CONTENT

Preface

Thanks for purchasing the digital ink jet printers of Xaar128/128+ serial products.

☆ In order to insure the correct and safe operation based on the complete mastery of the product performance, you are required to read the operation guide very carefully.

☆The operation guide and printing procedure of Allsign Company are only available for the legal ones authorized by Allsign. The legal ones are prohibited to copy, revise, exchange, or publicize the contents via Internet or in any other ways. Any one who acts against the above-mentioned must take the rap and the civil compensation responsibility.

☆It will not be informed if there is any modification in the operation guide and the product parameter.

☆We will be much appreciated if you could inform us any fault, even though we have tried our best to edit this operation guide and inspect our products.

Ningbo Allsign Trading Co., Ltd

Notice

In order to contact us conveniently, our service system is informed as below:

Please consult our operation guide at first to get the most direct assistance.

Please visit our website (www.ChinaPrinter.com.cn) to obtain the technique support. We will offer some solutions for the newly discovered technical problems.

Call the Technology departments of our agents all over the world and the branches of our company in China.

Call After-sales service department in Allsign factory. Working hours: 8:30—23:00； Technical professionals: 20：00—8：30; If you fax, please send the detailed information. Our professionals will contact you in time.

Online technique support:

Email: Support@ChinaPrinter.net

Ningbo Technique Centre

If convenient, please send the trouble picture to us via internet.

Ⅰ. Safety Instructions

1. Important Safety Instructions

- Please read following instructions carefully before using machine: warning and instruction marks on printer must be followed strictly
- Hatch on crust of plotter must not be blocked
- Do not insert anything into the slot of printers and spill any liquid into printer
- Use the indicated power supply specifications only; AC 110v and AC 220v can be selected according to different countries or regions
- Connect the plug of the cable to a grounded socket;
  it should be avoided to use the same loop as copy machine or air conditioner does, which need to open and close from time to time
- Avoid using the socket that is switched on a wall or controlled by automatic timer;
- Keep your computer system far from interference source of potential electromagnetism, for example, loudhailer or telephone set seat without line;
- Using damaged or attrited power line is not allowed;
- If additional power line is used, please make sure the total amperage of the equipment that connected it must not exceed rated amperage of this power. Besides, the total amperage of the equipment that
  Notes: The total amperage of the equipment that inserted in this additional power line must not exceed rated amperage of this power if additional power line is used, in addition, the total amperage for full equipment that inserted in wall must not exceed rated amperage of the receptacle on wall;

2. Attention items while using printer

- Do not move printhead while starting ,otherwise plotter may be damaged;
- Always shut off printer by using power button, power will be cut off when this button be pressed down; plotter's plug or data cable must not be pulled out before cutting off power;
- Make sure Printhead should be ensured in the home position before moving plotter, and which must be fixed.

3. Precaution in handing the ink cartridge

- Store ink cartridge in a place that is out of reach of children;
- If ink settles on the skin or clothes, immediately wash it off with detergent or water; if you get ink in your eyes, immediately wash your eyes with a lot of clean water
- Do not shake the ink cartridge violently; shaking or turning it roughly can cause leakage of ink.
- After three month using ,Ink tank must be taken off to clean and dry thoroughly, keeping clean while change old one with new ink tank

4 Warning、caution and note

- **Warning**
  Warning indicates the case where it is assumed that misuse of the machine, ignoring the sign ,as this may cause fire or poisoning, be sure to read this manual for proper operation
- **Caution**
  Caution indicates that the case where it is assumed of machine, ignoring this sign, can cause damage to the property
- **Note**
  note: indicates helpful information that will facilitate the use for the device

Ⅱ. Machine description

1. Brief introduction to products

1.1. Main features

- **Machine features**
  - England long working life piezo XAAR128 printhead, which can control each ink drops, has very good corrosion resistance. Therefore it can precisely adjust subtle tone of pictures, which can provide high quality outdoor pictures with vivid and coincident colors.
  - Automatic printhead cleaning system can always keep printhead in the best working status, and automatic flash weep function after starting machine can effectively prevent printhead from drying.
  - Automatic printhead cleaning function is adopted, Printhead can get cleaned and maintenance in time only need to click cleaning function in interface menu, which can prolong the printhead's life and avoid the inconvenience brought by dismantlement and washing. Therefore, high-efficiency, safety, convenience, and fast can be achieved, and nobody operating on duty can be realized.
  - Sucking controlled Media feedback-supply system ensures media can be fed steadily and avoid picture damaged caused by media sticking, which is the guarantee of realizing high output and resolution.
  - The imported linear guide rail effectively eliminates the impact of the vibration caused by carriage running which can affect the printing resolution. So, printing quality is greatly improved.
  - Liquid level sensor of primary and secondary ink tank and automatic alarm system can sense any changes of liquid, which can avoid damaging pictures caused by lack of ink.
  - Preheating system is installed inside, which ensures ink and media dissolves each other quickly. Consequently, not only outdoor duration of pictures is advanced, but also the range of material is extended. Each kind of banner, P.P, adhesive vinyl, PVC, mesh fabric, etc. can be printed with perfect quality.

- Hardware

  Light fibre data transmission system, solved interference problem;

  Double bearing servo motor run control system.

- Software

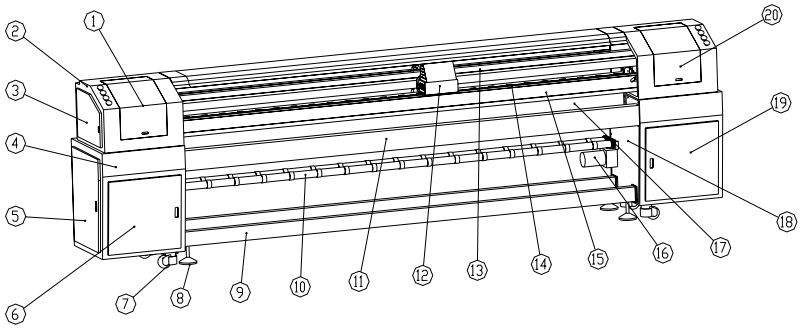
  ①Support all popular desktop file formats such as PDF,TIFF,PSD,EPS,PS

  ②Strong RIP software provides a resolution of 180x740DPI、240X555DPI、240X740DPI、360X740DPI. RIP and printing can be operated at the same time.

  ③Excellent ICC color revision and reversion function can exactly present picture color**,** and the surface of picture is vivid and shining, with a clearly layer which can present clear letters and brilliant color.

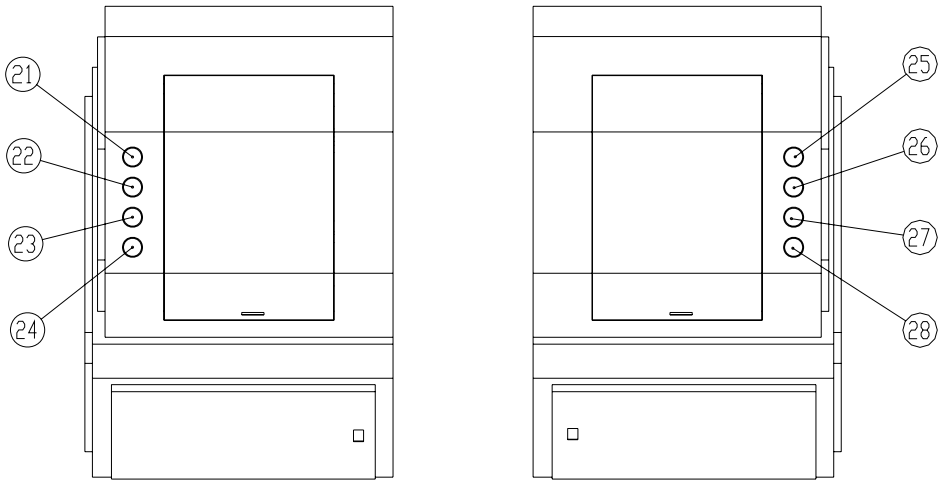
2. **Main components introduction**

The Front



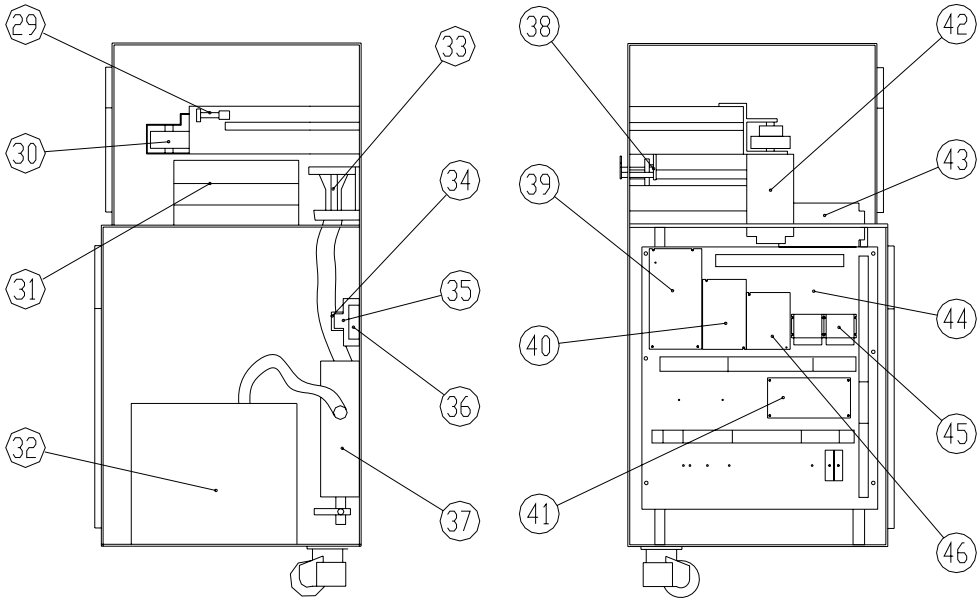
1. Front cover	2. Left-upper case	3. Left-upper case side lid
4. Left –down case	5.Left-down case side lid	6.Left-down case front lid
7.truckle	8. Bolster foot	9. Down transom
10. Media feeding rollers	11. Fan hood assemblies	12. carriage
13. Upper transom	14. Sucking flat	15. Front-hood
16.Media feeding motor assemblies	17. Main girder	18. Right wall board
19.Right-down case front lid	20.Right-upper case top lid	

Upside of left box **Upside of right box**



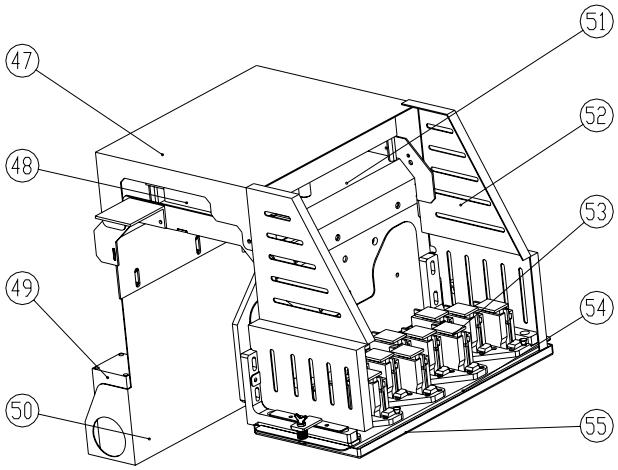
21.Emergency stop button	22.Front-hood heating button	23.Back-hood heating button
24.Feed motor button	25. Emergency stop button	26.printhead voltage button
27. Flat sucking button	28.Air-dry button	

