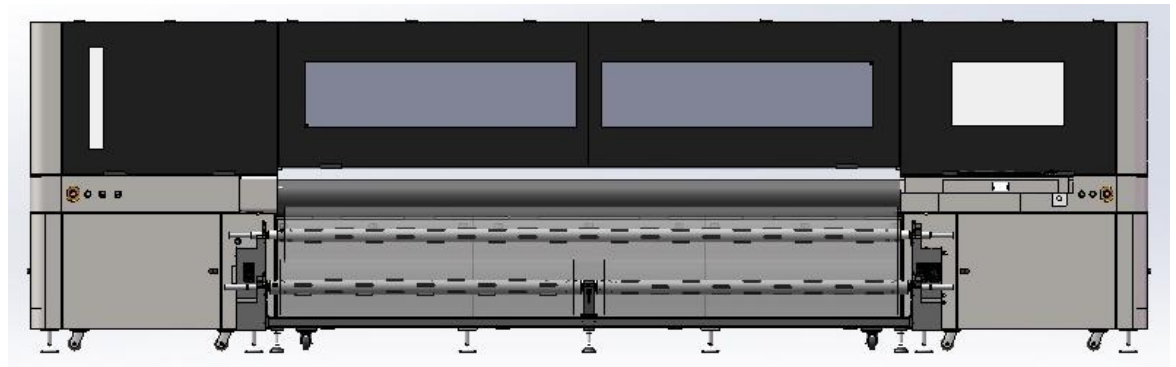
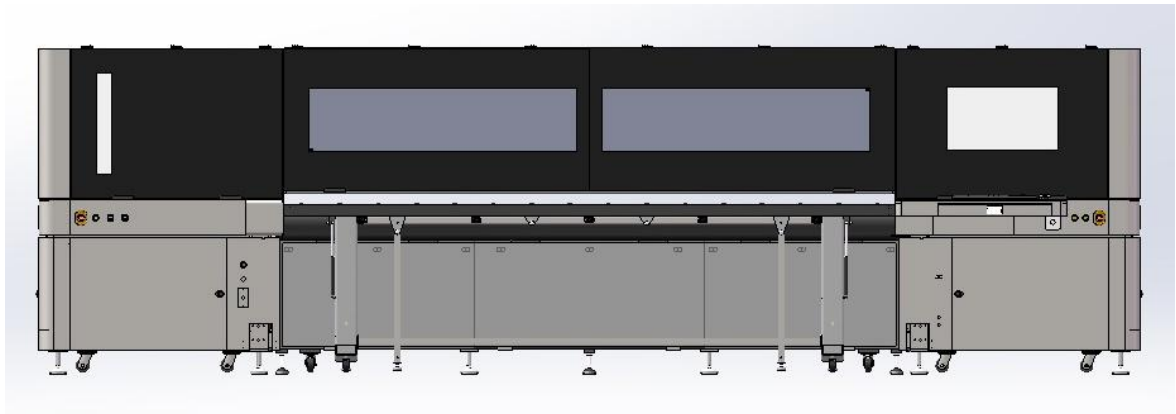


LIYU HYBRID DS32 Digital Guiding Belt UV Inkjet Printer

User Manual (PCIE System)





The second Edition. LIYU HYBRID DS32 Digital Guiding Belt UV Inkjet Printer User Manual May 18st, 2022. All rights reserved. Anhui LIYU Computer Equipment Manufacturing Co., Ltd. has the right to revise the technical specification and various contents in the Manual without any notice and shall not be liable for any damages (including causal damages) due to reliance on the contents in the Manual (including such mistakes as misprints, miscalculation and list errors).

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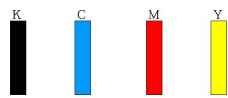
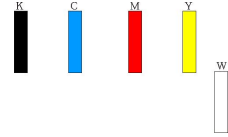
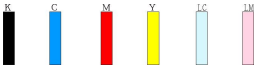
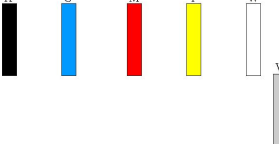

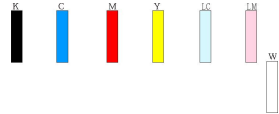
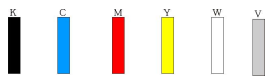
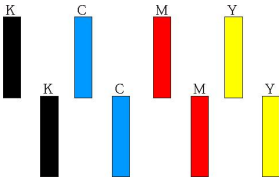

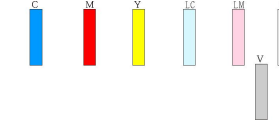

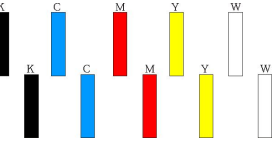
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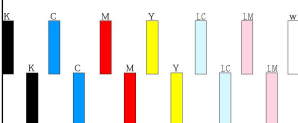
Introduction

Thank you very much for purchasing our LIYU DS Series Guiding Belt Inkjet Printer (hereinafter referred to as Guiding Belt UV Inkjet Printer). Please carefully read the manual before using the Guiding Belt UV Inkjet Printer and put the manual at the place within easy reach at any time. The guiding belt inkjet printer adopts environmentally friendly UV ink, with the maximum width of 3.2m, and the thickest material of 50mm. The manual describes the features of the printer, parts name, information that should be known before using the equipment and the basic operation, for instance, how to switch on and off and how to set various parameters of the printer. Please carefully read the following contents before reading Chapter One: Safety Precautions and Operation Cautions.

Technical parameters

The DS32 can be equipped with two kinds of print heads, Konica KM1024ISHE and that of 1024MHE, as respectively shown in the following table.

	Single row		Double row	
	Configuration type of print head	Diagram	Configuration type of print head	Diagram
1	4-print head and single 4-color		4-color, 5-print head and 1-white print head	
2	6-print head and single 6-color		6-print head, 4-color, and 1-white print head and 1-gloss oil print head	
3	5-print head, 4-color and 1-white print head		6-color 7-print head and 1-white print head	
4	6-print head, 4-color, and 1-white print head and 1-gloss oil print head		8-print head double 4-color 4-print head	
5	7-print head, 6-color and 1-white print head		8-print head, 6-color, and 1-white print head and 1-gloss oil print head	
6	8-print head, 6-color, and 1-white print head and 1-gloss oil print head		10-print head, double 4-color and 2-white print head	

7			<p>14-print head, double 6-color and 2-white print head</p> 
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● **List of Main Technical Parameters**

■ **Machine Parameters**

Machine model	DS3200-UV-LED
Print technology	Piezo continuous drop-on demand(DOD)
Type of print head	KONICA1024MHE/KONICA1024iSHE double row
Print head control	Use software to adjust the temperature and voltage of the print head.
Print head configuration	KCMY/YMCKKCMY/KCMYLcLm/ (optional of white and gloss oil)
Maximum printing size	3.2 m
Maximum resolution	600*2880 dpi
Fastest Print Mode and Efficiency	400x1080 3pass 70 m ² /h / 400X1080 3pass 80 m ² /h
Ink type	UV ink
Color profile	K C M Y Lc Lm W V (optional)
Ink supply system	Automatic continuous ink supply with vacuum negative pressure
Scraping Device	Available
Media absorption	Table vacuum absorption, frequency conversion segmented control
Table pressure	25kg/m ²
Drying device	LED_UV lamp solidification
Package size	Main engine: 6340*1938*2168/Auxiliary platform and take-up and feeding system: 3982*1750*1204
Machine size	Main engine (including take-up and feeding system): 6020*2220*1775; including 2 extension platforms: 6020*3732*1775
Machine weight	About 3 tons (the main engine)/1 ton (2 extension platforms and 2 take-up and feeding systems)
Printing interface	PCIE X1
Power interface	Mainframe 220V±10% 50HZ 3300W Fan: 220V±10% 50HZ 6000W UV lamp 220V±10% 50HZ 5000W
Environmental requirements	Temperature 15 °C ~ 30 °C Relative humidity 40% ~ 80%
RIP Software	Photo print/Caldera
Machine	Intelligent constant pressure adsorption, full-auto guide belt

<p>characteristics</p>	<p>guiding, independent temperature control for auxiliary ink tank, automatic ink scraping system and folding extension platform (optional), intelligent pressure negative-pressure ink-supply system, human engineering mechanics design, THK mute guide, LED cold light source solidification, front and rear dual displays and dual operation platforms, independent single and double winding take-up and feeding system, slow printing function triggered by screen touch, door interlock switch and anti-collision function Alarm tips when the ink supply level is short of ink and the waste liquid is full. and automatic media altimetry</p>
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■ Table of Printing Efficiency

The printing speed of DS series guiding belt printer is mainly decided by numbers of print heads in rows and printing modes. This table shows the printing efficiency by taking 8 KONICA1024MHE print heads and KONICA1024iSHE print heads as a sample.

DS_KONICA1024iSHE Series (double row)	
Printing Mode	Working Efficiency
Draft Mode 400*720 2pass	100m²/hour
Draft Mode 600*1080 3pass	63m²/hour
Working Mode 600*1080 6pass	18m²/hour
High-precision Mode 600*1440 8pass	14m²/hour

The printing quality can be ensured by properly adding feather values according to the state of different print heads.

Important particulars

The negligence of precautions mentioned below may seriously affect the working conditions of the equipment, equipment service life or the service life of relevant parts, or even cause the permanent damages of relevant parts, and may endanger staff's physical and mental health in some cases. Please operate in strict accordance with instructions.

- 1. Please carefully read the requirements for working space and working environment of the machine in this manual and strictly abide by the requirements. Otherwise, it will affect the working state of the machine, machine service life or service life of parts, or even endanger staff's physical health;**
- 2. Please use the ink designated by the manufacturer, otherwise, it may affect the printing effects or even cause the permanent damage of print head;**
- 3. During the operation and maintenance process of the machine, please be sure to avoid the contact of ink and non-cleaning fluid, so as to prevent the ink from any chemical reaction which may cause machine damage;**
- 4. Since the waste fluid generated from the machine will pollute the**

environment, please properly dispose of the waste fluid in accordance with the requirements of local environmental protection department;

5. The auxiliary ink box, filter, ink pump, air pump, liquid pump, refill tube, guiding belt and print heads of the machine all belong to wearing parts and shall be replaced periodically as per the service condition.

6. The platform cannot be overloaded, otherwise, the platform could be damaged or its accuracy could be changed.

Safety precautions

To ensure that operators will properly use the equipment and prevent equipment damages and unnecessary casualties, please carefully read the following safety precautions:

Please use the voltage as specified on the nameplate and never plug several devices into one power outlet at the same time to avoid fire disaster.

Please check and ensure the equipment has been grounded reliably. Otherwise, disturbance may be caused and lead to abnormal image printing of the machine.

Never dismantle or transform the equipment by yourself, otherwise, such accidents as fire disaster, electric shock and other accidents may be caused.

Keep the circuit control section of the equipment away from metal objects or liquid, otherwise, it will cause circuit board damage, fire disaster or other accidents.

Never connect the power line of the equipment with wet hands, otherwise electric shock may occur.

In the event of the following situations, please switch off the equipment and contact the local dealer if necessary:

1. The switch is insensitive or doesn't work.

- 2. When the inkjet printer makes abnormal sound or produces smoke.**
- 3. When any metal object or liquid splashes into the electric control part of the equipment.**
- 4. When problems that operators fail to settle arise.**
- 5. When the guiding belt is seriously abraded or breaks, it needs to be replaced.**

Operation precautions

Power Supply

- 1. Inkjet printer shall be installed near the power source convenient to use and the connecting outlet must be solid and reliable.**
- 2. Relatively stable power supply in accordance with technical specification of inkjet printer shall be used, and it should be mandatory to install the voltage stabilizer, and the USP (uninterruptible power supply) is the recommended one.**
- 3. Connect the power line to a separate outlet and never share the same power outlet with other equipment.**
- 4. Pay attention to the order of power on and off so as to avoid damages to print head.**
- 5. In case of unstable local voltage, please use voltage stabilizer to guarantee the stable voltage and choose the famous brand products, because inferior products may cause equipment fault or damage electrical component of the equipment (including print head).**

Inkjet Printer

- 1. Don't place any undesired objects on the platform of the inkjet printer so as to avoid damages to print head.**

2. In case of any maintenance for the machine as regards electrical control, please be sure to disconnect the power of inkjet printer.

3. Never touch the surface of print head with hands or hard objects.

Regular Inspection and Maintenance

- ✧ **Fill lithium base grease in mechanical parts with grease gun on a regular basis, and fill in the ink carriage linear guide and the lifting screw rod of the carriage in Z direction once for every week under normal printing.**
- ✧ **See contents in Chapter Maintenance and Service for maintenance method of ink and print head.**

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Chapter 1 Introduction to Basic Knowledge

This chapter dwells on the necessary information for inkjet printer operation. Please understand the necessary information before reading other chapters. Contents of this chapter:

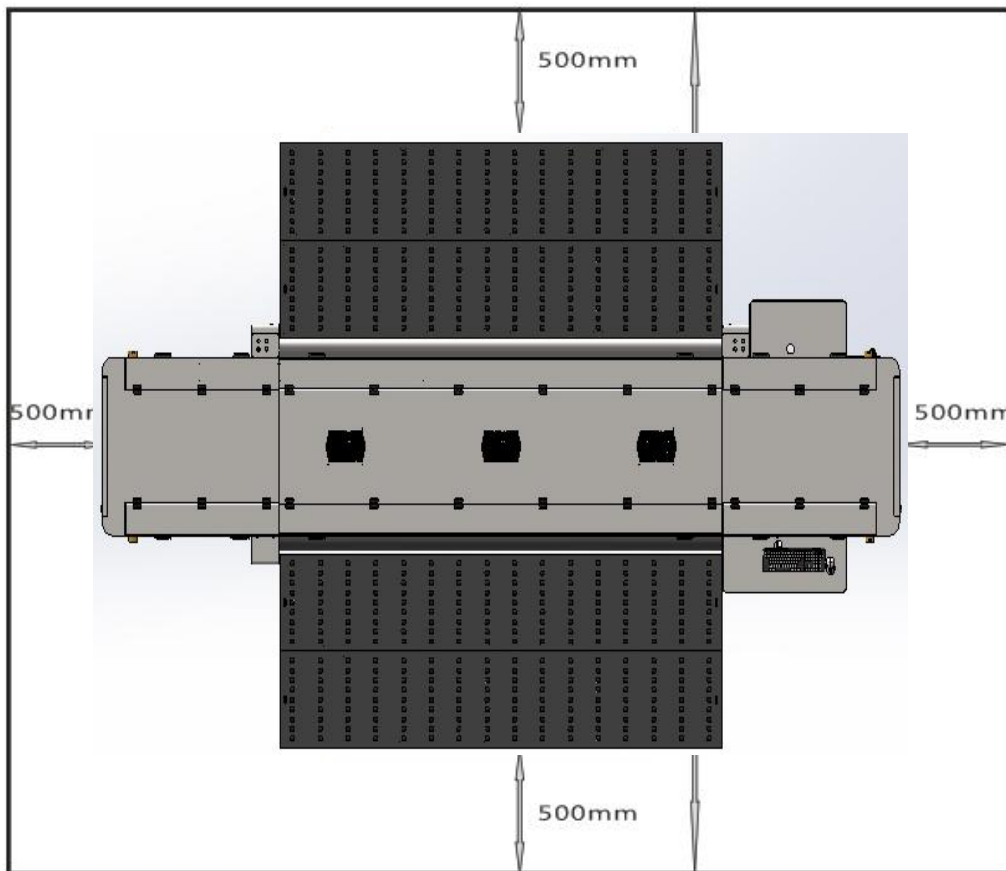
- **Working conditions**
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- **Environmental requirements**
- **Computer configuration requirements**
- **Appearance, name and functions of parts**
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- **Machine unpacking and floor installation**
- **Consumables**
- **Printing media**
- **Ink and cleaning fluid**
- **Maintenance tools**

- *Working conditions*

- **Working space**

Around the guiding belt must be sufficient space to leave room for maintenance, such as replacing some common parts and print media, as follows:

Installation and maintenance space is shown in the following figure:



Note:

1. DS32 Main engine (including take-up and feeding system): 6020*2220*1775; 2 extension platforms: 6020*3732*1775

Note: The space in the above figure is subject to an extended platform. If only soft materials such as soft film are used for printing, at least a space of 1m distance is reserved before and after the machine.

■ Environmental requirements

The optimal working temperature and humidity of the printer: temperature 23°C - 26°C, humidity 40% RH ~80% RH.

Please try to keep the printer (machine) working under the optimal working temperature and humidity; otherwise, the printing quality may drop and its service life may reduce.

Don't install the machine at the following locations:

- ◇ **In direct sunlight**
- ◇ **Vibrant and unstable location**
- ◇ **Dusty places**
- ◇ **Location with drastic temperature variation**
- ◇ **Location with great air mobility**
- ◇ **Near the air-conditioning or heater**
- ◇ **Place likely to be wetted**
- ◇ **Place likely to produce other polluting gas**

■ Computer configuration requirements

The minimum configuration requirements for the software operation of the product are as follows:

CPU: INTEL i5 and above.

Mainboard: brand mainboard of high quality, with PCIE slot.

Display card: Graphic display card with video memory above 1G.

Memory: Memory above 8G.

Hard disk: Over 50 G room is left, please use NTFS format as the hard disk format.

Operating system: WIN7 and above, 64-bit Professional or Ultimate

● *Machine unpacking and floor installation*

1. Fastening steel strips and fixed bolts are attached on the packing box, please cut off the steel strips before unpacking. Remove the fixed bolts of the packing box in turn, 5 sides in total, take down the side plate and top cap of the packing box; Some of the machines will be sent out according to the order requirements, only having the packing chassis fixed machine, with rain cloth and tin foil attached on it, the positions of the steel strip bolts are as shown in the red logo below:



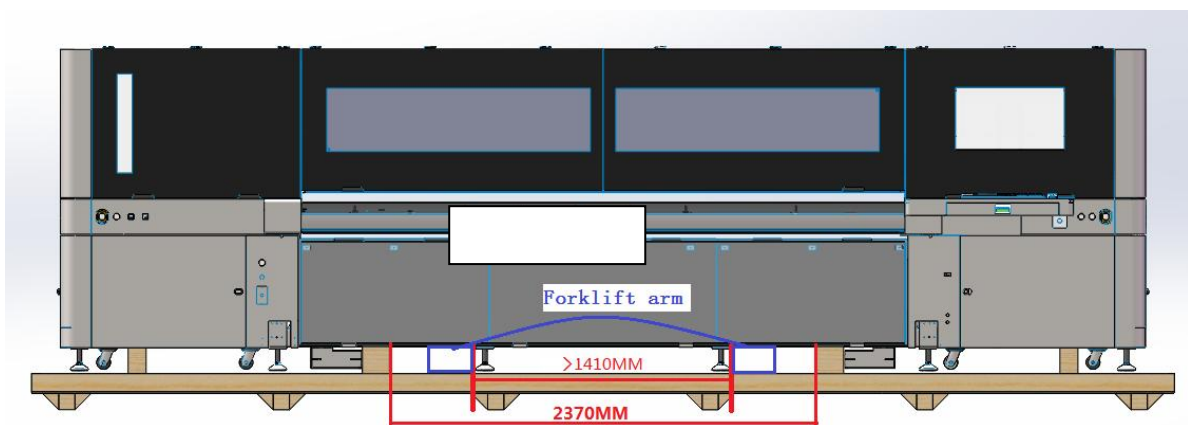
2. Remove the 30 fixed bolts of the packing box in turn, take down the side plate and top cap of the packing box; the positions of the bolts are as shown in the red logo below:



3. Remove the connecting bolts on the packing plate in turn, where're 4 fixing brackets (two in front and two at the back). The fixed bolts of the machine and bottom box for easy transport need to be removed. The positions of the packing pressing plate are as shown in the red logo below:



4. A 5T or above forklift may be used to unload the machine. The position of the forklift should be in the middle of the machine to ensure the center of gravity. After the machine is unloaded smoothly, push the machine to the designated location (**When unloading the machine, pay attention to the operation safety**). With reference to the schematic diagram, operate according to the actual situation under the premise of ensuring stable unloading.



Note: Due to the width of customer's door and the existence of step or gradient, the machine needs to enter directly when entering. Forklift can be used to lift from behind to assist in entering.

