DQS20 Series

Installation Manual

Note:
Indicating that it is useful for the efficient operation or installation of the machine.

Cross-reference:
Indicating a further reference for information or procedures.

Important Information:
Indicating that the information provided is important and should be carefully noted.

Warning:
Indicating a warning of a hazard.

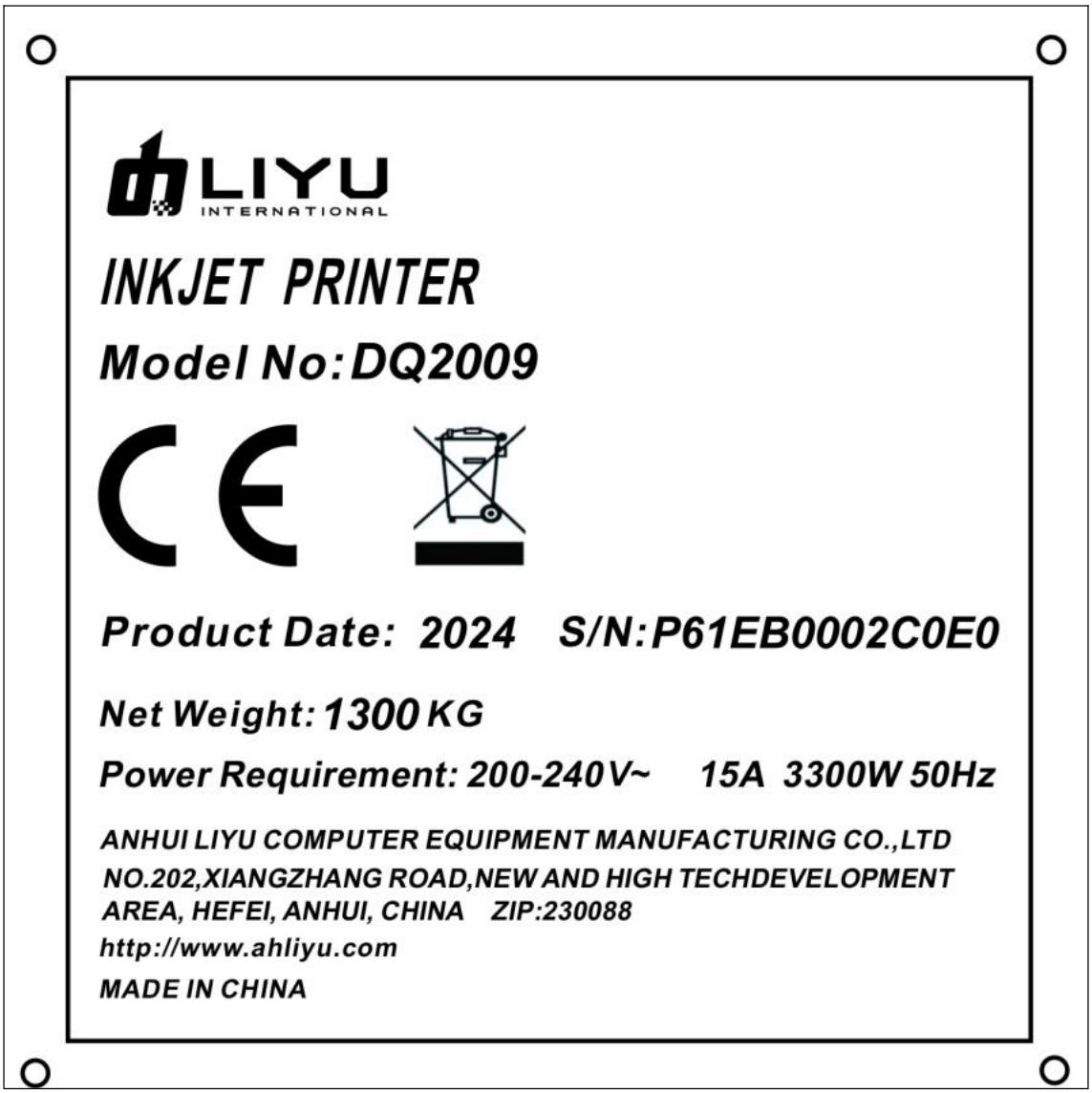
Caution:
Indicating the only safe method of installation or operation that must be followed.

DQS20 UV Hybrid Printer Installation Manual
First Edition, November 01, 2024

Revision History

Version	Prepared by	Date	Remarks
1.00	Liyu	November 01, 2024	Release version

EC Declaration of Conformity



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Note:
The installation consists of 12 major steps. The installation process is continuous, beginning with pre-installation preparations and ending with operator training. It is summarized below:

List of Installation Steps

Safety

This chapter details the risks and hazards that can be encountered when operating the DQS Series UV Hybrid Printer. Please read and comprehend carefully this chapter before operating it.

Cross-reference:
Indicating a further reference for information or procedures.

General safety instructions

Caution: Purpose
The UV hybrid printer can only be used for its specific purpose as designed, and any use other than that intended by the manufacturer may result in serious injury.

Caution: Protection
The UV hybrid printer is designed to include specific protective measures that may pose a hazard if they are not in place. Do not operate the UV hybrid printer if the protective device is missing or damaged.

Caution: Moving Parts
Pay attention to moving parts.

Caution: Entanglement Hazard
Due to the entanglement hazards associated with the UV hybrid printer, please do not dress loosely, and long hair should be tied up.

Caution: Modification
Do not make any modifications to the UV hybrid printer. Any modifications may have safety implications for operators.

Caution: Control System
Do not modify the control system. If the control system is damaged or inoperative, stop using the UV hybrid printer immediately. Do not operate the UV hybrid printer until the control system has been repaired by a qualified LIYU engineer.

Caution: Training
The printer should only be installed by professionally trained technicians.

Caution: High Voltage

Since the UV hybrid printer is fitted with a power supply that operates at high voltage, special care must be taken when operating in these areas or when installing it.

Caution: Restricted

Since electrical cabinets are installed with equipment that operates at hazardous voltages, the area should only be maintained or installed by authorized personnel. Operators are prohibited from entering such cabinets.

Caution: UV

Since the UV hybrid printer contains an LED ultraviolet (UV) light source, prolonged exposure to it may cause eye pain or skin burns. Please wear appropriate personal protective equipment when operating. Do not stare directly at the light source.

Caution: Installation Hazard

When installing the UV hybrid printer, be sure to wear appropriate personal protective equipment, including protective gloves, safety shoes, and safety glasses.

Caution: Manual Handling

During installation, the UV hybrid printer is subject to manual handling hazards that may not arise in the process of normal operation, including lifting and moving parts and moving the UV hybrid printer. Always evaluate the lifting or operation beforehand and use appropriate lifting aids whenever possible. If lifting aids are not feasible, use appropriate manual handling techniques.

Safety of UV inks and cleaning fluids

UV inks and associated cleaning fluids are mainly used in the DQS20 Series UV Hybrid Printer. Information on safety issues related to the handling, storage, and use of UV inks and associated cleaning fluids is detailed in their respective documents. Please read these documents before handling UV inks and associated cleaning fluids.
All UV inks and associated cleaning fluids are available from local LIYU distributors.

Personal safety

Operators must wear nitrile gloves, protective clothing (e.g., lab coat, coveralls, or protective apron), and safety glasses with side shields when handling ink or maintaining print heads. Safety information for handling inks and cleaning fluids is detailed in the Guide.

Warning:
Given that UV inks and cleaning fluids begin to penetrate disposable nitrile gloves in less than 10 minutes, gloves should be changed frequently, especially if they are contaminated. If heavy contamination is expected, heavy duty nitrile gloves should be used. Do not reuse disposable gloves. In the unlikely event that gloves are contaminated, they should be handled appropriately.

Due to the colorless nature of the chemicals in the gloves that UV ink penetrates, the ink is not easily visible. However, this does not mean that exposure does not occur even if there is no visible contamination on the skin.

Latex gloves provide little or no protection, which only temporarily prevent the penetration of certain components of UV ink, while allowing invisible harmful chemicals to penetrate freely, contaminating the skin with these chemicals and thus increasing the risk of exposure.

Important Information:
Always wear nitrile gloves when using UV inks.
Considering that UV inks contain irritating and sensitive ingredients, cumulative exposure may cause allergic reactions. Avoid contact of the ink with skin.
If ink sticks to your skin, wash it off immediately with soap and water. Do not use alcohol to remove the ink as this will transport the chemicals from the ink further into the skin, increasing irritation.
Check your hands regularly for any signs of irritation or inflammation.
If skin irritation or inflammation is caused by contact with UV inks, consult a physician.

Important Information:

Always wear protective clothing when handling UV inks.

If clothing is contaminated with ink, remove the clothing as soon as possible and rinse off any ink that comes in contact with your skin with soap and water.

Contaminated clothes can be washed with standard detergents. Avoid washing contaminated clothes at home as this may contaminate other items being washed. A professional laundry service is recommended.

Disposal of UV ink and waste ink

All waste contaminated with solidified or partially solidified UV ink is hazardous and must be disposed of separately. Do not mix contaminated waste with non-hazardous waste (domestic waste, office waste, etc.). Ink waste includes gloves, cleaning cloths, filters, empty containers and any other material containing solidified or partially solidified ink. Waste UV inks and cleaning fluids are prohibited from being fed into the sewage system or water supply system. All waste must be disposed of in accordance with local regulations and advice on local waste disposal regulations should be sought from local authority.

Designated individual containers should be provided to dispose of contaminated waste.

Routine use

UV inks can only be dried under UV light and will remain liquid unless exposed to UV light. Ink can easily be accidentally spilled, which increases the risk of skin contact.

Good cleaning is necessary to avoid accidental contact with UV ink. Always make sure that any leaks, no matter how a small amount of, can be cleaned up as quickly as possible. Make sure the lids of any containers storing inks and cleaning fluids are tightly closed and that the containers are properly placed to prevent them from being easily knocked over.

Any spilled ink and contaminated material should be disposed of as special waste in accordance with local regulations.

Plane views of the UV hybrid printer

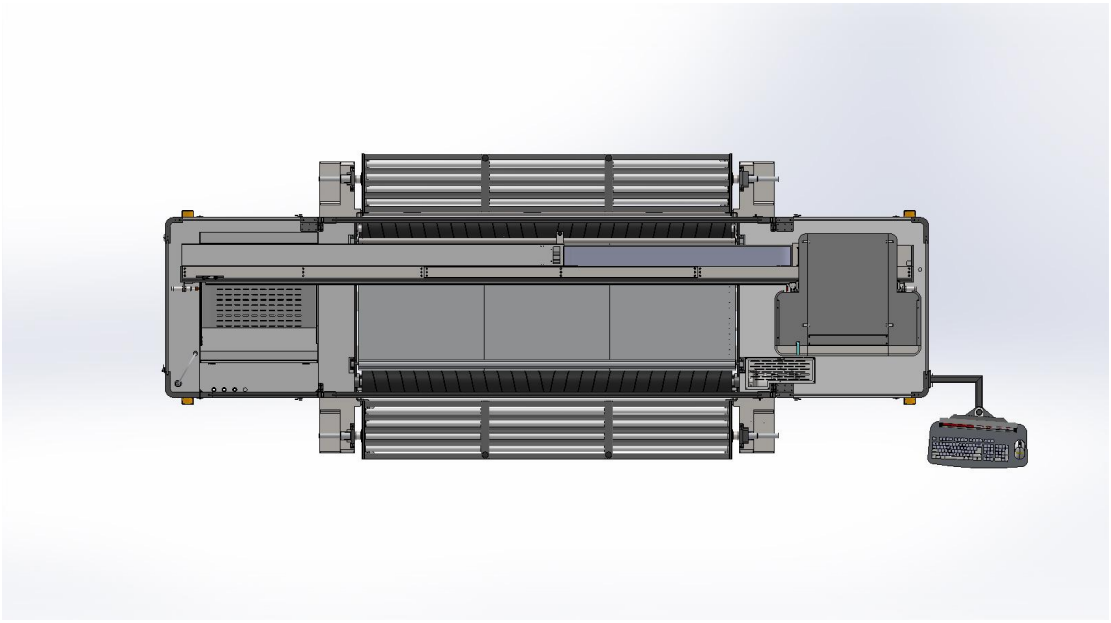


Fig. 1: Top view

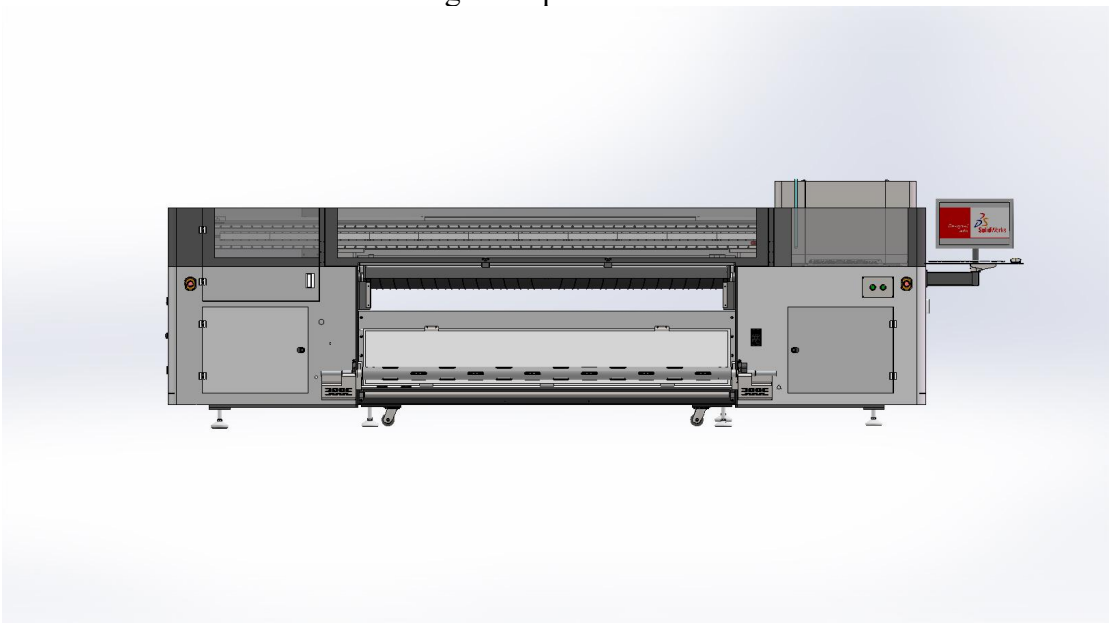


Fig. 2: Front view

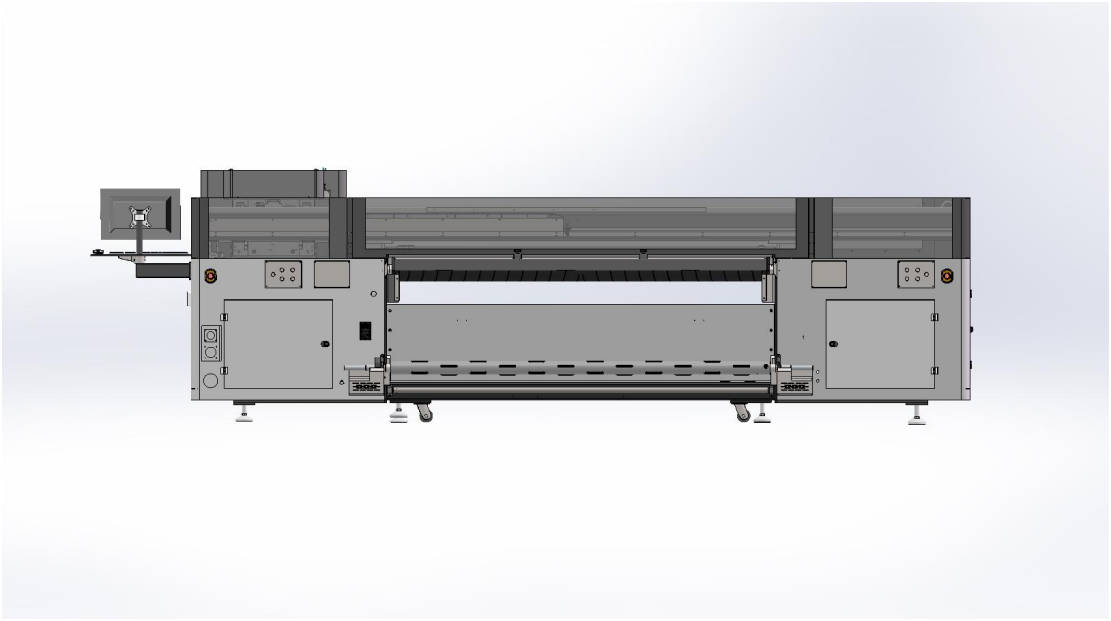


Fig. 3: Rear view

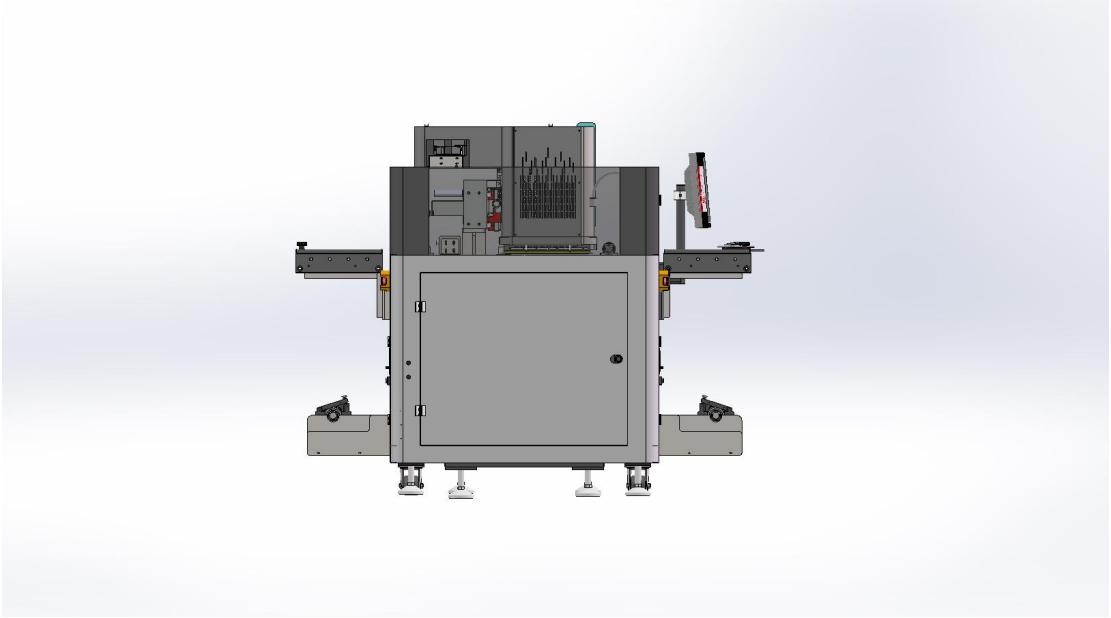


Fig. 4: Left view

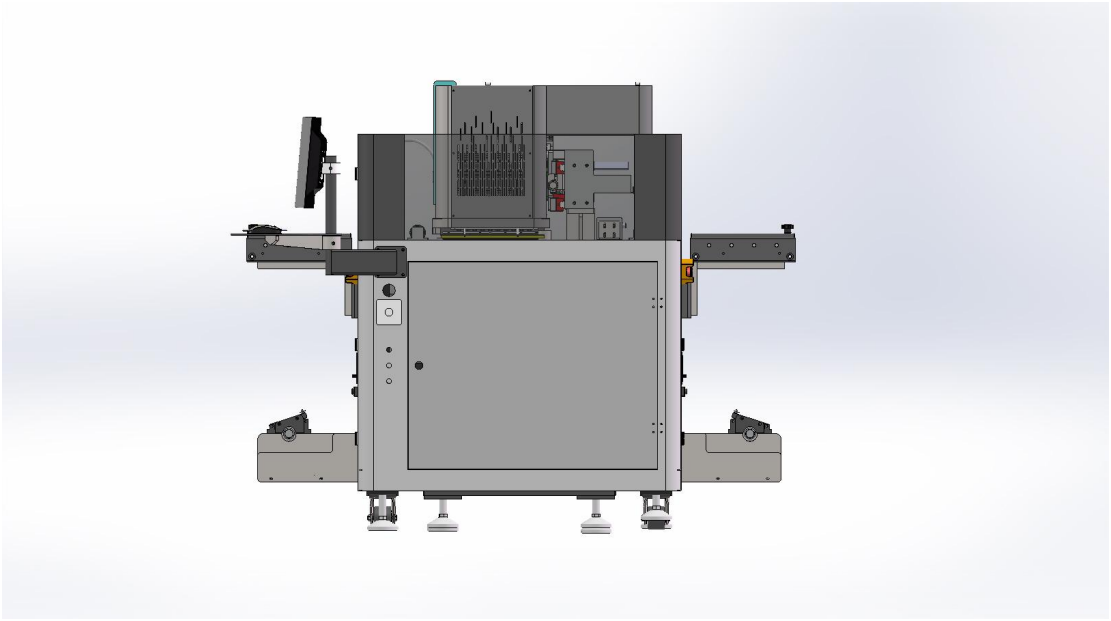


Fig. 5: Right view

Tools required

Note:
The list of tools below specifies the minimum requirements for installing the DQS20 Series UV Hybrid Printer.

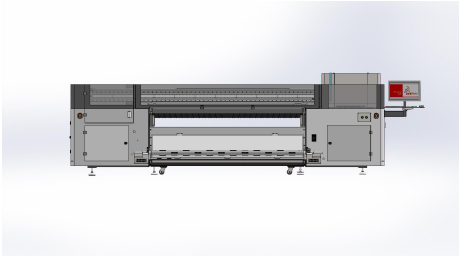
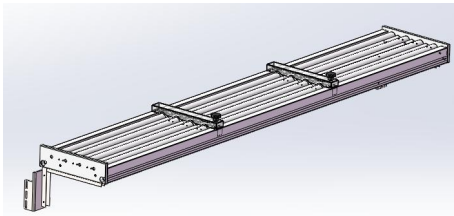
Unpacking and installing		
Quantity	Tool	Remarks
1	Hand electric drill (18 v)	Sleeve (8 mm, 16 mm)
1	Cross screwdriver	6*300
1	Straight screwdriver	3*200
1	Internal hexagonal wrench	2/2.5/3/4/5/6/8
1	Internal hexagonal wrench	6*300, lengthened T type
1	Paper cutter	
1	Open end wrench	14
1	Adjustable wrench	375MM
1	Adjustable wrench	375MM
1	Multimeter	Standard type
1	Tape	
1	Dial indicator	Magnetic base
1	Laser level meter	

Installation consumables

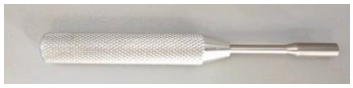
Note:
The list of consumables below specifies the minimum requirements for installing the DQS20 Series UV Hybrid Printer. End users should use the items highlighted in red in the daily operation of the UV hybrid printer.

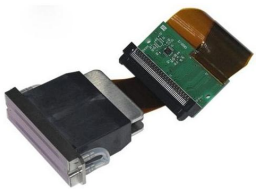
List of consumables		
Description	Purpose	Minimum quantity used
Carriage sticker (1.2 m)	Printing test	1 roll
PVC, KT sheets, etc.	Printing test	10 sheets
Non-woven fabrics	Manual wiping of print heads	1 pack
Full set of ink	Ink injecting and debugging	2 set
Cleaning fluid	Rinsing the print head	2 bottles
Nitrile gloves	Protection	1 box
Filter	Attached with the UV hybrid printer	1 of each color
Lithium base grease	Suitable for lubrication of rails, lead screws and bearing blocks, to be maintained by the customer at a later stage	1 tube

Packing list

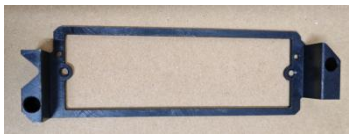
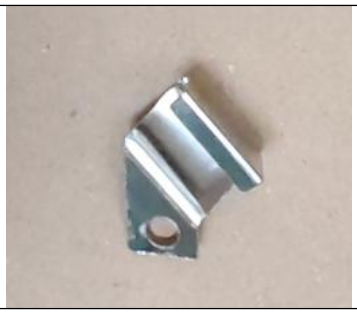
Diagram	Name	Quantity
	DQS20 UV Hybrid Printer	1
	Expansion platform	As per the order
	Host	As per the order
	Computer monitor	As per the order
	HDMI adapter	As per the order

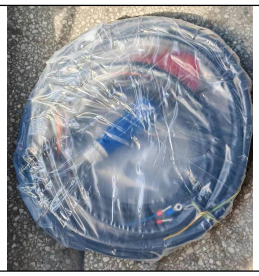
	Attached USB flash disk	1
	Cross screwdriver	1
	Straight screwdriver	1
	Internal hexagonal wrench set	1 set
	Extended internal hexagonal wrench	1
	Extended internal hexagonal wrench	1

	Wiping paper	1 pack
	Adjustable wrench	1
	Hand lift wrench	1
	Exhaust valve screwdriver	1
	Moisturizing tray	As per the order/1
	Set screws of the moisturizing tray	As per the order

	Ink scraping blade	1 piece
	Power box of LED water-cooled lamp	1
	Water tank of LED water-cooled lamp	1
	RIP software	As per order/1 set
	Print head	As per the order/pc
	UV ink	As per the order/liter

	UV cleaning fluid	As per the order/liter
	4*6 Ink Tube	10m
	4*6 Polyurethane tube	3m
	5*8 Polyurethane tube	5m
	3*6 Flexible ink tube	3m
	Joint	Print head quantity*4+4

	Filter	As per the order, print head quantity x1 or 2
	Plastic hose clamp	Print head quantity*4+4
	Holder of print head	As per the order, installed on the machine, print head quantity x1
	Fastening screw of print head	As per the order, installed on the machine, print head quantity x2
	Adjusting Screw for Print Head	As per the order, installed on the machine, print head quantity x2
	Leaf spring	As per the order, installed on the machine, print head quantity x1

	M3*10 screws	As per the order, print head quantity x2+4
	Hollow tube	As per the order, installed on the machine, print head quantity x2
	Ricoh print nozzle plug	As per the order, installed on the machine
	3X2.5X8m power line	1 pc
	3X6X8m power line	1 pc
	Hand-held box	As per the order

	USB cable	1 pc
	USB cable	1 pc
	Threading wire of guiding belt	1 pc
	High performance structural AB glue	1 set
	Grating feeler gauge	1 piece

Note:
The above list is a generalized list, and the actual materials in the accessory case are subject to the order.

Factory requirements

Important Information:

Please note the tonnage of the forklift prior to installation as a forklift with the appropriate tonnage and fork arm size may be required on site, especially when unloading.

Important Information:

Give that the gross weight of the machine in the transport container is about 1820 kg, a forklift with a tonnage of at least 3T, a fork length of at least 1600 mm (with the fork protruding from the edge of the packaging case by at least 100 mm), and a spacing between the fork arms of more than 850 mm is required.

The Manual is not applicable for unloading the parked UV hybrid printer from the original shipping container.

On-site requirements

Note:

The following on-site services are critical to the smooth and timely installation of the machine and the subsequent safe and efficient operation of the UV hybrid printer.

AC power supply	Voltage	Frequency	Wiring	Current
	220 240 VAC	50 / 60 Hz	Single phase	15A

Compressed air	Pressure (min.)
Clean, dry and oil-free. Filter before the machine	90 psi
	0.4 MPa

Ventilation
It is recommended that the DQS20 Series UV Hybrid Printer be placed in a clean, dust-free, well-ventilated area. If in an enclosed location, a ventilation system is required with a recommended ventilation rate of 50 m^3/min.

DQS20 Series UV Hybrid Printer

Pre-installation Preparations

Space requirements

Note:
The areas specified in the chart below are the minimum recommended values for safe and efficient operation of the DQS20 Series UV Hybrid Printer. Larger values should be allowed, if possible.

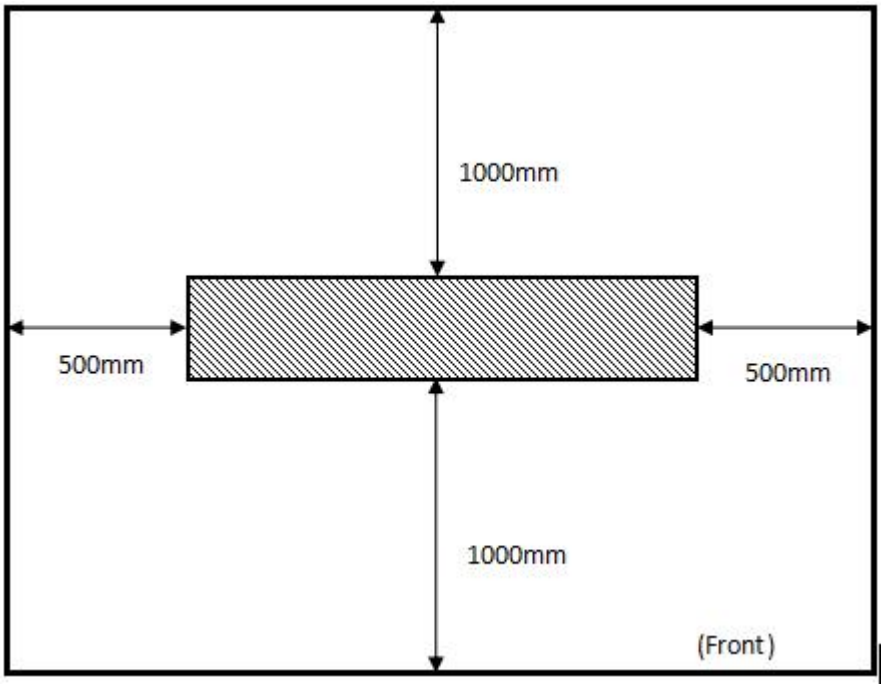


Fig. 6: Space requirements for the UV hybrid printer

DQS20 main unit (including media feeding and take-up system, expansion platform, and rotary table components); a floor space of 5970*3680*1400 is required for safe operation.

Restricted area

Warning:
It is recommended that the minimum operating area be marked on the floor around the UV hybrid printer. Only trained operators are allowed to operate within the smallest operating area.

Moving the UV hybrid printer

Important Information:

Once the entire machine has been removed from the packaging case, it is recommended that the packing and filling materials not be removed while moving it to its final location.

Ideally, the route of the whole machine moving to the final position should be as smooth as possible to avoid shock when moving.

The machine can be moved using a forklift or manually pushed into position using the machine's casters. If manually positioned, it requires at least 4 people distributed at each corner of the machine to push and guide it into position.

Trolleys are not permitted as they may cause deformation of the rack and thus damage the machine. The minimum requirements for the placement of the machine should take into account its size and the way in which it will be moved.

Ground requirements

DQS20 Series UV Hybrid Printer must be placed on a level, stable surface capable of supporting the weight of itself and all nearby materials and equipment during normal operation.

Do not place the UV hybrid printer on carpet or any ground that may settle over time, as its accuracy may change, resulting in reduced print quality or damage.

Note:

If the preferred area for positioning the UV hybrid printer is uneven or has a soft carpeted surface, a metal substrate can be used to hold it.

Do not place the UV hybrid printer on any surface that cannot support its weight, as this may be dangerous and it may twist or move over time!

Environmental requirements

Parameter	Specification
Operating temperature (℃)	15 - 28
Operating humidity (RH %)	30 - 70
Storage temperature (℃)	20 - 60
Storage humidity (RH %)	5- 85 (non-condensing)

Caution:

Do not store or install the UV hybrid printer in the following locations:

near any local heat source;

places exposed to direct sunlight;

places subject to vibration;

places where there is excessive dust;

places where there are extreme changes in temperature or humidity;

places where the UV hybrid printer may get wet;
places where there is poor ventilation/air circulation;

places where the floor is unstable or unable to support the load of the UV hybrid printer and other equipment and materials; and

places likely to produce other polluting gas.

Ventilation

Parameter	Specification
Air quality	Well-ventilated area where ink fumes can be kept to a minimum
Ventilation requirement	≥ 50 m^3/min

Power and gas supply requirements

AC power supply	Voltage	Frequency	Wiring	Current
	220 - 240 VAC	50 / 60 Hz	Single phase	15 A

Compressed air	Pressure (min.)
Clean, dry and oil-free. Filter before the machine	90 psi
	0.4 MPa

Note:

As the UV hybrid printer is not supplied with operating computers, users must purchase their own.

For optimal performance, we recommend that the computer should meet the recommended requirements below. As with all computer software, systems with faster processors, more memory, and more storage space allow for larger files to be processed, and processing time can be reduced.

Computer configuration requirements

Note:
The computer for the UV hybrid printer shall be configured to meet the following requirements, with its specifications as shown below. Deviations from the minimum specifications listed below may cause the computer and the services it runs to operate slowly and unreliably.

Parameter	Specification
Operating system	Windows 10 (64-bit)
CPU	Intel(R) Core™ i7 11700 @3.30GHz3.29 GHz
RAM	≥ 16 GB
Internal HDD	≥ 500G
USB port	USB 3.0 (2 required)
Input voltage	220V
Mainboard	Brand mainboard of high quality
Monitor	Recommended brands, ≥ 27 inches

It is highly recommended to purchase a branded desktop computer instead of a cheap assembled one.

Note:
The computer must meet the minimum requirements listed above.

DQS20 Series UV Hybrid Printer

Unloading and Placement of the Machine

Unloading of the machine

Machine size - packaging case size and net size

Please see the following table for the actual size of the UV hybrid printer and the packaging case for shipping. There are two shipping methods for DQS20 Series UV Hybrid Printer: complete shipment, as shown in the first table for relevant data, and split shipment, as shown in the second table for relevant dimensions.

Item	UV hybrid printer	Packaging case
Length	4400mm	4560mm
Width	1680mm	1860mm
Height	1450mm	1780mm
Weight	1350 kg	420 kg

Complete shipment

Item	Machine	Packaging case	Packaging case for expansion platform
Length	4400mm	4560mm	3000mm
Width	1680mm	1150mm	1125mm
Height	1450mm	1780mm	410mm
Weight	1350 kg	470 kg	

Split shipment

Arrival of machine

The machine will be packed in a standard container and transported to the port where the machine will be removed and then transported to the customer's site or local warehouse. Please keep in contact with your local service team to confirm how the UV hybrid printer will be delivered.

Unloading method

Caution:
Unloading of transport vehicles should be carried out by experienced personnel with correct devices.

Note:

The gross weight of the packaging case in the container is 1,820kg. A forklift with a capacity of at least 3T and a fork length of at least 1600mm (the fork protrudes at least 100mm from the edge of the packaging case) is required.

The Manual is not applicable for unloading the parked UV hybrid printer from the original shipping container.

Unloading space

Note:

The information provided here is very useful for efficient operation or installation of the machine.

For the purpose of convenience, it is recommended that the area for unpacking should be 3-4 times of the packaging case. In this particular case, an area of 8m x 5m is shown.

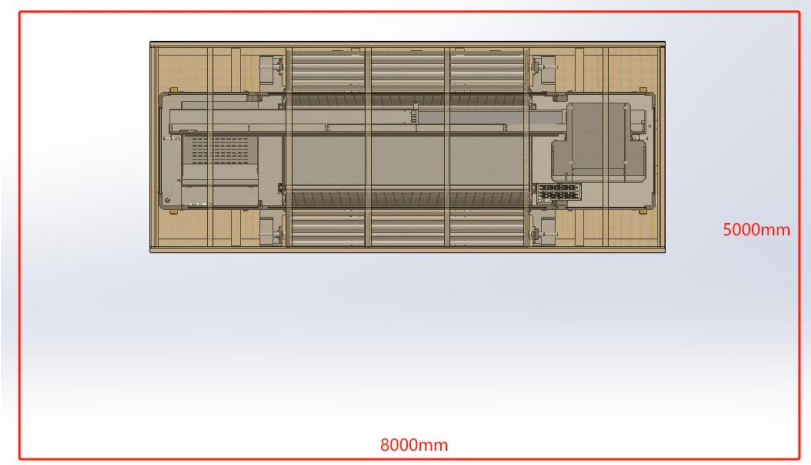


Fig. 7: Recommended unloading area around the packaging box

This provides a sufficient space for the entry of the forklift in front of the packaging case.

The center of gravity of the machine

Caution:

The UV hybrid printer is in the center of the packaging case, and the carriage is fixed onto the right end of the crossbeam. Therefore, the center of gravity of the packaging case is at the center point of the long edge of the packaging case.

Note:

In order to help remove the UV hybrid printer out of the packaging case, the hoisting point of the fork of the forklift is clearly marked with a label on the lower edge of the rear side of the machine.

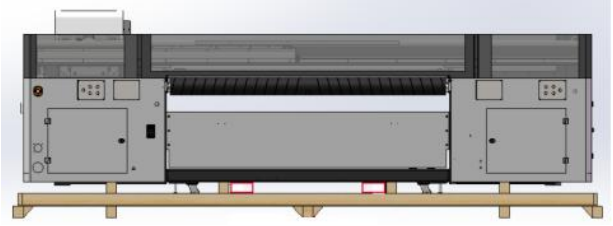


Fig. 8: Fork position of the forklift

Unpacking of the UV hybrid printer

The UV hybrid printer is packed in a wood case with a base. The rack of the UV hybrid printer is fixed onto the base with bolts via 4 packaging fixing frames; 2 packaging fixing frames are in the front, and 2 packaging fixing frames are on the back. Packaging cases are divided into wide and narrow ones.

Unpacking

Fastening steel strips and fixed bolts are attached on the packaging case, please cut off the steel strips before unpacking. Please disassemble the plates in this order: (1) top plate, (2) front plate, (3) back plate, (4) left plate and (5) right plate. Remove the bolts located around each panel.

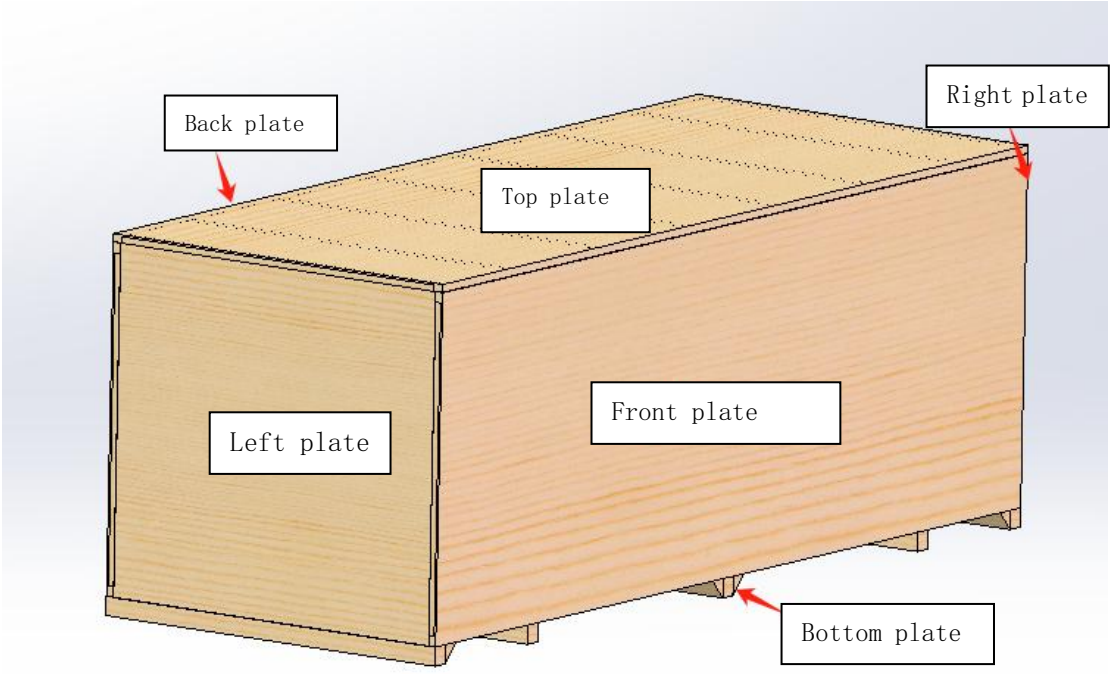
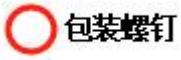


Fig. 9: Packaging case

Note:
The following figure shows the location and size of each type of screws and bolts to facilitate disassembly of the packaging case.



Packaging screws

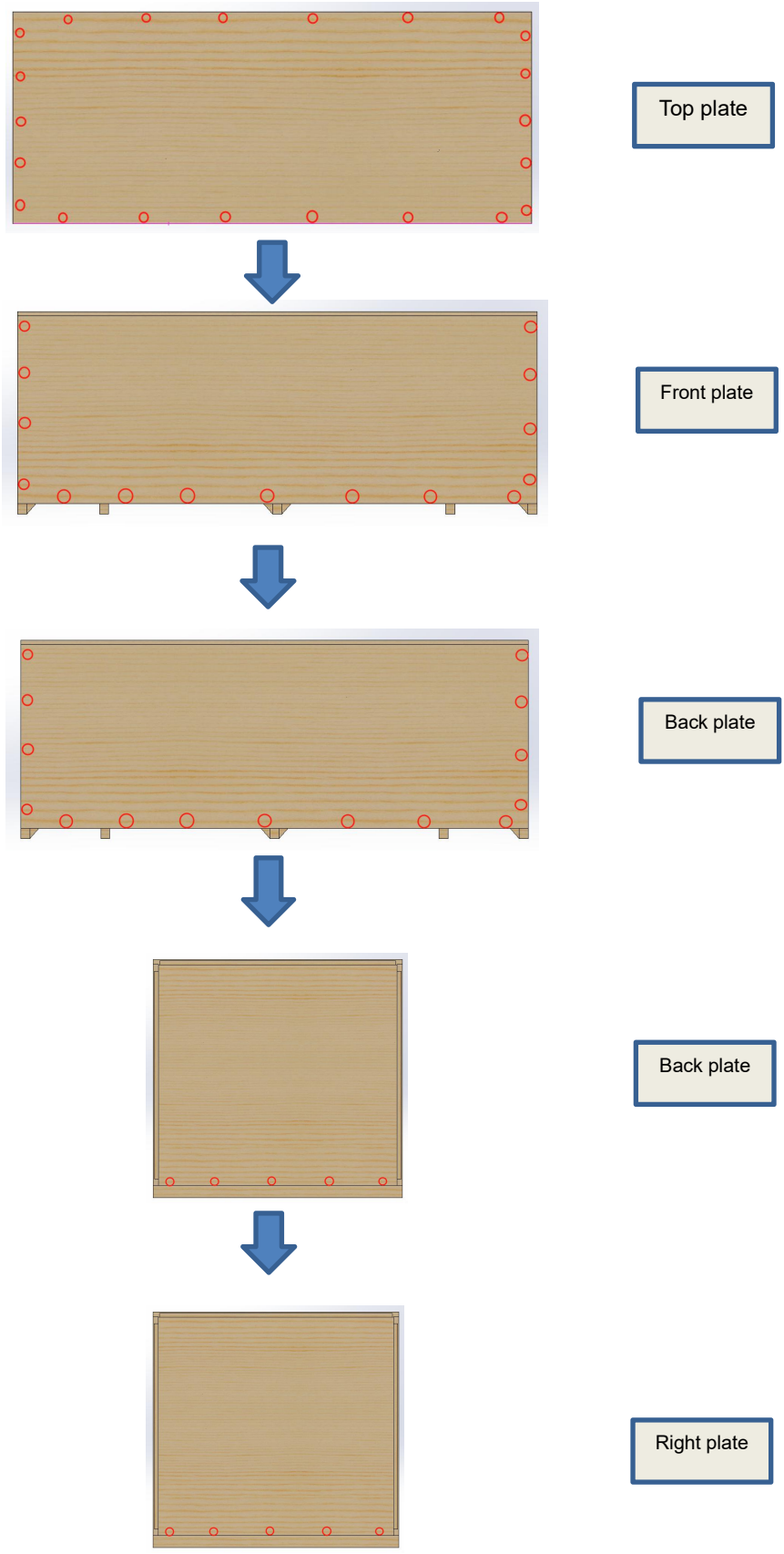


Fig. 10: The order for disassembling packaging plates

Disassembly of packaging fixing frames

These packaging fixing frames fix the UV hybrid printer onto the packaging base to ensure the stability in transportation.

Important Information:

Please be sure to remove all the packaging fixing frames fixed onto the rack before lifting the UV hybrid printer from the packaging base.

If not, the machine may be damaged. The location of these packaging fixing frames is as shown in the following figure.

Raise the feet and remove the fixed supports (as shown in the following figure, 4 fixed supports in total). There are standard accessories in the middle of the UV hybrid printer that need to be removed in a timely manner to prevent damage during forklifting: The following figures show the location of packaging fixing frames.

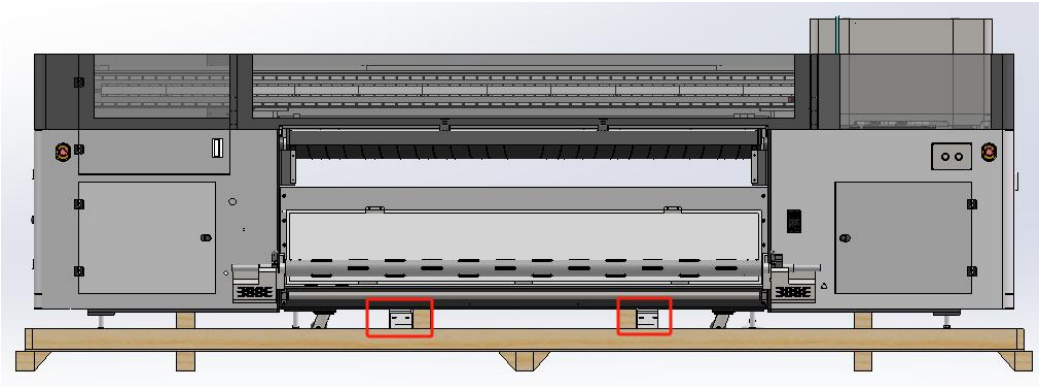


Fig. 11: Packaging fixing frame (front)

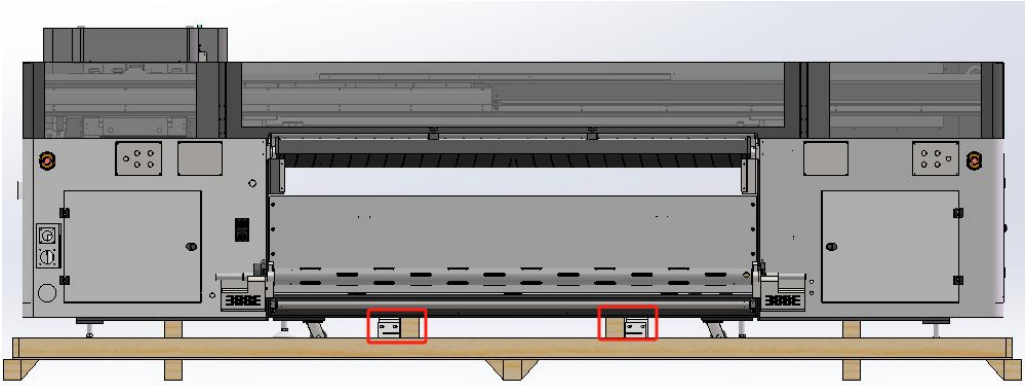


Fig. 12: Packaging fixing frame (rear)

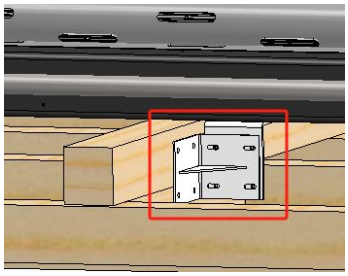


Fig. 13: Packaging fixing frame

Lifting of the machine from the packaging base

Important Information:

Before lifting the UV hybrid printer from the packaging base, be sure to remove the rear door (or both the front and rear doors) and take out the accessories placed inside the machine. If not, it may cause damage to the machine and related accessories.

