KJet UV Flatbed Printer
Operation Instructions

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Introduction

Thank you for purchasing KJ UV Flatbed printer (hereinafter referred to as the printer). Please read this manual carefully before using the printer. Keep the manual in a place easily accessible anytime.

The printer uses environment-friendly UV ink and supports printing on media with thickness up to 10 cm with various optional widths such as 120cm×250cm and 180cm×300cm.

This manual describes the characteristics and parts of the printer, information to be known before using and basic operations, such as powering on and off and setting of parameters of the printer.

Read the following carefully before proceeding to Chapter 1:
Accessories
Safety Precautions
Operation Precautions
Technical Parameters

Only the technical parameters of printers with the width of 120 cm × 250 cm are listed below and technical parameters of printers with other widths are virtually the same except printing width, printer weight, printing speed and dimensions.

Main technical parameters

<table>
<thead>
<tr>
<th>Model</th>
<th>KJ2512-08</th>
<th>KJ2512-06</th>
<th>KJ2512-00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Printhead</td>
<td>C M Y K * 2</td>
<td>C M Y K + 4W</td>
<td>C M Y K LC LM</td>
</tr>
<tr>
<td>Printhead</td>
<td></td>
<td></td>
<td>Piezoelectric type KM512MH</td>
</tr>
<tr>
<td>Number of prinheads</td>
<td>8</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>Max. width</td>
<td>360 x 720</td>
<td>360 x 1080</td>
<td>360 x 1440</td>
</tr>
<tr>
<td>Resolution</td>
<td>720 x 720</td>
<td>720 x 1080</td>
<td>720 x 1440</td>
</tr>
<tr>
<td>Printing</td>
<td>Draft</td>
<td>32.7 m²/h</td>
<td>16.6 m²/h</td>
</tr>
<tr>
<td>speed</td>
<td>Production</td>
<td>22.6 m²/h</td>
<td>11 m²/h</td>
</tr>
<tr>
<td></td>
<td>Fine</td>
<td>18.2 m²/h</td>
<td>8.4 m²/h</td>
</tr>
<tr>
<td>Ink type</td>
<td></td>
<td>UV ink</td>
<td></td>
</tr>
<tr>
<td>Ink supply</td>
<td>Vacuum negative pressure control, automatic continuous ink supply</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Media type</td>
<td>Hard media and soft media in maximum widths</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Media thickness</td>
<td>0~100mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workbench bearing</td>
<td>50kg/m²[1]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net weight</td>
<td>1080kg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Printer interface</td>
<td>USB2.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power supply</td>
<td>220V±10% 50HZ, 380V±10% 50HZ</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Working environment</td>
<td>Temperature: 15 – 30°C; relative humidity: 40 – 80%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimensions</td>
<td>3850mm x 2050mm x 1200mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other characteristics</td>
<td>Vacuum media absorption ensures close adhesion of media and the platform;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Requirement</td>
<td>Description</td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pneumatic media erection mechanism and bearing rolling facilitate loading</td>
<td>and unloading of wide media;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multiple duplication and adjustable clearance in X and Y directions</td>
<td>facilitate batch production;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High precision repeated printing realizes multi-layer overlaying, creating</td>
<td>better three-dimensional effects;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positioned printing with X and Y axis exempts from positioning for each</td>
<td>printing;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If you need to print multiple same products in one time, you just need to</td>
<td>press one button, facilitating batch production. In addition, the printer supports multiple duplication, narrow products can be printed in a full width to increase productivity;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coordination between two axles during printing saves time for stepping;</td>
<td>The software automatically calculates the daily workload;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KJ2508 can be flexibly configured to four-color eight-printhead or</td>
<td>four-color four-printhead plus white without tedious upgrade. Only four ink tubes need to be connected.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KJ2508 can realize white bottom and cover, and spot printing.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Requirements on power interface**

<table>
<thead>
<tr>
<th>Power source</th>
<th>Voltage Specification</th>
<th>Current Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power socket</td>
<td>220V single-phase triple socket</td>
<td>2500W (220V/16A)</td>
</tr>
<tr>
<td>UV lamp power supply</td>
<td>220V single-phase triple socket</td>
<td>3000W (220V/16A)</td>
</tr>
<tr>
<td>Vacuum motor power supply</td>
<td>380 V three-phase four-way socket (square hole)</td>
<td>1600W</td>
</tr>
<tr>
<td>Air compressor power supply</td>
<td>Refer to the product manual</td>
<td>About 1500 W</td>
</tr>
</tbody>
</table>

When the media lifting function is required, a small air compressor needs to be configured by users with the air displacement of 0.15m³/min and air pressure of 0.4 MPa.

*Operation Instructions of KJ UV Flatbed Printer
Compact Solven*
**Accessories**

Accessories include parts required for the printer, such as UV power supply and vacuum motor, and spare parts. For details, see Packing List.
Important

The important notes mentioned below may severely affect the working conditions and service life of the printer and service life of relevant parts, and even may cause permanent damage to relevant parts and hazards to health of personnel. Therefore, please operate as instructed.

1. Please use inks specified by the manufacturer; otherwise, printing effect may be affected or the printhead may permanently damaged.

2. Please carefully read requirements on working space and environment of the printer before installing it and follow the instructions strictly; otherwise the working conditions and service life of the printer and service life of relevant parts may be affected, and even permanent damage to relevant parts and hazards to health of personnel may be caused.

3. If the voltage of the external power supply is unstable, external stabilized voltage supply or UPS devices are recommended. Configure the power supply referring to Power required for power interface; otherwise the printer may not work normally or fire hazards may be caused. Please use stabilized voltage supply or UPS devices made by well-known manufacturers.

4. During printer operation and maintenance, prevent inks contacting any non-solvent liquids to avoid chemical reactions, which may damage the printer.

5. Please dispose waste liquids produced by the printer in accordance with the regulations of the local environment-protection authorities.
Safety Precautions

To ensure operators can operate the printer correctly and prevent damage to the printer and injury to personnel, please read the following safety precautions:

● Please use the voltage as instructed in the nameplate. Do not connect multiple devices to the same power socket so as to prevent fire hazard.

● Please check and make sure the printer is securely grounded and the indicator appears at the lower left corner. Otherwise, interference may be caused, causing abnormal operation of the printer.

● Do not dismantle or modify the printer by yourself; otherwise fire hazard, electric shock or other accidents may be caused.

● Do not contact the circuit control parts with metal products or liquids; otherwise, damage to the circuit board, fire hazard or other accidents may be caused.

● After the printer is powered on, do not contact with the front cover of the printer to prevent pressing button switches, causing maloperation of the printer.

● Do not touch the power cables with wet hands; otherwise electric shock may be caused.

● Shut off the printer when the following occur and contact local dealers if required:

   1. Switches are insensitive or do not function;
   2. Noises or smokes occur in the printer;
   3. Metal objects or liquids drop into the electric control parts;
   4. Problems that cannot be handled by operators occur.
Safety Precautions on UV Lamp Operation

UV lamps are high-voltage and energy peripherals. To ensure the safety of personnel and the printer, please follow the following instructions when operating them:

1. UV lamps emit high-energy high strength UV light which can cause injury to skins. Do not watch the lamp directly with naked eyes. When carrying out operations which may cause you directly expose to the light source, please wear protective suits and gloves, use sun shields and UV goggles.

2. When a PC is used to remotely control UV lamps, if the printer stops or pauses, the carriage will stop at the set position at left side. A heat dissipating device is installed under the position. So do not place flammable or explosive objects at the position.

3. When the UV lamp is started with the button switch on the UV power cabinet, if the printer stops, the carriage may not return to the set point on the left side, please move the carriage to the set point manually to prevent damage to the printing media or fire hazard.

4. When the printing media is thicker than 15 mm, it is recommended to place a thin seat pad with weak light reflection in the lighting range of right and left side lamps of the media to prevent light leakage of the UV lamp, causing injury to personnel.
**Operation Precautions**

**Power supply**

1. Install the printer at a place easily accessible to the power supply.
2. Use the power supply that is stable and meet the requirements of the printer.
3. Connected the power cable to an independent socket. Do not use the same socket with other devices.
4. Pay attention to the sequence of starting and stopping to prevent damaging the printhead.

**Printer**

1. Do not place any object on the workbench of the printer to prevent damaging the printhead.
2. Disconnect the power supply of the printer when servicing electric parts of the printer.
3. If the workbench is dirty, do not clean by scraping to prevent damaging the coating on the surface of the workbench. You may clean the surface after soaking in organic solvents such as acetone.
4. Do not contact the printhead surface with hands or hard objects.

**Regular Check and Maintenance**

1. Use a grease gun to lubricate the moving mechanical parts with lithium soap base grease. Under normal printing, add grease to the linear rail of the carriage every 5 shifts and to the forward and backward rail of the cross beam and the roller lead screw every two months, and to the lifting rail and lead screw of the cross beam every 6 months.
2. Regularly clean the dust screen on the UV lamp. Soak the screen in the organic solvent and then wipe it. Keep the quartz glass surface of the UV lamp clean without ink pollution.

3. For maintenance of inks and printhead, see Chapter Six Maintenance.
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Chapter One Basic Operations

1.1 Printer Installation

1. Unpacking

Please carefully check whether the box is intact before unpacking. If the box cracks or is damaged, you are entitled to refuse accepting the printer and contact the local dealer or us.

For the sake of safety, please use special tools to load and unload the printer. If a forklift is used, the arm length of the forklift should be longer than 1.25 m.

Indications of “front” and “back” are labeled on the packing box. When using a forklift to load or unload the printer, please operate the printer from the side labeled “Front”. For the sake of safety, please unload the printer on the level ground.

Schematic diagram of the packing box:

![Packing Box Diagram]

Unpack the box in accordance with the following steps. When unfastening screws on the packing box, please use special tools. Do not hit, strike or knock the packing box during unpacking.

1. Unfasten and remove the screws labeled with red circles on the front cover;
2. Remove the front cover;

3. Unfasten and remove the screws labeled with red circles on the back cover;

4. Remove the back cover;
5. Use special loading and unloading equipment such as forklift to unload the printer from the bottom of the packing box;

6. Transfer the printer to the working site. Do not knock the printer during transferring. For requirements on the installation space, see Chapter Two Installation Space.

2 Accessory Installations

Accessories to be installed on the printer include ball valve, front shroud cover, button control panel, Y-axis servo motor, back cover and absorbing vacuum motor.

- **Installing the printer front shroud cover and control panel**

  1. Install the front cover of the printer

  2. Install the control panel. Before installing, connect and secure the cables of the left stop switch and the control harness of the keypad, and connect the air tube control cables of the digital negative pressure gauge.
Cables of the control panel

Cables of the left stop switch on the front cover

Connect the cables of the control panel
3. Install the liquid level display panel of the main tank.

- **Installing the Y-axis servo motor and printer back cover**

  1. Install left and right Y-axis servo motors. Pay attention the indications of “left” and “right” on the coupling of servo motors.
Exploded view of Y-axis servo motor installation

Installing the coupling
2. **To prevent damages to the printer, please tighten the screws on the coupling firmly.**

3. Connect the control cables of the servo motors.

4. Install the left and right back cover of the printer.

5. The installation is complete.

- **Installing the absorbing vacuum motor**

1. Connect the printer to the air tube of the vacuum motor. One of the air tubes connects to the inlet of the vacuum motor and the other end connects to the printer. See the following:
2. Connect the power cables of the vacuum motor. See the following for the power connection:

3. The installation is complete.

**Grounding**

To ensure safe operation and stability of the printer, please ground the printer as specified in the manual before powering it on.

1. Making of the grounding pole: bury a 1-m copper bar with the diameter of 10 mm or other conductive metal bar into ground and water some salt water along the conductive metal bar into ground.