Left box front-overview **Right box front-overview**

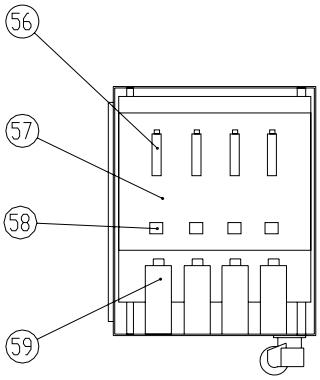


29.Buffer device	30.Extension pulley assembly	31.Cleaning case
32. Vacuum	33.Cleaning device	34. Relay
35. Vacuum socket	36.Row with connection	37. Cleaning filter
38. Impacting setup	39. 24V switch power	40. 24V switch power (printhead driver)
41. Mainboard	42.Carriage conveying assembly	43.Media feeding assembly
44. Electrics control installation board	45. AC driver	46. 12V switch power

Carriage

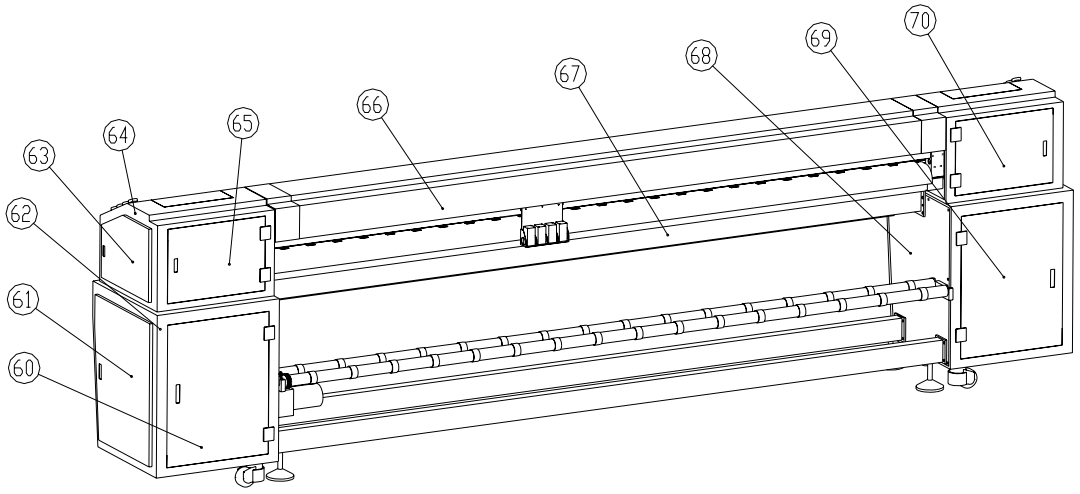


Rear right downside overview



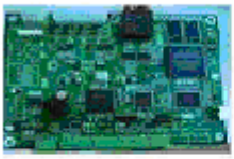
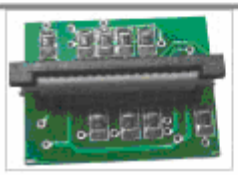
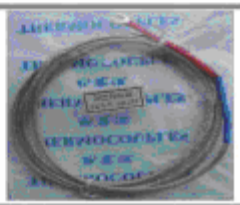
47.Carriage back-hood	48. Carriage circuit board	49. Ink tank
50. Ink tank bracket	51. Carriage bracket	52. Carriage front-hood
53. 128+ printhead	54. Carriage soleplate	55. Soleplate for keeping wet
56. filter	57.Ink pump installation board	58. Ink pump
59. Primary ink tank		

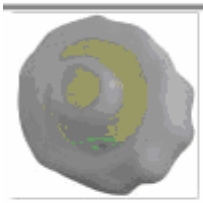
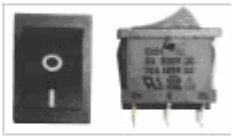
Exterior rear-overview

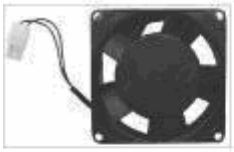
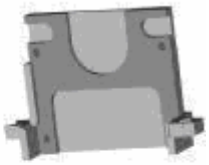
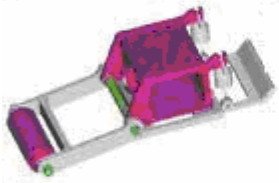
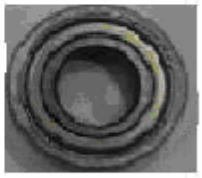
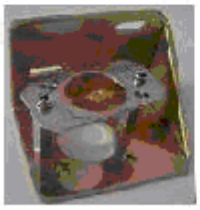


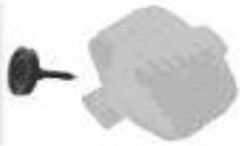
60. Back lid of right down case	61. Side lid of right down case	62. Right down case
63. Side lid of right-upper case	64. Right-upper case	65. Back lid of right-upper case
66. Middle hood	67. Back hood	68. Left wall board
69. Back lid of left down case	70 Back lid of left-upper case	

3. Spare parts distinguishing

	carriage board	USB cable	
	main board	fiber	
	raster bar	encoder	
	printhead interface board	temperature sensor	
	printhead cable	temperature protecter	
	media sensor	DC ink pump	
	air pump	relay	

	electromagnetism ralve	button switch(green)	
	ink insorb tube connection	photoelectricity sensor	
	ink coming tube connection	click switch	
	ink insorb tube connection cap	substrate sensor	
	ink supply tube connection	limit switch	
	general power supply switch	air brake	
	button switch(red)	temperature controller	

 cold fan	driver motor 
 bed vacuum fan	printhead bracket 
 belt	roller middle bracket 
 pinch roller	printhead soleplate 
 drive pulley	bearing 
 motor uphold subassembly	

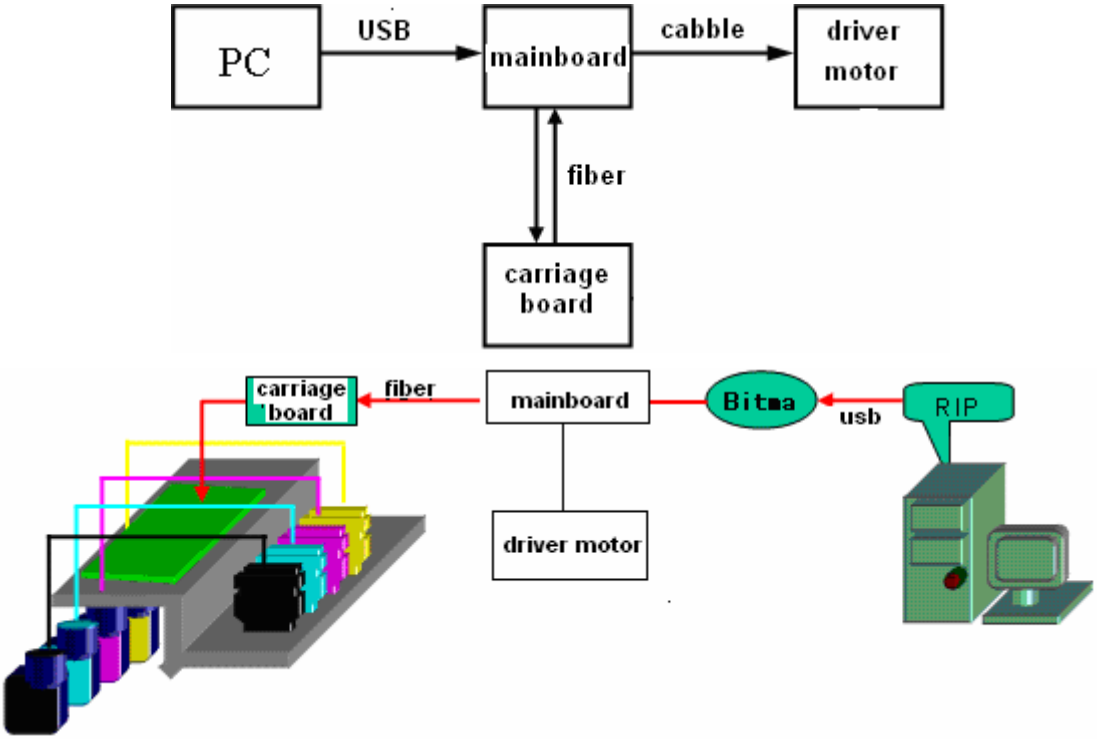
	ink tank	6A fuse	
	ink pump	12V3A power supply	
	bellow	24V6A power supply	
	soft tube	24V10A power supply	
	filter	35V3A power supply	
	ink sensor	driver motor	
	10A fuse	feeding motor	

4. **Electrical components**

ALLSIGN Xaar 128+ printhead digital inkjet printer's electrical parts consist of computer image processing system, servo control system, ink supply control system and heating system. Brief introduction to the working principle of each component is as follows:

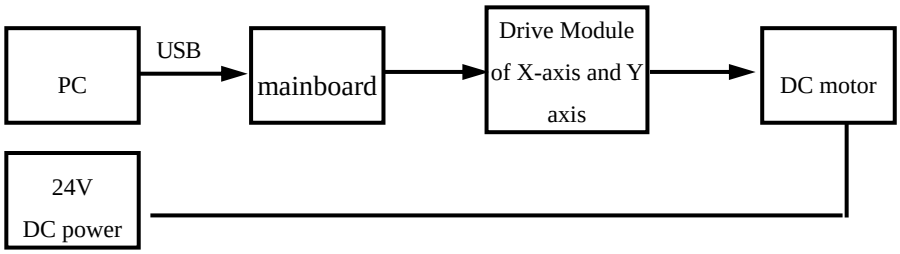
4.1. Computer image processing system

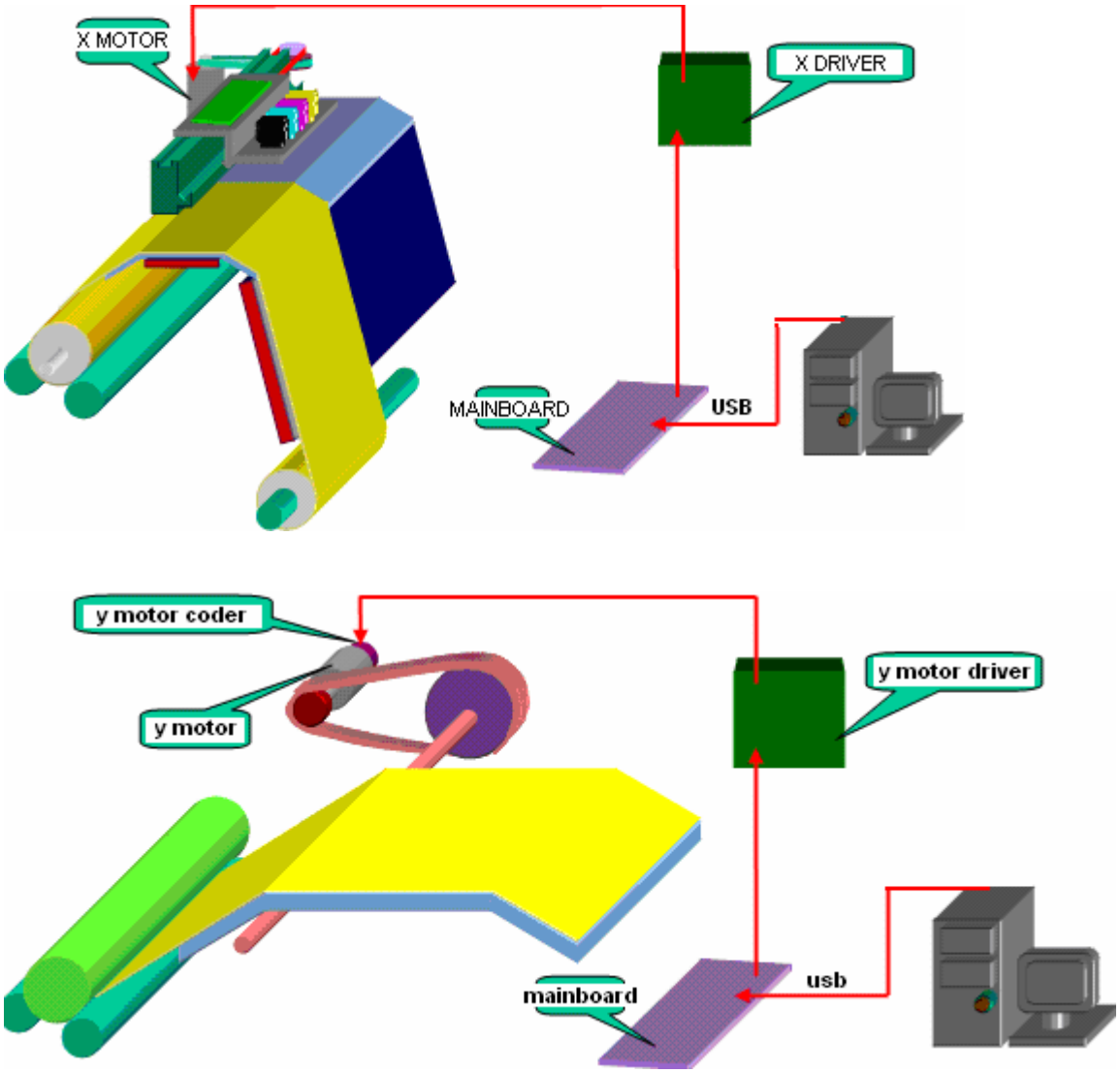
ALLSIGN 128+ digital inkjet printer image processing task is finished by computer image processing system which mainly consist of computer、image transmission parts, printhead control components. Its working principle is: Firstly, image information is processed by computer. Secondly, the processed information is sent to image transmission components. Then, the information is sent to printhead control components and pictures is to be printed.



4.2. Servo control system

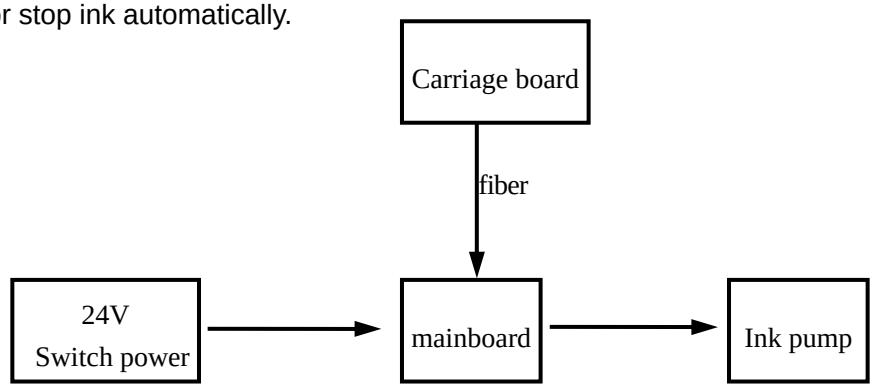
ALLSIGN 128+ digital inkjet printer's servo control system consists of computer、mainboard、X axis servo control system、Y axis servo control system. This part mainly accomplishes the control of X axis running and Y axis feeding of printhead.

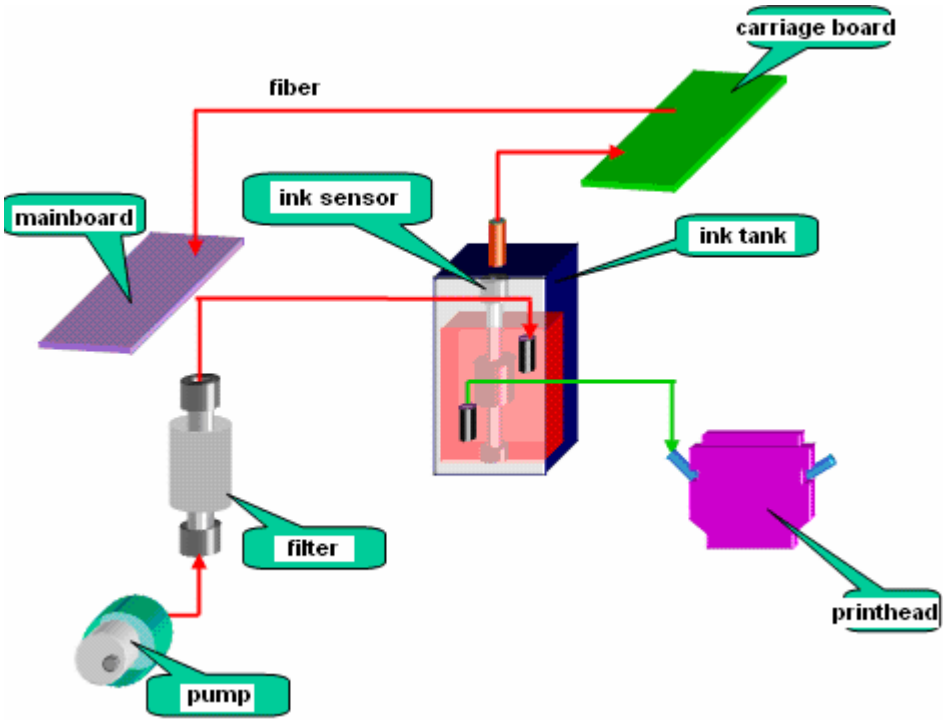




4.3. Ink supply control system

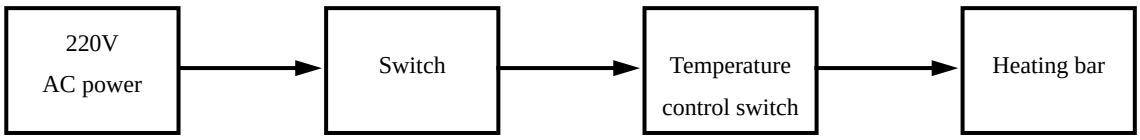
ALLSIGN 128+ digital inkjet printer's ink supply control system consists of mainboard, primary ink tank, secondary ink tank, ink pump and ink level sensor, etc. Its main task is to supply ink. The ink level sensor senses the ink level and sends the level information to mainboard to control the ink pump, which can supply or stop ink automatically.





4.4. Heating control system

ALLSIGN 128+ digital inkjet printer's heating is mainly to meet the technical demand to ensure the quality of printing pictures.

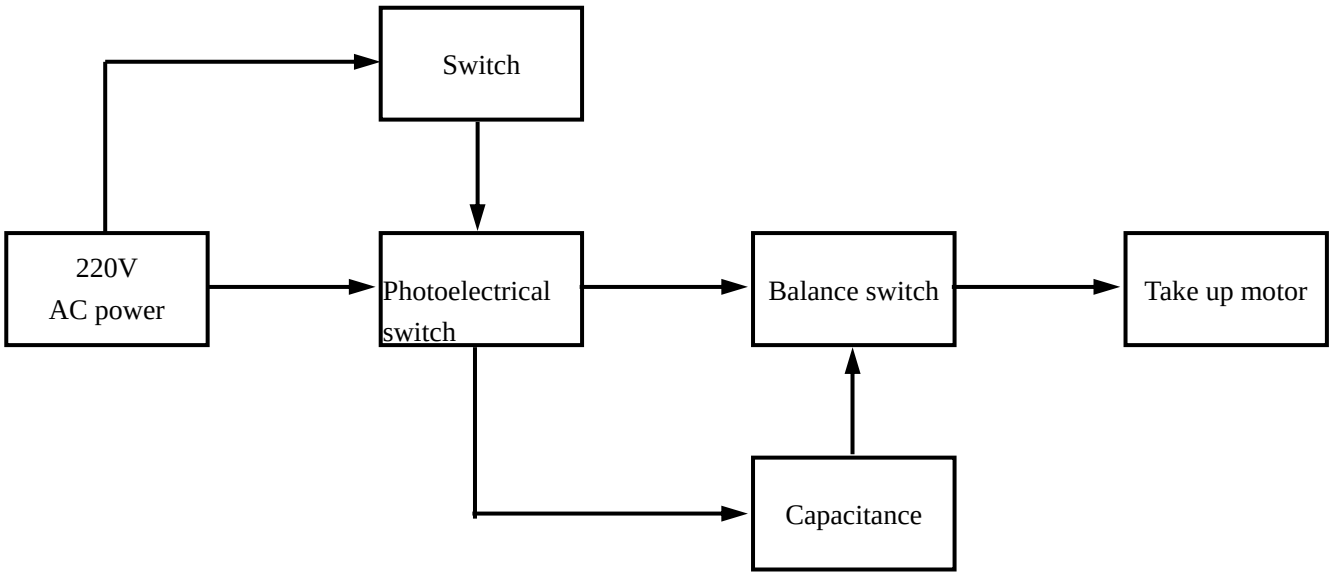


4.5. Electricals control and function instructions

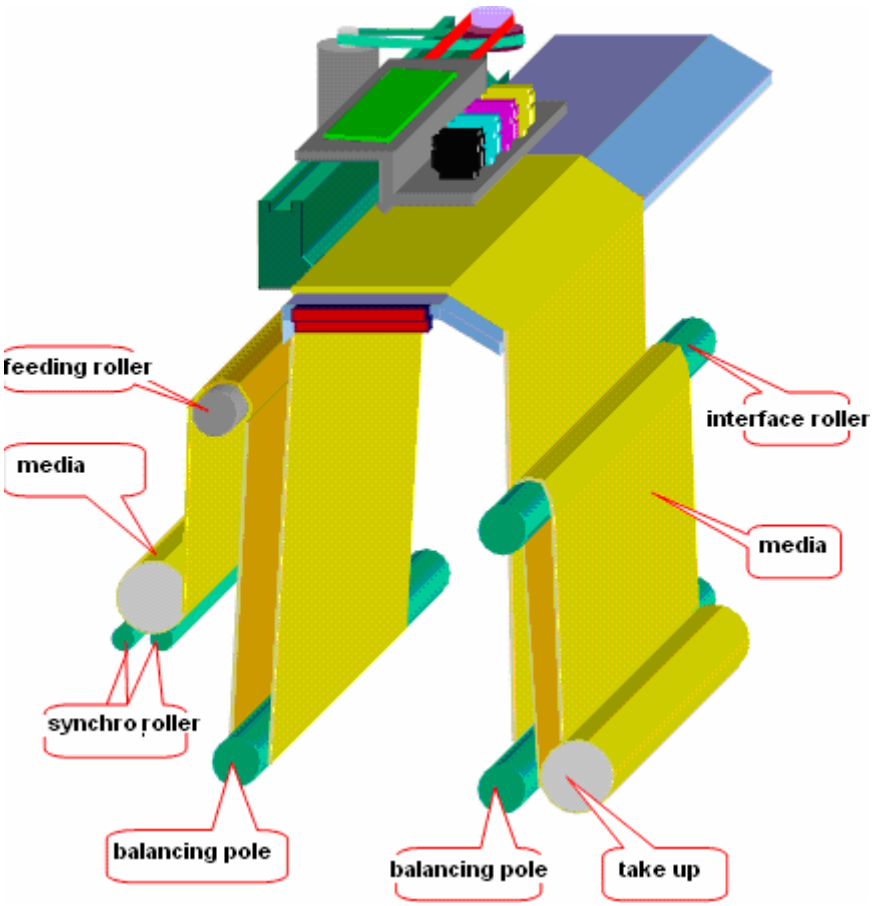
Mainboard	Control printer running
Main switch	Turn on or turn off printer power
Heating switch	Turn on or turn off preheating and drying circuit power
Control switch	Turn on or turn off HV DC power
Emergency stop switch	Stop X direction running when press down
Fan switch	Fasten solidifying of ink on which print pictures
Sucking switch	A fan motor is installed inside of printing flat which makes media more tidily adhere to flat surface
HV switch	The switch for carriage board power (35V)

5. Introduction to the Structure and Function of Feed and Take up System

5.1 Components of Feed and Take up Structure



The structure of feed and take up system consists of 5 components. They are: ① feed roller assembly, ②main roller assembly, ③extension and tightening roller assembly, ④transmitting-turning roller assembly, ⑤take up roller assembly. It shows in the following pictures:



◆ The function of feed roller assembly: supporting the media and ensure the media will run without resistance and will not flee away.