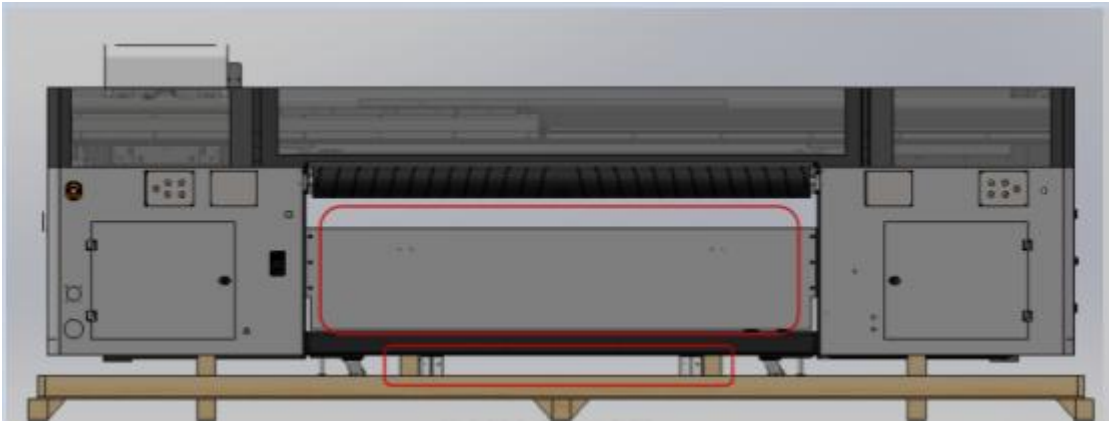


Fig. 14: Placement location of accessories

The machine is packed in a vacuum aluminum foil bag. First, the aluminum foil bag and some packaging materials should be removed to show the machine itself and the position of the lifting points.

Fig. 15 shows the UV hybrid printer in remaining package after removing the vacuum aluminum foil bag. It is suggested that the remaining package is not removed, until the machine arrives at the final location.

Fig. 15: Removal of aluminum foil

Important Information:
It is forbidden that the machine is transported with a forklift whose fork is directly inserted under both ends of the machine. Otherwise, the doors on both sides are damaged when moving the machine.

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 or removed 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 Fig. 16: (Note: though the illustrated machine is not DQS20 Series UV Hybrid Printer, their operation method are the same)

Fig. 16: Transportation of the machine with fork under both ends

Proper placement of UV hybrid printer

Important Information:
Once the machine is removed out of the packaging case, it is recommended that the inner package and protective materials should stay on the machine before the machine is moved to the final location.

Ideally, the route of the whole machine moving to the final position should be as smooth as possible to avoid shock when moving.

The machine can be moved using a forklift or manually pushed into position using the machine's casters. If manually positioned, it requires at least 4 people distributed at each corner of the machine to push and guide it into position.

Trolleys are not permitted as they may cause deformation of the rack and thus damage the machine. The minimum requirements for the placement of the machine should take into account its size and the way in which it will be moved.

Removal of packaging limit block

Caution:
Please be sure to remove the packaging limit block before any other operation of the machine. The packaging limit block may be removed after the machine is placed at the expected location.

If the carriage moves in the X direction during transportation of the packaging limit block, it must be removed before the machine is energized.

Fig. 17 shows the location of the packaging limit block (red).

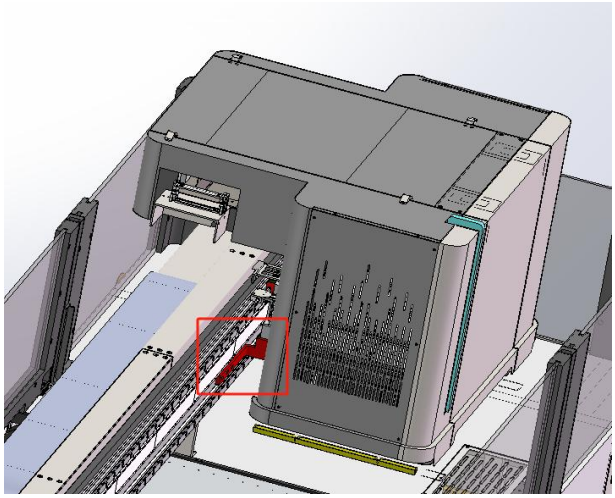


Fig. 17: Location of packaging limit block

Unpacking of expansion platform

In case of split packaging for your machine, the packaging case for expansion platform should also be unpacked to take out the expansion platform components and motor support components, etc.

Important Information:
Packaging case for expansion platform is only available for the machine in split package.

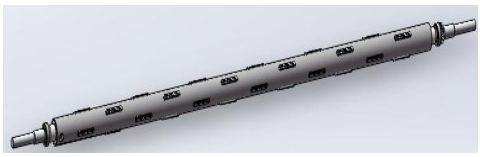
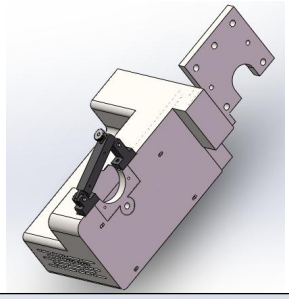
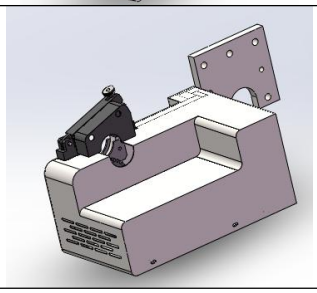
Fig. 18: Packaging case for expansion platform

DQS20 Series UV Hybrid Printer

Assembly of External Components

Assembly of external components

Several sub-components/parts of the UV hybrid printer need to be recovered according to the configuration. Such components separate from the main unit during shipment for convenient loading and transportation. Some of these components are packed independently, and some of them are packed and placed inside the machine.

S/N	Diagram	Description	Qty.
（1）		Monitor	Order quantity
（2）		Transitional roller component	2
（3）		Inflatable axis component	2
（4）		Media feeding and take-up support component	2
（5）		Media feeding and take-up support component (motor end)	2

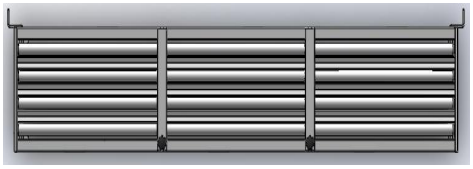
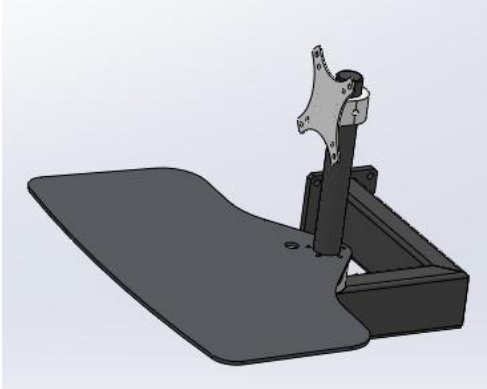
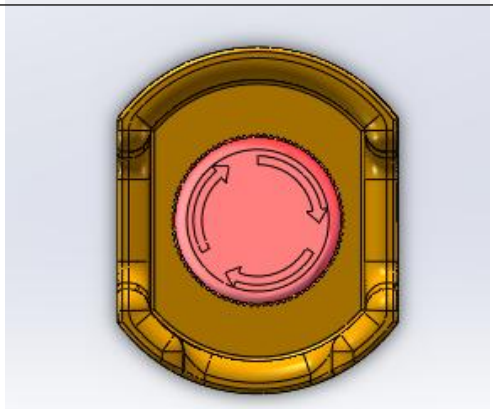
（6）		Expansion platform component	2
（7）		Rotary table component	1
（8）		Emergency stop component	4

Fig. 19: Sub-components of the UV hybrid printer to be installed

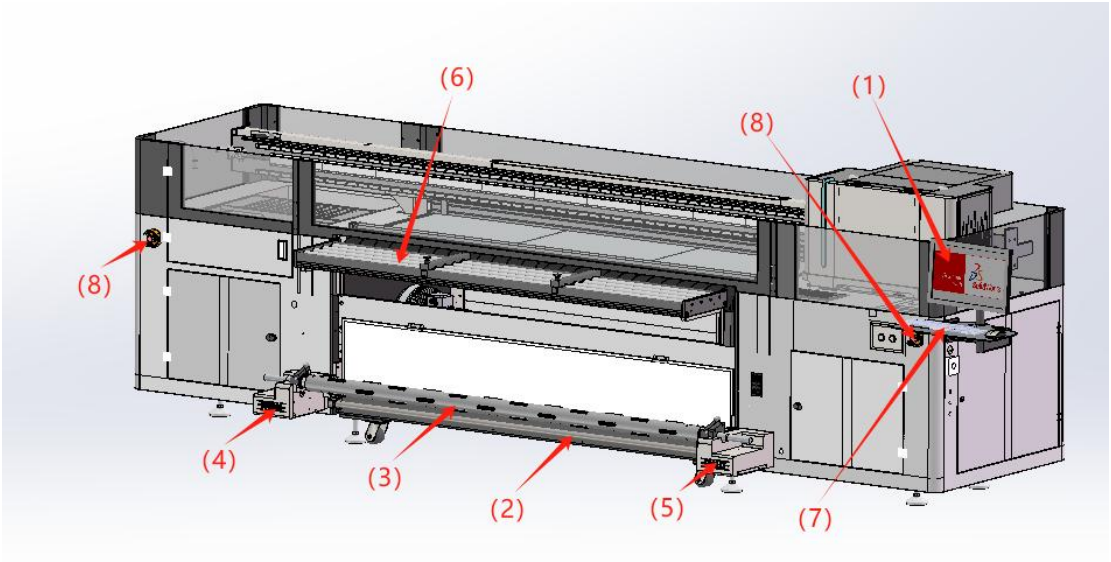


Fig. 20: Installation location of sub-components on the front of the machine

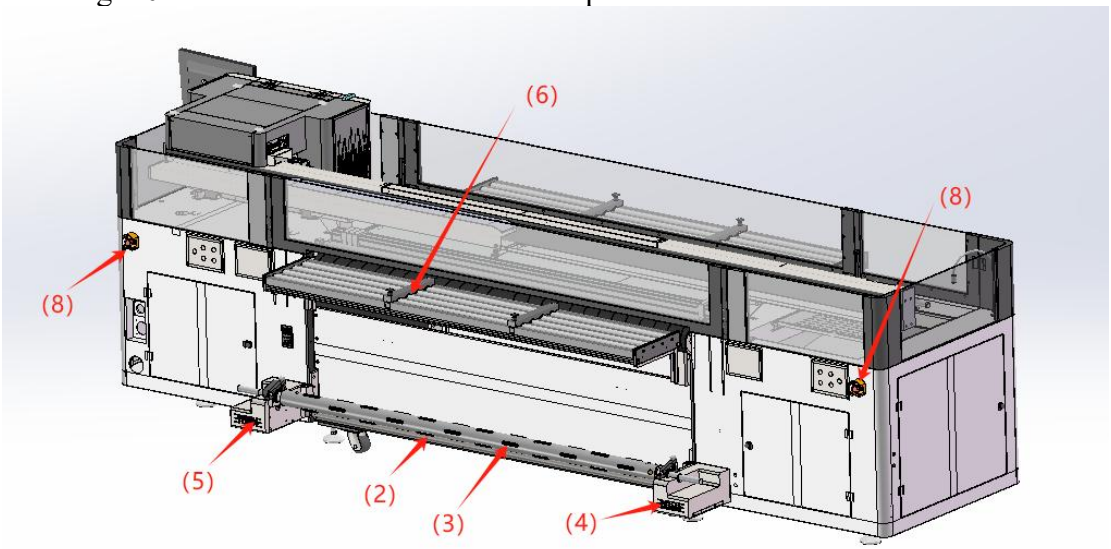


Fig. 21: Installation location of sub-components on the back of the machine

Installation of monitor and rotary table components

The machine is operated on the front right side. It is required to properly install the rotary table components and monitor, and thread the video cable and power cable.

Step 1: Connect the console mounting base to the right box with M8 screws, with the installation location shown in the figure.

Step 2: Connect and fix the keyboard tray to the keyboard support with M4 screws, and tighten with M5 screws on the back. Insert the assembly into the console mounting base and tighten it with M10 screws, with the installation location shown in the figure.

Step 3: Unpack and take out the monitor, fix it onto the monitor support with M4 screws. Place the monitor support on the console mounting base, adjust the height as needed, and tighten with M10 screws, with the installation location shown in the figure.

Step 4: Connect the power cable and video cable packed along with the monitor, make them get through the cable hole of the right case into the case for connecting the computer, with the installation location shown in the figure

Step 5: Install the USB docking station at last, place the keyboard and mouse, make the USB cable get through the cable hole to access the lower part for connecting the computer, with the docking station position shown in the figure.

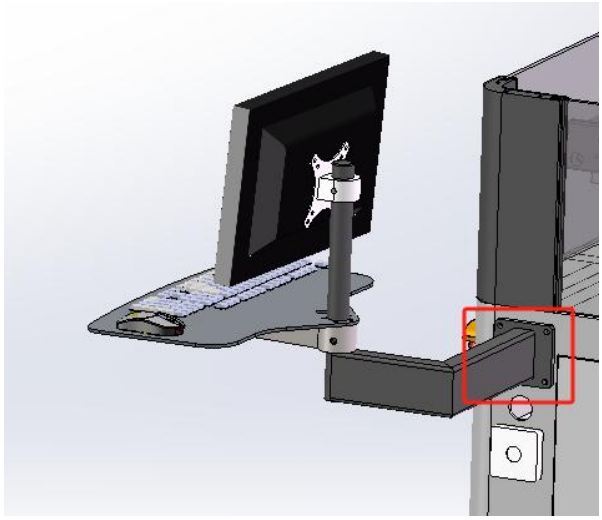


Fig. 22: Installation position of rotary table components

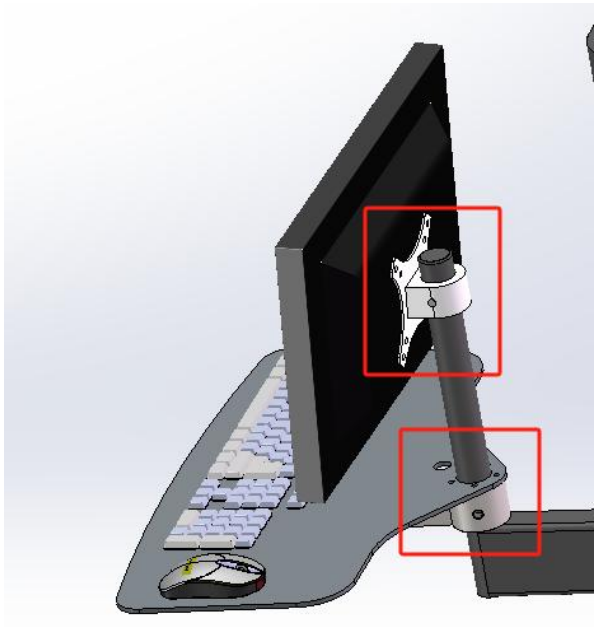


Fig. 23: Relevant connection inside the component (position 1)

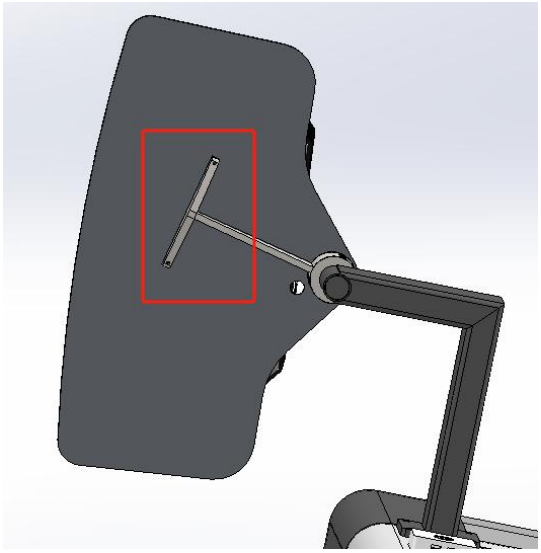


Fig. 24: Relevant connection inside the component (position 2)

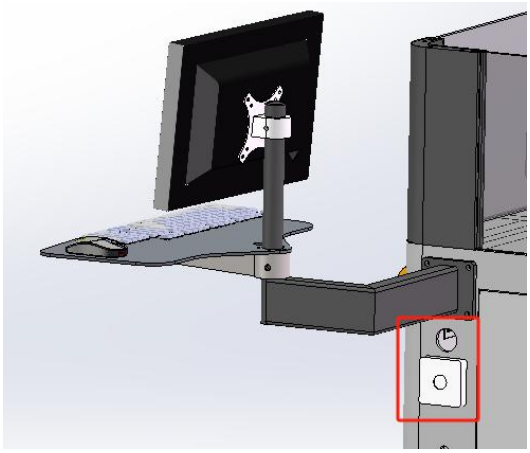


Fig. 25: Position of cable hole and USB docking station

Important Information:

If the machine is shipped in complete packaging, after installing the rotary table components, skip the remaining part of this chapter, which is specific to split packaging.

Connection of media feeding and take-up components

Important Information:

Be sure to remove the front and back middle doors of the machine before connecting the media feeding and take-up components.

Remove the middle door components, as shown below.

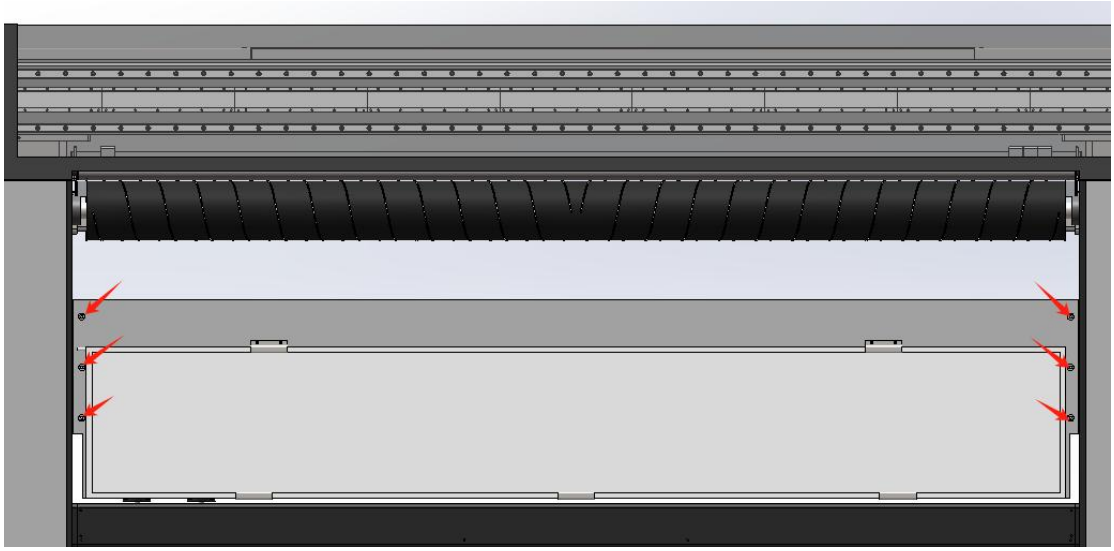


Fig. 26: Diagram of removing the front middle door components

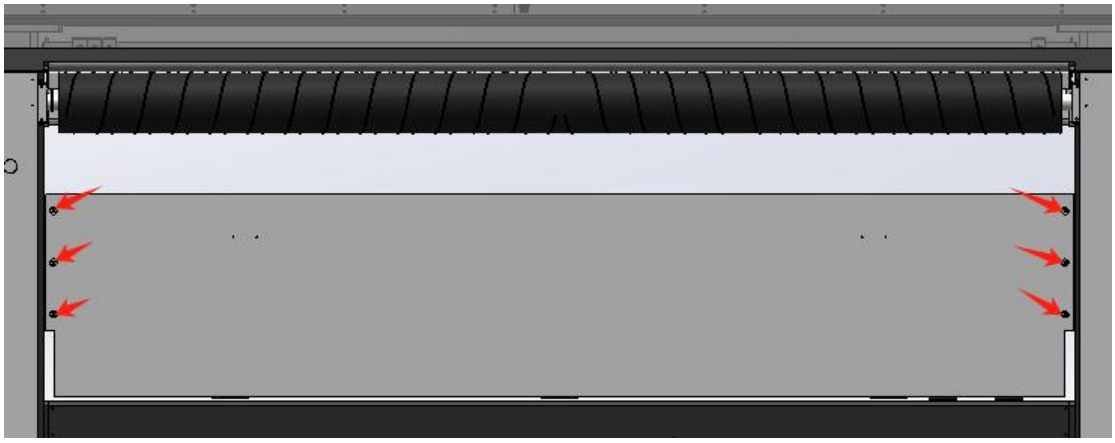


Fig. 27: Diagram of removing the back middle door components

After removal, fix the 2 sets of standard media feeding and take-up support components to the left plate with five high-strength M10 screws and two φ8 cylindrical pins provided with the machine. The installation method is consistent on the front and back, with the screw positions as shown in red arrows, and the cylindrical pin positions as shown in blue arrows in the following figure.

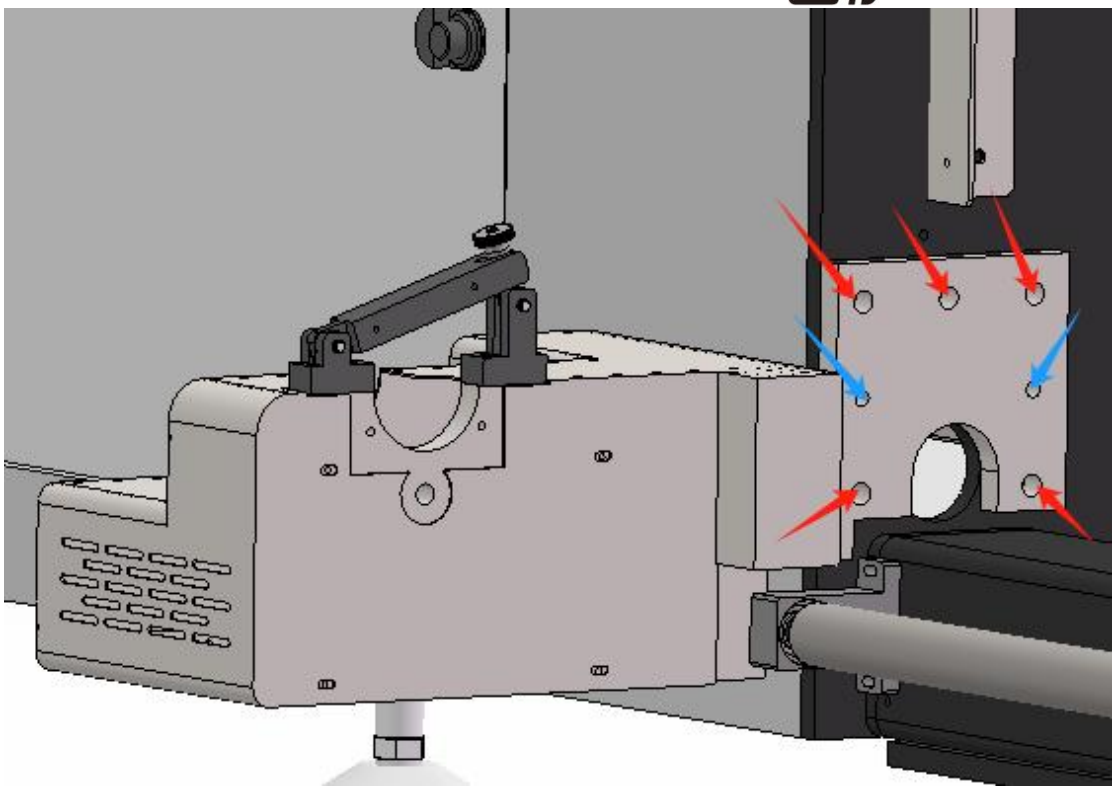


Fig. 28: Installation diagram of media feeding and take-up support components

Then, fix the 2 sets of standard media feeding and take-up support components (including motor) to the right plate with five high-strength M10 screws and two φ8 cylindrical pins provided with the machine. The installation method is consistent on the front and back, with the screw positions as shown in red arrows, and the cylindrical pin positions as shown in blue arrows in the following figure.

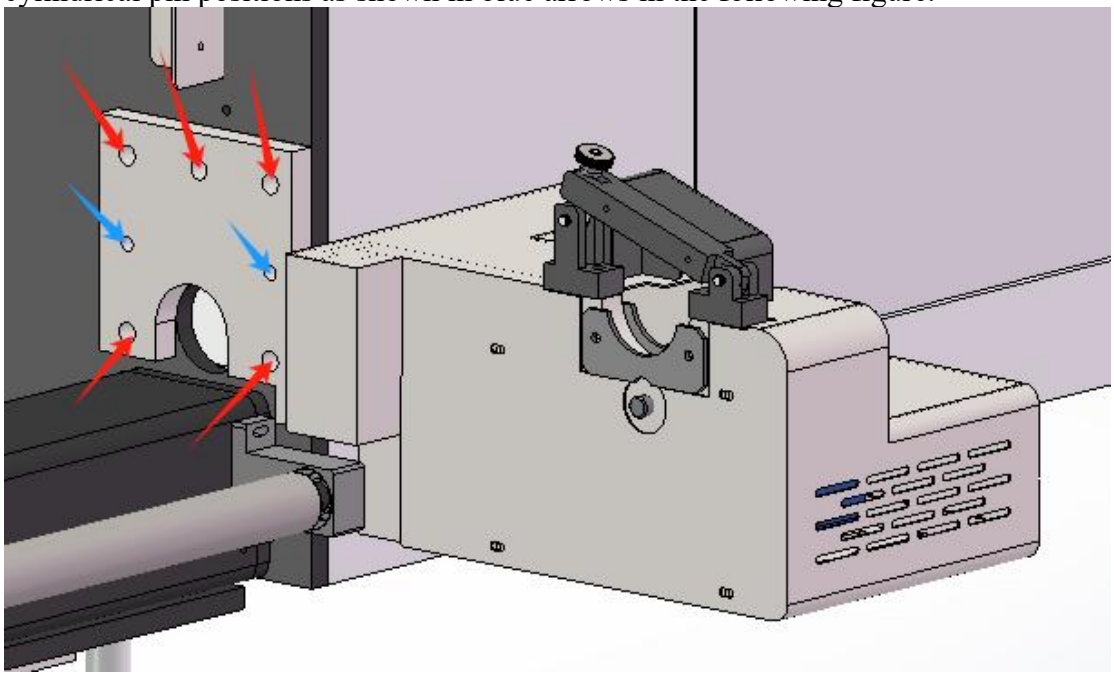


Fig. 29: Installation diagram of media feeding and take-up support components (including motor)

After installing media feeding and take-up supports on the front and back, reinstall the

removed front and back middle door components back onto the machine as they were. The operation method is the same as above. Finally, place and fix the front and back inflatable axis components on the bearing positions corresponding to the media feeding and take-up supports with knurled screws (4 in total on the front and back), and press the bearing clamping plate tightly against the bearing on the inflatable axis. The assembly diagram and completion diagram are as follows.

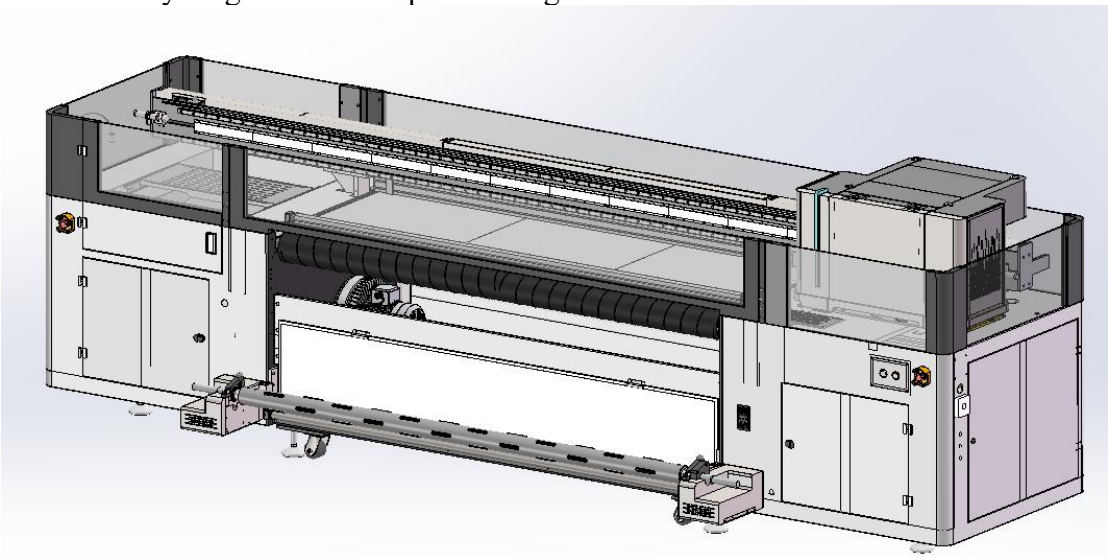


Fig. 30: Diagram of finished installation of media feeding and take-up components

Installation of transitional roller components

Important Information:

It is recommended to remove the front and back inflatable axis components before installing the transitional rollers.

Take out the 2 sets of transitional roller components, install them on the front and back faces of the lower case beam of the machine with M4 hex screws (the installation method is completely consistent on the front and back). The installation location and the completion diagram are shown as follows.

Fig. 31: Diagram of the installation locations and finished installation of the transition roller components

Installation of expansion platform components

Important Information:

When installing the expansion platform, be sure to adjust the upper surface of the roller to the same height as the mesh belt.

The installation location and completion diagram of the expansion platform components are shown in the following figures. The red box represents the screw installation location, and the installation method is the same for all four positions.

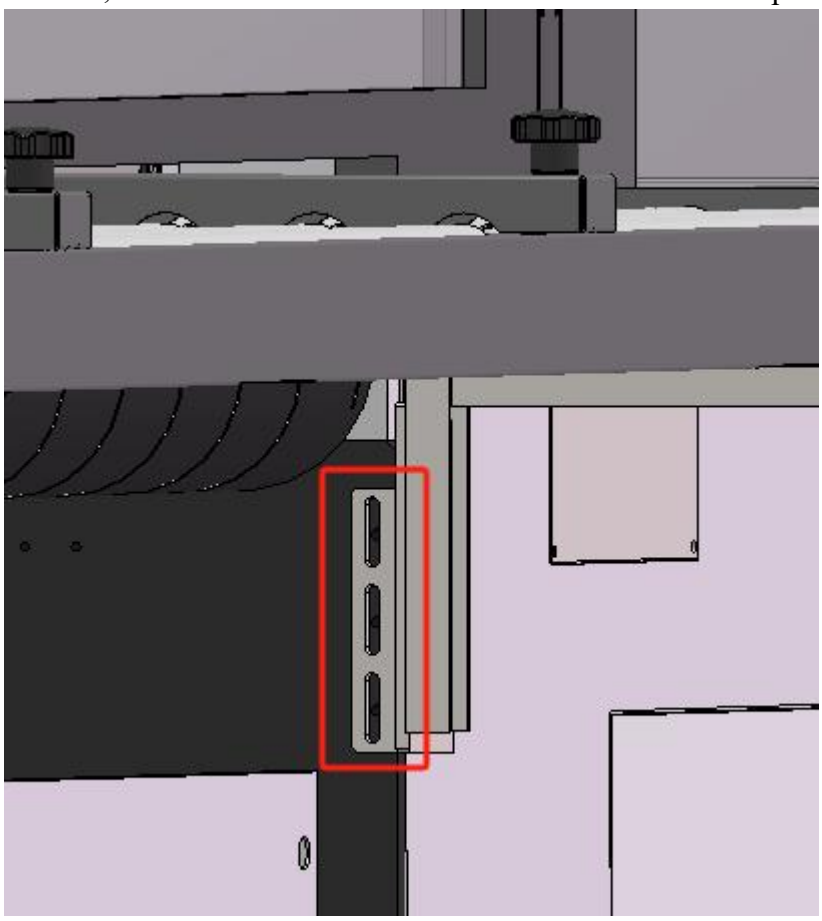


Fig. 32: Installation position diagram of expansion platform components

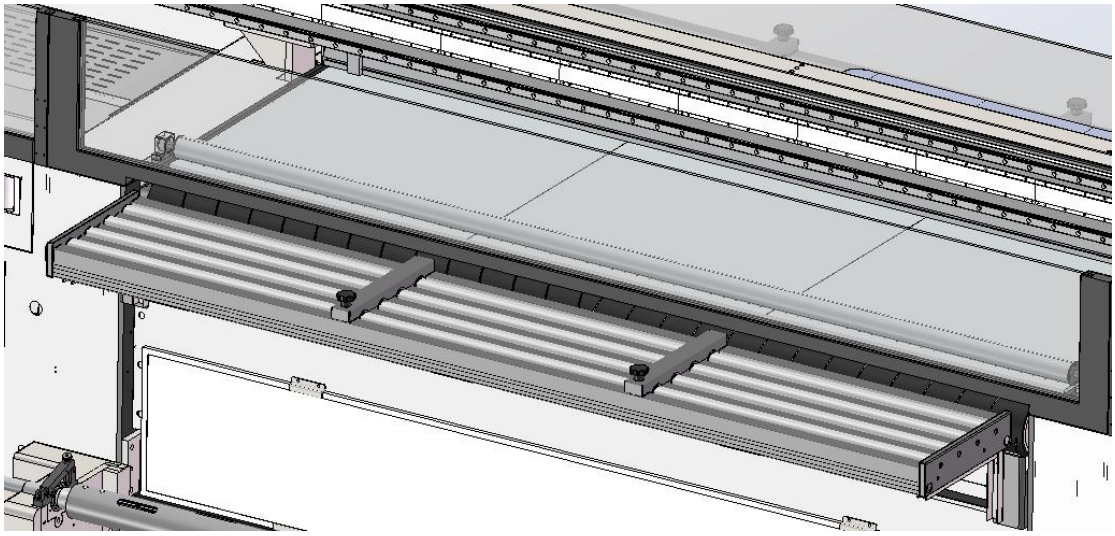


Fig. 33: Diagram of finished installation of expansion platform components

Installation of emergency stop components

Important Information:
For packaging purpose, the emergency stop components of the machine is removed before shipment and must be installed before normal use of the machine.

The installation locations of the emergency stop components are shown in the following figure. There are 4 locations in the left front and left rear of the left box, and in the right front and right rear of the right box, respectively. The installation methods are consistent for the 4 positions.

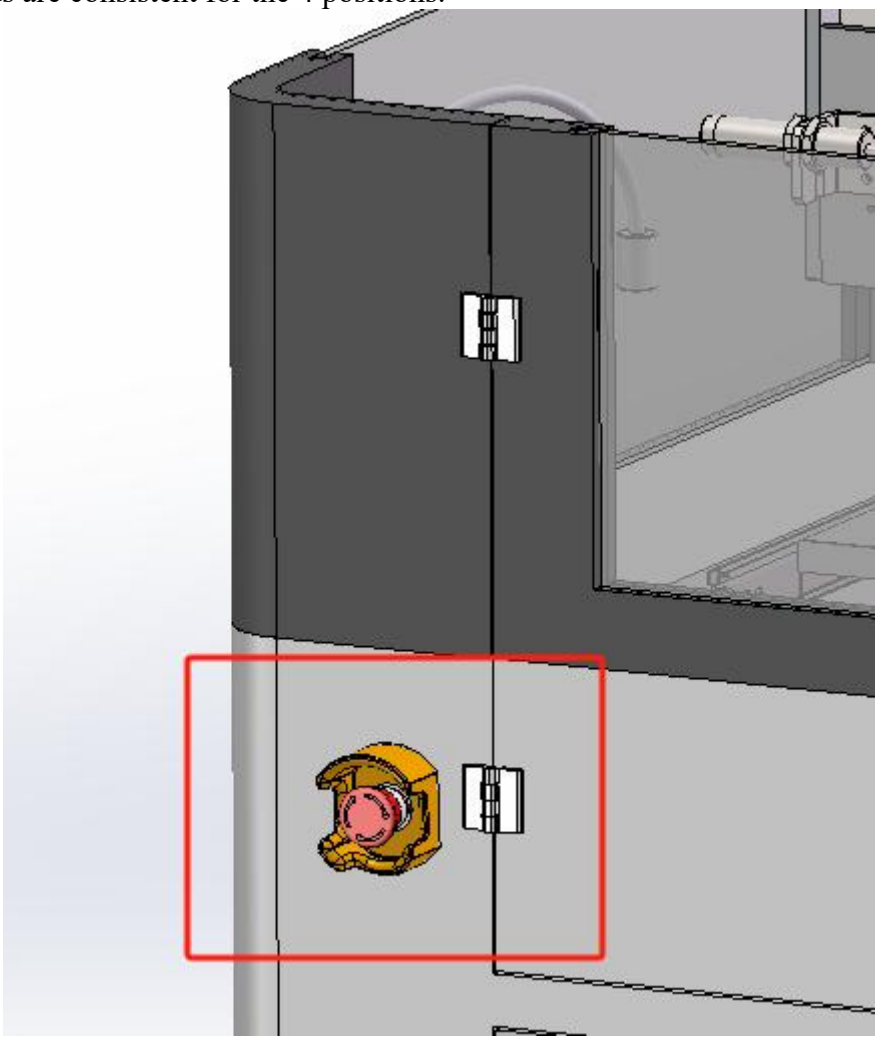


Fig. 34: Installation diagram of emergency stop components

The diagram of the finished installation of the complete machine is as follows:

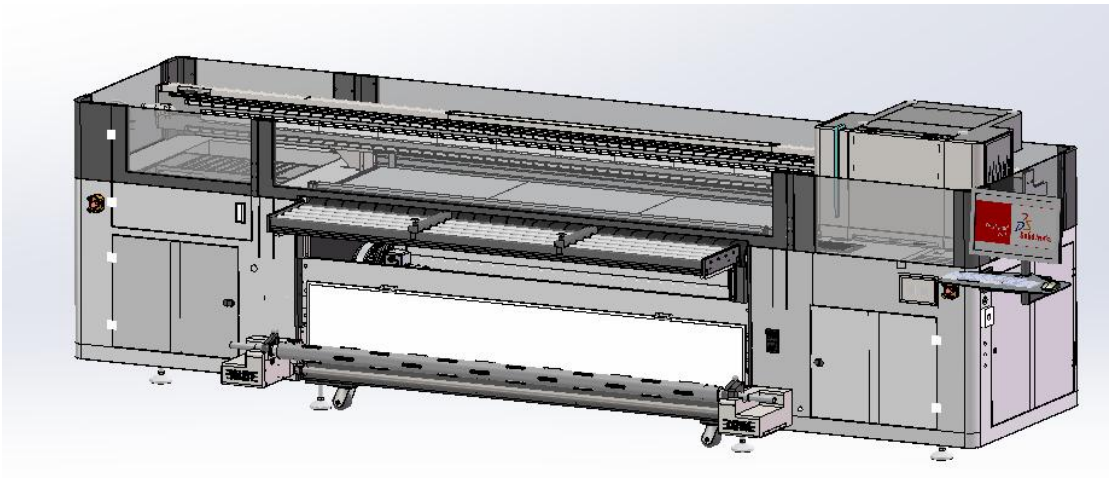


Fig. 35: Diagram of the complete DQS20 Series UV Hybrid Printer

DQS20 Series UV Hybrid Printer

Connection Services

Connection services

Power supply connection of UV hybrid printer

Caution:
NOTE! Any work involving machine wiring or connection to the main power must be performed by qualified electrical technicians.

AC power supply	Voltage	Frequency	Wiring	Current
	220 - 240 V	50 / 60 Hz	Single phase	25 A

The UV hybrid printer can be connected to the power supply in two ways: direct connection to the electrical box on the wall or connection to the wall outlet via IP44 32A 200 -250VAC plug. Due to the semi-industrial nature of most factory environments, it is suggested that cables should be provided with metal sheath to prevent accidental damage. See Figure 36.

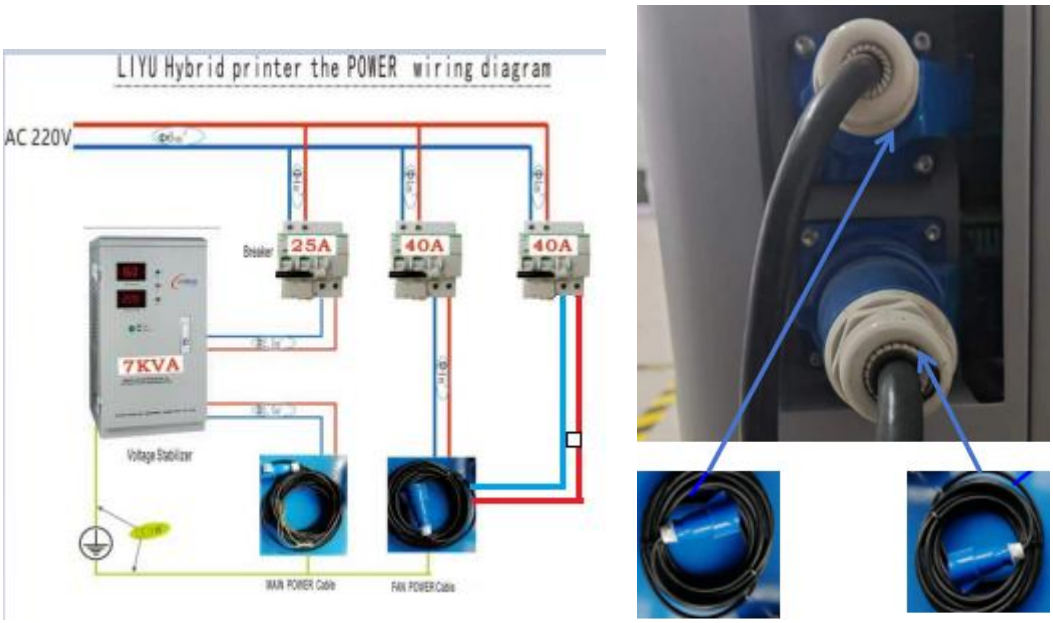


Fig. 36: AC power connection of UV hybrid printer

Grounding

Caution:
All the grounding connection points are on the back of the UV hybrid printer.

Fig. 37: Diagram of grounding position of UV hybrid printer

Connection between UV hybrid printer and computer

Important Information:
The UV hybrid printer and computer are connected via USB 3.0 coupler.
USB 3.0 should be coded in blue and marked with the following symbols.

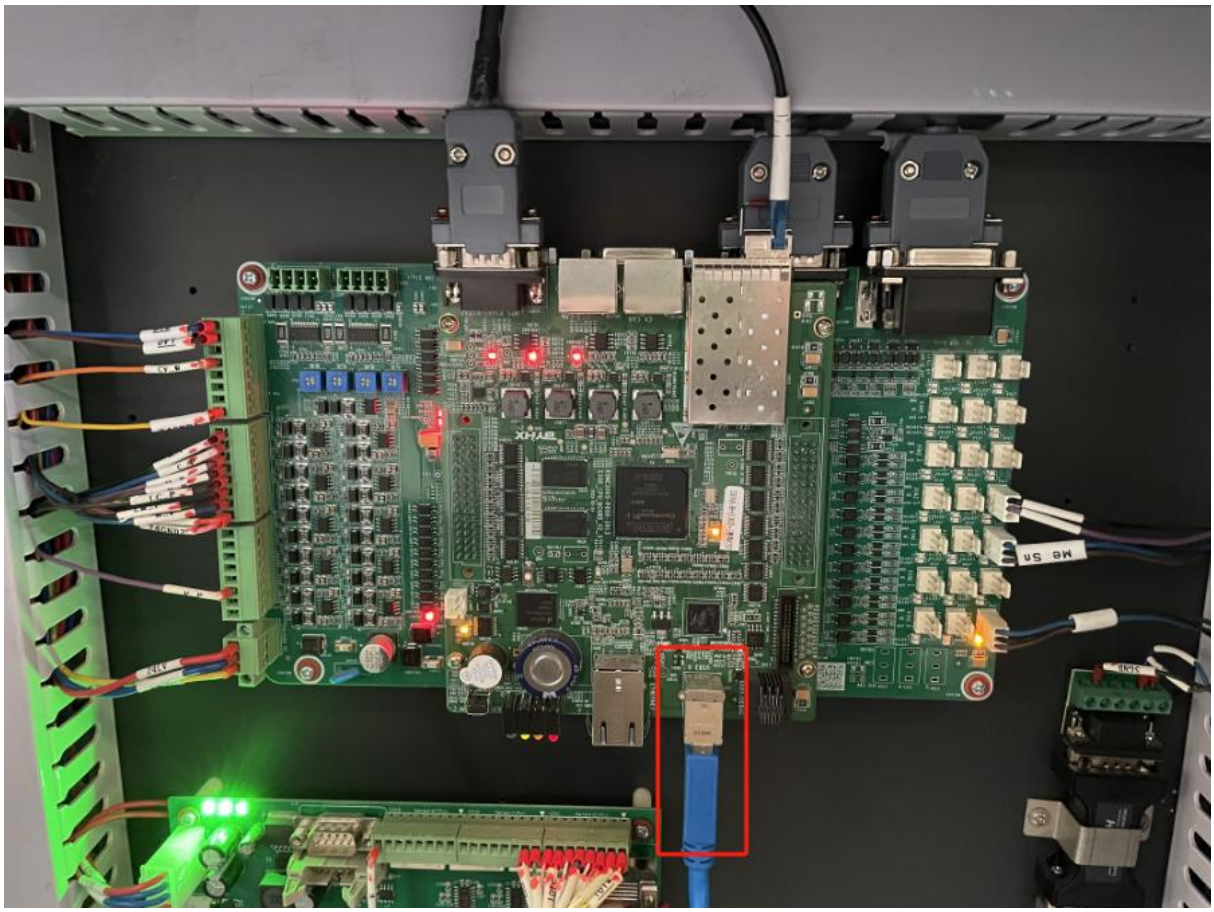


Fig. 38: Connection between UV hybrid printer and computer

Connection to compressed air

Note:
Compressed air conforms to the following requirements

Compressed air	Pressure (min.)
Clean, dry and oil-free. It should be filtered before connecting to the machine.	90 psi
	0.6MPa

Powering-on

Important Information:

Before powering-on of the machine, please check whether the packaging fixing frames that fix the carriages onto the crossbeam have been removed. In addition, it should be ensured that the computer, electrical devices and compressed air facilities are correctly installed and connected to the UV hybrid printer.

Release all the emergency stop buttons at each corner of the UV hybrid printer. Turn the button heads counterclockwise to remove them. The positions of 4 Emergency Stop buttons are as shown in the following figure.