2. Requirements on grounding wire: The grounding wire should adopt 4 mm² multi-twist copper core wires. The length of the wire depends on the distance...
between the printer and the grounding pole. It is recommended that the length should not be longer than 10 m.

3. A grounding bolt is set at the lower right side on the back of the printer. The specific position is as follows:

![Grounding bolt](image1)

4. Connect the grounding bolt and the grounding pole securely with grounding wires. The connection of the grounding bolt is as follows:

![Grounding bolt](image2)
1.2 Working Conditions

Installation Space

Site layout for KJ Flatbed printer

<table>
<thead>
<tr>
<th>Model</th>
<th>X</th>
<th>Y</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>KJ2512</td>
<td>3.85M</td>
<td>2.05M</td>
<td></td>
</tr>
<tr>
<td>KJ2518</td>
<td>3.85M</td>
<td>2.65M</td>
<td></td>
</tr>
</tbody>
</table>

Environmental Conditions

- Working temperature and humidity

  Optimum working temperature and humidity
  Temperature: 19 °C - 24 °C
  Humidity: 45% - 70%

  Note: Operation of the printer beyond the working temperature and humidity may cause decrease of printing quality.

- Do not install the printer at:

  - Places with direct sunshine
  - Places with vibration
  - Places with much dust
- Places with obvious temperature fluctuations
- Places near air-conditioners or heaters
- Places that may be wetted
- Places where polluting gases may occur
- Places that are unstable

**Requirements on computer configuration**

The minimum configuration requirements on the computer for the software are as follows:

- CPU: dual core 2.0G or above
- Motherboard: high quality brand motherboard with USB 2.0 interfaces.
- Graphics card: graphics card with 128 M or above video memory
- Memory: 1G or above
- Other: CD-ROM
- Hard disk: 20 G or above free space with NTFS format.
- OS: Windows XP.

**1.3 Horizontal Adjustment**

Ensure the ground is level before horizontal adjustment.

The horizontal adjustment of the complete unit is divided into left-right horizontal adjustment and front-back horizontal adjustment.

**Left-right horizontal adjustment:**

1. Put the six seat pads under the supports of the printer.
2. Rotate the seat pads as specified sequence to lift the castors from the ground.
   
   The sequence is ①→②→③→④→⑤→⑥
3. Start the printer and move the cross beam to the utmost front. Use a leveling ruler and a leveler to inspect the printer. See the following:
Put the leveling ruler at the middle of the rail on the cross beam

4. Observe the position of the bubble indicator in the leveler. If the indicator stays at left/right side, adjust (heighten) right/left seat pads (adjusting ② or ③). Adjust slightly each time. Observe the position of the indicator while adjusting until the indicator stays at the center of the red scale of the leveler.

5. Keep the leveling ruler and the leveler still and move the cross beam to the utmost back. Observe the position of the indicator of the leveler and adjust as in Step 4 (adjusting ② or ④).

6. After completing steps 4 and 5, adjust seat pads ⑤ and ⑥. Heighten seat pads ⑤ and ⑥ until they touch the supports of the printer and then rotate another 30 degrees.

7. Check the horizontal leveling of the cross beam at front-back direction (Y-axis). Keep the leveling ruler and the leveler still and move the cross beam in full stroke forward and backward to ensure the bubble indicator of the leveler always stays at the center of the scale (±3).

**Front-back horizontal adjustment:**

8. Directly put the leveler at the center on the left/right side of the printing workbench, as shown below:
9. Observe the position of the bubble indicator in the leveler. If the indicator stays at front/back side, adjust (heighten) back/front seat pads (adjusting ①, ② or ③ ④). Adjust slightly each time. Observe the position of the indicator while adjusting until the indicator stays at the center of the red scale of the leveler.

10. Repeat steps 4 to 9 to ensure that the indicator of the leveler always stay at the center of the scale (±3).

11. The horizontal adjustment is complete.

1.4 Vacuum Absorption and Media Lifting

Principle of vacuum absorption

- Distribution of vacuum absorption
Schematic diagram 1 of the workbench zoning:

Zoning ball valve

Back

Front

Main valve

Schematic diagram 2 of the workbench zoning:

Zoning ball valve

Back

Front

Main valve
Main valve for vacuum absorption  Zoning valve for vacuum absorption

The main valve for vacuum valve: Controls the on/off of the main air path. When the valve is switched on, zoning valves are effective.

Zoning valve: Corresponds to the zones on the workbench to realize independent control of zones on the workbench.

Principle of vacuum absorption and pipe connection

Schematic diagram of KJ 2512 vacuum absorption principle and pipe connection:

```
Introduction to the principle
1. The vacuum absorption is a media fixing method that produces vacuum through air bleeding of the vacuum motor and thus fixes media on the workbench.
2. The vacuum absorption system is comprised of vacuum motor, ball valve (main valve) and 6 zoning valves.

Schematic diagram of vacuum absorption of KJ flatbed printer
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Schematic diagram of KJ 2518 vacuum absorption principle and pipe connection:

Introduction to the principle
1. The vacuum absorption is a media fixing method that produces vacuum through air bleeding of the vacuum motor and thus fixes media on the workbench.
2. The vacuum absorption system is comprised of vacuum motor, ball valve (main valve) and 9 zoning valves.

Connection and operation of the vacuum motor

- Connection of the vacuum motor (see Chapter One Installation of the Absorbing Vacuum Motor)

- Operation of the vacuum motor
  1. Connect the printer to the power supply with the provided 380 V power cable.
  2. Connect the power cable of the vacuum motor to the 380 V output end of the printer.
  3. Switch the air switch for 380 V power supply in the control box at the lower left of the printer to ON.
  4. Open the main valve and required zoning valves.
5. Switch the motor control switch on the control panel to ON.

Principle of the Media Lifting System and Pipe Connection

Schematic diagram of the media lifting system and pipe connection

Connection of the Air Pump

Use air tubes with inner diameter of 5mm and outer diameter of 8mm to connect the pressure output end of the air compressor and air inlet of the relief valve (as shown below).

Pressure Adjustment Through the Relief Valve

- Schematic diagram of the relief valve:
■ Adjustment of the pressure:
   1. Connect the air tube.
   2. Lift the pressure adjustment knob. Then you can adjust the pressure.
   3. Turn the pressure adjustment knob according to the relief valve gauge to adjust the pressure.
   4. Press down the pressure adjustment knob after adjustment.
   5. Drain the waste water in the relief valve through the drainage outlet after long-term use. Pull down the drainage outlet joint.

1.5 Operation of the Negative Pressure Ink Supply System

Principle of the Negative System

The liquid level of the subtank of KJ UV Flatbed Printer is much higher than the bottom of the printhead; therefore, negative pressure is used to offset the pressure caused by liquid level differences. In this case, inks in the subtank will not flow out from the printhead and negative pressure control required for printhead operation is formed. This part has a negative pressure system and a positive pressure system. As shown, the blue line indicates the negative pressure system and the red line indicates the positive pressure system. Under normal operation, the printer is in the negative pressure mode, in which normal ink supply can be guaranteed. When the positive flush button is pressed, the system is switched to the positive pressure mode and ink
in the subtank is pressed into the printhead to eliminate air in the printhead and clear holes with light blocking, solving broken line problems during printing. The schematic diagram of the system is as follows:

Diagram 1:

Setting of the SMC ZSE40F Negative Pressure Gauge

The printer adopts SMC negative pressure gauge. The negative pressure value during negative pressure ink supply depends on the height difference between the liquid level in the subtank and the bottom of the printhead. The negative pressure increases with the increase of the height difference. The negative pressure is controlled with SMC digital negative pressure gauge. The SMC negative pressure gauge is as shown below:

The setting of the gauge includes initial working state setting and pressure valve setting.
Setting of the initial working state

1. Long press the SET button for over two seconds and release when PA appears on the screen. Do not press the button too long; otherwise, the gauge will be locked. PA indicates the unit of measurement for displayed values and can be adjusted by pressing UP and DOWN buttons. The default setting is PA.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>PA</td>
<td>kPa, MPa</td>
</tr>
<tr>
<td>CF</td>
<td>kgf/cm²</td>
</tr>
<tr>
<td>BAR</td>
<td>Bar</td>
</tr>
<tr>
<td>PSI</td>
<td>Psi</td>
</tr>
<tr>
<td>INH</td>
<td>inHg</td>
</tr>
<tr>
<td>MMH</td>
<td>mmHg</td>
</tr>
</tbody>
</table>

Table 2: Response time

<table>
<thead>
<tr>
<th>2.5:</th>
<th>2.5ms</th>
</tr>
</thead>
<tbody>
<tr>
<td>24:</td>
<td>24ms</td>
</tr>
<tr>
<td>192:</td>
<td>192ms</td>
</tr>
<tr>
<td>768:</td>
<td>768ms</td>
</tr>
</tbody>
</table>

2. Press the SET button to enter the OUT1 mode selection interface. Press UP and DOWN buttons to switch OUT1 to normal open (1no is displayed or normal close (1nC is displayed) mode. Set OUT1 to the normal close mode and 1nC is displayed.

3. Press the SET button to enter the OUT2 mode selection interface. Press UP and DOWN buttons to switch OUT2 to normal open (2no is displayed or...
normal close (2nC is displayed) mode. Set OUT2 to the normal open mode and 2nC is displayed.

4. Press the SET button to enter the response time interface. The default display is 2.5. Press UP and DOWN buttons to change the response time. Here default setting 2.5 is used.

5. Press the SET button to enter the mode selection interface. Press UP and DOWN buttons to select Automatic (AUL is displayed) or Manual (nAn is displayed) mode. Here the Manual mode is set and nAn is displayed.

6. Press the SET button to complete the setting.

---

**Setting of pressure values**

1. Press the SET button. The symbol n_1 is displayed. Press UP and DOWN buttons to change the value of n_1. The value of n_1 is the upper limit of the negative pressure.

2. Press the SET button. The symbol n_2 is displayed. Press UP and DOWN buttons to change the value of n_2. The value of n_2 is the lower limit of the negative pressure.

3. Press the SET button. The symbol P_3 is displayed. Press UP and DOWN buttons to change the value of P_3. The value of P_3 is the upper limit of the negative pressure.

4. Press the SET button. The symbol P_4 is displayed. Press UP and DOWN buttons to change the value of P_4. The value of P_4 is the lower limit of the negative pressure.

5. Press the SET button to complete the setting. The negative pressure
gauge works normally.

**Precautions**

- The default settings of the SMC negative pressure gauge are as follows:
  - n1=-2.3, n2=-2.1, P3=-2.6, P4=-2.4 (summer)
  - n1=-2.5, n2=-2.3, P3=-2.7, P4=-2.6 (Winter)

  The above settings are reference values and adjustable according to local room temperature and printhead states.

- In terms of absolute values, the sequence of the four values is as follows:
  - n_2 < n_1 < P_4 < P_3 \( \text{(P}_4 = \text{n}_1 + 0.1) \)
  - Or n_2 < n_1 = P_4 < P_3

- At ex factory, the values of initial working states have been set and no modification is required. Only the pressure value needs to be adjusted according to the working environment of the printer for the best performance.

- When adjusting the values, follow the following sequence:
  - To increase the negative pressure (absolute value), the setting sequence is: p3→p4→n1→n2
  - To decrease the negative pressure (absolute value), the setting sequence is: n2→n1→p4→p3

**Setting of SMC ZSE30A Negative Pressure Gauge**

This digital pressure switch is designed for inspecting and controlling vacuum with the range from 0 to 101 KPa.

1) **Calibration of the reference pressure of the gauge**

The reference pressure calibration of the gauge is to set one standard atmospheric pressure as the reference zero point and has been completed
before delivery. It does not need to be calibrated during normal operation.

When the reference pressure is changed due to unexpected factors, it should be calibrated; otherwise deviation will occur between the displayed pressure and the actual pressure and affect the normal use of the gauge.

The calibration method is as follows: 1. Remove the air tube of the pressure gauge to let the air tube expose to the free air.

2. Power on the pressure gauge. The pressure gauge will display pressure values.

3. Press and hold ▲ and ▼ for over two seconds. The pressure gauge displays “0”.

The reference pressure calibration is complete.

2) Value setting

F1 channel setting:

1. Press and hold the “S” key, the system displays “F0”. ▲ ▼ to adjust the displayed value to “F1”.

2. Press “S” to enter the output control mode setting. Keep the value as shown below (keep the default value):

3. Press "S" to enter the reversed output control mode setting. Set the value to as shown below (delayed output):
3. Press “S” to enter the n-1 digital setting mode. Set the value to the working pressure of the ink supply system, about -2.2 KPa. *(the value for PZS is -2.0 KPa)*

4. Press “S” to enter the delay value setting mode. Set the value to 0.1 as shown below:

5. Press “S” to enter the signal lamp setting mode. Set the value to as shown below:

6. Press “S” to complete the “F1” channel setting. "F1" is displayed on the screen.

Then enter the “F2” channel setting:

7. Use ▲ and ▼ to adjust to “F2”.

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8. Press “S” to enter the output control mode setting. Keep the value \( HYS \) as shown below:

Press “S” to enter the reversed output control mode setting. Set the value to \( 2.7 \) as shown below:

10. Press “S” to enter P2L digital setting state. Set the value to the startup pressure of the ink supply system during air makeup, that is, -2.4KPa (the value for PZS is -2.2KPa). The value is 0.2 smaller than P1.

11. Press “S” to enter the delay value setting mode. Set the value to 0.1 as shown below:

12. Press “S” to complete the “F2” channel setting. “F2” is displayed on the screen.

13. Press and hold “S” to complete the pressure gauge setting. The pressure
gauge returns to the inspection state.

**Note:**

1. Values above in brackets “()” are normal values for PZS. Values out of brackets are used for KJ.
2. The pressure gauge at the moment during powering on does not in the inspection state, as shown below:

```
The power is supplied
   ↓
Display to show the standard product
   ↓ 1s
Display to show the unit specification
   ↓ 1s
Display to show the product
   ↓ 1s
Display to show the pressure range
   ↓ 1s
Measurement mode
```

That is, five seconds after being powered on, the pressure gauge enters the working state.

**1.6 Powering On and Off**

**Powering On**

- **Printer**

  1. Plug one end of the provided power cable into the power input jack on the printer and the other end into the power socket.

  2. Switch the air switch in the control box at lower left of the printer to ON.
The operating indicator lamp in the control panel of the printer lights up.

3. Press the blue Release Carriage Motor button on the right end of the cross beam.
4. Open left and right Stop buttons on the front panel.
5. Press the green Start button on the control panel of the printer.
7. After self-check, the carriage will stop at the clean position at the left side of the cross beam. The powering on procedure is complete.
8. The high pressure function can be enabled. Make sure the High Pressure button is pressed before each printing.

Note: When the printer connects to a computer, the powering on sequence before printing is as follows: Start the computer → Start LiYuPrint → Start the printer → Press the High Pressure button of the printhead → Power on UV

If the powering on sequence is improper, the printer may not be able to connect to the computer or other faults may be caused.

■ Vacuum Motor (See Chapter One Connection and Operation of the Vacuum Motor)

■ UV Lamp

1. Connect the remote control signal cable of the UV lamp on the printer to control interface of the UV power supply.
2. Connect the signal cables of left and right UV lamps to corresponding output ends of the UV power supply and tighten with a flathead screwdriver.
3. Connect one end of the provided power cable of the UV power supply to the input end of the UV power supply and the other end to the power socket.
4. Switch the air switch in the power control box of the UV lamps to ON.
5. Open the Stop button of the UV lamp power supply.
6. Light up UV lamps from the software or on the UV power supply.
7. When the two UV lamps work normally, the powering on procedure is complete.

Note: Do not switch UV lamps on and off repeatedly. Power on UV lamps again after powering them off when the heat dissipating fan of UV lamps stop; otherwise the service life of UV lamps may be shortened.

**Powering Off**

- **Printer**
  1. Stop the high pressure of the printhead.
  2. Wait until the UV lamp fans stop.
  3. Press the Stop button.
  4. Switch the air switch for power supply in the control box at the lower left of the printer to OFF.

Note: When the printer is connected to a computer, the powering off sequence after printing is as follows: Stop UV lamps → Press the High Pressure button of the printhead → Stop LiYuPrint → Press the Stop button (both left and right button are OK) → Turn the air switch for power supply in the control box at the lower left of the printer to OFF. If the power off sequence is improper, faults may occur in the printer.

- **Vacuum motor**
  1. Switch the vacuum motor control switch on the control panel to OFF.
  2. Switch the air switch for 380 V power supply in the control box at the lower left of the printer to OFF.

- **UV power supply**
  1. Stop UV lamps from the software.
  2. When the heat dissipating fans above UV lamps stop, turn the air switch in the UV lamp control box to OFF.

**1.7 Connecting to PC**

**Installation of USB Driver**

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1. After connecting the printer to a PC, switch on the printer. The system prompts that a new hardware is found and the driver for the hardware needs to be installed.

Select “Install from a list or specific location (Advanced)” and click “Next”.

2. If the USB driver is stored at:
   
c:\LiYuPrint_UV\LiYuPrintDriver\LiYuDriver_USB
After clicking “OK”, click “Next”.

3. The driver installation starts. If a prompt window appears, click “Continue
Anyway” to continue the installation.

4. The first stage installation is complete.

5. After completing the installation of the previous stage, the system will prompts that a new hardware is found again. Repeat steps 1 to 4 to complete the installation.

6. After the installation is complete, start the Device Manage. If U_V_USB Transfer Device, it indicates that the installation is complete successfully.

**Installation and Update of Firmware Driver**

The installation directory of firmware driver files is **C:\WINDOWS\system32\MYDEVICE**. Copy the firmware driver file MYDEVICE.SP provided with the software to the folder **MYDEVICE**. When updating, copy the new MYDEVICE.SPT file and overwrite the old one.

**1.8 Functions of the Control Panel and the Ink Level Display Panel**

- Schematic diagram of the control panel
Functional Introduction

- 1 and 2: buttons for moving the carriage leftward and rightward. When the printer completes self-check after startup, you can press the buttons to move the carriage leftward and rightward.

- 3 and 4: buttons for moving the cross beam forward and backward. When the printer completes self-check after startup, you can press the buttons to move the cross beam forward and backward.

- 5 and 6: buttons for moving the cross beam upward and downward. When the printer completes self-check after startup, you can press the buttons to move the cross beam upward and downward.

- 7: button for printing. When the printer is connected to a PC and a drawing to be printed is selected, you can press the button to start printing.

- 8: Pause button. You can press the button to suspend the printing. The printer is in the pause state.

- 9: Continue button. Used with the Pause button to cancel the pause state to let the printer continue printing.

- 10: Vacuum motor power button. When the printer is powered on, you can...
press the button to start or stop the vacuum motor.

- 11: Vacuum motor control valve button. When the vacuum motor is started up, press the button to open the absorbing air path.
- 12: Lifting knob. When the printer does not print anything, you can turn the knob to implement media lifting.
- 13: High Pressure button for the printhead. The button needs to be pressed before printing to provide working voltage for the printhead.
- 14: Power indicator lamp. Connected with 220 V power supply and light up when the air switch is closed.
- 15: Working indicator lamp. When the Start button is pressed, the indicator lamp lights up.
- 16: Start button. When the Stop button is not pressed, you can press the button to start the printer.
- 17: Digital vacuum pressure switch. Used to set and control the negative pressure of the negative pressure ink supply system.
- 18: Stop button. When faults occur or the printer needs to be stopped, you can press the button to stop the printer. Stop switches are set at two ends of the front cover of the printer.
- 19: Carriage motor button. When the printer works normally, the button is in the pressed state. When the carriage needs to be moved manually, you can press the button.

- **Schematic Diagram of the Ink Level Display Panel**
This panel is the ink level display panel of the main tank and used to display the remaining ink in the main tank to prevent broken lines and suckback due to ink shortage. For the indicator corresponding to each color, if the indicator of a color lights green, it indicates that the remaining ink in the main tank meets the print requirements and if the indicator of a color lights red, it indicates that the remaining ink in the main tank is insufficient for printing and ink refill is required.
Chapter Two Use of RIP Software

2.1 Installation of the Software

Insert the provided CD into the drive. The following dialog box appears:

Select a language you use and then click “Confirm”.

Click “Next”.
Select “I accept the terms of the license agreement” and click “Next”.

Click “Browse” to select the installation path.
Click “OK”.

Click “Next”.

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Wait until the installation is complete.

Click “Finish” to complete the installation.
2.2 Installation of the Key of the Software

When the software is being stalled, the following dialog box appears to prompt you to install the key:

![Product Selection dialog box]

Enter the 32-bit key on the software packing box in the “Key” field and select a language you use in the “Language” field and then click “Confirm”.

---

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2.3 Adding of the Printer

- **Menu operation**

1. Click “Add Setup” on the “Setup” menu as shown below.

![Menu operation screenshot](image)

2. When the following dialog box appears
Select “Liyu” from the dropdown menu in the first box and select a printer type in the second box, such as KJ2508 KONICA MH512 for KJ printers. Then click “Next”, the following dialog box appears:
No modification is required for other options. The red circled position is the path for RIP images which is customizable. Then click “Finish”.

- **Shortcut operation**

  1. Click “Add device” as shown below.

  2. Other operations are the same as those in Menu operation.
2.4 Adding of ICC Profiles

- **Method 1:**
  Select “Import Preset” from the “File” menu and then select a ICC profile in PTF format, as shown below:

- **Method 2:**
  Select “Color profiler” from “Setup” menu, as shown below:

The following dialog box appears:
Select “Convert legacy preset” in the red circle in the dialog box. The following dialog box appears:

In the dialog box, click the button labeled “1” first, the system prompts you to select a profile to be added. Then the button (“Convert”) labeled "2” is available. Click the button. The following screen appears:
It indicates that the profile is added successfully.
2.5 RIP Procedures

- **Editing**

Media size: There are two options: default media size and customize. Usually the default media size is used and no setting is required.

Job size: The option can be used to adjust the size of the image to be printed.

When adjusting the size of an image, you may select to zoom in or out proportionally (check the Proportional option) and adjust at discretion (uncheck the Proportional option).

Position: The option is used to adjust the position where an image is displayed.

Copies: The option can be used to copy an image for multiple copies. The first box is for number of copies and the second box is for the distance between two images.

- **F**: It is the position of the mirror image.

- **R**: It is used to rotate images.
: It is used to select the preview mode.

■ Workflow

After output: This option is used to select to keep or delete an image after ripping.

Repeat job: If this option is checked, the number of the ripped image can be set.
Color Management

The dropdown menu has three options:

- **Use color profiler:** use ICC profiles for mixed color printing. This option is used under normal conditions.
- **No color correction:** do not use ICC profiles
- **Use linearization only:** pure color printing.

Output profile: This option is used to configure the density curve. When the above option is selected, this option is configured automatically.

Media: This option is used to select the media type and is also automatically configured.

Resolution: Used to select the resolution of exported files.

Color mode: The default setting is CMYK.

Dither: Used to select the diffusion mode during ripping. Usually “error diffusion” is used.
Gradient smoothness: There are three options: Normal, Enhanced and Super.

Keep the default setting.

Use color mapping: This option is automatically configured.

Ignore overprint: This option is automatically configured.

Printer Options

White ink options: This is used to set the white printing mode and has four options:

None: do not print white.

Substrate: print white, that is, white bottom or cover.

Spot color: spot color printing and to be used with EDITOR software.

Under color: print white at places with other colors and do not print at places without other color.

Fill color: Under color: print white at places without other colors and do not print at places with other color.

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Collage

Panel size: Used to set the size of tiles used for collage.

Selected tile: Select a tile after segmenting.

All tiles: This is used to set the segmenting method, such as horizontal or vertical even segmenting.
Label and Mark

This option has little actual usage and is usually not used.
**Color Adjustment**

In this option, it can be considered to adjust the ink output quantity. The ink output quantity is usually set during the curve calibration. However, due to requirements of some images and special requirements of customers, you can adjust the ink output by using this option. During normal adjustment, increase or decrease the ink output of all colors simultaneously. It is not recommended to adjust the ink output of a single color. This may cause color cast. Adjusting method: Select “All” in the “Channel” option and then click the red part in
. Enter the ink output quantity in the “Export” option or directly pull the line in the picture.

### Separation

This option is used for color-separation printing and usually not used.

**Note:** Generally, only editing, color management, printer management and color adjustment are required for image ripping. After completing these procedures, click **Send** and select the storage path.
Chapter Three Use of LiyuPrint Software

LyPrint is an integrated software suit developed by Compact Solven for the control and printing of Compact Solven printers. It is mainly used to control the movement of carriage and printing media, adjust printing parameters and read prt/prt files for printing. In addition, LyPrint software provides white skip and continuing from interruption for users. To use the software correctly, please read this manual carefully.

3.1 Introduction to the Software Interface

A shortcut LyPrint will be generated on the desktop after the software is
installed. Double-clicking the shortcut will start the software.

After the software is started, the main interface will display different contents according to different printer types.  

**The main interface of the software:** As shown below, the interface is user-friendly and easy to operate.

The software interface is divided into six modules:

- **Menu bar:** at the top of the interface
- **Toolbar:** below the Menu bar.
- **Left toolbar:** at left side of the interface
- **Image preview area:** center of the interface
- **Printer status bar:** below the left toolbar
- **List of files to be printed:** below the left toolbar
List of files to be printed: at the bottom of the interface

3.2 Description of Functions of the Menus

- **Menu bar** (File, Check, Print, Test, Clean, System)
  - **File**
    - **Open**: Open prt/prt files to be printed. When a file to be printed is opened, it will be displayed in the list of files to be printed (see List of files to be printed). At the same time, the image preview area displays the preview of the file to be printed.
    - **Save**: Save the current printing task list. When the software starts again, it will automatically load the printing tasks saved in the last time.
    - **System settings**: clicking the option will open the system setting interface (see Description of special functions → System setting).
    - **UV lamp settings**: clicking the option will open the UV lamp setting interface (see Description of special functions → System setting).
    - **Exit**: Click the option to exit the software.
  - **Check**

To hide a toolbar or status bar, uncheck the checkbox on the left of the
toolbar or status bar.

To show a toolbar, check the box on the left of the toolbar.

The preview speed decreases when the preview resolution increases. However, the display effect will be better.

- **High preview**: The display speed is very low and the display effect is the best.
- **Rough preview**: The display speed is higher but the effect is not so fine.
- **Automatic setup**: The software selects the preview fineness automatically according to your computer configuration.

### Print

- **Print**: Print selected prt files.
- Files opened through **File > Open** are displayed in the List of files to be printed. See 12.5 List of files to be printed.
- **Cancel**: During printing, when you click **Cancel**, the carriage will stop printing after finishing the current task.
- **Reset**: reset the printer.
- **Pause**: During printing, you can suspend current printing and flush the printhead.
- **Continue**: When the printing is suspended, click **Continue** to resume printing from suspension.

### Calibration
◆ **Horizontal test**: The main interface is as follows:

![Hori. Test interface](image)

The interface is divided into two parts from the center. The left part is used for calibration of printheads without white ink and the right part is used for calibration of printheads with white ink. The calibration methods are the same.
Meanings of items in the interface are as follows:

Print: horizontal calibration test for printing (see below)

Click “Print” to print the calibration diagram. In the calibration diagram, the black lines in the center are the reference line. Colored line boxes above the black lines are forward calibration values of the printhead. The colored line boxes below the reference line are backward calibration values of the printhead. K0 printhead has only backward calibration values. During calibration, select the calibration value aligned and add the value in the editing box behind the printhead number with this calibration value to obtain the new calibration value. Then enter the new calibration value into the editing box behind the printhead number. Please pay attention to the position of the calibration value in the calibration value interface. Forward calibration values are not necessarily identical with corresponding backward calibration values.

Effect: print the horizontal calibration effect images to check whether the horizontal calibration is precise (as shown).
Click “Effect” to print the horizontal calibration effect images. Observe color lumps in the images and their junctions with the black lumps in the center. In the effect images, color lumps above the black color lumps correspond to the forward calibration effects and color lumps below the black color lumps correspond to backward horizontal calibration effects. If a color lump is at left side by comparing with the black color lump, reduce the calibration value based on the original calibration valve and increase the calibration value based on the original calibration value if the color lump is at right side. Note: it is better to keep the increased and reduced values within one to two pixels. Print the effect images after correction until all color lumps are completely aligned with the black color lump. High magnifiers can be used to observe the effect images.

Check: print the horizontal calibration check images (see below)
Click “Check” to print the horizontal calibration check images. If all printed line segments are in the same straight line without any deviation, it indicates that the horizontal direction is precisely calibrated. If deviation occurs, calibrate the horizontal direction again.

In the check images, the black line is the reference line. The colored lines above the black line correspond to the forward calibration effect and the colored lines below the black line correspond to the backward calibration effect. The colored lines in the center show the overprinting effect of the forward and backward directions. If a colored line is at left side by comparing with the black reference line, reduce the calibration value based on the original calibration valve and increase the calibration value based on the original calibration value if the colored line is at right side. Note: it is better to keep the increased and reduced values within one to two pixels. Print the check images after correction until all colored lines are completely aligned with the black reference line. High magnifiers can be used to observe the check images.

**Setting the horizontal resolution for test printing:** Select a horizontal printing resolution to be calibrated from the list. Generally, different horizontal resolutions have different calibration values.
Setting test printing speed: Select the printing speed to be calibrated from the list. Generally, different speeds have different calibration values.

Forward left align calibration: The forward horizontal calibration values of printheads correspond to lines above the black line the calibration test images.

Backward left align calibration: The backward horizontal calibration values of printhead correspond to lines below the black line the calibration test images.

Note: The three horizontal calibration methods are of the same effect. You can select one method according to your experience.

◆ Step test: The main interface is as follows:

Printing mode list: Select a printing resolution to be calibrated from the list. Generally, different resolutions have different calibration
values.

**Calibration value:** Enter the step calibration value in pixels. After printing the step calibration images, enter the calibration values on the calibration images into the editing box. If a calibration value has been entered previously, add the new calibration to the original calibration value.

**Tuning value:** Enter a precise tuned calibration value here in mm. After the calibration value is corrected according to the calibration images, the step direction may slightly deviate. Then you need to adjust the tuning value to eliminate these imprecise factors. Normally, slight changes may occur in this interface after you enter values in the editing box and save the entered value.

**Print:** print step calibration images (see below)

Click “Print” in the step test interface. The printer will print the step calibration test images on media (as shown above). Select the calibration value aligned and add the value in the editing box behind the “Calibration value” with this calibration value to obtain the new
calibration value. Then enter the new calibration value into the editing box. Values of the aligned parts of different colors in calibration images generally are the same.

**Effect:** Print the step calibration effect images. After correcting the calibration values, observe whether the step is precisely calibrated (as shown below).

![Effect Image]

Click “Effect” to print the step calibration effect images. Observe the joint between Zone 1 in the effect image and Zone 2 in the black box. If the width, size and evenness of the gap at the joint are the same as those between other lines, the step is initially calibrated. And precise calibrations should be further performed.

**Check:** Print the step calibration check image to determine the tuning value (as shown below).
Precise step

Click “Check” to print the step calibration check image. The check image is used to precisely calibrate the step. Observe joints between lines in the check image and adjust the tuning value according to the joints to precisely calibrate the step. Generally, the adjustment can be made by 0.002 to 0.005 each time.

Note: For KJ Flatbed Printers, dual servo motors are used in the Y axis and the step value in the direction is precisely controlled; therefore, no calibration is required.

◆ **Printhead check**: Print the printhead test image to check whether printheads can spray inks normally (as shown below).
Each line in the image represents a printhead. If a line segment is not printed, it indicates that blocking occurs in the printhead. You can solve the problem through positive flush.

◆ **Vertical check:** Print the vertical check image to check the vertical arrangement of printheads.

In Zone 1, the joint between two lines has transplacement and transplacement between all neighboring lines are even and the same. If obvious difference occurs between a line and its neighboring lines, it indicates that deviations occur in the vertical arrangement of printheads.

In Zone 2, vertical arrangement between No. 1 printhead of all colors and K0 is displayed. K0 prints three horizontal lines and other printheads print two horizontal lines. If the two lines are precisely printed in the gaps between the three lines printed by K0, it indicates the vertical arrangements of printheads are correct.

In Zone 3, vertical arrangement between No. 0 printhead of all colors and K0 is displayed. If these lines are all printed in a straight line, it indicates that the vertical arrangements between printheads are correct.

◆ **Printhead deviation check:** This option is used to print the printhead deviation test image (as shown below) to check whether a printhead
Among horizontal lines, all color lines must be printed in the same straight line and all vertical lines must be in the same straight line without any deviation.

- **Workbench check**: Print the workbench check test image to check whether the levelness of the workbench. The levelness of the workbench has been set before delivery. Therefore, this option is rarely used.

- **Printhead inclination check**: Print the printhead inclination check image to precisely calibrate the printhead together with the printhead deviation check image.

- **Export calibration parameters to file**: Save current calibration parameters to files in hard drive. Generally, the files are stored in Test folder in the software installation directory.

- **Import calibration parameters from file**: Load calibration parameters from files previously saved (in Test folder of the software installation directory).

- **Save parameters to printer**: save current calibration parameters into printer.

- **Load parameters from printer**: Load calibration parameters from
printer.

- **Clean**

  - **Flashjet**: Enable the flashjet for the printer to prevent printhead blocking.
  - **Return**: Exit from the flashjet state.

- **System**

  - System settings: set system parameters of the printer. This interface has two tabs: parameters and list.

    Below is the parameter setting tab. Parameters in the List tab do not need to be modified by users.
System Options:

**Printer type:** select a matching printer type. For example, KJ2508w-KM.

Language: set the language version of the software: CHS (Chinese) and ENU (English)

**Testing:** 1: Test; 0: Do not test. If “1” in entered, all commands sent by the software during printing will be stored in *command.txt* in the installation directory of the software to facilitate operators to monitor whether control commands are correctly given.

**Zoom:** set whether to zoom in or out during preview. 1: Yes; 0: No.

**Mask auto generation:** 1: Yes; 0: No. Mask printing is a unique image processing method developed by Compact Solven. The method can effectively solve image printing problems caused by strips and broken lines. The default setting is “1” and does not need to be modified. Selecting different printing resolutions can automatically select whether to use mask generation. For example, for KJ2500-KM (KONICA 512 14PL 4-color), selecting 360*1080 (3PASS) will not use mask generation and selecting 360*1080 (6PASS) will use automatic mask generation.
Basic Control Parameters of the Printer:

**Printer mode**: printer version number: 1 = KT; 2 = PZ; 3 = KT-Konica; 4 = PZ-Konica, 5=KJ

**Bidirectional communication**: 1: support bidirectional communication; 0: do not support bidirectional communication.

**Output interface**: output interface type. This printer uses UV_USB and adopts USB cables and slave units for data communication.

Number of printing colors: set the number of colors for the printer. If white and multiple groups of white printheads are included, a group of white printheads is regarded as one color.

**Groups of printheads**: set the number of printheads used for each color.

**Horizontal pulse equivalent**: set the pulse equivalent of the motor in the horizontal direction. This option is used to control the stroke in the horizontal direction.

**Vertical pulse equivalent**: set the pulse equivalent of the motor in the Y axis direction to control the step distance.

**Jet distance**: the maximum acceleration distance of the carriage. Generally, the distance set on the origin should be greater than or equal to the sum of the jet distance and the distance from printheads to the origin.

**Maximum command delay**: set the timeout time for sending commands. Generally, it does not need to be modified.

Maximum single direction delay: When the printing is performed in a single direction, it is the timeout time for data sending in single direction printing. When the set time is reached, the current command ends.

