, restrain the electrical- magnetic disturbing on the power wire transmission, and fulfill the needs about electrical magnetic compatibility.
Main SW	Printer Power Switch On/Off
X axis SW	X axis servo control system Switch On/Off
Y axis SW	X axis servo control system Switch On/Off
Tension SW	Tension Motor Switch On/Off
Heating SW	Pre-heating and Drying Switch On/Off

Fuse	Protect the second circuit of transformer
Emergency Stop	Emergency Stop button. Press it, all of the movement control circuit will be shut off except the computer and PCB board (12V, 24V)
Fan SW	Ink cooling device
Temperature controller Reset	When the surface temperature of pre-heating or drying is over 55°C (±5°C), the heating circuit will be shut down automatically, after the surface temperature reduce to 45°C (±5°C), press the temperature controller reset button to start the heating circuit.
Platform Vacuum adjustment	There is a fan inside the printing platform. It can make the material spreading on the platform tidily. Since the printing material is different, the absorbability is also different. Turn clockwise to adjust the absorbability to the maximum.
Warm-up temperature control	Platform warm-up temperature controller. Used for controlling warm-up temperature not to exceed the fixed figure.
Drying temperature control	Side platform drying temperature controller. Used for controlling the drying temperature not to exceed the fixed figure.
AUX heating control	Controlling quartz tube temperature in the process of printing
PC Power	The button of PC Power.
Start Button	Let the printer start working. Correctly connect the power wire, turn on the air switch, and press the start button and the PC power button, then the printer can start working.
HV SW	Carriage board Power On/Off (40V)

Chapter 3 Installation Guide

3.1 Site Preparation

The customer should follow all installation instructions during the operation of the machine. Failure to do so can cause machine malfunction. All support required to repair malfunctions caused by the customer's failure to follow instructions are billable to the customer.

3.1.1 Working Area

Working area refers to the area very close to Printer (hereinafter referred to as Equipment), as shown in figure 1.

User must guarantee safety of operators within this area

Scope of working area: Length 6.35/7.05m, Width 3.83m, and Height 3m at the level.

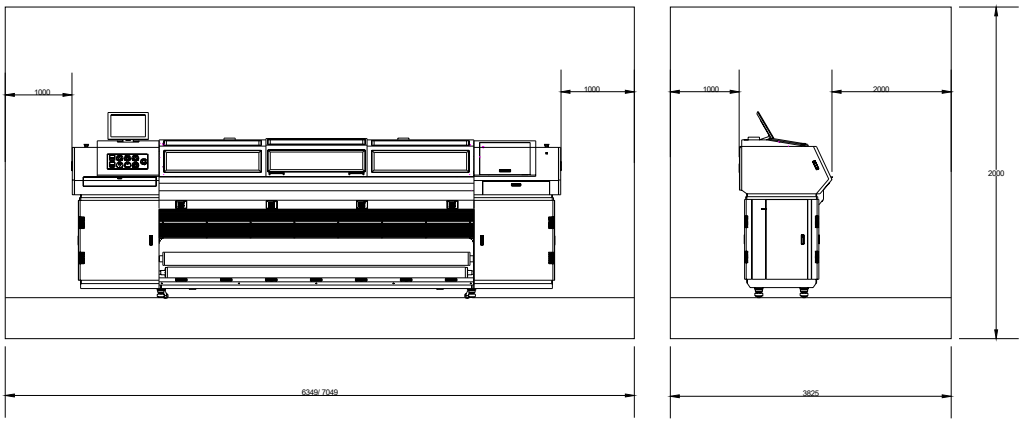


Figure 1: Sketch map of working area (unit: mm)

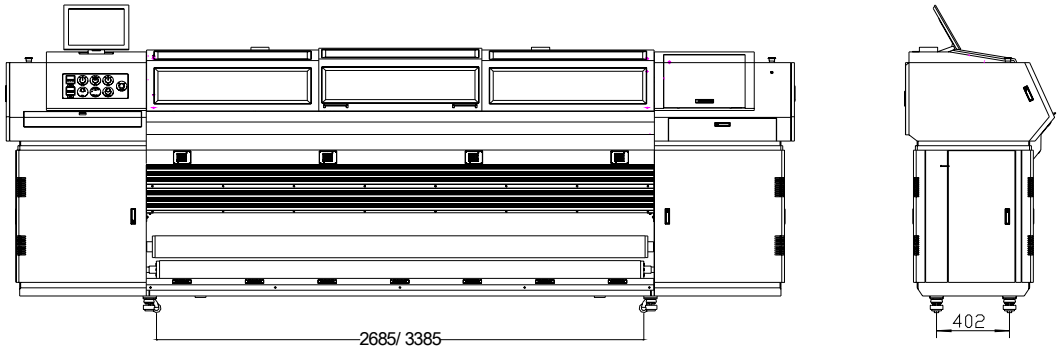
3.1.2 Environmental Requirements

Printer must be separated from seaming equipment (material connecting machine) or other radio frequency sources. The floor must be easily cleaned and not produce dust and static electricity. To help the operator and client to judge the accuracy of colors, try to use neutral gray for decoration and use pure white light (fluorescent lamp) for lighting.

Printer should be installed in the clean environment, without dust. Control temperature and relative humidity to the following specifications:

- Sea level height: under sea level 2000m.
- Temperature: 20 --29°c
- Relative humidity: 40% -- 60%

3.1.3 Floor Requirements



The overall foundation dimensions of *JetSet2.5//3.2i* are shown in figure 2 (unit: mm):

3.1.4 Weight Carrying Requirement

Net weight of *JetSet2.5i/3.2i* is 942/1200kg; the maximum roll of material is 80kg. We recommend installing the *JetSet printer* on 4 steel sheets with diameter of 200mm, or 4 pieces of steel sheets, with each sheet more than 200 x 200 mm. The thickness of each sheet shall be more than 8 mm.

3.1.5 Floor Material

Floor materials within working area must be guaranteed to carry the weight of the system safely and evenly. In the process of installation, the system must maintain accurate level to ensure correct movement of print heads on the same level and to prevent sliding and bending.

Floor materials within working area are required to prevent accumulation of static dusts. If necessary, use clean ceramic tiles and anti-static carpet. Polish cement floors in the work area before printer is positioned.

3.1.6 Space Leaving Requirements

Front of printer refers to printing input edge. Printer requires preserving 2.0m in front, 1.0m in back, and 1.0m on both sides. In addition, space-leaving area shall also include Matan high above ground level. Additional space in front of and behind the machine must be preserved to facilitate loading and unloading of printed pictures and materials.

3.1.7 Safety Requirements

- **Fire Proofing**

Ink and solvent must be stored in a cabinet used exclusively for flammable liquid, or in an independent storage room. Clearly mark the ink and solvent containers as flammable to comply with safety regulations.

Carbon dioxide and dry powder extinguishers must be placed at apparent and accessible positions in all passages. They should be placed near the printer and the flammable liquid storage cabinet (room), or comply with the requirements of local fireproofing regulations.

- **Ventilation**

To prevent collection of dangerous volatile gases, sufficient ventilation should be ensured in the working area to guarantee that the air can be replaced about 6 to 8 times every hour. Intake shall be low enough for volatile gases not to collect near the floor.

When materials pass through the drier, the solvents in the ink become volatile. An exhaust gas discharge system is required to release the solvents.

Note: Specific gravity of solvent gas is greater than that of air. The solvent gases may collect near the floor.

Electrical equipment installed near work area must meet GB/T standard and stipulations of national electric regulations with first grade second class filed. All electrical equipment must be installed by a qualified and professional electric contractor.

Disposal of dangerous wastes must meet all specific storage and disposal requirements of the relevant authorities.

3.1.8 Electrical Requirements

The JetSet printer uses a single-phase power supply and requires good single grounding. Grounding resistance must be less than 4Ω.

The range of power supply voltage is AC230V (±10v), AC50/60Hz. The power supply line output terminal must be installed by a certified electrician.

All electric parts of Printer only use one power supply socket. The socket must have an over-load protection function. The rated values of the circuit breaker are as follows:

Power supply (voltage)	AC 230V±10v
Single phase	15A/23A

Max. power consumption is less than 3.5/5.3 kW, average power consumption is 2 kW. UPS uses 2 KW, connecting all other electrical equipment except the heating system.

Main socket of power supply must be no more than 2m away from power supply input terminal of printer.

3.1.9 Requirements for Operators

The operators of printer have the following requirements and responsibilities:

- Operation of the printer according to the instruction manual.
- Proper operation and maintenance of printer.
- Communication with the after-sales service technical support department of Matan.
- Troubleshooting and maintenance by telephone
- Operation of Windows software.
- Technical understanding of electronics and machinery.
- Understanding of color aspect, knowledge of pre-printing and after-printing process.

3.1.10 Installation Stipulations

- Printer must be installed on a level surface. After printer is moved to the right position, level the Printer according to the gradient.
- Safety mark must be pasted in Printer work area to remind people to pay attention to potential danger. These marks must accord with local safety rules. Typical marks are in orange or black. For more information, refer to Annex 6.
- Recommend installing a telephone near operator control table to facilitate communication of maintenance and daily operations.

3.2 Check before Installation

For other contents concerning site preparation, please review and fill in《Installation Preparation Questionnaire》(see Annex 1).

- Report site voltage to Matan in advance.
- Power supply input plug of the machine is located at the left behind of the Printer
- Air conditioner in the room must be sufficient to ensure the above-mentioned temperature (20—29°C).
- Installation tools must be prepared before the arrival of the machine: a forklift above 3 tons or a crane above 3 tons. The client should notify Matan company in advance of all tools to be used. If Matan is not notified, the customer is charged for any delay caused by this.
- If no Matan engineers are on-site, client must not open the box. Damages to the packaging box should be photographed and reported immediately to Matan before arrival of engineers.
- There must be a washbasin in the room where Printer is placed.
- Client must complete all preparation work and cleaning work before arrival of engineer, since dust might cause damage to the machine.
- Client must prepare all the other equipments required, such as Apple computer and its Photoshop and Freehand software and 100M network connection.
- During installation, there must be at least two skillful operators in computer operation. Preferably, these operators also have printing experience.

- If the operators have insufficient experience, client should not carry on production independently. Operators should be trained first.
- Customer should pre-order ink.
- Matan selectively provides some spare parts. The client is to purchase other spare parts. If these parts have been used, please immediately order from Matan to make sure that sufficient spare parts are available.
- Pay attention to “left, right” and “front, back” on packing box during loading or unloading.
- Checklist is only the main points of site check before installation. Please refer to the complete site preparation file for a more inclusive list. Every item in the table shall be filled with “Yes”. After all procedures are completed on the site, send the site preparation list back to the maintenance center of Matan’s customer service department before installation. If the site is not prepared well, and the engineers arrive at the site, the customer is charged for the engineers’ waiting time.

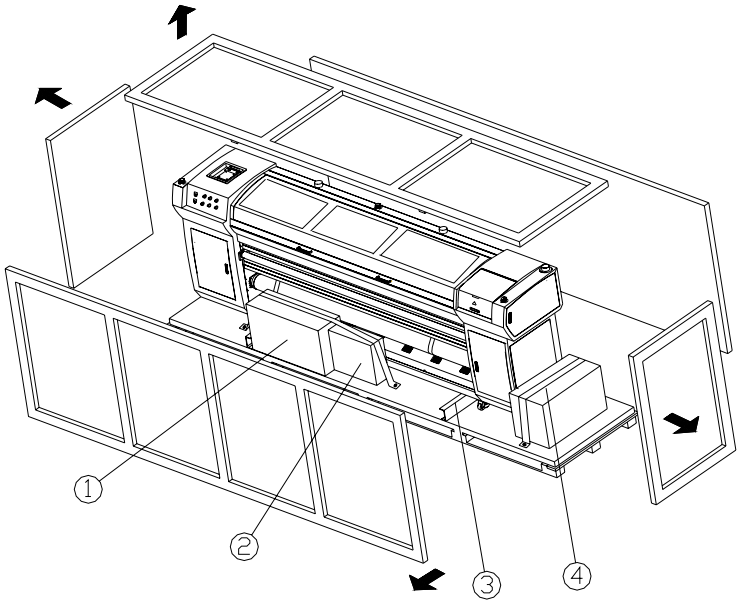
3.3 Installation

3.3.1 Shipping, Unpacking and Checking

3.3.1.1 Shipping

- Attention must be paid to marks on the surface of wooden box. Handle carefully, do not add weight on the box. Pay attention to rain resistance.
- The delivery vehicle must be driven carefully and shall not pull up or turn suddenly. since these movements might cause jumping or side turnover of wooden box and lead to damage of wooden box.