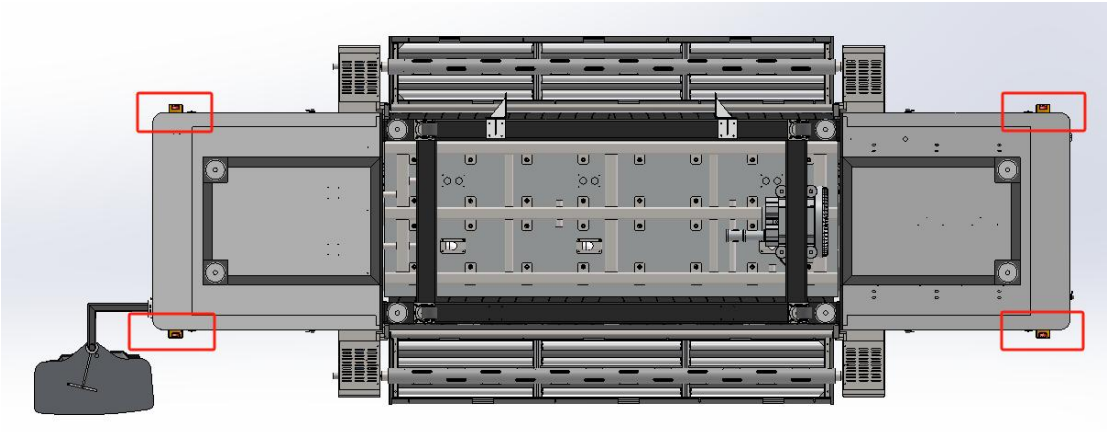


Fig. 39: Positions of Emergency Stop buttons

DQS20 Series UV Hybrid Printer

Introduction to Functions of Machine

Introduction to the main components and buttons of the machine

1. Front components and buttons of the machine

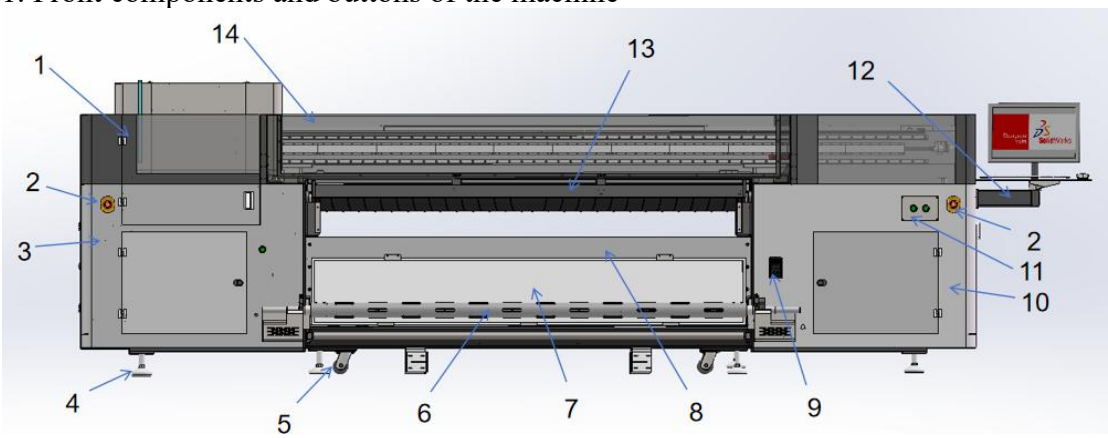


Fig. 40: Front components and buttons of the machine

No.	Name of parts	Description
1	Ink stack components	Open for ink pressing, maintenance, cleaning and other operations
2	Emergency Stop button	One on left and one on right of the front
3	Left box	There are the ink route system, air system, and negative pressure system inside it
4	Feet of the machine	For adjusting the level and fixing of the machine
5	Casters of the machine	For moving the machine
6	Take-up rod	It is inflated and expanded after the paper roll is inserted
7	LED backlight	For watching the effect during printing with backlight materials
8	Middle door	For fixing LED backlight and decorative elements
9	Torque controller	For controlling positive and negative rotation and torque of media take-up
10	Right box	There are HV and LV boards inside it
11	Button	On the left box is the backlight button; on the right box is the start button and the middle baffle lift button from left to right
12	Rotary table components	For placing the computer
13	Front expansion platform component	For printing sheets
14	Front middle baffle components	For lifting and lowering

2. Rear components and buttons of the machine

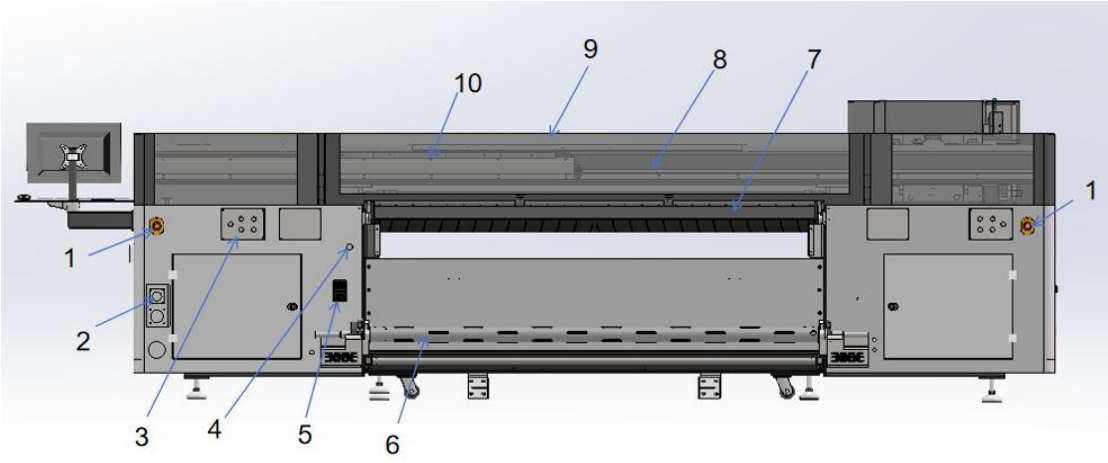


Fig. 41: Rear components and buttons of the machine

No.	Name of parts	Description
1	Emergency Stop button	One on left and one on right of the rear
2	Main power interface	Including UV LAMP POWER (adsorption UV lamp total input) and MAIN POWER (main unit power input)
3	Rear button panel	See below for details
4	Button	For controlling lifting and lowering of rear middle baffle
5	Torque controller	For controlling positive and negative rotation and torque of media take-up
6	Feeding rod	It is inflated and expanded after the material and paper roll is inserted
7	Rear expansion platform component	For printing sheets
8	Cable carrier	It connects to the motion part of the carriage, and there is ink tube, cable and UV lamp tube inside it
9	Rear middle baffle component	For lifting and lowering
10	Girder	It is the main part for supporting motion of the carriage

3. Rear button panel

Fig. 42: Rear button panel

Name of parts	Description
PRINT	One on left and one on right. Easy to print from the back
BACK-ROLLER UP/DOWN	To control back roller up and down.
VACUUM	Two in total, one on the left and right of the back. It can be independently controlled absorption to open and close.
FIX	Two in total, one on the left and one on the right of the back. Positioning rod up and down, positioning function of media.
PAUSE/CONTINUE	Easy to pause and continue from the back.

4. Inside of the front of left box

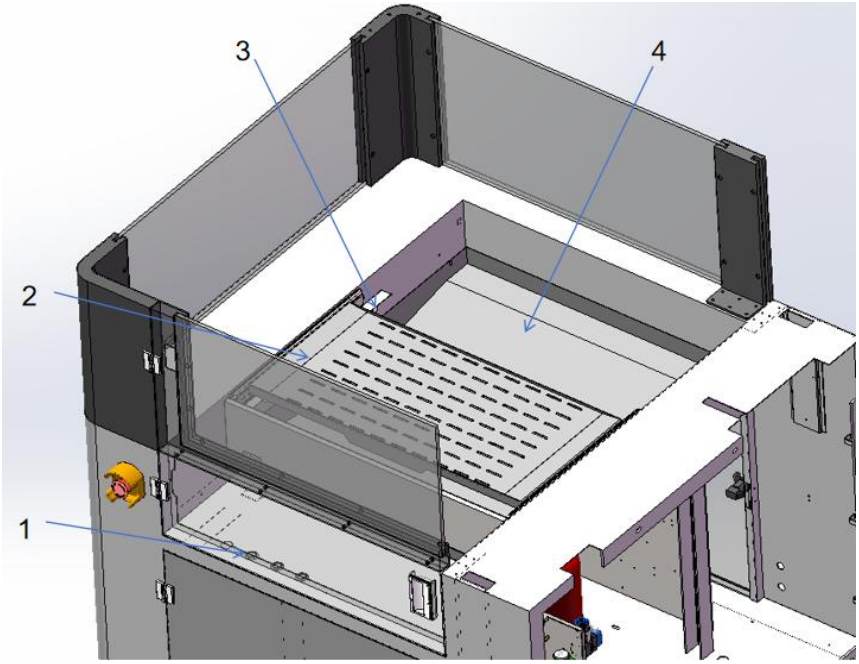


Fig. 43: Inside of the front of the upper left box

No.	Name of parts	Description
1	Maintenance button	LIGHT, CLEANING, MAINTAIN from the left to the right
2	Splash tray	For preventing ink splashing
3	Light	Light the maintenance area
4	Liquid receiver tank	For receiving waste ink generated during maintenance

Media measuring sensor

The activation and deactivation of the media measuring function is controlled via operating software.

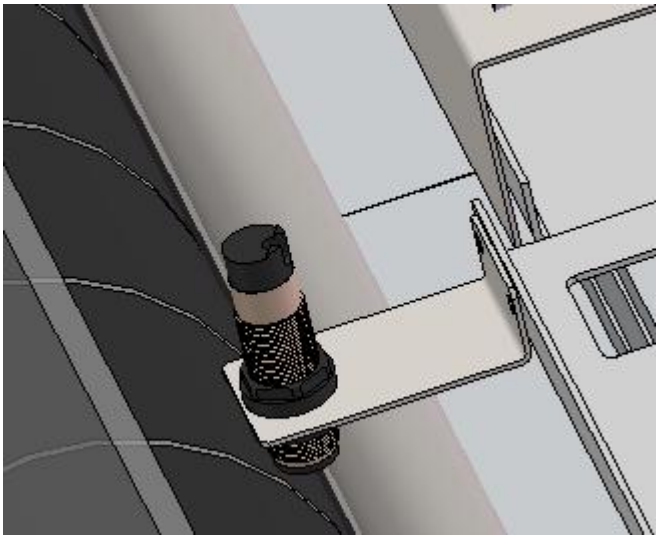


Fig. 44: Media measuring sensor

Carriage components

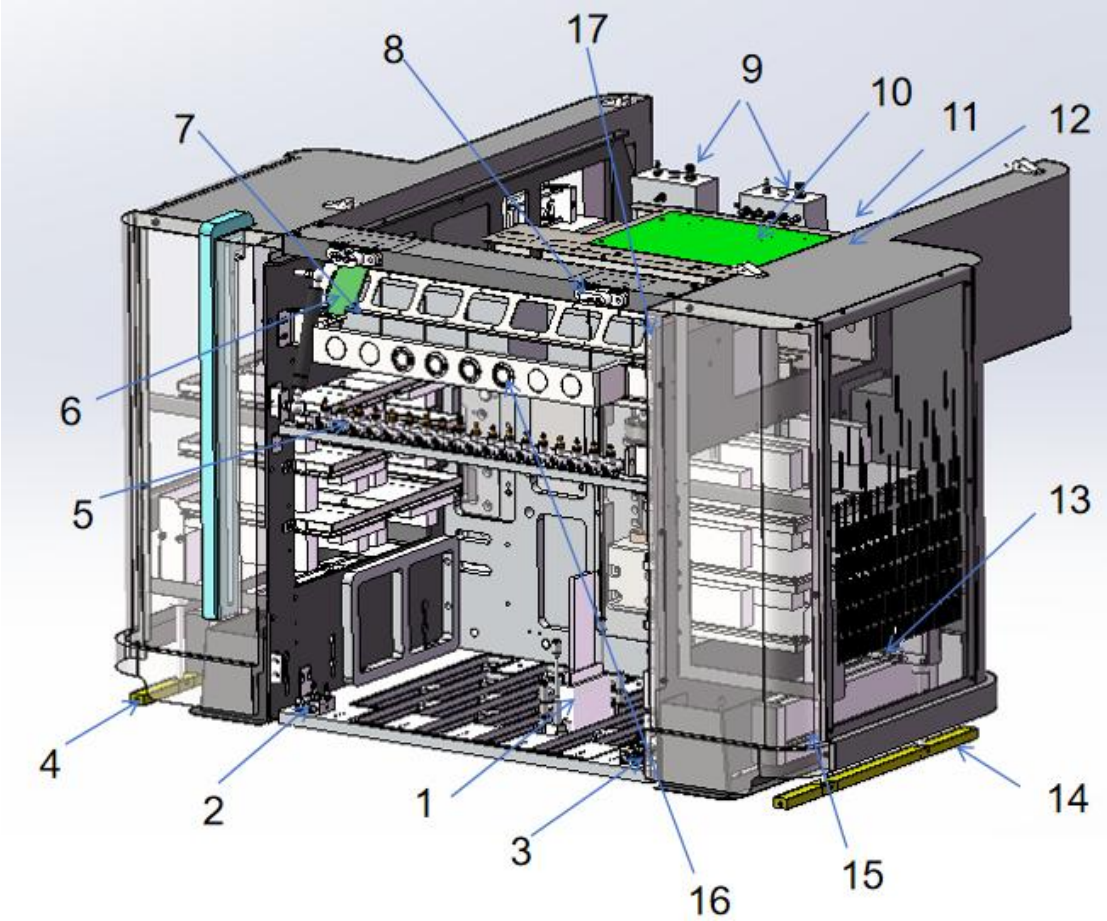


Fig. 45: Carriage components

No.	Name of parts	Function
1	Print head	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	Left collision protection switch	When hitting a high foreign object during printing, the carriage will stop and the switch will protect the UV hybrid printer.
5	Three-way valve body assembly	It has three states. It's used for printing, cleaning and closing.
6	Temperature control board	For adjusting the temperature of each auxiliary ink tank to the specified settings.
7	Auxiliary ink tank	Level 2 buffer negative pressure works as the ink in the

		main ink tank is filled to the auxiliary one.
8	Z lifting motor	To control the height of the print head.
9	Waste liquid tank	It's used for suck-back protection. Refluent ink will be stored here. It has two types: color and white.
10	Carriage board	For controlling ignition signal and data of print head.
11	Signal switchboard	For transferring all sensor signals from the carriage to the movable board and PCIE board through the switchboard.
12	Control board of colored ink pressing	Control the colored ink pressing signal
13	LED UV light	For solidifying UV ink.
14	Right collision protection switch	When hitting a high foreign object during printing, the carriage will stop and the switch will protect the UV hybrid printer.
15	Electrostatic removal device	One on left and one on right.
16	Button	For achieving colored ink pressing.
17	Electromagnetic valve	To manage the switch between positive and negative pressure.

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

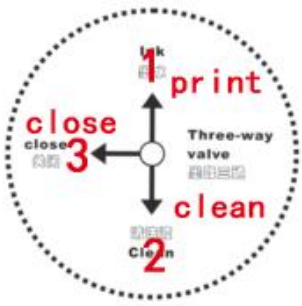


Fig. 46: Three-way valve

State 1: Print, when the UV hybrid printer is in normal operation, especially in printing, the valve shall be upward;
State 2: Clean, when it's time to clean the print head with cleaning fluid, please place the valve downward;
State 3: Close, when the UV hybrid printer is shut down, place the valve in closed direction.

Introduction to two states of two-way valve assembly:

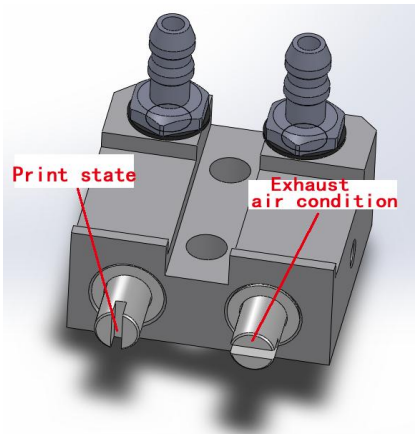


Fig. 47: Two-way valve

Print status: 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 state after the air is fully discharged.

Introduction to buttons of handheld box (optional)

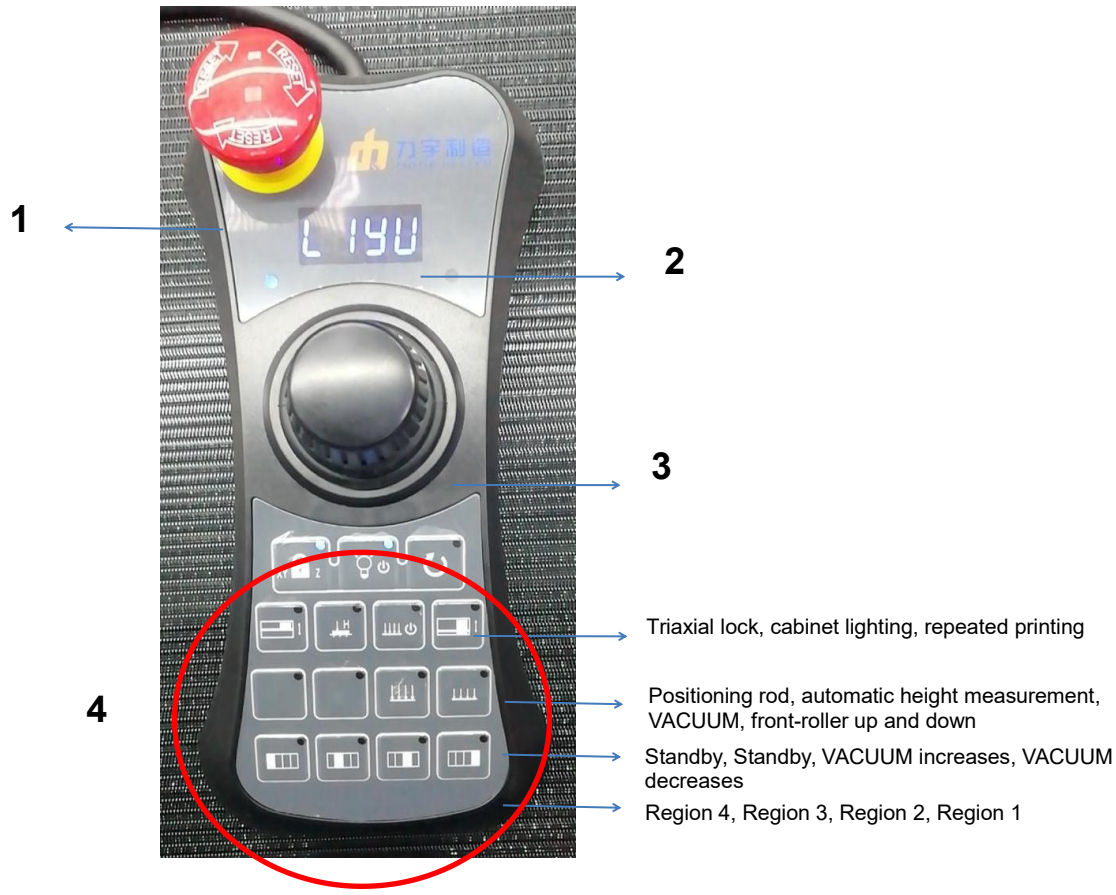


Fig. 48: Buttons of handheld box

No.	Name of parts	Description
1	Emergency Stop	Four on the model and one on the handle lever, five in total. Mainly for switch of the machine power supply and emergency stop
2	Display the LIYU LOGO and VACUUM value	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	Functional area	All functions are shown in the figure above.

Media feeding and take-up loading mode (coiled material)

DQS20 Series UV Hybrid Printer can print coiled materials and sheets, and the following diagram shows the loading method of coiled materials.

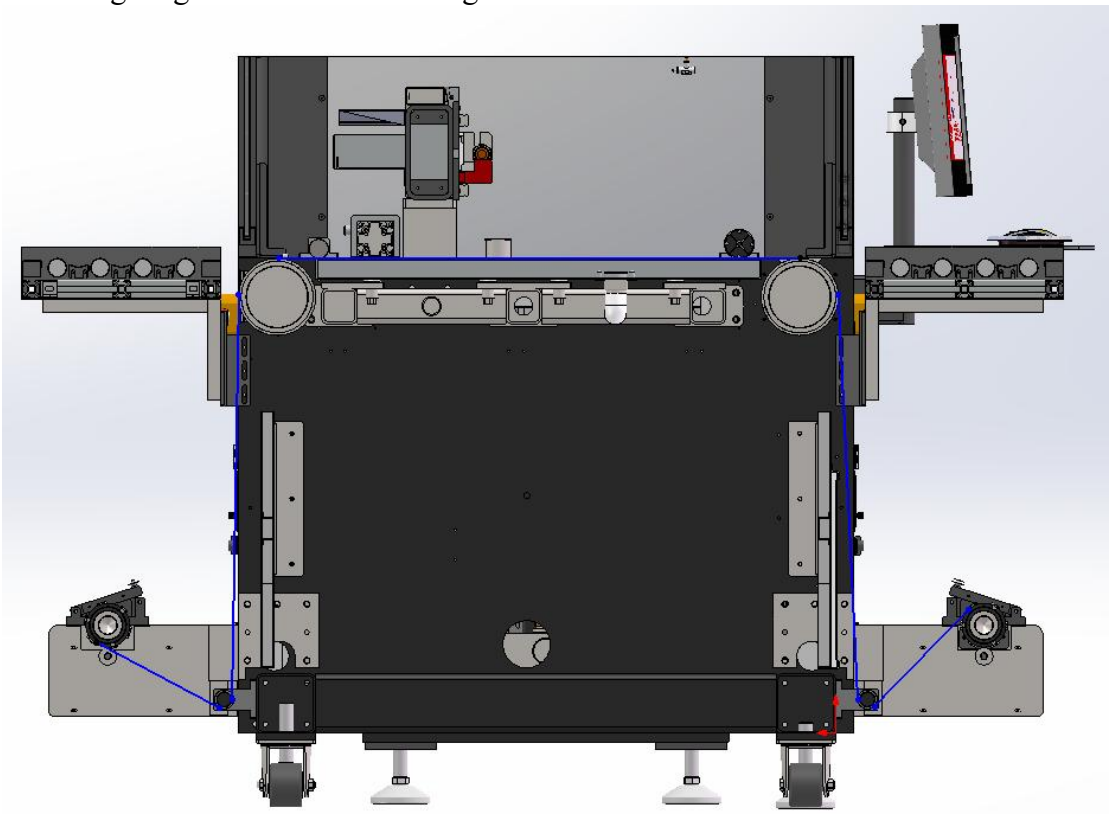


Fig. 49: Media feeding and take-up device loading mode

The tension of the media feeding and take-up system is adjusted by a torque controller (the same for front and rear)

REV: Reverse Control STOP: Stop FWD: Forward Control

Fig. 50: Media feeding and take-up control panel

Switch sequence of the DQS UV Hybrid Printer

Power ON

Caution:
Please check whether there are foreign matters on the guiding belt when starting DQS 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 rear of the machine **(including the Emergency Stop switch on the handheld box)**.
3. Remove the moisturizing tray.
4. Turn on the computer and start the PrinterManager software.
5. Press the **Start button** on the front right of the machine. Start the machine, the carriage rises to the highest point——》to the left to the origin——》the carriage drops to the height set before by the software——get ready)
6. 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.
7. Press “Automatic Maintenance”, the carriage rises to the highest position, which is convenient to clean the print head surface.
8. Put in the print material and set the print height and original point.
9. Start printing.

Ink pressing of the print head during printing

In case of printing disconnection during printing, click "Automatic cleaning" or "Maintenance" in the software. The carriage will move to the leftmost end of the beam and rise to the highest after printing current PASS. After manual inking, clean the print head surface, click "Maintenance", the carriage will automatically return to the last printing height and continue printing.

Power OFF

Power off processes

1. Press the Emergency Stop switch and close the moisturizing tray and the ink valve body.
2. Shutdown the computer.
3. Turn off the leakage protection switch of the main power supply of the machine.

DQS20 Series UV Hybrid Printer

Software Installation

Software Installation

Note:
The printer is not supplied with operating computers, users must purchase their own. The minimum configurations required for use are listed as follows.

Computer configuration requirements

Parameter	Specification
Operating system	Windows 10 (64-bit)
CPU	Intel(R) Core™ i7@3.30GHz3.29 GHz or above
Mainboard	Brand mainboard of high quality
RAM	8 GB or above
Display card	Graphic display card with video memory above 1G
Internal HDD	500 GB or above
USB port	USB 3.0 x2
Input voltage	220V
Monitor	19-27″
Recommended brands	Lenovo/Dell

PM installation steps (installed with installation package)

Connect the reserved port of the machine to USB 3.0 interface of the computer, start the machine, and **right-click on "PMsetup-Common-20240411-v1.2.1"**. Then, run as administrator or run as administrator through Properties>Advanced>to start software installation in administrative mode (the version number will also be part of the file name, but it is not included as it is varied). The setup wizard window will appear. Open the file and select the PM installation program for installation.

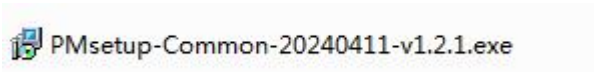


Fig.51: Installation step 1 of software

Select the installation language and click "OK" to proceed to the next step.

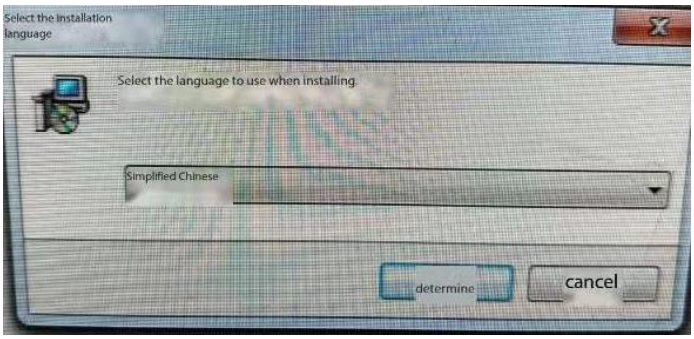


Fig.52: Installation step 2 of software

Select the USB port and click "Next" to proceed to the next step.

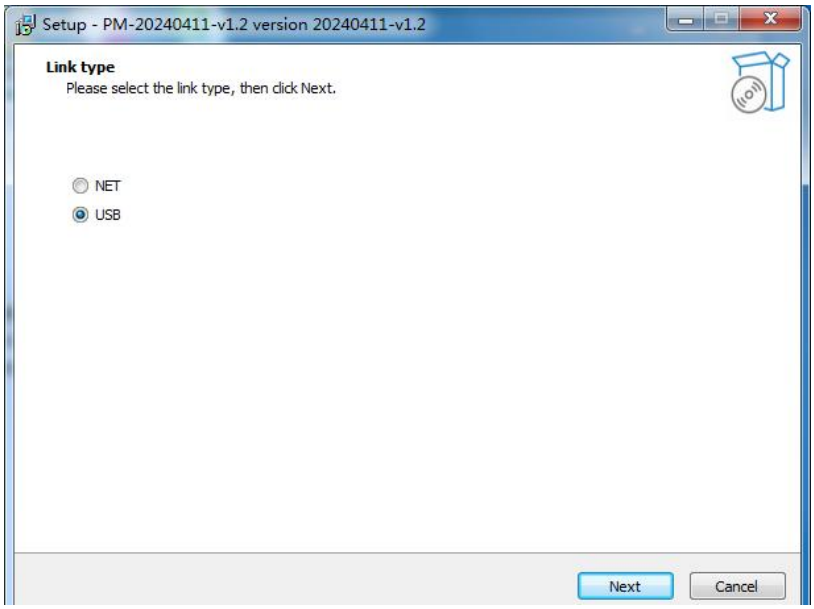


Fig.53: Installation step 3 of software

Select the agreement protocol and click "Next" to proceed to the next step.

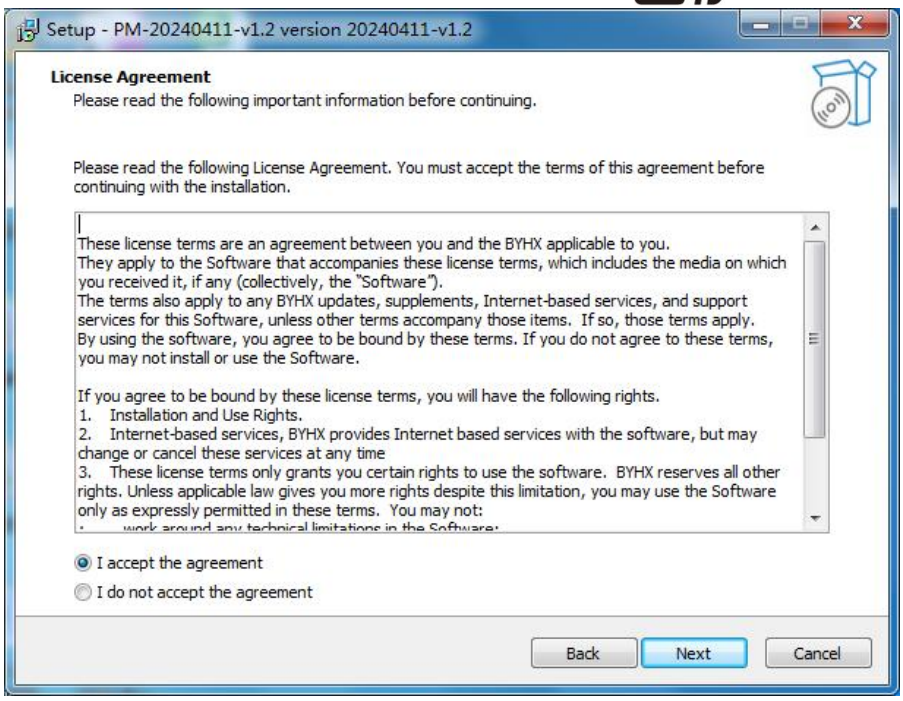


Fig.54: Installation step 4 of software

Select the installation path and click “Next” to proceed to the next step.

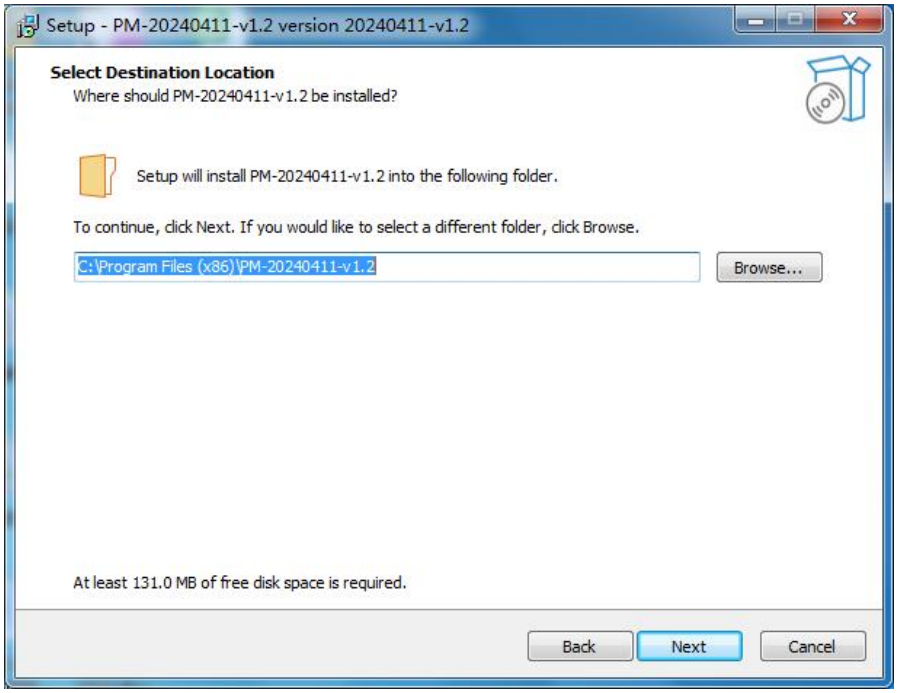


Fig.55: Installation step 5 of software

Click "Next" to install.

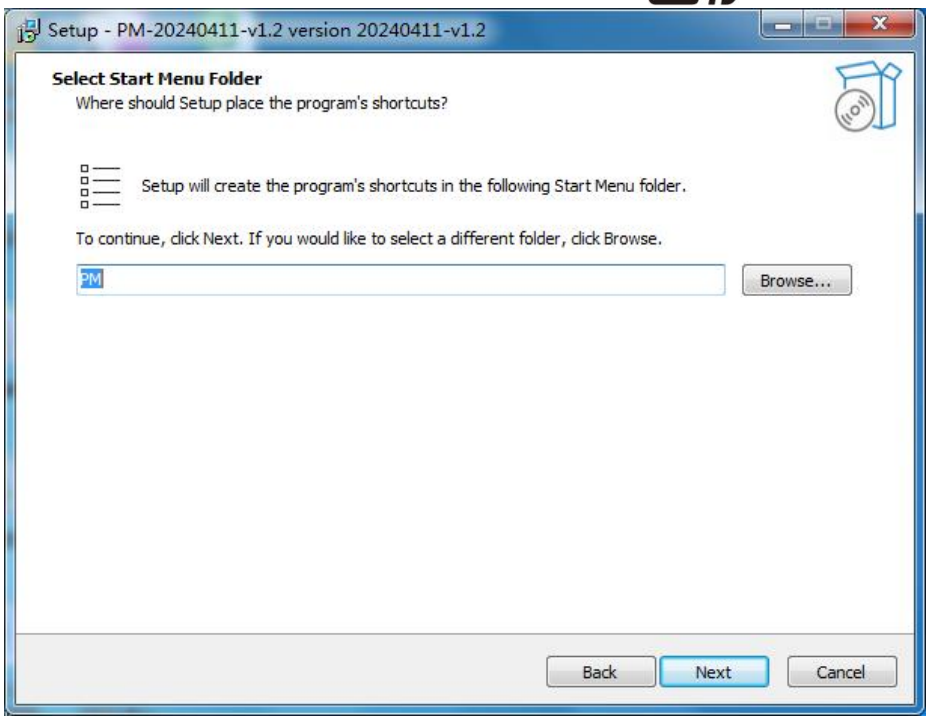


Fig.56: Installation step 6 of software

Click "Install" to start software installation.

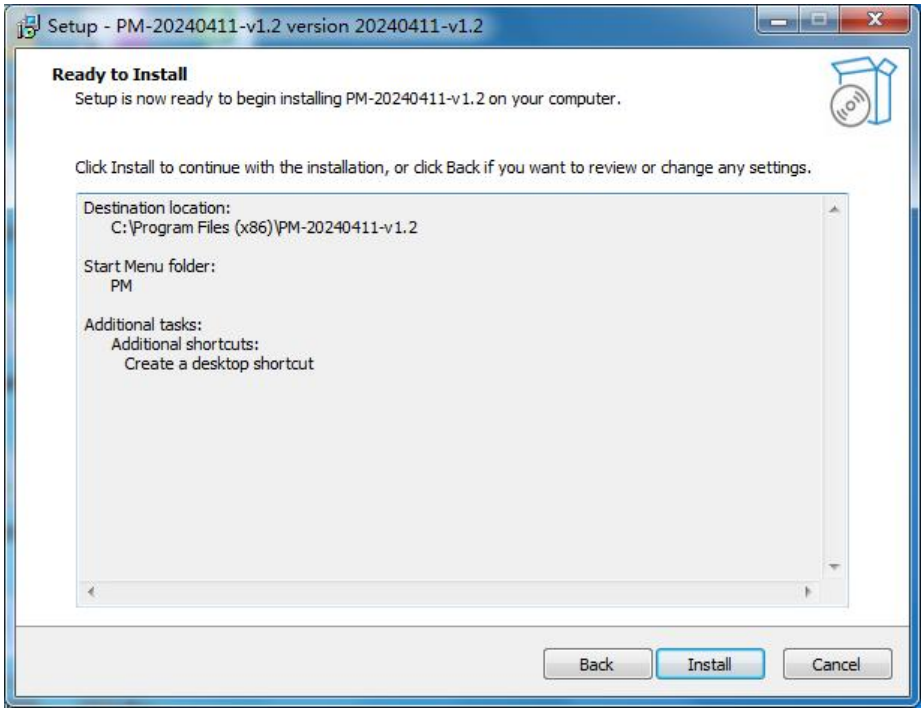


Fig.57: Installation step 7 of software

Click "Finish" to complete the software installation.

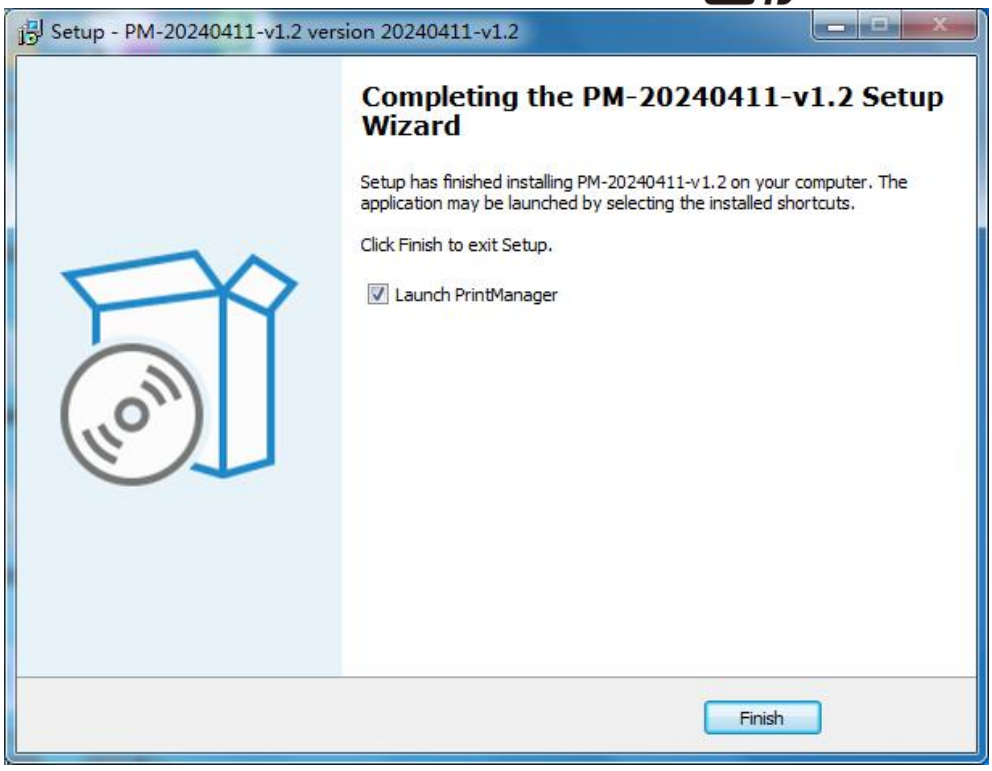


Fig.58: Installation step 8 of software

After installation is completed, open the "PM" software. When the UV hybrid printer is ready and online normally, it indicates that the UV hybrid printer driver has been installed.

Note:
Finally, set the PrinterManager software to run in administrator mode. To achieve this, right-click on the shortcut or exe file and select Properties>Advanced>Run as administrator.

This machine is connected via USB 3.0. Please select the USB connection mode during installation.

DQS20 Series UV Hybrid Printer

Machine Leveling and Locating

Mechanical leveling and positioning

Leveling the UV hybrid printer

Leveling the UV hybrid printer is the first step as well as one of the most important steps in installation of the machine. There are 8 adjustable feet to support the UV hybrid printer. The height of each foot can be adjusted with bolts to achieve the best leveling. Unscrew the supporting feet of 4 corners of the rack to make its universal casters suspended; screw other supporting feet to make its universal casters go above the ground; the following figure shows the style of one foot used by this machine.

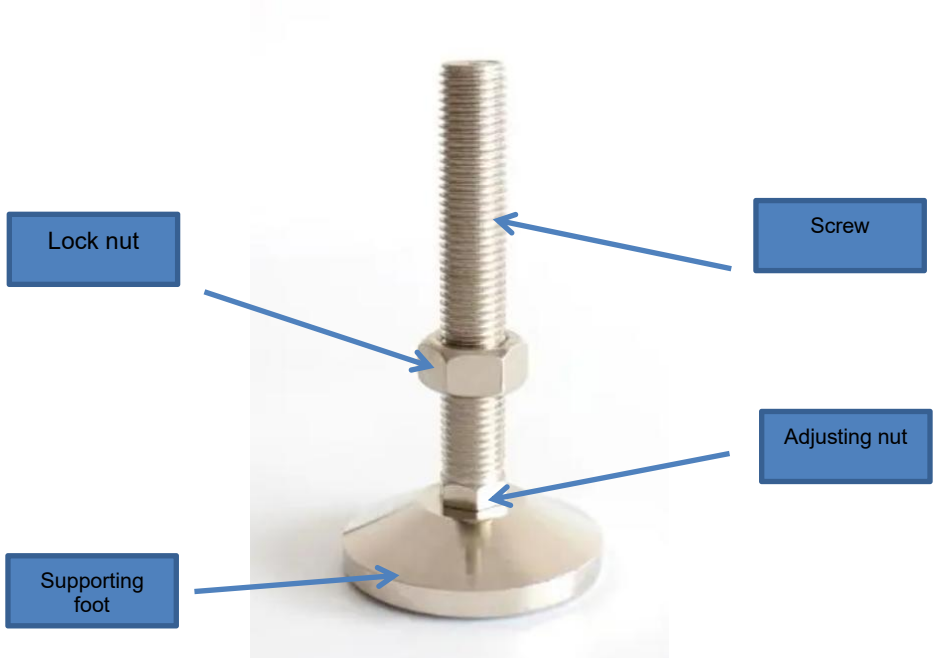


Fig. 59: Supporting foot

Once the machine is leveled, the foot should be locked onto the base of the UV hybrid printer by using the lock nut. Use an adjustable wrench or open wrench to rotate the lock nut clockwise to unlock the foot and rotate the lock nut counterclockwise to lock the foot.

Use the adjustable nut to raise or lower the foot cup base. Use an adjustable or open wrench to rotate the nut clockwise to lower the foot cup base and then raise the UV hybrid printer. When rotating this nut counterclockwise, the foot cup base will be raised and then the UV hybrid printer is lowered.

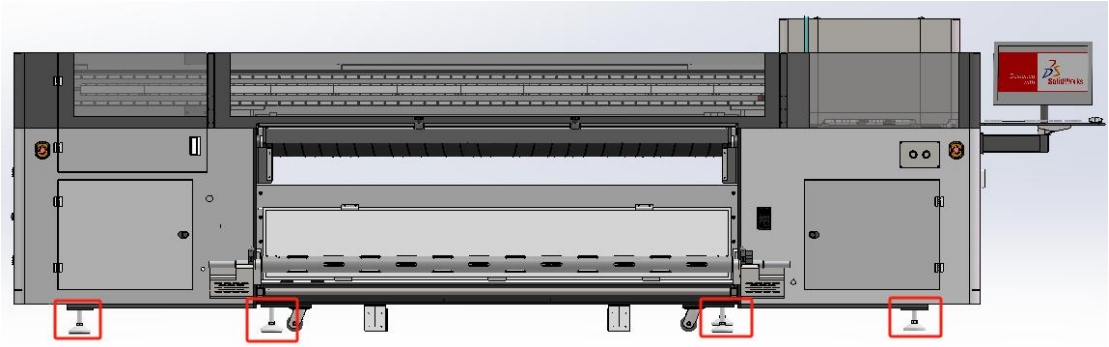


Fig. 60: Supporting foot

Level in the X and Y direction of the machine by using a frame level as the measuring tool. Leveling the machine by adjusting the supporting feet of the rack, adjust the level, so that the bubble on the frame level is in the middle position, and the bubble for accuracy is within 1 grid slightly left or right in the middle.

Adjustment of the air suction platform of machine

Important Information:

Please carefully read the following method for adjusting the flatness of the platform. It needs to be adjusted by professional after-sales personnel. Improper adjustment method will lead to permanent damage to the platform. The platform can bear 25Kg per square meter. Please do not stand on it.

The flatness error of the platform is no greater than ±0.2 (factory acceptance standard). It needs to be adjusted only when the platform flatness error is substandard and affects the print precision.

Since the air suction platform is inside the mesh belt, when readjusting the platform, the mesh belt must be removed before adjusting the platform, and then the mesh belt is installed for adjustment.

Important Information:

The guiding belt should be moderately tensioned rather than excessively, so that the guiding belt and the drive roller do not slip. Excessive tension may cause deviation and wear to the guiding belt. As this machine does not come with an automatic corrective structure, after adjusting the guiding belt without deviation, the guide wheels on both sides should be adjusted to about 2mm from the edge of the guiding belt.

Dismounting/mounting and adjustment of guiding belt

Dismounting of the mesh belt:

Step 1: Transfer the joint of guiding belt to the position above the platform near the operation surface;

Step 2: Adjust the tension roller to the position nearest to the driving roller;

Step 3: Remove the glue at the sealing parts at both ends of the guide belt joint;

Step 4: Pick out the head of filler wire at both ends from the joints with an awl and straighten it;

Step 5: Draw the filler wire out of the guiding belt; Please note that the wire should be pulled out slowly with constant force;

Step 6: Pull off the joint of the guiding belt directly by hand or with a pen slowly;

Step 7: Roll up the dismounted mesh belt with a paper tube, and protect the joint and corner well.

Mounting of the mesh belt:

Step 1: Adjust the tension roller to the position nearest to the driving roller;

Step 2: Clean the oil stain, dust and other foreign objects on the surfaces of the suction platform, driving roller, tension roller and middle support roller;

Step 3: Bind the driving roller, tension roller and correction roller with mesh belt for one circle, then keep the joints at both ends of the mesh belt in the center above the platform, and align the two ends to connect them. Please note that the loops with white marks shall be put outward;

Step 4: Buckle and press the loops at both ends of the mesh belt joints alternately in order by fingers, marker pens, screwdriver handles or other non-metallic tools ;

Step 5: Thread the round filler wire from one end to the other end of the joint, and allow for ends of about 20mm on both sides;

Step 6: Insert the ends into the joints reversely;

Step 7: Adjust the mesh belt connected with the joints to the middle position of the platform, and make sure that the front and rear positions can be aligned as far as possible without twisting;

Step 8: Adjust the tension screws at both ends of the tension roller to tension the mesh belt. The mesh belt shall be just tensioned without slipping for the fist time, while the final requirement is that the suction is opened by 60% with the whole carriage sticker placed above the platform, and the mesh belt shall not be allowed to slip.

Step 9: Turn on the machine to keep the driving roller working in the positive direction. Then check the tightness of both sides of the mesh belt and the deviation;

Step 10: In case of deviation, fine adjust the tension screws at both ends of the tension roller; It is noteworthy that the adjustment shall be carried out slowly rather than quickly at large angles;

Step 11: If the mesh belt runs continuously for more than 0.5 hour in the positive direction with no correction device without deviation, bulging or distortion, it is deemed as acceptable; (Paste wood grained paper on the edge of the mesh belt, and mark a point as the check point).

Step 12: If the machine with a correction device involves the deviation correction structure in the mesh belt operation control and can operate continuously for more than 1 hour, it is deemed as acceptable if there is no abnormality.

Step 13: After adjustment, the two ends of the mesh belt joint can be properly sealed. Please note that a piece of paper should be placed under the joint at both

ends to prevent the glue from polluting other parts when sealing.

If resistance is encountered during the threading process with filler wires, the awl can be used to find the position of the screw head, leave a distance behind to pick out the screw head, pull out the filler wire at the tail, cut off a small section of the screw head, and then continue to thread forward where it came out; If resistance is encountered again during threading, the operation described above can be repeated until filler wires are threaded through the mesh belt completely.

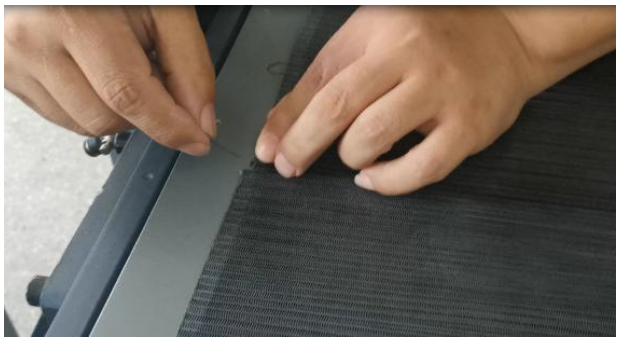


Fig. 61: Mounting of the mesh belt

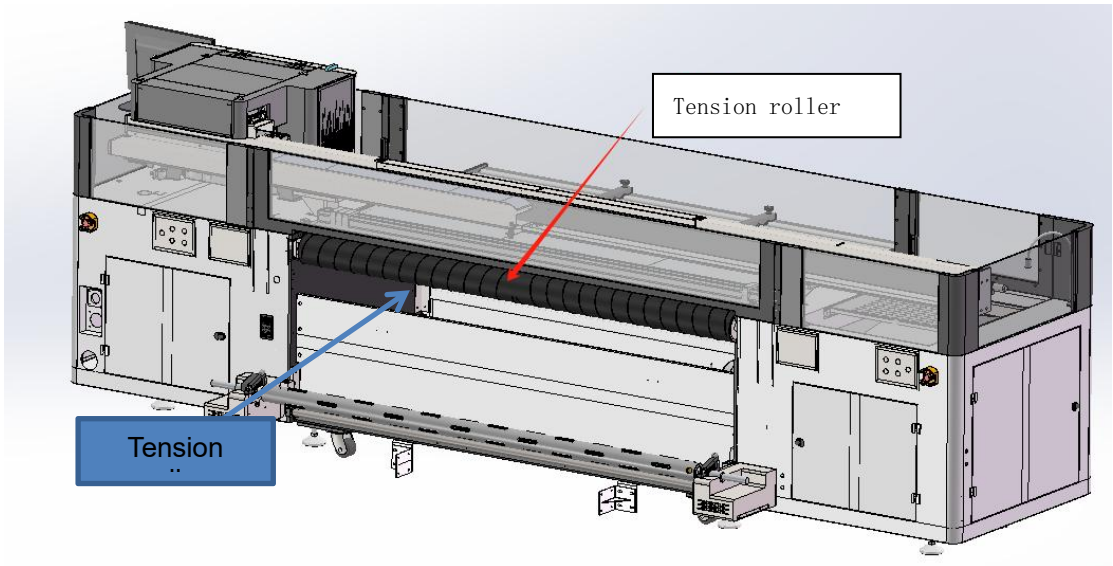


Fig. 62: Tension roller

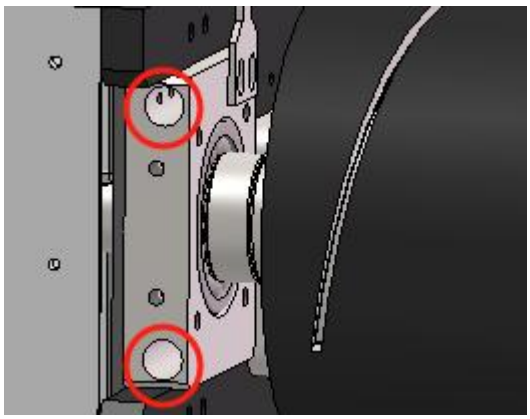


Fig. 63: Positions of adjusting screws for tension roller

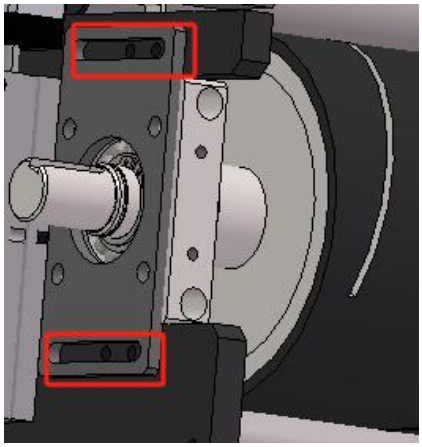


Fig. 64: Positions of lock screws for tension roller

Adjustment of air suction platform

The air suction platform is fixed with a single adjusting (supporting) point.