In particular cases, when the forklift forks the machine from left or right,

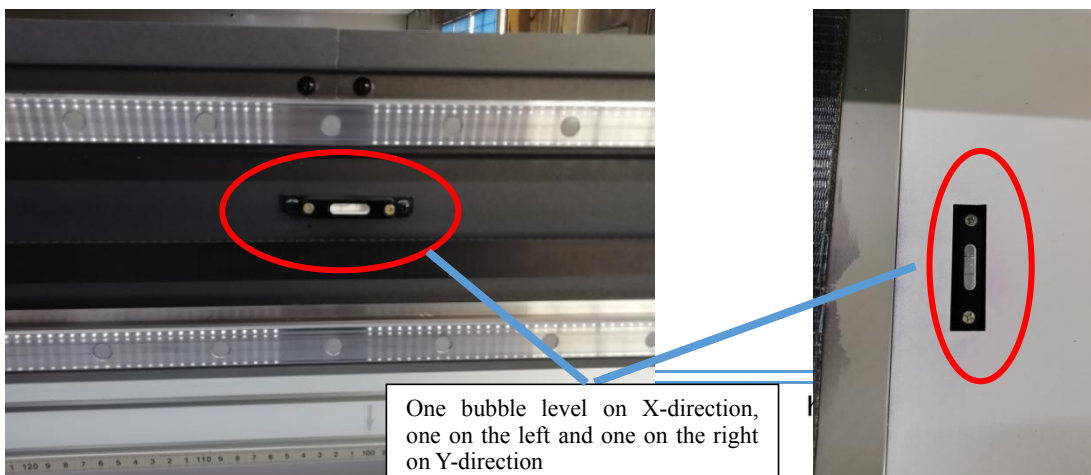
the side door must be opened first, and wooden blocks must be padded on the forklift inserts. This can prevent the damage of the door due to forklift problems. As shown in the following figure:



5. Leveling machine. Unscrew the leg of the machine frame corner, make its universal caster wheels suspended into other legs and leave from the ground;

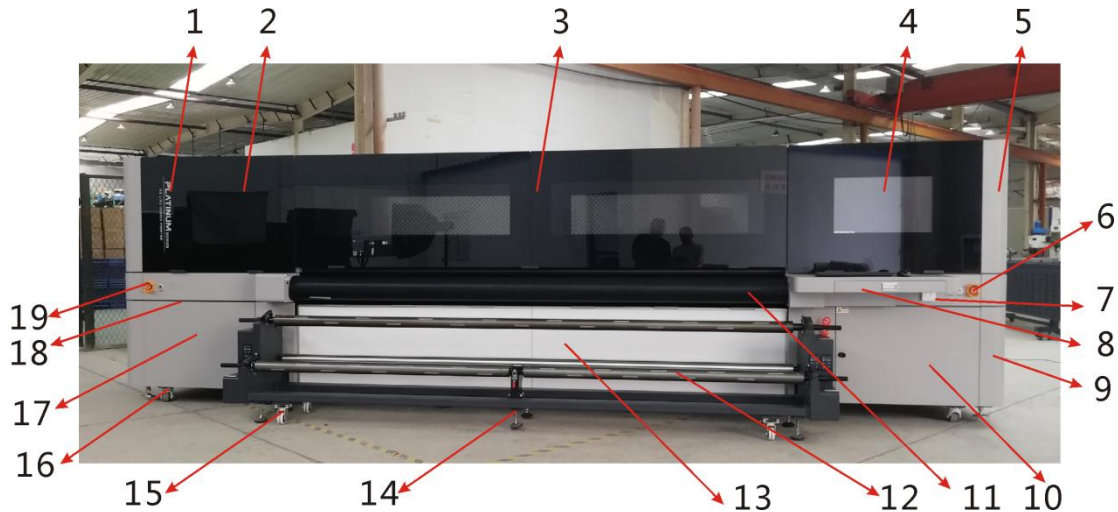


6. By adjusting the leg of the machine frame, level the machine by using the gradienter that comes with it (levelled before leaving factory), make the level vial of machine in the middle part, and the precision blister in the left or right of the middle within 1 grid.



● *Appearance, name and functions of parts*

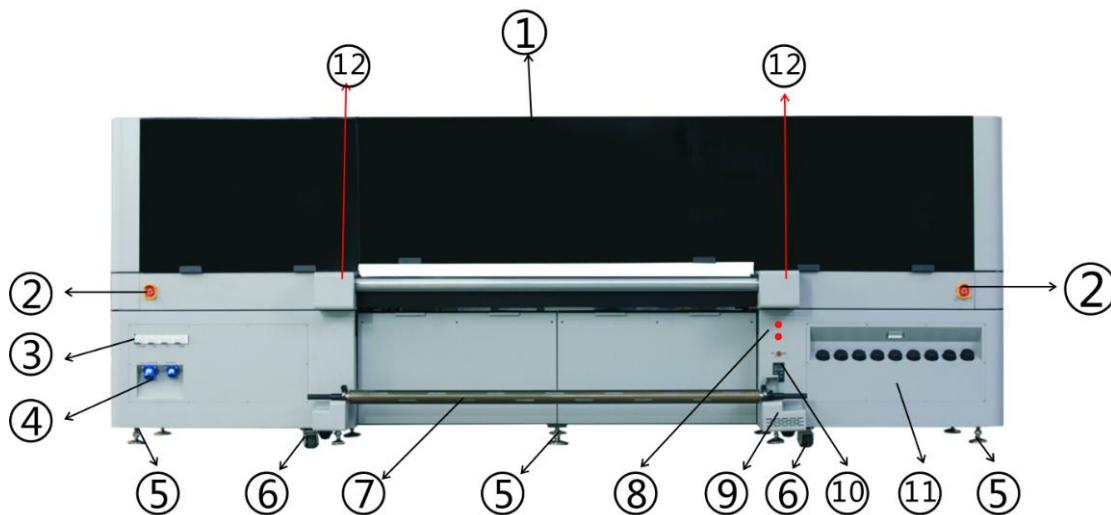
■ **Ds_32XX Front view**



Code	Name of parts	Description
1	Machine LOGO	Synthesizing effect of back inlaid LED phosphor screen
2	Left carriage bin	Drive tensioning assembly in the scanning direction of the carriage, cleaning and maintenance position, cleaning and ink pressing position, ink scraping device.
3	Central printing bin	Printing area in this position. Inside inlaid LED lighting.
4	Display	The display is mounted behind the glass, one at the front and one at the rear. The bin is the original point for the carriage, and it is in the flash spraying position in normal state.
5	Right bin gate	It's the position for the release button of X-direction motor and motor assembly, which is also the position for replacing flash spraying cloth.
6	Right button	Right to left: right emergency stop, start, high pressure of print head (Ricoh machine does not have this button).
7	USB interface	Computer external power switch, mainly USB interface for now.
8	Keyboard pallet	For placing keyboard and mouse. Drawer at the bottom for tools storage
9	Lower Right Box	For placing the host. All power switches are inside installed.

10	Lower right box in front	Control cabinet of circuit board; there are main board, motion control board, deviation correction board and main control components inside.
11	Guiding belt	Front main guiding belt roller, guiding belt, rear tensioning roller, electric machinery and speed reducer
12	Take-up and feeding system	There are one 3.3-meter inflatable rod above and two 1.6-meter inflatable rods below.
13	LED backlight	For watching the effect during printing with backlight materials. (Optional)
14	Leg	Support of take-up and feeding system for fixing.
15	Caster	Caster of take-up and feeding system
16	Caster and support	Caster and support of the machine for moving and fixing the machine
17	Lower Left Box	There is a negative pressure system inside for controlling the lifting pressure of the front and rear positioning rods.
18	Atmosphere light strip	Blue during printing and red during stopping.
19	Left button	From left to right are left emergency stop and start buttons

■ DS_32XX Back view

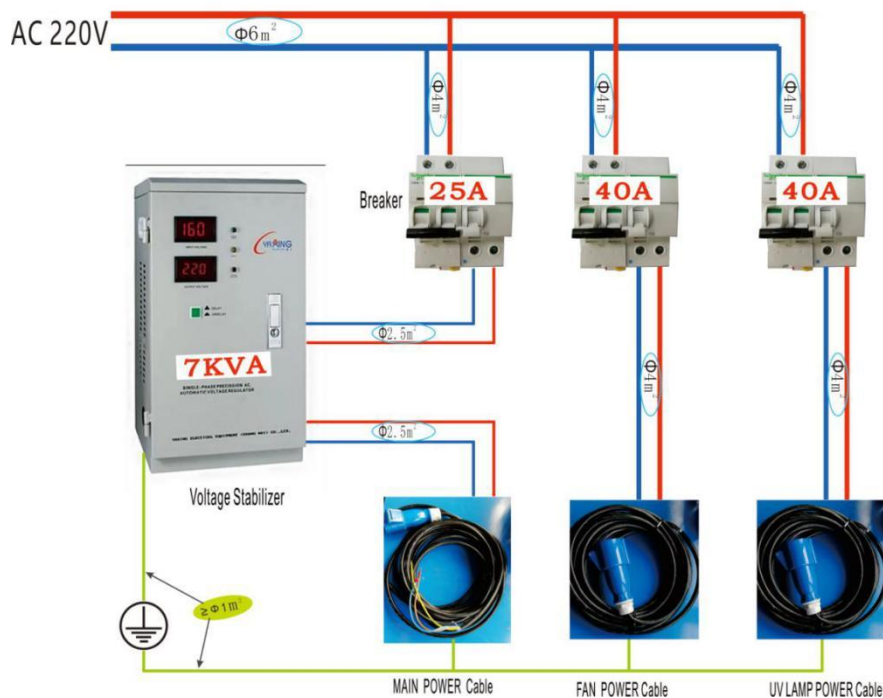


Code	Name of parts	Description
1	Upper cover part	Upturned tempered glass mainly.
2	Emergency Stop	Totally five, one on the handle and one on the front, rear, left and right of the machine.
3	Machine main switch	They are UV LAMP (UV lamp main switch), FAN (adsorption main switch), PC (computer switch),

		MAIN (machine main switch).
4	Main power interface	FAN/UV LAMP POWER (main entry of adsorption UV lamp) and MAIN POWER
5	Leg	For adjusting the level and fixing of the machine.
6	Pulley	For facilitating the moving of machine on flat ground.
7	Feeding rod	Feeding inflatable rod, an inflatable roller for fixing the materials.
8	Alarm	Above is the main ink tank alarm and below is the liquid waste alarm of automatic ink scraping.
9	Media Feeding Motor	The cloth feeding motor controls the operation of cloth feeding rod.
10	Feeding control	For control of positive and negative rotation of the cloth feeding motor and torque adjustment.
11	Main ink tank	Position of adding ink
12	Control panel for back operation	One on the left and one on the right, which can control printing, positioning, adsorption, and the rise and fall of the back pressure bar.

■ DS power wiring schematic diagram and power interface:

DS20 LIYU Hybrid printer the POWER wiring diagram



The above figure shows the wiring diagram of DS guiding belt machine. The customer's inlet bus adopts the diameter of 6mm². Two air switches (circuit breakers) are respectively passed, 25A and the two 40A. For the stability of the

machine operation, it is necessary to install a voltage stabilizer (as shown in the figure above). Underpinning shall be connected to during ground connection.



Tip: please connect the air compressor before power on!

Connect the battery plug to the machine separately, switch on all the circuit breakers of control, and then the machine can be energized. Then the machine can be powered on.

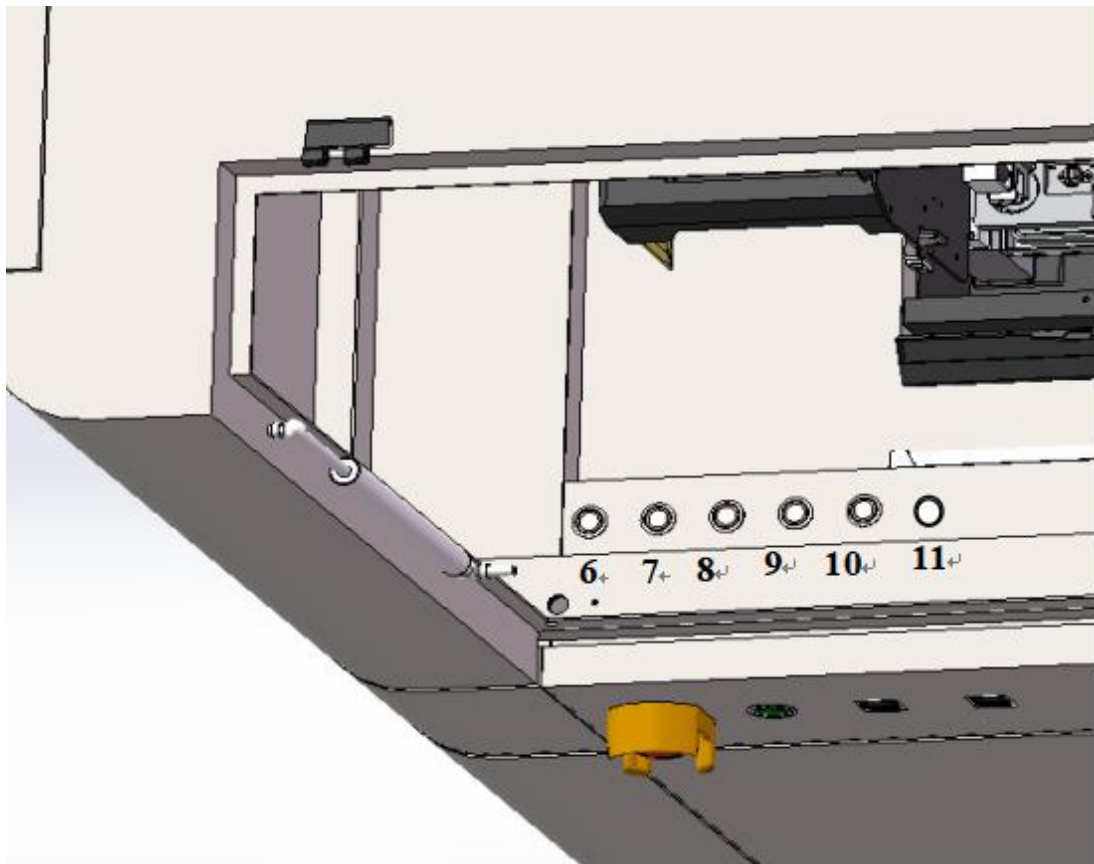
■ Introduction to function keys

1. Front left panel:



S/N	English abbreviation	Description
1	EMERGENCY STOP	A total of 4 in the front and at the back, mainly for switch of the machine power supply and emergency stop
2	POWER	2 in total in the front of the machine, one on the left and one on the right, for machine startup.
3	B LIGHT	Print backlight material and check printing quality.
4	MOTOR CONTROL	For adjusting the moment of the torque motor
5	Air connector	For connecting inflatable gun

2. Left internal side of the front panel:



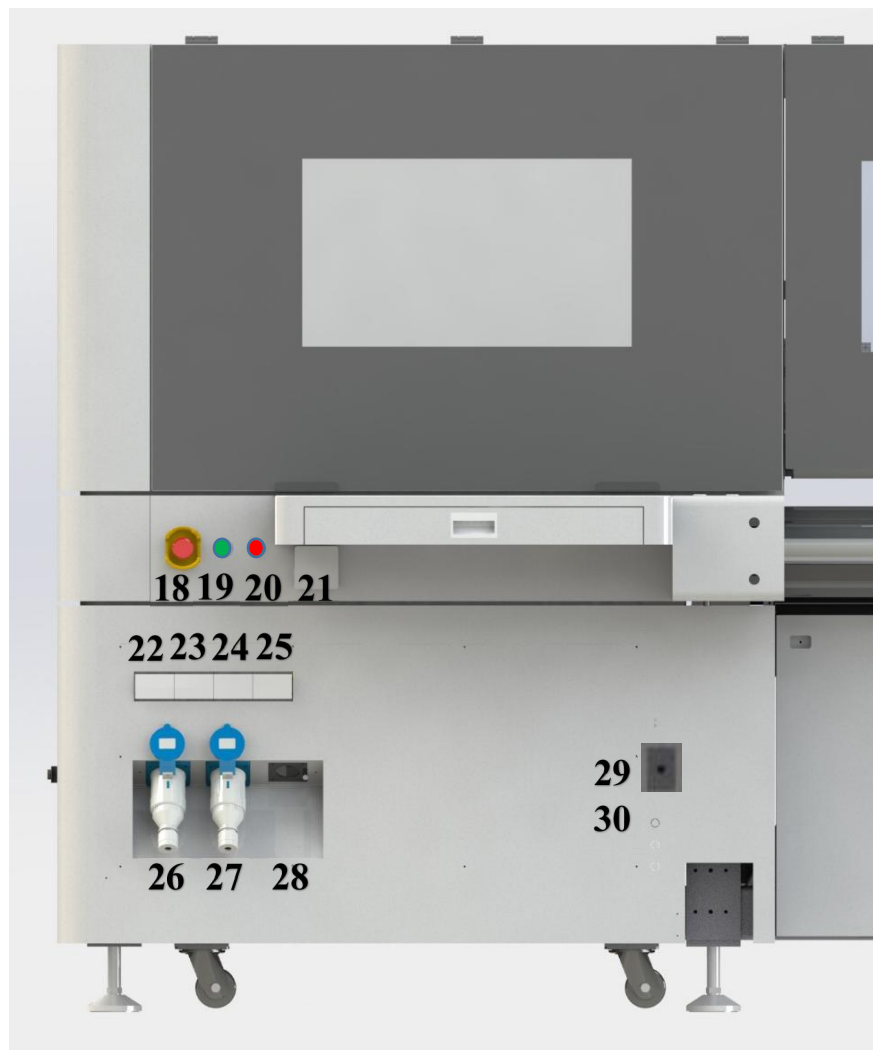
S/N	English abbreviation	Description
6	FLUSH	Power the positive pressure pump and use atmospheric pressure to press the ink out of the print head.
7	CLEAN	Connect the scavenging pump, supply the cleanout fluid to the print head, and clean it.
8	MAINTAIN	For making carriage ascend or descend at the leftmost end of the beam, and facilitating the manual cleaning of the print head
9	AUTO WIPER	It can realize the function of ink scraping by manual operation.
10	MOISTURIZE	It can realize the function of one-key moisturizing and print head protection after shutdown.
11	LIGHT	To clearly see the surface of print head during maintenance.

3. Front right panel:



S/N	English abbreviation	Description
12	EMERGENCY STOP	A total of 4 in the front and at the back, mainly for switch of the machine power supply and emergency stop
13	POWER	3 in total, one on the front left, one on the front right, and one on the rear right, for machine startup.
14	JET VOLTAGE	2 in total, buttons for print head power supplying. (Ricoh machine as the operation indicator light of the print head)
15	USB	Plug USB with no need of opening the bin of computer.
16	MOTOR CONTROL	Power supply for the motor of take-up and feeding system and signal interface of control torque motor
17	AIR	For connecting inflatable gun to supply inflatable gun

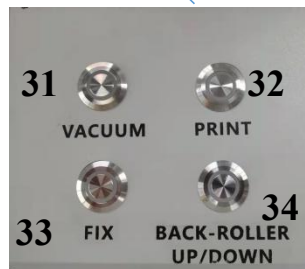
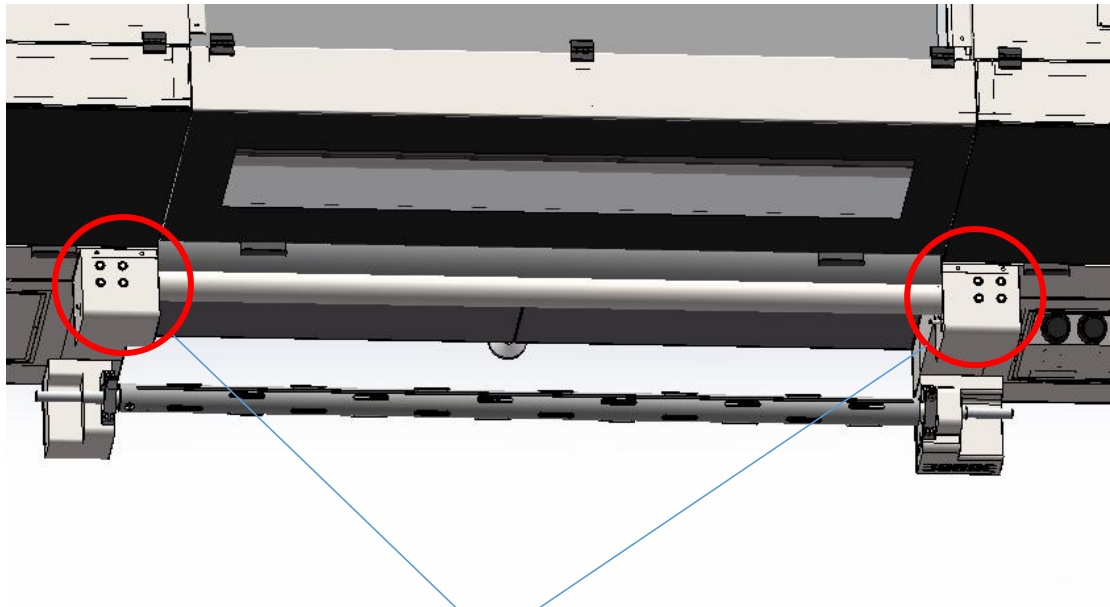
4. Rear left panel