◆ The function of main roller subassembly: providing drive for material loading and feeding media into the printing flat roof.

◆ The function of extension roller subassembly: extends media, and ensure that the input and output media is level and parallel.

◆ The function of transferring roller: The transition of cloth material is easy for even material receiving.

◆ The function of material receiving roller: Supporting and furling the printed cloth material and supply the drive to receive material.

5.2. Principles of Feed and Take up performance

The functions of feed and take up system are achieved by the running of motor. And it is controlled by photoelectric switch. Its principles are:

◆ While feeding, the photoelectric switch sends a signal if it senses no media, then, the motor runs to feed till the photoelectric switch senses the media. Then, the motor stops.

◆ While taking up, the photoelectric switch sends another signal if it senses media, then, the motor runs to take up till photoelectric switch senses no media. Then, the motor stops

◆ The step of media on the printing flat is achieved by the running of the wheels, which is controlled by software.

Ⅲ. Installation Requirements

1. Preparation before Installation

1.1 Preparation of the site

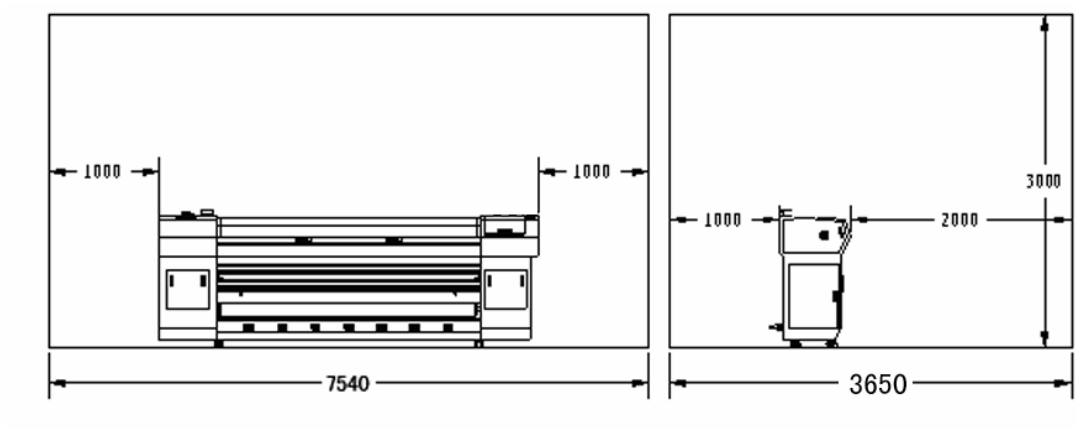
Customers have the responsibility to follow all the instructions of installation and put them into implementation during the operation of machines.

If they don’t do so, the machines probably could not function properly and the consequent revision may incur some costs.

1.2. The working region

The working region means the area close to ink jet plotter (hereafter referred to as equipment), which is shown as follows. What should be especially pointed out is that the users should ensure the safety of operators working in this area.

The working area measures 7.54 m in length, 4 m in width and 3 m in the height of the floor.



picture 1: the schematic plan of the working region around ALLSIGN-3216 ink jet plotter(unit: mm)

1.3. Requirements for Environment

The ink jet plotter should be away from the seaming equipment (cloth seaming machine) or other radio frequency source. The floor is easy to clean and free of dust and static electricity. Fitment of neutral gray color and pure white lighting such as daylight lamp should be used as much as possible in order to help operators and users distinguish the color accurately.
The ink jet plotter should be installed in a clean and dust free environment of which the temperature and relative humidity are controlled in the following range:
Altitude: used under the altitude of 1000 meters.
Temperature: 18 to 28 degrees centigrade.
Relative humidity: 40% to 60%

1.4. Requirements for the Floor

The materials of the floor in the working region should guarantee the safe and even weight dispersion of the system. During the installation, the system should maintain accuracy and precision in order to ensure that printing head moves horizontally in a correct way and avoid gliding and bending.
The materials of the floor in the working region should be free of static electricity and dust. If necessary, clean ceramic tiles, polished cement or anti-electricity carpet could be paved in the working region before the ink jet plotter is installed.

1.5. Requirements for Load bearing

The net weight of X3216A ink jet plotter is 540 kgs and the biggest coil stock usually adds up 50 kgs.
It is suggested to install ALLSIGN printer on four steel plates of 20 centimeters in diameter each or on four steel plates with an area of over 200*200mm and a thickness of over 8 mm each.

1.6. Requirements for Space Reservation

The front of ink jet plotter is the input border. ALLSIGN ink jet plotter is required to reserve 2.0 meters in the front, 1.0 meter at the back and 1.0 meter on both sides. Besides, the space reservation area also

includes a height of 3 meters above the ground. Moreover, space should be spared at the front and back of the machine for loading and unloading media.

1.7. Safety Requirements

◆ Fireproofing

The ink and solvent should be installed in the special store cabinet for inflammable liquid or in the independent storeroom. They should be clearly labeled in accordance with the requirements of the professional safety regulations.

The storage of ink should strictly comply with the local fireproofing regulations of using and storing inflammable matters.

Carbon dioxide or dry powder fire extinguisher should be placed in all the passageways where it's easy to be seen and obtained. They should be put near the X3216A ink jet plotter and the store cabinet for inflammable liquid or according to the local fireproofing regulations.

◆ Aeration

In order to prevent the potential danger of volatile gas storage, enough aeration should be guaranteed to insure 6 to 8 times of air change in the working region every hour. The air outlet should be positioned as low as possible so that the volatile gas could not accumulate around the floor.

The solvent in the ink volatilizes when the cloth is going through the drying apparatus. So an exhaust gas outlet system is needed to discharge the solvent.

Notes: the solvent gas is heavier than the air and will accumulate around the floor.

The electrical apparatus installed near the working region should comply with GB/T standard and the regulations concerning Class I Category II in the National Electricity regulations, and they should be installed by the professional electricity contractors with related qualified specialty.

The regulation of handling the dangerous waste should be in accordance with special storing and disposing requirement set by related sections.

1.8. Electric Requirements

ALLSIGN ink jet plotter uses single phase power supply and is required of good grounding. Its electric resistance is less than 4 ohm.

The range of power supply voltage is 220V (±10%), alternating current is 50Hz or 60Hz. Users should ask professional electrical specialists or contractors to install the output terminal of the power circuits.

All the electronic components of ALLSIGN ink jet plotter share an only one power outlet which has the function of overload protection. The rated values of circuit breaker are as follows:

Power supply/voltage	Alternating current 220V	Alternating current 110V
Single phase	15A/phase	30A/phase

The largest power consumption is less than 3.5 kilowatt with an average of 2 kilowatt. UPS could use 2KV A and cut in other power utilizations except heating.

The distance between the outlet of primary power supply and cut in terminal of the power supply of ink jet plotter should not exceed 2 meters.

ALLSIGN ink jet plotter is equipped with a standard 5-meter cable.

1.9. Requirements for Operators

◆Requirements and responsibilities are suggested as follows for the operators of printing system:

- They are in charge of the operation and maintenance of the ink jet plotter.
- They keep in touch with the department of after-sales service and technology supports from Allsign Company.
- They know how to solve problems and undertake the maintenance work with the help of phone communication.
- They have the experience with Windows XP and PC.
- They have the technological background concerning electron and mechanicals.
- They have the ability and know the theory about color and the knowledge of preparation before printing and postproduction.

1.10. Installation Regulations

- The printers should be installed on a horizontal ground. Use a leveler to adjust even the ink jet plotter from front to back after the machine is moved into the designated position.
- Operators are advised to install a telephone near the console for maintenance and communication during daily operation.

2. Examination before Installation

As for other information about site preparation, please check and fill in the “Inspection Form of The Site Preparation of Ink jet plotter”. (See attached list 1)

- Report the voltage of the site to Allsign Company in advance.
- The power supply input socket of the machine is on the left side at the back of the machine.
- The air-conditioning in the room should warrantee the temperatures stated above (18 to 28 ℃)
- Customers should prepare proper machine installation tools in advance: a forklift truck or a crane of over three tons. They should inform Allsign Company all the tools used in advance or else they have to be charged for the consequent delay.
- Customers should not open the case without the presence of engineers from Allsign Company. All damages of the packing case should be photographed and reported to Allsign Company immediately before the arrival of engineers.
- There should be a wash cistern in the room where X3216A ink jet plotter is installed.
- Customers should finish all the preparation and cleaning before the arrival of the engineers because dust may probably bring damages to the machine.
- Customers should get other required equipment ready such as a Apple Computer and application software used on a Apple Computer such as Photoshop, Freehand、Illustrator, and computer network of 100M, etc.

- During the installation, at least two operators who have good command of computer skills should be at the side of the machine. It would be better if they have the experience with ink jet plotter.
- Customers should not operate independently before their operators have enough experiences. A training program should be taken in advance.
- From ink ordering to delivery, it lasts for a long time. Customers should order the ink in advance so as not to affect the producing.
- In order to reduce the downtime utmostly, factory party should provide some spare part selectively and advise the customers to buy some spare components. If theses components have already been used, please order from Allsign Company as soon as possible to ensure the sufficient supply of the spare components.
- There are labels “left and right” and “front and back” on the transport box. Please take notice of it when unloading.
- The examination form is an essential point of site examination before installation. Please refer the complete file of site preparation at any time. Every item in the form should be filled “yes” and the form should be sent back to the maintenance center of client service section of Allsign Company after site be ready and before installation.
- If when the engineers arrive on spot but the site preparation has not been finished, they could charge the customers for the waiting time.

3. **Delivery, unpacking and examination**

3.1. Delivery

- Pay attention to the signs on the surface of the wooden case during loading and unloading. Handle with care. Don’t put heavy objects on it; make it rainproof..
- Vehicles should be driven steadily during the delivery without sudden brake or sharp turns which would cause the wooden case to bump or turn over result in damage.

3.2. Unpacking

- The wooden case should be taken photos in time if it is found to be damaged before unpacking with an immediate processing scheme submitted to Allsign Company.
- Remove the top lid of the wooden case.
- Remove the surrounding wooden boards after removing the large screw bolts around the wooden case.
- Move out the machine and tally the articles that come with the machine.