The single adjusting point of the air suction platform consists of the air suction platform, machine rack, jacking screw (platform adjusting screw), tensioning screw (hexagon socket head cap screw), flat washer and spring washer (Figure 46);

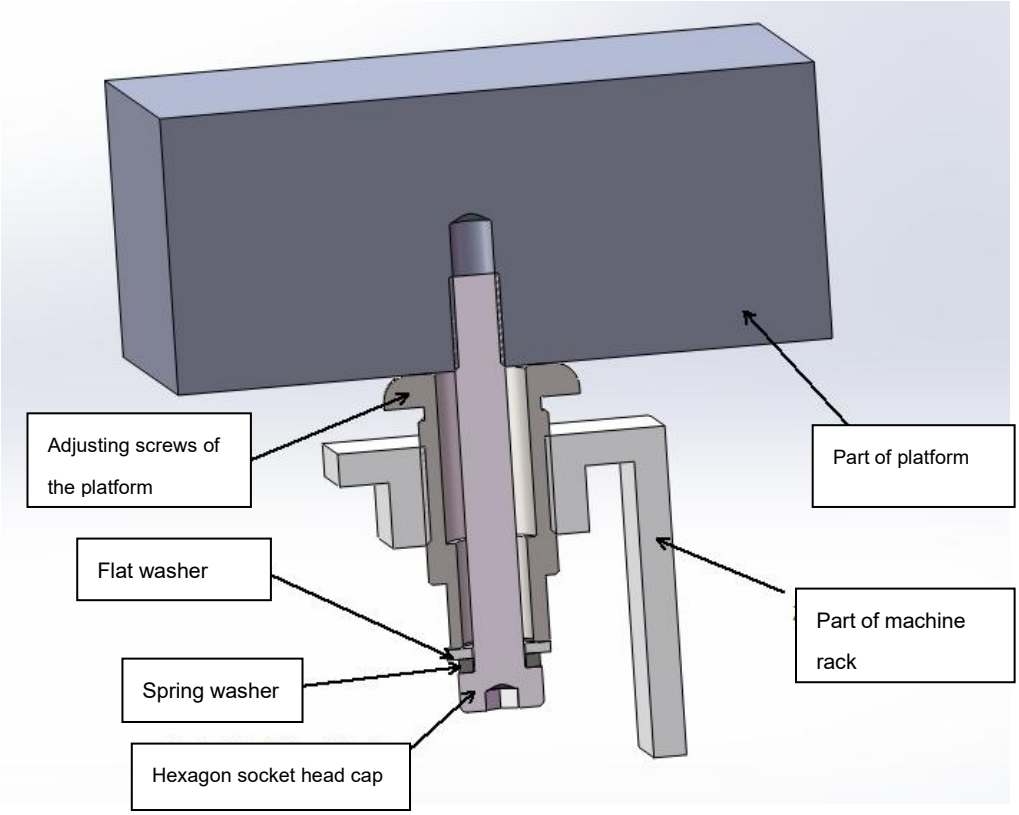


Fig. 65: Diagram of adjusting point positions of the air suction platform

Methods of adjusting the platform: Select the adjustment point as the zero point according to the initial inspection error value, first adjust a row of adjustment points close to the beam, and then adjust the outer row of adjustment points; Requirements for flatness error of the platform: the adjustment point of the printing area shall be less than 0.10mm, and the non printing area shall be less than 0.20mm.

During adjustment, it shall be noted that there shall be no gap between the adjusting bolt and the platform; Remove all tooling parts after adjustment.

Adjusting screws are placed below the adjustment points marked on the platform. Under the platform at the corresponding position of the adjustment points, the tightened screws should be adjusted with an internal hexagonal wrench (6); while the upward bolt should be adjusted with an open end wrench (14);

The platform is adjusted with the adjusting (supporting) point position of the machine. As shown in Figure 66 below:

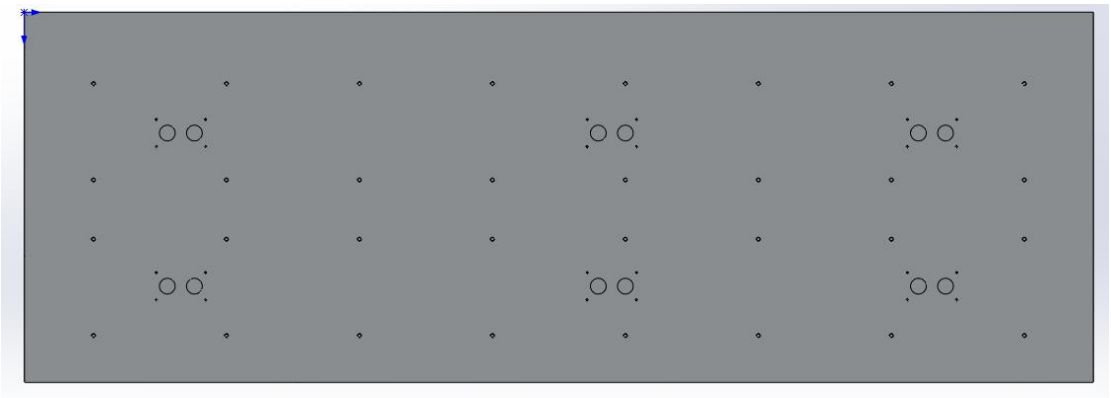


Fig. 66: Adjustment points of the platform

Adjustment steps of the air suction platform of machine:

Step 1: There are marked points corresponding to the adjusting points on the platform, and such points can be circled with a marker pen to facilitate identification.

Step 2: Fix the dial indicator onto the carriage head by using the magnetic meter base; move the carriage to ensure all the adjusting points are measured.

Step 3: Move the carriage and measure all the adjusting points with the dial indicator and record the results.

Step 4: Take the mean value of the measured values or the more concentrated height value as the reference value, and adjust the height of each adjusting point to the reference value.

Step 5: Move the carriage to measure the overall flatness of the platform and check the platform flatness error after adjustment; if it cannot meet the acceptance standard, the position where the flatness is substandard should be recorded; properly adjust the height of the nearby adjusting points, until the platform flatness error meets the requirement of the acceptance standard.

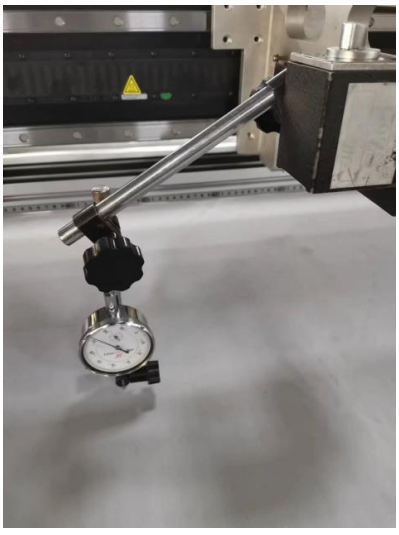


Fig. 67: Dial indicator

Note:

This work will be completed by 2 persons, with one adjusting the screw under the machine, and the other reading the numerical value above the machine. The one who reads the numerical value can be one worker of the client.

Caution:

In this process, the machine has been powered on. Since the platform is adjusted under the platform, work needs to be performed nearby the electrical system. The machine must be powered off in adjustment. Please note all the electric shock warning signs.

Caution:

The flatness adjustment process of the platform is completed, and the machine is prohibited from working. Otherwise, the machine may be damaged.

Tools required

S/N	Tool specification	Qty.
1	Allen wrench 6mm	1 for each
2	Open-end wrench 14mm	1 for each
3	Dial indicator with a magnetic seat	1

Leveling of print head base plate

Adjust the parallelism between the print head base plate and the mesh belt print platform and measure it with a feeler gauge or dial indicator; Drag the carriage to measure the spacing between the print head base plate and the platform (overall length). If case of an error, adjust the print head base plate or the platform to ensure the error of the entire platform is less than 0.5mm.

When encountering situations where adjustments cannot be made or faults cannot be eliminated during the debugging process, the debugging personnel should provide timely feedback, solve the problem in time, and classify and summarize the problems that arise during debugging.

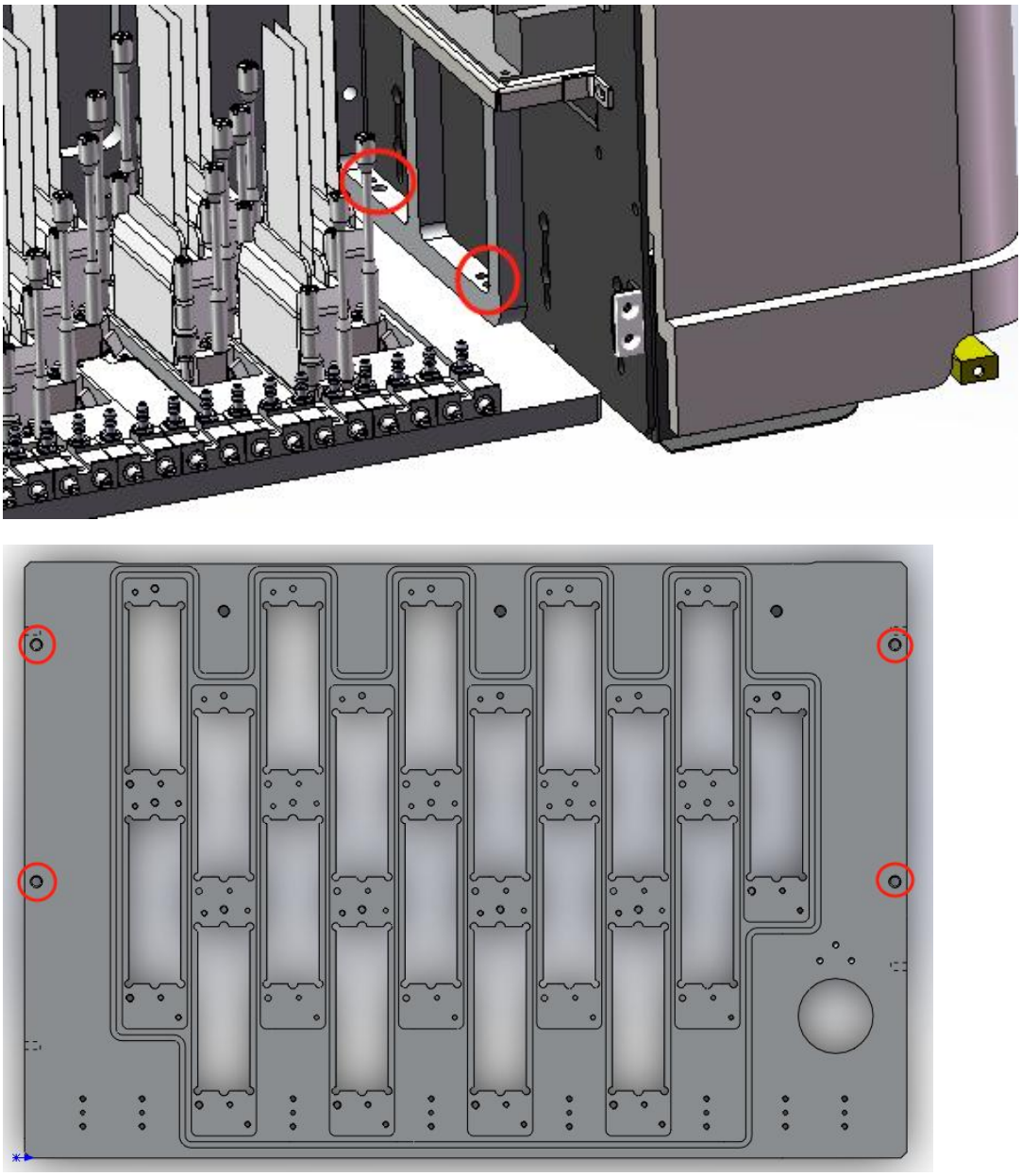


Fig. 68: Position of adjusting screws of print head base plate

Note:

Figure 69 shows the position of adjusting screws on the print head base plate. By fastening the locking screw, the base plate can be pushed downward to the platform. By fastening the fixing screw, the base plate can be pulled upward and get further from the platform.

Note:

To adjust screws more conveniently and make preparation for future calibration, any other parts should not be installed onto the print head base plate at first.

Steps for adjusting the print head base plate:

Step 1: Push the carriage to the middle of the platform manually.

Step 2: Lower the carriage to make it about 2mm from the print head base plate to the mesh belt surface, and use the manual lift wrench in the accessory box to rotate the hand wheel seat at the tail of the motor in the Z direction (see Figure 69 for the position).

Step 3: Measure the height of four corners of the print head base plate with a feeler gauge and calculate the error value.

Step 4: Take the mean value of the measured values or the more concentrated height value as the reference value, and adjust the height of each adjusting point to the reference value.

Step 5: Place four identical coins at four corners of the print head base plate after making the print head base plate level through adjustment (Figure 51) and check the gap at four corners; if the error is greater than 0.5mm, perform fine adjustment to make the level error meet the

requirement.

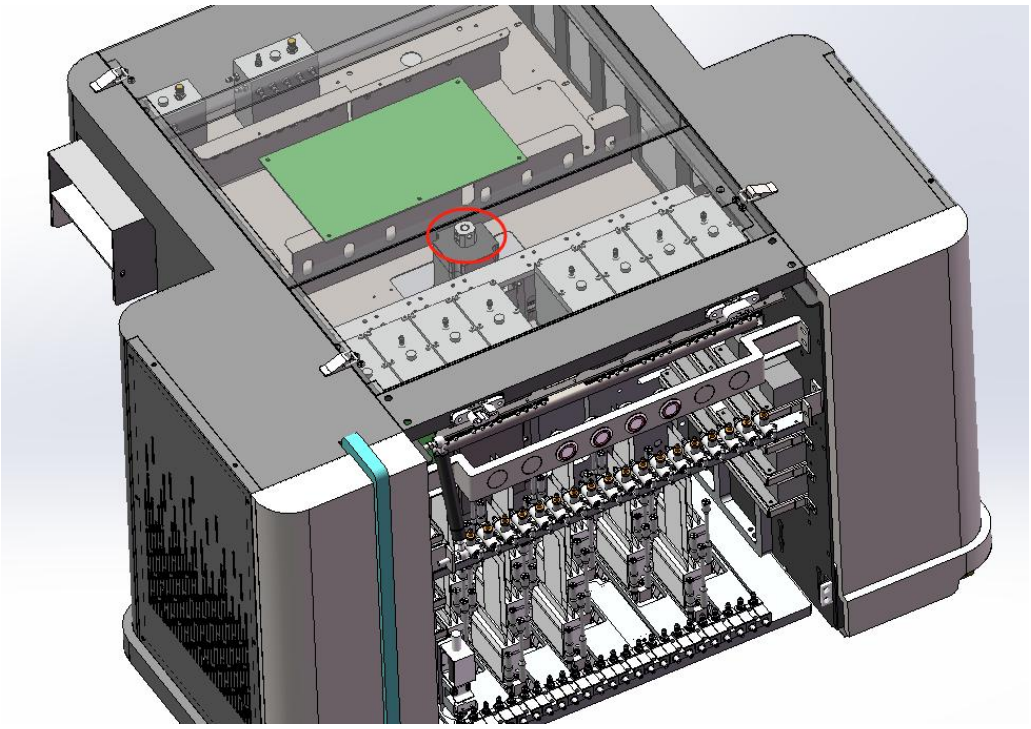


Fig. 69: Z-direction lifting hand wheel base

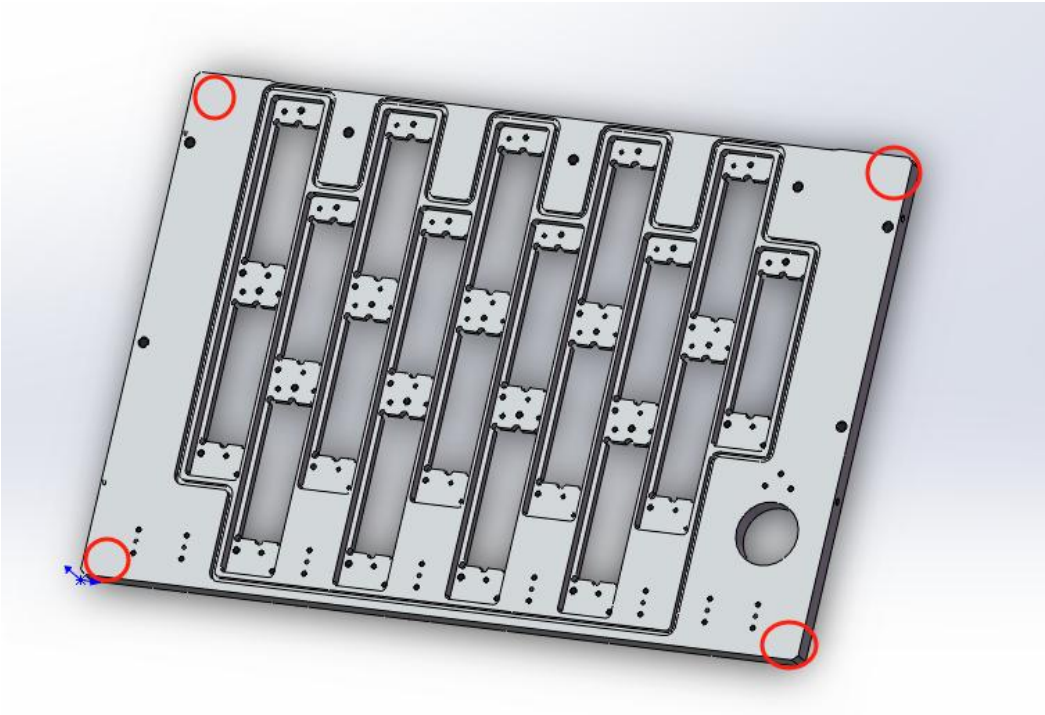


Fig. 70: Position for placing the retest coins on the print base plate

Adjustment of anti-collision assembly

2 anti-collision sensors are installed on both sides of the carriage. If there are abnormal protruding matters higher than the normal height of printed materials on the X motion path, the anti-collision sensor will be triggered, and the sensor will control the UV hybrid printer to make an emergency stop, and the carriage stops moving.
If any anti-collision sensor is triggered, the UV hybrid printer needs to be restarted.

Caution:

Anti-collision sensor is a key part for protecting the print head. Please be sure to make it safe and effective in work. If the height of the anti-collision assembly is not set correctly, the print head may be damaged.

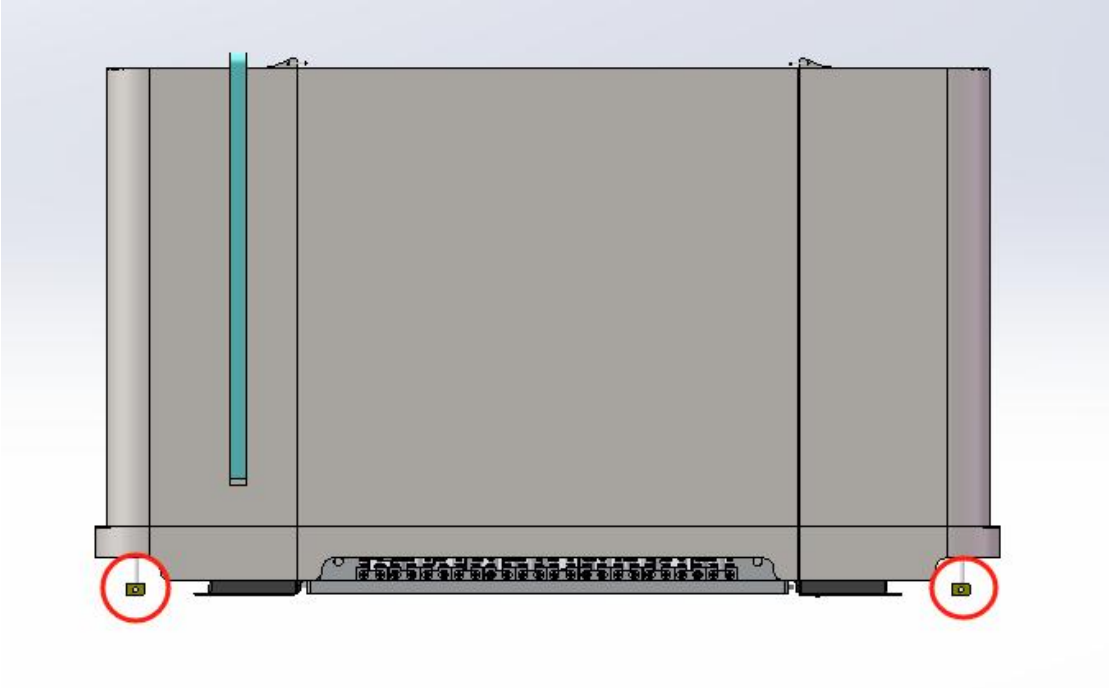


Fig. 71: Anti-collision assembly

Steps for adjusting anti-collision assembly:

Step 1: Push the carriage to the middle of the platform manually.

Step 2: Lower the carriage to ensure the print head base plate just contacts the mesh belt. Use the manual lift wrench in the accessory box to rotate the hand wheel seat at the tail of the motor in the Z direction (see Figure 50 for the position).

Step 3: Adjust the fixing screws of the anti-collision assembly on both sides of the carriage to ensure that the front and rear of the anti-collision strip just contacts the mesh belt.

Step 4: Raise the carriage for about 2mm after adjusting the position of the anti-collision assembly, and push the carriage left and right to check the distance between the anti-collision assembly and the mesh belt.

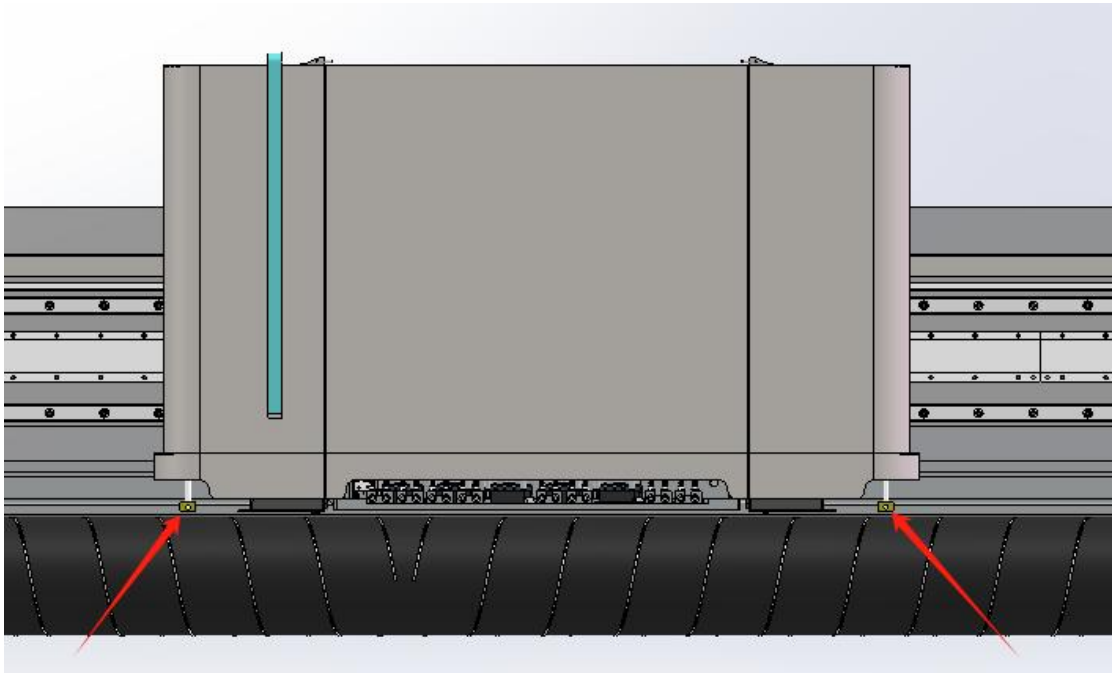


Fig. 72: Adjustment of the Distance between the Anti-collision Strip of the Anti-collision Assembly and the Mesh Belt

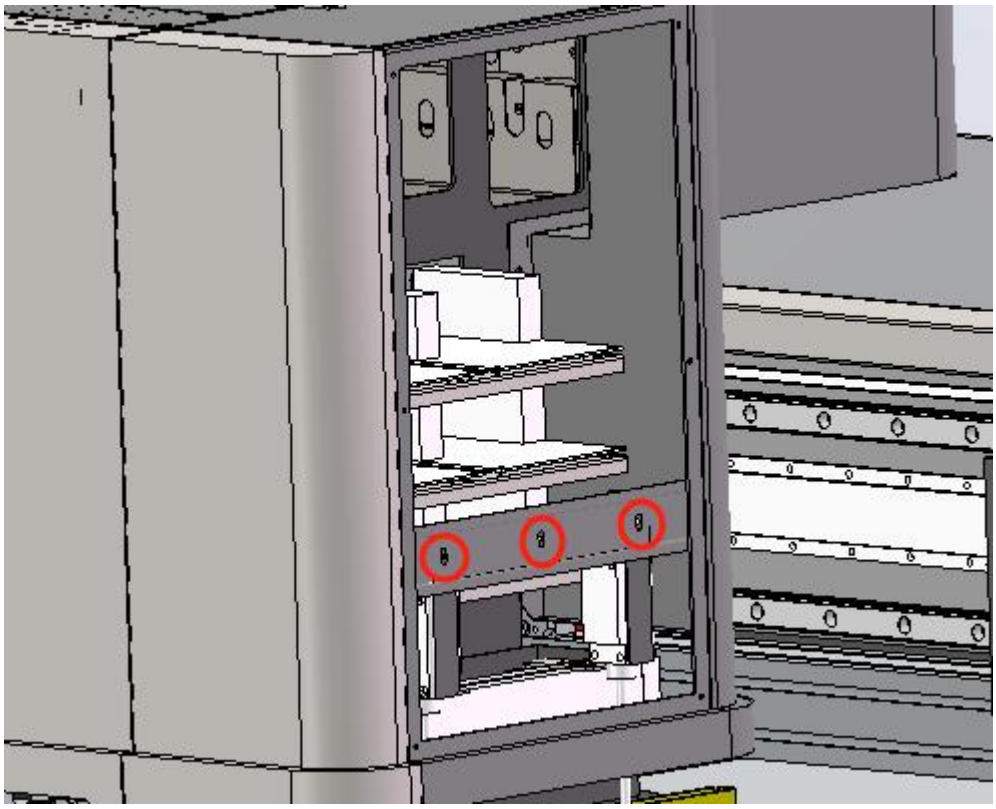


Fig. 73: Fixing screws of anti-collision assembly

DQS20 Series UV Hybrid Printer

Installation of Print Heads and connection of Ink Routes

Note:

Before positioning the print heads on the print head base plate, please check the labels on the print heads and record the nominal ignition voltage of each print head to be installed. The table below this Note is created to help achieve this. Ensure that all voltages are recorded and keep this table for easy reference during installation and maintenance.

Try to divide each color part of the print head into 3 or 2 groups, so that their emission voltages match as closely as possible. This will make the color balance process between the print heads of each pair of colors significantly easier. It will be more difficult to balance the print heads with the same color but significantly different voltages, which may lead to potential issues with regard to density and gloss bands.

Also, please note the location where the print head will be installed inside the carriage.

Group I	Print head 1	Voltage	Print head 1	Voltage	Print head 1	Voltage
	A		A		A	
	B		B		B	
	C		C		C	
	D		D		D	
Group II	Print head 2	Voltage	Print head 2	Voltage	Print head 2	Voltage
	A		A		A	
	B		B		B	
	C		C		C	
	D		D		D	
Group III	Print head 3	Voltage	Print head 3	Voltage	Print head 3	Voltage
	A		A		A	
	B		B		B	
	C		C		C	
	D		D		D	

Voltage Record

Print head (Ricoh GEN6)

1,280 nozzles are configured as 4 x 150dpi rows. The head realizes high definition of 300dpi of every channel. In addition, ink routes are isolated, enabling that one print head jets as many as two colors of ink.

The print head of Ricoh UV hybrid printer is made of stainless steel at the bottom. Such print heads are very firm and provide extraordinary anti-corrosion performance for types of printing ink to achieve extraordinary durability and longer service life.

With a built-in heater, such print heads are capable of jetting high-viscosity printing ink. Multi-droplet function allows setting of a series of droplet sizes to realize Level 4 grayscale printing.

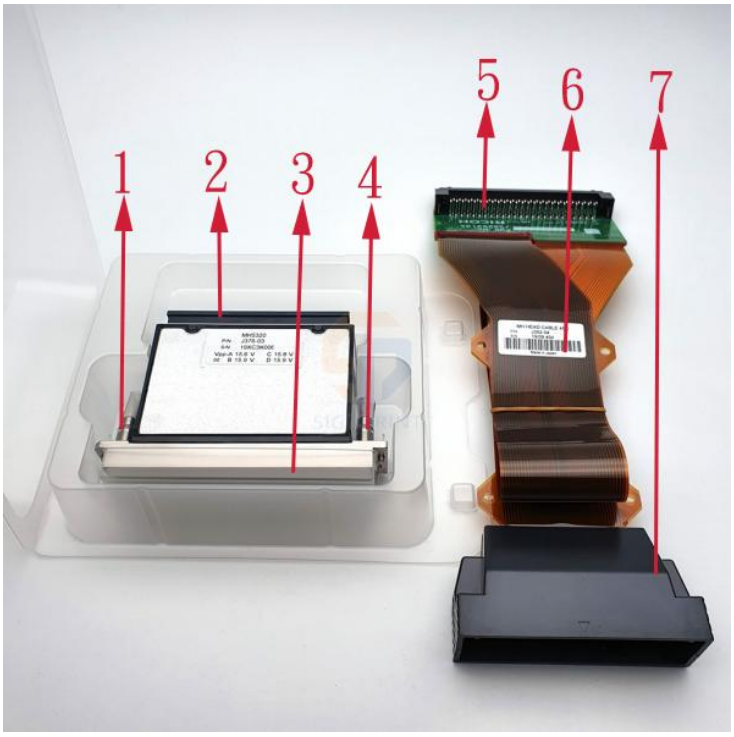


Fig. 74: Installation diagram 1 of Ricoh G6 print head

Fig. 75: Installation diagram 2 of Ricoh G6 print head

S/N	Description	Function
1	Ink outlet	The dual-channel ink outlet connects the ink tube to the exhaust two-way valve.
2	Power line interface of print head	Ricoh GEN6 print head improves the power line connection mode and allows for separate replacement of flexible cables to be free from any concerns about damaged cables that cannot be replaced
3	Metal nozzle	A metal nozzle is placed at the bottom of the print head, which improves the scratch resistance of the nozzle surface to a certain extent, and thereby extends the service life of the print head
4	Ink inlet	The dual-channel ink inlet connects the ink tube to the exhaust three-way valve.
5	PCB connector	PCB connector connects to the print head's drive board
6	Flexible cable	Connection cable between the print head power and the data signal
7	PCB connector	PCB connector connects to the power interface at the print head end

Parameter	Specification
Type	Print head with metal diaphragm plate
Print length	54.1 mm (2.1")
Qty. of nozzles	1280 (4 × 320 channels), in staggered arrangement

Nozzle spacing (4 color prints)	1/150" (0.1693 mm)
Nozzle spacing (line to line distance)	0.550mm
Nozzle spacing (distance between upper and lower bands)	11.81mm
Overall size of print head (excluding cables and connectors)	89(W) × 66.3(D) × 24.51(H) mm (3.5" × 2.6" × 1.0")
Weight	228 g
Maximum quantity of ink colors	MH5320: 2 colors
Operating temperature range	Up to 60℃
Temperature control	Integrated heater and thermistor
Jet frequency	Binary mode: 50kHz/Grayscale mode: 30 kHz
Reduced volume	Binary mode: 5pl/Grayscale mode: 5-15pl * Depending on the ink
Viscosity range	10-12 cPs
Surface tension	28-35mN/m
Grayscale	Level 6
Qty. of ink ports	2 dual-port
Locating pin direction	Front (standard)

Print head parameter

Print head color profile

Ricoh Gen6 MH5320 can achieve one head one color or one head two color printing on the same print head simultaneously. Each color channel consists of 640 nozzles arranged in two rows, totaling 1280 nozzles in combination. The following figure shows the arrangement modes of the nozzle.

LIYU

1

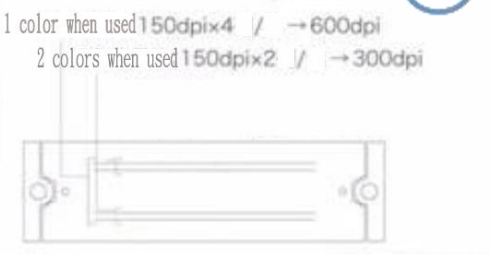
Product composition

MH5320 (two-colors model)

MH5320 (One-colors model)

2

3



Unpack the print head

Unpack the outer packaging box

Unpack the inner packaging box

Remove the plug tube of the ink inlet and remove the protective cover for the nozzle surface.

Fig. 76: Print head unpacking

Installation and locating of print head holder

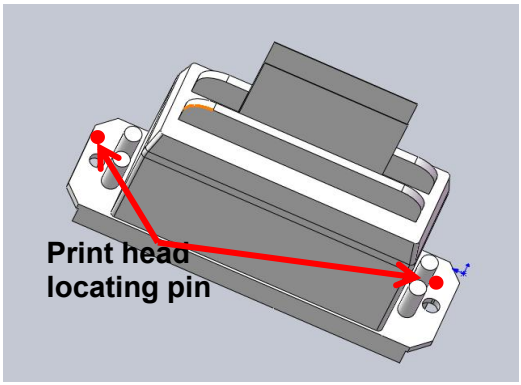


Fig. 77: Print head locating pin

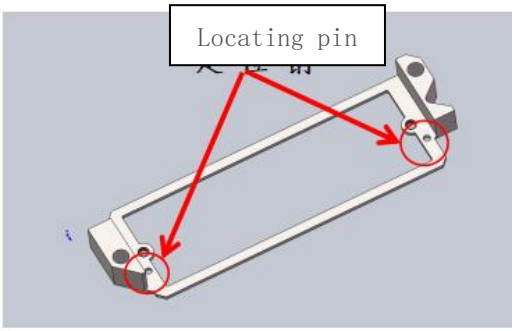


Fig. 78: Print head holder

Disassembling of adjusting screws of print head

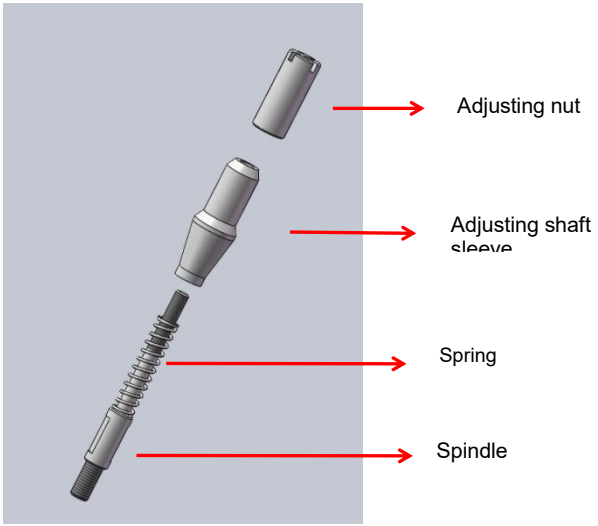


Fig. 79: Disassembling of adjusting screws of print head

Print head installation assembly

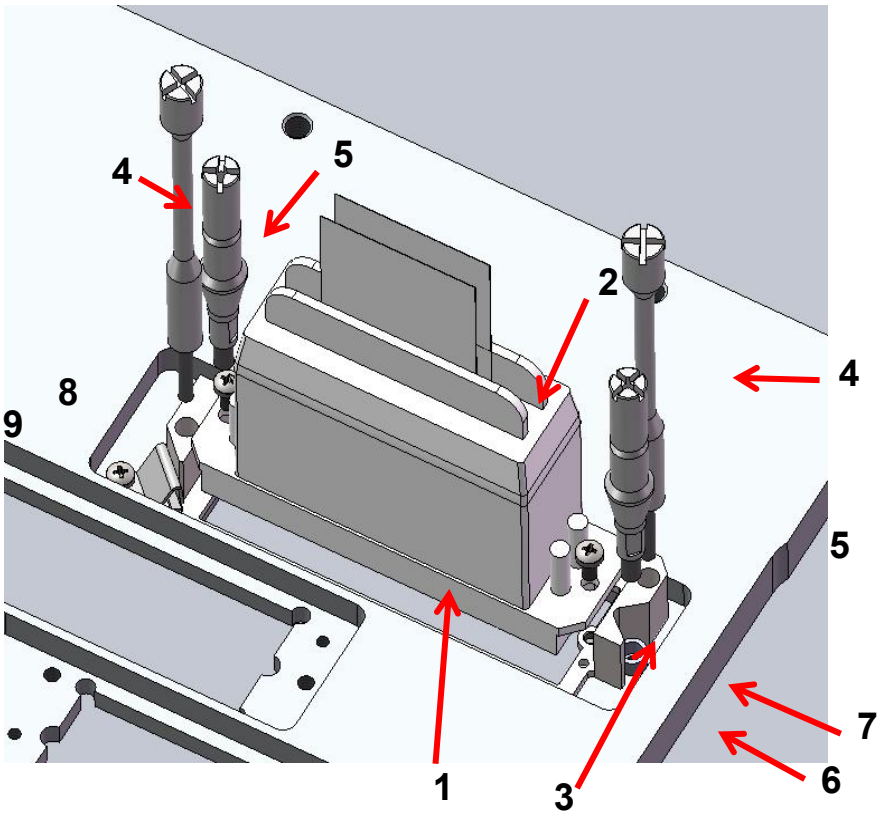


Fig. 80: Print head installation assembly

No.	Name of parts	Qty.	Specification	Description

1	Print head	Based on the installation quantity on order	Ricoh G6	
2	Print head cable	Based on the installation quantity on order	45cm	
3	Print head fixing screw	2	M3X6	Fix the print head onto the print head holder
4	Fastening screw of print head	2	M4	Fix the print head holder (extension screw)
5	Adjusting Screw for Print Head	2	M4	Adjust the inclination and front/back position of the print head
6	Hollow isolating column	2		Fix print head adjusting screws
7	Holder of print head	1		Main component of print head adjusting mechanism
8	Leaf spring	1		Adjust the print head
9	Clip fixing screw	1	M3X6	Fix clip

Steps for installing the print head

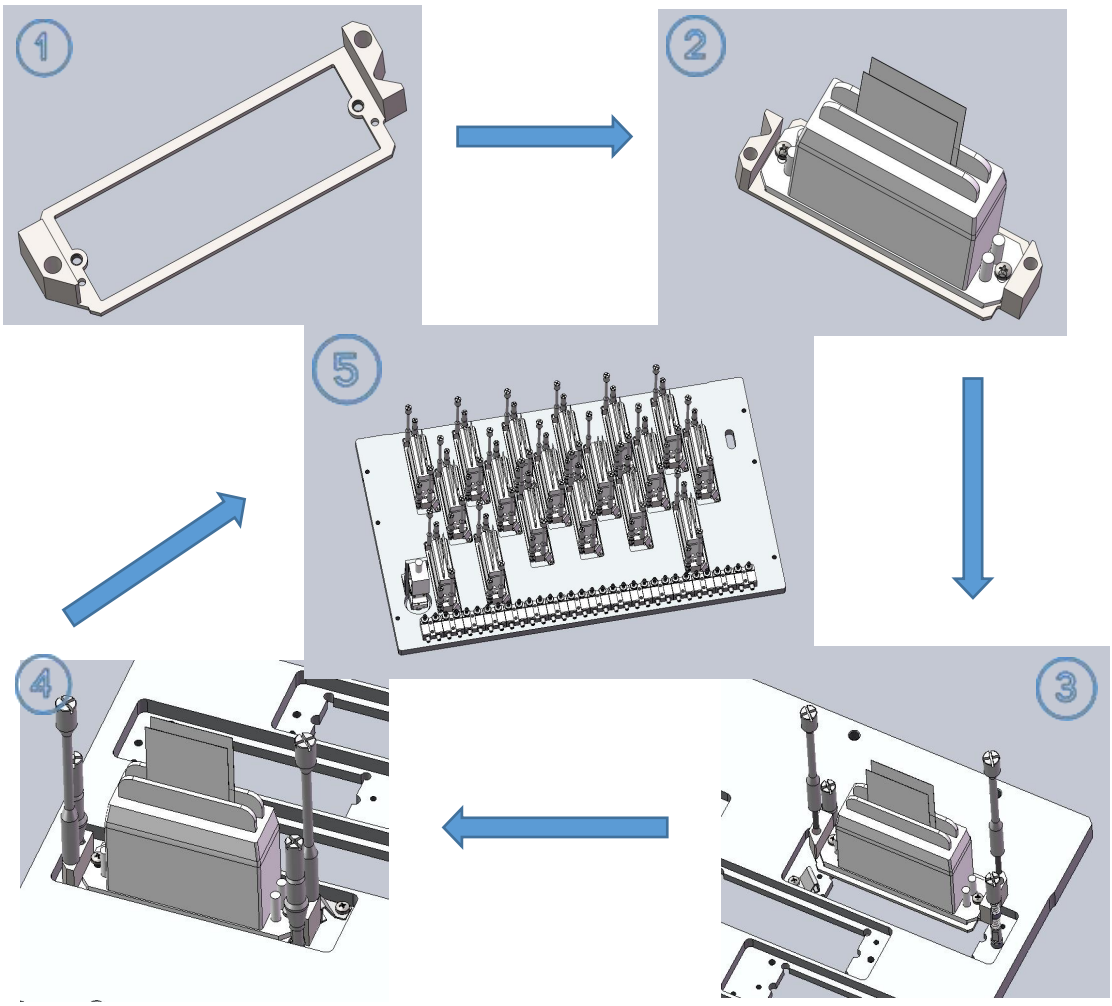


Fig. 81: Print head installation steps

Note:

1. The print head is provided with a locating pin. The position of the locating pin and the locating hole of the print head holder are determined.
2. All the print head fixing screws must be tightened and should not be loose.
3. After the print head is adjusted, all the screws should be checked to ensure that they are tightened.
4. When there are more than two rows of print heads, it is suggested that the first row should be installed and calibrated. And then the second row of print heads are installed and calibrated. This will save labor and time.

Connection of the ink tube of print head

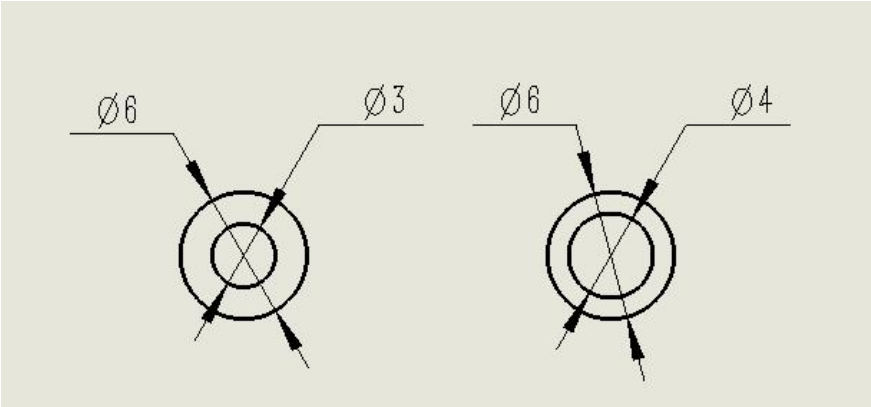


Fig. 82: Ink tube

Note:

There are two types of ink tubes. 3X6 ink tube mainly connects to the nozzle interface;

4X6 ink tube mainly connects to the upper part.

Connection of filter

15UM filter are between the secondary ink cartridge and the print head. This will prevent solid contaminants from entering and clogging the print head. Filter should be checked to ensure the correctness. It should follow the printing ink flow arrow direction or fit the ports.

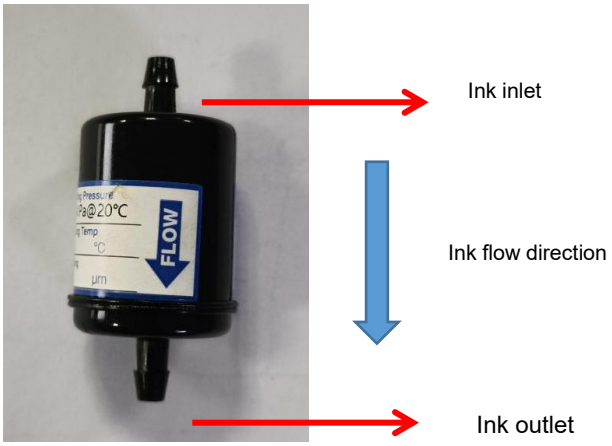
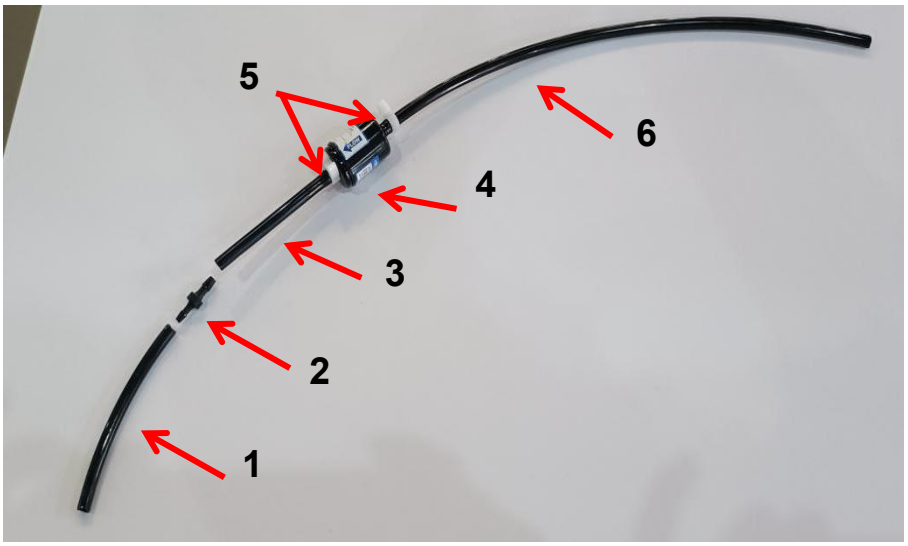


Fig. 83: Filter

Caution:
Check whether the twist and clamp on the filter are sufficiently tightened to ensure that they do not accidentally come loose, and the ink will not leak onto the harness or print head inside the compartment.