3.3.1.2 Unpacking



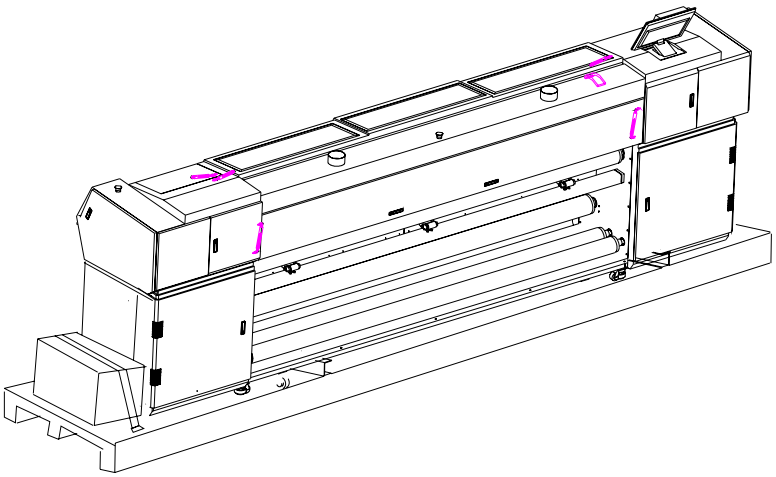
1. Spare parts and toolbox

2. Monitors

3. Printer fixing

4. PC

- If wooden box is found damaged before unpacking, client shall photograph and immediately report the damage to Matan Company.
- Remove top cover of the wooden box.
- After removing big bolts around the wooden box, remove the four boards around.
- Take the machine out and count attached articles.



3.3.1.3 Checking

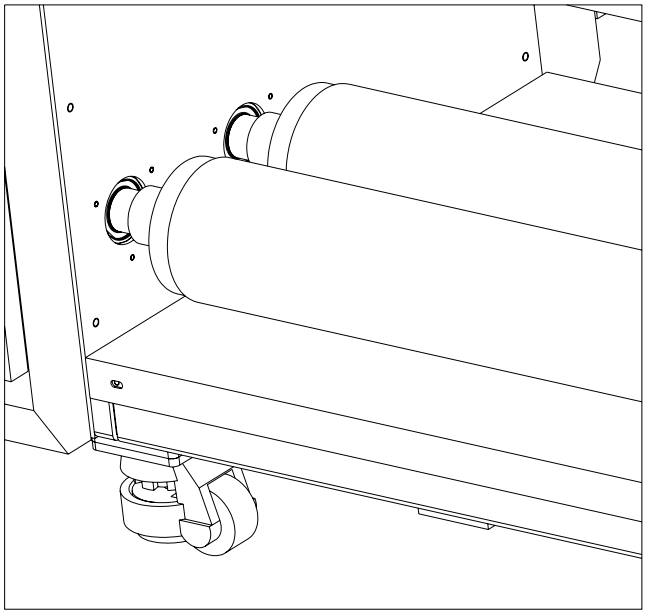
- Matan engineer on site should count the attached articles one by one.
- After counting, client signs on the list and Matan engineer returns it.
- If there is anything missing, please note on the list. Matan supplements it immediately.

3.3.2 Fixed Installation

3.3.2.1 Truckle

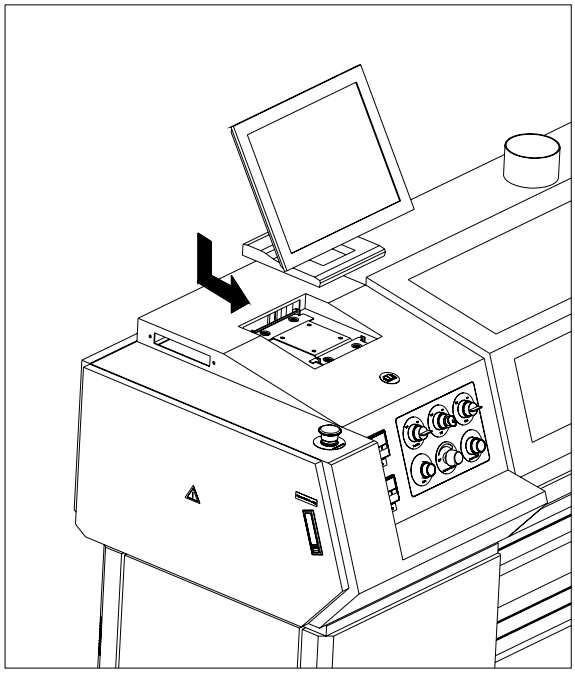
- Turn right the four truckles until they leave the ground. Adjust the level of the machine. Allow the air bubble in the level to center.

3.3.2.2 Remove the Shockproof Cushion and Binding



3.3.2.3 Installing the LCD Monitor

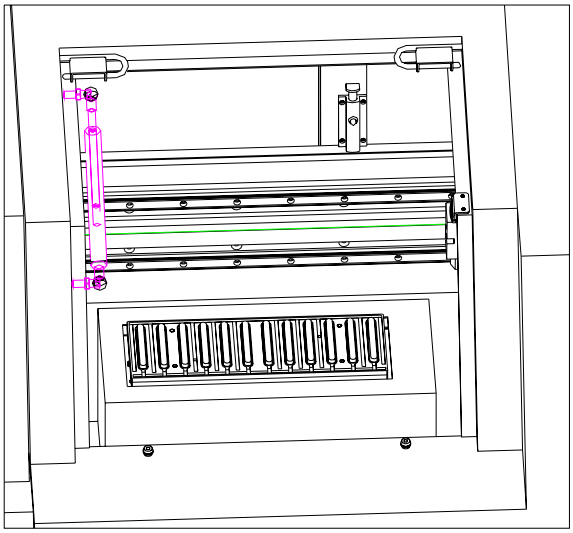
- Install the LCD monitor, and insert the Power and Data wires behind the monitor.



3.3.2.4 Print Heads Installation

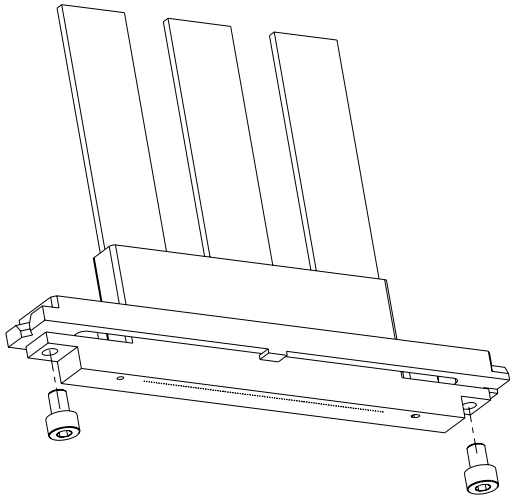
Note: Print heads were fixed when the printer was packed. You should unpack the print heads carefully

- Unscrew the bolts in the two sides of the carriage cover, remove the carriage cover, and dismantle the Twelve Print heads supporter.

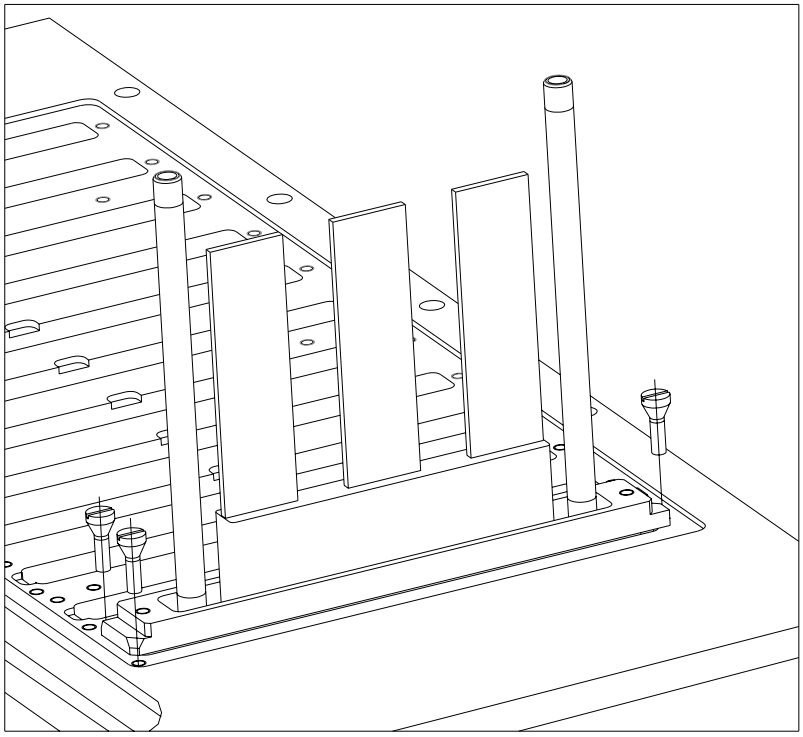


Install the inner Print heads. The ink tube must be fixed well on the Print head before installing the printer. There are 2 M2.5X12 fixed bolts on the bottom.

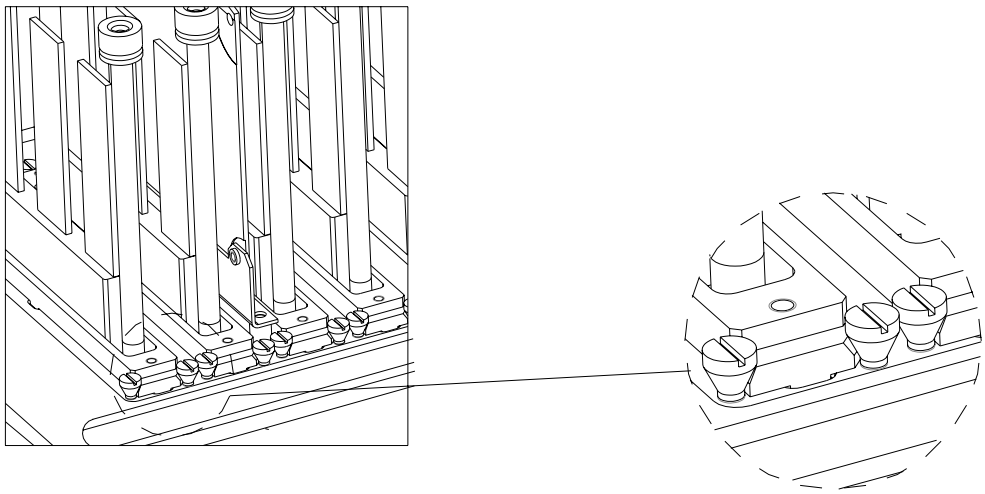
Note: The Print head must be flushed with solvent to clean the oil inside the heads.



- Fix the Print head bracket on the Print head soleplate with 3pcs of M3x0.35x7 angle bolts.

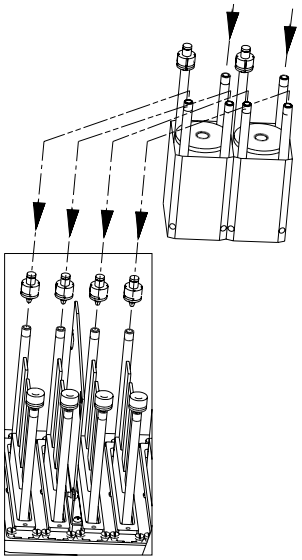


- Adjust the Y axis. Vertical degree of the Print head depends on the offset pin's turning. During the initial installation, check that the offset pin is on the same level with Y axis. Adjust again after the print test.