**Maximum bidirectional delay**: When the printing is performed in bidirectional, it is the timeout time for data sending in bidirectional printing. When the set time is reached, the current command ends.
**Horizontal resolution of test images:** This is the resolution in the X axis direction for calibration test images.

**Vertical resolution of test images:** resolution of test images in the Y axis direction.

**Raster film resolution:** set the resolution of the raster film.

**Display resolution of single color printheads:** set the display resolution of printer printheads. It can be used as the resolution for test images.

**Basic Position Parameters of Printheads:**

**Distance between printheads and the origin:** The distance between the jet orifice of the first printhead on the left and the origin of the carriage in mm.

**Distance between the origin and UV lamps:** The distance between the origin of the carriage and the external boundary of UV lamps in mm. For UV models, it is 353 mm.

**Distance between the material sensor and UV lamps:** The distance between the material sensor and the external boundary of UV lamps in mm.

**Origin of mechanical minimum printing:** The mechanical minimum printing origin. It must be greater than or equal to the sum of distance from the printhead to the origin and the jet distance (maximum acceleration distance).

**Physical resolution of single-color printheads:** The actual physical resolution of the printer printheads, the actual physical resolution in the vertical direction of the printheads after installation.

**Other:**

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Minimum voltage value: set the minimum voltage of the printheads.

Maximum voltage value: set the maximum voltage of the printheads.

Pre-printing step: Set the step distance before printing. If no step is required, it is set to 0.

Print white: If white data is included, it is set to 1; otherwise it is set to 0.

Pulse equivalent of the front pressure beam: The pulse equivalent for lifting of the front pressure beam.

Z-axis pulse equivalent: The Z-axis pulse equivalent is used to control the upward and downward movement of the cross beam on KJ printers.

Maximum printing width: The maximum mechanical printing width in mm.

Maximum vertical length: For KJ printers, it is the maximum mechanical step width in the vertical direction.

◆ Voltage setting: open the printhead voltage setting interface (see Description of special functions → Voltage setting).

◆ Language: used to select the language used for the interface display of the software. It includes English and Chinese. After a language is selected, the interface display language of the software is changed and the software will restart.

◆ Help: Open the help for the software.

 Toolbar: The toolbar displays shortcut buttons for controlling and configuring the printer. When the cursor moves to a button, operation instructions of the button will be displayed in the status bar.
- Open prt files. When aprt file is opened, the printer automatically loads the printing file. The image preview area displays the loading progress bar. When the file is opened, the progress bar disappears.

- Save the current printing task list. When the software is started again, it will automatically load the printing tasks saved in the previous time and you do not need to open the printing file again.

- Enter the system setting interface.

- Enable the flashjet function to prevent printhead blocking.

- Return to the state before entering the flashjet state.

- Clean the printheads.

- Control the leftward and rightward movements of the carriage and the forward and backward movements of media (corresponding arrow keys on the keyboard).

- If this option is checked, the printing starts from the origin position set previously. If the option is not checked, the printing starts from the position where the carriage currently stays.

- Select whether to print strips at either sides or either side of images.

- Select whether to use the white skip function during printing. When this option is selected, vertical white spaces in images will be directly
skipped and the printing continues when the media is moved to the area behind the white space. During white skip, the carriage will not move forward and backward. For horizontal white spaces, the software automatically judges the white spaces and lets the carriage move at non-white spaces to reduce printing time. For images with white space in the center, this option cannot be used. Using this option will save much time for printing images with large white space.

- **Auto. FlashJet**: Select whether to use the flashjet automatically during printing to prevent blocking.

- **Help document**: Help document. If you come across any problems during using the software, you can search relevant items in the document for solutions.

**Left toolbar**: Functional buttons in this toolbar are the same as those in the print and test menus of the software (Figure 1.9). Buttons here will facilitate operations by users. The option is divided into two parts: print and test, which correspond to the print and test menus in the main menu of the software.
Printer status bar: This status bar is at the lower left of the main interface (as shown above) and displays the current status of the printer, including offline, ready and flashjet. It also gives prompts for operations by users. The specific functions are as follows:

- **Offline**: This indicates that the printer is not started or the USB cable is not correctly connected.

- **Ready**: The printer is correctly connected with a PC and can be operated through the PC.

- **Print**: The printer is in the printing state.

- **Pause**: The printer is in the pause state.

- **Flashjet**: The printer is performing flashjet operations.

Image preview area: It displays the preview of the file to be printed.

List of files to be printed: This option lists prt files opened through the software and information about these files. You may modify printing mode, printing speed, direction and copies in the list. To print a file, select the file and then click the print button in the left toolbar.
- **Task name**: Name of the file to be printed.
- **Status**: Display the current status of the file, including printing and non-printing status.
- **Color**: Display whether a file is a 4-color, 5-color or 6-color file. The number of colors must match the printer type; otherwise, the file cannot be printed.
- **Size**: This option displays the size of RIP files.
- **File resolution**: This option displays the resolution of RIP files.
- **Printing mode**: This option is used select the printing resolution. The printing resolution selected here must be the same as the file resolution; otherwise, color deformation may occur.
- **Speed**: This is used to set the printing speed and has three options: Low, Middle and High. Lower printing speed will provide better precision with lower efficiency and vice versa.
- **Direction**: It is used to set the scanning method of the carriage, including Unbidi and Bidi. The Unbidi provides higher printing precision with lower efficiency and the Bidi provides lower printing precision with higher efficiency. If the horizontal calibration is precisely performed, the printing precision of these two modes has little difference.
- **Estimated remaining time**: The software automatically calculates the time required for printing with a specific algorithm.
- **Number of vertical printing**: Set the number of vertically printed copies. Please set the option alternately (See System Settings → Advanced setting).
- **Number of horizontal printing**: Set the number of horizontally printed copies. Please set the option alternately (See System Settings → Advanced setting).
- **Mirror mode**: Set whether to print files with mirror images. Select from
the dropdown menu after clicking the option.

- **Right-key menu of the file list**: select a file from the file list and right-click. A pop-up menu appears (as shown below).

  ![Dropdown menu for file list]

  - **Print**: start to print the selected file.
  - **Continue**: continue to print a file.
  - **Delete**: Delete the selected file from the list.
  - **Save**: Save a selected file in the file list. The file will be displayed in the list when the software is started next time.

### 3.3 Descriptions of Special Functions

This software has some important settings which need to be described in details.

- **Setting of UV Lamps** (as shown below)

  ![UV Lamp Control window]

  - **Current status of UV lamps**: This option displays the current...
status of UV lamps. Click “Refresh” to search the status of UV lamps, including:

◆ **OFF**: UV lamps are powered off.
◆ **60% Power**: The current power of UV lamps is 60%.
◆ **100% Power**: The current power of UV lamps is 100%.
◆ **Error**: Status of UV lamps is not obtained.

➢ **UV lamp setting**: This option can be used to set the on/off and power rate for UV lamps. After selecting the power in the dropdown menu behind left and right lamps, click “Apply” to finish the setting.

➢ ![Progress bar for lamp starting. When the progress bar is full, the lamp is powered on. During lamp starting, other functions of the software will be disabled. Therefore, please do not perform other operations in the process to prevent system crush.](image)

■ **Printhead voltage setting** (as shown below, K, C, M, Y and W respectively represent black, cyan, magenta, yellow and white printheads)
- **Reference voltage setting for printheads**: Increase or decrease voltage values in the editing boxes (in the range from 10.0 V to 18.0 V) and then click “Set”. The set voltage value takes effect and displayed in the **Current Printhead Voltage** field.

- **Current printhead voltage**: display the current voltages of printheads.

**Cross Beam Control**
including up, down and reset Z axis.

**Up:** Press and hold the Up button with the left key. The cross beam goes upward continually. Release the button, the cross beam stops moving.

**Down:** Press and hold the Down button with the left key. The cross beam goes downward continually. Release the button, the cross beam stops moving.

**Reset Z axis:** Z axis refers to the direction of the upward and downward movements of the cross beam above the printing media. Click the button. The cross beam starts to reset its position and returns to the initial position after resetting.

- **Move specified distance:** You can move the cross beam automatically to a specified height through setting the *upward/downward distance* (mm) (note: entered value must not be greater than 30).

- **Automatic positioning:** You can move the cross beam directly above the printing media through setting the media thickness (mm) (note: entered value must not be greater than 30). Under default conditions, when the
cross beam reaches the lower limit, the distance between the bottom of printheads and the printing workbench surface is about 2 mm. This positioning method is generally used for replacing printing media with given thickness and the printhead height does not need to be adjusted. For example, the printing media previously used is 4 mm thick and now the printing media is 6 mm thick, you just need to enter 6 in the box and the cross beam will automatically moves to the position 2 mm above the media surface.

- **System setting** (including six functional tabs, as shown below)

![Setup dialog box]

- **General settings** (as shown above)

- **Printer setting**

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**Printer:** Printer list. Please select the printer model you currently use from the list; otherwise, the printer may not be operated correctly.

**Speed:** Printing speed list. You can select a printing speed from the list, including: Low, Middle and High.

**Printing method:** Printing resolution list. You can select printing resolution from the list. Higher resolution provides finer printing and needs more printing time.

**Direction:** There are two options: Bidi and Unbidi. Bidi printing is to print both from right to left and from left to right. Unbidi is to print only from left to right or from right to left.

◆ **Clean setting**

**Flashjet frequency:** It is used to set the jet times of printheads every second when the printer performs flashjet operations. It is usually set to 40.

**Flashjet interval:** During printing, after the printer works for specific circles, the carriage goes to the flashjet position at the left side of the printer to perform flashjet operations. These circles are the flashjet interval. Correct setting of the option can effectively prevent printhead blocking.

**Clean frequency:** During automatic cleaning, after the carriage goes to the cleaning position at the left side of the printer, the printer automatically starts the cleaner connected to the printer. The carriage moves back and forth above the cleaner for several times. The times that the carriage moves back and forth above the cleaner is the clean frequency.

**Clean interval:** During printing, after the printer works for specific circles, the carriage goes to the clean position at the left side of the printer to perform cleaning operations. The printer continues to print
after cleaning. These circles are the cleaning interval. Correct setting of the option can effectively prevent printhead blocking.

◆ **Feather setting**

**Feather mode**: including No, Feather and Wave feather. Using the feather function can effectively reduce the stripping problems of printed images. The wave feather method adopts the wave joint technology for printing and can effectively solve the problems color unevenness between joints and other places.

**Number of feathered lines**: It is used to set the number of lines to be feathered. More feathered lines provide better feathering effects but reduce the printing efficiency. Usually, it is set to a number ended with 9, for example, 19, 29 and 39.

➢ **Origin Setting**
◆ **Origin positioning type:** When the Carriage Origin is selected, the image is printed from the coordinate set from the origin. When the Media Origin is selected, the media is used to position the origin. This option is rarely used in KJ flatbed printers.

◆ **Media origin positioning** (corresponding to Media Origin)
  