Connection method of one head two color ink tube

Diagram of connecting ink tube at ink inlet for print head

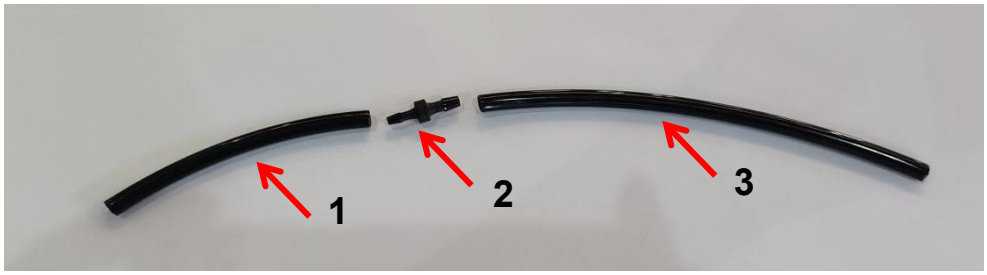


S/N	Parameter	Length	Specification
1	Ink tube	10CM	3X6
2	Straight-through connector		4X6
3	Ink tube	10CM	4X6

4	Filter		15UM
5	Clamp		6-7
6	Ink tube	25-30CM	4X6
	Type-Y three-way valve		6X4

Fig. 84: Connection of one head two color ink tube (method 1)

Diagram of connecting ink tube at ink outlet for print head

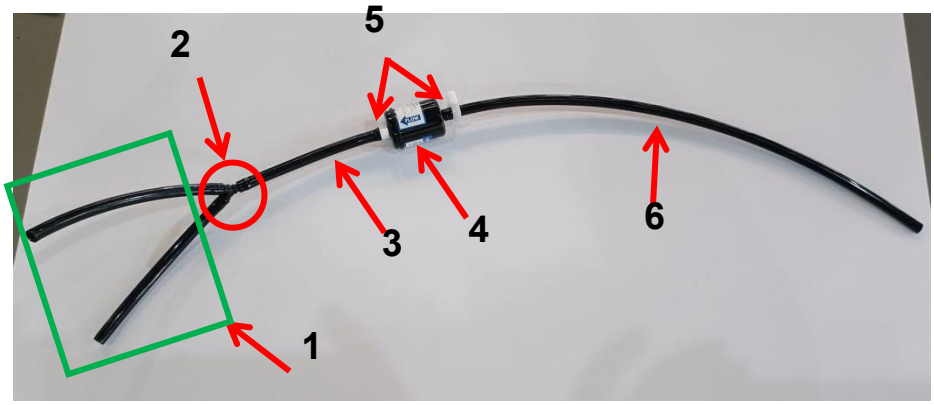


S/N	Parameter	Length	Specification
1	Ink tube	10CM	3X6
2	Straight-through connector		4X6
3	Ink tube	20CM	4X6

Fig. 85: Connection of one head two color ink tube (method 2)

Connection method of one head one color ink tube

Diagram of connecting ink tube at ink inlet for print head

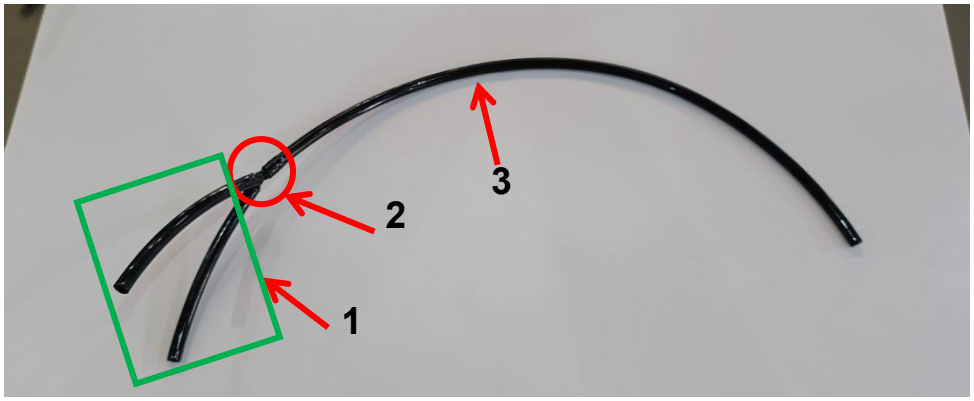


S/N	Parameter	Length	Specification

1	Ink tube	10CM	3X6
2	Type-Y three-way valve		6X4
3	Ink tube	10CM	4X6
4	Filter		15UM
5	Clamp		6-7
6	Ink tube	25-30CM	4X6

Fig. 86: Connection of one head two color ink tube (method 1)

Diagram of connecting ink tube at ink outlet for print head (Type-Y three-way)



S/N	Parameter	Length	Specification
1	Ink tube	10CM	3X6
2	Type-Y three-way valve		6X4
3	Ink tube	20-25CM	4X6

Fig. 87: Connection of one head two color ink tube (method 2)

Note:
These are recommended ink tube length above. If there are different requirements or special models, it is suggested to use the measured dimensions at the installation site.

Print head connection

Once the print head is installed on the print head base plate, ink tube connection can be made. For convenient operation, you can first connect the ink tube and then install the print head onto the print head base plate. The following figure shows how the print head is connected to the tube:

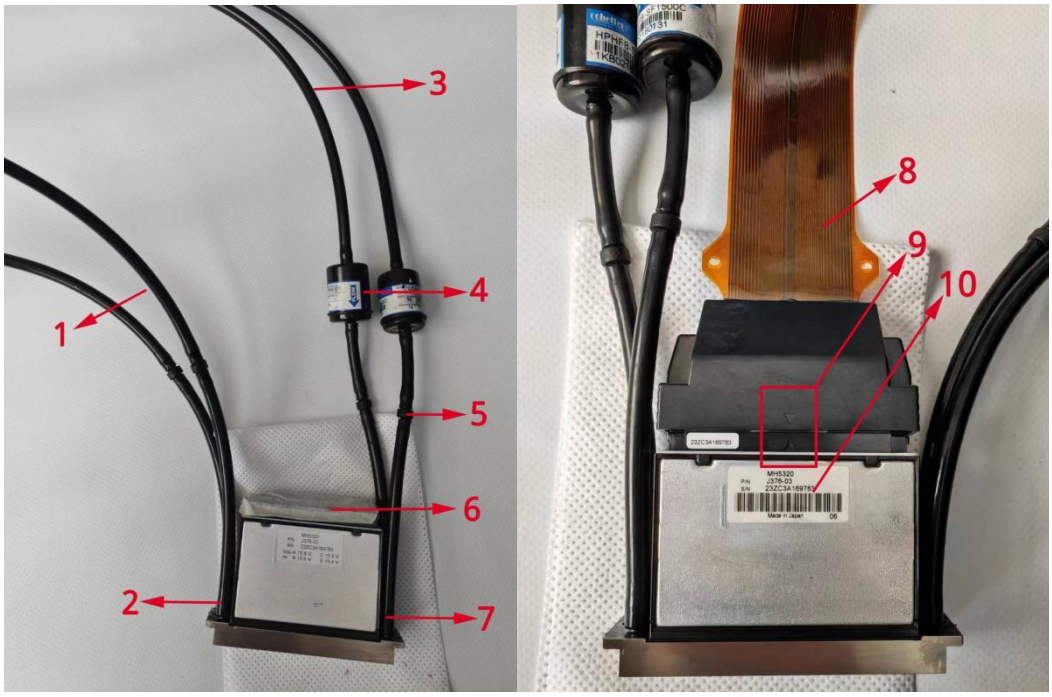


Fig. 88: Diagram of connecting one head two color ink tube

S/N	Description	Function
1	Ink tube at the ink outlet	Ink tube to which the print head ink outlet is connected, and which connects to the two-way valve.
2	Print head ink outlet interface	Print head ink outlet interface, with two separate ink channels.
3	Ink tube at the ink inlet	Ink tube to which the print head ink inlet is connected, and which connects to the three-way valve.
4	Filter	Print head pre-filter, to filter ink and other impurities and prevent clogging of the print head.
5	Joint	Φ 4 to Φ 3 ink tube joint, for tube diameter switching.
6	Print head cable interface	Ricoh GEN6 print head improves the connection mode of the cable, which can be replaced separately. When not connected, it is suggested to seal it with tape to prevent

		foreign objects or ink from entering.
7	Print head ink inlet	Print head ink inlet interface, with two separate ink channels.
8	Print head cable	The flexible cable of the print head connects the print head to the drive board, thus driving the print head
9	Cable protection cover	Cable protection cover, marked with arrows to prevent reverse insertion, allows you to confirm the cable and print head connection direction.
10	Print head identification	Print head number identification, which indicates the print head model, number and other parameters.

Caution:

Due to narrow space in the compartment, when installing the print head, it is important to protect it from scratch or damage, especially at the bottom of the print head.

Three-way valve to print head and two-way valve

When the machine is configured with 8 colors, the standard configuration of each connected color is connected according to the following diagram. The client can change the color configuration mode according to its own needs. For the color channel not enabled, keep the three-way valve closed. If only 4 colors are configured, the tube in the corresponding color will be configured.

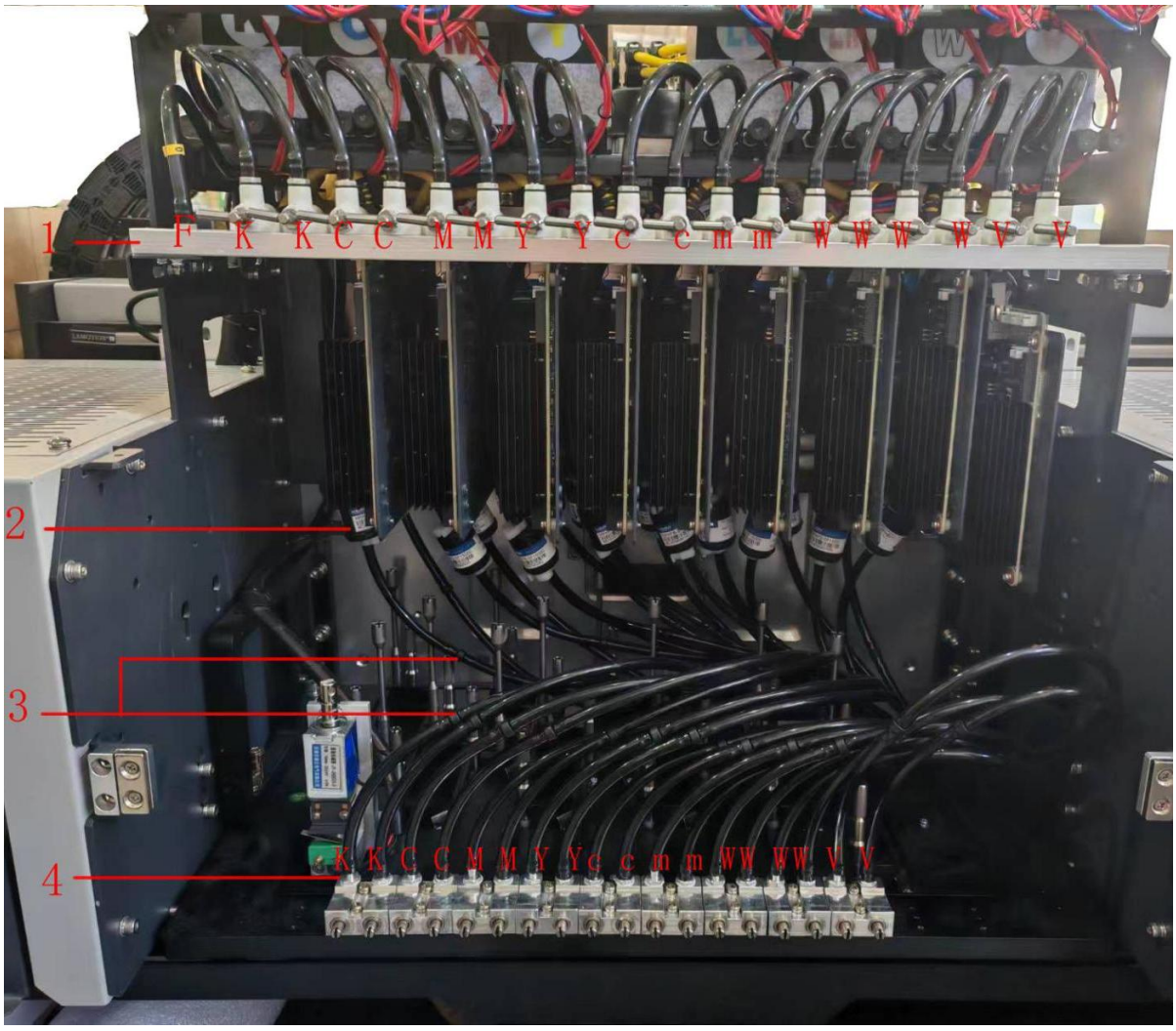


Fig. 89: Schematic diagram of three-way valve > print head > two-way valve

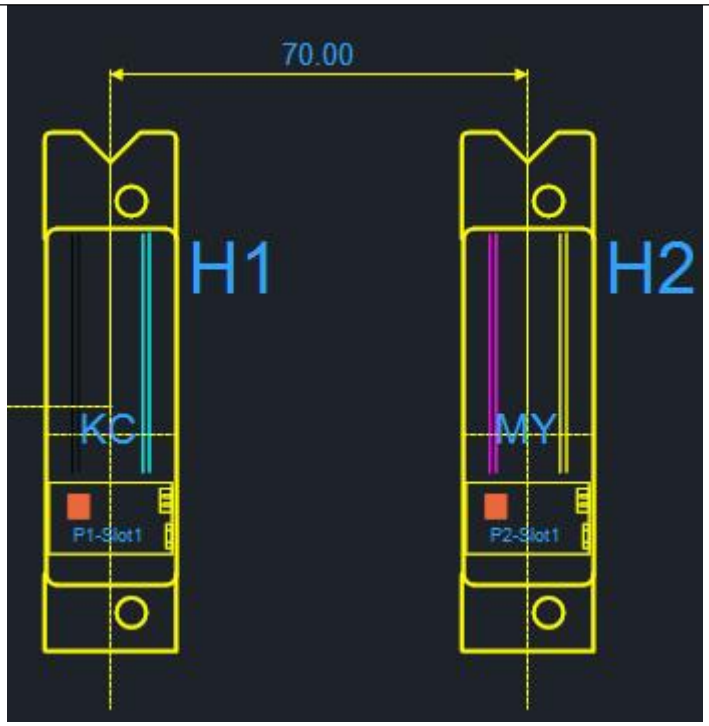
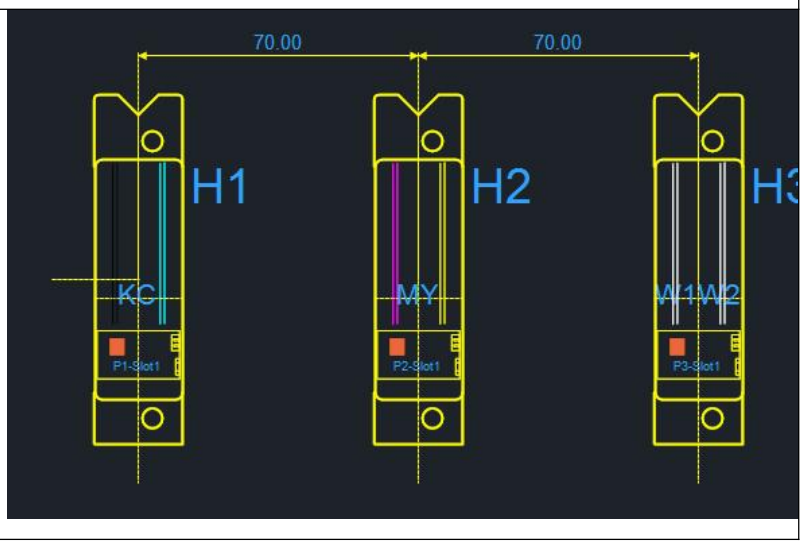
Note:

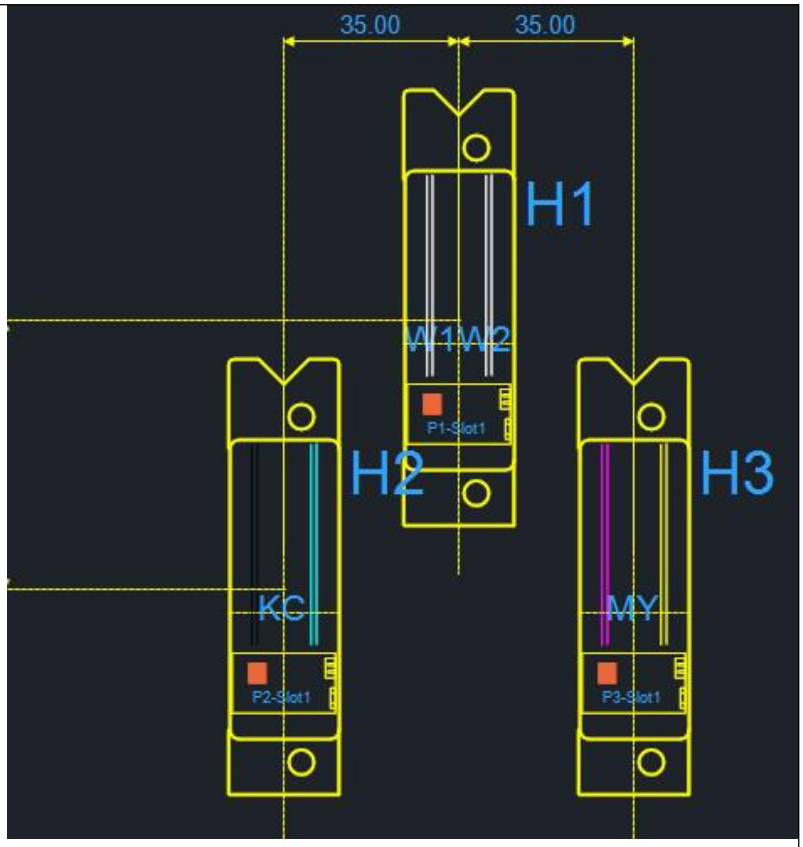
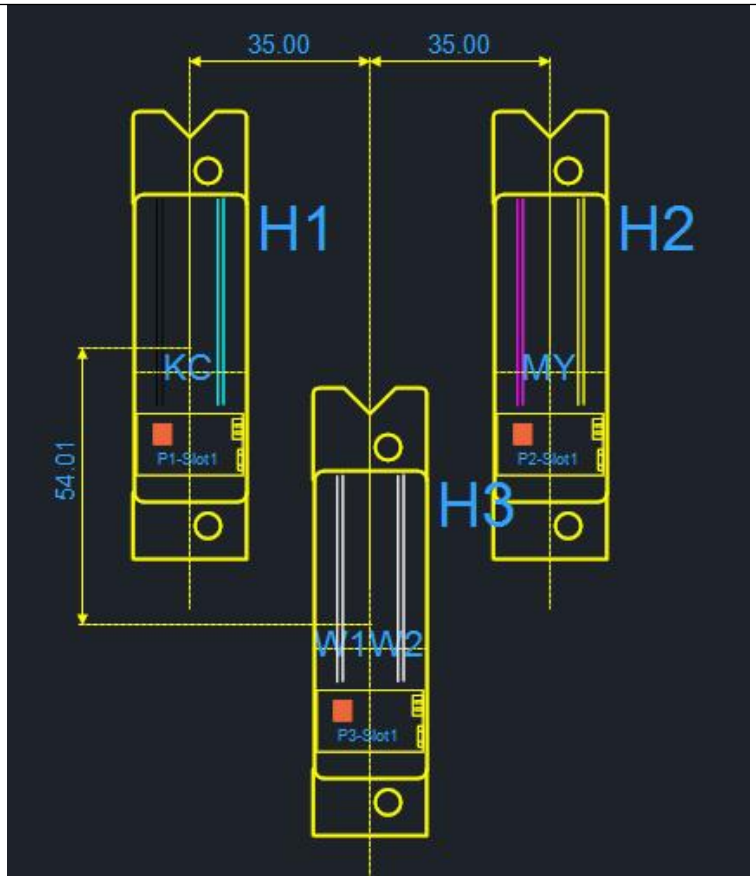
The ink tube from three-way valve to print head to two-way valve is not connected when the machine leaves the factory normally. All accessories are included in the accessory box and should be connected according to the requirements during installation.

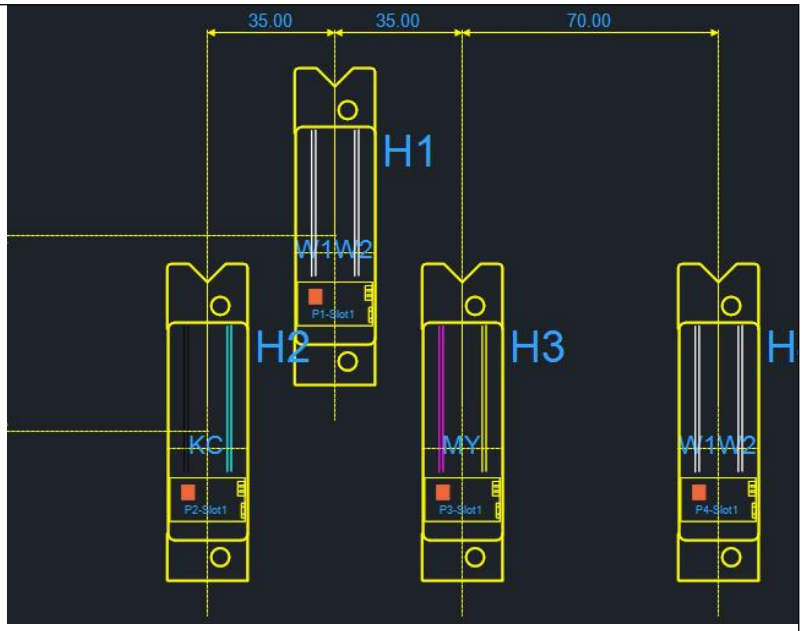
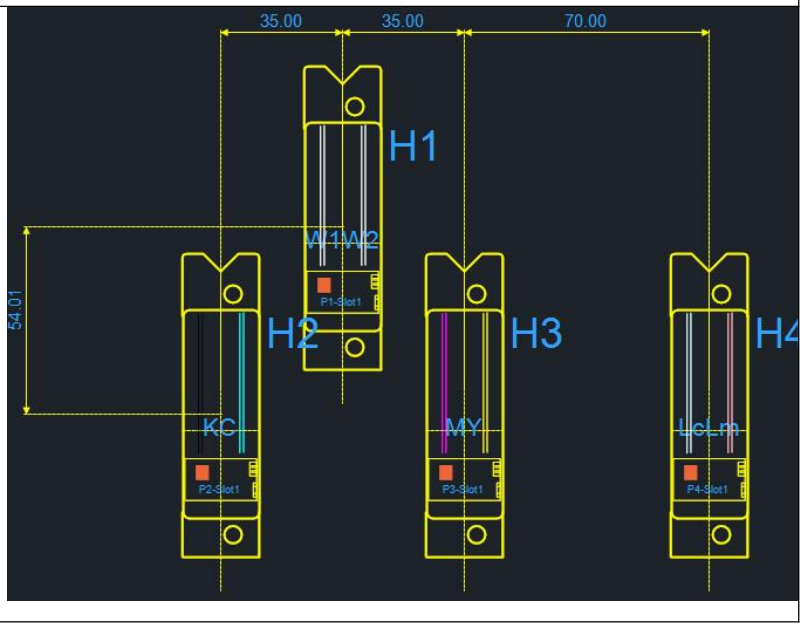
S/N	Description	Function
1	Three-way valve	When opening upwards, connect the secondary ink tank to the ink inlet of the print head, so as to press ink into the print head; when opening downwards, connect the common terminal (F) of the valve body to the ink inlet of the print head, so as to press cleaning liquid into the print head.
2	Filter	Print head pre-filter, to filter ink and other impurities and prevent clogging of the print head.
3	Joint	Φ 4 to Φ 3 ink tube joint, for tube diameter switching.
4	Two-way valve body	It closes when being vertical, and opens when rotating to horizontal position to eliminate the air in the print head and tube.
F	F	Cleaning liquid used for cleaning the print head.
K	K	Black ink channel identification.
C	C	Cyan ink channel identification.
M	M	Magenta ink channel identification.
Y	Y	Yellow ink channel identification.
c	Lc	Light cyan ink channel identification.
m	Lm	Light magenta ink channel identification.
W	W	White ink channel identification.
V	V	Vanish ink channel identification.

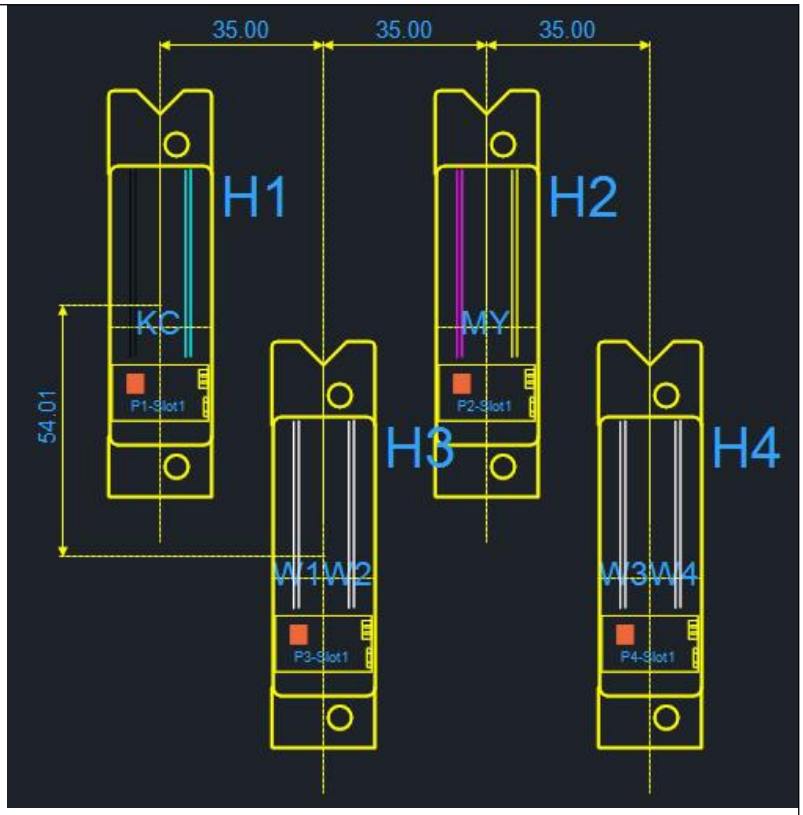
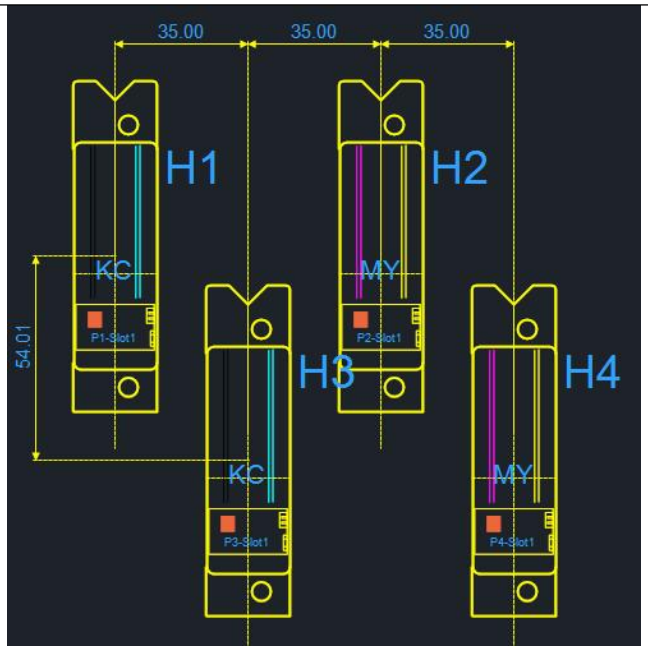
Print head configuration

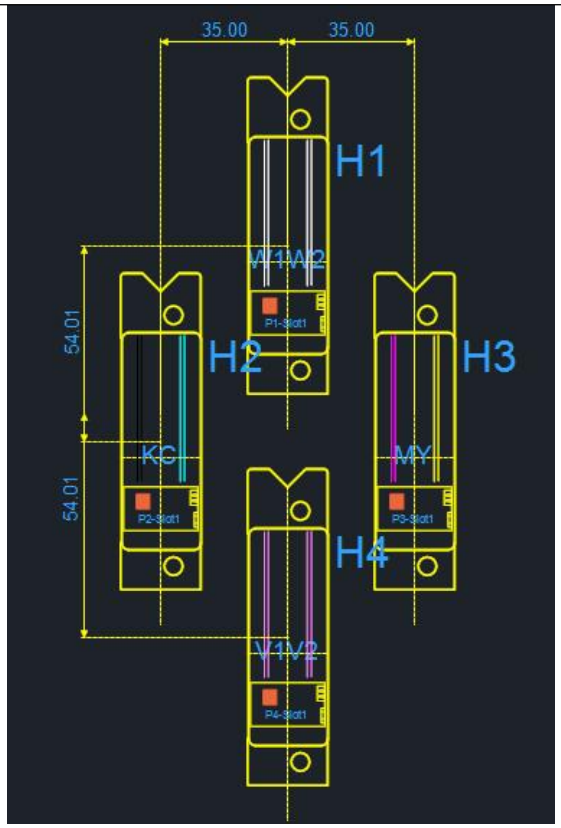
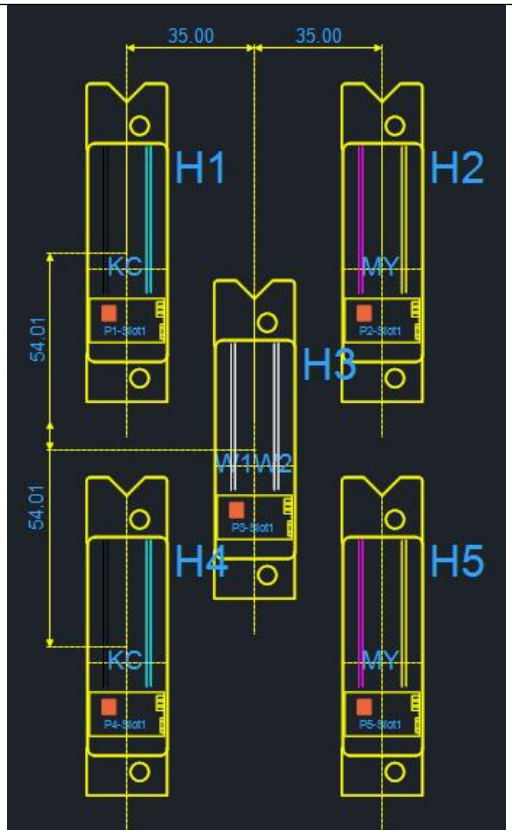
Basic print head and color configuration is as follows:

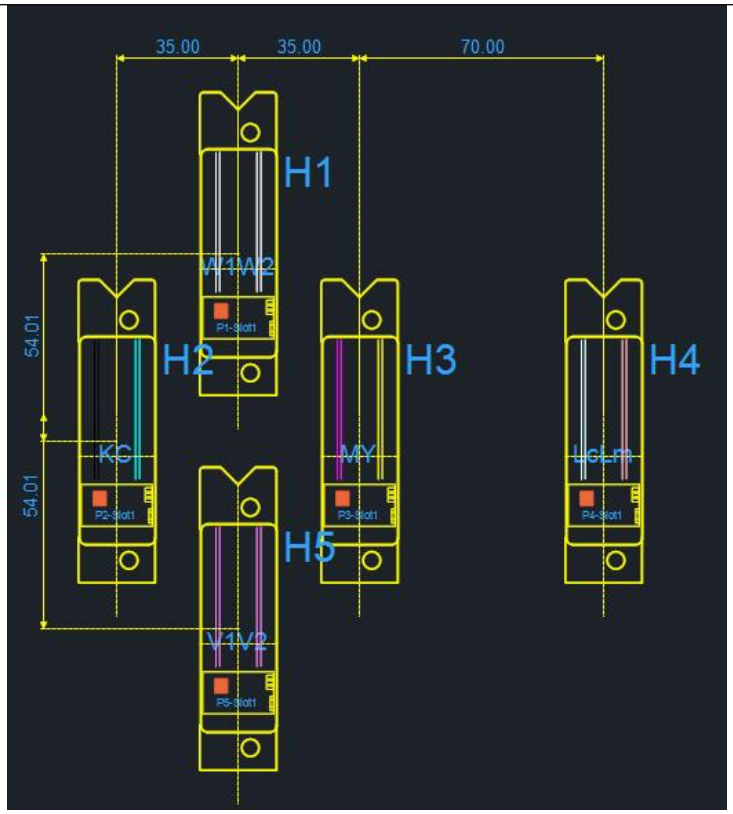
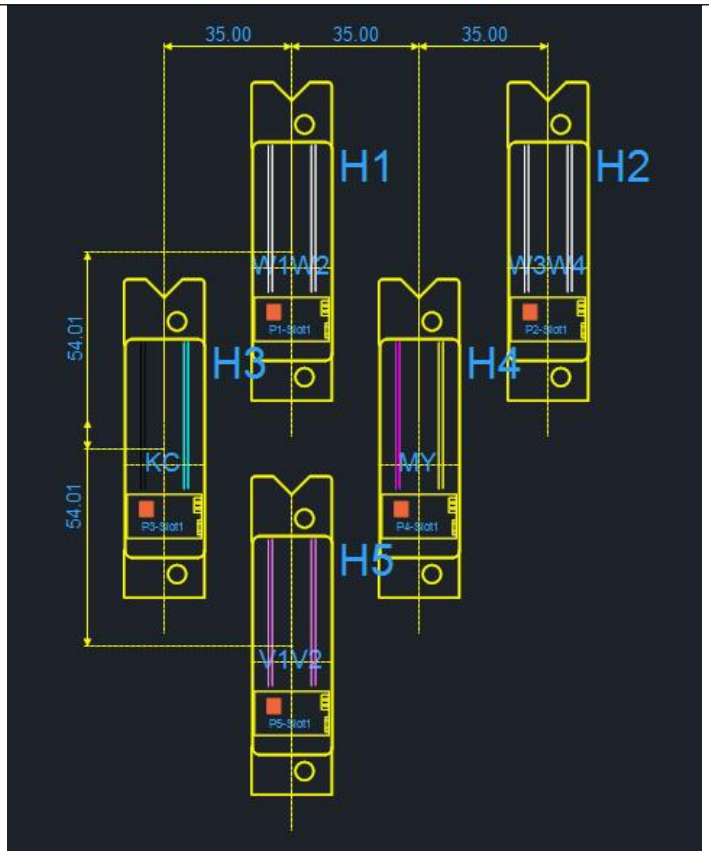
Print head base plate type	Color profile	Quantity of print heads	**Print head layout**
1st row: 5 2nd row: 5 3rd row: 4	KCMY	2	
	KCMY W	3	

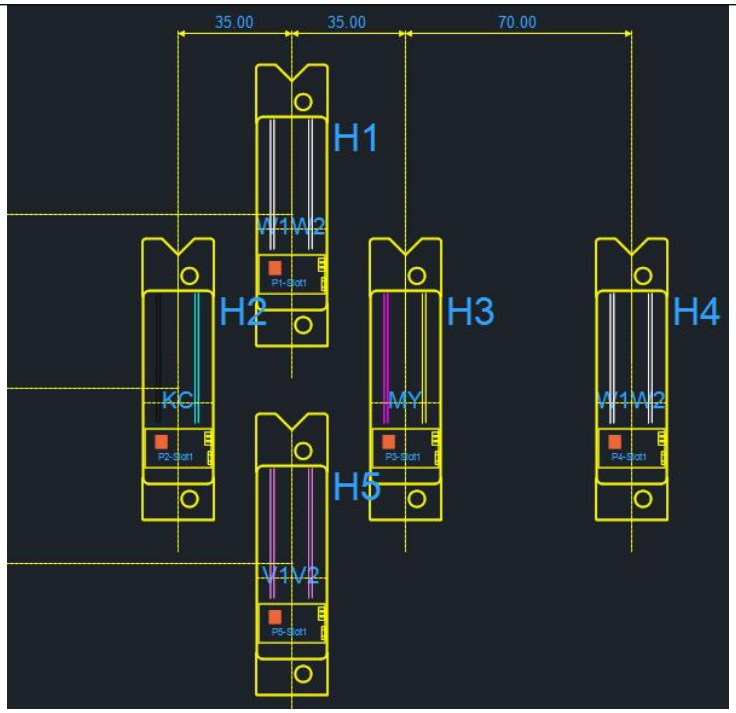
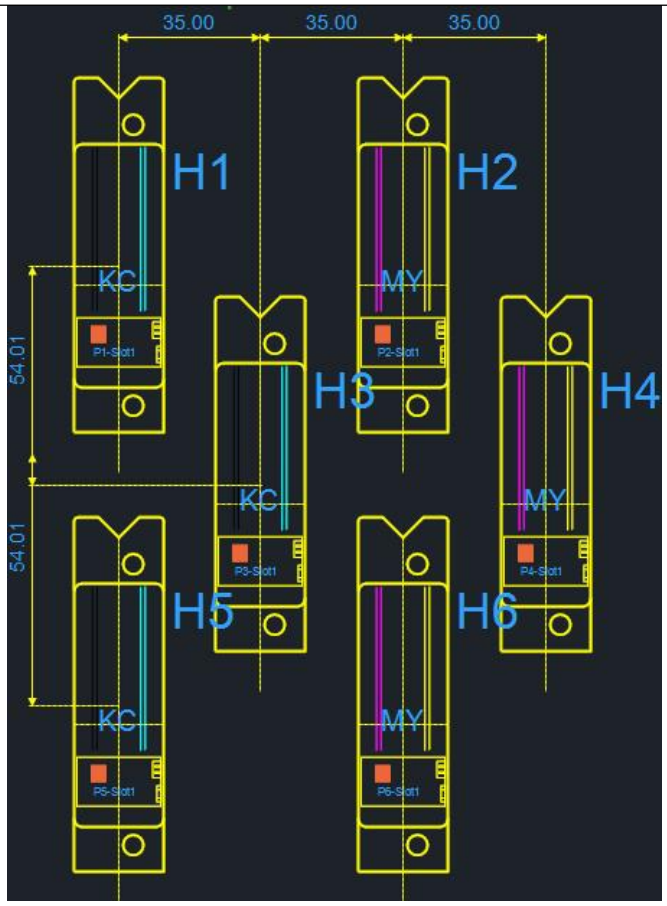
1st row: 5 2nd row: 5 3rd row: 4	WW KCMY	3	
	KCMY WW	3	

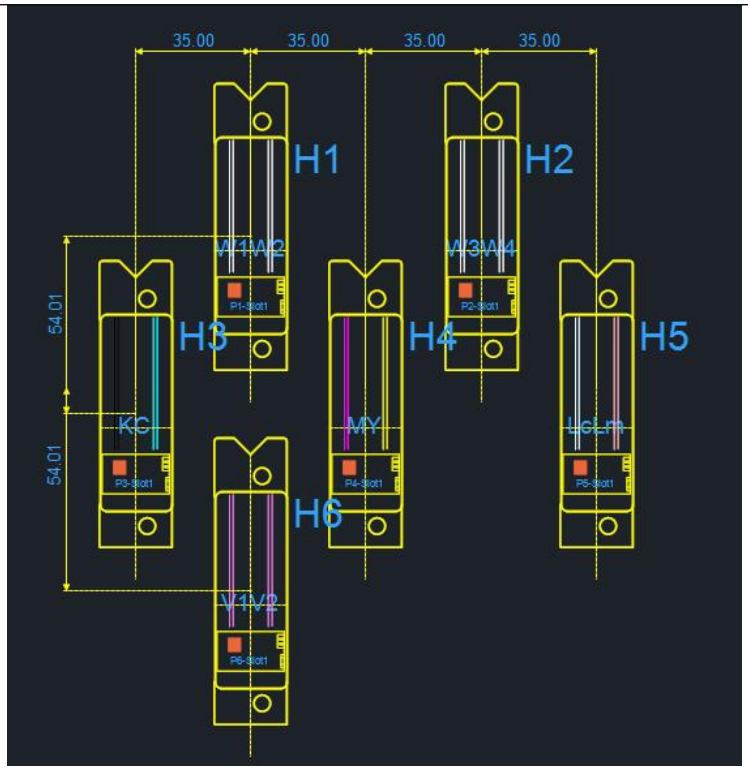
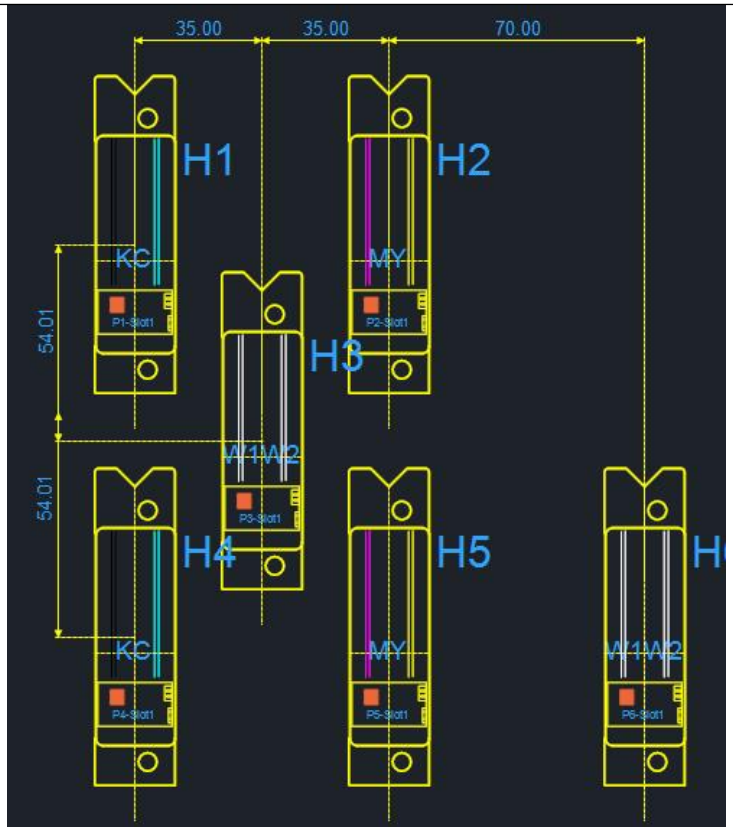
1st row: 5 2nd row: 5 3rd row: 4	WW KCMY WW	4	
	WW KCMY LcLm	4	

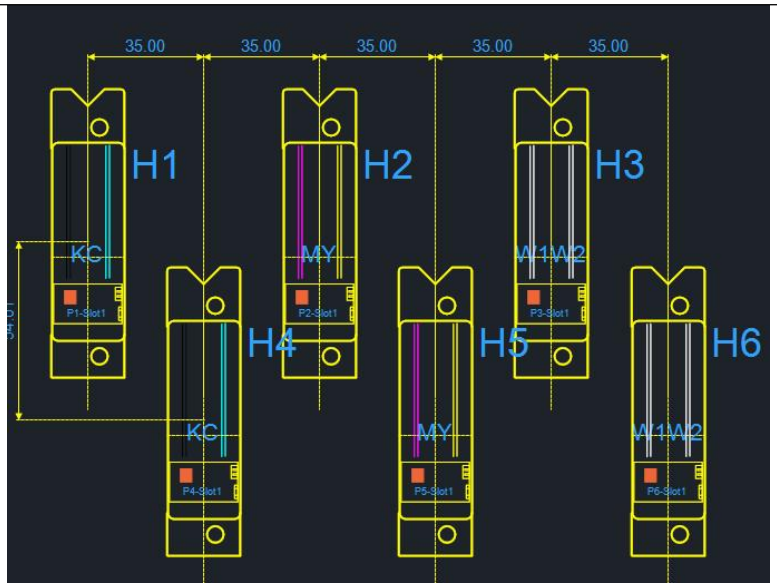
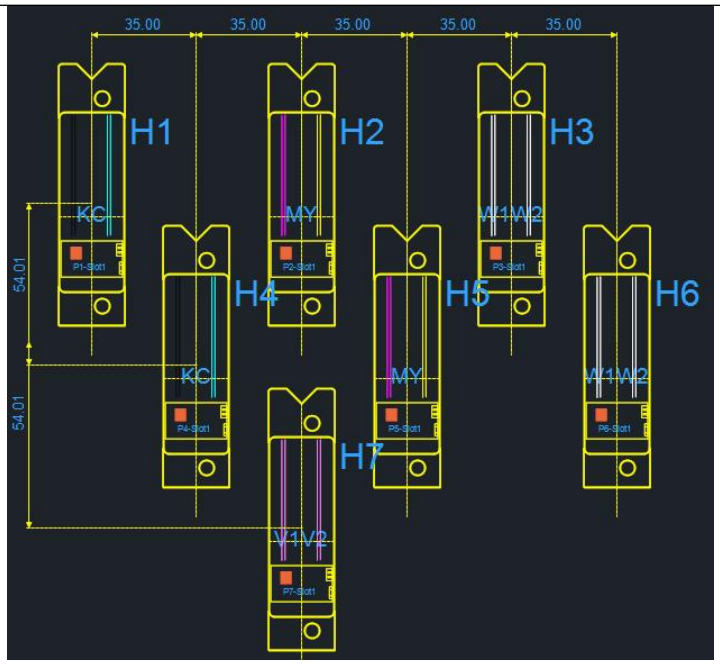
1st row: 5 2nd row: 5 3rd row: 4	KCMY WWW W	4	
	KCMY KCMY	4	

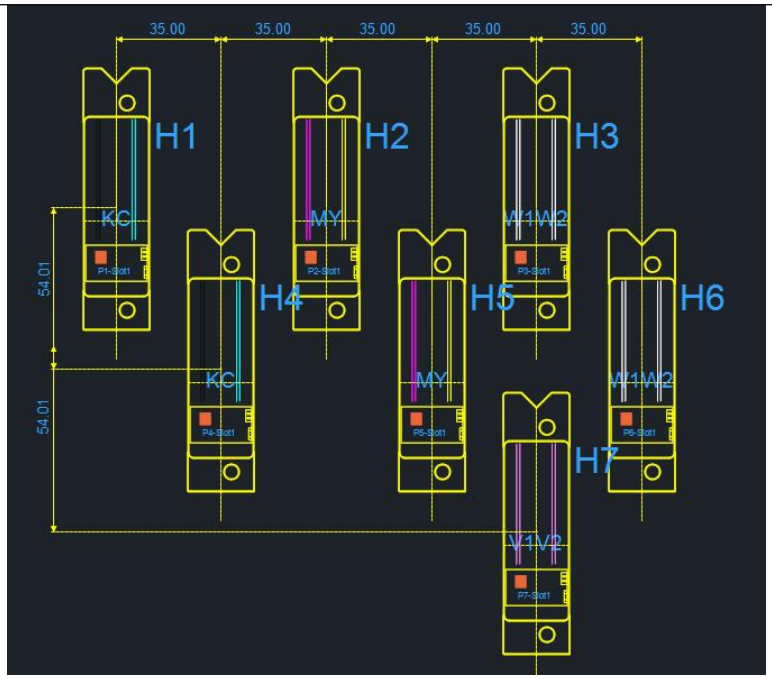
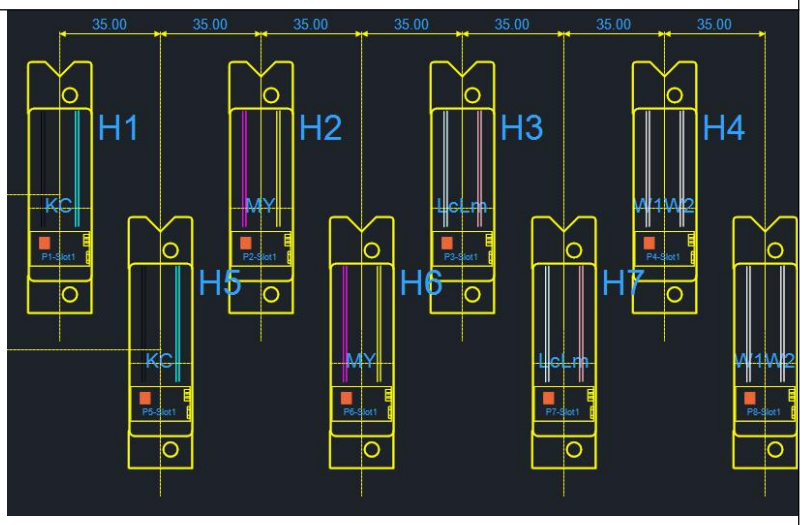
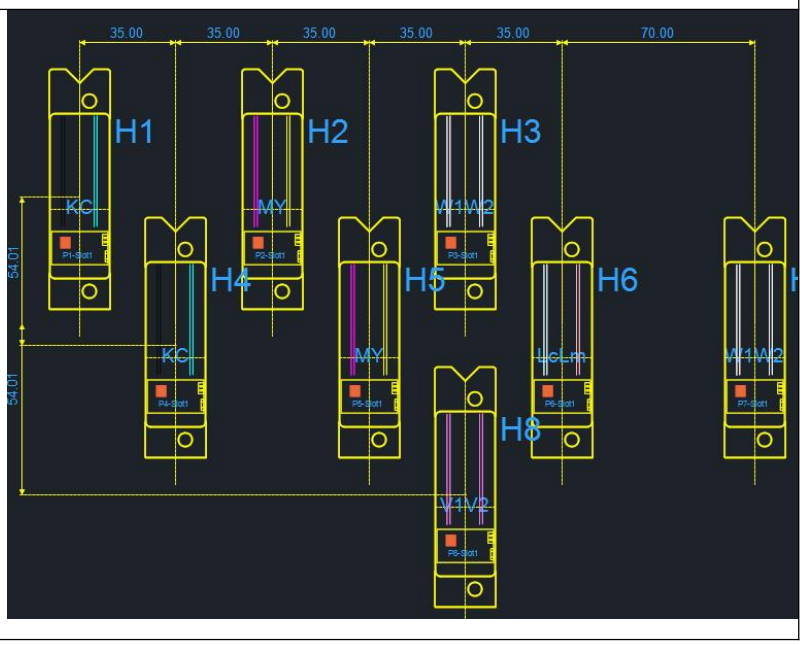
	WW KCMY VV	4	
1st row: 5 2nd row: 5 3rd row: 4	KCMY WW KCMY	5	

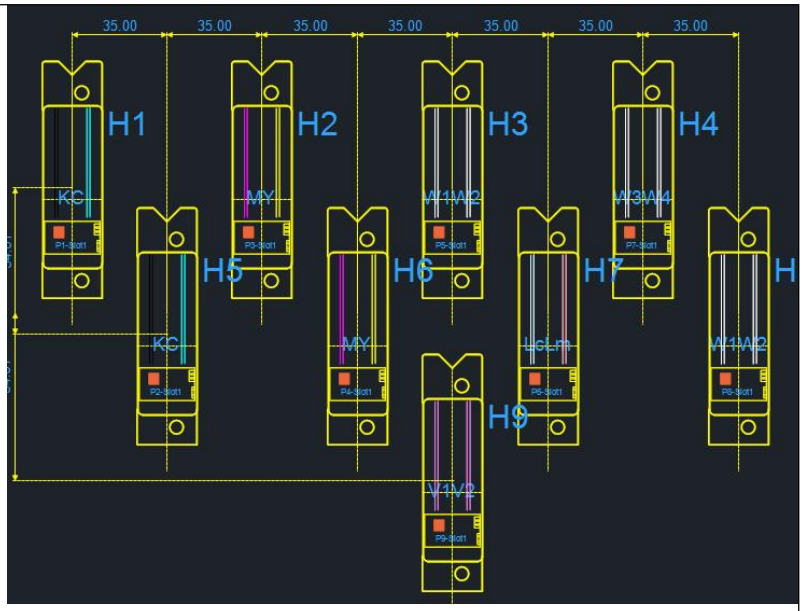
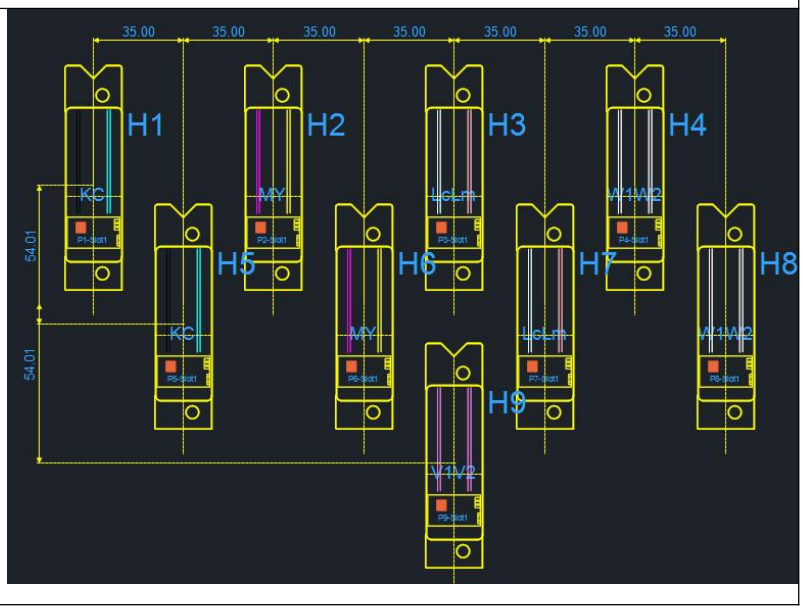
	WW KCMY LcLm VV	5	
1st row: 5 2nd row: 5 3rd row: 4	WWW W KCMY VV	5	

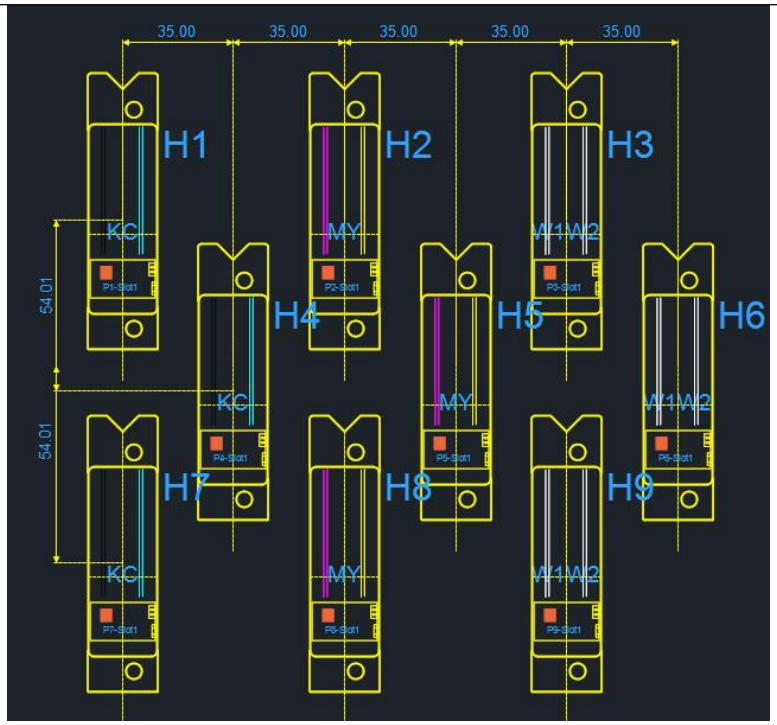
	WW KCMY LcLm VV	5	
1st row: 5 2nd row: 5 3rd row: 4 (	KCMY KCMY KCMY	6	

	WWW W KCMY LcLm VV	6	
1st row: 5 2nd row: 5 3rd row: 4	KCMY WW KCMY WW	6	

	KCMY WW KCMY WW	6	
1st row: 5 2nd row: 5 3rd row: 4	KCMY WW KCMY WW VV	7	

	KCMY WW KCMY WW VV	7	
1st row: 5 2nd row: 5 3rd row: 4	KCMY LcLmW W KCMY LcLmW W	8	
	KCMY WW KCMY LcLmW W VV	8	

1st row: 5 2nd row: 5 3rd row: 4	KCMY WWW W KCMY LcLmW W VV	9	
	KCMY LcLmW W KCMY LcLmW W VV	9	

1st row: 5 2nd row: 5 3rd row: 4	KCMY WW KCMY WW KCMY WW	9	

Note:

Before positioning the print heads on the print head base plate, please check the labels on the print heads and record the nominal ignition voltage of each print head to be installed. Try to divide the print heads into 3 or 2 groups, so that their emission voltages are as close as possible. This will make the color balance process between the print heads of each pair of colors significantly easier. It will be more difficult to balance the print heads with the same color but significantly different voltages, which may lead to potential issues with regard to density and gloss bands.