3.3. Examination

- Engineers from Allsign Company tally the articles that come with the machine one by one.
- After the tally, customers sign on the inventory list which is brought back by the engineers.
- If there is anything missing, please give a clear indication on the inventory list. Allsign Company will add it on immediately.

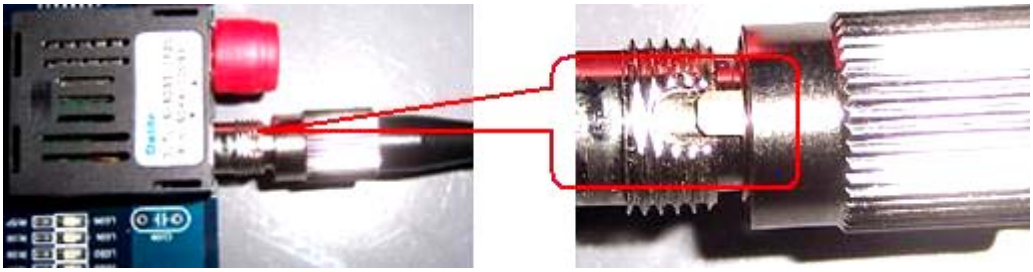
Part 错误！未找到引用源。 User's Guide

Chapter 1 Installation Guide

1. Installation processes

◆ **The correct way of fiber installation**

The signal between Mainboard and carriage board is transmitted by fiber line. Each end of a fiber line has A or B marker. There is a nick on the tie-in of the fiber line. The nick of the tie-in and the nick on Mainboard should be inserted correspondingly. After inserting correctly, you can hear the low sound of connection, which shows that the fiber line is inserted correctly. Then, tighten the opening of the screw. But please don't tighten it forcibly so as not to break the fiber line. Something wrong may occur on the printing data if the fiber line isn't inserted correctly.



Note: Place the socket of the fiber optic line accurately into the slot, otherwise signal delivery may cease.

◆**Notice while using fiber**

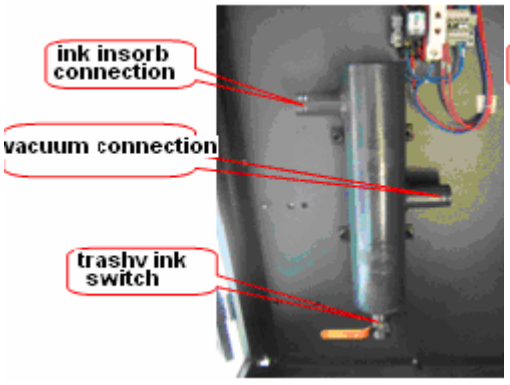
1. Fiber is an important tool for transmitting signal between Mainboard and carriage board, and it is the most important transmitting tool on the machine. It directly affects the accurate location of printing dots. So it must ensure it in a good condition and make sure of the information transmitting accuracy..
2. One should follow the above way strictly while installing fiber. It will make the signal broken off if something wrong occurs.
3. The fiber cannot be curved or folded and don't overexert to tighten the fixing screw.
4. While the fiber is not in use, please put on the special fiber protecting cover immediately in order not let the fiber damaged by the pollution of dust, ink and other blots.
6. Don't step on the fiber.

1.2. Vacuum installation

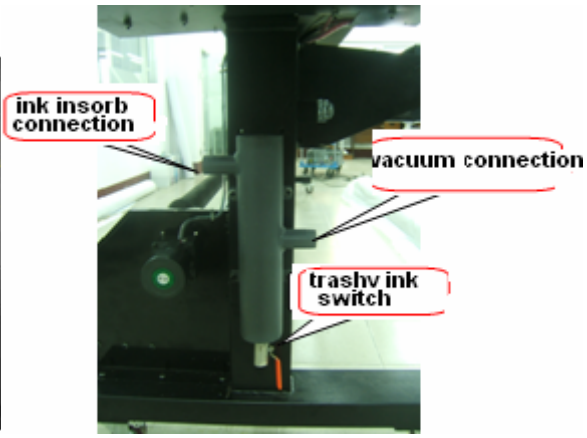
◆ Insert the conduit of the vacuum into the leftmost suction nozzle.

◆ Plug the vacuum power plug into the socket (located at the top of left case).

◆ Switch on the duster.



Box Machine



Leg Machine

1.3. Power on and test the Machine

Turn on the power and test the machine to recheck whether the electric part is normal or not.

1.4. Printhead Installation

1.4.1. Printhead Installation

Printhead is the most expensive and fragile part of the machine, meanwhile it can print and affect the perfect printing effect. So, it has strict rules and process to touch, install, clean and protect.

◆ **The correct way to take the printheads**

1. Please touch the metal to release the static electricity before taking the printheads.
2. Please hold two sides of the printheads and don't touch the surface of the printing holes and outlets.
3. There is a protection membrane on the surface of the printing holes. Don't touch by anything. If cleaning the printheads, one should use special cleaning paper or cleaning stick.

◆ **The pictures of the correct way to take the printhead**

◆ **The correct installation of printhead**

1、The cleaning of solvent in printhead

When the printheads are manufactured, lots of liquid for keeping wet is put in them to protect the

printheads. Before installation, it should use the solvent corresponding with the ink to clean the printheads.

a. While cleaning, connect a filter between injector and ink supply tube of the printhead. 30ml solvent can be injected into it to release the liquid for keeping wet at the first time.

b. Inject solvent into the printhead and marinate it for 5-10 minutes to let the rudimental liquid in the printhead dissolve.



c. Flush the printhead with about 30ml solvent. If the printed line is not straight, it need to clean the printhead again till it can print straight line, which can get rid of the liquid for keeping wet basically.

Please make sure all such operations should be done in a balanced and clean environment.

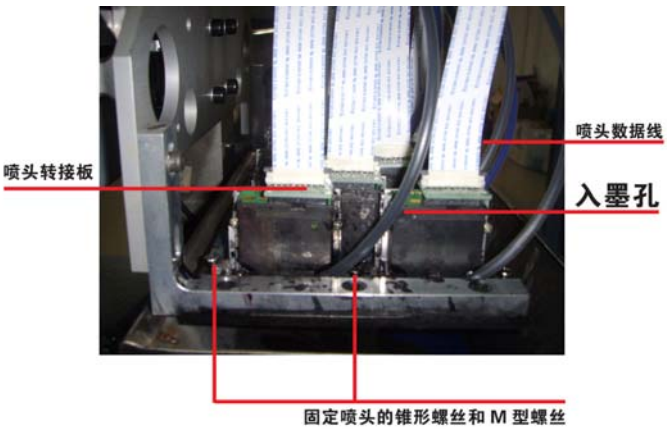
2. Printheads installation and fixation

- put the washed printheads on the printhead supporting bracket and fix them on the soleplate. Adjust the position with the back taper screw.
- insert 4*0.75 hard tube into the outside of the printhead.
- while installing the printhead interface board, please take care of connecting the bevel of the interface board with printheads correctly in order to avoid damaging the printheads. And press down while inserting.
- connect the data cable of interface board and take care of the direction. Don't insert inversely in order not curve or break the pins in the socket.

3. The physical location adjustment of printhead

Loosen the M screw of the printhead, and adjust the taper screw up or down to let printhead be on the proper position. Then, tighten the M screw of the printhead.

4. Notice while installing the



printheads

- The surface of the printheads cannot be touched by other objects.
- Turn off the power before installing the printheads. Please don't insert or draw the printheads while the machine is power on.
- While installing the printheads, please make sure that the ink supply system is clean and the injected solvent ink is normally used.
- While installing, please open a package till the last printhead is installed in order not to let the dust come into the printheads.
- Don't overexert while installing and inserting the printhead interface board in order not to let the pins broken.
- After the printheads are installed, please wash printheads before printing. Please use special solvent to wash. Sometimes it needs to wash them by several times.
- After the printheads are installed, please get rid of the air in the printheads in time. In addition, air remains between the ink tank and printheads are not allowed.
- While installing the printhead, please try one's best to keep lengthways uprightness of printhead. And the mechanical location and the uprightness of the printheads must be adjusted.

1.4. The connection between printheads and the primary ink tank

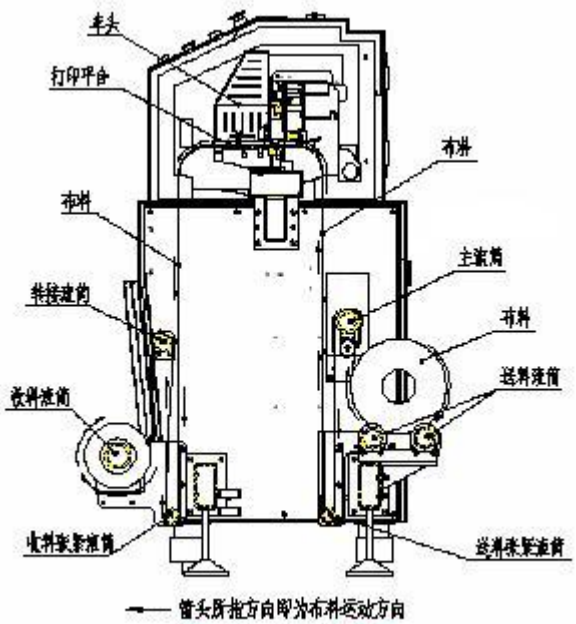
- There are three tubes connectors connected with 3/5 tube on each ink bottle, and the lengths of three tubes are not the same. Connect the longest tube to the outmost connector and connect the others in turn.
- The float of the ink bottle should be black, blue, red and yellow from left to right respectively.

Chapter 2 Operation Guide

1. Machine Operation

1.1. Feed and take up order and method of Box Machines

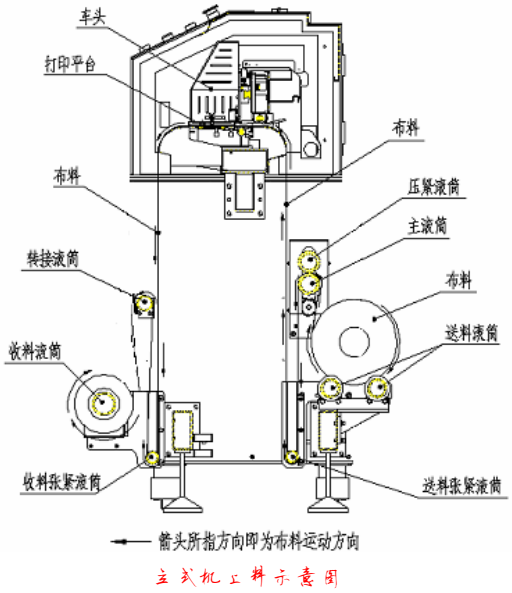
- Make a good preparation for the media to print
- Put a roll of media on the roller, make the media stay middle and the head of the media towards the printer.
- Draw sides of the head of the material, and let the material unfolded for about 2 meters. Then, let the



卧式机上料示意图

unfolded material round the main roller (while printing adhesive vinyl, add impaction roller on the main roller, and the material runs between the main roller and the impaction roller). The head of the material is down, then round the loading extension roller from the bottom up and the head of the material is upward.

- Before the material comes onto the printing platform, loosen the extension assembly and let the material come onto the printing platform. Then, draw the material gently to make the length of the material 3 meters longer than that of the platform (while drawing, one should do it slowly and not draw the extension roller out of the rack). Then, press and tighten the impction assembly.