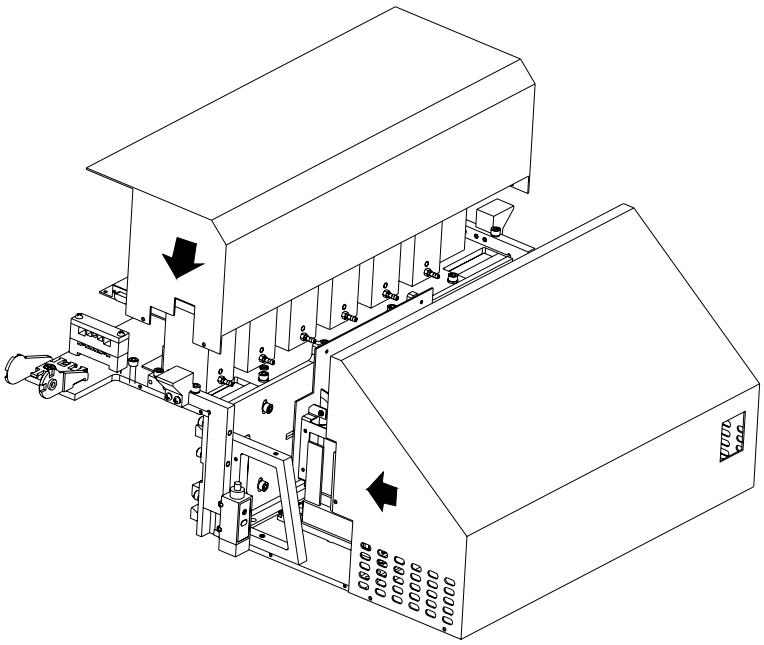


- Connect the Print heads with the second ink tank pipe.

  Pay attention that the order from left to right should be LC, Y, M, C, K, LM.

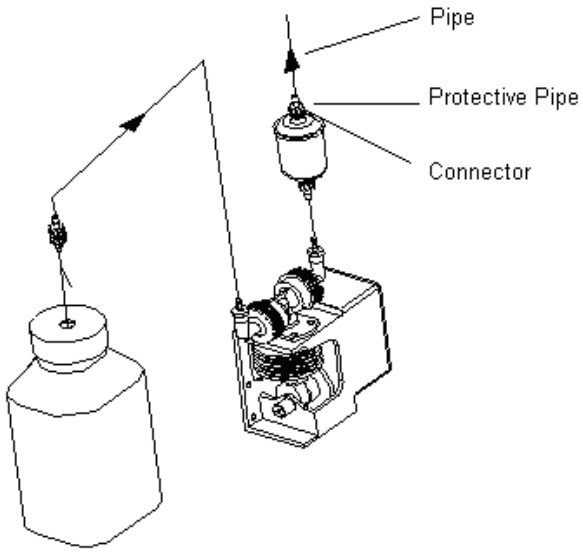


- Close the carriage cover, screw on the bolts.



3.3.2.5 First Ink Tank Installation

Note: Every connector between the ink pipe and its adaptor must be covered with the protective pipe.



3.3.2.6 Install Control Software

Refer to Chapter 3 in the User Manual.

3.4 The Basic Electricity Devices Inspection

3.4.1 Before Startup Inspection

3.4.1.1 Power Wire Inspection

Tools: multimeter-DT9280. Range: AC230±10V

Turn off all of air switches, check the AC230 power input by digital multimeter-DT9280 at AC750V shift, the range of the power input should be within 230±22V.

3.4.1.2 Insulated Resistance Measure

Tools: Mega-ohmmeter, not less than 2MΩ。

Turn on the isolation SW.

Open the isolation switch, measure the insulated resistance between the out frame of the machine and the L, N power cable with 500V Mega-ohmmeter. The insulated resistance figure should be ≥2MΩ.

3.4.1.3 Grounding Resistance Measure

Tools: multimeter-DT9280. It should be less than 1.

Measure the resistance between the PE terminal and the ground by using the Ohm level of multimeter-DT9208 at 200Ω. The value should be less than 1Ω.

3.4.1.4 Measure the Power Input

Leaking electric current should be less than 3.5mA

3.4.1.5 DC Power Supply Measure

Measure the values of DC5V, DC12V, DC24V, DC40V according to the drawing of the wire connection.

Take off the servo card, ink supply control panel, and Print head driver card power plug. Turn on the power SW and the HV power SW. Test the power input +5V,+12V,-12V, 24V, 40V at the DC voltage shift by multimeter-DT9280. +5V should be adjusted in the range of 5.0V±0.5V,+12V should be 12.0V±0.5V, -12V should be -12.0V±1V, 24V should be 24.0V±1V, 40V should be 29V±0.5V;

Turn off the test power SW. Insert the plug of the ink supply control panel and servo card. Turn on the SW of control power. Check if the ink pump and control are in order. Monitor the ink supply.

Turn on the SW of the HV power. Measure the voltage value of the Print head driving card power plug by using the digital multimeter-DT9280 (the voltage 5V should be in the range of ±10%, 29V should be ±2%).

3.4.1.6 Motor Inspection

1. Check the servo controller CN1A, CN1B, CN2 to see if the plug is correctly connected.
2. Configure the parameter of every controller according to the servo motor parameter book. (Details in appendix 2)

3.4.2 Trial Operation Inspection

3.4.2.1 Turn Off the Air SW

Ensure the platform vacuum, the cooling fan and the tension motors are running correctly.

To check the platform vacuum, turn on the platform wind speed adjustor, rotate in clockwise direction, the wind speed turn from min to max. Check if every fan runs normally.

To check the cooling fan, operate the SW of every fan, check if every fan runs normally.

To check the tension motor: close the air SW, open the tension SW, turn on the tension

motor speed adjustor, rotate clockwise, look at the voltage adjusting range on the voltage meter: 0~69V±0.5V. When feeding the material, adjust the tension, normally should be 60V, when print on the mesh or thin substrate, adjust a little bit lower, to approximately 55v. When printing on the vinyl or thick substrate, should comparatively increase the tension, to approximately 65V.

3.4.2.2 Press Down the Emergency Stop SW

When the machine is stopped, notice if the Mitsubishi servo controller shows AL E6. After the plug is taken out, the machine returns to the state before pressing down the button.

3.4.2.3 The Left and Right Limited SW

Move the carriage to left, press down the left limited SW, the carriage should be stop moving. After you release the SW, it goes on moving until stop.

Move the carriage to right, press down the left limited SW, the carriage should stop moving. After you release the SW, it goes on moving until stop.

3.4.2.4 Thermocouple

Check if the thermocouple is in the right position and if there is any looseness. (The thermocouple is located under the printing table)

3.4.2.5 Temperature Controller

When the temperature is under the setup value, the heat light is on. When the temperature remains steady, the heating light flickers. When temperature is over the alert temperature, the alert light is on.

3.4.2.6 Cleaner

Controlled by the software, high voltage output from servo card. The relay (K4) works through the action of opening and closing.

Chapter 4 Parameters of Adjustment

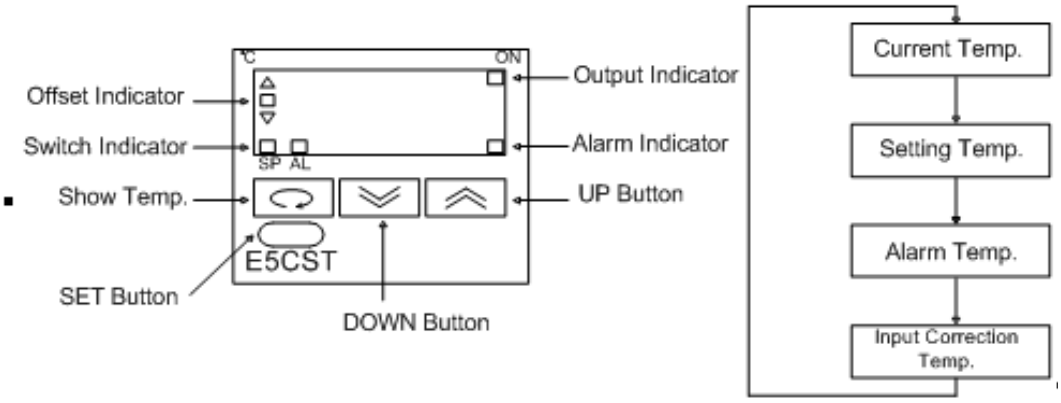
4.1 Temperature Adjustment

Turn on the cooling fan and set the pre-heating and drying temperature of the temperature controller to 30° C before leaving the factory and 32° C for alarming（meter configure AL as 2° C).

You can adjust the pre-heating and drying temperature according to the actual operation circumstance temperature and the print materials, but the maximum figure cannot be over 50° C.

Temperature Controller （E5CST-Q1KJ）set up instruction

Button functions are as follows:



♦ Set the temperature to 30° C

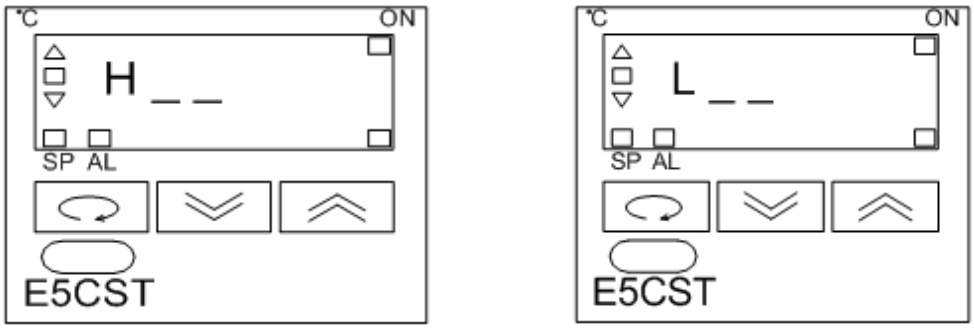
Click the button “Show Temp.”, the indicator is on “SP”, then click the button “SET” + “UP” to adjust to 30° C.

♦ Set the alarm temperature to 32°c

Continue to click the button “Show Temp.”, the indicator ”AL” will be light, press the button “SET” + “UP” to adjust to 2°c

When setting up the alarming temperature, input temperature control is comparative value, not absolute value. This is the difference between the alarming temperature and the set up temperature.

♦ Third step, adjust the offset value: if there is difference between the real tested figure and the real figure, then press button “Show Temp.” to see.



H means raise, L means lower. Press the button “SET” + “UP” to adjust the moving figure.

4.2 Tension Adjustment

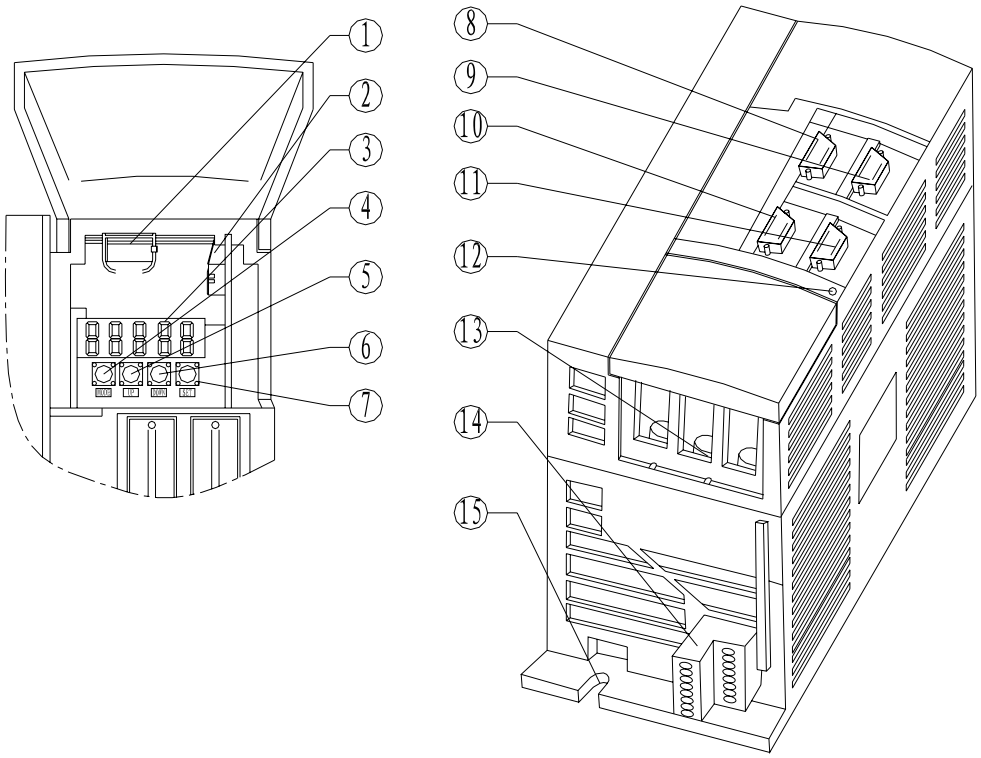
Regularly set to 60V. When printing mesh or relatively thin materials, lower the tension to approximately 55V. When printing self-adhesive vinyl or relatively thick materials, increase tension properly, to approximately 65V.