Print head connection

Print head wiring connection

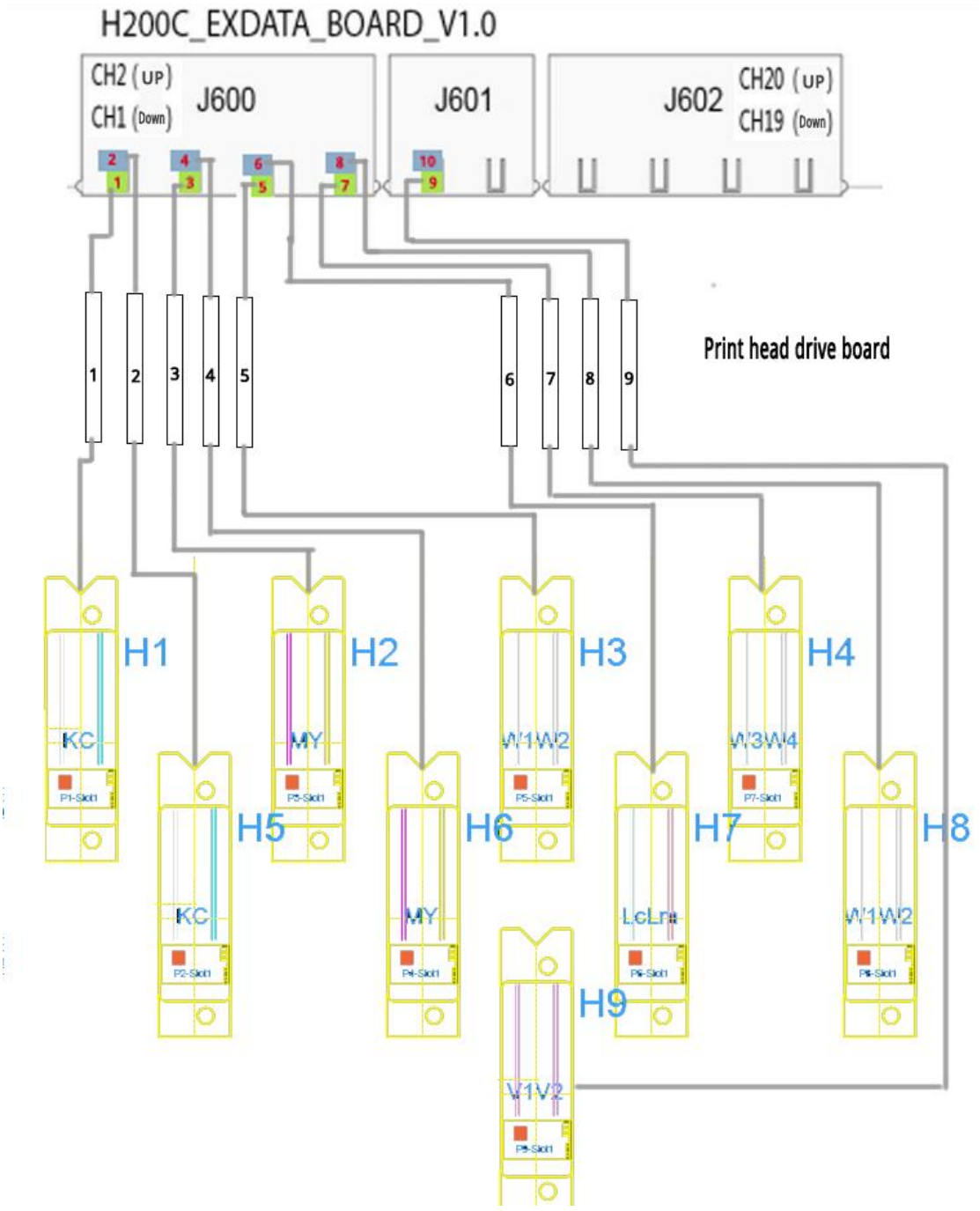


Fig. 90: Diagram of print head wiring

Print head connecting to driver board

Note:
See "Diagram of print head wiring" for the correct connection sequence of print head cables". Besides, you can also modify the connection sequence in the software according to your preferences. Specific details will be explained later.

Caution:
When connecting the print head to the drive board cable, ensure that the UV hybrid printer is in a power-off state.

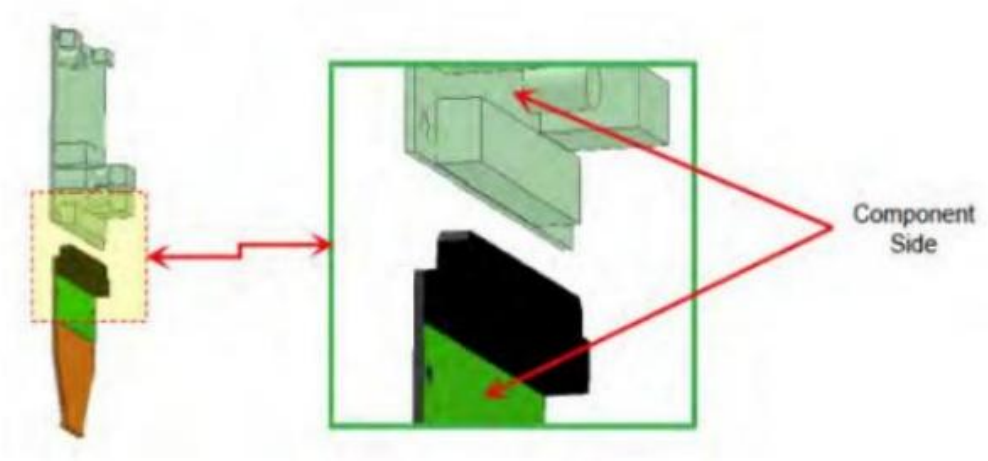


Fig. 91: Connection diagram of print head

Note:
Due to limited space in the compartment, when connecting cables, be careful not to interfere with other connected cables and ink tubes, and ensure that the connectors are securely in place.

Before powering on the UV hybrid printer, please check whether all connections have been completed correctly, and confirm that there are no problems before power-on.

Installing and connecting ink tubes in such a small space may easily cause the already installed connectors to loosen. Before using the ink injecting system, please ensure that the ink tube joints inside the compartment are tight and without leakage.

DQS20 Series UV Hybrid Printer

Ink Injection into Ink Routes

Ink injection

Ink refilling channel

Note:

Installing and connecting ink tubes in such a small space may easily cause the already installed connectors to loosen.

Before using the ink injecting system, please ensure that the ink tube joints inside the compartment are tight and without leakage.

If the print head configuration only uses four (4) ink channels K-C-M-Y, while the UV hybrid printer has eight (8) available channels, the unused channels should be disabled by simply unplugging the sensor at the auxiliary ink tank position. This will inform the system that the auxiliary ink tank is always full. Therefore, the corresponding ink pump will not work. Besides, it is necessary to disable the ink channel during the initial ink filling.

Standing behind the machine, open the top cover of the compartment. A spray painting machine board is installed under the top cover of the compartment, as shown in the following figure:

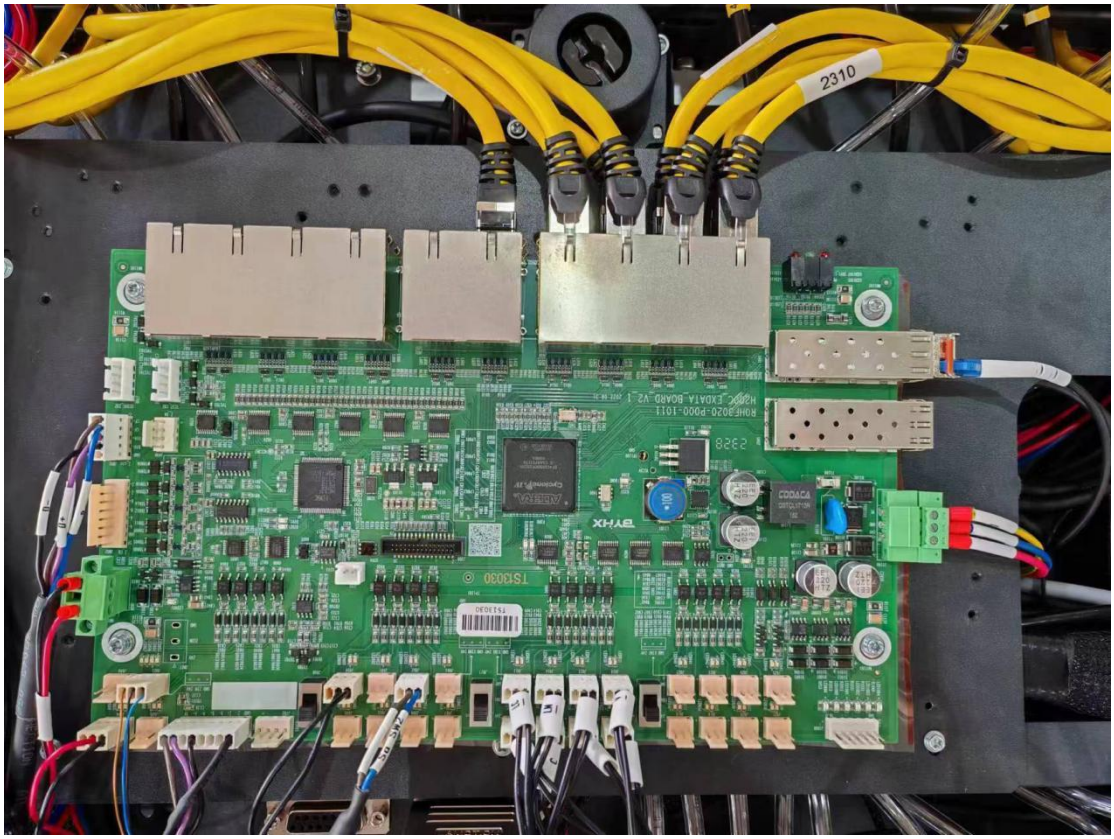


Fig. 92: Carriage board

The auxiliary ink tank level sensor has 4 to 8 connectors (depending on configuration) that can be connected to the board (print head control board) at the rear of the compartment. If connected, the pump will immediately run. Before starting the ink filling process, open the top cover of the compartment. If the connectors are connected, remove them so that the pump will not run before you want them to run, and thus ensure the accuracy and safety of the initial ink filling.

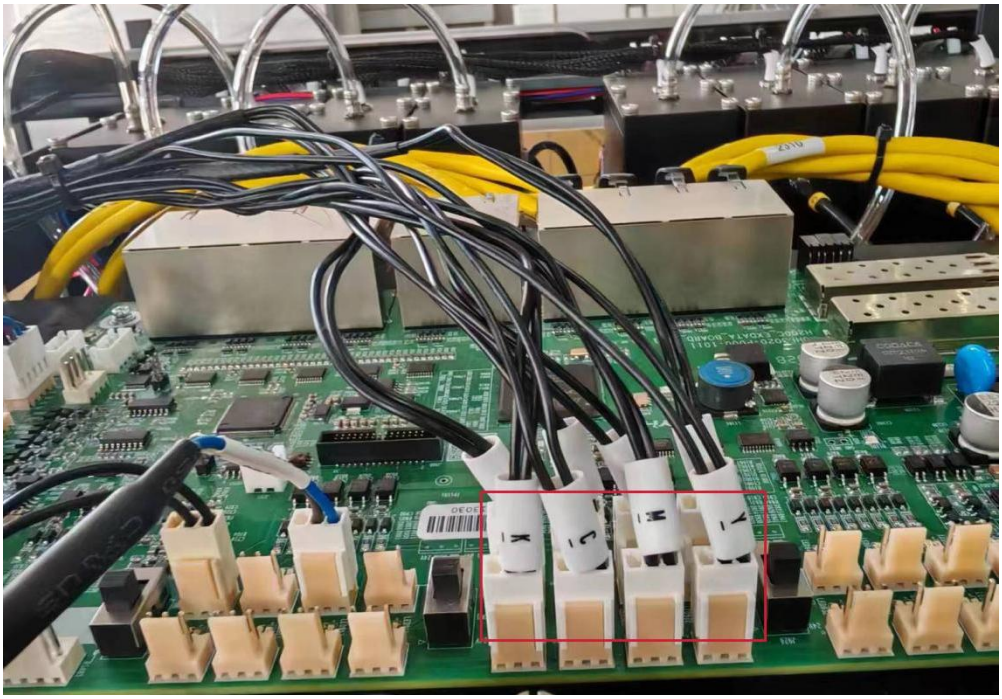


Fig. 93: Connector connection diagram 1

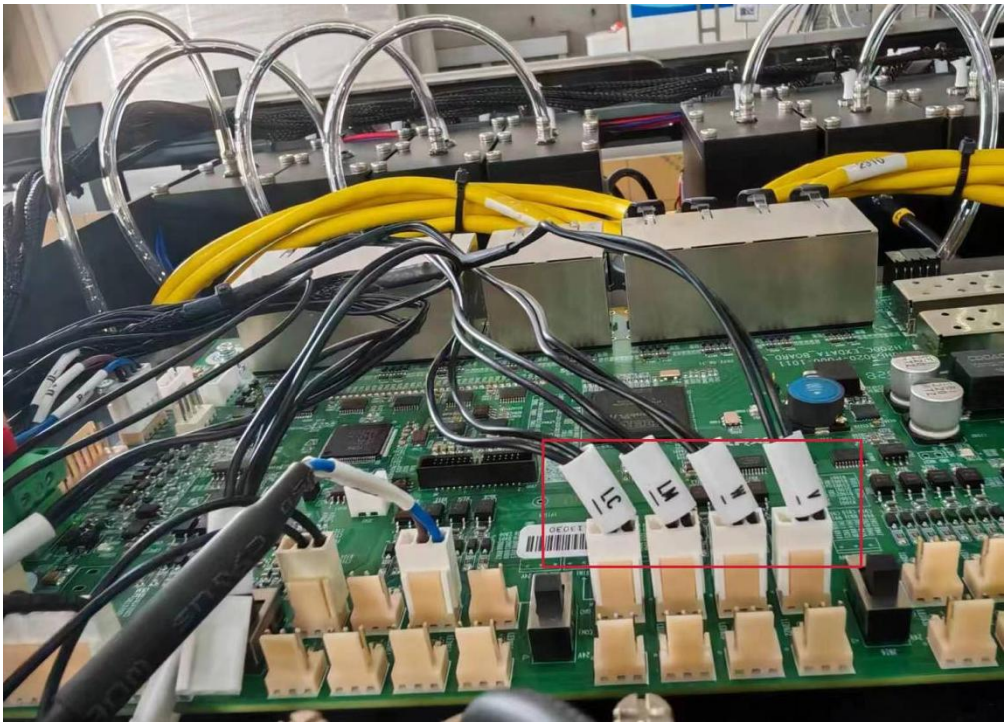


Fig. 94: Connector connection diagram 2

Connection position of auxiliary ink tank sensor on the board	
Sensor identification	Corresponding secondary ink tank
K	Cancel plug to disable/plug in to enable black channel
C	Cancel plug to disable/plug in to enable cyan channel
M	Cancel plug to disable/plug in to enable magenta channel
Y	Cancel plug to disable/plug in to enable yellow channel
Lc	Cancel plug to disable/plug in to enable light cyan channel
Lm	Cancel plug to disable/plug in to enable light magenta channel
W	Cancel plug to disable/plug in to enable white channel
V	Cancel plug to disable/plug in to enable vanish channel

Inject ink into the auxiliary ink tank

When the UV hybrid printer is running normally, the ink level is low. Compared to regularly replenishing ink bottles, the initial ink bottle installation requires more steps. Keep in mind that the ink supply line is empty and filled with air. Before the UV hybrid printer operates correctly, any trapped air should be completely cleared.

UV hybrid printer state

The UV hybrid printer is in power-on state during ink filling, and the machine is in the ready state.

The computer control software is opened and in online mode for convenient observation of the ink supply status.

The carriage is in the origin maintenance position.

The rear cover of the carriage is in an open state to observe the liquid level signal light on the board.

Inject ink into the main ink tank

After the channel signal at the secondary ink tank is confirmed, the corresponding main ink tank can be filled with the corresponding ink.

Open the middle door of the left box of the machine, where the main ink tank is installed. You can see the K-C-M-Y-W-F and other main ink tanks (up to 9, at least 5, depending on the machine configuration) as shown in the following figure:

Fig. 95: Location plan of main ink tanks

Uncover and inject the corresponding color ink according to the identification. After injection, close the cover to prevent dust and light.

During initial ink injecting, there may be a situation where the secondary ink tank is

not fully filled with ink while the ink pump stops working. This is because the ink supply timeout function is set in the software. This error should be cleared in the software to continue ink supply. Only after observing the board signal light off, a complete ink filling process of a channel is indicated.

Caution:

When operating printing ink, please always wear personal protective equipment (PPE) including goggles, powder-free gloves and protective clothes to protect your arms.

Watch out for ink spills around the UV hybrid printer as this may lead to the slippery danger on floor.

For initial ink filling, fill the auxiliary ink tank one by one. This can effectively reduce the risk of failing to timely detect any leakage caused by filling ink into all auxiliary ink tanks or installing the wrong color ink.

The main ink tank has a capacity of 2.5L. Normally, inject only 2L ink. Do not fill too much to prevent overflow.

Note:

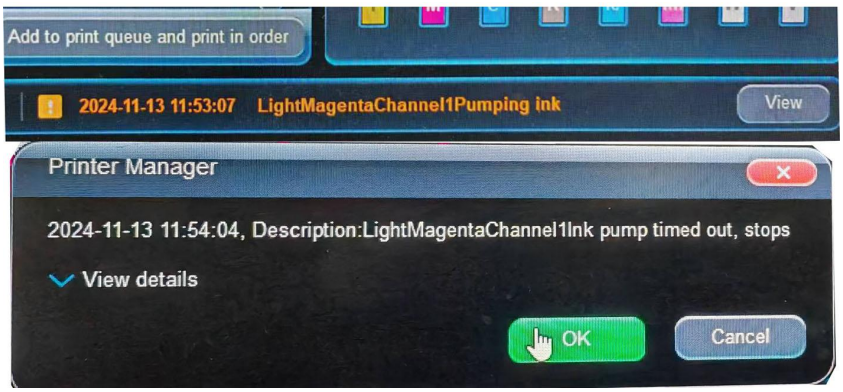
Open the top cover of the compartment to expose the required circuit board.

If it has not yet been disconnected, please unplug and disconnect all liquid level signal lines of the auxiliary ink tank.

Open the control software, which is in the ready state.

Plug in the liquid level signal line of the corresponding auxiliary ink tank as needed, and the main ink pump will start working to fill the auxiliary ink tank with ink.

Observe whether the ink is supplied to the corresponding color channel in the lower right corner of the control software. When the software displays an "ink supply timeout alarm", click Confirm to allow the main ink pump to continue supplying ink. When ink supply no longer displays at the lower right corner of the software or auxiliary ink tank level signal light goes out, it indicates that a channel has been fully filled with ink.



Perform the same operation process on the remaining colors to complete the ink supply for all colors.

Injecting ink to print head

Open the three-way valve in front of the cartridge, and enable the corresponding color upwards.

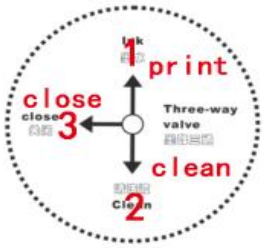


Fig. 96: Valve state diagram

Press the Ink Pressing button to wait for the ink to flow out of the nozzle, and release the button.

Wait for about 3 seconds, press the Ink Pressing button again, and open the two-way valve until there are no bubbles (trapped air) flowing out of the exhaust valve. When the ink flows without bubbles, first close the exhaust valve, and then release the ink pressing button.

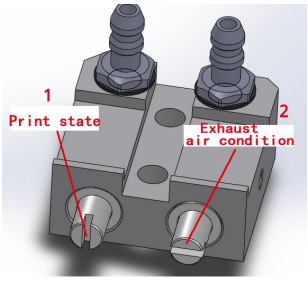


Fig. 97: Schematic diagram of two-way valve operation

After completing the ink pressing, use a lint free cloth or a soft scraper to wipe the nozzle surface in one direction to complete the print head ink injection.

Note:
Do not scrub or apply pressure back and forth on the nozzle plate.

Print head cleaning

It is necessary to clean the print head during maintenance or repair. If it is required to clean or replace the print head during use, it can be achieved by the automatic print head cleaning function, i.e., switching the cleaning fluid channel through the 3-way valve and pressing the Cleaning button to complete the cleaning of the print head.. The following steps outline the specific operation.

Ensure that sufficient cleaning liquid is added to the main ink tank.

Park the cartridge in the maintenance area, and open the three-way valve downwards to connect to the cleaning channel.

Press the Cleaning button, and the ink pump at the main ink tank will fill the cleaning liquid into F channel of the three-way valve, and then fill the print head through the three-way valve to clean the print head

During the cleaning process, it is necessary to open the two-way valve to clean the ink at the print head ink outlet.

Repeat the cleaning process for multiple times to ensure that the cleaning liquid flows out without any residual ink color.

Negative pressure adjustment

1. Introduction to dual negative pressure control system:

The dual negative pressure control system consists of three parts: one negative 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, as shown in the following figure.

No.	Description	Qty.	Description
1	Air buffer bottle	2	Negative pressure storage
2	Two-position three-way solenoid valve	2	Keep switching of negative and positive pressure
3	Two-way solenoid valve	2	Air supply
4	Diaphragm pump	2	Speed adjustable one-way air suction
5	Control board of negative pressure	1	Two-way color and white negative pressure control

Fig. 98: Dual negative pressure control system

2. Description of system parameters :

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 can not be referred as an absolute atmospheric value of the reference due to the lack of strict

mathematical correction. It cannot be used as an absolute atmospheric pressure reference. 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.

3. Display interface:

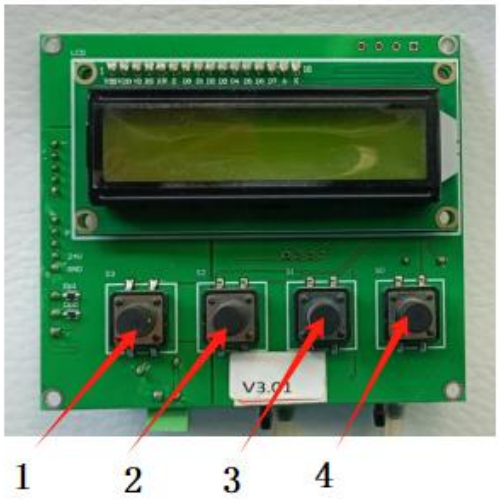
After the system is powered on and started

Fig. 99: Negative pressure display interface

Color negative pressure control The first row of the screen (top row) shows the current negative pressure value collected by the sensor in route A and the set value in route A. We specify: route A is the color negative control.

White negative pressure control: The second row (bottom row) shows the current negative pressure value collected by the sensor in route B and the set value in route B. Route B is specified as white negative pressure control.

4. Introduction to functions of setting buttons



No.	Description	Description
1	Setting button	Enter the parameter setting interface
2	+ button	The setting for increasing parameters

		under the setting mode
3	- button	The setting for decreasing parameters under the setting mode
4	Confirmation button	Save parameters and exit

Fig. 100: Setting buttons for negative pressure control

5. Set parameter reset

Fig. 101: Negative pressure reset

Note:
During the reset in A-channel (color) or B-channel(white), it is necessary to hold down the Setting Selection key 3 and then press the OK key 4 before reseting. This setting is to avoid the misoperation to reset the sensor.

6. Setting of Pause or Recovery of Negative Pressure Regulation

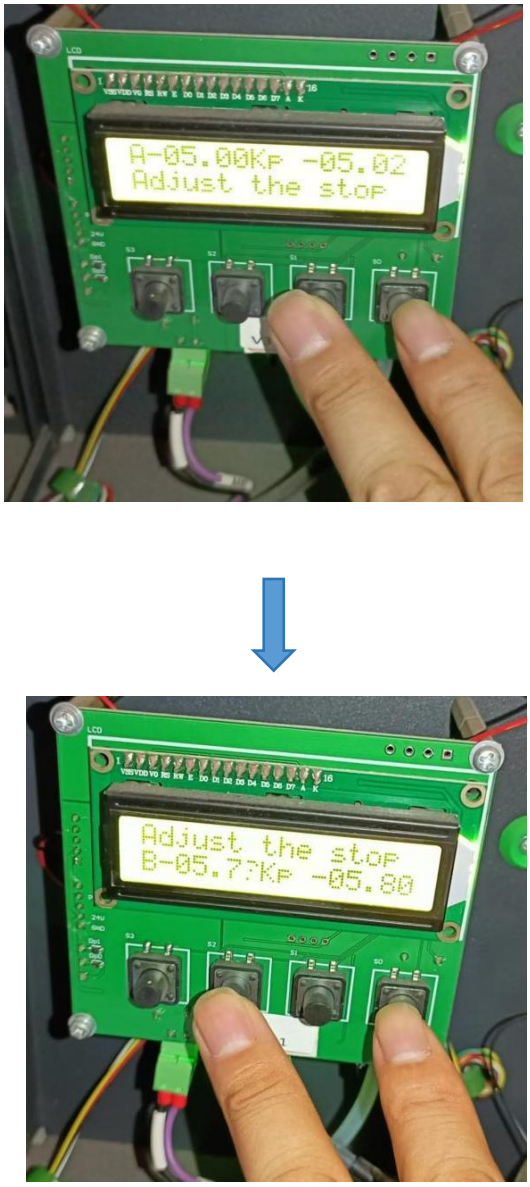


Fig. 102: Setting of Pause or Recovery of Negative Pressure Regulation

a) By pressing the Parameter Selection key 2 and the OK key 4 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.

b) By pressing the Parameter Selection key 3 and the OK key 4 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.

7. Introduction to Parameter Setting:

a) Parameter 1: Set vacuum A

Fig. 103: Set vacuum A

This parameter is set to maintain the negative pressure of route A. After setting with + and - in the middle, the system will automatically control the peristaltic pump and regulate to the set pressure value.

b) Parameter 2: Correct zero A

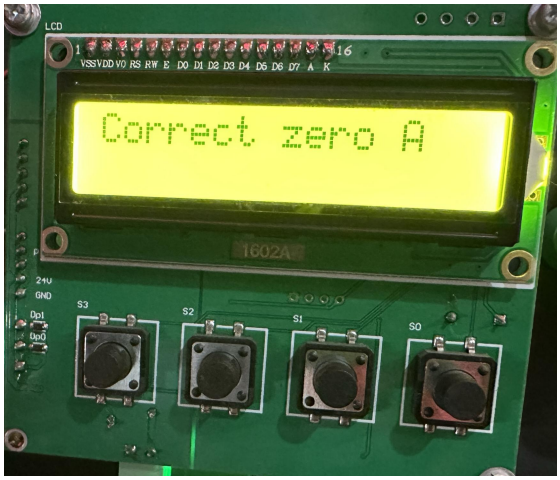


Fig. 104: Correct zero A

In this setting interface, correcting zero of route A (color) negative pressure difference will be automatically performed by pressing the function confirmation button 4.

Note:
Correcting zero must be performed in the case of no pressure difference or in the case where the atmosphere is directly connected. As there are errors in the electronic devices and the incoming voltage, 0 pressure needs to be corrected before it can be used.

c) Parameter 3: MotorA base V

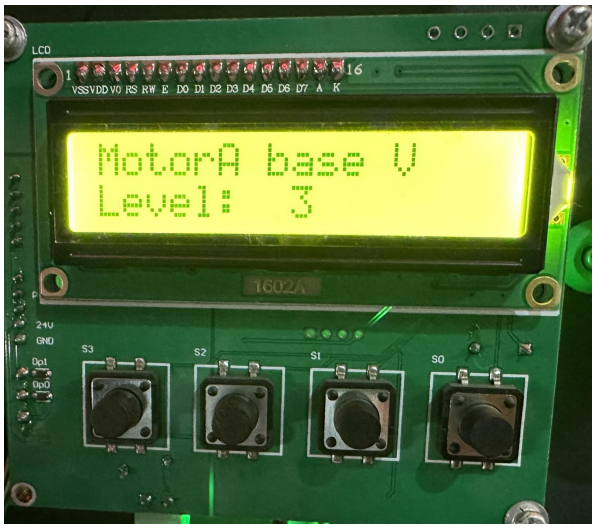


Fig. 105: MotorA base V

The parameter is to set A-channel negative pressure to adjust the rotating speed of pneumatic peristaltic pump at low speed, and the factory speed is level 3 (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.

d) Parameter 4: Set vacuum B

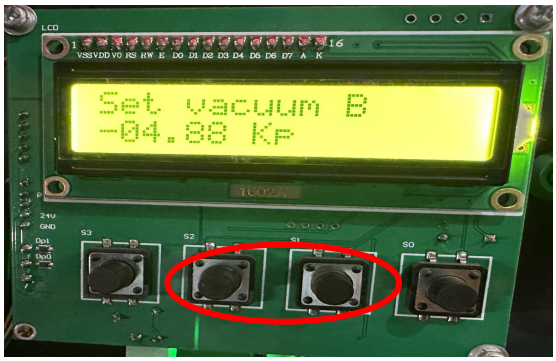


Fig. 106: MotorA base V

This parameter is set to maintain the negative pressure of route B (white). After setting with + and - in the middle, the system will automatically control the peristaltic pump and regulate to the set pressure value.

e) Parameter 5: Correct zero B

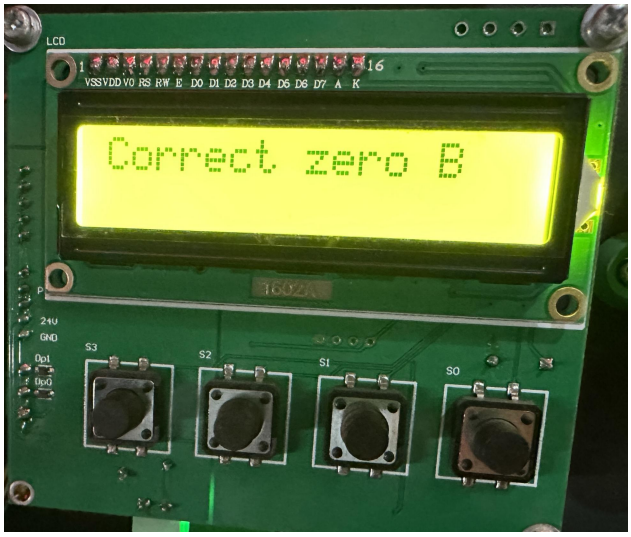


Fig. 107: Correct zero B

In this setting interface, correcting zero of route B (white) negative pressure difference will be automatically performed by pressing the function confirmation button 4.

Note:

Correcting zero must be performed in the case of no pressure difference or in the case where the atmosphere is directly connected. As there are errors in the electronic devices and the incoming voltage, 0 pressure needs to be corrected before it can be used.

f) Parameter 6: MotorB base V

Fig. 108: MotorB base V

The parameter is to set B-channel negative pressure to adjust the rotating speed of pneumatic peristaltic pump at low speed (factory speed: level 3), 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.

g) Parameter 7: Software version

Fig. 109: 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.

8. Cautions:
   a) 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.
   b) 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.
   c) 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.

d) 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.

Set ink temperature and waveform

Note:

Before moving on to the next stage of print head alignment and calibration, remember to set the correct ink temperature and to write in the waveform file matching with the ink.

Set the ink temperature based on the ink to be used. Two temperature settings are required: the secondary ink box preheating temperature setting and the print head temperature setting.

Ink brand	Secondary ink box temperature	Print head temperature
UV…KCMY	41°	43°
UV…W	42°	44°

Auxiliary ink box temperature

Set the temperature of auxiliary ink box. The heating temperature of each auxiliary ink box needs to be set on the temperature control panel at the carriage. As shown below:

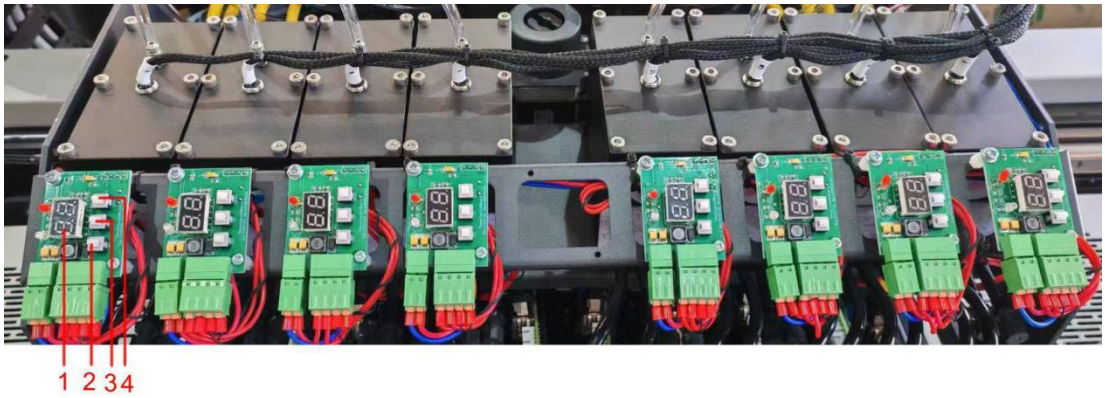


Fig. 110: Temperature control panel

Press “Temperature Setting” button to set the temperature. Press the “Temperature+” or “Temperature-” button to increase or decrease the temperature. After that, press the “Setting” button again to make the screen returned to display the real-time temperature.

S/N	Description	Function
1	Display screen of temperature control panel	Display screen of temperature control small panel shows the heating temperature.

2	“Temperature Settings” button	Press the button to enter the interface of setting temperature, and press it again to return to the interface of real-time temperature.
3	Temperature+	In the temperature setting mode, press this button to increase the set target temperature.
4	Temperature-	In the temperature setting mode, press this button to decrease the set target temperature.

Print head temperature (control software)

In the control software, click “Menu”> “Real-time Settings” to enter the interface of real-time settings, and the specific operation details as follows:

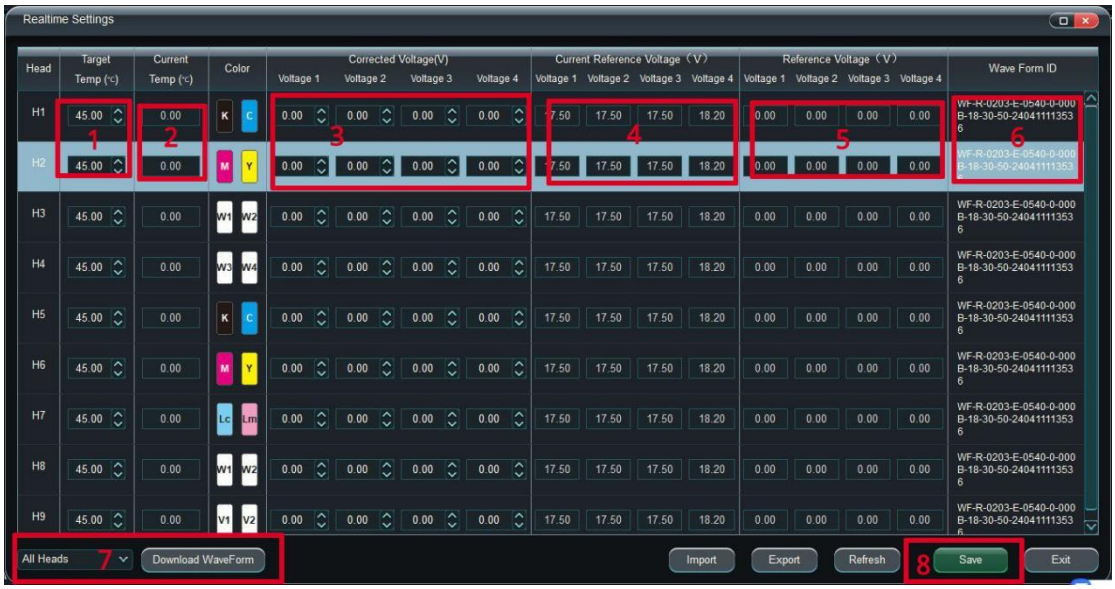


Fig.111: Temperature settings of the print head

S/N	Description	Function
1	Temperature setting	Set the temperature of the print head and its target heating temperature.
2	Real-time temperature	Provide feedback on the current actual temperature of the print head.
3	Voltage adjustment	Adjust the current voltage of the print head. The voltage is controlled by the waveform files with no need for adjustment under normal circumstances.
4	Voltage setting by waveform files	The loaded waveform files generate the set voltage.
5	Real-time voltage	Display the current actual voltage of the print head.
6	Waveform file ID	Display the current names and tag attributes of

		waveform files.
7	Waveform file loading	Select one or all of print heads to load the waveform files. The loading needs to be done in engineer mode. The operation of entering the engineer mode will be introduced later.
8	Save	For saving the modified settings.

DQS20 Series UV Hybrid Printer

Calibration of Print Heads

Note:
Before the calibration, ensure that the UV hybrid printer is functioning properly, and save related parameters in advance or export the saved parameters for backup. Save and back up the parameters after each operation.

Note:
Before the alignment, it is recommended to test the print head to check that all/most nozzles are in good condition. If needed, clean and wipe the print head until its state is satisfactory.

The calibration of print head is the process of matching actual droplet placement with expected or target droplet placement through mechanical adjustment and software compensation. Newly installed print heads may be tilted or misaligned, so they need to be calibrated to achieve the best image quality.

Calibration of print head

Open the control software to enter the main interface of the software, as shown below:

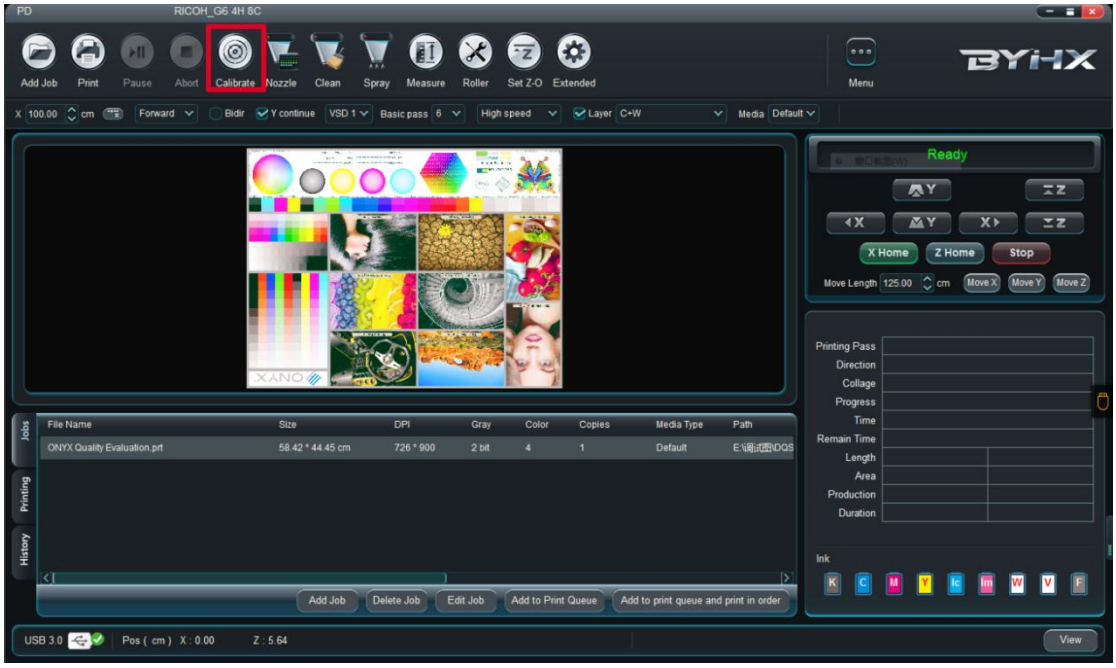


Fig.112: Main interface of the control software

Click the shortcut icon button 

to open the calibration window: set calibration parameters and print calibration patterns.

Calibration includes "mechanical calibration" and "software calibration":

Firstly, click on "Horizontal" to select or click on "New" to add the desired printing

mode of "363 VSD Mode 1"(recommended) or other modes.

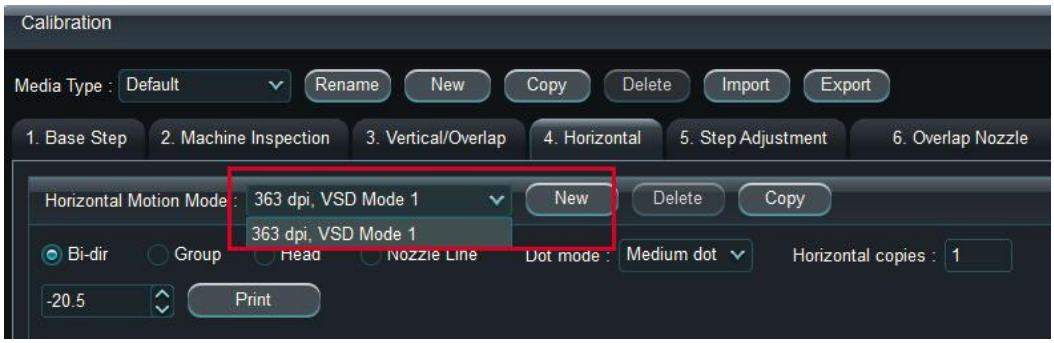


Fig.113: Calibration step 1

Firstly, perform step calibration on the UV hybrid printer, click "Print" to print.

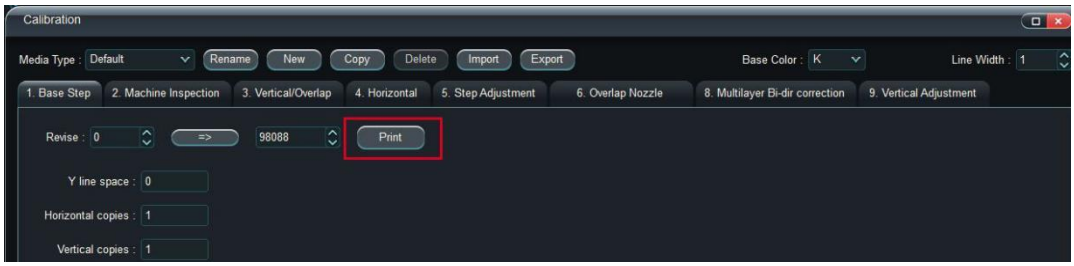


Fig.114: Calibration step 2

Observe which group of lines in the printed calibration patterns are stacked the smoothest, taking the following image as an example, 1 is the best.