S/N	English abbreviation	Description
18	EMERGENCY STOP	A total of 4 in the front and at the back, mainly for switch of the machine power supply and emergency stop
19	POWER	3 in total in the front of the machine, one on the left and one on the right, for machine startup.
20	JET VOLTAGE	2 in total, buttons for print head power supplying. (Ricoh machine as the operation indicator light of the print head)
21	USB	Plug USB with no need of opening the computer cabinet.
22	UV LAMP	Main switch for controlling UV power
23	VACUUM	Main switch for controlling adsorption power

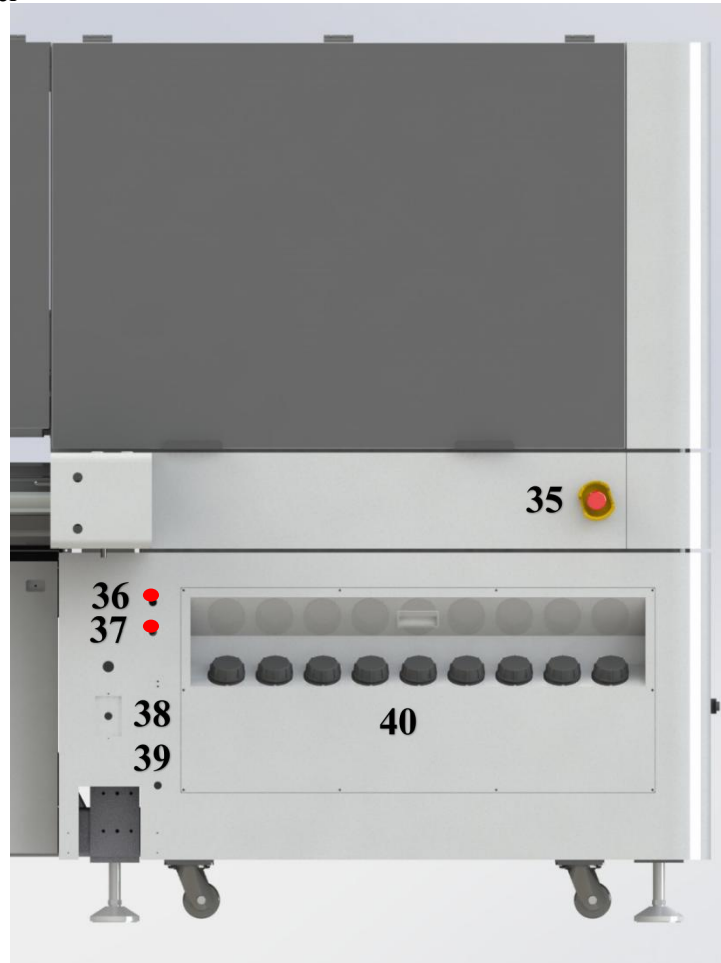
24	PC	Main switch for controlling computer power
25	MAIN	Main switch for controlling inkjet printer power
26	UV LAMP POWER	Main input of UV power
27	FAN POWER	Main input of adsorption power
28	MAIN POWER	Main input of inkjet printer power
29	MOTOR CONTROL	Power supply for the motor of take-up and feeding system and signal interface of control torque motor
30	AIR	For connecting inflatable gun to supply inflatable gun

5. Rear middle panel:



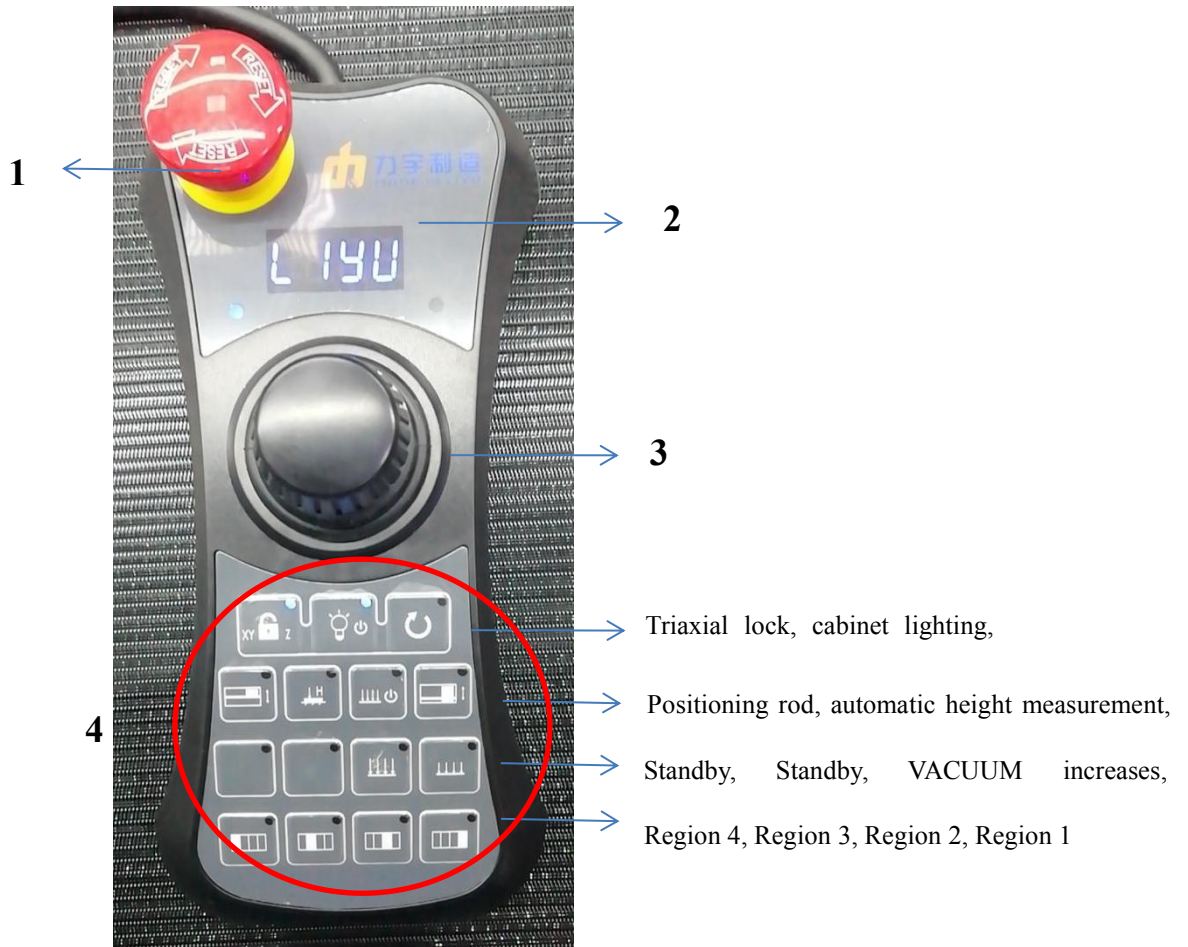
S/N	English abbreviation	Description
31	VACUUM	Three in total, one on the left and one on the right of the back, and one on the top of the hand-held box. The front and back can be independently controlled to open and close.
32	PRINT	One on left and one on right. Easy to print from the back (there is a print job on the software).
33	FIX	Three in total, one on the left and one on the right of the back, and one on the top of the hand-held box. Positioning rod up and down, positioning function of media.
34	BACK-ROLLER UP/DOWN	To control back roller up and down.

6. Rear right panel



S/N	English abbreviation	Description
35	EMERGENCY STOP	A total of 4 in the front and at the back, mainly for switch of the machine power supply and emergency stop
36	Ink alarm	Alarm when lacking of ink in the ink tank.
37	Effluent alarm	Alarm when the effluent tank is full.
38	MOTOR CONTROL	Power supply for the motor of take-up and feeding system and signal interface of control torque motor
39	AIR	For connecting inflatable gun to supply inflatable gun
40	Ink	Main ink tank (including ink supply system of ink pump and filter inside).

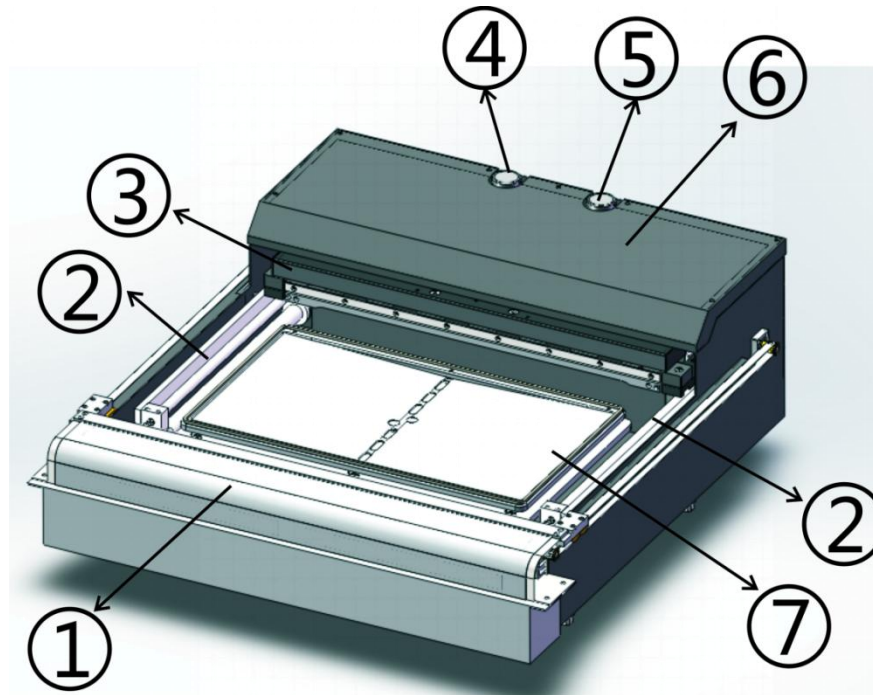
7. Introduction of hand-held box buttons:



S/N	English abbreviation	Description
1	EMERGENCY STOP	Four on the model, one on the handle lever, five in total. Mainly for switch of the machine power supply and emergency stop
2	SCREEN	Display the LIYU logo normally. During VACUUM adjustment, the VACUUM value is displayed as a percentage standard.
3	Handle lever	For controlling forward, backward, leftward, rightward, upward and downward movement.
4	All functions are shown in the figure above.	

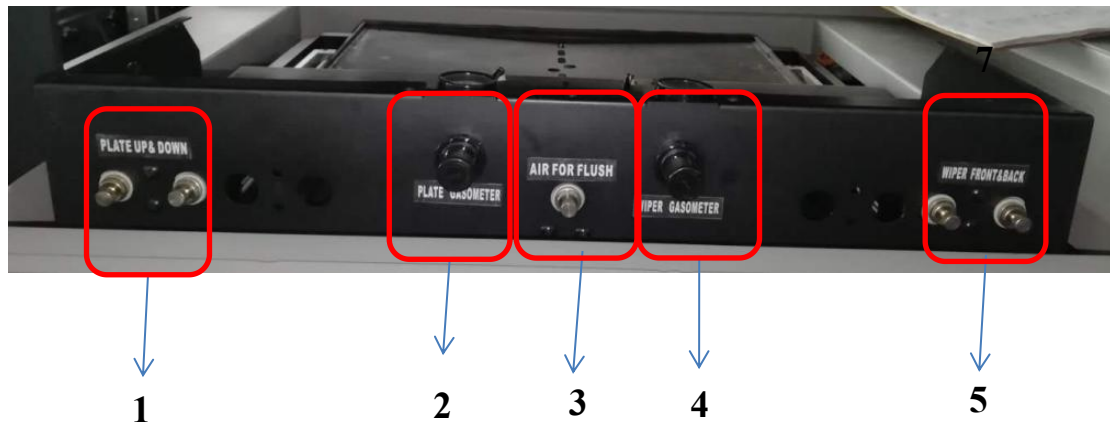
8. Introduction to adjustment of ink scraping system

Front of scraping system:



S/N	Name of parts	Description
1	Front baffle	When the wiper moving forward, scrap ink to prevent splashing.
2	Linear cylinders	One on the both side respectively to control the movement of wiper
3	Wiper	For cleaning the wiper on surface of print head.
4	General intake of linear cylinders	For controlling the total air inflow for back and forth movement of wiper.
5	General intake of lifting cylinders	For controlling of total air inflow for tray up and down.
6	Back cover plate	There are air pipe joints inside to control front and back, up and down, and cleaning fluid.
7	Moisturizing tray	For moisturizing the tray

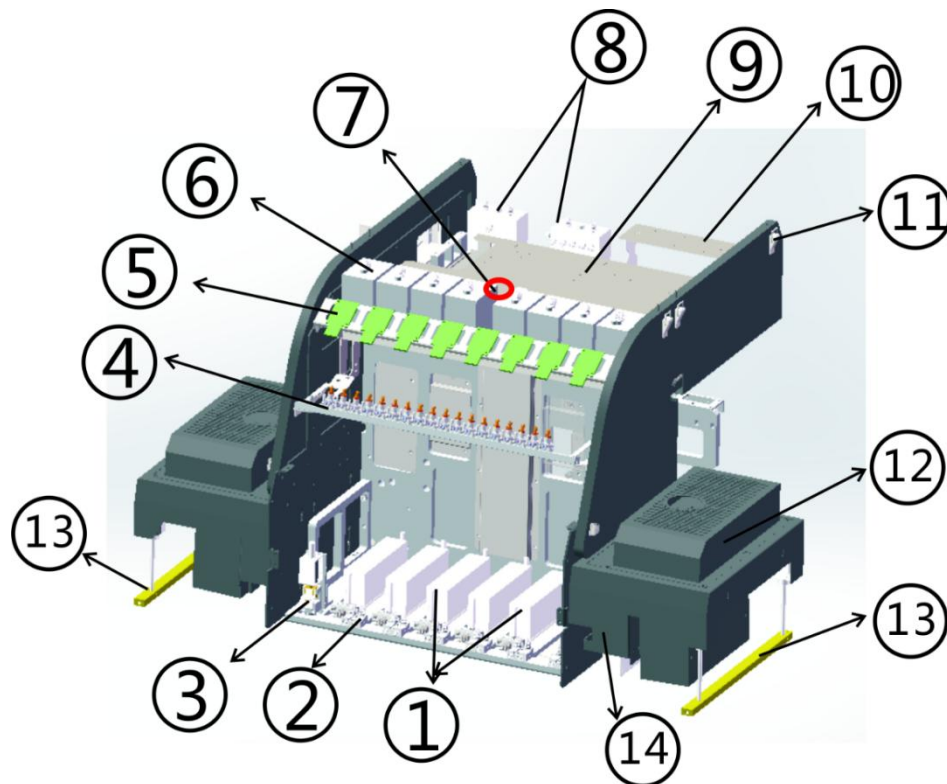
Back of scraping system:



S/N	Name of parts		Description
1	Up and down control buttons of plate	PLATE UP&DOWN	Adjust the air pressure to control the speed and force of the tray cylinder upward or downward
2	Plate gasometer	PLATE GASOMETER	To control the intake air pressure of plate
3	Air pressure for flush	AIR FOR FLUSH	To adjust the intake air pressure of flush
4	Wiper gasometer	WIPER GASOMETER	To control the intake air pressure of wiper
5	Front and back control buttons of wiper	WIPER FRONT&BACK	To adjust the air pressure to control the speed and force of the wiper forward or backward

Note: Plate gasometer and wiper gasometer control the air pressure of above and below the moisturizing tray as well as forward and backward movements of the wiper. The normal air pressure value is 0.3kpa instead of more than 0.4kpa.

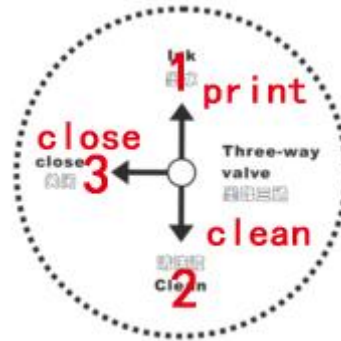
9. Carriage view



S/N	Name of parts	Description
1	Print heads	Deciding numbers and positions of print heads according to print heads types.
2	Two-way valve body	It has two states, which can be used to discharge the gas in the print head.
3	Height measurement system	It's used for automatic measurement of medium height by handle operation and software operation.
4	Three-way valve body assembly	It has three states. It's used for printing, cleaning and closing.
5	Temperature control board	For adjusting the temperature of each auxiliary ink tank to the specified settings.
6	Auxiliary ink tank	Level 2 buffer negative pressure works as the ink in the main ink tank is filled to the auxiliary one.
7	Z lifting motor	To control the height of the print head.
8	Waste liquid tank	It's used for suck-back protection. Refluent ink will be stored here. It has two types: color and white.
9	Carriage board	For controlling ignition signal and data of print head.
10	Signal switchboard	For transferring all sensor signals from the carriage to the movable board and PCIE board through this adapter board.
11	Cover lock	For fixing the cover plate lock of carriage.
12	LED UV lamp	It is used to solidify UV ink. According to the machine

		configuration, air-cooled and water-cooled UV lamp can be equipped.
13	Left/right collision protection switch	When hitting an exorbitant foreign object during printing, the carriage will stop and the switch will protect the machine.
14	Electrostatic removal device	One on left and one on right.

10. The following pictures are details for three working statuses of the three-way valve body:

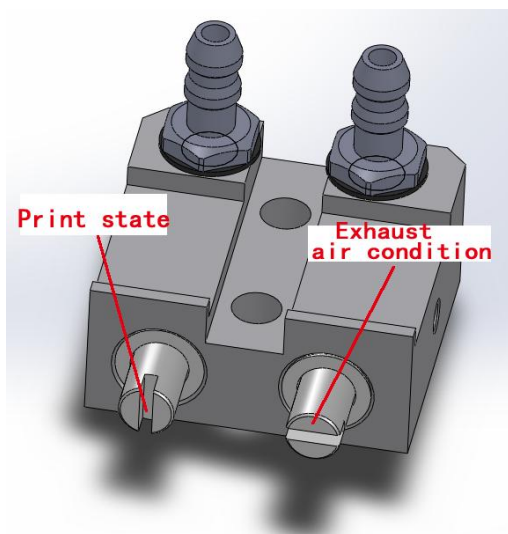


State 1: Working state, when the equipment is in normal operation, especially in printing, the valve shall be upward.

State 2: Cleaning state, when it's time to clean the print head with cleaning fluid, please place the valve downward.

State 3: Off state, when the equipment is shut down, place the valve in closed direction.

11. Introduction to two statuses of two-way valve assembly:



Print state: upon printing for daily work, the valve core is vertical and valve body is closed.

Air-extraction state: When it is required to extract the air out from print heads, making the valve core rotate 90°, pressing ink at the same time and reinstate the valve core in print status after the air is fully discharged.

- *Consumables*

- **Printing media**

The common media for the inkjet printer include such commonly used media for advertising equipment as PVC, PMMA, glass and wall cloth. Please pay attention to the following matters as regards media purchase, storage, use and disposal:

- ◇ Inferior medium may reduce the printing quality, so it is suggested you select the high quality printing media.
- ◇ Do not store the media vertically so as to avoid clutter or damaged edge, especially for plate media, please place the plate media on flat surface and avoid any deformation of the plate.
- ◇ Do not preserve the media in the environment with great temperature and humidity changes, instead, the media shall be preserved in clean and tidy environment with proper temperature and humidity.
- ◇ Do not use the printing media with scratch, wrinkle, curl and surface bulge for the coiled material. The use of this kind of printing media may result in equipment failure or damage when printing.
- ◇ Ensure the clean and tidy printing surface of the media during printing, free from any dust and clutter, otherwise, equipment failure or damage may occur.

- **Ink and cleaning fluid**

The print head of inkjet printer belongs to high precision equipment. Therefore, the ink quality will greatly affect the printing quality and the service life of print head. Please use the ink and cleaning fluid recommended by the manufacturer and pay attention to the following items at the same time:

- ◇ Failure to use the ink as recommended may cause lowered printing quality or equipment damage.
- ◇ The guarantee period of ink is 12 months in general (calculated from the production date), so please use the ink within guarantee period.
- ◇ Make sure that there is plenty of ink in main ink bottle during the working period of the machine.
- ◇ Ink should be kept in a shady and cool place.

- ◇ Since ink and cleaning fluid are strong acid or alkaline liquid, please store them properly and try to avoid skin contact, let alone swallow, and keep it away from eyes.

■ **Maintenance tools**

Please use the cleaning fluid recommended by the manufacturer to clean the print head, moreover, use the specialized wiping paper recommended by the manufacturer to wipe the print head, otherwise, it may lead to the permanent damage to the print head.

Chapter 2 Basic Operation

This chapter illustrates the basic actions of machine installation and operation.