4.3 Temperature of Print Head

Normal working temperature is between 25° C to 40° C. If temperature exceeds the range, room temperature should be adjusted appropriately.

4.4 Set the Servo Controller Parameter

Press the button MODE on the servo controller, after it shows P, press the button UP or DOWN to the according parameter, press button UP or DOWN. After pressing, the SET button increases or decreases the servo controller parameter. Press the SET button again to confirm the parameter.



1. Battery base

2. Battery connector (CON1)

3. Monitor

4. Button ‘MODE’

5. Button ‘UP’

6. Button ‘DOWN’

7. Button ‘SET’

8. I/O Signal connector (CN1A)

9. I/O Signal connector (CN1B)

10. Encoder connector (CN2)

11. Communication connector (CN3)

12. Charging indicate light

13. Main circuit terminal base (TE1)

14. Control circuit terminal base (TE2)

15. Protecting grounding (PE) terminal

Note: *Refer to Appendix 2 for the servo parameter adjustments.*

- The servo controller parameter is preset by the factory.
- Operational problems send alarm messages. Refer to Appendix 3 to troubleshoot, or refer to the introduction book of Mitsubishi General Communicate Servo System MELSERVO-J2-SUPER Series, or contact Matan engineers.
- No alarm ‘o’ in the Alarm eliminating bar. Eliminate it through corresponding operation

Notice:

1. Wait about 30 min after eliminate the procreant causes. Eliminate the alarm after complete cooling.
2. ‘0’: Connect with ‘SG’ (OFF)

   ‘1’: Disconnect with ‘SG’ (ON)

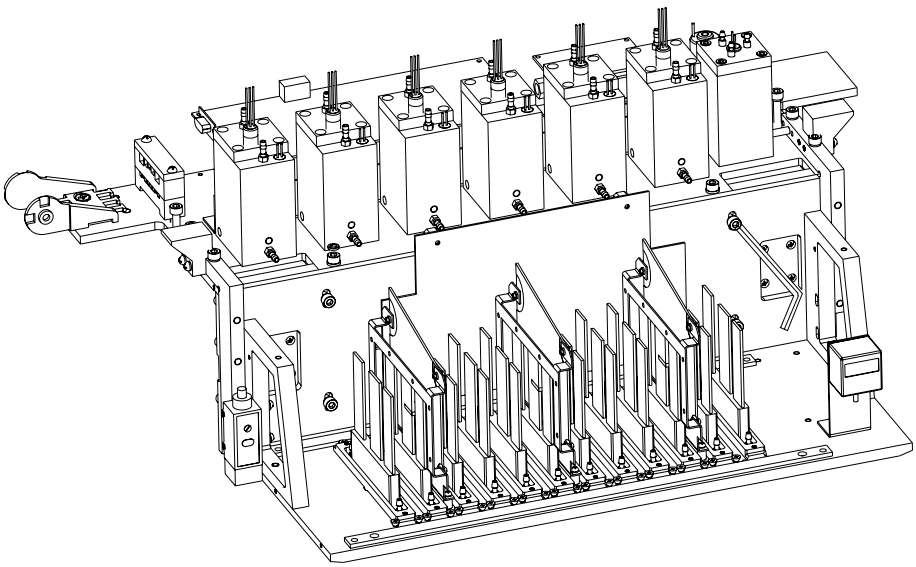
4.5 Improve Printing Quality Method

4.5.1 Printing Gap

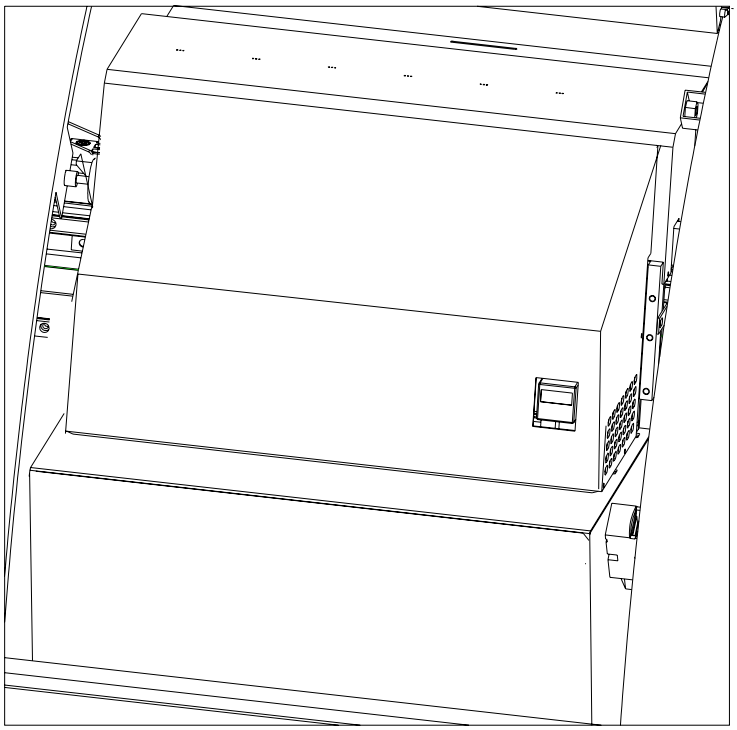
To get good printing quality, print head must be adjusted, to minimize the gap between Print head and material (but not touch material), around 2.5mm to 3.5mm. If the gap is too small, the Print head comes too close to printing platform and is influenced by heating. This causes clogging, add cleaning times while printing.

See the picture for adjusting printing gap as follow:

1. Loosen and tighten the screw.



2. You can adjust the height of carriage through adjusting the screw on the carriage.
3. Adjust the height of the ink inhalant to ensure the cleaning effect.
   The smaller the gap between the ink inhalant and Print heads, the better the cleaning effect.



4.5.2 Temperature of the Print Head

Temperature of the Print head influences printing quality significantly. Optimal temperature of the jet is between 25° C and 40° C. If the temperature is too high or too low, the jet can malfunction. Therefore, room temperature must be kept constant.

4.5.3 Pre-heating

Material is hot during printing, so ink sprayed on it can melt. For most material, a temperature between 30° C and 45° C is suggested. If the preheating temperature is too low, white lines can appear on the material, since material did not absorb ink evenly, and ink might flow out if quantity of ink is too large. If preheating temperature is too high, cloth can stick on printing platform and lead to a step error. If there are no special requirements when printing wide format pictures, heating does not have to be turned on.

4.5.4 Drying

Drier is used to dry the pictures. Humidity setting enables the picture to be fully dry before it enters the tension roller. If drying temperature is too high, the material sticks and causes a step error, or the cloth can become distorted.

4.5.5 Offset Adjustment for Print Heads

Refer to Chapter 4 in the User Manual.

Chapter 5 Troubleshooting

5.1 Common Problems, Reasons and Simple Eliminating Methods

Problem	Cause	Eliminating Method
Bad material feeding.	Motor screw on Y-axis is loose. Reducer screw on Y-axis is loosened.	Fasten motor screw. Fasten Reducer screw.
Carriage does not move or material does not move.	1. The Start button has not been pressed down.	1.Press down the Start button.
	2. Motor power supply is not on.	2. Switch on motor power supply.
	3. The Print head protector is available.	3. Disable the Print head protector.
	4. Emergency switch is active.	4. Pull emergency switch out/up.
	5. Motor fails.	5. Check the motor.
Material crinkles or deviates.	Not feeding smoothly.	Set down pinch roller, re-feed materials.
Tension is suddenly lost.	1. The tension adjustment is broken. 2. The tension adjustment module is broken.	1. Change tension adjustment module. 2. Change tension adjustment module.
Tension motor does not work	Tension motor is broken.	Change tension motor.
Print head does not work.	1. HV power supply is not on.	1. Switch on HV power supply.
	2. Print head cables loosened.	2. Switch off Head Voltage power supply (not necessary to switch off Printer power supply), re-plug Print head cable firmly, then switch on Print head power supply.

Problem	Cause	Eliminating Method
	3. Print head is clogged.	3. Clean surface of the Print heads by solvent, or use syringe to inject solvent into the Print heads to clean the inside of Print heads.
	4. Software causes.	4. Restart software.
One or half of channel of carriage board don't work.	The channel of carriage board is broken.	Change the carriage board.
Two Print heads in a color channel spray in disorder. Ensure the Print heads have no problem.	1. The color channel on carriage board has problem. Or the IC 1k10 is trustless soldered.	1. Change the carriage board.
	2. There are trustless soldered dot on PCI Image card.	2. Change the PCI Image card.
All twelve print heads do not work.	HV power supply failure	Use multi meter to check HV power supply, power supply wires（30 – 34VDC）.
Random dots printed.	1. The carriage board has problem.	1. Change the carriage board.
	2. The 35V-5V Power supply wire has problem.	2. Change The 35V-5V Power supply wire.
	3. The 37 pins data wire has problem.	3. Change the 37 pins data wire.
While printing, some colors spray in disorder.	Cable broken or not inserted well.	Replace cables (spare cables provided for users) or plug tightly.
Some Print heads spray in disorder.	The carriage board is broken.	Change the carriage board.
Single Print head spray in disorder.	The Print head is broken.	Change the Print head.
Single Print head printed two parts repeated.	The Print head is broken.	Change the broken Print head.
Single color spray in disorder or has random dots.	The Image board is broken.	Change the Image board.

Problem	Cause	Eliminating Method
Voltage output is only 24V .The 40V power supply is not loading and cannot reach 35V.	The 40V Power supply has problem.	Change the 40V Power supply.
Color leakage on the picture.	1. A segment is blocked.	1. Use solvent to clean the surface of Print heads, or use syringe to inject solvent into the Print heads to clean the inside of Print heads; check the sealing conditions of connector and seal it again.
	2. Print head temperature is too low, Print head temperature shall reach 15-30°c, test method: Check software.	2. Increase room temperature to rated figure, or increase protection frequency of Print heads, shorten jetting interval, or make Print heads continuously work to increase Print heads temperature.
	3. There are bubbles in the Print heads, or there are bubbles in ink tube, quality of printing ink is poor (viscosity is too high).	3. Suck it out by vacuum cleaner. Check viscidity of printing ink by ink measuring cup, confirm that the viscosity is within normal range, repeat 9 times, take weighted average every three times.
Sometime there are leakage lines in the printing picture, or sometime there are superposition lines in it.	The main roller is loose.	The reducer is loose. Re-fix it.
There is superposition between each PASS.	Step is too small.	Increase step figure, adjust the step difference in the software.
There is color leakage between each PASS.	Step is too large.	Decrease step figure, adjust the step difference in the software.
The position of cleaning Print heads is not correct.	The zero position and the cleaning width are incorrect in the control software.	Modify the position parameters in the control software.