主式机上料示意图

- Adjust the material loaded right now, and make sure the extension surface of the material is flat, the cylindric material is plain, and the left and right edges of the material are on the same plane. And try to make sure the printing material is at the center of the printing platform.
- Demount the take-up roller, and draw out the baffle whoes end have no gear. Then, put on the material from the end which has no gear, then, install the baffle demounted right now. At last install the take up roller on the printer and cover the paper roller on the left and right baffle tightly.
- Let the material drawed in the step 3 round the take up extension roller from the bottom up and the head of the material is up, then, round the transforming roller from the top down and the head of the material is down. At last, round on the take up paper roller from the bottom up.
- while rounding on the paper roller, please conglutinate the head of the material on the paper roller. After doing this, tauten the material and make sure that the extension surface of the material is flat, and the left and right edges of the material are on the same plane.
- Adjust the whole material and make sure the extension surface of the material is flat and the left and right edges of the material are on the same plane. At last, let the four fixing circles for feeding roller lean against the edge of the cylindric material and tighten it. Then, lock the baffle of the take up roller. Till now, the material installing is finished.
- Make a choice to heat or not, according to different media. Generally it is suggested that

1.2. Power on

1.2.1. Preparation before Power-on

- check if the tray for protecting printheads is put down or not.
- Check if there is some other things on the printing platform, such as screw, tool or oddment. Clean the guide rail and daub the oil on it. In addition, daub oil on the guide rail to keep the rail smooth while the machine is working.
- Check if the stick for holding materials is clean or not. If it is not clean, please use special solvent to wash it. While doing this, pleae set the material feeding value on the software at the same time. Then, let the stick for holding materials run atuomatically. After wahsing it, please dry the solovent on the stick by using air gun.
- Check if all the switches are turned off.
- Check if the ink in the main ink tank is enough or not and the rubbish ink is cleared away on time or not.
- Check the temperature （20-28℃）and humidity in the room（40%-60%）

1.2.2. Add Ink

- Add ink sequentially from left to right into the left case in black、blue、red、and yellow turn..
- Insert the four tubes into their corresponding bottles to supply ink.

You can choose to use the air pressure system to add ink atuomatically if the air pressure system is install on the machine. Please turn off the voltage of the printhead by several times so as not to let the air come into the tube because the ink cannot come into the subsidiary ink bottle.

1.2.3. Operation Process of Power on

- Demount the printhead soleplate for keeping wet.
- First, turn on the computer, then the general power of the printer. Pull up the emergency button, then, turn on the printhead voltage switch, platform fan switch, feed motr switch, cold wind switch and heating switch one by one.
- At last, open the software.

1.4. Preparations after power on and before printing

1.Open the printing software, and click ‘back home’ button to make the carriage back to the zero position. After repostion, the printhead will do flash printing automatically to set up the normal connection between the machine and the software.

Notes: flash printing can be inter-changed. Flash or not Flash can be choosed. A piece pf paper can be put under the printhead to check whether it is flashing or not.

Click cleaning button to clean the printhead.

If the printer has the air-pressure system, printhead can be cleaned with the air-pressure. Then, if vacuum is used, the cleaning effect will be better.

2. Necessary parameter setting in the printing software

- Set up the frequency, times and mode of automatic cleaning, and the frequency of flash printing;
- Set up the 4-color-bar or 6-color-bar to be printed in the margin of the material;
- Set up the distance of the white margins;
- After the parameter is set up, print out the picture of the print head state, the excursion, and the ascensive excursion. Adjust the print head and the excursion value to be the best state;
- Before the formal printing, print out a small picture with multi-passes. The advantage is that sometimesthe print head can be warmed up, consequently adding the fluency of the ink.
- If heat it up after it is opened, print out 1 meter to test its difference from the actual one in order to avoid the wrong dimension. The flexibility of different materials in different temperatures is a little different.

1.5. The Printing control Process

- Absorb the ink by using the software. If the effect is poor, please improve the height of the absorbing board to be reasonable or remove the absorbing head and directly absorbs the print head;
  If the ink jetprinter has a air pressure system, the print head can be cleaned with the positive pressure, and then with thecleaner. The effect is better.
- Click the button for cloth test in the function table; the carriage will test automatically;
- Enact the location of the carriage and material. I.e., the white margin；
- According to the test bar, please adjust the relative scientific position of each print head with a screwdriver(connect the head to the end and make them mutually parallel)；
- Further adjust each print head until they are in the best condition by using the software test chart, and meanwhile observe the test chart to make sure no the abnormal phenomenon such as ink breaking and ink hanging appear in the printing process. And then it is allowed to print the picture normally.

1.5.1. Notices in the printing process

- After one picture is printed out, the print head should be cleaned in time; Move around the machine to examine the work state in the normal printing process to make sure the heating temperature is normal and there is no impurity on the surface of the machine; Listen carefully to confirm whether there is any abnormal sound in the printing process. If there is, the machine must be paused to check out the reason; Smell by one’s nose to make sure if there is any peculiar smell. If there is, the machine must be paused to check out the reason;
- Other user from the LAN is prohibited to visit or share in the resource in the printing process in order to interfere in the printing unnecessarily;

1.6. Load material

After printing, there are two ways to load the material:

- Load the material with the roller
  - Take down the take-up roller and loosen the lock knob of the take-up roller baffle. Then, reel off the end of the baffle and take-up roller which have no gear.
  - Install the baffle
  - Install the take-up roller on the printer
- Load the material only
  - Loosen the baffle of the take-up roller to finish loading the material. Lock the knob and pull the material to load directly.

1.6.1. Notice while feeding and loading the material

1. The material should be flat. One should adjust it timely if the movement excursion occurs while printing.
2. Please pay attention to the material feeding to check if it is normal or not and the photoelectricity switch is ok or not.
3. While installing the material, it should be put at the cetre of the paper holding stick. And the roller fo the material should be too big for fear that the material is too heavy and the feeding is not smooth. In addition, too big material roller may let the motor have too heavy burthen and affect the normal printing
4. If adding and connecting material is needed, please stick them on the ground and sticking them on the printer is not allowed. While printing, please make sure the pinch roller cannot run into the connected part.
5. Please don't lift the handle bar while printing.
6. Before loading, please make sure the ink has been dry. Then, cut the media on the printer. But please be careful, don't injure the machine and your finger.
7. After printing, you'd better cover it with membrane before rolling in order not to damage the picutre by the wet ink. Besides, don't fold the pictures.

1.7. Turn off

1. Press the emergency switch
2. Turn off the switch of the voltage of the printhead, HV switch.
3. Then, turn off the turn off the heating switch, wind absorbing switch and air-dry switch
4. At last, turn off the main power switch and then turn off the computer.

1.7.1. The task after turning off the machine

- **Cleaning**
  - Wash the carriage pedestal, printhead and the ink stain on the board by using solvent.
  - Rave about the rubbish ink and scrub the ink stain on the machine.
  - Check the subsidiary ink tank to make it airproof.

- **Maintenance**
  - One should do something for protecting the printheads after printing. Put the three-layers non-woven and proper quantity of solvent into the cleaning tray. Then, buckle the cleaning tray on the printhead pedestal. Tighten the screw of cleaning tray, then, inject a certain quantity of solvent (about 2-3 mm)
  - Use oil to protect the linear guide rail and some other main movement parts.

- **The clearance and back up of hard disk**
  - Before turning off the computer, back up the quired documents, please delete the temporary and usless documents in time.
  - Clean up the disk signs, search and eliminate the virus.

2. Software Instruction and Operation

Chapter 3 Maintenance Guide

1. Maintenance Rules

Proper maintenance is of vital importance to the sound operation. The maintenance rules list different degrees of maintenance in details. We advise you to write down these rules, paste them to the printer or prominent places nearby.

2. Daily Maintenance

- **While not in use**

1. Clean the printheads by the air pressure system, and then, clean the soleplate of the printheads, then, power off.
2. Fold several levels of the non-woven cloth and put them on the plate which the printhead dipped in. If the non-woven is not too much, the sponge is recommended. This can save money and the elasticity of the sponge is better than that of the non-woven.
3. If non-woven is used, please fold more.
4. Put enough membrane on the non-woven or sponge, which let the membrane not damaged easily and prolongs the lifespan of the cushion.
5. Inject the solvent on the membrane
6. Please don't inject too much
7. Install the printhead soleplate
8. Fix the printhead soleplate
9、Check if the soleplate and membrane are in proper position or not
10. Inject 3 mm solvent into the printhead tray.
11. At last fix the membrane

- Often examine the cleaning and lubricating condition of the linear guide rail, and lubricate the guide rail with accepted lube.

- Inject oil on the ball bearing of the sliding set on the guide rail periodically with appointed grease gun and special oil
- Examine the ink barrel in the box and check if the ink is enough or not.
- Replace the ink filter periodically
- Wash the printhead often and wash ink tank and ink amount sensor periodically
- Check if the connection axis skids or not and tighten the screws.
- Clean the dust on the computer, power source and electronic board periodically

2.1. Preparations before starting the machine

- Demount the printhead protection plate
- Clean the printhead, roller and printing platform, and get rid of the sundries on the platform
- Check the ink position of the first level ink tank
- First open the general power, and, then turn on the computer, then the machine.
- Pull up the emergency button on both sides.
- Check if the movement parts are normal or not and they moves smooth or not. After opening the software, run it and check the X axis, Y axis, cleaner, position located switch and emergency stop button
- Turn on the switch of the HV voltage and select “flash print”
- Check the indoor temperature (20℃-28℃) and humidity (40-80%)

2.2. Maintenance While Printing

◆ Wash the print head before printing. This will make ink jetting fluent. Wash print head immediately after one frame of image is printed. (Refer to print head's cleaning methods)

◆ When printing, walk around to see the equipment:

○ There is no particle or dirt on the working platform.

○ Touch the heating board to make sure that the heating temperature is in normal.(Note: when the print head is moving, you are not allowed to touch the heating board.)

○ Listen to it and see whether there are irregular sounds. Stop to check under that circumstance.

○ Smell. If smoky, stop it and check.

2.3. Maintenance when stopped.

- Push down the jerk switch.
- Protect the print head (refer to print head maintenance)
- Discharge ink in the cleaner.
- Clean the equipment (only special PMA liquid can be used)

2.4. Every 8 Hours' maintenance

- After the equipment runs for 8 hours, use petroleum based grease to lubricate the guide rail for one time. Don't refill too much otherwise it may leak below the guide rail.
- Use cleaning liquid to clean the surface and interface of the vacuum to guarantee flexible movements

up and down.

2.5 Daily Maintenance

- Clean all the small pinch rollers.
- Check the waste liquid in the waste barrel and pour out it in time.

2.6. Weekly Maintenance Content

- Detach supportive lid board of the print head and wash its underside with cleaning liquid.
- Check if liquid level sensor is secure enough
- Add lubricant to guide rail and grease to guide rail bearing
- Conduct daily inspection for others

2.7. Monthly Maintenance

- Change ink filter; wash primary ink bottle and ink path (refer to ink path cleaning method)
- Wash the secondary ink bottle on the print head shelf.
- Check and fasten the screw on the transmission coupling, electric engine coupling.
- Check the fixation screws on the print head and strait guide rail. Check simultaneous belt. If it is loosen, fasten it.
- Check all the cooling fans and processor.
- Clear computer's hard drive space, scan and kill virus.
- Dedust the power supply case, electricity control board and other circuit board with air gun(must be dry air)

2.8. Quarterly maintenance

- Heating test: 15 minutes after the temperature is set, measure temperatures in the pre-heating and drying system. Make sure the left, middle and right temperature is not hotter than 10℃. Also no obvious temperature difference should be felt when touching it.
- Dedust the equipment thoroughly including the interior of the left and right case.
- Inspect and change ink filter.
- Blow away any dust on the power supply case and the driver with dry compressed air.