The main content of this Chapter:

- Computer connection
 - Installation environment for LYprint
 - Installation steps for PCIE driver
 - Connect and plug the PC external switch control line
 - Installation of LyPrint software driver

- **Installation and adjustment of print head**
 - ◆ Introduction to KONICA 1024i print head
 - ◆ Installation of Konica 1024i print head
 - ◆ Protective casing of the Konica 1024i print head FFC interface

- **Switch order of the DS printer**
 - Power ON
 - Power OFF

- **Introduction of DS functions in LyPrint**

- **Printing methods of various materials**

- **Correction function**

- **Positioning rod function**

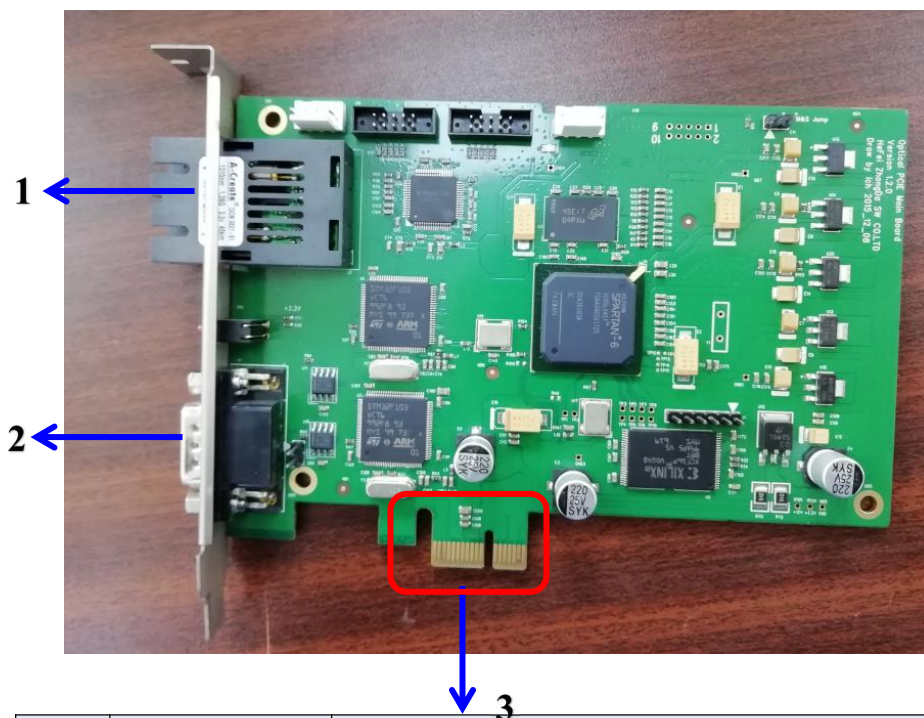
● **Computer connection**

■ **Installation environment for LYprint**

Please apply WIN7 64-bit and 64位操作系统和WIN10 64-bit operating systems to secure the normal working of the software.

■ **Installation steps for PCIE driver**

1. Plug PCIe card into its slot at first, double click the file **LiYu PCIe(1.0.8).exe** after the computer is started.

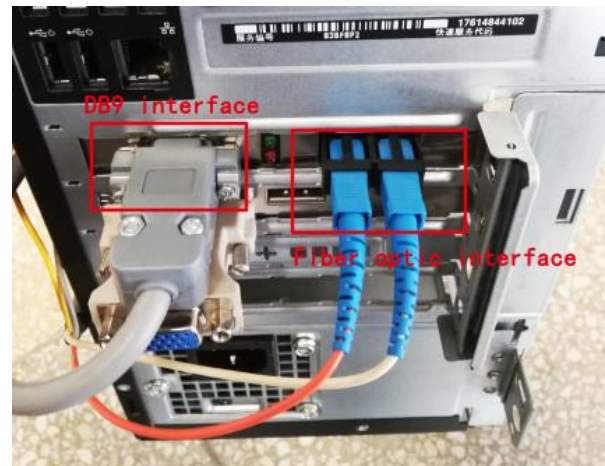
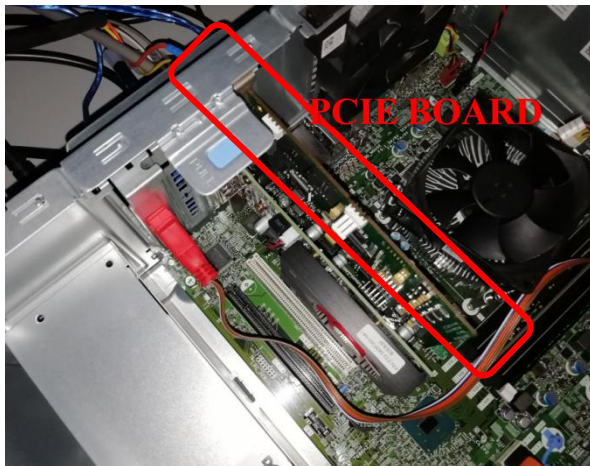


S/N	Function	Description
1	Fiber Interface	The fiber interface is connected to the carriage board. In principle, the TX on the PCIE card is connected to the RX of the carriage board; the RX on the PCIE card is connected to the TX of the carriage board.
2	USB1 interface	The interface signal with the transmission function is connected to the motion control board, the hand-held box plate and the ink supply board.
3	PCIE pins	It's plugged and fixed into the PCIE slot connector on the computer motherboard.

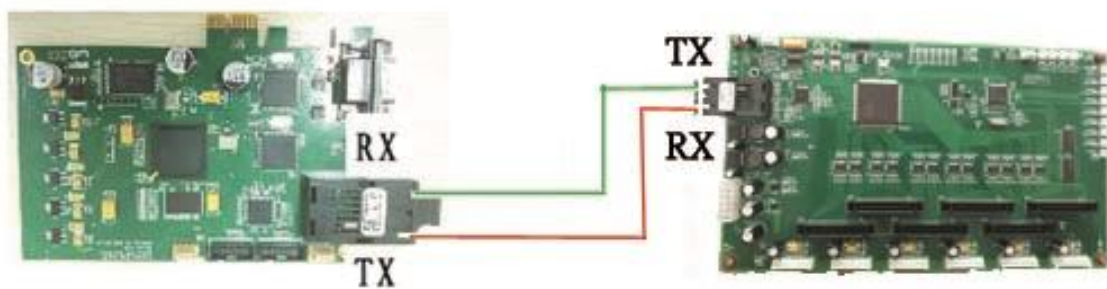
2. PCIE X1 interface shall be provided in PC configuration; unstable factors would exist if X4, X8, X16 interfaces are used. Plug and fix the PCIE card into the PCIE interface on the computer motherboard as shown in the following figure.












3. After plugging in as shown in the figure below, connect the machine to the DB9 interface of the PCIE card, tighten the screw, and then connect the corresponding interface of the fiber.



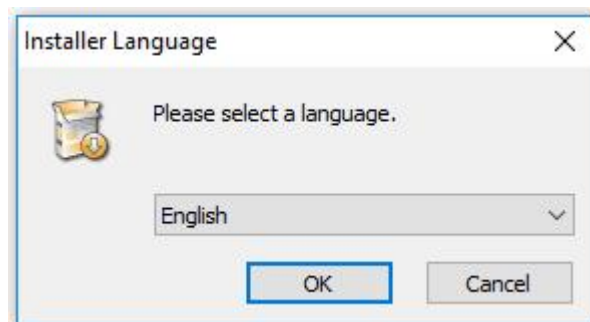
4. Fiber installation and connection with the carriage board in corresponding method. The connection method is as shown below:



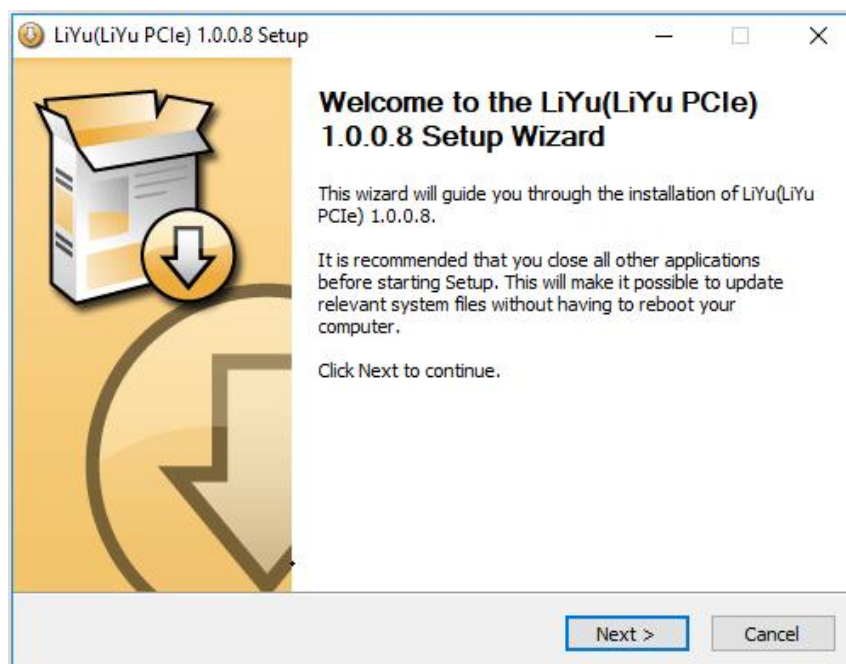
■ Installation of LyPrint software driver

 DiGiM.bin	2008/12/23 10:02	BIN 文件	6 KB
 DiGiS.bin	2008/12/23 9:36	BIN 文件	5 KB
 DiGiSS.bin	2015/10/28 10:16	BIN 文件	1 KB
 ENUHelpFile.mht	2013/7/2 9:40	MHT 文件	8,853 KB
 LiYu PCIe(1.0.0.8).exe	2016/12/8 16:02	应用程序	5,526 KB
 liyupt.dll	2017/10/18 14:13	应用程序扩展	10 KB
 lyprint.apw	2015/4/10 16:10	APW 文件	1 KB
 LyPrint.exe	2017/10/18 15:13	应用程序	4,855 KB
 lyprint.ini	2018/1/9 14:06	配置设置	21 KB

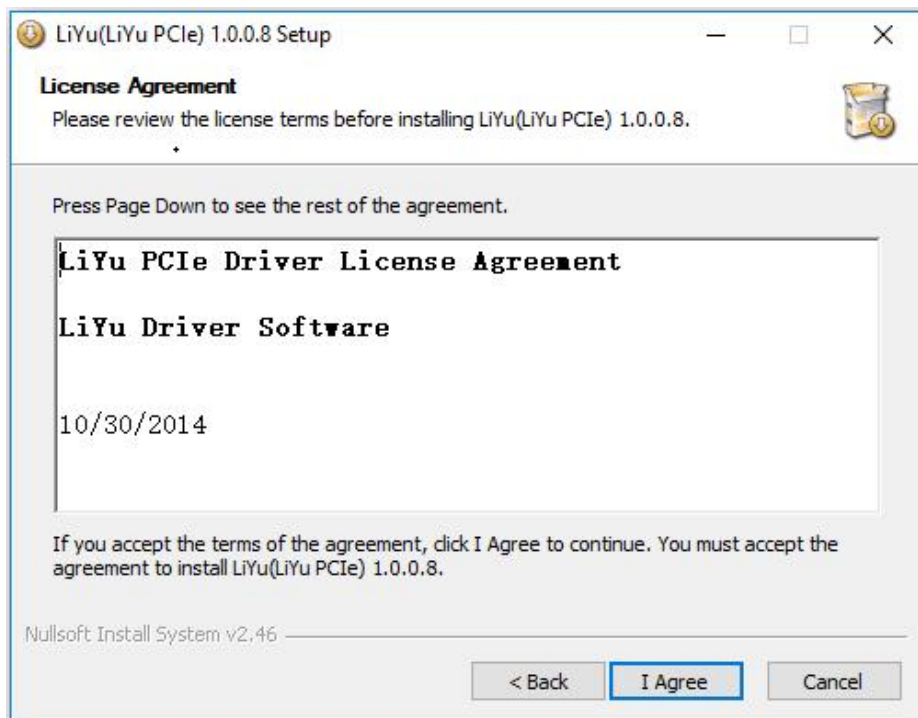
The following interface pops up.



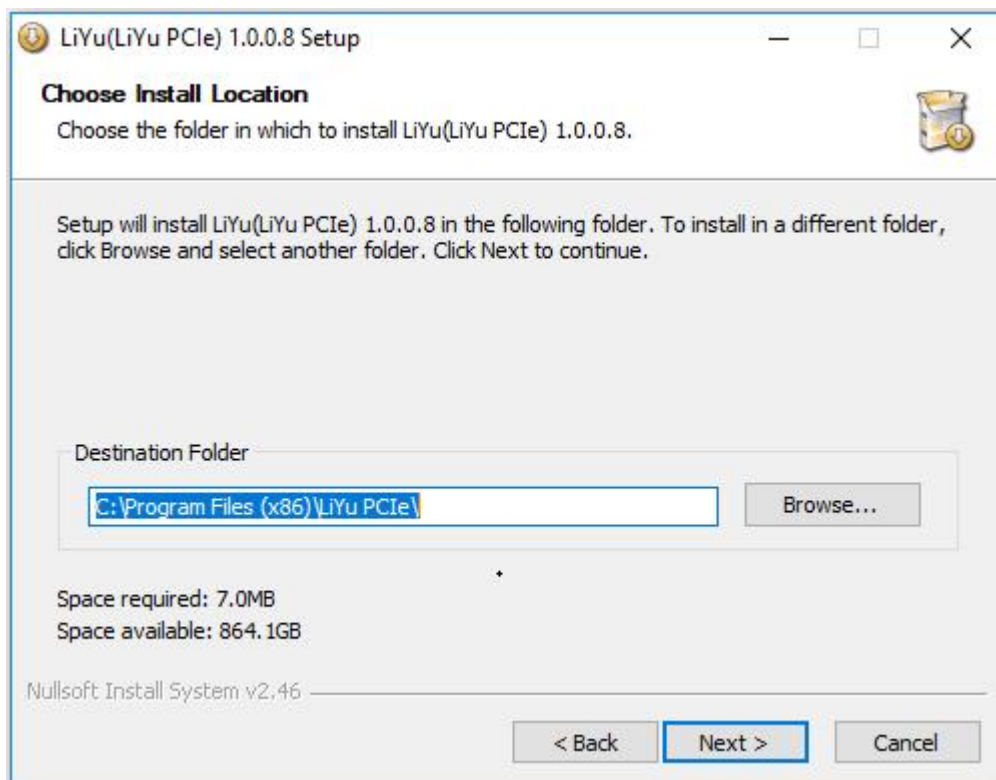
Select required language, then click "OK".



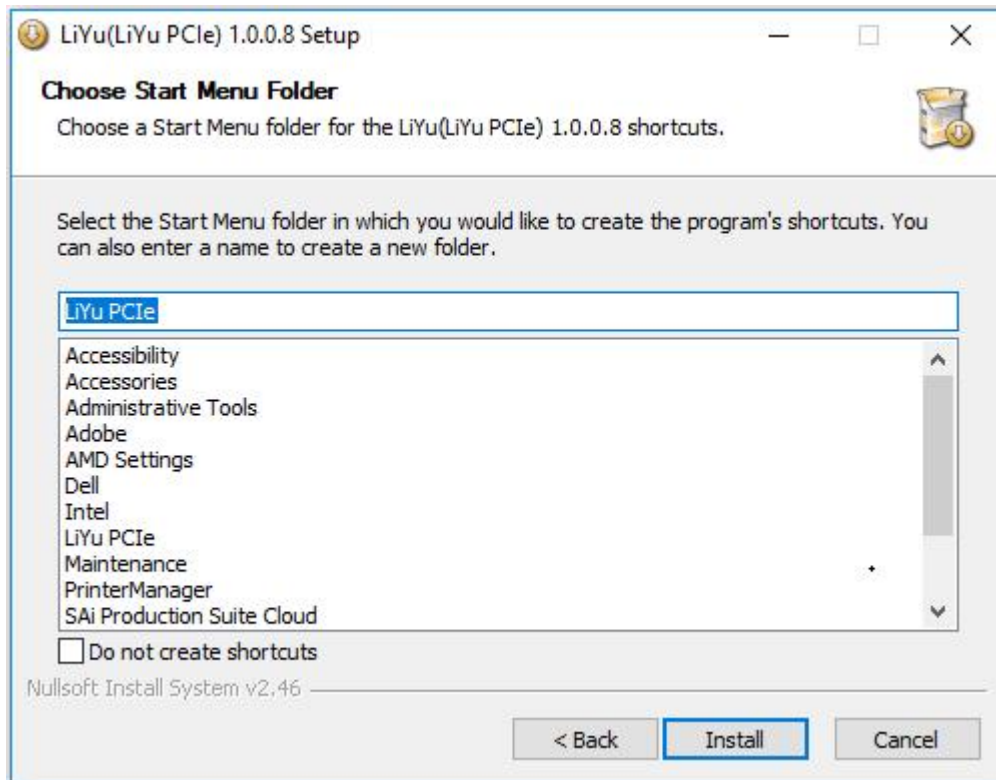
Click “Next”.



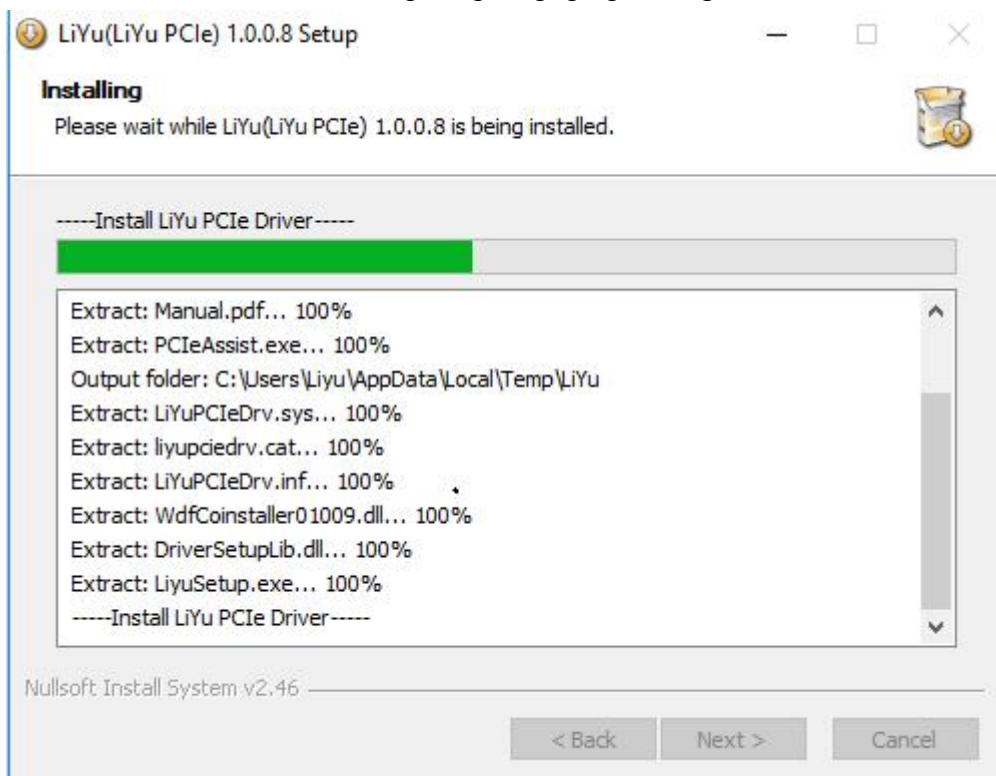
Select the required installation path, then click “Next”.

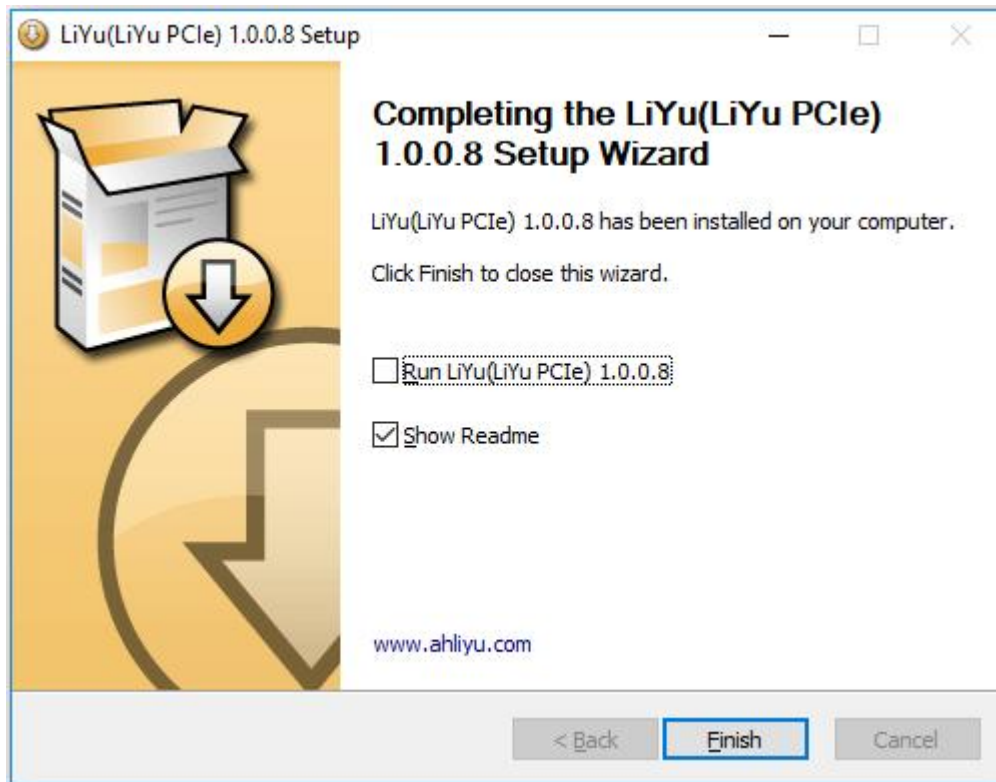


Click “Next”.