Problem	Cause	Eliminating Method
When materials move, those in the middle are loose, those at both ends are tight, or the opposite situation.	Pressure of pinch roller is not even.	Adjust length of pinch roller.
The edge checking figure is zero or shows an error.	The linear encoder plug has not been inserted well.	Re-insert the linear encoder plug.
The edge checker (Light sensor) indicator does not work.	The edge checker is broken.	Change the edge checker.
Check edge fail.	The sensitivity of edge checker is not good.	Change or adjust it.
Check edge fail. When the carriage moves left, the position figure on the software status bar is increasing. And when it moves right, the figure is decreasing.	The A\B direction wire of the Linear encoder is connected in reverse.	Exchange the A\B direction wire of the Linear encoder.
The edge checker does not work normally.	The ground wire of edge checker is connected with signal wire in reverse.	Connect the ground wire of edge checker correctly with the signal wire.
Ink supply is deviant.	1. Ink supply wire has problem. 2. Ink supply card has problem.	1. Change the Ink supply wire. 2. Change the Ink supply card.
Insufficient ink supply.	Insufficient ink in Ink box	1. Check whether there is no ink in the first ink cartridge; 2. Whether ink pump does not work; 3. Replace filter; 4. After pull out/plug in power supply, activate ink supply system.
	No ink in the ink tank.	Add ink.
	Filter is blocked or has air leakage.	Replace blocked filter.

Problem	Cause	Eliminating Method
An ink indicator of a color is always lit, but another color pump is working.	The Ink pump wire on Ink supply card is falsely connected with the Ink level checking wire on carriage board.	Check the connection to the ink pump.
Single color ink is not being supplied.	The axis of Ink pump is departed	Change the Ink pump.
The secondary ink box can not be aspirated.	Stop machine for a long time, haven't clean the pipeline, the tube blocked from the second ink tank to the Print head	Cleaning secondary ink tank and Print heads pipeline with cleaning solvent.
Ink tube connector leaks.	Thin ink tube and bushing are partially cracked.	Remove the broke part, reinstall the ink tube.
Ink flows out from the secondary ink box, the corresponding ink pump can't be stop.	The ink tube not been cleaned for a long time the ink level sensor is pasted by ink.	Dunk the secondary ink box with the solvent for 1.5 hours.
Ink pump works but ink can't be supplied.	Ink input or output one-way valve break down.	Change the one-way valve.
Ink pump leaks	Air cell of ink pump breaks.	Change the air cell of ink pump.
Single color ink supply smoothly.	Ink overtime or not good kept. Ink solvent volatilizes.	Clean the corresponding tube, use the qualified ink.
When cleaning Print heads (automatically), X-axis and Y-axis stop moving suddenly.		Check display of servo controller, if no display, then check motor circuit; if there is display, check displayed data.
During printing, the start position of carriage move to left little by little.	X axis lost the pulse.	Chang the X axis servo control wire.
The carriage still moves to the left after reset.	Grounding not correctly, affect the control of servo.	Grounding correctly.
The noise of the X axis reducer is loud.	The reducer breaks down.	Change the speed reducer.

Problem	Cause	Eliminating Method
The X axis motor makes noise.	Motor resonance.	Decrease the X axis servo controller P02 (minimum is 101).
The movement is not under control.	1. 25 pins wire burnout. 2. Servo card break down. 3. PCI image card break down.	1. Change the 25 pins wire. 2. Change servo card. 3. Change PCI image card.
The air spring of the cover loose, the cover moves down and up.	The air spring broke down.	Change the broken spring.
Very hot after heating, shows the FFF.	Solid relay or thermocouple burn out.	Change the solid relay or the thermocouple.
Pre-heating temperature is very high.	Solid relay break down.	Change the solid relay.
Y axis main roller loose, reducer break down.	Motor or reducer break down.	Change the motor or the reducer.

5.2 Appendix

5.2.1 Installation Preparation Questionnaire

1	An empty receiving area of 7mX5m (23x16.5 ft) is available on site in order to lift the printer from the delivery truck and rotate it for transporting to the site.	❑ Yes	❑ No
2	Forklift of 3 tons and up will be ready upon printer delivery	❑ Yes	❑ No
3	The entrance to the site is at least 1.8m (5.9 ft) in width and 2m (6.6 ft) in height.	❑ Yes	❑ No
4	The space of work is at least: 6.35/7.05m in length, 3.83m in width, and 3m in height	❑ Yes	❑ No
5	The floor is capable of carrying a load of 250kg/m^2 (51.2 pound/$foot^2$)	❑ Yes	❑ No
6	There is complete and smooth emergency passage in work area;	❑ Yes	❑ No
7	There is a basin in work area	❑ Yes	❑ No
8	The site equipped with a solvent ventilation system to suck all the gas from the printer and capable of replacing air at least 8 times per hour, and intake low enough to avoid collection of gases near the floor	❑ Yes	❑ No
9	Air conditioner in work area ensures temperature in work area to be 20-29°c, and humidity must be 60%-80%;	❑ Yes	❑ No

10	An air compressor with the below capabilities is avalailble on site: Min: 60 PSI (4.2 kg/cm^2) Max:120 PSI (8.4 kg/cm^2)	❑ Yes	❑ No
11	The site is equipped with the following power capacity: 230± 10V AC, Single phase, 15A/23A	❑ Yes	❑ No
12	At least one or more skillful operators with PC experience, technical knowledge in aspects of electronics and mechanism, have pre-printing and after-printing process knowledge with respect to color is attended on site.	❑ Yes	❑ No

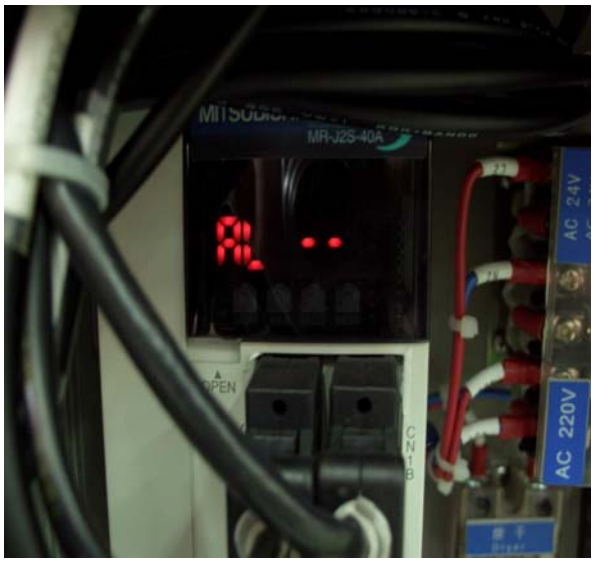
***** To avoid incurring charges for Matan engineering personnel waiting onsite for preparations to be completed, complete the checklist according to your situation and return to Matan in advance of installation (e-mail: support@matanprinter.com, Fax: 972-3-9039947)

5.2.2 Adjustment Parameters of Servo Controller

- Parameters setting:

In order to check the driver parameters follow the instruction below:

1. Open the driver cover.



2. Push the “Mode” key 4 times till you reach P_XX.
3. Use the “UP / Down” keys to move between programs. Start with program number P00.
4. Push the “Set” key to see the content of the program.
5. Compare the content of each program to the below tables. Be aware that every type of printer has different sets of parameters.
6. if the parameter in the driver does not match the parameter on the tables below modify it by pushing on "Set" (the content will be flashing) and change it by the " Up/Down" keys. Press "Set" key again to lock the new parameter.
7. Use the "Up/ Down keys to move to the next program.
8. Check all the programs in both the X and Y drivers.
9. When you finish, push and release the E.S. button.

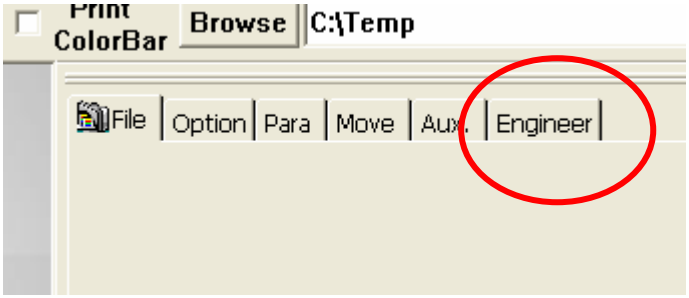
JetSet 2.5i/3.2i (Hitachi heads)				
X – Motor			**Y - Motor**	
P00	00		P00	00
P01	02		P01	02
P02	105		P02	105
*P03	1911		*P03	1070/9934
*P04	10		*P04	10/100
P05	100		P05	100
P06	34		P06	43
*P07	10		*P07	10
P08	100		P08	100
P09	500		P09	500
P10	1000		P10	1000
P11	0		P11	0
P12	0		P12	0
P13	0		P13	0
P14	0		P14	0
P15	0		P15	0
P16	0		P16	0
P17	100		P17	100
P18	0		P18	0
P19	0		P19	0
**P41	0001		**P41	0111
**P51	0100		**P51	0100

** In order to set P41/P51 parameters you must first set P19 to 00E and then shut down the driver power. Power on the driver and set all the other parameters according to the above table. When finished re-set P19 to 0000 and shut down the driver power again.

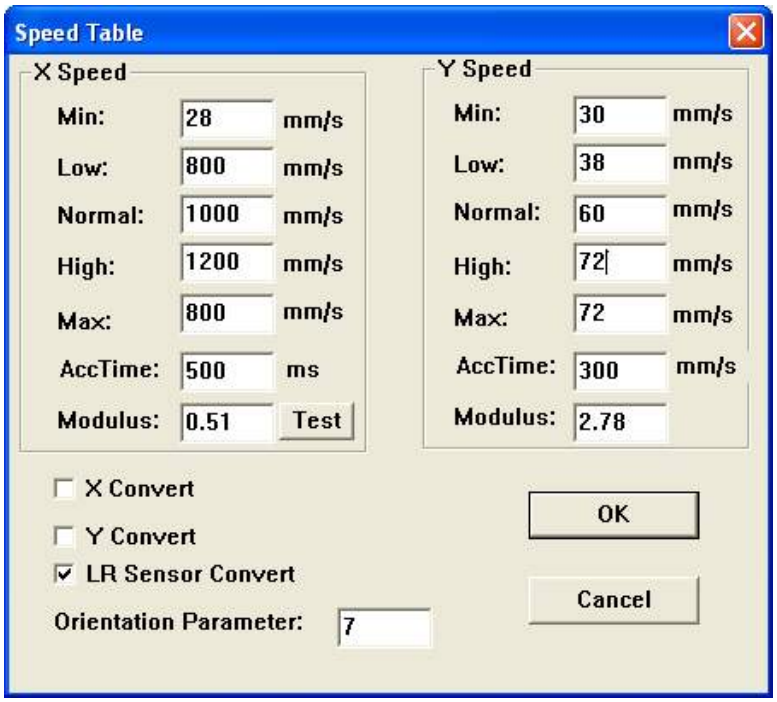
Only then all the parameters will be saved in the driver.

10. After you checked and set the motor driver parameters you also must check the parameters of the speed, located on the Engineer folder in the software. In the JetSet software, choose the tab called: "Engineer", the factory setup password is: "Shift + TJ".