2.9. Annual Maintenance

- Horizontal inspection on guide rail and printing platform (can contact our company)
- Check the equipment thoroughly to see whether the screws are loose.

3. Printhead Maintenance

3.1. Treatment before printhead is installed

- Cleaning of solvent in the printhead.

When the equipment leaves factory, the injection cup contains a large quantity of moisture locking liquid for the purpose of protection. Before installation, it must be cleaned with the ink related cleaning liquid. Connect a filter between the injector and the inlet tube of the injection cup. Inject 30ml cleaning liquid into the injection cup at first, discharge the moisture locking liquid and then fulfill the injection cup with cleaning liquid. Leave the injection cup in the water for 5-10 minutes, and the remaining moisture locking liquid will be totally dissolved. Lastly, wash the injection cup with about 30ml cleaning liquid. If the line printed is not straight, wash it over with cleaning liquid. Don't stop until the line is straight. In this way the remained moisture locking liquid is cleared. Remember when doing this, please choose a considerably sound and clean platform.

- **Notice:**
  - Keep the operation platform clean
  - Don't touch the surface or the socket of the platform
  - Filtrate the injector with the filter.
  - Surface of the injection cup is not touched.
  - Distinguish outlet hole from inlet hole
  - When cleaning liquid is pushed out of injection hole, pressure should not exceed 0.3kg (i.e. hold the injector with one hand and push the injector with the thumb of the same hand.)

3.2. Air Pressure System Introduction

3.2.1. Function Introduction

There will be clogging print head when printing for a long time, which could be solved by vacuum. But if can not clean out, we can adopt air pressure way to do. (When cleaner is no use and under the condition of having break line.)

3.2.2. System Introduction

Air Press System consists of Air Pressure Switch, air pump and electromagnetism ralve and vacuum ink tank.

3.2.3. Operation Guide

Fist install the small cover on the vacuum ink tank, then, press down the red button of the pressure system to check if all the ink in the printheads flows out or not, which is held within 5 seconds.

3.2.4. Notice

Power of the printhead must be turned off before pressing the button.

3.2.5. Wetness of the Printhead Surface

Clean the surface of the printhead in single direction with depurating wet stick softly to form a thin bed of solvent on the surface of the printheads.

3.2.6. Discharge the Printhead

3.2.6.1. The step of the print head discharge

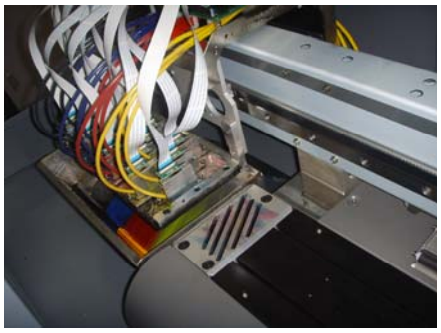
- Turn off the HV power and the main power supply.
- Discharge the screws and take out the printheads from carriage. Please be careful, don't let it collide or fall on the ground.
- Inject solvent into the printheads to clean and install the protection board of printheads or membrane.

3.2.6.2. Detach the printhead

- Do not hit or fall the print head on ground during the process of installation or discharge.
- Before printhead is stored, wash it with cleaning liquid.
- The cleaning print head should be set the original protect board or wrapped sealed by the plastic bag immediately .If need to post, anti-shock packing should be offer.

3.2.7. Common knowledge about printhead maintenance

In normal working condition, turn on the print head flash jet function in the software. Set the value to be 8.



- If clogging cannot be solved under normal cleaning process, it is better to dismount the injection cup and dip it in the cleaning liquid.
- Before injection cup is dismounted and stored, wash it with cleaning liquid; wrap it with wiping paper, and store it sealed. If the injection cup is to be posted, use anti-shock packing.
- Carefully and regularly clean the base of the printhead where auto ink sucking machine locates.

3.2.8. Cleaning and maintenance of printhead

3.2.8.1. Changing ink

In principle, only one kind of ink can be used on a machine. If it is necessary to change, it can not be changed into other chemical solvent ink in case of the damage to the print head.

While changing the ink, wash the printhead with the previous solvent first. Then wash it with the new solvent compatible with new ink to lessen the residue ink and liquid in it.

3.2.8.2. Washing the print head

- If the surface of the print head is so dry that it is clogged, inject some ink into it and wash it with ink carefully.
- If the above mentioned methods still don't work, dismantle the connection tube; add cleaning liquid directly into the syringe. Then connect the tube and inject ink.

3.2.8.3. Keeping printhead wet

When the printer is not in use, printhead clean salver should be used to keep the printhead wet. Please also pay attention to the cleanness of the salver. Put non-woven cloth in the salver three to four layers to ensure the surface of the printhead is clean. Add a little solvent, and then screw the nut on both side of the salver to assure printhead is in the solvent. If the salver hasn't been cleaned, please use non-woven cloth to mix a little wetness-keeping liquid or solvent instead and wrap well with plastic foil.

3.2.9. Printhead protection while stopping the machine overnight

- Turn off the computer and all power supplies.
- Put three layers of non-woven cloth on the cleaning tray and add proper solvent.
- Carefully cap the tray on the pedestal. Fasten the screws on the cleaning tray.
- To prevent ink mix, fill the hole on the back of the ink bottle with a black cap and vacuum the space between the ink bottle and the print head. Pull out the black cap when use again.
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4. Printhead protection when the printer stops for several days

- If the printer is not in use for more than 48 hours, the ink in the printhead must be cleared, otherwise, ink will dry as solvent volatilizes or even impair the nozzle permanently. Treatment is as follows:
- Turn off printer's power supply
- Move the printhead to the leftmost cleaning position and put an anti-erosion receptacle below the injection cup to contain waste liquid.
- Aspirate with glass injector or directly pour out ink in the secondary ink tank. Then, wash it thoroughly with special solvent.
- Pull out the ink supply tube (from secondary ink tank) and aspirate 40ml special solvent with glass injector to clean the print head twice. Don't blow away residual solvent in print head because solvent inside the printhead can keep it wet.
- Discharge the print head bracket, wrap it with the plastic bag and or film.

5. Maintenance of the ink supply system

- If the filter is in good condition, seal the plastic connecting tube with adhesive tape to avoid dust entering.
- Filter cleaning: Dismount it and discharge ink. Dip it in the solvent and vibrate it in ultrasonic cleaning machine for more than half an hour. Then blow in compressed air from the ink hole so as to discharge wastes. Do it repeatedly until the filter is unobstructed.

6. Choice of ink

The printhead is the brain of the printer. The choice of ink is very important because it will directly affect the printhead. A bad choice may destroy the whole ink supply system. So choosing ink should be very serious.

Chapter IV Technology Guide

1. Improving printing quality

1.1. How to perform printing with your printhead without breaking a single line?

1.1.1. Choosing suitable ink

Any ink factory or distributor relies on profits to do business continuously. We recommend our ink. Although the price may be a little higher than the cheapest ink available in the market, the cost is quite low if it is distributed on each square meter. Poor ink will damage the printhead and break the line seriously within one month. So the bad image will be printed. Naturally customers will purchase less ink by poor quality as time goes by.

1.1.2. Protection function design and daily maintenance during printing

- **Four colors or six colors printing**

Make sure that color bar is printed! This can prevent clogging in one or two printhead which cannot jet ink for a long time. What is more, color bar enables us to discover which printhead breaks line easily.

- **Regular auto ink sucking**

Only a few seconds are needed and we can guarantee that no line is broken in printing. "Under the circumstances that print head are in good condition, the main reason for line breakage is due to ink cluster on the surface of the print head." Cluster is caused by ink feature, environment temperature, comparative moisture, ink level of sub-ink bottle, thickness and airtightness of the tube, resistance to tube wall flow, levelness of print head board and etc.

Set PASS number of the auto cleaning intervals according to the practical situation, the pre-condition is no line breakage in long image printing

Remember that damage to the print head starts from a small hole. Many operators let the printer run through to the end of the image printing because they don't care about one or two broken lines. What they don't know is the injection hole that does not spray ink due to delayed cleaning, affects neighboring injection holes. "What we must do is to prevent things from happening before they actually happen!"

At intervals of printing, do not turn off the printer. Keep the print head in the state of flash jetting.!

During the process of flash jetting, ink consumption is very small (only 2‰ of that in normal printing). This keeps the injection hole moist. At the same time, keep the normal print head temperature. Make sure when printing starts, print head are in best working conditions.

When operating ALLSIGN printer: first turn on the computer, then start up the printer and print head voltage .Choose reset when entering the system.

- If the ink jet plotter is turned off, you need to press the key RESET to restart the system. Only in this way can the print head return to the left side for automatic flash injection. To ensure the proper function of flash injection, you may use a piece of paper to check whether it works well or not.

- Examine jet hole before or during printing:
  - Before printing, if ink isn't found flowing out of a jet hole, firstly try to suck it out.
  - The disconnection in the process of printing is usually due to the conglomeration of ink, which can easily be solved by setting automatic cleaning.
  - The practice of spraying painting should be stop, when a disconnection occurs. otherwise, the jet hole would be clogged with the accumulated ink.
  - If you fail to deal with, please promptly consult the technicians at the supplier's for detailed information.
- Protection after turn off

  After the shutdown, immediately cover the print head with the bonnet (equipped with cleaning solvent and non-woven fabrics), for the sake of preventing the surface of print head from direct exposure to the open air. If it were not done, the ink would evaporate and the resin in the ink might clog the jet hole. If print head is found out of order, 2mm of solvent can be injected onto the bonnet and then cover the cup so that its surface is immersed into solvent till tomorrow.

  Notice: If the suck back of ink appears in the process of using print head bonnet, block the air hole of vacuum ink tank. Then remove the wad when turn on the machine next time .

- **Cautions regarding repairs**

  If you need to dismantle the components on the print head. shelf and the direct exposure of print head to the open air seems unavoidable, you must inject the cleaning liquid onto the surface of the print head with the needle cylinder, which help slow down the rate of the ink's evaporation. (The cleaning liquid evaporates slowly and there are no solid particles left after the evaporation).

1.2 Adjust the relative positions between the print head of one color and the print head of other colors.

For the first adjustment, mechanically adjust the screw and put the test bar in the very position, Second, run the software to further adjust the print head in a proper position. Then use the adhesive to fix the screw so that the screw won't be dislocated by vibration.

Prior to daily operation, first print the test bar, and then check whether each jet hole is in good order and whether the relative position and parallelism of each print head are within the permissible error range. Then can produce high quality images only when all the requires can reach.

Since the way to inspect and adjust varies from one factory to another, users should be familiar with this operation and carry out examination and adjustment before starting operation every morning.

1.3 How to solve the problem of the stripe of special color?

The stripe is the result of unevenly distributed ink jetted by many injection cups of the same color. But for the xaar126, each injection cup regulates its own voltage. The specific method is as follows:

There is another shortcut, which goes this way: 8/12/16 injection cup is unlikely to produce stripe if it is printed by 4/3/4 pass respectively. The reason is that for all the difference in the injection cup of the same color, the picture is thoroughly painted by each injection cup. Under such circumstances, stripe will be invisible as long as every injection hole of the same color works equally. As a matter of fact, the most efficient is injection cup 12. Using 3 pass can ensure the fast and effective printing. For 16 injection cups, if every four injection cups are in almost the same state, the effect will be better if 3 pass is used.