  **Media position:** the position at the right end of the printing media from the printing origin.
  
  **Media width:** the width of the printing media.
  
  **Media length:** the length of the printing media.

◆ **Carriage origin positioning** (corresponding to Carriage Origin)
  
  **Red point positioning:** If this option is checked, the laser localizer under the carriage printhead board obtains the current position of the
carriage in real time.

**X axis origin position:** When the carriage moves to the edge of the media, click “Obtain the X axis position”. The software automatically obtains the X axis position.

**Y axis origin position:** When the carriage moves to the edge of the media, click “Obtain the Y axis position”. The software automatically obtains the Y axis position.

Note: When the coordinates of the X axis and the Y axis, click “Apply”, the software automatically save the coordinate values. When the Origin Printing option is checked in the main interface, the carriage will start printing from the coordinate value.

- **Advanced Settings**
**Color Strip Setting**

*Color strip position*: select the color strip printing position from the list. There are three options: Left, Right and Both, that is, color strips are printed at the left, right or both sides of the image.

*Color strip width*: The width of printed color strips.

*Distance from the color strip to image*: The distance between the inner edge of the color strip and the image in mm.

**Task Setting**

*Vertical distance*: When multiple files are printed in the vertical direction, this option is used to set the distance among these files in the vertical direction.

*Vertical distance*: When multiple files are printed in the vertical
direction, this option is used to set the distance among these files in the vertical direction.

**Maximum preview lines:** Number of lines to be displayed during prt/prt image preview. The preview speed will decrease when the value increases.

◆ **Setting of Empty Space for Images**

**Adding empty space to images:** Add empty spaces before and behind images to be printed to increase the stroke of the carriage. Thus, the direction change is performed out of the media, preventing deformation of the media caused by lighting of UV lamps during direction change.

**Pre empty space:** Add empty space width in front of the image to be printed. If this width is set, the same width should be reduced from the X axis coordinate in the origin setting dialog box to ensure the printing on the image starts from the set origin position.

**Post empty space:** Add empty space width behind the image to be printed.

➢ **Temperature Setting**
◆ **Printhead temperature setting**: It is used to set the temperature for K, C, M, Y and W printheads. Click the up and down arrow in the temperature setup to increase or reduce the temperature. The temperature range is from 45°C to 80°C. **UV inks are sensitive to temperature.** Therefore, adjust temperatures by a proper range each time. After setting, click “Set” to finish the setting.

◆ **Current printhead temperature**: It displays the current temperatures of printheads.

- **White printhead setting** (for UV white printer)
**Print white**: To print white, check this option. Under default conditions, white is not printed and the options below are disabled.

**White data source**

**Automatic generation**: LyPrint automatically adds white printing data during printing. This is only used for common bottom and cover printing methods. In addition, the images must be 4-color images during ripping.

**RIP file**: White data is added in RIP software for printing files and is set. Therefore, the files can be directly printed after loading. For specific printing methods for white, see Chapter Two → Part 7 → Printer Options.
◆ **White thickness**: When white data is generated automatically, the density of white inks is divided into eight levels. The higher the level is, the higher the printing density is and vice versa. You can select a proper density level according to actual needs.

◆ **White printing method**

  **Bottoming**: Print white first and then print image data. In this case, the image is printed backward.

  **Covering**: Print image data first and then print white. In this case, the image is printed forward.

◆ **Number of white printheads**: Select the number of printheads to be used.

◆ **Shrink**: How much will the white color print on left or right of the image?

◆ **Super thickness**: Super thickness provides printer with more density of white ink.

➢ **Output Calculation**
The output (area) can be calculated according to the horizontal and vertical lengths of printed files. The output (unit: square meter) can be queried by year, month and day and the total output is automatically calculated in a time range. The output data is stored in output.dat in the software installation directory.

3.4 Additional Functions

- **White Skip**

  If large empty space occurs at left and right sides in the horizontal direction or in the vertical direction, the printer will automatically skip the empty space during printing and prints non-empty area to save time. To use this function, check "White skip" in the toolbar.
Memory Print Function

Printing may be interrupted due to various reasons and perhaps half of an image has been printed. In this case, you can right-click the file and select “Memory Print” from the menu. The printer will continue printing the file from the position where the printing is interrupted last time to facilitate jointing in the later stage.

3.5 Shortcut Operations of the Software

Shortcut keys can be used on keyboard during the use of the software. The shortcut keys are as follows:

<table>
<thead>
<tr>
<th>Function</th>
<th>Keys</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cancel printing</td>
<td>Ctrl+C</td>
</tr>
<tr>
<td>Start printing</td>
<td>Ctrl+P</td>
</tr>
<tr>
<td>Pause</td>
<td>Ctrl+H</td>
</tr>
<tr>
<td>Memory Print</td>
<td>Ctrl+K</td>
</tr>
<tr>
<td>Reset</td>
<td>Ctrl+R</td>
</tr>
<tr>
<td>Manual flashjet</td>
<td>Ctrl+L</td>
</tr>
<tr>
<td>Return from flashjet</td>
<td>Ctrl+B</td>
</tr>
<tr>
<td>Moving leftward and rightward of the carriage</td>
<td>Left and right arrow keys</td>
</tr>
<tr>
<td>Moving forward and backward of printing media</td>
<td>Up and down arrow keys</td>
</tr>
</tbody>
</table>

Note: Shortcut keys for starting printing, canceling printing and resetting are only valid in the horizontal test and step test interface. Direction arrows are always valid.
Chapter Four UV Equipment

4.1 Introduction to UV Power Supply

- Overview

- Technical Parameters

Parameters of DX90 UV lamps and power supply:

- Power: 130W/cm
  - 2200W @50Hz
  - 2200W @60Hz

*Operation Instructions of KJ UV Flatbed Printer*
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Current: DX90 5A/6.5A/10.2A
Lamp arc length: 90mm (DX90)
Focal distance: 5mm (to the quartz glass surface)
Weight:
   DX90 power box  56kg
   DX90 UV lamp 1.85 kg/each
Dimensions:
   Power box: 535mm x 315mm x 440mm (LxBxH)
   DX90 UV lamp: 210mm x 135mm x 170mm (LxBxH)

- **Main Components** (The UV equipment consists of two UV lamps, a power box, power cables and remote control cables)
  - **Power box**
    The power box adopts the cold rolled plate housing and houses control circuits for lamp operation. The unit mainly includes the following components:
    - Programmable logic controller (PLC), inductive ballast, capacitor, high voltage electric fluorescent starter, fuse, cooling fan, remote control adapter (optional)
  - **UV lamps**
    This unit mainly includes the following components:
    - High pressure mercury vapor lamps, bowl, cooling fan, overheat protective switch, lamp circuit board, quartz glass panel and supports
  - **Remote control unit**
    The remote control unit is option for the UV equipment. If the remote control unit is equipment, the UV equipment can be controlled with a PC through remote control cables.

- **Installation of UV Lamps**
There are three mounting holes on the side of lamps, as shown below (schematic diagram of the mounting holes of UV lamps):

Schematic diagram of UV lamp installation

Install the UV lamps on the two sides of the bottom plate of the printhead and secure them with screws.

The bottom of UV lamps should be slightly higher than the bottom surface of the printhead to make UV light focus on the printing media surface.

The UV equipment has two 10m control/power cables. The minimum bending radius of the cables is 55 mm.

**Key Functions**
- **Power indicator lamp**: Green. When the main power switch is closed, the lamp lights up.
- **Stop switch**: When exceptions occur during operation of the UV power supply, the switch can be used to power off the UV power system directly. The Stop switch should be lifted up before switching the UV main power switch on. Under normal use or when the UV power is
switched off, do not use the Stop switch.

- **Left/right lamp switch**: This switch is a dual-color double action switch. Green indicates 40% power for UV lamps and red indicates 60% power for UV lamps. When the switch is completely pressed, it indicates 100% power.

  To switch on UV lamps, you can select the red or green button. The low power (40%), that is, green switch, is recommended.

  The button can also be used to change the power of UV lamps. When the green or red switch is switched on, you can switch on the other switch to implement full power operation (green + red). Similarly, you may also turn off one of the two switches to implement 40% or 60% power operation from full power operation.

- **Left/right lamp fuse**: implement protection for left and right UV lamps.

- **Left/right lamp interface**: The power cable interfaces of left and right UV lamps. Left and right UV lamps are powered up and other functions are implemented through the interface.

- **Remote control interface**: The remote control port for the UV power supply. This interface can implement non-button control on UV lamps.

- **Power interface**: the input interface of UV power supply.

### 4.2 On/Off Operations of UV Lamps

- **Switching on**

  - **Button-control**

    Before switching on the UV lamps, check the power cables of the lamps and make sure the power cables are securely connected. (The remote control cables may not be connected.)

    Make sure the Stop switch is lifted up.
Turn on the main switch of the UV power supply. The UV power indicator lamp lights up and the heat dissipating fan starts to work.

Turn on green button (red button) of the left lamp (or right lamp). The lamp lights up and becomes stable gradually. The lamp fan will work after 30 s.

After the lamp fan works for 30s to 50s, the UV power supply becomes stable and printing operations can be performed.

➢ Remote control

◆ Connection: Connect the remote control cables first. Connect one end of the remote control cable to the remote control interface on the UV power box and the other end to motion control board on the UV printer. For example, in KJ printers, the other end connects to the UV lamp control interface on the motion control board, as shown below:

![Motion control board of KJ flatbed printer](image)

This interface is the remote control interface of UV lamps

◆ Remote control software: Start the LiYuPrint software and the UV lamp control function.

When the printer is connected, set the remote control through
Menu -> File -> UV lamp setting or enter the UV lamp control interface by clicking ☰ on the Toolbar. Description of the UV lamp control interface is as follows:

**Current UV lamp state:** It displays the current states of left and right UV lamps, including 100% power, 60% power and Off. The current state is automatically updated when you enter the interface.

**UV lamp setting:** It is used to control the switches and power state of left and right UV lamps. After selecting the power for lamps, click “Apply” to finish the setting.

When the UV lamps are being switched on, a progress bar will be displayed at the lower part of the interface with the duration of one minute. At this time, all buttons are disabled and can only be used again when the lamp switching on process is complete.

Note: When a UV lamp is turned off, it can only be turned again after 5 minutes; otherwise, the UV lamp may be damaged.

■ **Switching off**

- **Button control:** Turn off the lamp switch directly. When the lamp is turned off, the lamp heat dissipating fan will continue working for another 6 minutes.

- **Remote control:** It is similar to switching on UV lamps. Select OFF on the control panel of UV lamps and click “Apply”. When the lamp is turned off, the lamp heat dissipating fan will continue working for another 6 minutes.

**Warning:** Under normal conditions, do not use the main switch to turn on or off the lamps. Otherwise, permanent damage may be caused to lamps due to excessive heat. Do not turn off the main switch of UV power supply before the lamp heat dissipating fan stops.

**4.3 Cleaning of Lamp Filter**
■ Disassembly

1. Make sure the UV equipment is turned off and the lamps cool down.
2. Loosen the banking screws on the lamp box.
3. Remove the upper cover and filter.

■ Cleaning method

1. Soak the filter in clean water with washing agents or organic solvent for 10 minutes.
2. Brush the both sides of the filter for three times.
3. Change the water and clean the filter.
4. Air-dry or baking dry the filter.

■ Installation: Reverse the disassembly operations.

4.4 Cleaning of Quartz Glass

■ Removal of quartz glass

1. Make sure that the system is sufficiently cooled down and then remove the UV lamp box below the carriage bottom.
2. Loose the four M4 screws and remove the stoppers at the bottom.
3. Slightly slide the glass out.

The schematic diagram is as follows:
Glass stopper and banking screws

Remove the two banking screws

Remove the stopper from the chute.
Remove the quartz glass from the chute carefully.

Note: Please wear cotton gloves when removing the glass. Do not expose your skin to the glass; otherwise, fingerprints will be left on the glass, causing uneven temperature on the quartz glass when the UV lamps work and eventually breaking the glass. The surface of the glass is hard and not easy to be scratched. However, glass is usually vulnerable, thus handle the glass carefully to prevent cracking or breaking.

- Cleaning of Quartz Glass

All UV lights expose on oil inks through the quartz glass; therefore, any dirt on the glass will affect the curing of UV inks.