11. If you would like to change the password push the "<<" button and enter the new password.



12. At the bottom of the window choose the "Move Property" option to enter the "speed table" window, as shown below:



The Speed Parameter For JetSet 2.5i / 3.2i (Hitachi Heads)			
Speed of X axis		**Speed of Y axis**	
Min	28mm/s	Min	30mm/s
Low	800mm/s	Low	38mm/s
Normal	1000mm/s	Normal	60mm/s
High	1200mm/s	High	72mm/s
Max	800mm/s	Max	72mm/s

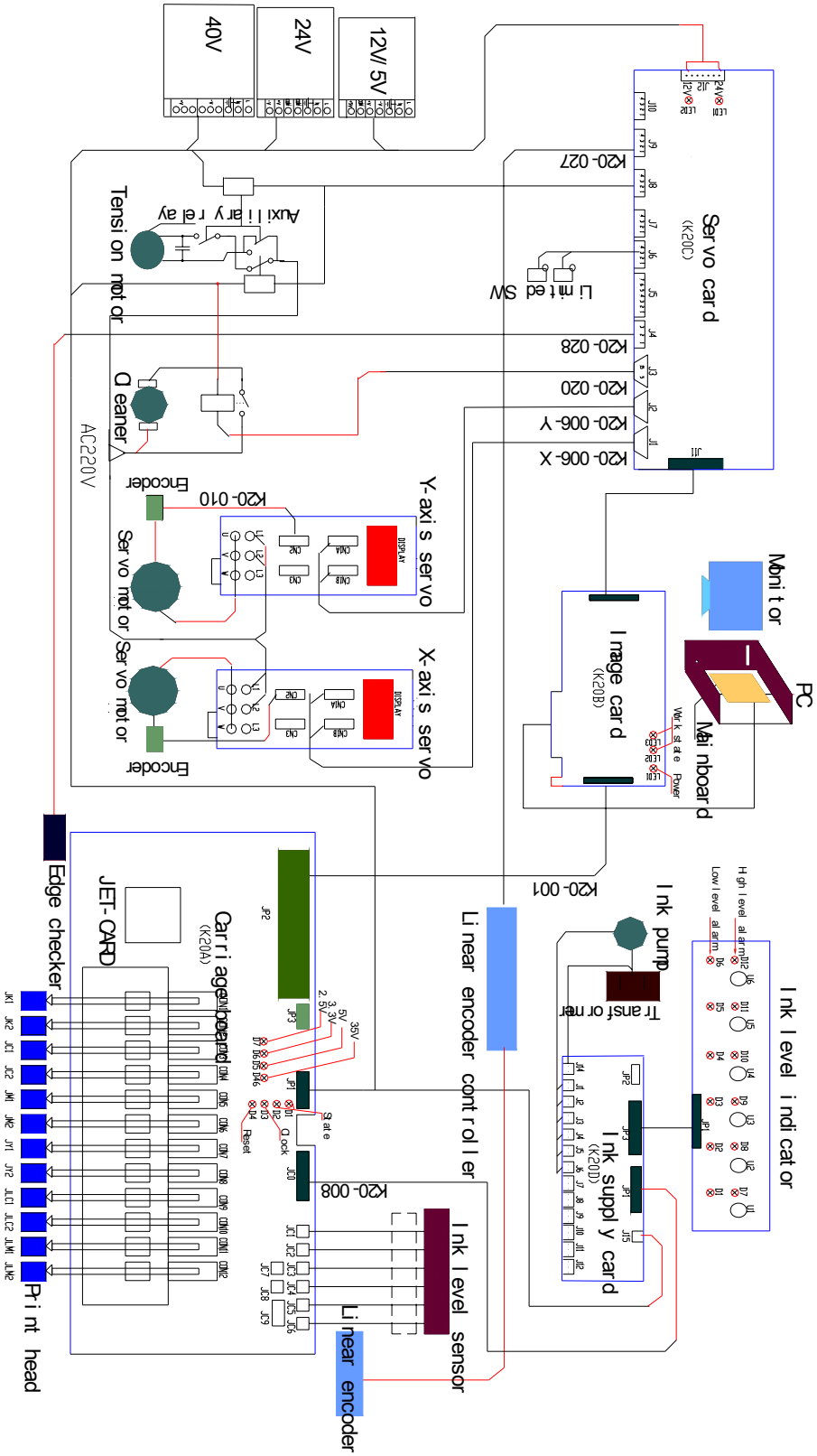
5.2.3 Alarm and Warning Code

Mitsubishi Servo Motor

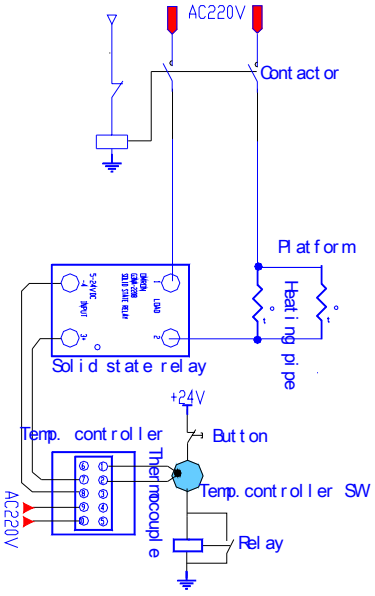
	Show	Note 2 Alarm code			Description	Elimination of Alarm		
		CNIB 19	CNIA 18	CNIA 19		Power shut down → Switch on	Press 'SET' on current alarm code SET	Alarm reset signal （RES）
Alarm code	AL.10	0	1	0	Under voltage	O	O	O
	AL.12	0	0	0	Memory error No.1	O		
	AL.13	0	0	0	Clock error	O		
	AL.15	0	0	0	Memory error No.2	O		
	AL.16	1	1	0	Encoder error No.1	O		
	AL.17	0	0	0	Circuit error No.2	O		
	AL.19	0	0	0	Memory error No.3	O		
	AL.1A	1	1	0	Motor matching error	O		
	AL.20	1	1	0	Encoder error No.2	O		
	AL.24	1	0	0	Motor grounding failure	O		
	AL.25	1	1	0	Absolute position lost	O		
	AL.30	0	0	1	Recycle brake error	O	O	O
	AL.31	1	0	1	Over speed	O	O	O
	AL.32	1	0	0	Over current	O	O	O
	AL.33	0	0	1	Over voltage	O		
	AL.35	1	0	1	Command pulse frequency error	O	O	O

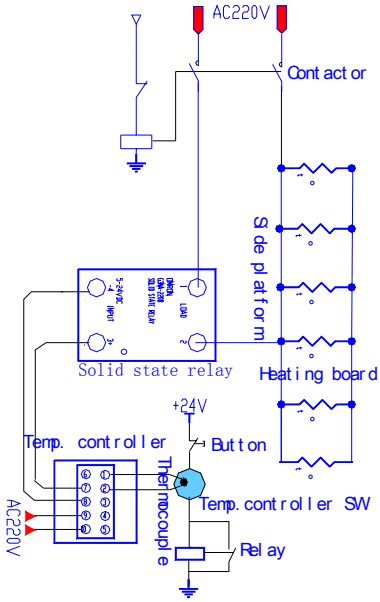
	AL.37	0	0	0	Parameters error	O		
	AL.45	0	1	1	Main circuit parts overheat	O	O	O
	AL.46	0	1	1	Motor overheat	O	O	O
	AL.50	0	1	1	Overload No.1	（Note 1）O	（Note 1）O	（Note 1）O
	AL.51	0	1	1	Overload No.2	（Note 1）O	（Note 1）O	（Note 1）O
	AL.52	1	0	1	Error so big	O	O	O
	AL.8A	0	0	0	Serial communication overtime	O	O	O
	AL.8E	0	0	0	Serial communication abnormity	O	O	O
	88888	0	0	0	Watchdog	O		
Warning code	AL.92				Battery disconnecting warning	After eliminating warning occurring cause, the warning will be eliminated automatically		
	AL.96				Original point setting failure warning			
	AL.9F				Battery warning			
	AL.E0				Recycle brake over current warning			
	AL.E1				Overload warning			
	AL.E3				Absolute position counter warning			
	AL.E5				ABS overtime warning			
	AL.E6				Servo motor abnormal stop			
	AL.E9				Main circuit OFF warning			
	AL.EA				ABS Servo ON warning			