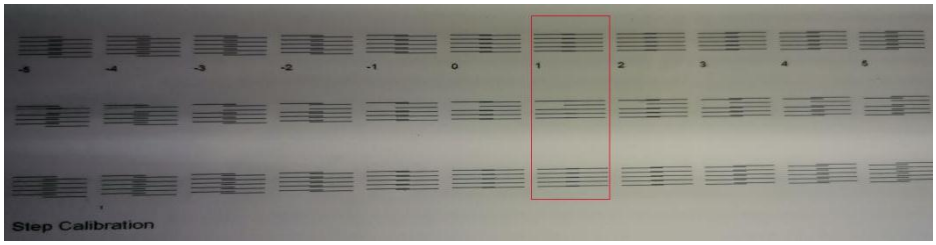


Fig.115: Calibration step 3

Enter the corresponding number in the revise box and click on the arrow icon

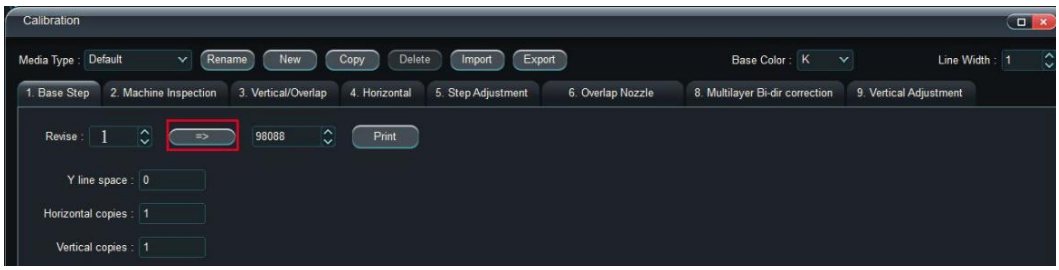


Fig.116: Calibration step 4

Then click "Save" and confirm by clicking "Print" again

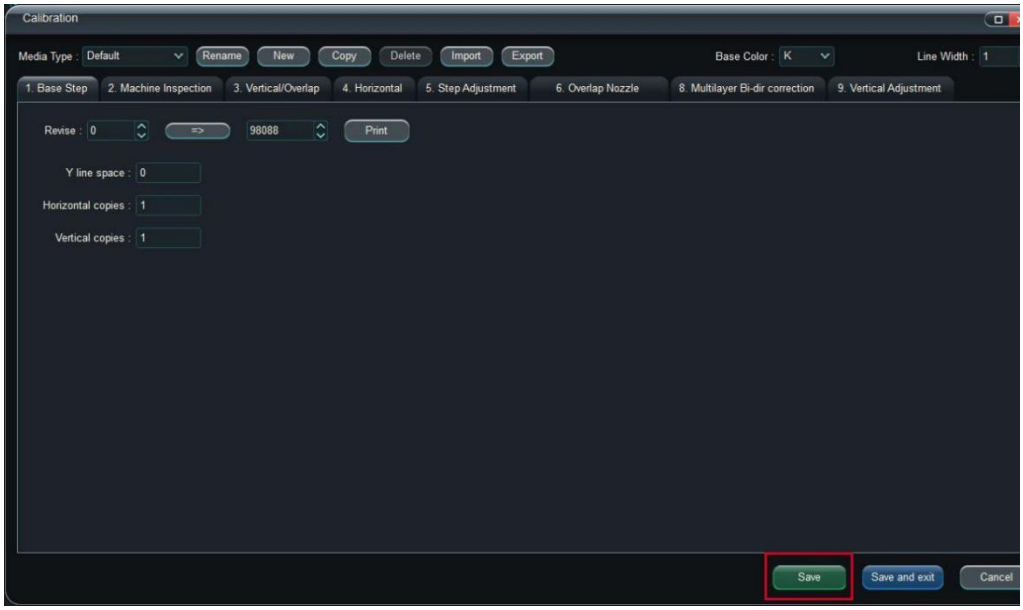


Fig.117: Calibration step 5

When the lines of 0 are stacked the smoothest, step calibration is completed.

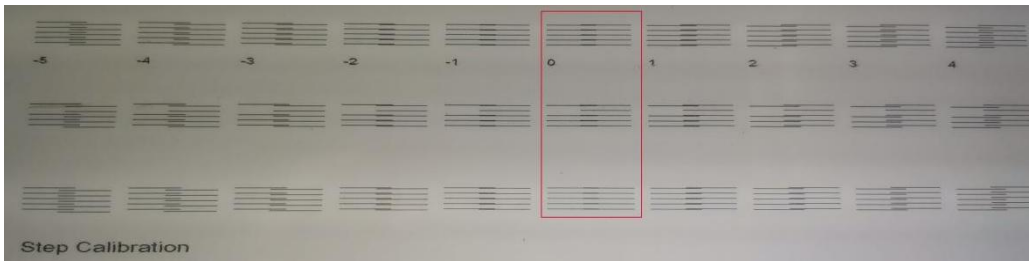


Fig.118: Calibration step 6

Mechanical calibration

Select the "Machine Inspection" interface and click on "Angle and Vertical Check" to check the mechanical calibration.

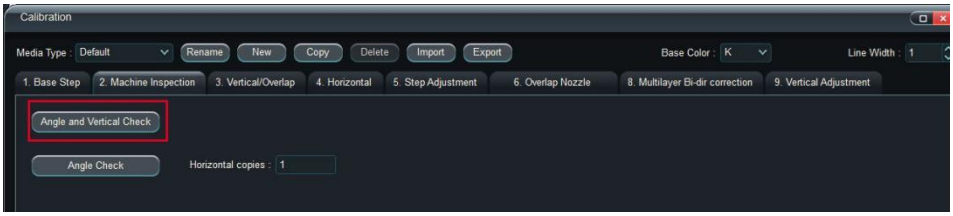


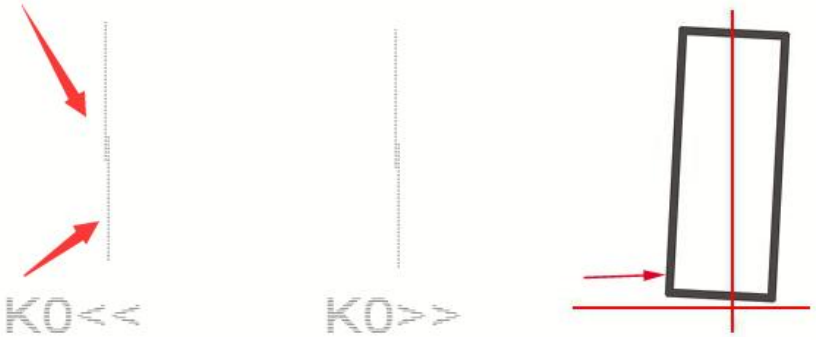
Fig.119: Mechanical calibration step 1

Printed mechanical check patterns includes angle check pattern and vertical check pattern, as shown below:

Fig.120: Mechanical calibration step 2

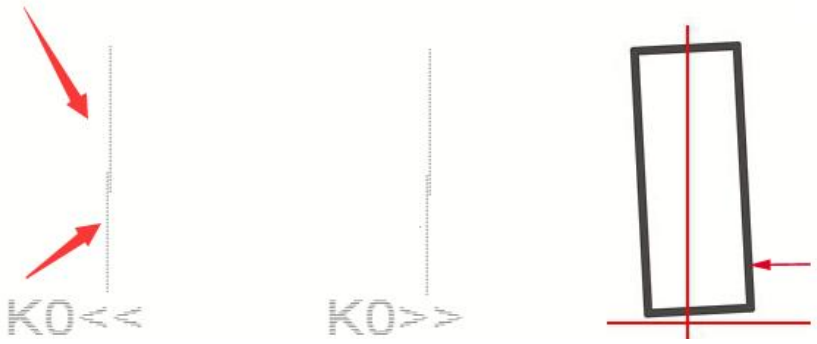
Print head angle adjustment

The schematic diagram is as shown below:



The upper and lower lines printed as shown mean that the front end of the print head is to the left, and it needs to be pushed to the right.

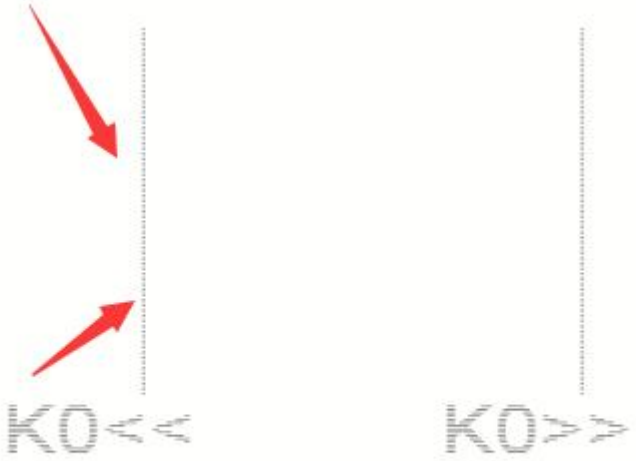
Fig.121: Mechanical calibration step 3



The upper and lower lines printed as shown mean that the front end of the print head is to the right, and it needs to be pushed to the left.

Fig.122: Mechanical calibration step 4

The following schematic diagram shows the print from the correct angle of the print head:



The upper and lower lines printed in a straight line mean that the print head is installed perpendicular to the X-axis direction.

Fig.123: Mechanical calibration step 5

Physical vertical calibration, for example, if two print heads with four colors are installed in a row with the color sequence of K, C, M, Y, it is necessary to calibrate the physical positions of the two print heads, as shown in the following figure:

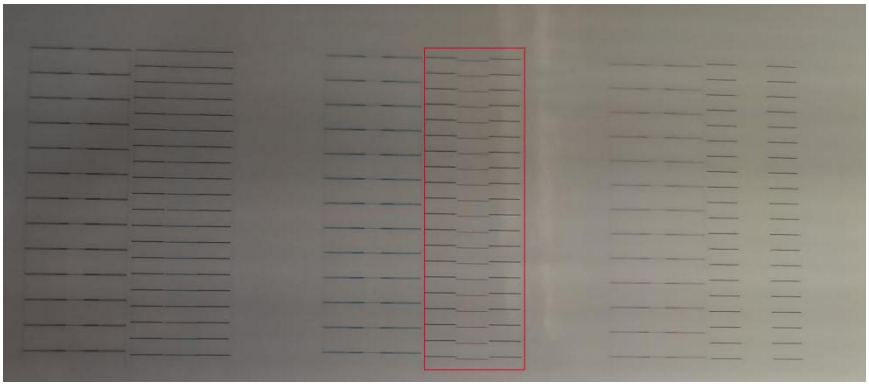


Fig.124: Mechanical calibration step 6

It is necessary to adjust the physical installation location of the print head to adjust the alignment error of the two print heads, and adjust the color lines of K and M to be stacked smooth, as shown in the following figure:

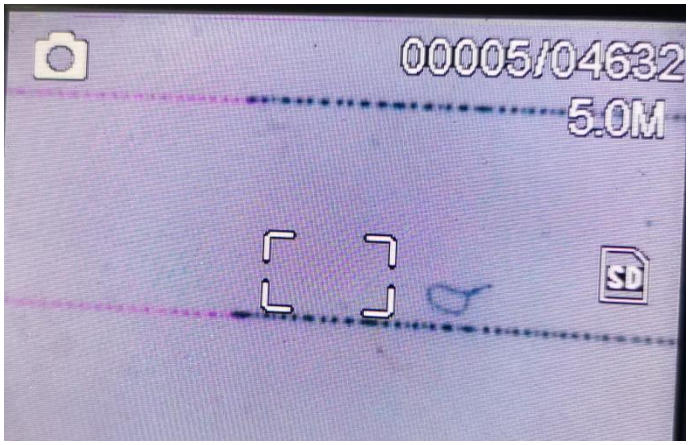
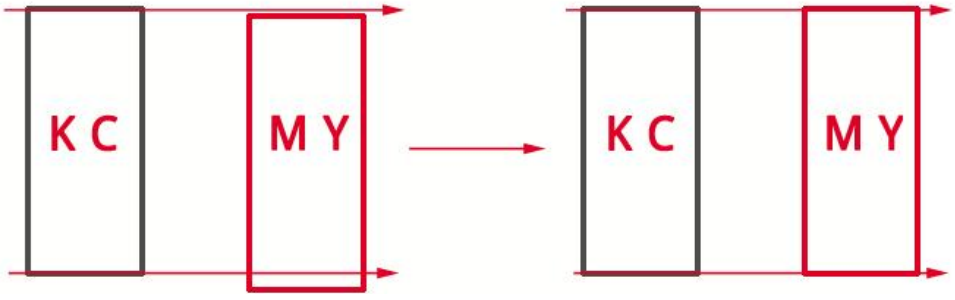


Fig.125: Mechanical calibration step 7

The schematic diagram of the physical vertical adjustment of print head is as follows:



As shown in the figure, one print head supports two colors. KC and MY represent a print head respectively. When the M print head is tilted down, it should be adjusted upwards to be flush with K print head.

Fig.126: Mechanical calibration step 8

The mechanical calibration of the print head is completed after the angle and vertical calibration. Follow this step to complete the physical position calibration of other print heads.

Software calibration

Select the "Horizontal" interface to enter this interface, select the mode that needs to be calibrated, select "Bi-dir" to calibrate both directions first, and click "Print"

Fig.127: Calibration step 1 of the software

Check which group of lines in the calibration patterns are stacked the smoothest, and adjust the value into the calibration value, and click save

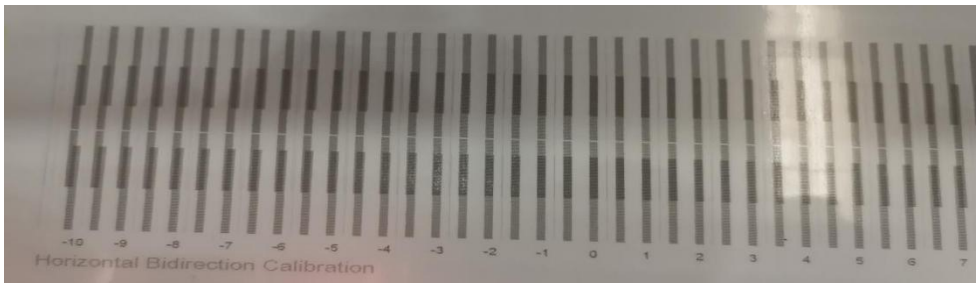


Fig.128: Calibration step 2 of software

Select the "Horizontal" interface to enter this interface, select the mode that needs to be calibrated, select "Head" and "Left" respectively, and click "Print" to perform left calibration of the print head.

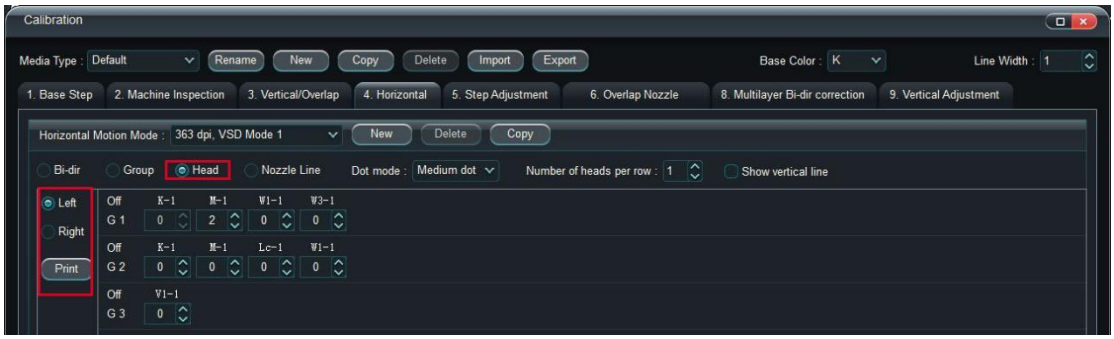


Fig.129: Calibration step 3 of software

Check which group of lines in the calibration patterns are stacked the smoothest, and adjust the value into the calibration value, and click save

Fig.130: Calibration step 4 of software

In the "Horizontal" interface, select "Head" and "Right" respectively, and click "Print" to perform right calibration of the print head.

In the "Horizontal" interface, select "Nozzle line", select "Left" and "Right" respectively, and click "Print" to perform left and right calibration of the nozzle rows.

Fig.131: Calibration step 5 of the software

After the calibration is complete, save and back up the calibrated parameters in engineer mode. Hold down Ctrl+Shift+g and enter the password (LY123456) to enter the engineer mode. Meanwhile, the software toolbar menu will pop up the “Loading” and “Save” icons. Click “Save”, the software parameters will be saved to the mainboard. The backup parameters can be loaded if you replace the computer or reinstall the software. As shown below:

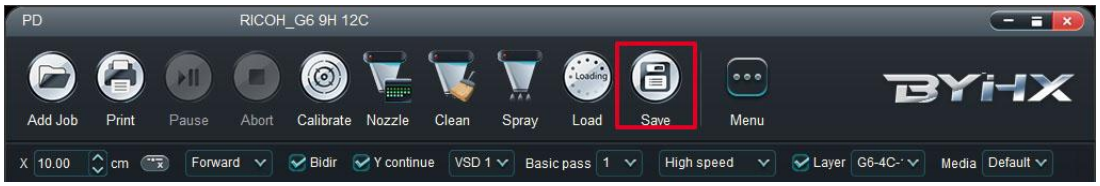


Fig.132: Save calibration data

After the physical and horizontal calibrations of the calibration interface are completed, the image can be loaded, printed and verified.

Note:

After the calibration is completed, saved and back up the calibrated parameters to prevent computer damage or abnormal parameter loss.

DQS20 Series UV Hybrid Printer

Print Software Interface and Functions

Introduction to software

Introduction to software interface

Main interface

As shown below, the main interface of the software consists of toolbar, parameter setting, preview bar, taskbar, status bar, and print queue bar. This chapter introduces each part in detail.

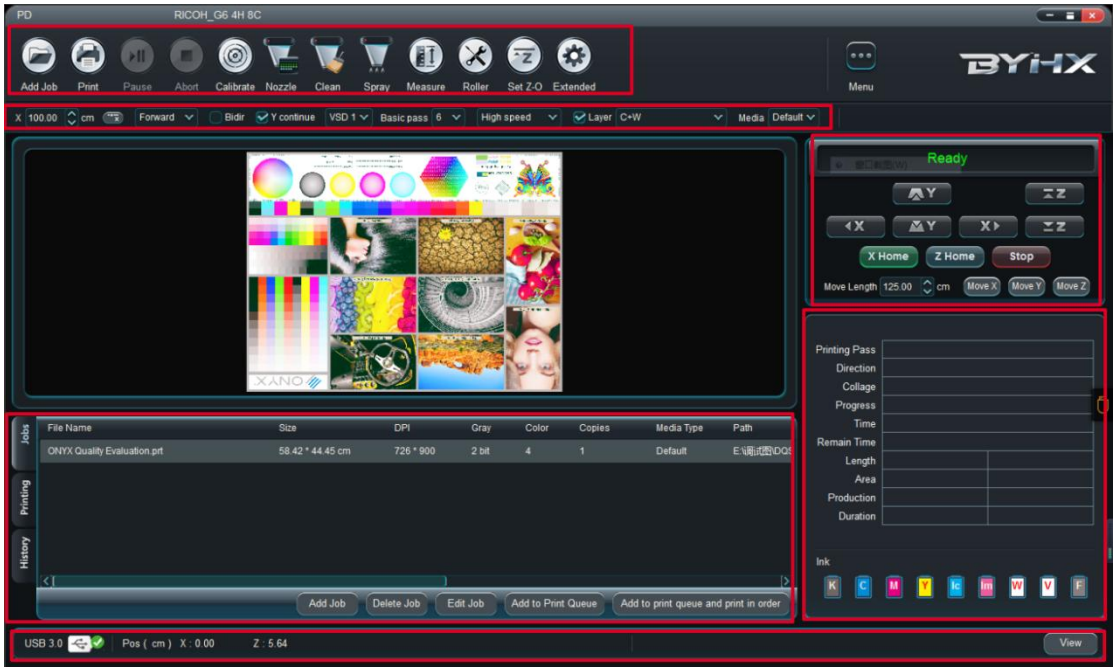
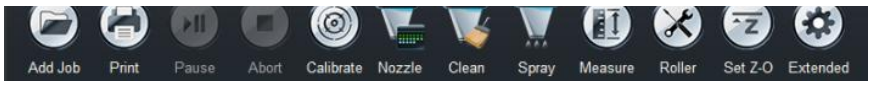
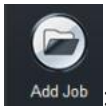


Fig.133: Main interface

Toolbar

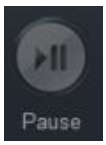
Tool buttons:





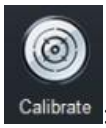
: Add job

: Start job

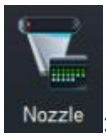


: Pause job

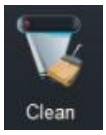
: Abort job



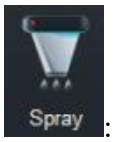
: “Calibration” wizard icon



: “**Print Nozzle Check” button**



: “Automatic Cleaning” button. Applicable to printers with cleaning function, not this model.

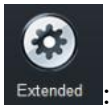


: “Automatic Flash Spray” button

: “Automatic Height Measurement” button. Applicable to printers with height measurement function, including this machine.

: “Roller Control” button. Applicable to printers with roller control function,including this machine.

: Lock the Z-axis height. Lock the current Z-axis height as the print height



: Extended settings. Set the maintenance parameters.

Movement control area


: Move left


: Move right

 : Move backward

 : Move forward

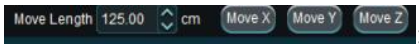
 : Move upward

 : Move downward

: Move to the origin of X axis

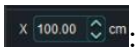
: Move to the origin of Z axis

: “Stop Moving” button



: Move X, Y and Z axes to set the move length. Click “Move X”, “Move Y” and “Move Z” respectively to move according to the set length.

Parameter setting toolbar



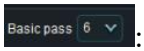
: X-axis starting point position, which can be changed at the printer ruler.

: X-axis starting point direction. You can select to print forward or reverse.

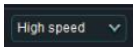
: Select unidirectional or bidirectional printing. Tick the bidirectional printing and untick the unidirectional printing.

: “Y continue” is the specific function for tablet machine. Tick it in normal cases for this model.

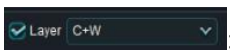
: Select the carriage’s speed in printing. There are four modes of VSD Mode 1, 2, 3 and 4 to choose. The actual carriage speed is determined by the ignition frequency of the four modes. This model only has VSD Mode 1, 2 and 3.



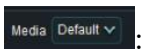
: Set the number of “Basic Pass”. Select the Pass number for current job.



: Select the printing speed. Set the resolution of the X direction when printing. The high precision is the grating resolution, and 1/2 of it is the high speed.



: Select the print head. Select the layer of print head for current job.



: Select the medium. Select the calibration parameters for different media.

Preview bar

When you select the current job, you can preview the current job picture, and the status bar will display the current job name, job size, job accuracy, gray level, color quantity, number of copies, media type, and file location.

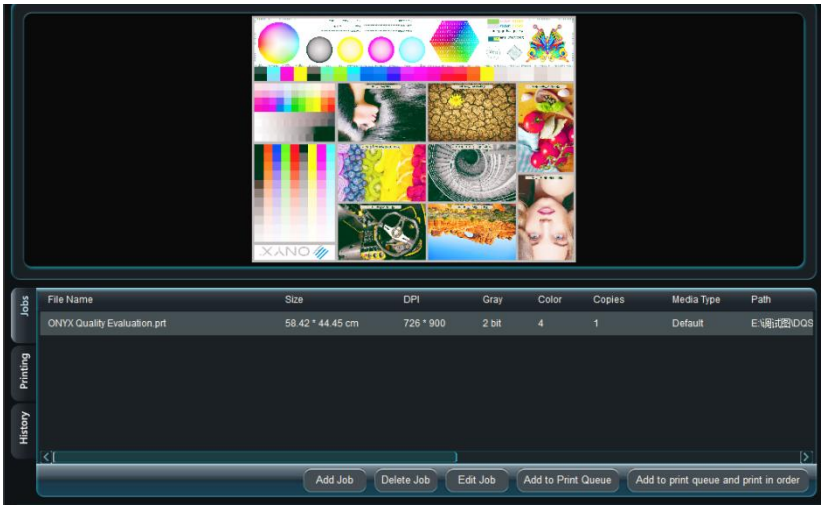


Fig.134: Preview bar 1

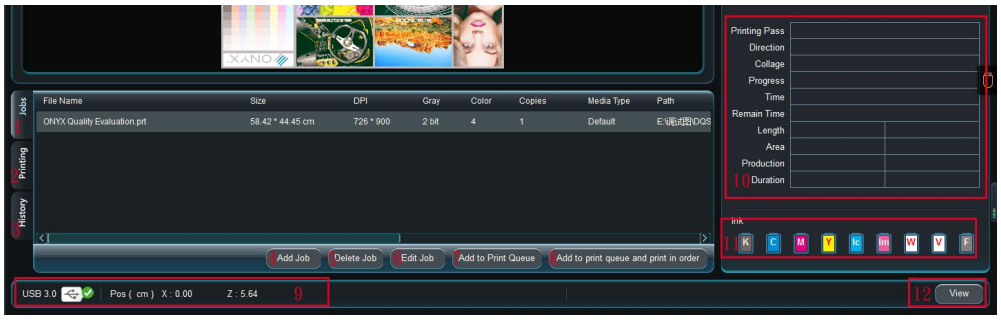


Fig.135: Preview bar 2

No.	Description	Function
1	Jobs	Job list, select to see the jobs in the current list
2	Printing	Print queue, select to see the jobs in the print queue
3	History	History queue, select to see the completed jobs in the history queue
4	Add job	Add job
5	Delete job	Delete the selected printing job
6	Edit job	Edit the selected job
7	Add to Print Queue	Add the selected job to print queue
8	Add to print queue and print in order	Add the selected job to print queue and print in order
9	USB3.0/Pos-X:/Z:	Display current USB connection state/X-axis coordinates/Z-axis height position
10	Printing job status bar	Display the current status of the printing job, such as number of passes, printing direction, number of collages, progress, time, area, and production capacity
11	Ink status bar	Display the current ink status of the main ink box

12	View	When an error occurs, click “View” to enter the error list record, which will provide detailed error information to help troubleshoot the problem.

Print setup

Fig.136: Print setup

Description	Function
Stripe width	Set color stripe width.
Stripe space	Set the spacing from color stripe to the job.
Stripe position	Select color stripe position: left, right, or both sides.
Stripe ink	Set the ink quantity of color stripe: 100>75>50>25
Stripe interval	Color stripe interval setting: set the number of Passes printed after each color strip
Color overlap	Color overlap setting: set the overlapping position of color stripe
Same height with image	Setting of same height with image: print color stripe at the same height as the job
Print meters	Print meters setting: display print meters
Fixed image position	Fixed image position setting
Machine color stripe Near	Machine color stripe - Near end distance
Far	Far end distance
Ink box liquid level display	Main ink tank level display settings: you can view the current storage status of main ink cartridge, and select the desired color according to the configured ink color.
Electric Eye	Electric eye open settings: tick it to use electric eye mode, which is not applicable to this machine.
Move distance after trigger	Setting of move distance after trigger. After triggering the electric eye mode, set the move distance of the medium.

Last move distance	Last move distance setting. The distance moved after completing the print job with voltage function.
Feather ink correct	Correct the quantity of feather ink
Overlap feather qty	Set the number of overlap feather nozzles
Feather type	Feather type setting. It is recommended to use gradient, UV gradient, or exquisite.
Feather strength	Feather strength setting: Weak, medium and strong or custom selection
Exquisite	Exquisite feather setting. Tick it to print with exquisite feather mode.
Uniform print	Uniform print setting. Tick it to print with uniform mode.
Feather between Heads	Feather between heads setting. Use this mode after ticking it.
Feather granule	Feather granule size setting
Pass granule	Pass granule size setting: set the size of feather granule
Use File Setting	Use File Setting: print according to the accuracy of the file, other settings are no longer effective.
Basic pass	The number of basic pass: set the number of basic pass for printing
Pass multiple	Pass multiple: increase the multiple on the basis of basic Pass for printing
X Div	Select the printing speed. Set the resolution of the X direction in printing. The high precision is the grating resolution, and 1/2 of it is the high speed.
VSD	VSD, VSD1/2/3 setting, VSD4 is not available
Step mode	Select step mode
Fixed color order	Fixed color order: Use the same color sequence when printing forward or reverse
Tail printing	Tail printing setting
Layer	Select print head. Select the layer of print head for current job.
Color ink	Color ink: 0-100
Auto skip white	Auto skip white takes effect after ticking it and it is recommended to use.
One step skip white	One step skip white takes effect after ticking it and it is not generally recommended to use.
Mirror	Mirror printing: the image can be horizontally mirrored for printing
Blank band qty	Blank band quantity: fill in the value after ticking it. The carriage scans the blank band quantity after printing, which is generally used for UV tail solidification.
Solidify offset	Solidify offset is similar to the blank band quantity. Calculate the offset of UV tail curing with length units.
Blank band step	Tick it, blank band quantity will step.

Step before printing	It can take a step before printing with the settable length.
Step after check nozzle	It can step forward after printing the nozzle check pattern.

Layer settings

Fig.137: Layer settings

Taking the example of white-color varnish (3 rows of print heads)	
Description	**Function**
Head selection	Print head selection mode
Rename	Rename, modifying the current selection mode name
New	Create a new print head layout mode
Copy	Copy the currently selected print head layout mode
Delete	Delete the currently selected print head mode
Import	Import saved layout file
Export	Export the currently selected layout mode
Export ALL	Export all layout modes
Layer	Use the "+" and "-" signs to increase or decrease the print head layout layers
Y Offset	Select the current layer and set the Y offset of the current print head in the layout. Set the Y offset of the print head in layer 1 to "0" (starting from 0 in software design, "1" is for layer 2, and so on)
Y Continue	Select the current layer and set the Y continuity of the current print head in the layout. For example, if there are 1 row of print heads, set the Y continuity to 1. If there are continuous 2 rows of print heads with the same color, set to 2, and so on.
Zoom In	Shrink point printing (zoom in)

X Offset	Select the current layer and set the X offset of the current print head in the layout. Calculated by the software itself, generally without setting
X Continue	Select the current layer and set the X continuity of the current print head in the layout. Generally not used
Zoom Out	Shrink point printing (zoom out)
Sublayer 1	Sublayer
Mirror	Mirror setting
White mode	White configuration, color configuration for color mode
Source	Data source setting, generally set to 1. If double-sided printing is required, choose 1 for A side and 2 for B side
Data Type	Data type setting, generally selecting normal
Color	Color selection setting, selecting the ink color of the current layer

Roller control

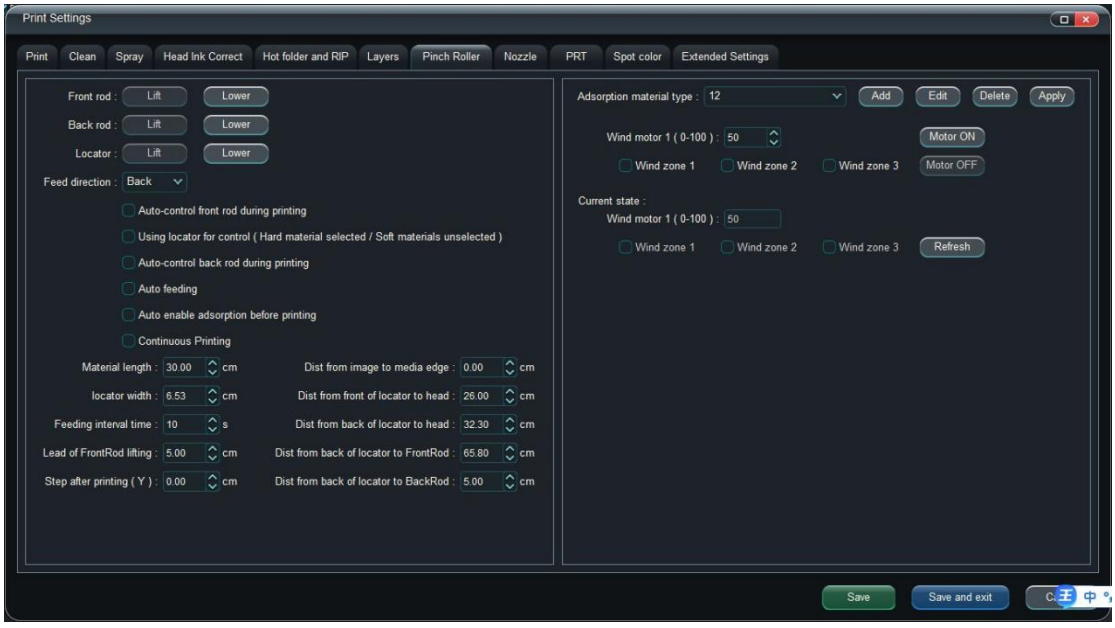


Fig.138: Roller control

Description	**Function**
Front rod	Control the lift and fall of the front rod. Click the Up and Down icon in the back, you can control the rise or fall.
Back rod	Control the lift and fall of the back rod. Click the Up and Down icon in the back, you can control the rise or fall.
Locator	Control the lift and fall of the locator. Click the Up and Down icon in the back, you can control the rise

	or fall.
Feed direction	Divided into front and rear feeding, that is, positioned in front or rear of the locator. When the front feeding function is not used, select the rear feeding state.
Auto control front rod during printing	Select to automatically control during printing; if not selected, it will not be executed
Using locator for control (Hard material selected/Soft materials unselected)	Select to automatically execute it, mainly used for plate printing
Auto control back rod during printing	Select to automatically control the lifting and lowering of the front rod during printing, mainly used for plate printing
Auto feeding	Select to continuously feed hard plates in the rear, corresponding to the feeding time
Auto enable adsorption before printing	Select to automatically control the start and stop of the adsorption fan during printing
Continuous Printing	Select to achieve continuous printing of hard plates
Material length	Material length. No need to fill in, the software will calculate the height of the printing job and automatically fill it in
Dist from image to media edge	Set the distance from the starting point of the printed image to media edge
Locator width	Set according to the locator width. If there is a deviation in the Y-axis positioning of hard plates, the setting value can be fine tuned
Dist from front of locator to head	Set the distance from front of locator to print head for adjusting the Y-axis positioning distance of the media in front
Feeding interval time	For continuous printing, the feeding time can be set, making it convenient to set the feeding time for different materials
Dist from back of locator to head	Set the distance from back of locator to print head for adjusting the Y-axis positioning distance
Lead of front rod lifting	After the printing job is completed, the lead of front rod lifting can be set to facilitate the picking up of the plates
Dist from back of locator to FrontRod	Set the distance from back of locator to front rod
Step after printing (Y)	Set the step distance after printing to facilitate the picking up of the plates
Dist from back of locator to BackRod	Set the distance from back of locator to back rod
Adsorption material type	Adsorption control media type, can be added, edited, deleted, and applied
Add	Add different media names and set corresponding parameters to use
Edit	Edit the set parameters

Delete	Delete the currently set media
Apply	Apply the set parameters
Wind motor (0-100)	Adjustable wind motor power setting
Motor ON	Wind motor on
Wind zone 1	Select to set wind zone 1
Wind zone 2	Select to set wind zone 2
Wind zone 3	Select to set wind zone 3
Motor OFF	Wind motor off
Current state	Current state, click refresh to view the current wind motor and wind zone state
Wind motor (0-100)	Wind motor power state query
Wind zone 1	State query of wind zone 1
Wind zone 2	State query of wind zone 2
Wind zone 3	State query of wind zone 3
Refresh	Click refresh to view the latest state

Hole breakage compensation

Hole breakage compensation can be used to correct when the print head occurs irreversible hole breakage that affects the printing job. Hole breakage compensation needs to be operated in the control interface of hole breakage compensation.

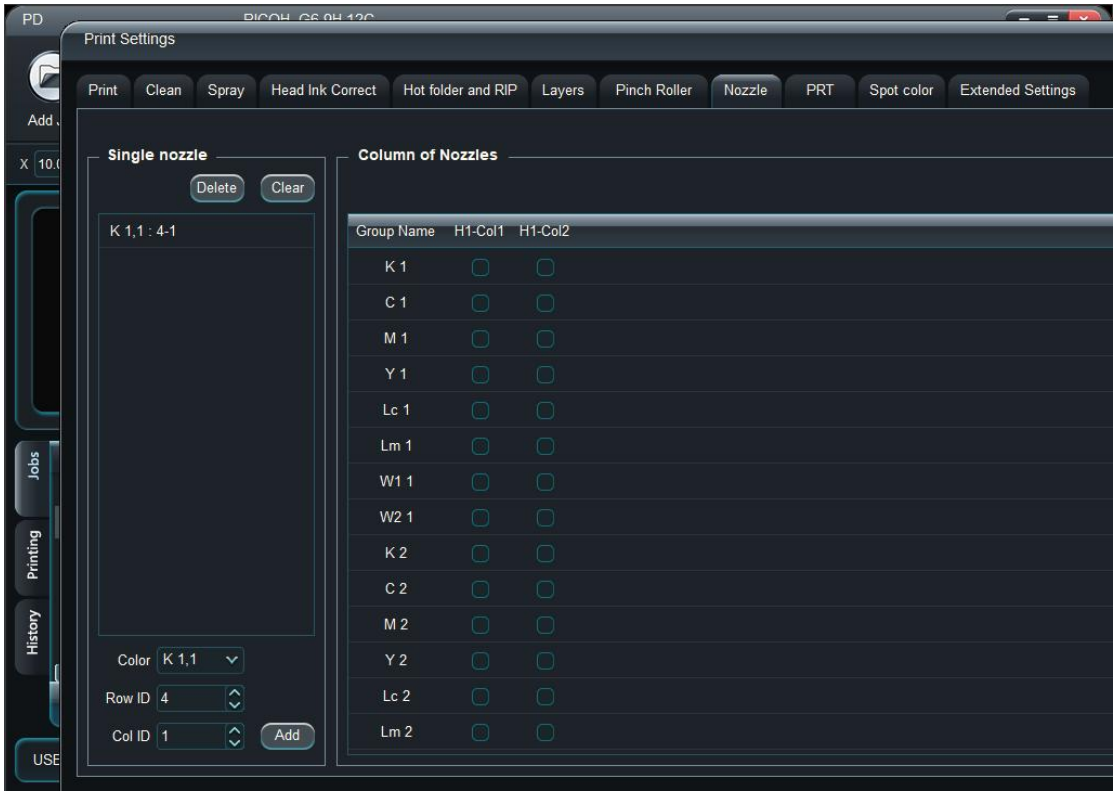


Fig.139: Control interface of hole breakage compensation

For the position of a single hole breakage, select the row and column of the hole breakage with any color to set a single hole breakage;

For the position of the whole row of hole breakage, select any row of any print head to set.

Note: Hole breakage compensation is an emergency but not a long-term solution

PRT setting

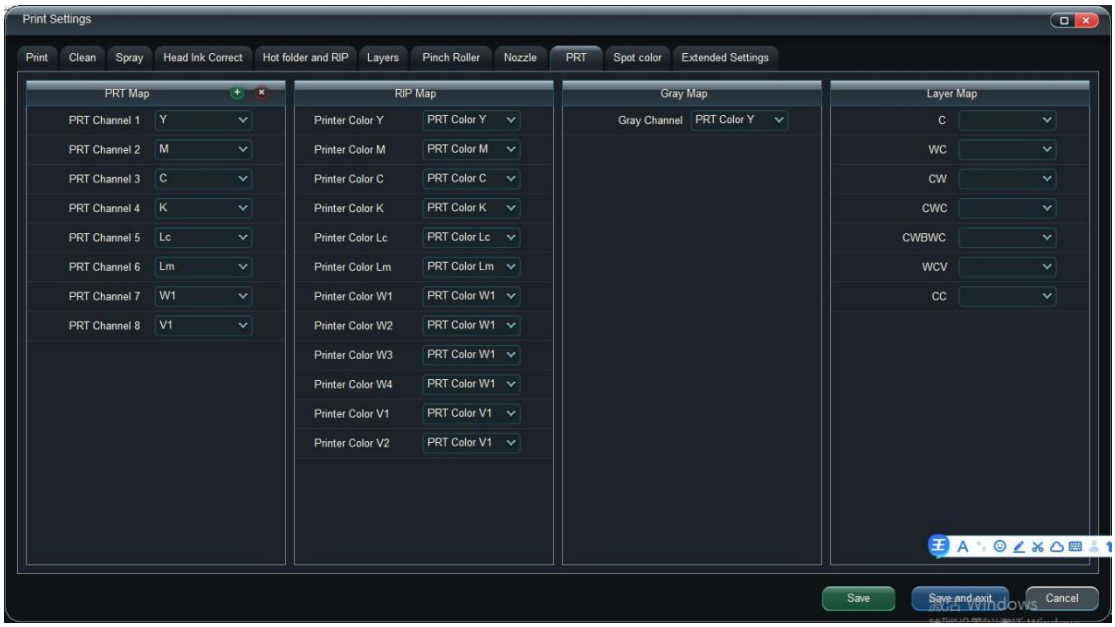


Fig.140: PRT setting interface

Description	Function
PRT Map	Use "+" or "-" to add or delete PRT channel mapping, as shown in the above figure: PRT color channel mapping only has K, C, M, Y, W1. If adding Lc or Lm, use "+" to add PRT channel mapping, default channels 1-4: Y-M-C-K
RIP Map	Set the correspondence between printer colors and PRT file color sequence, with default printer colors corresponding one-to-one to PRT colors.

Spot color settings

Fig.141: Spot color settings interface

Description	Function
White Settings	White ink setting
Large dot	Large dot setting
Medium dot	Medium dot setting
Small dot	Small dot setting
Shrink point: Zoom In	Shrink point printing: Zoom in
Zoom Out	Zoom out
White quantity	White ink quantity setting
Type	Printing type
All	All setting, white ink according to the full image
RIP	RIP setting, white ink according to RIP
Image (Inverse/Intersect/White)	Image setting, divided into three modes: inverse, intersection, and white ink, white ink according to the background color of the image
Y/M/C/K	When selecting image setting, choose which color to use to output white ink
W1	When selecting RIP setting, RIP generates white ink and W1 needs to be selected to output white ink
Varnish Settings	Varnish setting
Large dot	Large dot setting
Medium dot	Medium dot setting
Small dot	Small dot setting
Varnish quantity	Varnish quantity setting
Type	Printing type
All	All setting, varnish according to the full image
RIP	RIP setting, varnish according to RIP
Image (Inverse/Intersect/White)	Image setting, divided into three modes: inverse, intersection, and white ink, varnish according to the background color of the image
Y/M/C/K	When selecting image setting, choose which color to use to output varnish

V1	When selecting RIP setting, RIP generates varnish and V1 needs to be selected to output varnish
Gray Settings	Gray setting
White Large dot	White large dot setting
White Medium dot	White medium dot setting
White Small dot	White small dot setting
Colored Large dot	Colored large dot setting
Colored Medium dot	Colored medium dot setting
Colored Small dot	Colored small dot setting
Gray volume	Gray ink volume setting
Type	Printing type
All	All setting
RIP	RIP setting

Extended settings

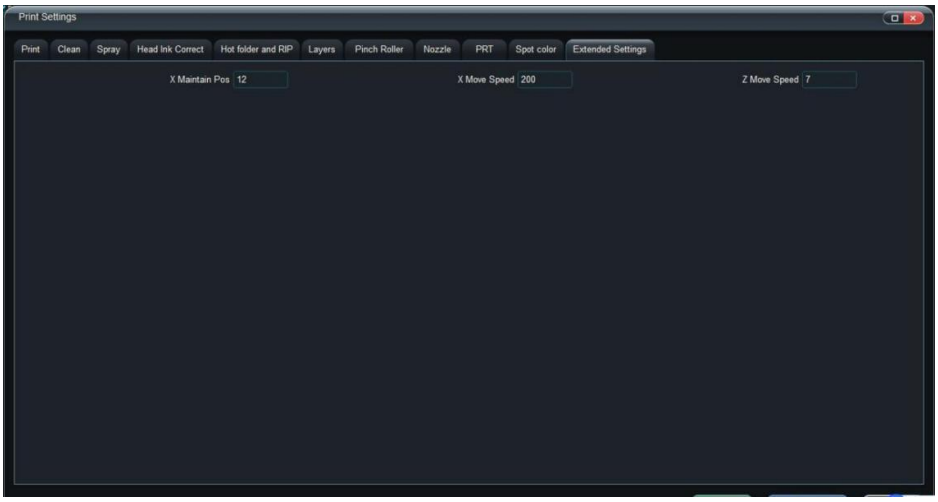


Fig.142: Extended settings interface

Description	**Function**
X Maintain Pos	X axis maintenance position offset setting: for machines with ink stack, you can set this parameter to adjust the position
X Move Speed	X-axis maintenance move speed setting: this maintenance button takes effect after setting the speed.
Z Move Speed	Z-axis maintenance move speed setting: tThis maintenance button takes effect after setting the speed.

Z-axis settings

Fig.143: Z-axis settings interface

Description	Function
Z Max Route (Zmax)	Maximum Z-axis route, setting the effective maximum Z-axis route
Measure Zmax	Measure the maximum Z-axis route, move the carriage to the printing table, and in the absence of media, click on measure to measure the maximum Z-axis route. Apply the Z-axis printing position to the MainBoard, with the maximum distance higher than the print platform, to ensure that the carriage descends to the lowest point and does not collide with the print platform
Cancel	Cancel measuring the maximum Z-axis route
Material Thickness (hm)	Material thickness. The value is automatically obtained after measuring the media
Measure Material	Measure the media, move the carriage onto the media, click on measure to measure the media thickness, and the value is automatically obtained
Cancel	Cancel measuring the media height
Head distance From Media (hj)	Fine adjustment of the distance from print head to media, which can be manually adjusted
Z Print Position (Zw)	Z-axis printing position, the actual printing height of the Z-axis after measuring the media thickness, and the value is automatically obtained

Apply Z Print Position to MB	Apply the Z-axis printing position to the MainBoard, save and lock the Z-axis position
Move to Z Print Position	Move to Z-axis printing position
Current Position	Current Z-axis position
Save	Save parameters
Cancel	Close the current window

Manufacturer settings (Engineer mode)

Connect the board card properly. (Note: if replacing the board card, do not connect the print head for the first time when powering on!!!) Power on the board card.
* Generally, the manufacturer of the normal printer has completed this setting. If the board card is damaged or backup files are lost, after upgrading the Mainboard upgrade package, the following settings need to be reconfigured.