Splashing inks or other fine materials may stick on the glass surface after the
glass is used for a long period of time and are hard to clean. The cleaning can be performed as follows:

   Remove the glass plate.

   Oil inks that have been cured can be softened by soaking with acetone (please wear gloves and handle according to relevant safety standards when using these solvents). The dissolving of solvents needs some time. You may soak the glass plate in the solution for a whole night to facilitate cleaning.

   For dirt that is hard to clean, you may use a metal squeegee to scrape the dirt off. But take care not to scratch the glass surface.

   When the glass surface is cleaned, you can use non-fiber fabrics to wipe with ethanol and then use dry non-fiber fabrics to clean the glass surface to ensure that no dirt remains on the glass surface.

   If the glass plate is no longer transparent, has gaps, cracks or cannot be cleaned, it should be replaced. If such problems occur, you can contact us or specified dealers.

**4.5 Fan Replacement**

   This must be performed by professional technicians. If fan replacement is required, please contact your local dealers.

**4.6 Replacement of UV Lamps**

   This must be performed by professional technicians. If UV lamp replacement is required, please contact your local dealers.
Chapter Five Printing

5.1 Precautions Before Starting

- After installation, make sure all connectors are connected securely and correctly. Check power input for all functional parts carefully.
- No other objects on the printing workbench.
- The bottom surface of UV lamps should be 1 - 2mm higher than the bottom plate of printheads and do not incline.
- Locking screws of the UV lamp box must be secured firmly.

5.2 Precautions on Printhead Installation

- During printhead installation, place the printheads at the center of the mounting holes to leave margins for adjustment.
- Screws for installing printheads must have proper lengths and can be securely tightened.
- After the printhead installation is complete, check whether hard objects such as screws remaining on the printhead bottom plate carefully and thoroughly and clear them if such objects are found.

5.3 Printhead State Calibration

After prinheads are installed, when they are used for the first time, parameters need to be adjusted according to the actual operating environment to ensure optimum state for printheads and thus obtain satisfactory images. Factors that affect the printhead state are as follows:

- **Temperature**: Temperature affects on the ink output of printheads. Excessively high or low temperature will cause abnormal ink output to printheads, causing broken lines. UV inks are sensitive to temperature; therefore, operators should adjust the printhead temperature according to
the ambient temperature. Generally, the temperature of UV inks recommended by ink manufacturers is from 40 to 55°C. However, temperature varies from place to place and the setting may be not so proper. Therefore, you can adjust the temperature in the range of 40°C to 55°C in actual operations. Generally, the temperature in winter is set higher than that in summer and north is set higher than south.

- **Voltage**: Voltage also has influences on the ink output. When the voltage increases, the ink output also increases due to the influence of the voltage increase on physical structure in printhead. And when the voltage decreases, the ink output also decreases. Therefore, the voltage will influence the color density of printed images (the image color may be deep or light). When printheads output more ink, you need to reduce the voltage of printhead and vice versa. In addition, excessively high or low voltage will also affect the jet orifice state of printheads. If the voltage is too low, the printed lines may be very light; if the voltage is too high, the printed lines will be distributed unevenly. No matter which condition occurs, they will affect the effect on the printed images; therefore, you need to adjust the printhead voltage before printing. Do not adjust the voltage by excessively large step. The recommended adjusting step is 0.1V to 0.5 V.

- **Negative pressure**: The negative pressure is to form a convex liquid surface in the printhead, providing even ink output. However, excessively high or low negative pressure will also affect the printhead state.

  Generally, the printhead state is a combined consequence influenced by multiple factors. Adjustment of single factor may not have good result. For example, when the temperature of the printhead increases, you may reduce the voltage of the printhead and increase the negative pressure. When the temperature decreases, you may increase the voltage. This requires you to observe and summarize in actual operations.

**5.4 Printhead Calibration**

Operation Instructions of KJ UV Flatbed Printer
Compact Solven
After the printheads are installed, they need to be adjusted for satisfactory printing effects. For KJ flatbed printers, the following calibrations are required:

- **Vertical calibration**: Vertical calibration is a physical calibration. That is, adjust the position of printheads in the same row to make them in an absolute horizontal line (as "1" shown in the figure) and make printheads opposite to each other separate by a distance of a printhead (as “2” in the figure).

- **Inclining calibration**: KJ flatbed printers use KONICA 512 printheads which are arranged in two rows. Therefore, inclining calibration is of great importance. If deviation occurs in the inclination, the effect of printed images will be severely affected.
Joint

As shown above, the printing method of the inclining calibration image is as follows: the media does not move and the cross beam moves forward and backward to make the first orifice and the last orifice of the printhead output ink. The line above the joint shown above is printed by the last jet orifice and the line below is printed by the last jet orifice. If the printhead is inclining, the joint will have gaps. In this case, you can loosen the locking screws on one end of the printhead and adjust the printhead to vertical state manually. This calibration needs to be performed repeatedly to achieve the optimum state.

- **Horizontal calibration**: This calibration is frequently used in daily printing. For details, see [Chapter Four → Part 3 → Test → Horizontal Calibration](#).

Under the following conditions, the horizontal calibration is required:

- When the printer is used for the first time, the horizontal calibration is required.

- After the media is replaced, if the thickness or surface smoothness of the new media is different from that of the previous one, the horizontal
calibration is required.

- The height of the cross beam is increased or reduced and needs to be calibrated again.
- When relevant mechanical parts such as cross beam and motor are adjusted, calibrations are required.
- The voltage of the printhead increases, the calibration is required.

➤ **Step calibration:** The step direction of KJ flatbed printers is controlled by two servo motor; therefore, the step is very precise and thus no step calibration is required.

Note: The vertical calibration and inclining calibration are one-time calibrations. That is, if the printhead is not replaced or the position of the printhead is changed, no calibration is required. The horizontal calibration should be performed in real time. When the distance between the printhead bottom plate and the printing media keeps unchanged, the two directions of the printhead will not change. That is, once the distance changes, the calibration must be performed.

### 5.5 Adjusting Printing Height

Adjusting the printing height is to adjust the distance between the printhead and the printing media. KJ flatbed printers require that the distance between the printhead bottom plate and the printing media is about 2mm. If the distance is too large, it will affect the printing precision. If the distance is too small, the printhead may be damaged. 2mm seat pads or one-yuan coins can be used to help the adjustment for higher precision. When media with known thickness is printed, you can use the software to adjust automatically to avoid repeated manual positioning. Perform parameter adjust such as horizontal calibration on a kind of media first and then enter the thickness directly in the software. This can avoid repeated height adjustment and horizontal calibration. For details, see [Chapter Four → Part 3 → Test → Cross Beam Adjustment](#).
5.6 Setting Printing Origin

KJ printers use the laser red point positioning method to use laser for precise positioning. A laser device is equipped at the upper left corner on the bottom plate of the printhead. During positioning, align the laser red point with the upper right corner of the printing media and then click “obtain X and Y axis coordinates” on the software. For details, see Chapter Four→ Part 4 → Description of Special Functions → Origin Setting.

5.7 Printing Procedure

Please read this printing procedure carefully to prevent maloperation and unnecessary problems and to save your time and increase the printing efficiency.

- After the printer resetting is complete and the printer is connected to a PC, click “Set” in the Printhead temperature and voltage setting interface on the software to re-set the printhead temperature and voltage.
- Load the images to be printed to RIP software for image ripping.
- Place the printing media, start the absorbing vacuum motor (if required) to smoothen the media surface and then clean the media surface and perform other processing.
- Adjust the printhead height and set the printing origin (once the UV lamps are turned on, the carriage will return to the origin when it stays in the workbench for more than three seconds; therefore the origin setting is hard to perform).
- Switch on UV lamps and enable the high pressure function.
- Open the valve core of the ink path on the subtank to clean printheads with positive flush.
- Load ripped images from LiyuPrint software and set parameters for the files to be printed (printing resolution, printing method, number of printed copies and whether to use mirror image).
- Click “Print” to start printing.
Chapter Six Maintenance

6.1 Printer Maintenance

➢ Keep the operating environment clean and vented.
➢ Keep the workbench clean. Check whether there are foreign objects such as screws on the workbench to prevent scratching printheads.
➢ Proper tension should be maintained for the long belt of the carriage. To adjust the tension of the long belt of the carriage, remove the right end cover of the printer. After adjustment, tighten the connecting screws firmly.
➢ After each ink adding, ensure that the tank cover is tightened securely. Wipe the ink on the external wall.
➢ After positive flush and printhead wiping, perform flashjet for about 20 seconds and then start to print so as to form a good intrados for the ink in the jet orifices.
➢ During image printing, when the printer stops printing, you can set the printheads to the flashjet state to prevent jet orifice blocking.
➢ Areas around jet orifices must be clean without ink residuals, dust and fibers. Do not scratch the orifice plane.
➢ Inks and cleaning liquids contain strong solvents. Do not expose them to electric parts and conductors. If inks or cleaning liquids accidentally splash onto electric parts and conductors, power off the printer and clean immediately.
➢ Clean waste liquid in the used liquid tanks timely.
➢ Clean the dust-proof cover on UV lamps regularly according to the conditions of the operating environment.

6.2 Printhead

Printheads are core parts and the most expensive parts of a printer. Maintenance of printheads directly relate to the service life of printheads and quality of printed images. Poor ink quality and improper use and maintenance during use will greatly shorten the service life of printheads. During normal use
of the printer, do not replace inks at discretion. If good maintenance is provided, printheads may be used for a longer time.

In addition to printhead state and inks, printhead voltage and environmental factors (ambient temperature and humidity) also affect the printheads. The printhead voltage can be set through software.

Note: When the ambient temperature is lower than 10°C, ensure the temperature of the ink in the printhead is above 30 before printing; otherwise, broken lines may occur on the printed images.

Measures should be taken when the printheads are not used:

The following maintenance methods all use the recommended common UV inks. For maintenance of special UV inks, please refer to description of special UV inks of our company or the operation manuals of ink manufacturers.

- When the printer stops printing or the printing interval is long, to prevent printhead blocking, you can set the printer to the flashjet state. This state will consume some inks.

- Before stopping the printer, tighten the valve core to prevent ink leakage of the subtank through the jet orifices when the negative pressure becomes 0.

- If you will not print images in 12 hours to two days, stop the printer, pack the printheads with preservative film and shied jet orifice plate with black paper boards after the UV fans stop and the temperature of the printhead bottom plate decreases to normal temperature.

- When the printer is not used for a week, the maintenance method is similar to the above procedures. But a piece of cleaner cloth soaked with cleaning liquid should be placed on the preservative film.

- When the printer is not used for 7 to 20 days, it is recommended that you drain the ink in the printhead with a glass syringe. Then fill in cleaning liquid and process as above.

- If the printer is not used for a long period of time, it is recommended that you fill in 15 ml cleaning liquid into all printheads every 20 to 30 days.
Cleaning and clearing blocked jet orifices

If a jet orifice is found not spray inks, possible reasons are that the ink supply for the printhead is insufficient, air bubbles exist in the printhead, the jet orifice is blocked and the jet orifice is physically damaged. If the physical damage can be excluded, we can take the following measures:

- **Wipe the jet orifice plate**

  If the orifice plate has dirt or inks, you need to wipe the orifice plate. Spray some cleaning liquid on the plate before wiping is helpful.