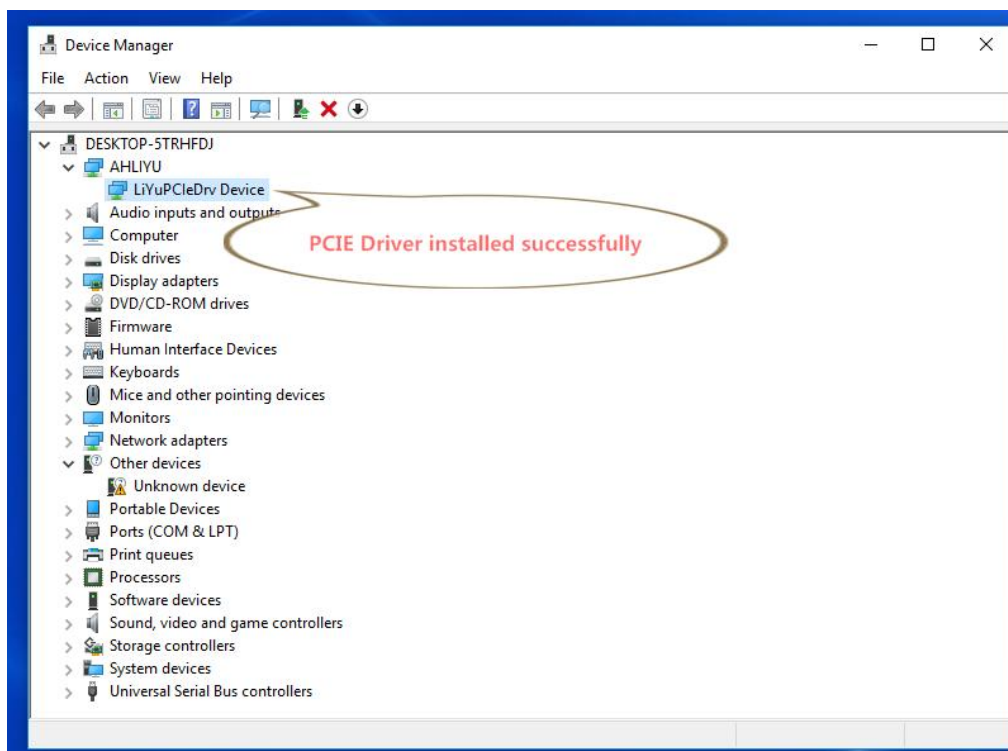


Please click “Install” when the prompt is pop up during the installation.





The driver has been successfully installed if the content in DevManView is shown as the figure above.

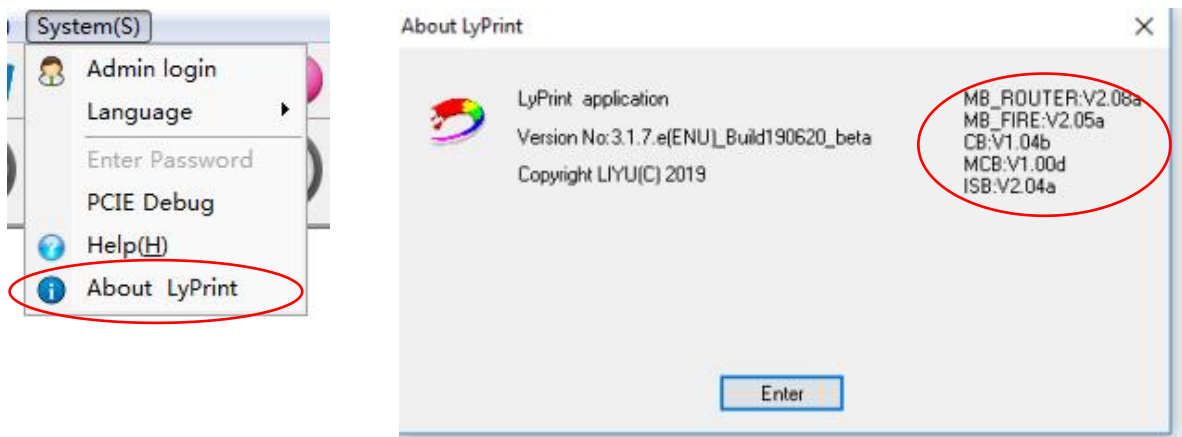


Unscrew the emergency stop button on both sides or the emergency stop button on the handle.

Start the Inkjet Printer and click to start. The carriage will automatically reset to the right side of the flash and spray position.

Double-click the Lyprint icon to pop up the Lyprint operation interface. And the carriage will reset left and right at the same place. The bottom left side of the software shows the state of “**Disconnected**” to “**Ready**”, indicating that the machine and software are normally connected and the ink supply pump starts to pump ink from the main ink tank into the auxiliary ink tank. This process will be accompanied by the negative pressure meter and electromagnetic valve, and when the ink injection of each auxiliary ink tank reaches the liquid level sensor, the ink supply will be finished.


In order to determine the online connection of software and machine, the SYSTEM>About LyPrint of LyPrint software can be used.



Description:

- ✧ MB_ROUTER: V2.08a and MB_FIRE:V2.05a Version No. of PCIE board fixed program
- ✧ CB:V1.04b Version No. of carriage board and firmware program
- ✧ MCB:V1.00d Version No. of motion control board and firmware program
- ✧ ISB:V2.04a Version No. of ink supply board and firmware program

Please refer to random documents and when using Lyprint.

 CHSHelpFile.mht (Lyprint Operation Manual) English) or

 ENUHelpFile.mht (Lyprint Operation Manual) (English)

● *Installation and adjustment of print head*

◆ Introduction of KONICA 1024i print head



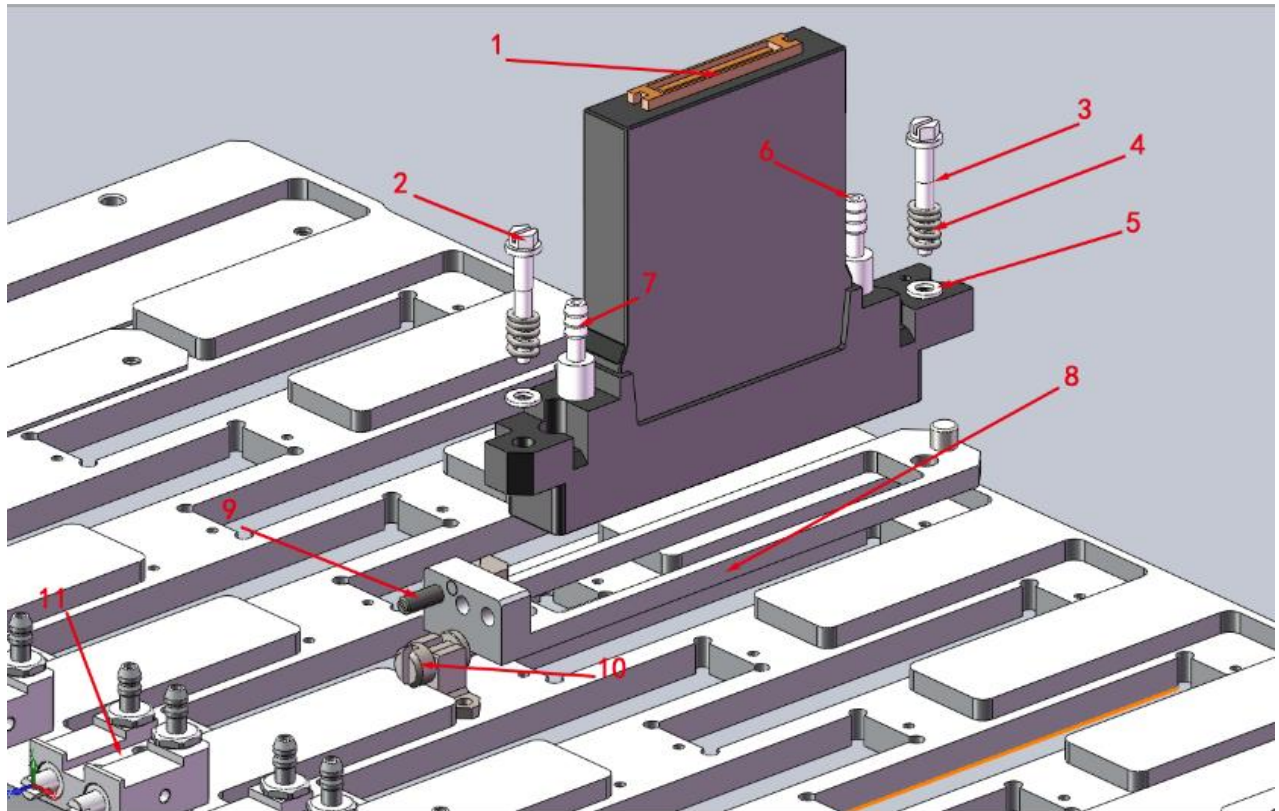
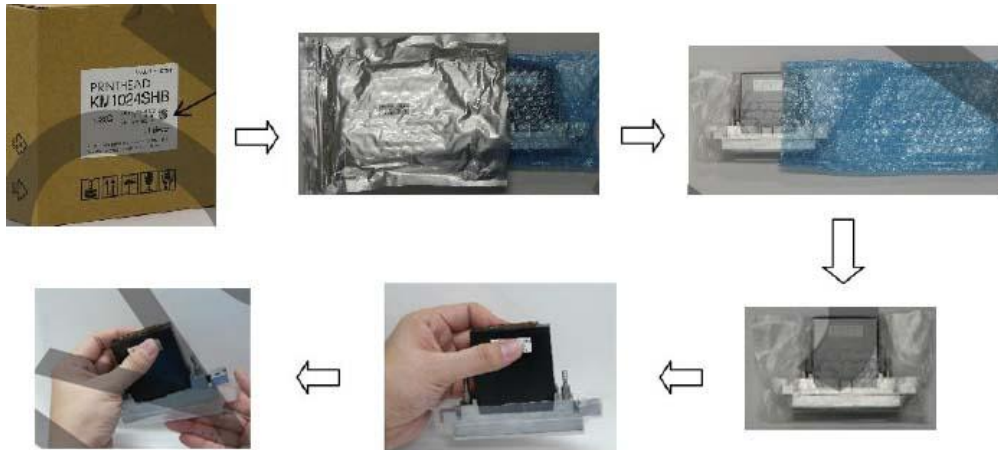
A high precision and high speed print head is widely used in the printer industry, and is also the most mainstream print head now supporting with 14PL and 6PL ink dot, among them the 6PL supports the grayscale printing. Two rows of ink eyelets are respectively on both right and left sides of the bottom of each 1024i print head; 512 nozzles stand in each row and a print head has $512 \times 2 = 1024$ nozzles.

The print head identification is shown on the package of each print head. Please input referenced voltage into “Voltage Setting” of LyPrint.

◆ Installation of KONICA 1024i print head

Some print heads of the machine have not been installed onto the machine. Therefore, this chapter will start from the installation of single print head to the machine. If print heads have been installed onto the machine, please omit the illustration of print head installation.

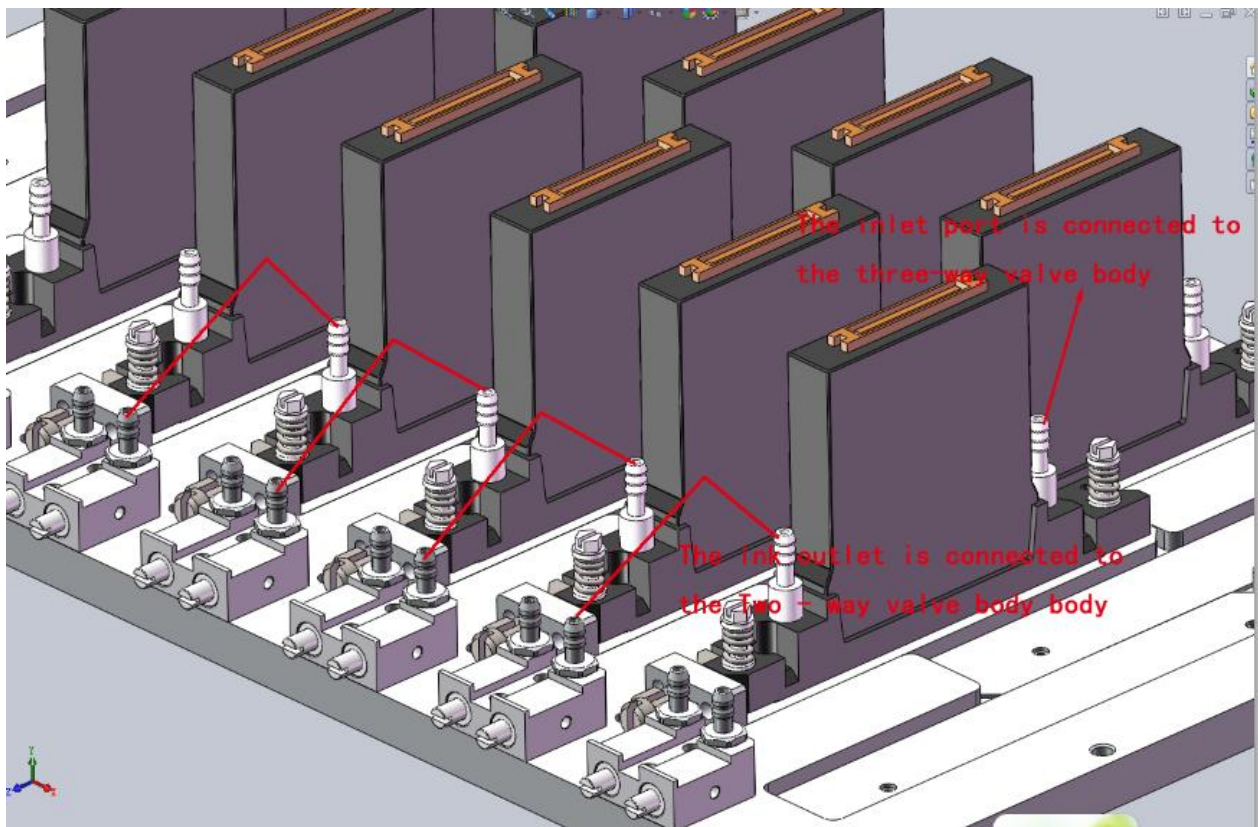
1. First install the bottom plate of print head onto the machine and place clean non-woven fabrics under the bottom plate of print head, so as to avoid soiling nozzle panel or blocking nozzle during print head installation process.
2. Remove the packing of print head according to the order below and take down the protection cover under print head (the protection cover is used to protect nozzle panel).
3. Place the print head to the adjusting support, and then the appointed nozzle position.



Installation Diagram of Print Head Konica 1024i

S/N	Name of parts	Description
1	Print head FFC interface	Connect the driver board for print head to transmit the data signal.
2	Mounting screw for print head	Fix the print head on the adjusting support.
3	Mounting screw for print head	Fix the print head on the adjusting support.
4	Spring	Keep the effect of fixed print head

5	Spacer	Keep the effect of fixed print head
6	Ink inlet	Connect the outlet of three-way valve to supply the print head with the ink.
7	Ink outlet	To exhaust the air inside the print head to balance the differential pressure.
8	Adjusting support for print head	To adjust the physical position of the print head.
9	Inclined adjusting screw for print head	To adjust the inclined physical position of the print head.
10	Vertical adjusting screw for print head	To adjust the front and back physical position of the print head.
11	Two-way valve body	It can be used to discharge the gas in the print head.

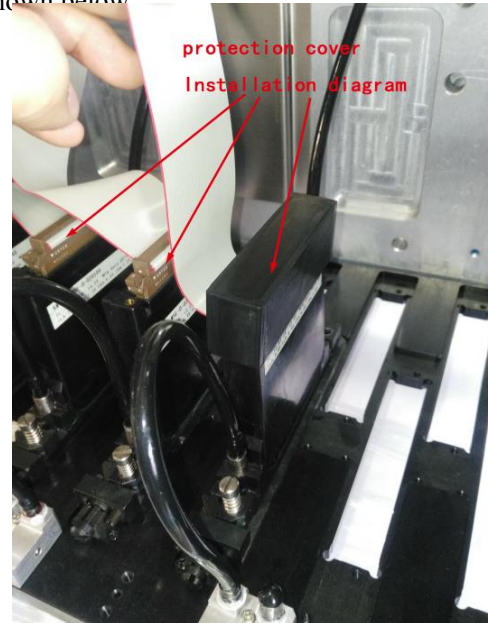


Installation Diagram of Print Head RKonica1024i

Please use the rubber cap for the used two-way valve to prevent leakage.

◆ **Protective casing of the KONICA 1024i print head FFC interface**

The protective casing shall be used to protect the FFC interface to prevent FFC interface from being contaminated by ink and cleaning fluid, the effect is shown below



- *Switch order of the DS printer*

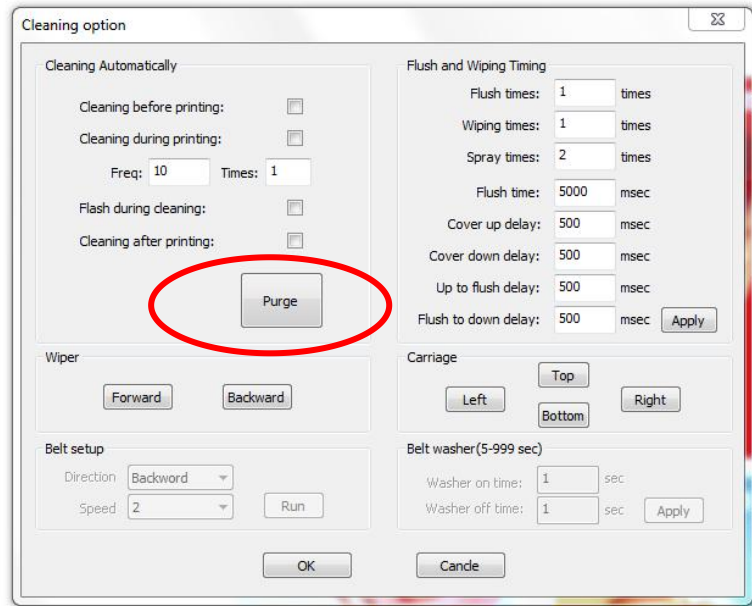
- **Startup (please pay attention to foreign objects on the guiding belt when start up the DS machine)**

- **Startup processes**

1. Connect the input power of the machine, and push on the leakage protection switch of general power on the rear left.
2. Unscrew the **emergency stop buttons** on the four corners in the front and at the back of the machine (**including the emergency stop switch on the handheld box**).
3. Turn on the computer and start the LyPrint software.
4. Press the **start buttons** on the left or right and rear right sides of the machine. Start the machine, and the moisturizing state is automatically canceled. At this time, the moisturizing tray is lowered, and the carriage rises and starts to move from the left to the right and stops at the rightmost flash spaying position of the girde.
5. Press **print head high pressure button** to make the print head work (some systems do not need this process).
6. Click the “Clean” icon on the software, and the carriage moves down from the rightmost end to the leftmost end.
7. Unscrew the three-way ink path valve body and press the **ink pressing button** to allow the ink flow from the auxiliary ink tank into the print head through the three-way ink path valve body and then flow out; the air can be exhausted through the blowoff valve.
8. Press **automatic scraping button**, the scraping brush can move back and forth for several times. Clean up the ink on the surface of print head.
- 9, For steps 7 and 8, automatic ink pressing and scraping process can also be achieved through **automatic cleaning function** in the software.
10. Put in the print material, cancel the flash spray print, and set the print height and original point.
11. When the software is in ready state, then print.

- **Ink pressing of the print head during printing**

When disconnection occurs during the printing process, click the “automatic cleaning” function in the software and click “PURGE” in the popped-up window. The carriage head will move to the leftmost end of the girde to fall, and after automatic ink pressing, the ink wiper will start to move back and forth to remove the ink from the surface of print head. After the scraping brush returns to the rearmost end, it will be automatically flushed. The carriage head returns automatically to the last print position and continues to print.