2 Adjust the clearance

To achieve the satisfactory effect, it is necessary to adjust the headstock so that the clearance between it and the material to be printed, can be reduced to the minimum, 2.5 mm—3.5mm (Notice: material isn't allowed to be touched.)

Adjust the height of the rocker blotter and screw down and fix the screw in order to ensure the good cleaning effect.

Notice: the shorter the clearance between rocker blotter and injection cup is, the better the cleaning effect will be.

3 Techniques for using injection cups

- **Environment**

  Keep a tidy working environment and make main body free from any dust because in the dirty environment dust will make its way to major ink pots, minor ink pots, and then injection cups. If it is the case, the printing effect will be harmed and the service life of an injection cup will be shortened.

- **Operation**
  - Operate in accordance with the procedures for the maintenance of injection cup and avoid the friction between the nozzle and any object because it may make the surface of the nozzle frosted and broken.
  - When cleaning the surface of nozzle, we must use the special paper or non-woven fabrics instead of the tissue paper to clean the surface of injection cup. With untold tiny fibers on its surface, tissue paper can gain easy access to the nozzle. Additionally, the tiny hairs that remain on the surface of nozzle probably lead to the clogging and dripping of the ink and

then affect the print quality.

- **Accessory**
  - Every accessory serves certain purpose and shouldn't be detached at random.
  - Keep intact the primary inkpot and the air filter of the secondary inkpot so that the particles of various kinds floating in the air can be denied access to the ink. If clogged or even broken, they should be promptly replaced.

- **Static**
  - Ink jet plotter should be connected with zero line to prevent the static's effect on the injection cup.
  - Maintain a constant temperature in the working environment and ensure that the temperature ranges from 20 ^{o}C to 28 ^{o}C because the heat generated by the working injection cup is mainly carried by the ink and then discharged from the heat sink.
  - The humidity in the working environment should be within the range of 40%-60%.If it is too dry, medium will be charged with static, thus affecting the print quality.
  - Generally, static that exists in the zero line of the equipment, in the particles floating in the air and in the friction between medium and equipment, together with the leakage of the equipment, may charge the main body with electricity, which does harm to the major accessories including injection cup, main board.

- **Ink**
  - The quality of the ink exerts direct effect on the image quality. The lower price doesn't amount to the decreasing cost. Instead, the ink of inferior quality is more likely to bring about the following consequences. For example, injection cup is clogged, printing is stopped, product is discarded as useless and customers ask for refund because the product is of poor color quality. Then it may cause considerable waste.
  - Users are strongly recommended to use the ink supplied by the manufacturer and its agents on account of the fact that the ink that has been strictly and persistently tested is helpful to maintaining both the equipment and injection cups.

- **Maintenance**
  - Maintenance is very important to prolong the working life of the printhead. After turning off the printer, be sure to put the cleaning solvent on the surface of injection cup and cover the nozzle with the preservative film so tightly as to reduce the evaporation of both the solvent and ink. It will, to a great extent, extend the service life of injection cups.
  - If the machine is out of service for a long period (during the long holidays, for example, International Labor Day, National Day, Spring Festival), users must put the solvent into the injection cup and then cover it with the bonnet. Besides, more solvent should be added to the bonnet. Finally preservative film can be adopted to enclose the whole injection cup for the purpose of preventing the dust's penetration and reducing the evaporation of cleaning solvent.

4 The solution to the clogging of the nozzle

4.1 The techniques for slight clogging of the nozzle

- If the nozzle is found slightly clogged in the process of printing, don't hesitate to press the key

PAUSE to stop printing. Then use a vacuum cleaner to suck the clogged ink out of the nozzle. By means of this method, we can clean the nozzle. Afterwards, cleaning solvent should be taken to wash away the residue. (Notice: Vacuum cleaner should not be utilized to suck a given injection too many times, otherwise, it will likely to damage the injection cup.)

- The prompt, resolute and thorough treatment to the slight clogging is of paramount importance to maintain the optimum working state for the long printing.
- In addition, it is necessary to carefully examine the injection cup and eventually discover the reason for the clogging. (If it is due to the ink, change resolutely and make sure that the ink tract be cleaned as well.)

4.2 The techniques for frequent clogging of the nozzle

- Firstly press the key PAUSE to stop printing and then move the head to the leftist cleaning position
- Generally speaking, the problem can be solved through directly using the vacuum cleaner to suck the injection cups.
- If it still doesn't work, open the machine and pull out all the signal wires of a liquid level inductor connected to control panel. Then suck the injection cup, restart printing and observe the possible change. If there is a change for the better, it indicates that the problem originates from liquid level. At that moment you should try to restore the injection cup to the normal state by adjusting the position of ink box, the temperature of working environment and the working voltage of injection cup.
- If there is still no change, pull out the ink-supplying pipe on the injection cup and use a glass syringe to draw out the special solvent for cleaning the injection cup. The procedure is as follows: inject 40ml solvent each time and wait for 10 minutes. The process should be repeated 3-4 times.
- After cleaning, make ink-supplying pipe and the signal wire of liquid level inductor plugged into. Then resume the printing that stopped previously.

4.3 Measures taken after the methods mentioned above don't work.

- Avoid using non-woven fabrics and directly cover it with the injection cup bonnet. Then inject 3mm of solvent into the bonnet and enclose the injection cup shelf with the protective membrane to guard against the evaporation.

Notice: The signal interface on the top of printhead cannot meet solvent, or the printheads will be burned.

- After the injection cup is immersed in the solvent, use the glass syringe to draw out the solvent one or two times from the interface of the ink pipe, which is on the top of injection cup.
- Use the glass syringe to draw out 40ml of special cleaning solvent and then inject the solvent into the interface of ink-supplying pipe. Next pay attention to the waterline that comes out of the nozzle. If the waterline is straight, it proves that the cleaning is effective and the injection cup can be further used (The prerequisite is that the circuit and piezoelectric crystal are intact). If it is distorted, then repeat step 2 and step 3 two or three times.

5 Preventing clogging of the injection cup

5.1 The origin of the clogging

- **The ink is of inferior quality.**

- **The dramatic changes in both temperature and humidity exert effect on both injection cup and ink.**
  - The stability of the ink determines the use of the injection cup of ink jet plotter. On the other hand, its stability is determined by the following factors: viscosity, surface tension, volatility, and fluidity. However, these indexes are not totally decided by manufacturing technique. Actually, storage, temperature and humidity also play the decisive role in the normal use of the ink. If the temperature is high, the viscosity will grow low. If it is low, the viscosity will become high. These two conditions can change the previous state of ink and the spotted line or spurious image will thus occur, which is referred to as false clogging.

    On the other hand, if the humidity is low but the temperature is relatively high, the volatility of the ink will be raised. As a result, the ink is dried into a hard condensate and left on the injection cup, which may affect the normal function of the injection cup. However, if there is a high humidity, the ink will accumulate around the hole, dripping and even flowing, which makes the image difficult to be dry. Under such circumstances, it will also contribute to the improper function of the injection cup. Therefore, attention should be paid to the variation of temperature and humidity at any moment. Even the minute change in humidity may influence the working of injection cup. On account of the limited ink within the ink cavity of the injection cup, ink is supplied through syphonage. So the dramatic change in the external temperature is easy enough to disturb the previous equilibrium state. The reason is as follows: the working injection cup can produce given amount of heat, which enables the ink to be balanced and stable. But if when the weather changes sharply, a sudden decrease or rise in temperature, and there is no device available for regulating temperature, the effect on the injection cup can appear to be apparent. At this moment, injection cup fails to function well, the same is true of the ink, even for the ink of the same type. The only way out is to control temperature so well as to ensure the daily temperature range of 3-5 degrees in workshop.

- **The effect of voltage on the injection cup**
  - Since the voltage of injection cup can be determined by the degree of curvature of piezoceramics inside the injection cup, the high voltage can also increase the amount of the ink jetted. For the injection cups of diversified norms, manufacturers offer their respective voltage ratings within which interjections can perform normally. Users should strictly follow the rule while operating the machine. For instance, the manufacturer of XAAR-128 injection cup recommends that the voltage rating be less than 35 V. Under the prerequisite that it doesn't work at the cost of image quality, the lower the voltage is, the better. It is proven that if the voltage surpassed 33V, stoppage of the ink supply will occur frequently and the service life will be reduced. It has been mentioned that high voltage can increase the degree of curvature of piezoceramics. So if the injection cup works in the state of high frequency oscillation, the piezocrystal likely to fatigue, wear out and even break. On the hand, the low voltage can affect the saturation degree of the image. So for the injection cup of the XAAR-128 the suitable working voltage ranges from 28V to 33V. For XAAR 126, 20 V is adequate. Hence the service life of the injection cup can be greatly extended.

- **The effect the static exerts on equipment and ink**
  - Very often this problem goes unnoticed. XAAR-128/126 is a piezoelectric injection cup. In the process of printing considerable static is generated by the friction between the material and the roller. If not eliminated promptly, the static is likely to affect the proper working of the injection cup. For example, if the static is strong enough to attract the ink drops, the latter may deviate from the normal trace and will be scattered in the unconventional way. On the other hand, the extremely powerful static will destroy the injection cup and even burn the circuit board. Thus it is extremely important to eliminate the static by means of the correct and effective measures, the best one of which is to have the ground wires installed.
  - Strictly speaking, ground wires shouldn't be connected with the common ground wires because there is the possibility that static may exist in the other equipment connected to the whole supply network. From the past experience, ground wires of every equipment should be installed separately. The correct way to overhead the ground wires is after the copper plate (no less than 0.5 square meters) is connected to the equipment with the copper conductor, bury the plate in the well-dug humid space under the ground (below 1.8 meter) and pour the brine in. When it is completed, run the equipment for more than 1 hour and then measure the amount of remaining static in the equipment. The method is as follows: use the multimeter to adjust alternating current to be 200 and connect the needle with both the zero line of input of the voltage rating 220 V and ground wires, and then read the number (whose absolute value is the amount of the remaining static). The suitable value is 1 ohm and the measurement should be often made. If the value is above 1 ohm or fluctuates sharply, the groundwires must be checked immediately. Many companies hold that once the groundwires are installed, it will function well for good. Actually it is dangerous to ignore the routine examination.
- **The effect of cleaning manners on injection cup**
  - The surface of XAAR injection cup is usually covered with a layer of protective membrane, on which there are some laser drilling holes determining the precision of injection cup. However, many users simply use the sponge and non-woven fabrics to make the injection cup tidy. In consequence, the surface of injection cup is scratched and even damaged, which results in the occurrence of some tiny hairs that will shape the direction in which the ink is jetted and cause the accumulation of ink drops on the surface of the injection cup(which is easily confused with the clogging of injection cup). Nowadays, non-woven fabrics prevail on the market of cleaning cloth. But owing to the relatively rough texture, it may pose a great danger to the injection cup which can hardly bear the wear and tear. So it is strongly recommended that users employ the special paper for cleaning injection cup or the special non-woven fabrics.

6 Cautions for using printing ink

- The storage temperature for printing ink ranges from 10℃ to 40℃
- Avoid the violent vibration of printing ink pot in the process of storage and use
- Don't wobble the ink bottle acutely while transporting or using the ink.
- Read the relevant instructions carefully before using the printing ink
- Treat the printing ink in accordance with the local rules and regulations concerned

- The ink pot cannot be recycled
- Expeditous measures taken after osculating the printing ink.
  - When ink goes into your eyes, use massive fresh water to clean.
  - When the skin osculates the ink, use the soap and fresh water to clean
  - When ink is mistakenly eaten, try to vomit.