  The cloth for wiping the plate must be clean and does not fall off any fibers or other matters, and cannot be stored in places with dust or dirt. Oil, especially oil with silicon, cannot contact the orifice plate surface.

  When the whole orifice plate surface including orifices needs to be wiped, it is better to wipe along the narrow side of the surface. Therefore, dirt and debris will not drop into other jet orifices. The wiping should be performed in a straight line in one direction. Do not wipe back and forth or in circles.

- **Automatic positive flush cleaning**

  You can use the positive pressure button to perform positive flush cleaning. This is helpful for sufficient ink supply for printheads and elimination of gases in prinheads. Perform the operation repeatedly and compare the printhead state after each cleaning to judge whether the positive flush is effective.

- **Vacuum cleaning**

  The most direct method for vacuum cleaning is to put the tube of the dust cleaner close to the surface of the orifice plate. Start the dust cleaner which will suction some liquids from the orifice and clear particles that may block orifices. After vacuum cleaning, usually one
or two positive flushes need to be performed to fill liquids into the printhead to ensure sufficient ink supply.

- **Manual cleaning**

  Manual cleaning should be performed under powering off conditions. Tighten the valve core and then remove the sealed cap of the cleaning liquid hole to clean through the cleaning liquid hole.

  This needs a clean syringe. Use the syringe to suction 20 cc cleaning liquids and install the filter (1 to 5 um) to the end of the syringe. Quickly fill the cleaning liquid into the cleaning liquid hole (about 10 ml/s) by pushing the syringe piston. When the cleaning liquid is discharged from orifices, a “waterfall” formed by small drops can be seen below the orifice plate. If broken lines or inclining spraying is found, it indicates that orifice is blocked or partially blocked, you can continue cleaning the orifice with cleaning liquids. After manual cleaning, perform positive flush operations to ensure sufficient ink supply for printheads.

  **Warning:** Manual cleaning may produce a cleaning pressure higher than the maximum cleaning pressure for printheads (4.5 pounds/square inches, 310KPa); therefore, it must performed with due care.

- **Factors that affect ink output of printheads**

  In addition to printhead status and inks, parameters of printheads (printhead voltage, pulse width, heating temperature and negative pressure) also influence the ink output. The negative pressure can be set as described in Chapter Five and printhead voltage, pulse width and heating temperature can be set with the software.

6.3 Inks

- **Safety Precautions**
- UV inks contain acrylic monomers and photoinitiators. These chemicals are irritating to skin, eyes and the respiratory system and cause allergies. Good ventilation and personal protective equipment can greatly reduce contacts with UV inks.
- When handling UV inks, make sure to wear goggles, acrylic gloves and laboratory clothing. If inks splash onto skins, flush with soap water thoroughly immediately.
- UV inks are slightly volatile and thus it is not easy to contact with the volatiles of the inks. This is different from solvent-based inks. However, under poor ventilation conditions, suspended matters produced by spraying can be breathed in. Therefore, keep good ventilation for the operating environment.
- Eating, drinking and smoking in the working area is forbidden.
- UV inks that are not cured have as special smell which is not harmful to human health.

### Storage

Inks must be stored in sealed containers in dry, cool and ventilated places without direct sunshine. The proper storage temperature should not be higher than °C. Inks must be used in the validity period; otherwise, printheads may be damaged.

### 6.4 Ink Overflow Tank and Secondary Filtering

Maloperation or system faults may cause excessive negative pressure or failure of the tank to supply ink. This will inevitably cause inks to exceed the subtank liquid level and flow into the ink overflow tank through air tubes. When inks entering the ink overflow tank reach certain amount, the system will give alarms and the negative pressure system stops working.

In this case, you can remove the sealed cap of the ink overflow tank at the left side of the carriage and connect a standby ink tube. Then use the positive flush to lead
waste ink in the ink overflow tank to a container.

A secondary filter screen is installed under the manual valve of the subtank. After long-term use, the filter screen may be partially blocked by impurities, causing unsmooth ink supply. You need to remove, clean, dry and re-install the filter screen. Then the filter screen can be used after testing. The whole cleaning process must be clean without any pollution. The cleaned filter screen must be dried. Tests have proved that chemical reactions may occur between inks and water. In the entire operation process, no liquid can contact the filter screen, valve and inside of the subtank except cleaning liquids.
Chapter Seven Troubleshooting

This chapter lists common faults during the use of the printer and provides brief analysis to reasons that may cause these faults to help users locate and solve some common problems during using the printer.

1. The printer does not perform self-check after startup
   - Power supply problems: Check whether the power supply input is correct, whether the air switch is closed and whether the Stop switch is pressed.
   - Drive problems: Check whether the cables of the drive are correctly connected, whether cables of sensors are correctly connected and whether alarms are given in the drive.

2. The self-check of the carriage is not completed after startup, that is, the carriage does not return to the origin position
   - Loose connectors of the limit sensor: Power off the printer and plug the connector again to ensure the connector is firmly connected. Then restart the printer.
   - Electromagnetic interference: check whether the grounding wire is well connected and then restart the printer.

3. The printer completes self-check successfully but cannot be connected to computers
   - Make sure the driver is correctly installed. For details, see driver installation parts. Make sure the firmware driver is installed in C:\WINDOWS\system32\MYDEVICE.
   - Make sure the USB cable connecting the printer and the computer is reliably connected.
   - Due to the working characteristics of USB devices, occasional
disconnection can be solved by restarting the printer.

4. No ink output for image printing but flashjet is normal
   - Make sure that the 50-pin data communication cable of the printer is securely connected;
   - Make sure that the cable of the linear encoder is connected to the printhead board;
   - Check whether the cable is severely deformed or broken.

5. Printed images are obscure and boundaries are not clear
   - The printhead bottom is too far from the printing media. The height technologically required is within 2.5 mm.
   - The printer is imprecisely calibrated. Please check all calibration procedures.
   - The indoor air flows too fast, causing ink spitting.
   - Ensure the printer is reliably grounded; otherwise the static may cause ink spitting.
   - The printhead is not in good conditions. Jet orifice blocking or inclining spraying may cause quality decrease of printed images.
   - The working environment (voltage, temperature and negative pressure) of printheads are incorrectly set, which may decrease quality of printed images.
   - Ensure that images have sufficient resolution; otherwise obscurity and sawtooth may occur after printing.

6. The carriage vibrates severely during high-speed movement
   - The drive is incorrectly set or damaged. Please contact your local dealers or the drive manufacturer.

7. Severe distortion occurs in the color reproduction
   - Wrong printer type is selected from the RIP software. Please check whether the printer type is correct or whether you perform ripping under the correct printer type.
- ICC profiles are incorrectly loaded. Please load correct ICC profiles.
- The ink model is incorrect. Please use the ink specified by the manufacturer.

8. Broken lines occur during image printing

Broken lines during printing is a common fault of printers. This can be caused by various reasons, including temperature, humidity, printing speed, voltage, negative pressure, piping, inks and printhead conditions.

- Temperature: Please make sure correct temperature is set in the software. Set the temperature as instructed by technicians of ink manufacturers. Generally, the temperature only needs to be tuned according to different seasons.
- Humidity: Please make sure that the humidity is within the range required by the operation manual. Excessively high or low humidity will affect the working conditions of printheads.
- Excessively high printing speed: Generally, the printing speed higher than the maximum working speed will cause insufficient ink supply or overfrequency, leading to broken lines.
- Incorrect voltage setting: generally, voltage and temperature only need to be tuned. Please adjust the voltage as instructed by technicians of the ink manufacturer.
- Incorrect negative pressure setting: The absolute value of the negative pressure is too high, directly causing broken lines. If the absolute value of the negative pressure is too low, inks may accumulate at the bottom of printheads, causing broken lines.
- Ink: Do not use expired inks. Use inks specified by the manufacturer.
- Environmental affects on the printheads: The printer requires a clean working environment. Do not place the printer with carving machines or equipment that can easily cause dust in the same room.
The room cannot be heated up with equipment that can easily cause dust to prevent permanently blocking jet orifices. Keep the printer and clean and clean regularly.

- Scratches on the printhead surface: Please operate correctly. Do not use any hard media to contact the printhead surface.
- Regularly check the waste liquid tank and air tubes. If backflow of inks occurs in the air tube, it may permanently damage some parts of the printer and cause broken lines or ink output failure.

9. A single printhead does not output inks

- Check whether the conduction band between the printhead drive board and the printhead patch panel is correctly connected (the metal surface of the conduction band must contact the metal surface of the socket) and whether the conduction band and the connectors are reliably connected. Plug the connectors again to make sure they are reliably connected.
- Check whether problems occur in the printhead drive board by changing the channel.
- Damage of the conduction band. The conduction band is usually damaged by frequent contacts of the metal surface (make sure the metal surface is smooth and level after each connection).
- The printhead is damaged.

10. All prinheads do not output inks

- Check whether the high pressure function is enabled.
- The linear encoder is damaged. It can be judged as follows: The printer can complete the first motor movements but does not spray inks. At the same time, the indicator lamp does not light up on the printhead drive board. After returning to the origin position, the printer can enter the flashjet state and can effectively perform flashjet operations. After an imaged is printed, the flashjet become
invalid. The indicator lamp D3 on the main board lights up.

- Check whether the 50-pin SCSI cable is reliably connected.
- Make sure all conduction bands are reliably connected. Check whether the printhead board (especially the conduction band socket) is polluted by inks or cleaning liquids. If pollution is found, power off the printer immediately, remove the printhead board and clean it.
# Appendix 1: Packing List

<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Quantity</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>KJ Printer</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>RIP software (CD)</td>
<td>1</td>
<td>PHOTOPRINT6.0</td>
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<tr>
<td>3</td>
<td>LIYUPRINT (CD)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>UV equipment</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Vacuum motor</td>
<td>1</td>
<td>4m cables. Pay attention not to crash the connectors.</td>
</tr>
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<td>6</td>
<td>Printer power cable</td>
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<td>5m</td>
</tr>
<tr>
<td>7</td>
<td>UV power cable</td>
<td>1</td>
<td>Special</td>
</tr>
<tr>
<td>8</td>
<td>USB cable</td>
<td>1</td>
<td>3m</td>
</tr>
<tr>
<td>9</td>
<td>380 V power cable</td>
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</tr>
<tr>
<td>10</td>
<td>Glass syringe</td>
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</tr>
<tr>
<td>11</td>
<td>Grease gun</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Cleaner cloth</td>
<td>5m</td>
<td></td>
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<td>13</td>
<td>Air tubes (4*6)</td>
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<td>Sealed at two ends with rubber caps</td>
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<td>14</td>
<td>UV ink pump</td>
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<tr>
<td>15</td>
<td>Liquid carriage box</td>
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<td>For new KJ printers</td>
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<tr>
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<td>Box wrench</td>
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<td>S=13-15</td>
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<td>Seat pads</td>
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<td>Soft tubes</td>
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<tr>
<td>19</td>
<td>Hose clamps</td>
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<td>22-38</td>
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<td>Hex key wrench</td>
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<td><strong>UV Ink</strong></td>
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<td>Depending on actual order</td>
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