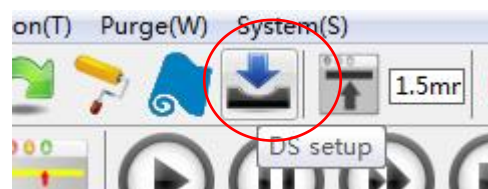
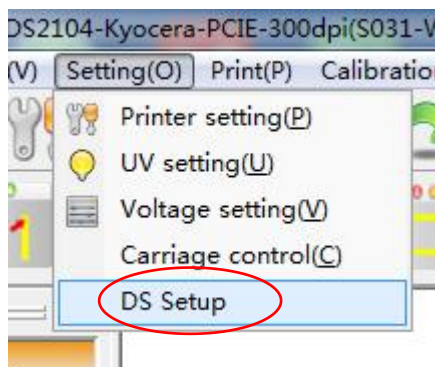
■ Power OFF

Power OFF processes

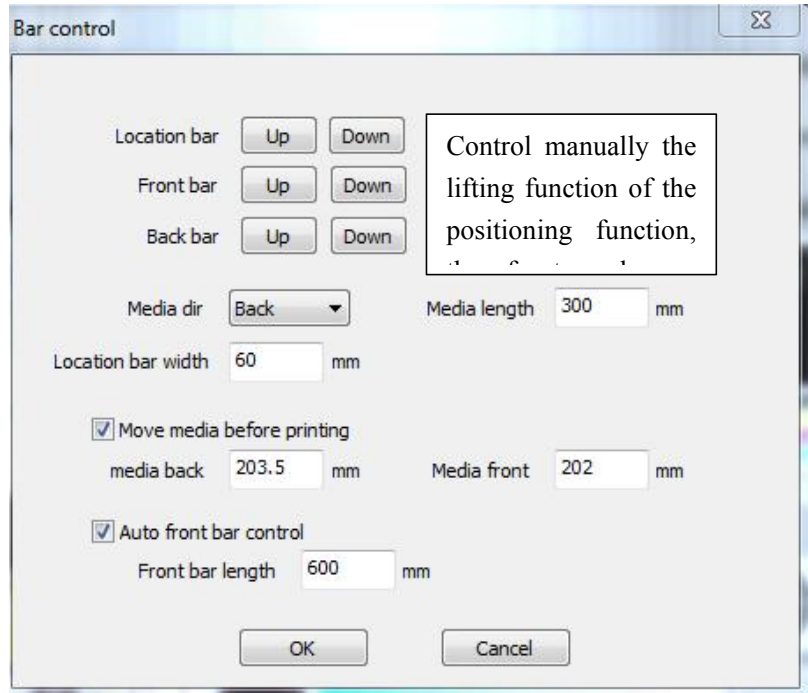
1. If in the flash spray state, first cancel the flash spray.
2. Press the moisturizing button, (the carriage will moves down from the rightmost end of the girde to the leftmost end), close the ink valve body.
3. Close the **print head high pressure button** (some systems do not need this process).
4. Press the **Emergency Stop** switch. At this time, the moisturizing tray will automatically rise until under the print head bottom board.
5. Shutdown the computer.
6. Pull down the leakage protection switch of the main power supply of the machine.

■ Introduction of DS functions in LyPrint:

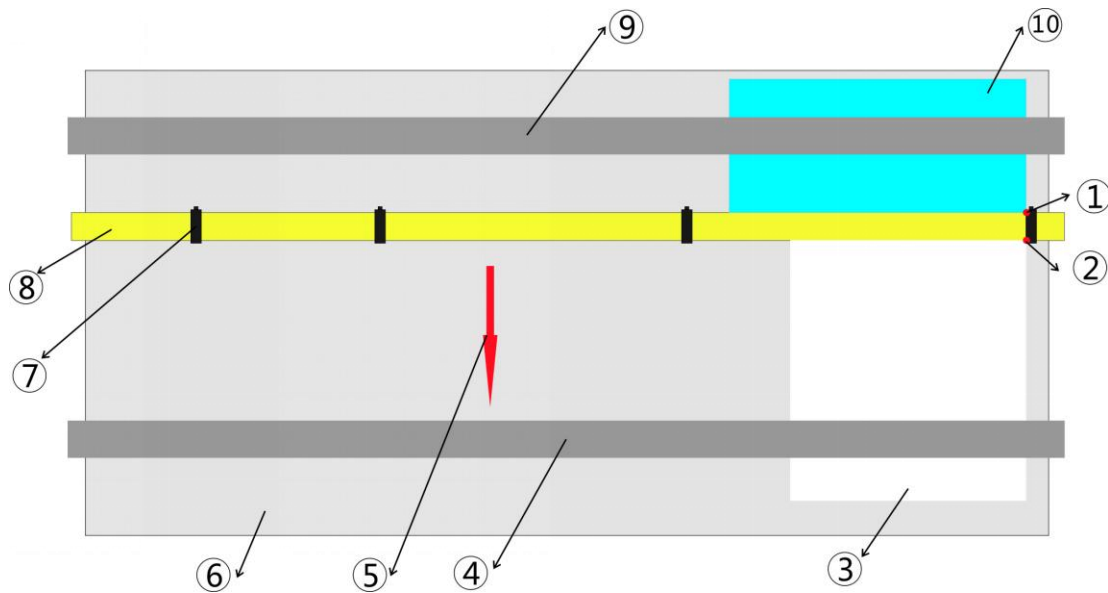
1. Printing setting of the front pressure roller, positioning rod and back pressure roller: the equipment offers positioning function and rise and down functions of the front and back pressure rollers. You may set these functions in the dialog box “setting-DS setting”. You can also open the dialog box “DS setting” by clicking the icon in LiyuPrint main interface.



Open the window as follows:



- Media direction: setting to choose positioning from Front or Back. As shown in the following figure:



S/N	Name of parts	Description
1	Back original point	Positioning point to load from back.
2	Front original point	Positioning point to load from front.
3	Front printing media	Diagram of printing media for material loading from the front
4	Front pressure	When media printing is beyond the adsorption range of the

	roller	platform, it may warped. After setting distance, the front and back pressure rollers will automatically drop, or you can manually control the lifting and down.
5	Arrow	Movement direction of guiding belt during printing
6	Guiding belt	The Guiding belt is the main printing drive mechanism.
7	Partition	There are four partitions, which can be used when printing multiple copies between media.
8	Positioning rod	For positioning.
9	Rear Pressure Roller	Before printing, putting down the back pressure roller will greatly increase the flatness of media.
10	Back printing media	Diagram of printing media for material loading from the front

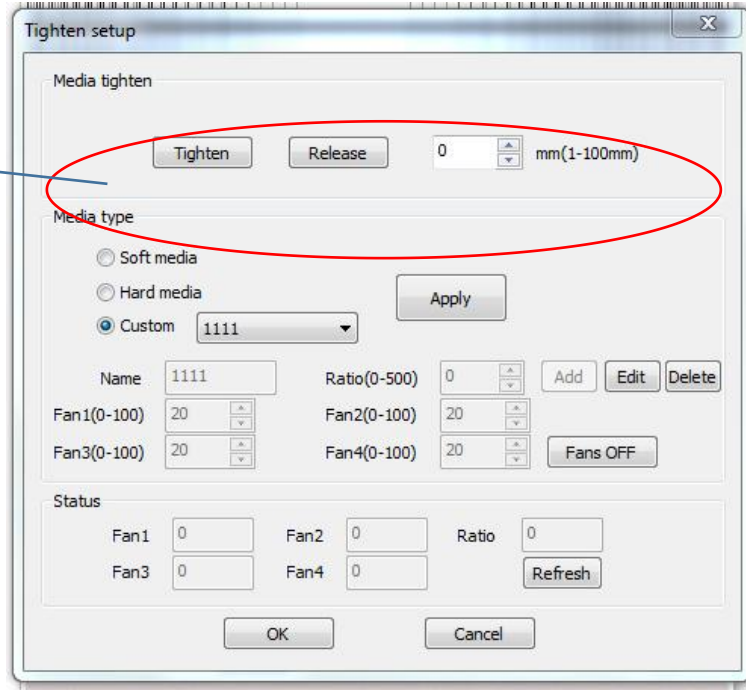
- Media length: If the setting media is loaded and positioned from the front, set the length of the printing media, so that it can be printed to the starting point of the media. If the setting media is fed and positioned from the back, then the value is automatically invalid.
- Automatic movement before printing: the starting point of two different values of feeding and positioning from the front and back can be set to make positioning more accurate.
- Automatic control of the front pressure roller when printing: the length of the printing media can be set so that the front pressure roller can press the media when the media is printed below the front pressure roller to prevent the media from warping.

2. Platform adsorption settings: these functions are set in the “Tighten setup” icon on LiyuPrint main interface, click to open the dialog box.



Open the window as shown below:

This setting is specific to FS models. Omit here.

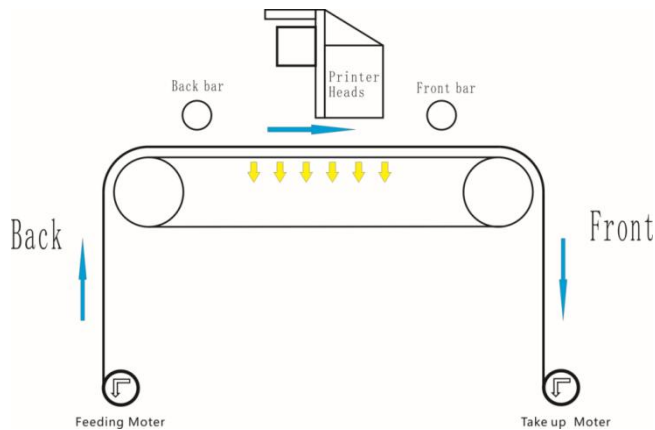


- Media type: In the media type, you can set and save the adsorption value of various materials and, so that you can choose reuse without need to remember the parameters of this media when replacing the same material next time. It can be divided into soft, hard, and custom media.
- In the custom, you can set and save the adsorption value of various media (name the media).
- Adsorption shutdown: you can shutdown the platform through the software.
- Current status: you can refresh the adsorption value of the current platform, and the adsorption value of the platform is based on the percentage as a reference standard.

■ Various printing processes and methods:

❖ Printing process of soft materials

1. The feeding and printing process (the media feeding motor is under tension status when printing)



- 1.1 Center the soft material or insert it into the inflatable axis through the origin point, and tension the inflatable axis;
- 1.2. According to the material width, press the **adsorption main switch** to open the corresponding adsorption area; (the soft membrane is generally set at 40%, and the flex banner is set at 70%)
- 1.3. According to the material winding direction, rotate the **positive and negative knobs of the back torque motor** to release the material to the middle position of the platform;
- 1.4. Turn off the **positive and negative knobs of the back torque motor**, turn on the **adsorption main switch (behind the machine)**, press the **lift and down button of the back pressure roller**, so as to lower the pressure roller;
- 1.5. Unscrew the **positive and negative knobs of the back torque motor** to make sure the feeding motor is under tension status.
- 1.6. Use **forward and backward** movement (hand-held box or software control) to move forward to the air shaft, and fix it on the penetrated and tightened roller (note: the original points shall be same);
- 1.7. Adjust the status of the soft material on the platform, and rotate the **adsorption adjustment button** in the corresponding area according to the material characteristics to adjust the adsorption of each partition.
- 1.8. Use the **height measuring function** in the software to determine the height and set the original point.
- 1.9. Turn on the UV lamp and print.

❖ **Printing process of hard materials**

- 2.1. When printing hard materials, it is usually necessary to use an auxiliary platform, one piece at the front and one piece at the back. If more than 3 meters of materials need to be printed, two auxiliary platforms shall be installed at the front and back respectively.
- 2.2. Insert the bars connecting the front and back auxiliary platforms with the machine to adjust the height and level of the platform.
- 2.3. Press the **positioning button**, lower the positioning rod, place the material behind the positioning rod, and position the original point. Press **back absorption switch** to hold the printing material.
- 2.4. Press the **back lift roll button** to allow the back roller fall and press onto the printing material.

- 2.5. After **automatic height measurement** and setting of the original point
- 2.6. There should be a Y original icon in the software to test, calibrate and modify parameters. Draw a line with the reference of the positioning rod and start the Y origin test. The software will draw the line to coincide with the actual line to calibrate. If coincidence does not occurs, add or subtract the value in the software alignment window until the actual line coincides with the software printing line.
- 2.7. Turn on the UV lamp and print.

❖ **Continuous printing function:**

Introduction to the function:

The automatic continuous printing function is designed to meet the customers’ requirements for fast printing of plate materials. After the customer completes the generation of a batch of printed image files, continuous printing operations are required. However, in the case of an operator, if back-end feeding is frequent, front-end printing will cause complicated operation procedures and waste a lot of time. Therefore, only one operator is required to feed the material at the back end, and the front-end software printing operation can be completed automatically.

Operational process:

- 1. Adjust the equipment to printing state, and place files that need continuous printing on LIYUPRINT software:

You can select all the printing job at the same time.

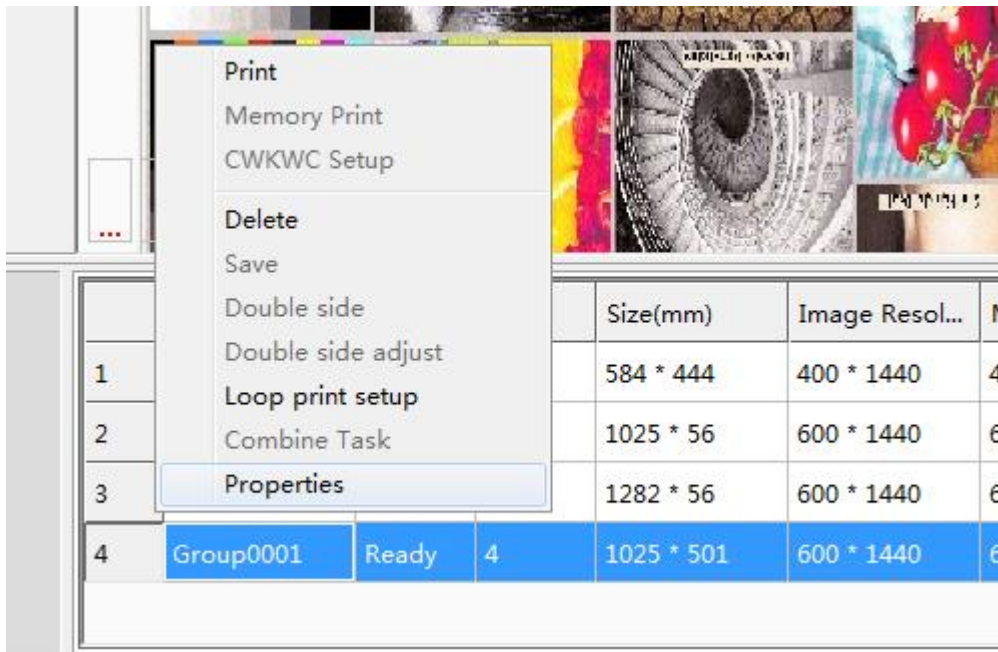


Group the two selected job into a new GROUP0001.

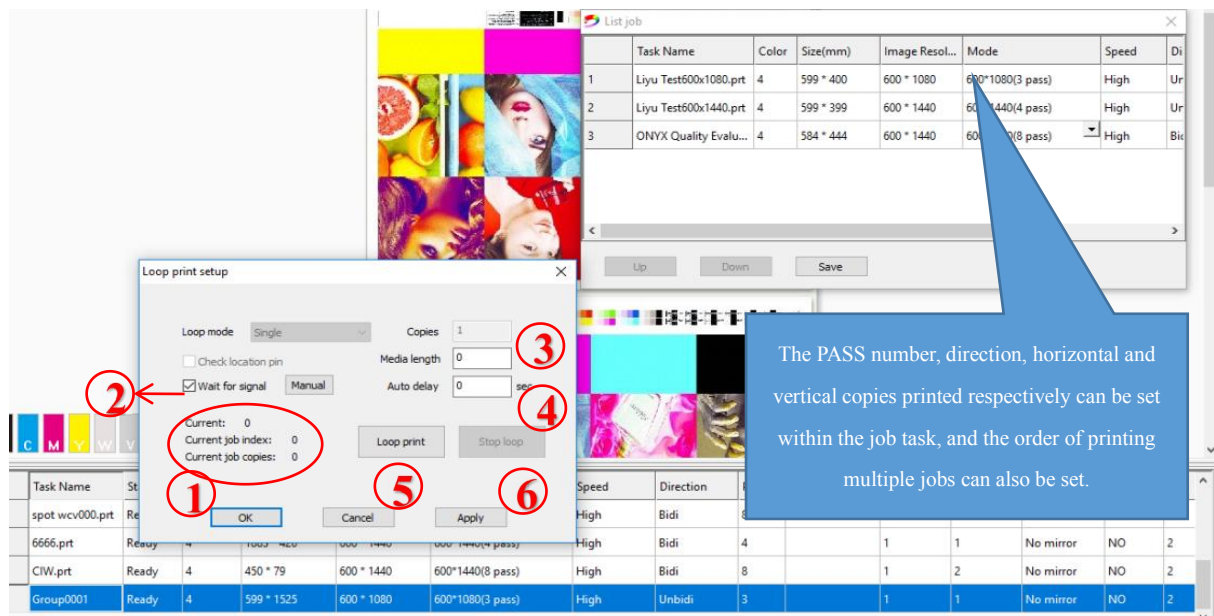
4	Group0001	Ready	4	1025 * 501	600 * 1440	600*1440(4 pass)	High	Bidi	4		
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Rightly click the grouped job and select “Properties” to set the task list of the job; select “Loop

Print Setup” to set printing related settings.



Loop print can be started after setting the original point of job, media thickness, and number of copies, PASS number and other related settings.



In the loop print setup:

- ① The number of copies and serial numbers of the current print job can be displayed.
- ② Waiting for the handle button: when selected, after each job is printed, the next job can be printed only by pressing the print button on the handle or the print button on the back, thus allowing sufficient time for the customer to feed. If it is not selected, the next job will be printed

automatically within the default time (generally, the interval is 20 seconds).

③ Media length: This setting is to set the length of the printing media. If the media is larger than the size of the image, in order to make sure the positioning rod do not press the printed media to set a larger sized image (generally set the size of the currently printed media), the positioning rod will fall beyond the media before falling.

④ Auto delay: When setting up automatic circular printing, in order to allow customers more time to feed, a delay time can be set to lengthen the time of waiting after each job being finished before the next job if performed.

⑤ Start button of loop print.

⑥ The stop button of loop print: if you click the button, all the printing job will be stopped; if you click the cancel button on the software, the current printing job will be canceled, and the next job will be printed automatically.

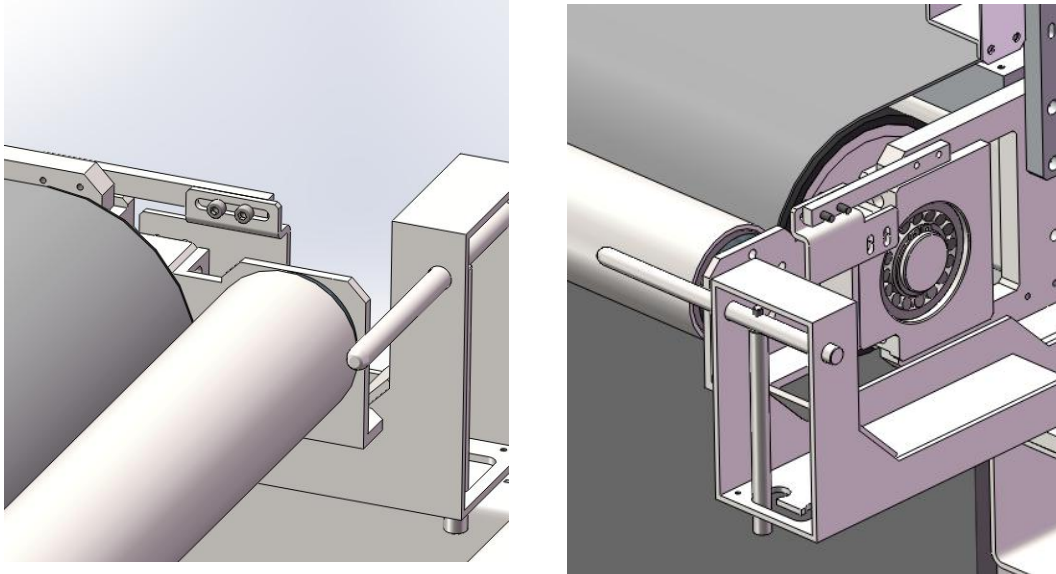
2. Operator goes to the back of the machine. Put down the positioning rod and place the printing material at the original set behind the positioning rod.
3. When the operator clicks the print button, the device will automatically raise the positioning rod, guide the material to the designated original point, and start printing the first job in the continuous printing list.
4. After printing, the equipment automatically completes the advance operation of blank material (if the material is longer), and drops the positioning rod after detecting that the first piece of material completely passes over the positioning rod.
5. The operator starts the feeding process of the second piece of material and clicks the print button to start the printing operation of the second job.