5.2.4 Printer Control Module Diagram



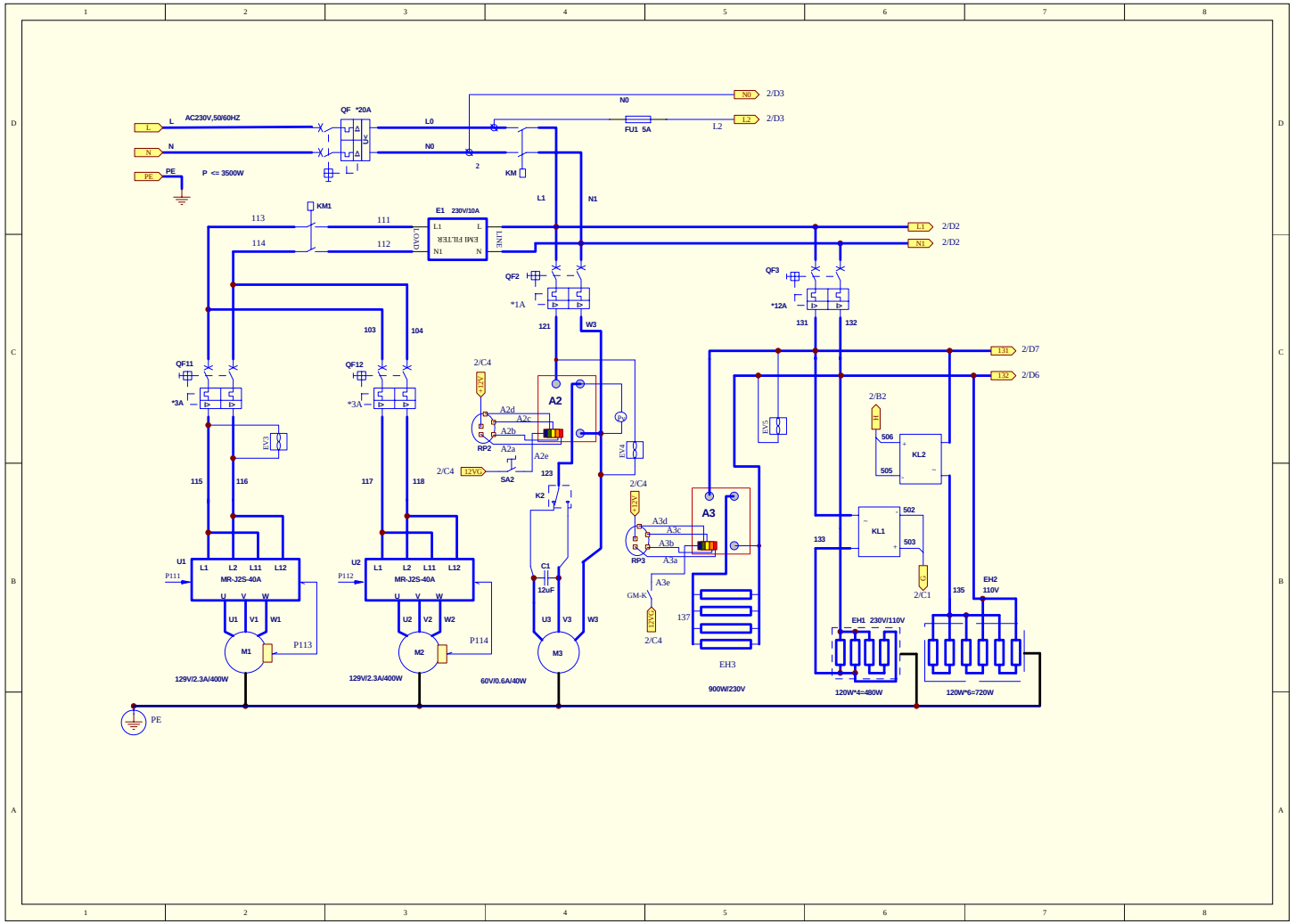
5.2.5 Heating System Control Diagram



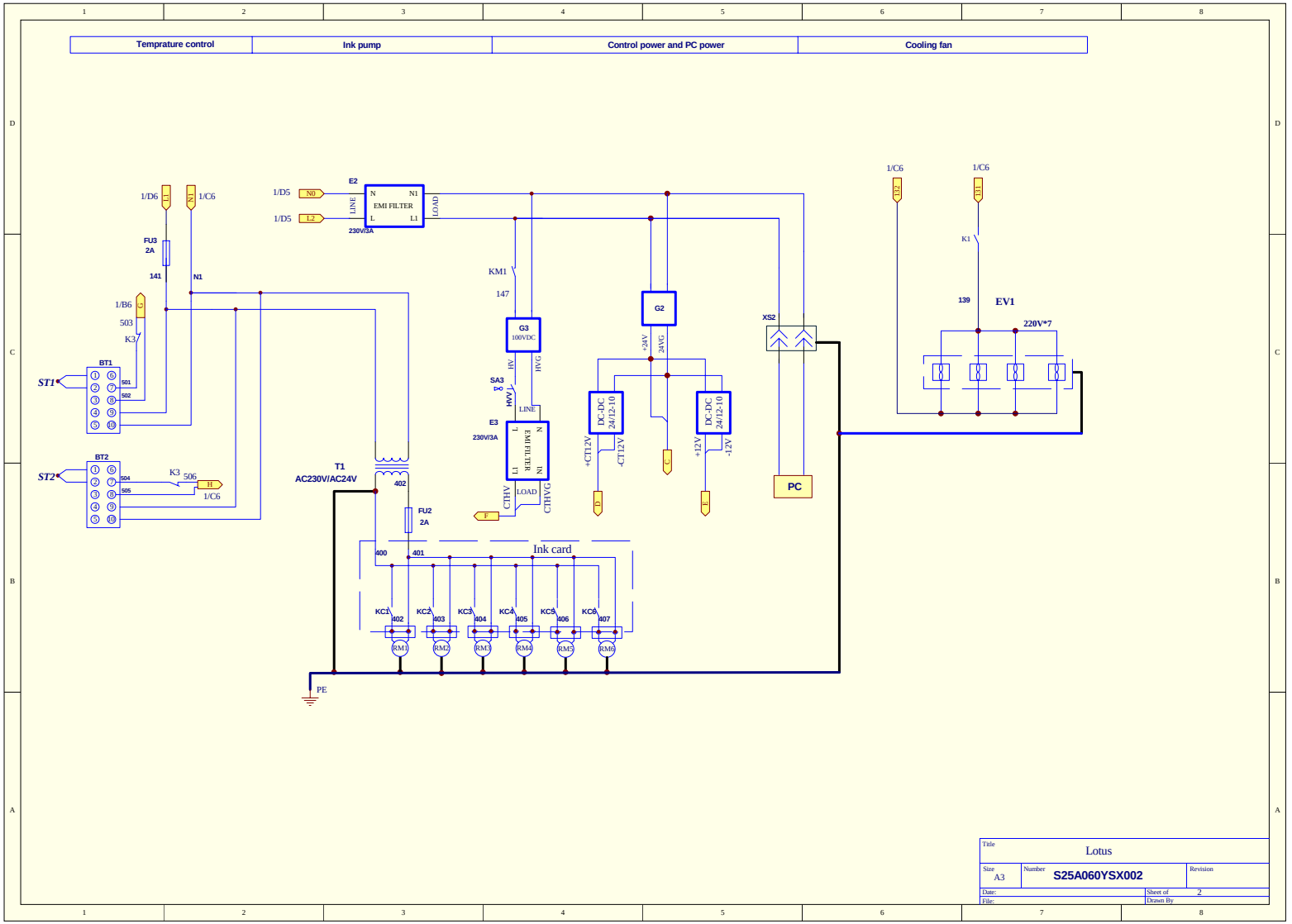


5.2.6 Circuit Diagrams

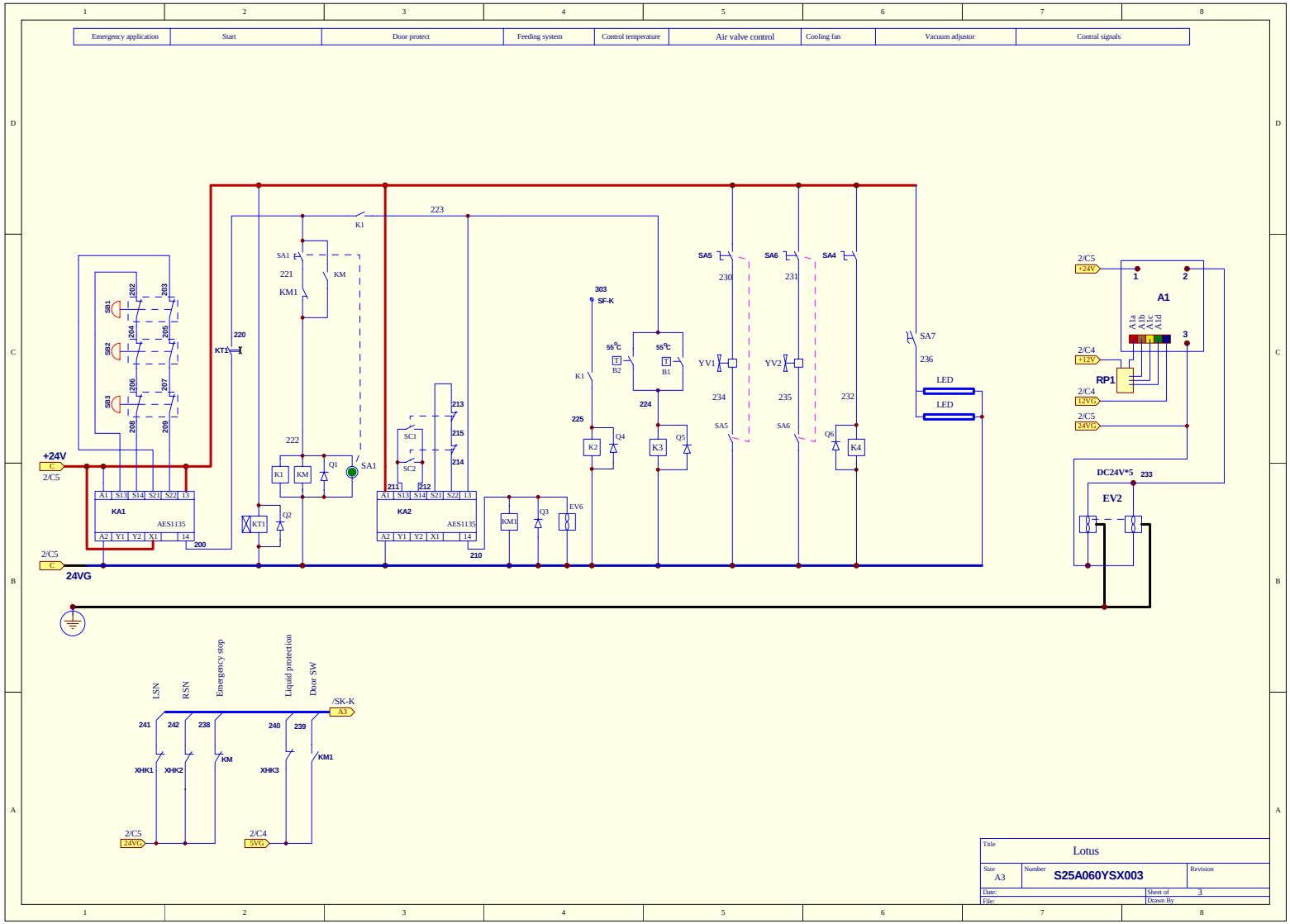
1. Main Circuit Diagram

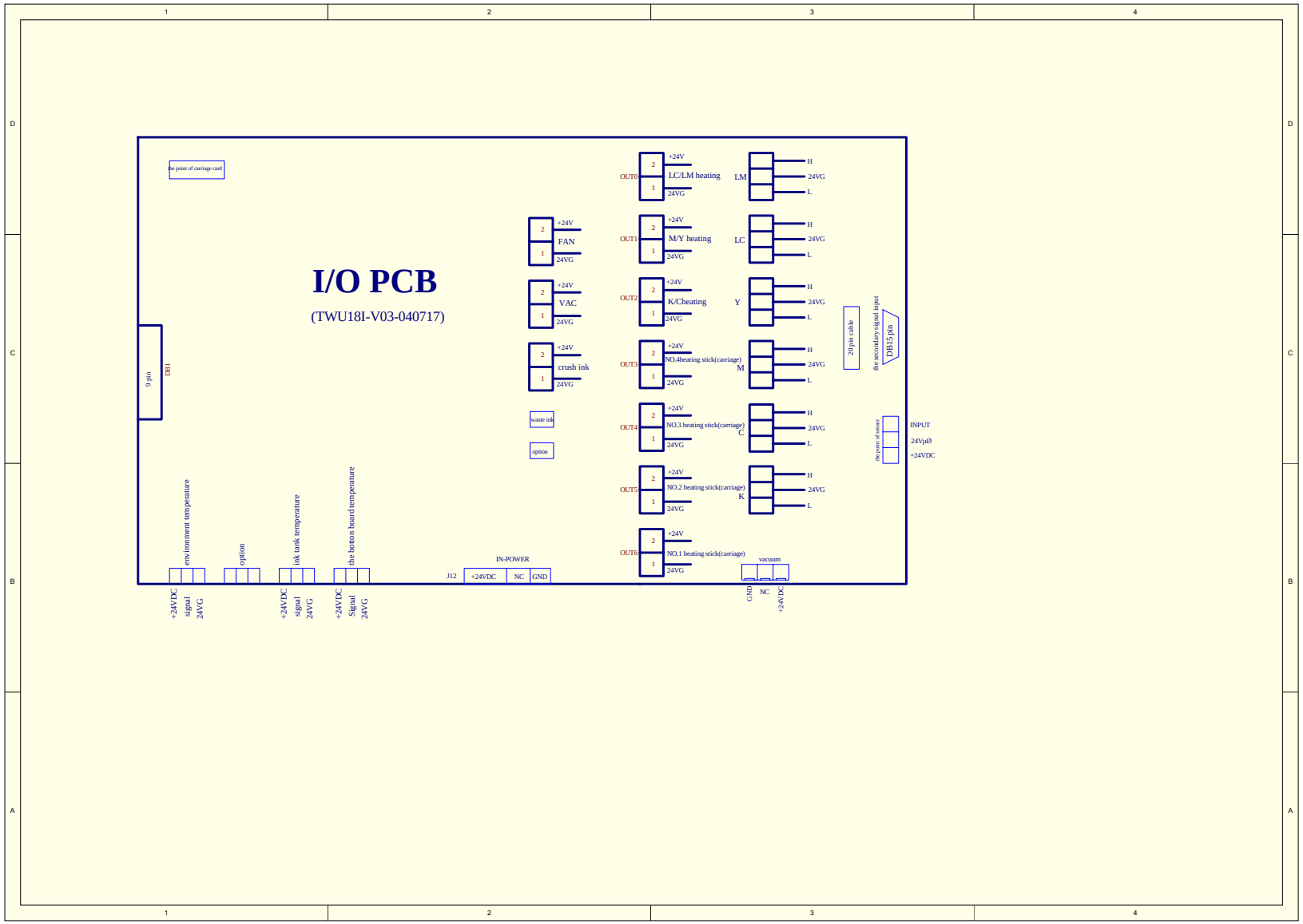


2. Control Circuit Diagram

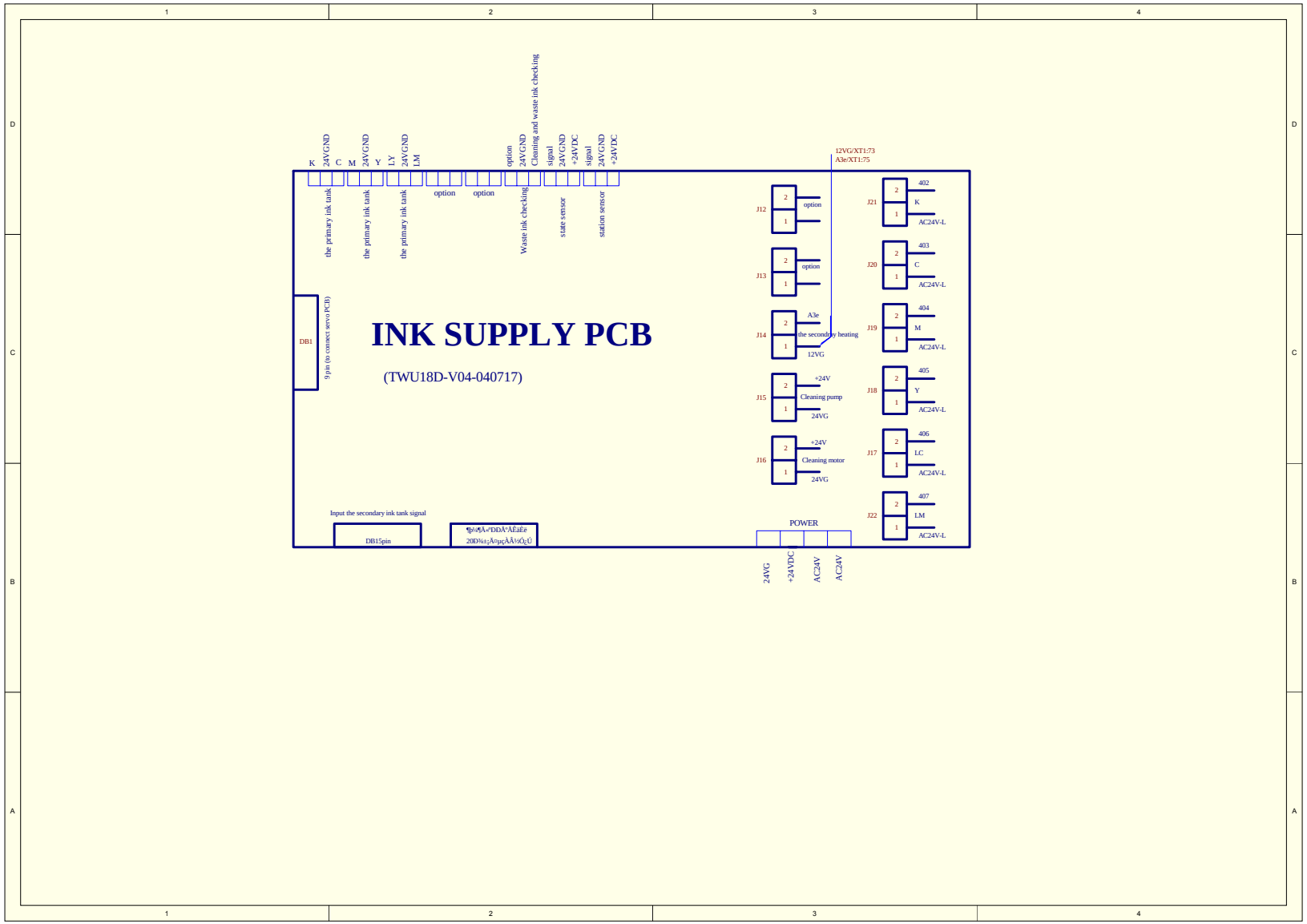


3. Auxiliary Circuit Diagram

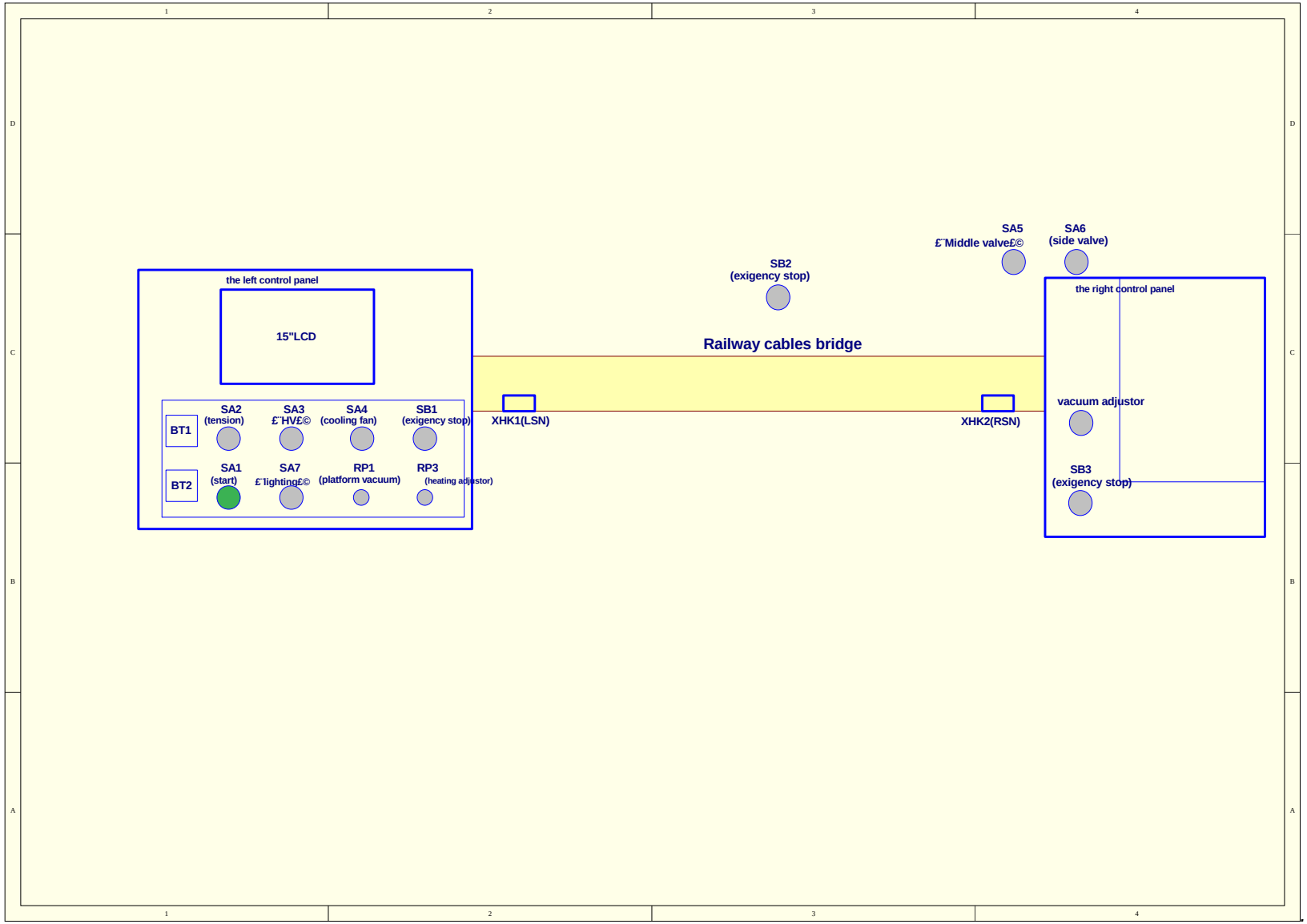



I/O PCB
(TWU18I-V03-040717)
the point of carriage card
9 pin
DB1
+24V
FAN
24VG
VAC
crush ink
waste ink
option
OUT0
LC/LM heating
OUT1
M/Y heating
OUT2
K/Cheating
OUT3
NO.4heating stick(carriage)
OUT4
NO.3 heating stick(carriage)
OUT5
NO.2 heating stick(carriage)
OUT6
NO.1 heating stick(carriage)
LM
LC
Y
M
C
K
H
L
20 pin cable
the secondary signal input
DB15 pin
the point of sensor
INPUT
24VμØ
+24VDC
environment temperature
option
ink tank temperature
the botton board temperature
+24VDC
signal
24VG
Signal
IN-POWER
J12
NC
GND
vacuum

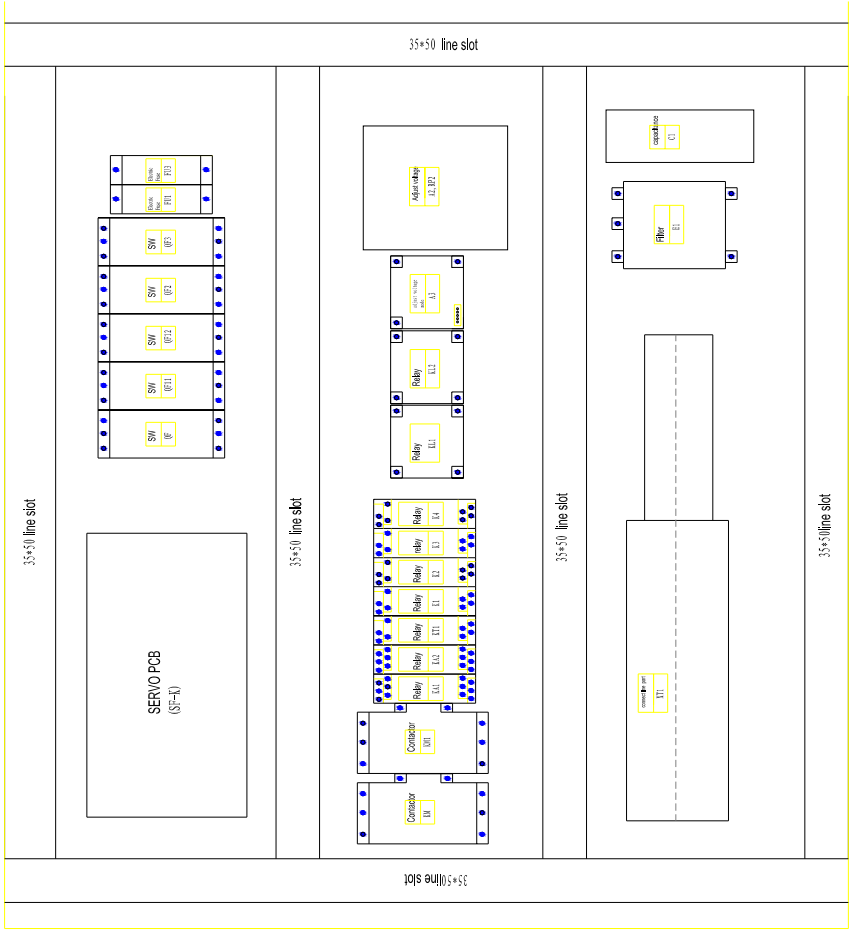
5. .Ink Supply Diagram



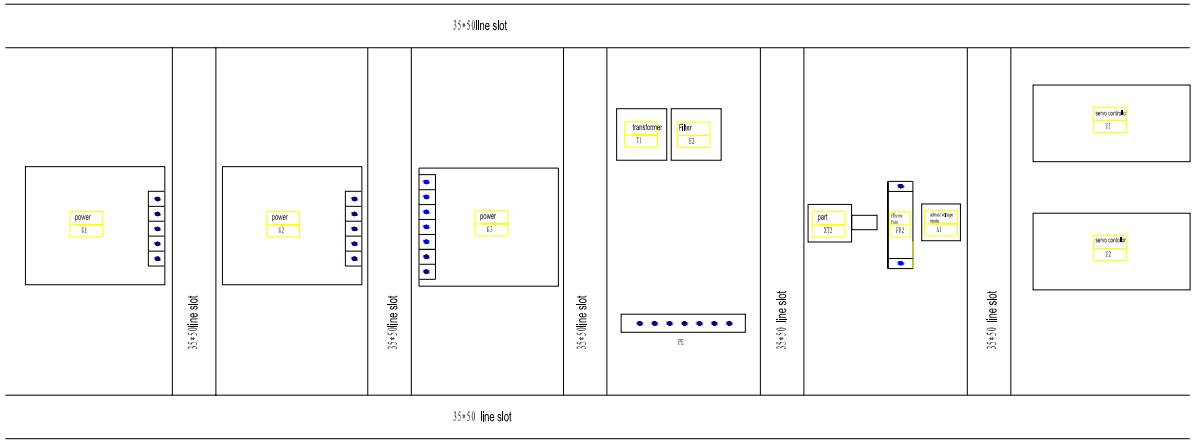
6. Panel Control Diagram



7. Installation Diagram of Left Box Body from Back View



8. Installation Diagram of Left Box Body from Front View



9.Connection Diagram of the Whole PCB