◆ The correction function:

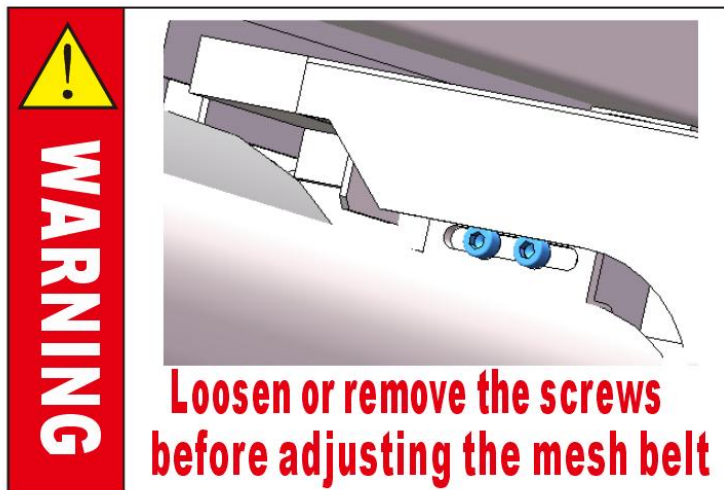
The correction system is consists of correcting roller, shielding photoelectric switch, stepping motor, driving screw and limit switch. Considering the deviation of the conveyor belt due to uneven tension at the two ends, the correction roller is used as an adjustment mechanism. One end of the correction roller is fixed, in which a rotatable circular bearing is installed. The other end can detect the deviation signal of the guiding belt via shielding photoelectric switch, control the rotation of step motor; it moves back and forth to adjust the structure of the conduction band (there's a limit switch for adjustment of the screw rod), so that the tension at both ends of the conduction band can be balanced.

1. Introduction to tensioning device fixation:

1.1 In order to reduce the impact of the looseness of the guiding belt during transportation, fixtures are installed on both sides of the tension roller, as shown in the following figure:



1.2 Please loosen specified screws before adjusting the guiding belt, and it is better to fix the screws again to ensure that the guide belt will not be affected after adjustment.



2. Adjust the guiding belt to the middle position

2.1 After the guiding belt is installed, the left and right screws of the tension roller need to be tightened according to the deviation of the guiding belt, so that the tension roller can tension the guiding belt. Adjustment principle: The end to which the guiding belt is offset needs to be tensioned and adjusted.



Left adjustment of the tension roller



Right adjustment of the tension roller

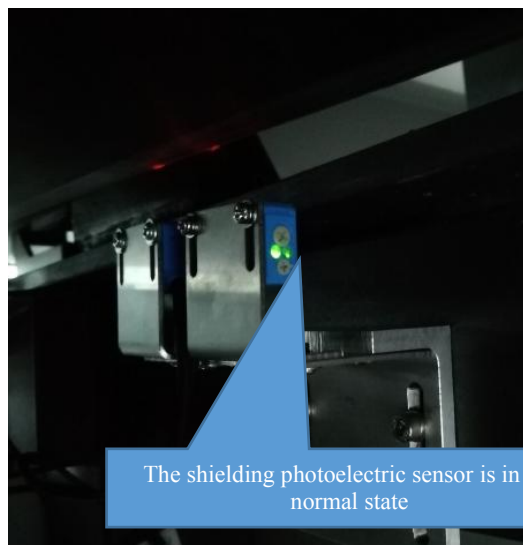
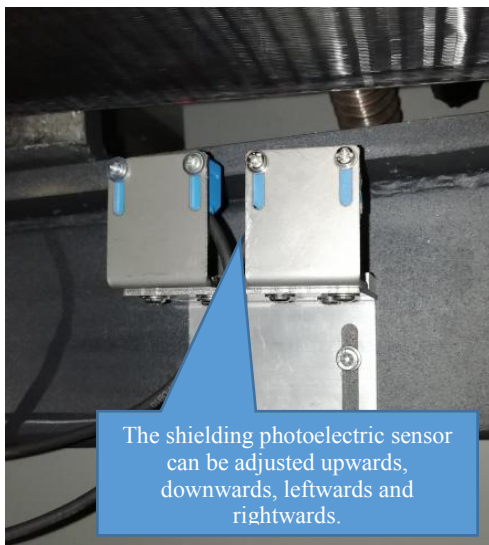
2.2. Adjustment method of the shielding photoelectric sensor position:

In order to correct the guiding belt deviation fast and accurately, two photoelectric sensors are installed with a dislocation less than 2 mm, and the guiding belt is driven between the two photoelectric sensors. It can be divided into three states:

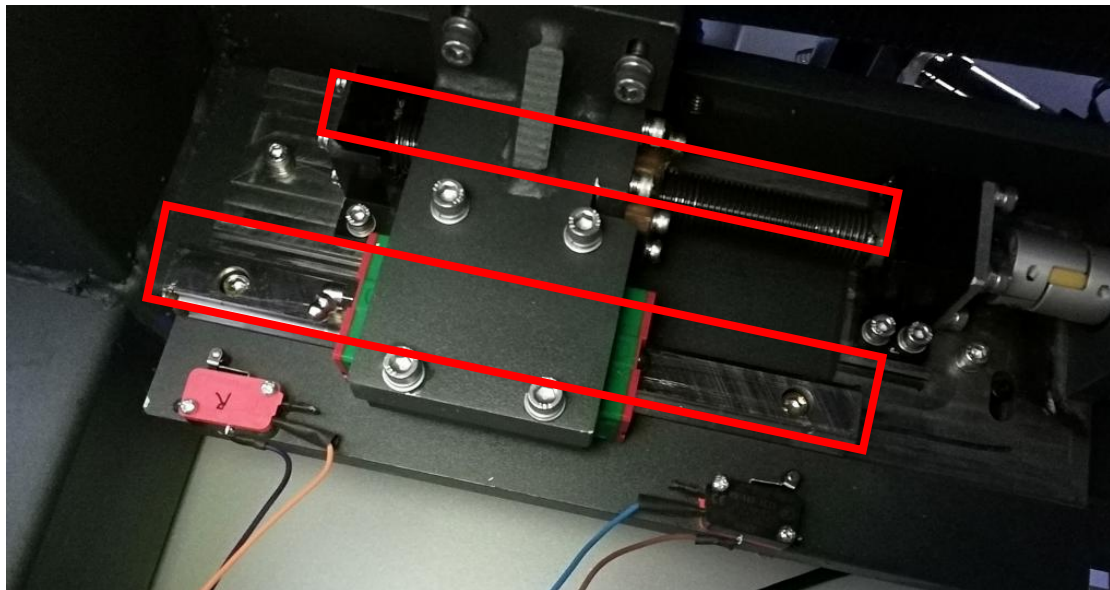
When the guiding belt is between the two photoelectric sensors, the yellow and green lights of the internal sensor are on, and the external photoelectric sensor has only one green light on;

When the guiding belt is offset to the leftmost side, the yellow and green lights of the internal sensor and external sensor are on;

When the guiding belt is offset to the rightmost side, only the green lights of the internal sensor and external sensor are on;



3. Maintenance of the motor screw rod: Be sure to apply advanced grease to the screw rod and guide rail every month.



4. Initialization action of deviation correction:

Move forward to the limit switch first——» Then move backward to the limit switch——»
After the carriage reset——» Return to the middle position

5. Working state of correction rod:

If the guiding belt always moves to the left when it moves forward, the correction rod will move forward to correct it to the middle position.

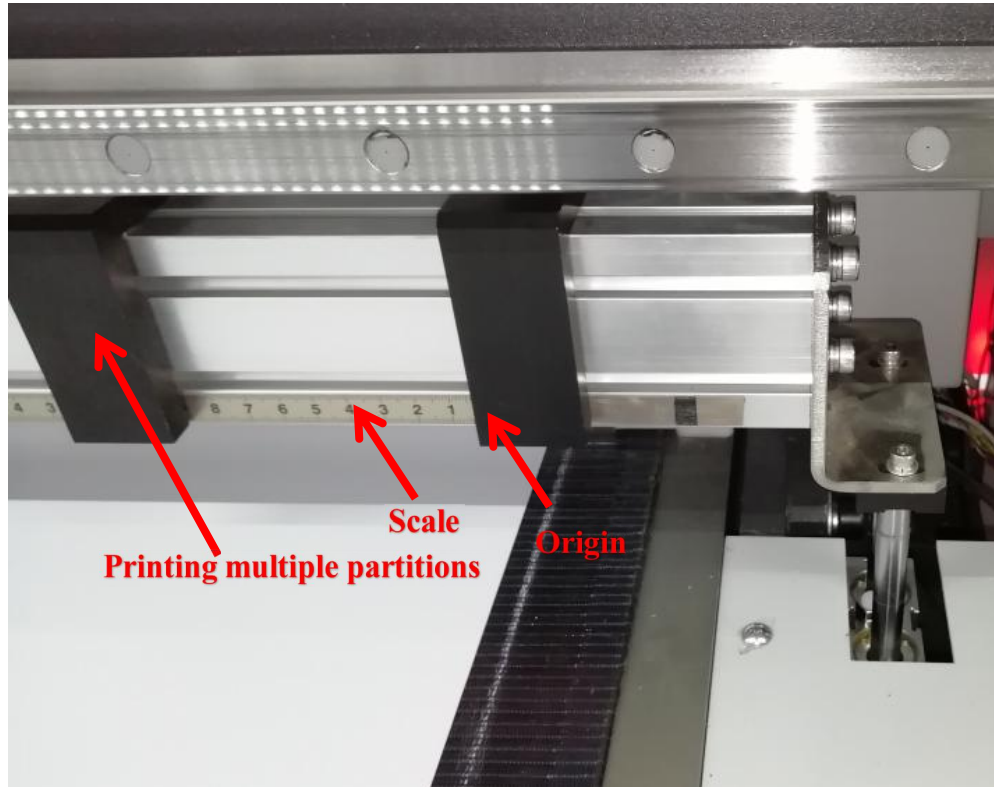
If the guiding belt always moves to the right when it moves forward, the correction rod will move backward to correct it to the middle position.

If the guiding belt always moves to the left when it moves backward, the correction rod will move backward to correct it to the middle position.

If the guiding belt always moves to the right when it moves backward, the correction rod will move forward to correct it to the middle position.

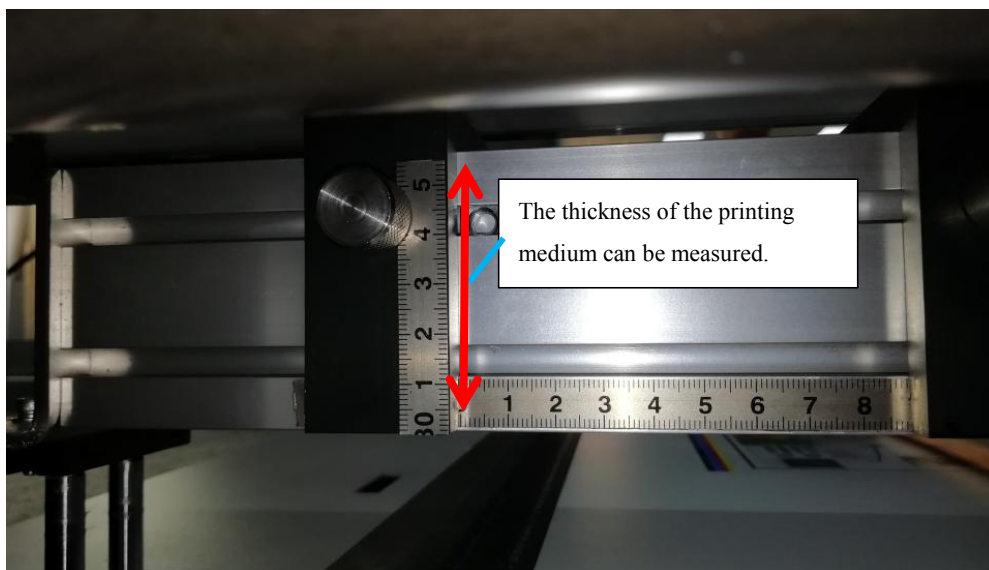
■ Positioning rod function

1. The positioning rod is controlled by the left and right cylinders. The positioning rod is provided with forward and reverse scale in the front and rear, and the scale partition can be moved at will, which can effectively solve the problem of printing multiple gaps.



Feeding in front

2. A scale for measuring medium thickness is added on the origin partition of feeding material behind the positioning rod. Actual value can be input on the software for faster and easier operation after measuring the thickness of the printing medium.



Feeding in rear

■ Setting parameter of the middle support

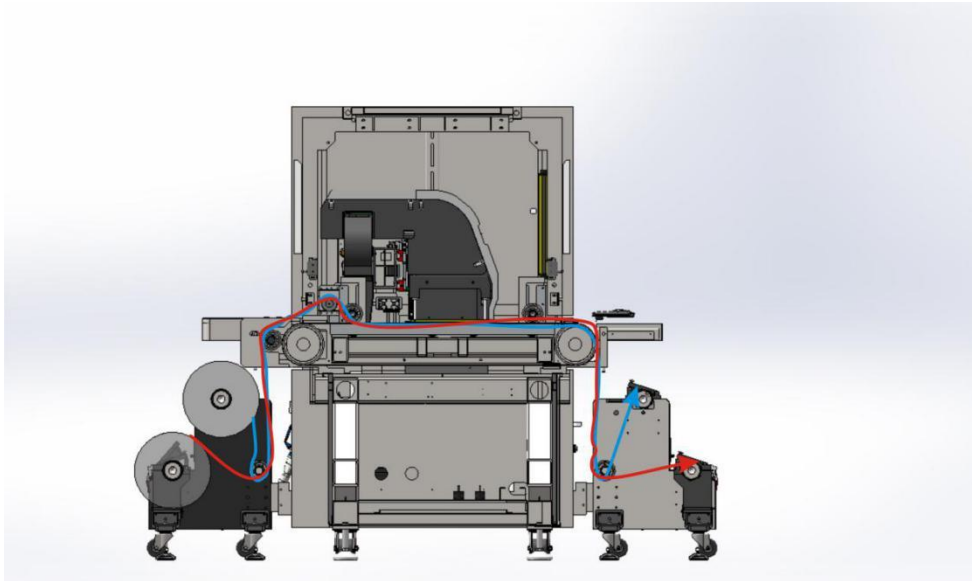
The middle support is jacked up by the cylinder, and controls the air pressure for the air inlet of the cylinder. A group of pressure gauges and check valves are added to the front and back respectively. These can control the air pressure in a specified pressure range and lock the air source in a certain period of time, and keep the cylinder to support rubber rollers.

	Pressure range	Unit	Note
Pressure gage of the front support	0.44 ± 0.02	Kpa	
Pressure gage of the back support	0.30 ± 0.02	Kpa	



■ Feeding method for material take-up and feeding

As an independent system, the take-up and feeding function of DS32 printer enables to print two rolls of materials. When installing the printer, special attention shall be paid to the height and power connector. The following figure is the diagram of feeding. If the printing material is soft, the rear pressure bar of the high ceiling bar will be used. If the printing material is hard, like carriage sticker or banner, it may be absorbed and printed by directly passing the rear pressure bar to the guiding belt, without passing the high ceiling bar.



Notes: red lines are for double-roll feeding, while blue lines for single-roll feeding.

Four outer joints and four gas filling nozzle are set to combine with the double take-up and feeding system. Besides, reduce forward and reverse rotary knobs, and use the control panel to operate.

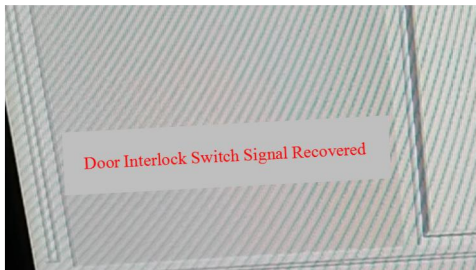


REV: Reverse Control STOP: Stop FWD: Forward Control

■ Door interlock switch function

The DS32 printer shall be set with the security function for the rear three doors—door interlock switch to avoid unnecessary misoperation when printing. During the normal printing, if the printing operator opens any door behind the printer, the carriage will stop at the flash spraying position after printing the current 1PASS and continue to print after the door is closed. At this moment, an error prompt “Door Interlock Switch Signal Valid” will pop out in the prompt bar of the software interface. If the printing operator closes the door, a prompt “Door Interlock

Switch Signal Recovered” will pop out in the prompt bar of the software interface. Then the carriage will rise to the previous printing height to continue printing.

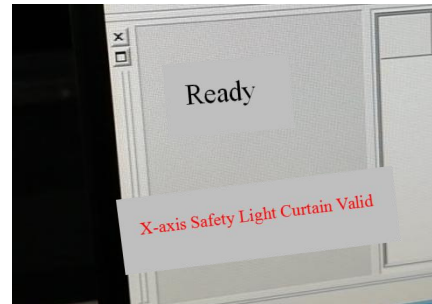
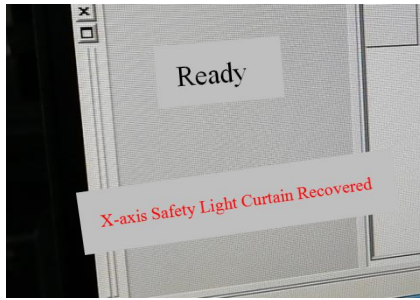


■ Function of light curtain

Light curtains are installed on both sides of the front door of the printer and the installation height is about 30mm higher than the highest position of the front pressure rod. In case the printing operator's hand or head comes into contact with the range of the light curtain, the carriage in the printing process will slow down the speed and stop at one end of the current image after printing the current PASS and continue to print after the object in the light curtain leaves.

If the carriage stops at the image's edge, and the object falls within the light curtain, the carriage will stop until the object in the light curtain leaves and the carriage starts moving again.

If the object blocks the light curtain, the prompt bar of the software interface will pop out “X-axis Safety Light Curtain Valid”; if it leaves the light curtain, the prompt bar will pop out “X-axis Safety Light Curtain Recovered”.

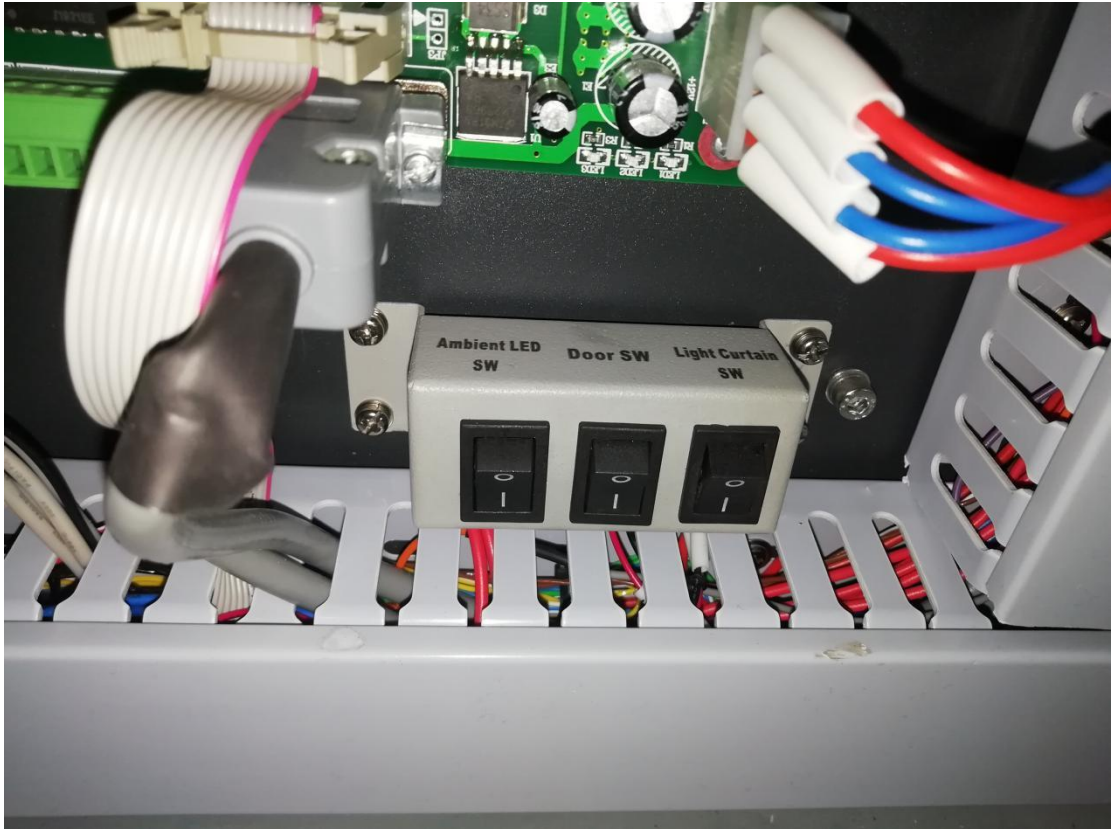


If the light curtain is triggered during printing, the carriage will slow down immediately, the accuracy of the picture will have a certain change, but the accuracy of the following will not change too much.

■ Shield operation of the functions of door interlock switch and light curtain

Functions of door interlock switch and light curtain will certainly protect the printing operator. However, these functions may be needed to be canceled in exceptions, like maintenance, to avoid unnecessary troubles. For this purpose, we set a switch in the front right lower box of the printer.

See the following pictures for positions and details:



**Ambient LED SW: Ambient Led Switch Door SW: Door Switch Light
Curtain SW: Light Curtain Switch**

0: Turn Off

0: Function Works

0: Function Works

1: Turn On

1: Shield On

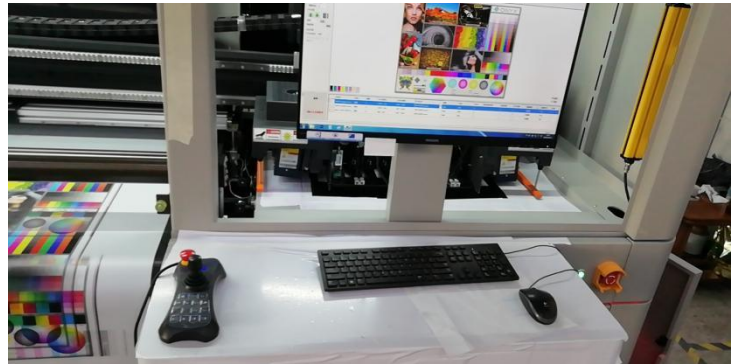
1: Shield On

■ Dual operation platform

It consists two operation platforms, which can operate the front and rear control software and double hand-held box buttons, archiving the same operation in the front and rear of the printer.



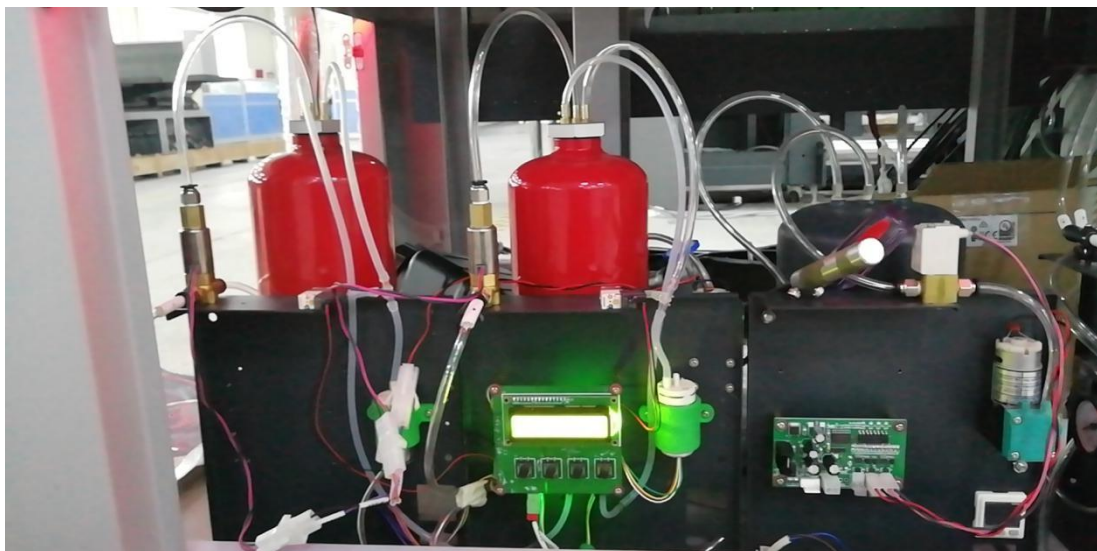
Rear



Front

■ Dual negative pressure system

Provided with the differential negative pressure system, the DS32 printer enables the measurement accuracy reaching 0.01KP, so that the negative pressure system is more stable. In addition, the system is simple to set up and operate. (Please see the Chapter III—Negative pressure adjustment for the detailed setting method)



Chapter 3 Ink addition and the control of positive and negative pressure

- *Add ink and fill the print head with ink*
- *Inject ink into the main ink tank*
- *Inject ink into the auxiliary ink box*
- *Fill the print head with ink*
- *Positive pressure ink*
- *Negative pressure adjustment*

● Add ink and fill the print head with ink

■ Inject ink into the main ink tank

You can find the inking port of the main ink box on the left side of the machine. Please infuse ink in accordance with the colors marked on the main ink boxes. The following is schematic diagram:



■ Inject ink into the auxiliary ink box

Before injecting ink into the auxiliary ink box, make sure that there is enough ink in the main ink box.

- ✧ Ensure that there is enough ink in the main ink bottle and conduct inspection of the machine before starting;
- ✧ When energizing the printer at the first time, auxiliary ink boxes are empty, so ink pumps of different colors will work automatically to pump ink from main ink boxes into auxiliary boxes;
- ✧ When all the ink pumps stop working, it means all the auxiliary ink tanks have been injected with ink;
- ✧ The transient buzzer sound during the process may be resulted from rather long ink pump route and timeout;
- ✧ In the event of ink pump not working or prolonged alarming of buzzer, please switch off the machine in time and examine. In case of failure to settle the problem, please contact the local dealer or after-sales department of our company immediately.

■ Fill the print head with ink

Since it is a very important operation to inject ink into the print head, please operate in strict accordance with requirements. There are two critical operations, namely print head cleaning and

venting.

Print head cleaning:

The new print head must be purged with cleaning fluid before being injected with ink for the first time because protective liquid has been injected into the nozzle of print head, so the ink can only be injected into until the protective liquid being cleaned.

In view of the power of cleaning fluid pump, it is suggested that you clean a single print head every time. First, put the three-way valve of single print head at purging state with other print head valves off, then unscrew corresponding two-way valve and press Cleaning button, the cleaning fluid will flow out from the two-way valve through the ink chamber of the print head. About one or two seconds later, close the two-way valve and make the cleaning fluid cascade out from nozzle for about five seconds. Clean other print heads according to the above method. After five minutes, clean all the print heads again as per the above method.

Venting of print head:

Inject ink into the print head after cleaning print head. Venting operation shall be conducted together with ink injection with the specific operation process as follows:

1. It is also suggested that you conduct venting for every single print head, that is to say, venting operation is conducted for only one print head every time with valve body of other print heads off.

First of all, put the corresponding three-way valve body in a working state.

2. Unscrew the corresponding two-way valve core to ensure a smooth ink outlet. Press positive pressure button and impress ink from the auxiliary ink tank into the print head, then ink will flow out from two-way valve core. Observing the flow state of the ink from the the ink outlet and closing the two-way valve as a blast of the ink falls plumb down without air bubbles, then the ink flows out from the jet orifice. (Tips: it may takes long to impress ink for the first time with such long pipelines, moreover, there is no sufficient ink in the auxiliary ink tank, please hold on for a while after positive pressure so as to enable ink supply system to refill the auxiliary ink tank and then continue positive pressure);
3. Carry out the above operation for every print head in succession. Place all three-way valves of the ink path in working state after completing venting for all print heads. Press Positive Pressure button and impress ink for all colors again, then complete ink injection of print heads.
5. Meanwhile, in case of bubble found in ink tube leading to print head, which affects ink out of the print head, the above method can also be adopted to carry out venting operation.

● *Positive pressure ink*

Positive pressure ink refers to impressing ink of the auxiliary ink tank into the print head by pressing positive pressure button, flush through the nozzle blocked not so seriously and eliminate the air in the print head, as well as solve some common problems of printing disconnection. You can impose positive pressure to either a single print head or several or all print heads with the specific operation steps as follows:

- ✧ Pushing the carriage to the non-operating position, i.e. the leftmost of the machine.
- ✧ Making sure that the ink-path three-way valve corresponding to the print head required to press ink stays in the state of working; the ink-path three-way valves corresponding to other print heads shall be rotated to the closing state if other print heads are on the same color.
- ✧ Rotating the air-channel three-way valve according to each color to the state of the positive pressure.
- ✧ Press positive pressure button and hold for a while, observe the ink out status of print head and release positive pressure button when you feel ink flowing smoothly.
Wait for two seconds and wipe the nozzle surface with clean non-woven fabrics.

● *Negative pressure adjustment*

■ **Introduction to Dual Negative Pressure Control System:**

The dual negative pressure control system consists of three parts: **one main control board**, a set of **air pumps** and two **air buffer tanks**. The air pump consists of two PWM speed control no-return air pumping diaphragm pump and two air evacuation solenoid valves.

The system board card and buffer tanks are shown by the following figures.



(Fig. 1)



(Fig. 2)

■ System Parameters Description:

The effective measurement and control range of this board card is **0~ -7kp**. The accuracy will not be guaranteed for those beyond this range. The pressure sensor will be damaged when the pressure range exceeds **+14 ~ -21kp**.

The measuring accuracy of this product can reach 0.01KP. However, the pressure shown is close to the standard atmosphere, which cannot be referred as an absolute atmospheric value of the reference due to the lack of strict mathematical correction. Meanwhile, negative pressure values with error may be obtained by setting the same negative pressure parameters

for different negative pressure control board due to the error of each sensor.

In order not to frequently rotate peristaltic pump to adjust the pressure, the default adjustment range of this system is set pressure value of ± 0.02 KP. The air pump or peristaltic pump can only be started to adjust the pressure if it is larger or smaller than this range. Therefore, the actual control accuracy of this system is ± 0.02 KP.

■ **Instructions:**

When the system is powered up normally, the first line on the screen (the top line) shows the current negative value collected by the sensor in A-channel and the setting value of A-channel. The second line shows the current negative pressure value collected by sensor in B-channel and the setting value of B-channel.

Setting key: When the Setting key is pressed, the system enters the parameter setting interface. Every time the key is pressed, the setting menu jumps backward and cycles in turn.

In the setting mode, the size setting of the parameters is set by Setting Selection key 1 and Setting Selection key 2.

When the setting is finished, press the OK key to save the parameters into the system, and exit the setting mode.

During the reset of the sensor in A-channel or B-channel, it is necessary to hold down the Setting Selection key 2 and then press the OK key before the sensor can be reset. This setting is to avoid the misoperation to reset the sensor.

By pressing the Parameter Selection key 1 and the OK key at the same time, the negative pressure adjustment of A-channel can be ceased. After pressing these two keys again, the negative pressure adjustment of A-channel can be resumed. The negative pressure of A-channel can be ceased temporarily by this function.

By pressing the Parameter Selection key 2 and the OK key at the same time, the negative pressure adjustment of B-channel can be ceased. After pressing these two keys again, the negative pressure adjustment of B-channel can be resumed. The negative pressure of B-channel can be ceased temporarily by this function.

■ **Introduction to Parameter Setting:**

Parameter 1: Set vacuum A

The parameter is negative pressure parameter that should be maintained when setting the A-channel negative pressure. After setting, the system will automatically control the peristaltic pump and adjust it to the set pressure value.

Parameter 2: Correct zero A

Press the OK key in the setting screen. A-channel negative pressure will automatically correct the 0 pressure difference. ***Note** Zero correction must be carried out without any pressure difference or with direct connection to the atmosphere. As there are errors in the electronic devices and the incoming voltage, 0 pressure needs to be corrected before it can be used.

Parameter 3: MotorA base V

The parameter is to set A-channel negative pressure to adjust the rotating speed of pneumatic peristaltic pump at low speed, including 16 levels of speed available for adjustment and setting. The minimum peristaltic pump speed means the method of slowly rotating the peristaltic pump to regulate the air pressure in this system when the air pressure

parameter is close to the set value. The motor of the peristaltic pump will work at full speed when there is a big gap between the pressure measured by the pressure sensor and the set value; the speed of the peristaltic pump will decrease to achieve the purpose of approaching the set value at soft /variable speed, instead of just switching control, when the pressure approaches the set valve, so that the fluctuation of the pressure in the system can be minimized.

Parameter 4: Set vacuum B

The parameter is negative pressure parameter that should be maintained when setting the B-channel negative pressure. After setting, the system will automatically control the peristaltic pump and adjust it to the set pressure value.

Parameter 5: Correct zero B

Press the OK button in the setting screen. B-channel negative pressure will automatically correct the 0 pressure difference. ***Note** Zero position must be corrected without any pressure difference or directly connected to the atmosphere. As there are errors in the electronic devices and the incoming voltage, 0 pressure needs to be corrected before it can be used.

Parameter 6: MotorB base V

The parameter is to set B-channel negative pressure to adjust the rotating speed of pneumatic peristaltic pump at low speed, including 16 levels of speed available for adjustment and setting.

Parameter 7: Software version

The parameter only displays the software version of the system so that the after-sales service personnel can determine the functions of the system.

■ **Cautions:**

- 1) The airtightness of the whole air route system should be guaranteed. If air leakage occurs, the air pump will work frequently, resulting in a decrease in the service life of the pump. Please check the airtightness if the air pump is found to be adjusted once 3~5 seconds.
- 2) Strictly prevent liquid and ink from entering the whole air system. The negative pressure sensor and rapid extraction diaphragm pump will be damaged once the ink and liquid entering.
- 3) **Air tube connected on the negative pressure sensor** must be a separate one way air tube on the negative pressure buffer tank. Do not share an air tube with the air pump. Sharing may cause the system to produce great fluctuations, and the peristaltic pump will be frequently adjusted by positive and negative rotation.
- 4) 24V DC power supply is applicable for the system. 12V supply power may be adopted according the situation, while 40V supply power may burn down the electronic components of the system. The connection of AC high voltage will break down all the components.

Chapter 4 Maintenance and Service

Contents of this chapter:

- Daily maintenance instructions
- Print head maintenance instructions
- Maintenance of drive system
- Maintenance of ink route system
- Maintenance of LED solidification system
- Maintenance of electrostatic eliminator
- Ink use guidelines

● *Daily maintenance instructions*

1. Keep the working environment of the printer clean and ventilated, and clean dust and ink on the printer periodically;
2. Keep the work surface clean. Every time before starting it up, check whether the working board is cleaned, to avoid scratching the print head;
3. Inject lithium base greases into the slider by grease gun every one month operation, to reduce its frictional resistance against the guide rail and extend its service life;
4. Maintain an appropriate belt tightening of the ink carriage timing belt. The belt tightening of the ink carriage timing belt can be adjusted after removing the upper left end cap. After the adjustment, connecting screws must be fixed tightly;
5. Every time after finishing refilling ink, make sure the cover of the main ink tank is screwed tightly. Wipe off residual ink on the outer wall of the tank;
6. For positive pressure printing, after wiping the print head, flash spray for around 10 seconds first before printing pictures, to achieve sound meniscus formed by ink droplets in the nozzle;
7. The area around the orifice must be maintained clean. No residual ink, dust or fiber is allowed. Orifice shall not be scratched;
8. Since the ink and the cleaning fluid contain strong solvent, they mustn't contact electrical components and wires. Were ink or cleaning fluid spilled on them accidentally, they would be wiped off cleanly as soon as possible;
9. Clear liquid waste in the liquid waste box in time;
10. Every day before the startup and shutdown, it is recommended to print nozzle test chart to check whether the nozzle is in normal condition. Provided that ink outflows brokenly, press the ink or clean the nozzle to make it work properly.

● *Print head maintenance instructions*

As the core component, the print head is much expensive and sensitive, which requires good maintenance. Otherwise, print quality and its service life would be seriously affected. Print head maintenance instructions are as follows:

1. In using the printer, please use the ink appointed by the manufacturer. Do not change the ink at will, or it might lead to malfunction of print head;

2. When the device stops running, maintenance methods of different sorts should be adopted in accordance with the length of downtime:

- ✧ If printer downtime is within a working day and you are not willing to turn it off, it should be set under the state of flash spray. Before the flash work, please confirm the status of print head. If it is not in a good condition, do the ink press operation first;
- ✧ If the downtime is over 12 hours to 1 day, it is recommended that the valve knob can be screwed to the closed state, the ink carriage can be stopped on the left, and the moisturizing tray shall be lifted up.
- ✧ If the downtime is over 3 days, clean up the ink within the print head following its cleaning method, inject a little cleaning liquid into it (leave some cleaning liquid in the print head when cleaning). The power off the machine, leaving it in the moisturizing state.

3. Scrubbing the nozzle panel

- ✧ Every time when pressing ink with positive press or after cleaning the print head, scrub the nozzle panel. Wipe away residual ink and cleaning liquid on the nozzle panel, to prevent it dropping onto the printer or print media;
- ✧ When scrubbing the nozzle panel, dedicated non-woven fabrics should be used, and make sure of its cleanness. Non-woven fabrics contaminated by dust, stain, oil or water, especially the one which has been used to scrub ink, should not be used to wipe the nozzle panel, as ink on it can lead to a seriously blocked nozzle;
- ✧ Scrub the nozzle panel along a single direction rather than back and forth. Do not scrub it with great strength, but touch it lightly, to avoid damage of nozzle surface;
- ✧ Dispose the used non-woven fabrics properly. Do not reuse it.

4. Adjusting the print head condition in printing

- ✧ To guarantee print quality, please make sure every nozzle on the print head is in good condition, whose condition can be improved by pressing ink with positive Negative pressure or doing the cleaning. The following items are very important to guarantee the nozzle

condition;

- ◇ The requirement of printer's working environment shall be maintained well, especially the temperature. The print head temperature shall be between 15°C and 26°C. Print quality may be affected if the temperature is below 15°C or above 28°C;
- ◇ Make sure the print head exhaust completely, and no bubble remains in it;
- ◇ Adjust voltage and negative pressure of print head. A higher print head voltage can improve the accuracy and color saturation of ink droplets, but it can cause the ink outflow to be frequently broken as well, so the best balance shall be adjusted.

● *Maintenance of drive system*

The drive system includes high-speed guide rail, lead screw, slider, driving gear and corresponding motor, driver, and sensor. Please clean up the oil and dust on the surface of guide rail, lead screw, and sensor regularly, and add appropriate amount of anti-rust oil and grease to the moving parts every month;

● *Maintenance of ink route system*

Given that the ink route system is one of the core components of the printer, the stability of ink supply of the ink route system directly affects the ink flow of the print head. Therefore, it is recommended to replace the filter of the system every half year; once the main ink tank is short of ink, add it in time; Clean the waste liquid timely if there is a small amount of ink in the air tank on the head of the carriage.

● *Maintenance of LED solidification system*

Please clean the dust on the cooling fan and filter screen of the control cabinet of UV lamp regularly to keep the heat dissipation of the box in good condition. The solidified ink and dust on the surface of the UV lamp cap glass can be cleaned regularly with alcohol and other solvents; In addition, add antifreeze and purified water in the ratio of 1:1 during freezing in cold areas. During freezing period, it shall be replaced with purified water every three months and it is recommended to use purified water in the south.

The meaning of fault code for water cooling power box of UV lamp is as follows:

- E0: Abnormal communication of 2 circuit boards. It is due to the damage or loose of the connecting wires between two boards under ordinary circumstances.
- E1: Over temperature protection. When the water temperature is higher than +C0 (target value), over temperature protection fault will output a signal of interruption.
- E2: Low temperature protection. When the temperature is lower than -C0 (target value), low temperature protection fault will output a signal of interruption.
- E3: Water lack protection. If the water pump can't pump water, the water pipe or the water flow is blocked, the water lack protection will be activated to output the signal of interruption.
- E4: Fault of refrigeration system. The fault causes include the damage of the ventilating fan, the blockage of the condenser by dust, and the poor air inlet, and it will output the signal of interruption.
- E5: High voltage protection. Start protection when the high voltage switch is off. Output the signal of interruption.
- E6: Low voltage protection. Start protection when the low voltage switch is off. Output the signal of interruption.
- E7: Over room temperature protection. Output the signal of interruption.

● *Maintenance of Electrostatic Eliminator*

Customers can clean the pinpoint of ion stick according to the environment of the workshop in time. Pen brush and dust-free cloth can be used to dip anhydrous alcohol and gently wipe the dust and carbon deposits around the pinpoint of the ion stick. Attention during cleaning: ①The power must be turned off for 5 minutes before cleaning; ②After cleaning, it is necessary to wait for the alcohol to volatilize completely before power on. It is not allowed to use any other organic solvent to clean the pinpoint of the ion stick; ③When there is no static electricity in the printed material, the electrostatic eliminator must be turned off. When printing metal materials, the electrostatic eliminator must be turned off.

● *Ink use guidelines*

1. **Special note:**

Any part of the ink or ink path shall not touch water or any solution containing water molecule, otherwise gel would come into being which will block the ink path and even the print head.

2. **Safety instructions:**

Some chemical substances contained in ink are of very low toxicity and irritation, which will irritate eyes and respiratory system and cause allergic reaction. Contact with ink can be effectively reduced with sound ventilating device and personal protective devices. When dealing with ink, acrylic gloves and work clothes should be worn. If ink spills onto the skin,

it should be washed immediately with soap-suds. Eating, drinking and smoking are forbidden in the workspace.

3. Storage of ink:

Ink should be stored in sealed containers and placed in a cool, dry place with good ventilation no long-period exposure to light (including indoor sunlight, illumination light, etc.) and with temperature of 10°C~40°C. Although ink has a storage duration of 12 months, it recommended to use it up within 3 months. Pay attention to the production date. Out-of-date ink cannot be used. Ink viscosity is greatly affected by temperature and varies according to different seasons, especially in summer and winter, which would have influence on printing quality. In addition, ink producers would make adjustment in ink viscosity in keeping with seasons. Thus, you must see to it that you choose ink on the basis of actual environmental temperature.