Layout settings of print head

For this version of the software, the layout setting is embedded in the control software with no need for third-party tools to make the layout. In engineer mode, customers can change the layout configuration by themselves. Therefore, for customers with more ideas, this setting is more convenient.
Simultaneously hold down Ctrl+Shift+g and enter password: LY123456 to enter manufacturer mode:
Click "Main Menu" > "Settings" > "Factory Settings" and complete the following settings on the tab "Print head layout":
Click on the "Visual layout" icon on box 1 to jump to the page of box 2:
Click on the "Settings" icon on box 2 to jump to the page of box 3:
Enter the "Settings" interface:

Select the print head type (RICOH_G6), print head board type (DB_RICOH_G5/G6_1H H200), number of print head colors (2), number of splicing print heads (1), number of driver boards (4), add configuration color quantity according to requirements for the default value of group colors, fill in X unit shift (35.00) and Y unit shift (0), and click "Apply" to complete the settings;

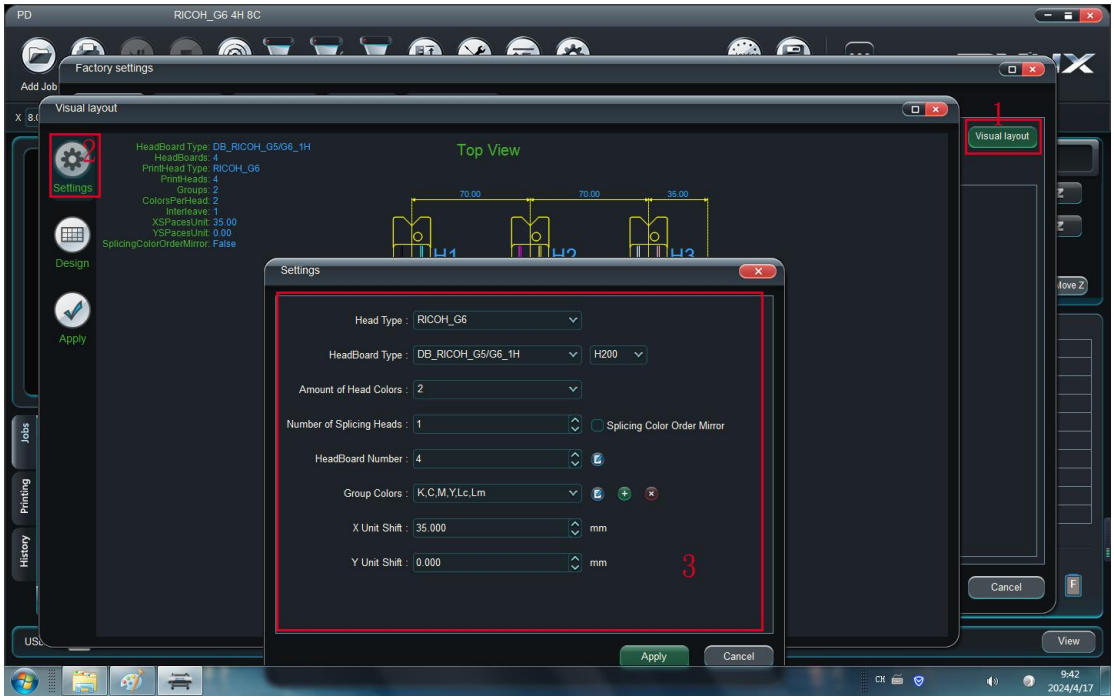


Fig.144: Print head layout setting 1

In the interface of print head layout setting, click the "Layout Design" icon in the middle to enter the "Settings" interface:
For selecting the installation location of the print head, click the "Apply" icon below to complete the layout design of the print head;

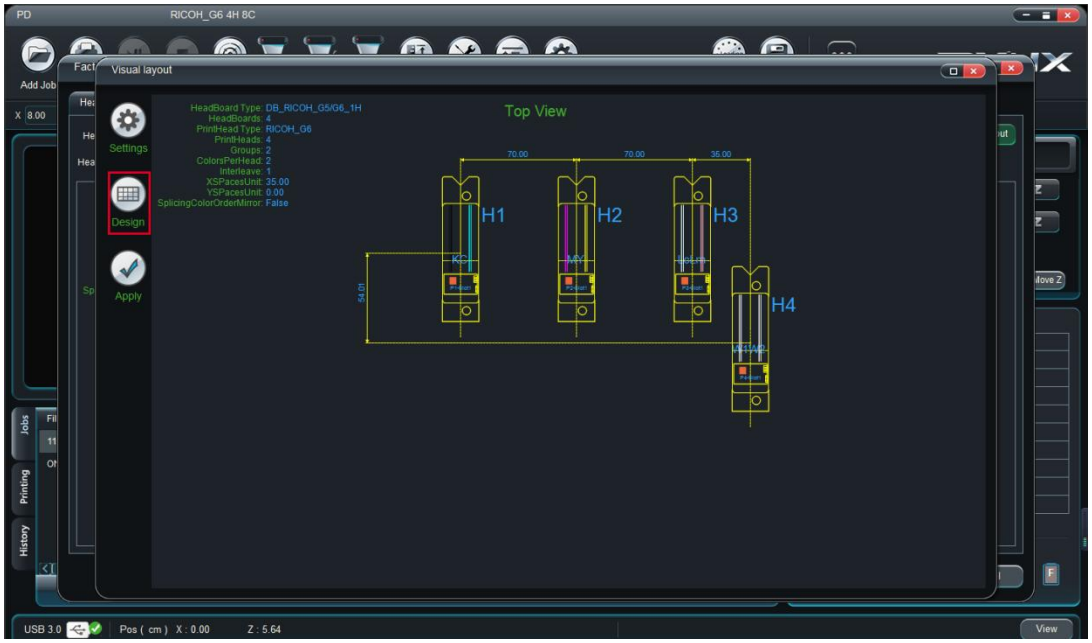


Fig. 145: Print head layout setting 2

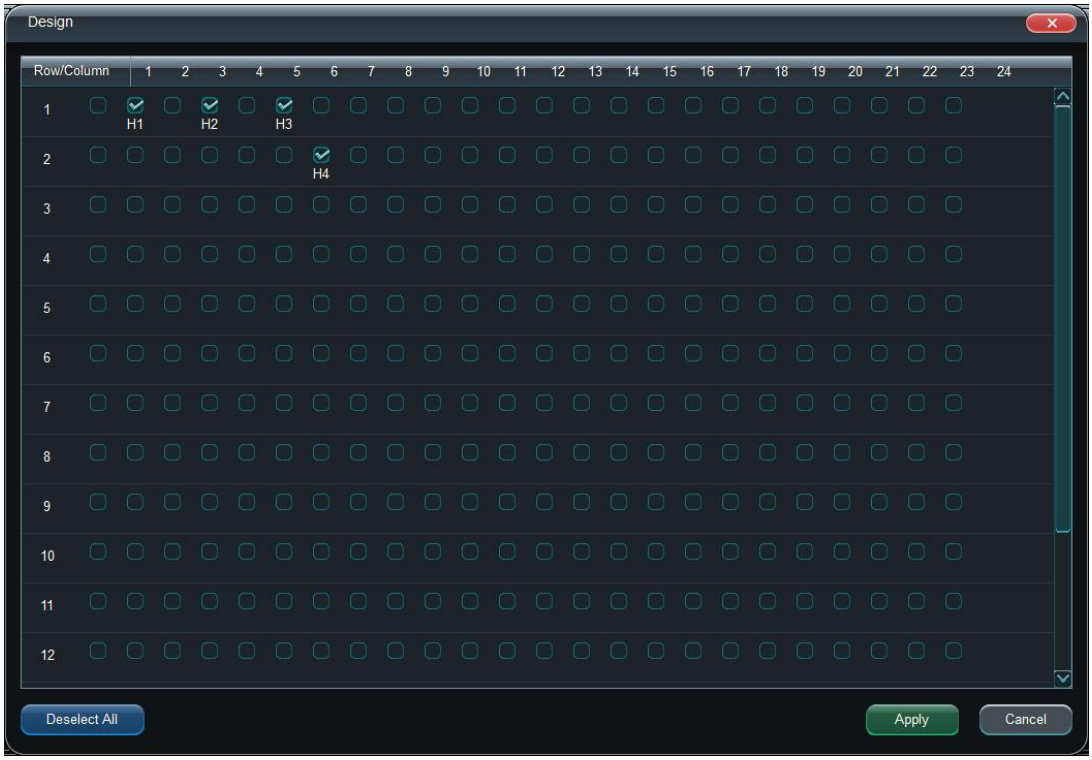


Fig. 146: Print head layout setting 3

Enter the "Visual layout" interface, left click on the print head icon to pop up a settings window. Select the "Set Color Order" icon to enter the "Color Order Settings" interface and set the desired color for each print head.

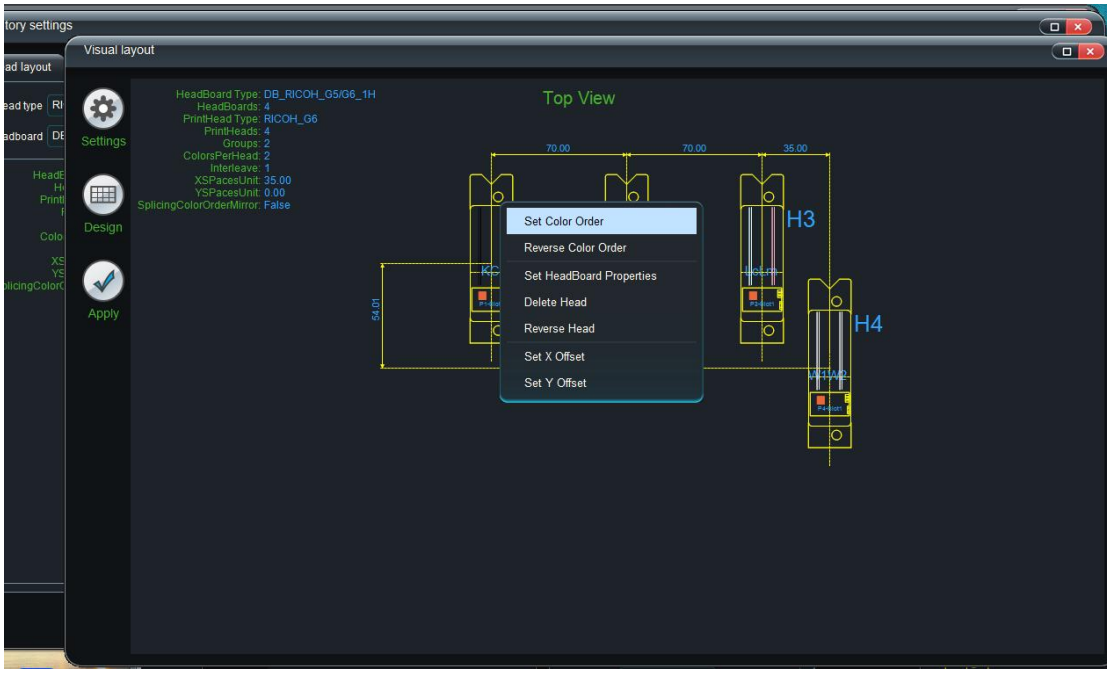


Fig. 147: Print head layout setting 4

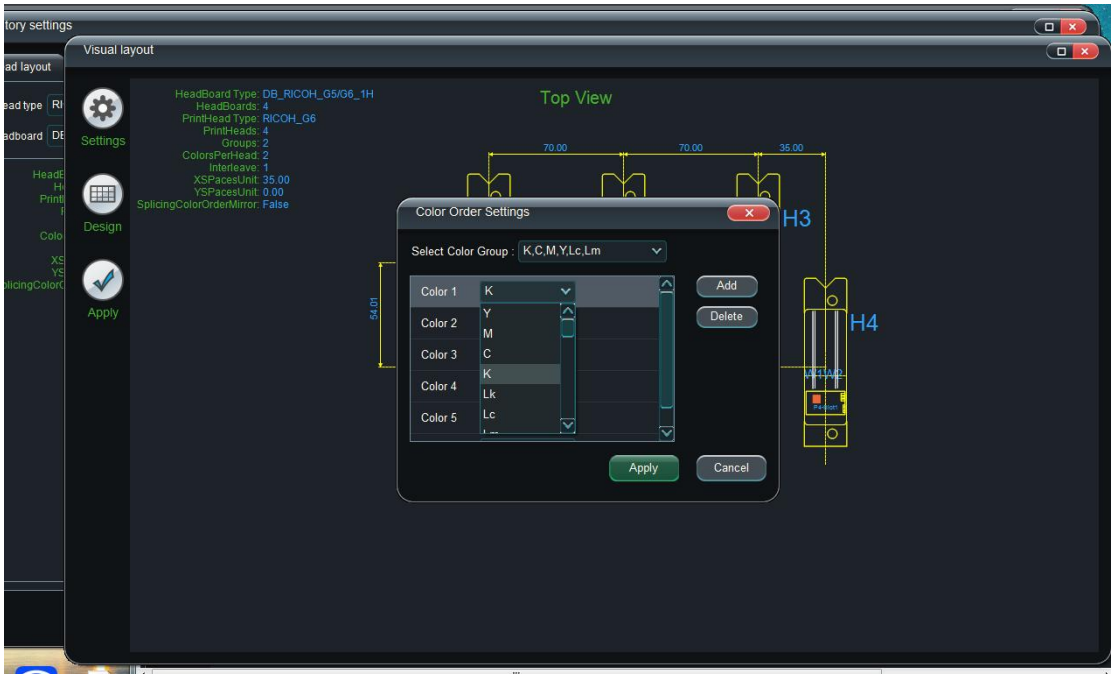


Fig. 148: Print head layout setting 5

Enter the "Visual layout" interface, left click on the print head icon to pop up a settings window. Select the "Set Print Head Board Properties" icon to enter the "Print Head Board Properties Settings" interface, and complete the corresponding channel properties settings for each print head board. After completing all settings, click on the "Apply" icon in the lower left corner to complete the print head layout design and restart the UV hybrid printer;

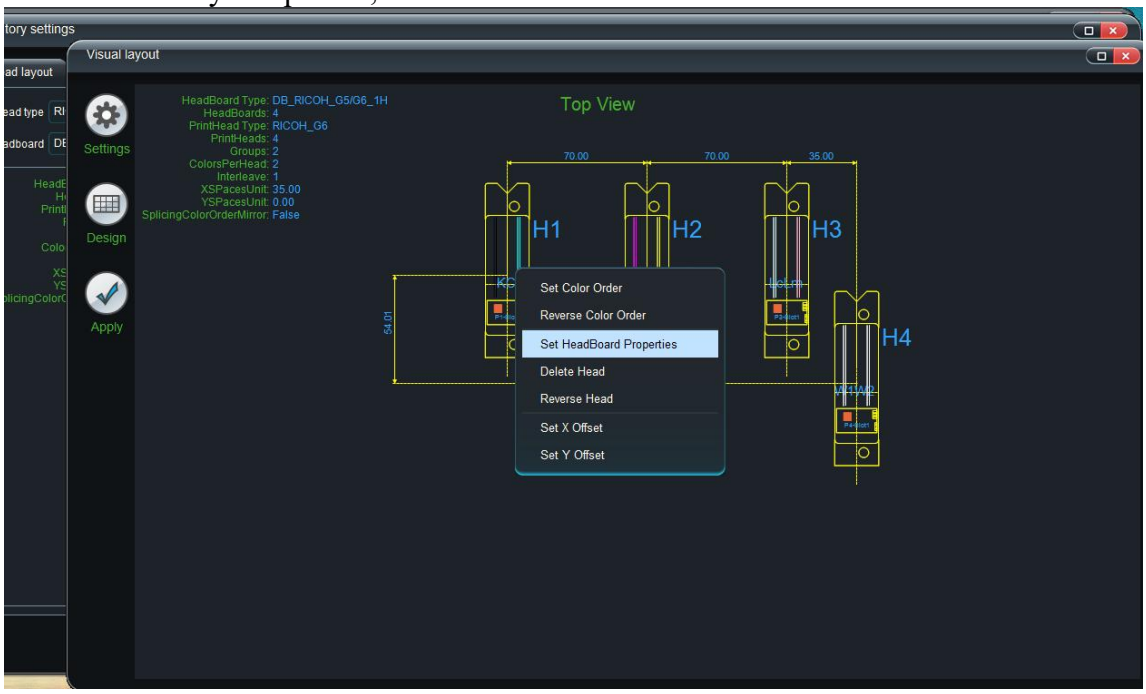


Fig. 149: Print head layout setting 6

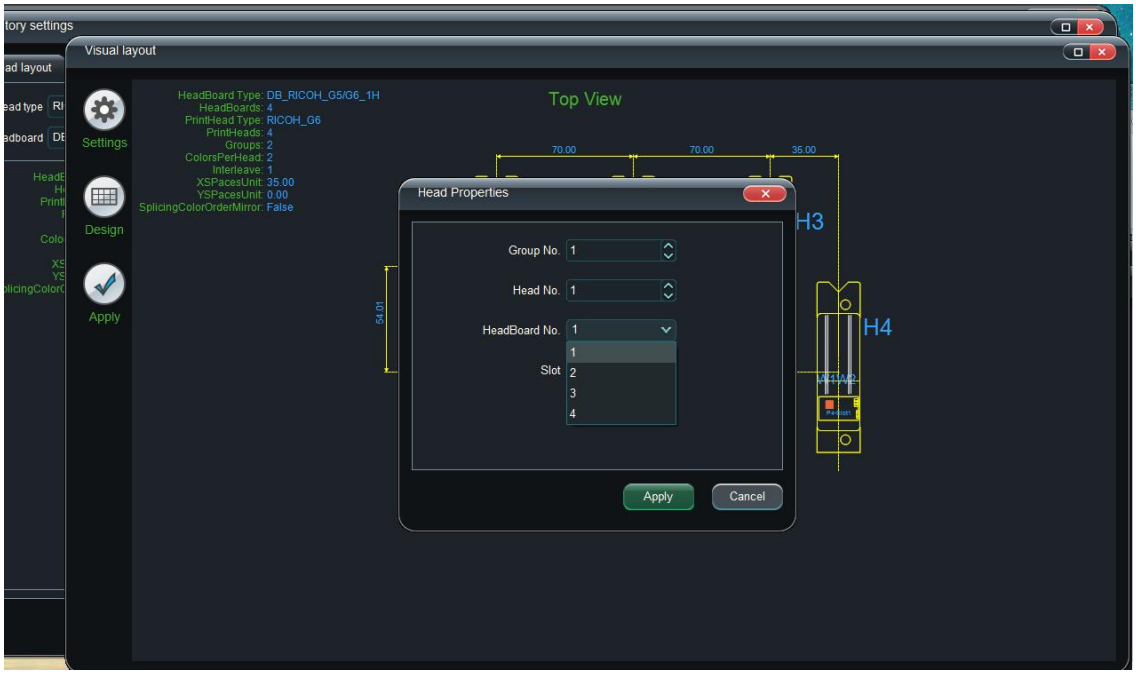


Fig. 150: Print head layout setting 7

UV hybrid printer settings

Click on the "Printer Settings" tab to enter the “Printer Settings” page. Select the matching raster resolution, printing width, distance from the origin to the platform, distance from the endpoint to the platform, etc. as shown in the figure below, click "Save" to complete the settings, and restart the UV hybrid printer to complete the factory parameter settings;

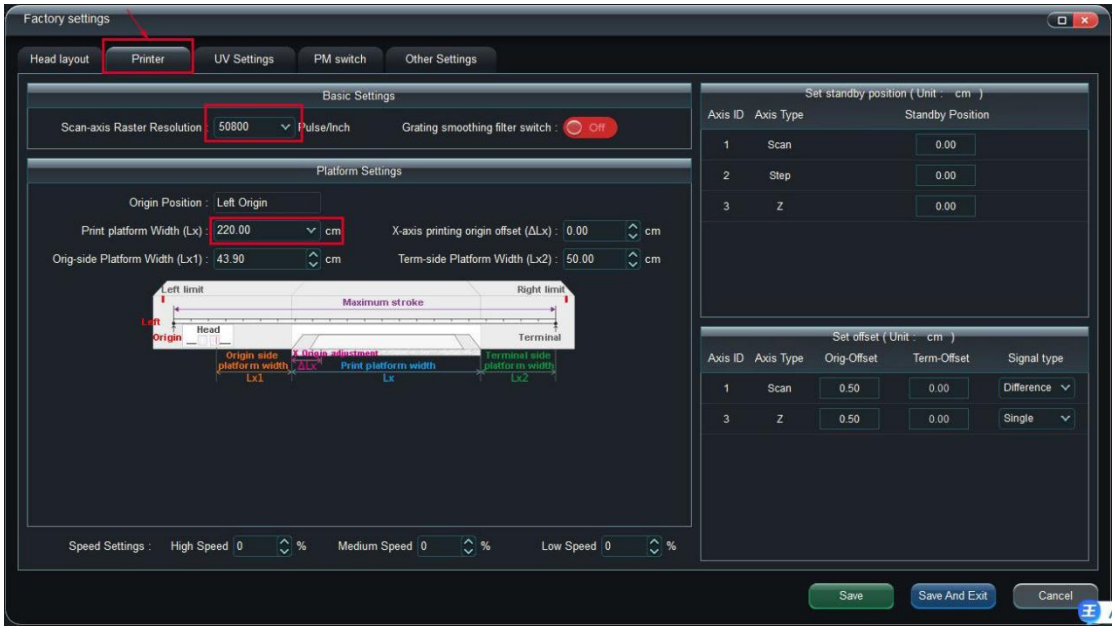


Fig.151: UV hybrid printer settings

UV light settings

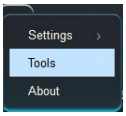
Fig.152: UV light settings

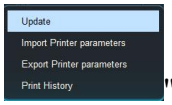
Description	Function
Test UV light Switch	Test UV light switch
Headlight 1	When selecting, the UV light will flash once. Confirm whether the headlight is at the terminal side. If it is not correct, the control signal line on the UV box can be swapped (the headlight and backlight can be determined according to the instructions on the page)
Backlight 1	When selecting, the UV light will flash once. Confirm whether the backlight is at the origin side. If it is not correct, the control signal line on the UV box can be swapped (the headlight and backlight can be determined according to the instructions on the page)
Enable for each group	Enable multiple groups of UV lights
Group 1 Enabled	Select the first group of UV lights to enable
Check Nozzle	Print nozzle check diagram for setting the position of headlight and backlight switches
Set position 1	Set the position for switching on the backlight. Move the X-axis, the back UV light is on the left side of the left color bar on the nozzle check diagram in the printing direction of the schematic diagram. Click on Set position 1 to set the parameters for switching on the backlight. (If there is any deviation, obtain the position of the parameters below and adjust the parameters according to the instructions in the diagram. The same applies below.)

Set position 2	Set the position for switching on the headlight. Move the X-axis, the front UV light is on the left side of the left color bar on the nozzle check diagram in the printing direction of the schematic diagram. Click on Set position 2 to set the parameters for switching on the headlight. (The software will automatically calculate it.)
Set position 3	Set the position for switching off the backlight. Move the X-axis, the back UV light is on the right side of the right color bar on the nozzle check diagram in the printing direction of the schematic diagram. Click on Set position 3 to set the parameters for switching off the backlight.
Set position 4	Set the position for switching off the headlight. Move the X-axis, the front UV light is on the right side of the right color bar on the nozzle check diagram in the printing direction of the schematic diagram. Click on Set position 4 to set the parameters for switching off the headlight.
Print Towards Terminal Backlight	When switched on, switch on the backlight when printing towards the terminal
Print Towards Terminal Headlight	When switched on, switch on the headlight when printing towards the terminal
Print Towards Origin Backlight	When switched on, switch on the backlight when printing towards the origin
Print Towards Origin Headlight	When switched on, switch on the headlight when printing towards the origin
Delay distance of Light on	Setting of delay distance of light on
Save	Save parameters to MainBoard
Save And Exit	Save parameters to MainBoard and exit
Cancel	Close the window

Updating

To repair some bugs not found during the test or add some functions, the firmware of the mainboard or print head board needs to be updated. The following details how to update the firmware.

Click "  > 

> 

" to pop up the "Open the Dialog Box", select the corresponding upgrade file and click OK (the suffix of the upgrade file is .zip)

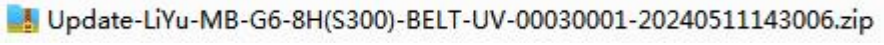
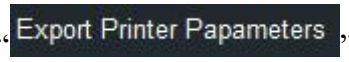


Fig.153: Upgrade page

Import/export parameters

Parameters import and export is a way to quickly restore printer parameters, which is mainly for the UV hybrid printer that has been installed on the client-side. Save and export the calibrated parameters, which is convenient to quickly restore printer parameters when replacing the computer, reinstalling the system or replacing the board.

After the newly installed machine is calibrated, click “  ” first to save the calibrated parameters to the mainboard, and then click “  ” to export the parameters to a file, including manufacturer settings, layout package, layout settings, and calibrated parameters.

When reinstalling the system and software, click “  ” to import the previously backup parameters to the software.

Version information

Select “About Items” in the main menu to pop up the version information of the entire system and ink quantity information as shown in the following figure, and also support to download the log file of board card.

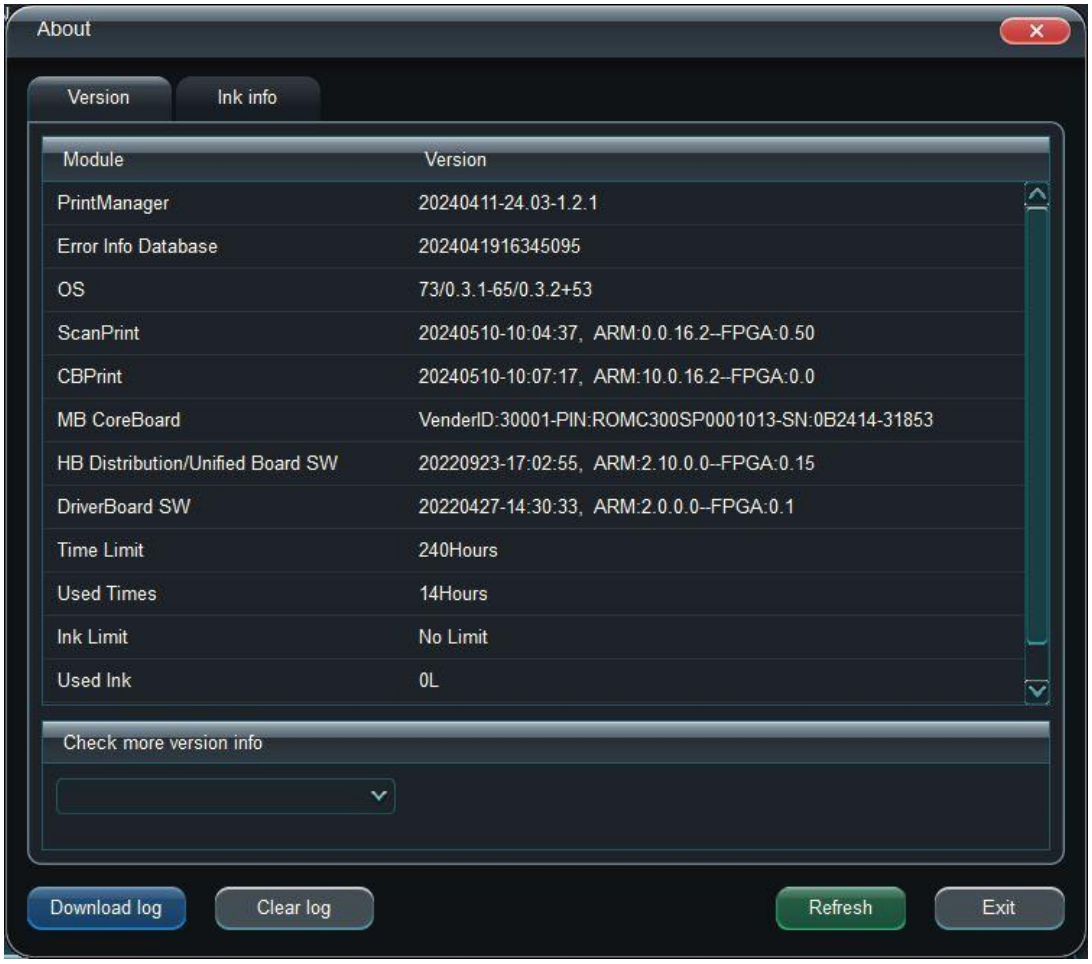


Fig.154: Version information page

Description	**Function**
PrintManager	PM software version
Error info database	Error info database version
OS	Mainboard kernel version
ScanPrint	Mainboard main print program version
CBPrint	Mainboard business program version
MB CoreBoard	Mainboard CoreBoard hardware version
HB Distribution/Unified Board SW	Distribution/Unified Board software version
Time Limit	Time limit of board card
Used Times	Cumulative used times of board card
Ink Limit	Ink limit of board card
Used Ink	The total quantity of current used ink of the board card
Download log	Download the current log information of the board card
Clear log	Clear the current log information of the board card

Board card description

Introduction to print head board

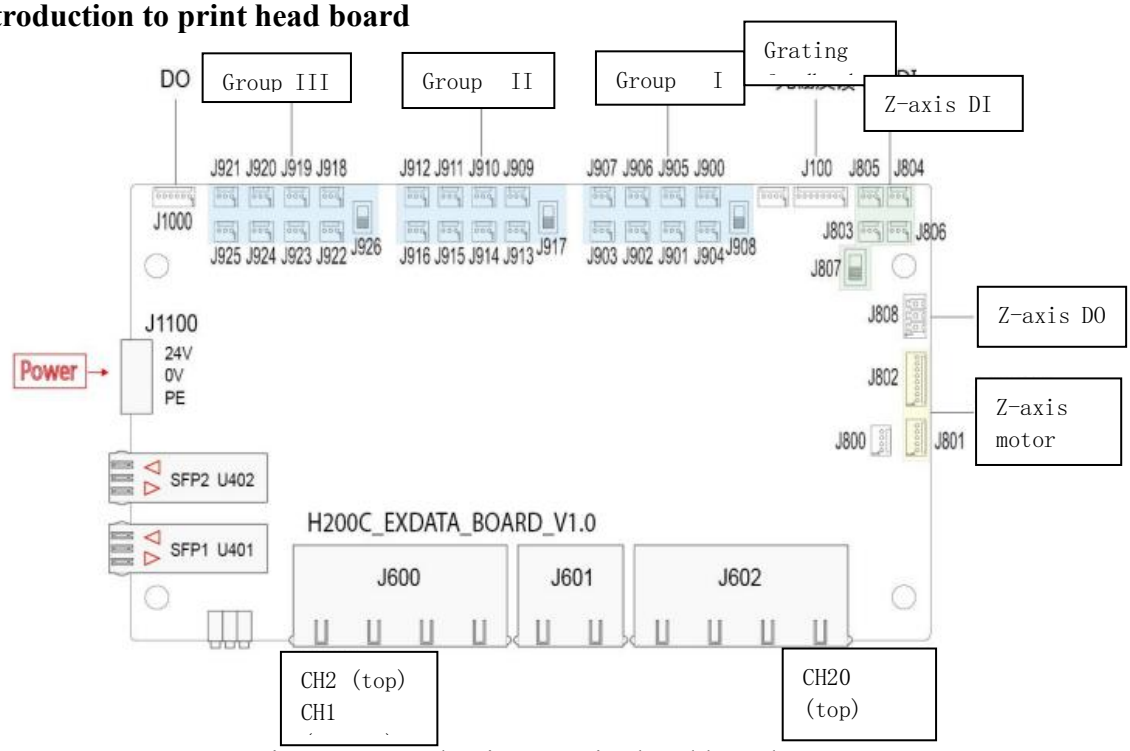


Fig.155: Introduction to print head board

Description	Function
J908/J917/J926	The default position of the board card is at the front when it leaves the factory. When using it, the three dial switches must be turned to the back, otherwise it will cause the interface in the rear area to fail.
Group II DI	Secondary ink box signal interface: J909-K, J910-C, J911-M, J912-Y, J913-Lc, J914-Lm, J915-W, J916-V
Group I DI	J904 safety bottle signal interface, J902 anti-collision signal interface
J100	Grating feedback signal
J804	Z-axis electromagnetic sensor signal interface
J803	Z-axis sensor signal interface
J808	Z-axis electromagnetic output interface
J801	Z-axis driver signal interface
J1100	Print head board power input interface
SFP1	Interface of the first group of fiber modules, with only one fiber interface for less than 16 modules
SFP2	Interface of the second group of fiber modules, with dual fiber interfaces for more than 16 modules
J600	The print head board outputs signals to the signal transmission network interface of driver board, with CH1 at the bottom, CH2 at the top… (from left to right)
J601	The print head board outputs signals to the signal

	transmission network interface of driver board, as above
J602	The print head board outputs signals to the signal transmission network interface of driver board, as above

Introduction to indicators

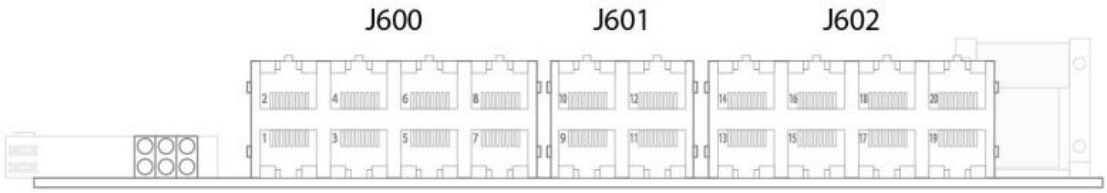


Fig.156: Introduction to indicators

Position	**Identification**	**LED**	**Color**	**Functions**	**Normal working mode**	**Abnormal condition**
Upper left	POWER	LED1100	Red	Power indicator	The indicator is on during power-on. If it is steady on, the indicator is normal.	Off
Lower left	SFP1_LINK	LED1101	Green	Optical fiber 1 indicator	On	Off
Upper middle	FPGA_RUN	LED1102	Green	FPGA running indicator	Flash	On/off
Lower middle	SFP2_LINK	LED1103	Green	Optical fiber 2 indicator	On	Off
Upper Right	ARM_ERR	LED1104	Red	ARM fault indicator	Off	On
Lower right	ARM_RUN	LED1105	Green	ARM running indicator	Flash (1 time/second)	On/off

Introduction to MainBoard

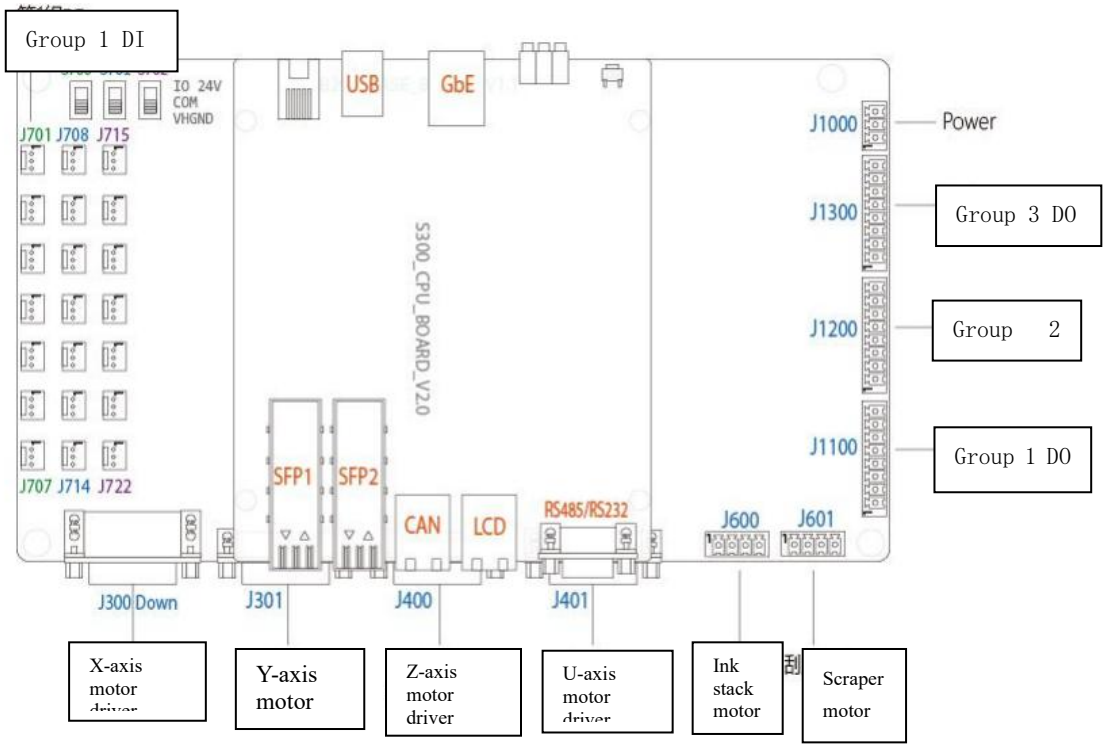


Fig.157: Introduction to mainboard

Description	Function
USB	The USB3.0 interface of mainboard is connected to the computer and the UV hybrid printer is controlled by software
J701	X-axis origin sensor interface is connected to the X-axis origin sensor and X-axis starting point after reset.
J703	The interface of paper shortage sensor is connected to the paper shortage sensor. When the sensor is enabled, the paper will be detected. The software will display an error message when there is no paper and pause printing.
J704	The interface of maintenance button is connected to the maintenance button for printer maintenance.
J1000	Mainboard power input interface for power supply for mainboard
J1300	Output signal, the first is the common terminal, the third is the ink supply signal V for the main ink pump, and the rest are temporarily not used
J1200	Output signal, the first is the common terminal, the second is the output signal W for the main ink pump, with Lm, Lc, Y, M, C, K from top to bottom.
J1100	Output signal, the first is the common terminal, the fifth is the circulating pump signal W, the sixth is the mixing pump signal W, the seventh and eighth are the

	UV light output signals, and the rest are temporarily not used
J300	X-axis motor driver interface for the connection of X-axis control driver
J301	Y-axis motor driver interface for the connection of Y-axis control driver
SFP1	Interface of the first group of fiber modules, with only one interface for less than 16 modules
SFP2	Interface of the second group of fiber modules, with dual fiber interfaces for more than 16 modules
J401	Key board communication interface

Introduction to fiber optics and modules

The optical module model configured for the S100/S300 system is HSP313G-S5DT (single core and single mode), which needs to be paired for use.
Module 1 is a red optical module: 1310T/1550R
Module 2 is a green optical module: 1550T/1310R
The above two optical modules need to be paired for use, with one red and one green as a pair. The two modules do not distinguish between the mainboard and the print head board.

Fig.158: Fiber optic module

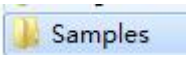
DQS20 Series UV Hybrid Printer

Quality Inspection and Receipt

Quality Inspection and Receipt

Once the installation and debugging of printers are completed, you need to print a standard inspection diagram as the acceptance standard. This file as an additional file, you can load the image from the “SAI” software and generate the PRT file.
The name of this file for checking print quality is called:
SAi_FlexiPRINT_Quality_Sample_2019

Note:

This file can be found in the “SAI” 

file directory.

Print the picture to the vehicle sticker and other materials. After analyzing the reference file on quality, if you are satisfied with the print quality, you can ask the appropriate customer representative to print. After confirming that you are satisfied, you need to record the printing parameters and date on the side of the image and co-sign the signature and date.

Note:

Ensure that at least 2 files on quality are printed and signed for each mode tested so that one copy is for the customer and the other is for company record.

Fig.159: Quality inspection diagram

DQS20 Series UV Hybrid Printer

Common Troubleshooting

Basic troubleshooting

This chapter overviews the basic troubleshooting tips and solutions for some typical problems that may occur during installation and use of the UV hybrid printer.

The fault of print head

No.	Problem phenomenon	Possible solutions
1	No ink or drip from the print head	Caused by air in the print head. Pressing ink to discharge the air.
		Caused by the leakage of ink tube. Check the ink tube joint.
		Caused by low or no negative pressure. Adjust the negative pressure gauge to increase the negative pressure and check whether the negative pressure component works normally.
		Caused by the damage of print head. Replace the print head.
2	Printing disconnection in the spraying inspection status chart	Caused by the improper work of ink pressing. Press ink again.
		Caused by low temperature of print head. Check its setting temperature and real-time temperature in the software to reach the established ink temperature.
		Caused by the blockage of print head. Clean or replace the print head in time.
		Caused by mismatch or loss of waveform files. Reload the waveform file.
		Caused by loose cables of driver card. Check cables.
3	The spray inspection status diagram is blurred.	Check that the height of print head is too high.
		Caused by low temperature of print head. Check its setting temperature and real-time temperature in the software to reach the established ink temperature.
		Caused by mismatch or loss of waveform files. Reload the waveform file.
		Caused by the change of ink properties. Replace the matching ink.

Ink fault

No.	Problem phenomenon	Possible solutions

1	The auxiliary ink box is out of ink.	The lack of ink in the main ink box results in supply shortage of ink to the auxiliary ink box, which can be solved by injecting ink to the main ink box.
		The ink-supply timeout protection of the software causes the ink-supply to be cut off.
		Caused by the disconnection of signal lines or faulty of the auxiliary ink box. Connect its signal lines or replace it.
		Ink backflow into the safety bottle, resulting in overflow protection, which can be solved by discharging the ink of safety bottle and checking the cause of backflow.
		Caused by the damage of ink tube. Check whether the ink tube leaks, if exists, replace the ink tube in time.
		Caused by the damage of main ink pump and it can not work. Replace the main ink pump.

Other faults

No.	**Problem phenomenon**	**Possible solutions**
1	Only color bars are displayed when printing	Check that the inkjet channel is closed during level calibration.
		Check the color ink quantity on the print settings screen is set to lower than 30.
		Check the layer settings to see if the relevant color channels are not checked or if the layer settings are correct.
2	When printing, the X-axis and the Y-axis work	Check the PRT settings to see if the relevant color channels are added, which usually occurs when printing W and V colors.
		The layer settings are incorrectly selected or incorrectly set.

DQS20 Series UV Hybrid Printer

Maintenance of Print Heads and the Machine

Daily maintenance of print heads

1. Every day before the startup and shutdown, it is recommended to print nozzle test chart to check whether the nozzle is in normal condition and to observe whether the ink droplet on the surface of the print head drips smoothly when ink is pressed.

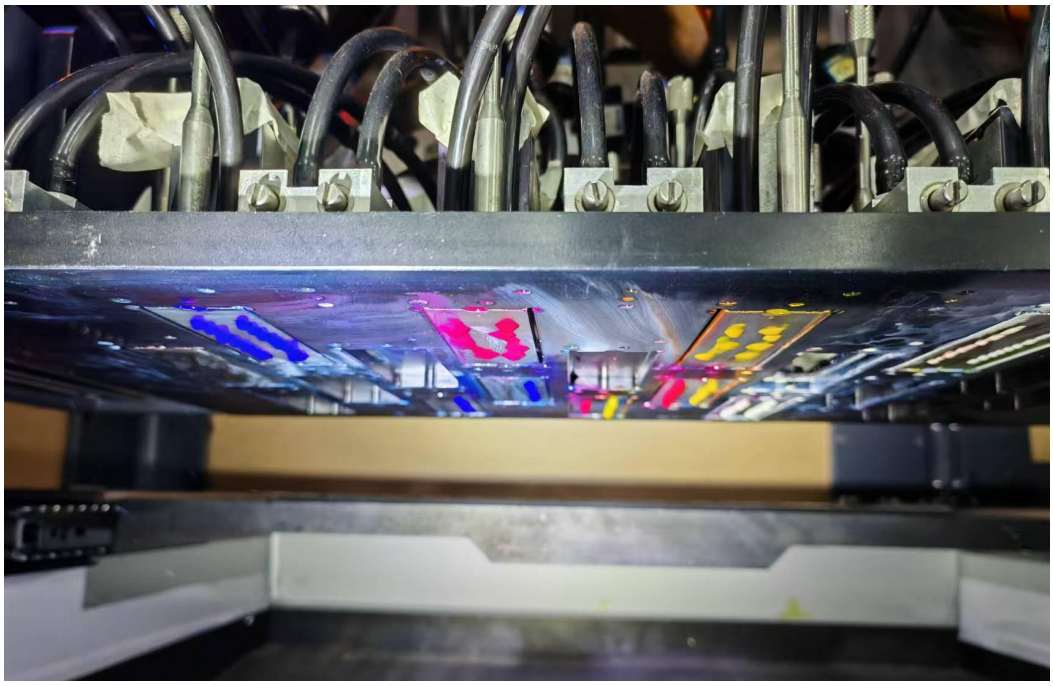


Fig.160: Observe the ink droplet on the surface of the print head

2. If a great deal of bubbles appear on the surface of the print head when ink is pressed, the two-way valve can be turned on to exhaust air.

Fig.161: Air exhaust from the print head

Notices about installing print heads

1. To prevent the blockage of the nozzle, a clean environment should be kept when the print head is installed.
2. To prevent the chip of the print head from damaging caused by static electricity, please install the print head in an environment with ESD protection.
3. To prevent the nozzle from damaging and clogging, crashing or directly touching the nozzle with your hands is forbidden.
4. The cable of the print head should be protected from being squeezed by external forces, scratched or cut off.
5. To prevent the port of ink supply from damaging, the installation and removal of the ink tube by lateral force is forbidden.
6. The cable itself and the end should be carefully checked before connecting the cable of print head to make sure no squeezes or scratches.
7. Connecting or disconnecting the cable of the print head without cutting power is forbidden.
8. Ink and cleaning fluid should be kept away from the electrical interface, board card and wire of the print head.

Initial ink refilling

1. Preparations for initial ink refilling
   (1) All kinds of solutions, including ink, cleaning fluid, and humectant, should be matched with the print head.
   (2) Please check the filter of the ink route system. In the ink route system, a filter of 15um or less is usually installed in the front of the print head.
   (3) The initial ink refilling can be started when the work environment of the print head reaches the desired temperature.
2. Steps for refilling inks
   (1) This Manual only describes the work of ink refilling of non-cyclical print heads. For ink refilling of cyclical print heads, please read the relevant product manual as a reference.
   (2) It is recommended that the ink can be refilled directly, but the cleaning fluid is not recommended for cleaning the print head before refilling.
   (3) Refilling can be done in two steps. The pressure of ink refilling should usually be kept below 30Kpa, and the manual of the print head can be referred to in particular cases.
      ① Step 1: The two-way valve should be opened first, and the ink is refilled to the ink tube, filter, print head by ink pressing with positive pressure; the impurities and bubbles of these parts are removed with the flowing ink.
      ② Step 2: Shut down the two-way valve and keep ink pressing until the ink flows out of the print head. Maintenance of Print Heads-V1.00
      ③ The change of liquid level in ancillary ink tank during ink pressing should be noticed or ink pressing in an intermittent way (stop ink pressing about 3~5s or wait the indicator light of liquid level turning off after continuous ink pressing for 3~5s) can be adopted to avoid pressing the air into the ink route system and print head when the ancillary ink tank is empty.

④ In step 1, the quantity of ink discharged is different because of different print heads, but no less than 100ml ink is suggested to discharge to make the ink route system clean and the bubbles are completely discharged.

⑤ In step 1, the two-way valve should be shut down after the ink is discharged in a straight line.

3. Abnormal handling for ink refilling

The print heads should be wiped and a nozzle test chart is printed after finishing refilling. Normally, all print heads can discharge the ink. If several print heads fail to discharge the ink or discharge the skew ink, which may be caused by the small bubbles. In this circumstance, you can press the ink several times or continuously print for a period of time.

Daily maintenance and wiping of print heads

1. Materials and methods for wiping print heads
   (1) The residual ink on the print head can be wiped with an absorbent lint-free cloth/non-woven cloth, or be scraped with a non-absorbent scraper. Materials with high friction coefficient or fuzz and scrapers with foreign matter are forbidden to wipe the print head. Dust-free cloth and scrapers made of EPDM rubber are recommended.
   (2) The residual ink on the nozzle should be slightly wiped in the same direction (wiping from back to front is recommended) and hard wiping back and forth is forbidden. The residual ink on the gap of mounting hole and baseboard of the print head should also be wiped.
2. Daily maintenance of print heads
   (1) This section mainly describes the way and period for maintaining print heads in daily use.
   (2) Daily maintenance includes ink pressing and flash spray. The way and period of maintenance is different based on the different ink types. In normal circumstances, when the machine is idle, the solvent and water-based machine should always be kept in the flash spray state to prevent the print head from blocking caused by drying ink; UV printer is recommended to keep in the flash spray state with low frequency.
   (3) It is recommended that ink pressing should be stopped when the needles are seriously broken (more than 3 newly increased broken needles in a single print head). Maintenance of print head-V1.00
   (4) There are two steps before the start and the end of each working periods: ink pressing and checking ink discharged from all nozzles. Besides, maintenance based on the instructions before shutdown is also a step before the end of each working periods. During working hours, it is recommended to press the ink every 4 hours and ensure that all nozzles can discharge the ink.

Short-term outage of nozzles for maintenance

1. The short-term outage is less than 7 days.
2. If the UV hybrid printer stops printing for several hours, the flash spray should be turned on standby to minimize the probability of the blockage of nozzles.
3. For short-term outage of more than 1 day, the print head require daily maintenance first to ensure that all nozzles discharge the ink, and then cover the bottom surface of

the entire baseboard of the print head with a moisturizing tray to reduce the drying speed of the ink in the nozzles and to prevent dust from entering the nozzle.
4. Before covering, the moisturizing tray should be kept clean. The materials for wiping the print head are applied to the tray and moisturized by a little cleaning fluid and humectant.
5. During outage, the UV hybrid printer should be kept in an environment with required temperature and humidity of the manual. The materials for wiping the print head in the moisturizing tray should be checked everyday to make sure it keeps in a moist state.
6. If possible, nozzle can be checked everyday by printing test strips to troubleshoot any possible malfunctions in time.

Long-term outage of nozzles for maintenance

1. The long-term outage is more than 7 days.
2. The ink in the print head should be completely cleaned when there is a long-term outage and the cleaning fluid should be drained. For humectant suitable for the print head, it should be injected into the print head for moisturizing according to the maintenance of short-term outage. What calls for special attention is that the liquid injected into the print head should be consistent with that used to moisturize the materials for wiping in the moisturizing tray.

Machine maintenance

1. Regular cleaning and check shall be made for mechanical operating parts, so that these parts can remain clean and keep working well. Moderate lubricating grease is evenly applied to the guide rail and lead screw, and sliding blocks are lubricated with lubricating oil from oil gun.

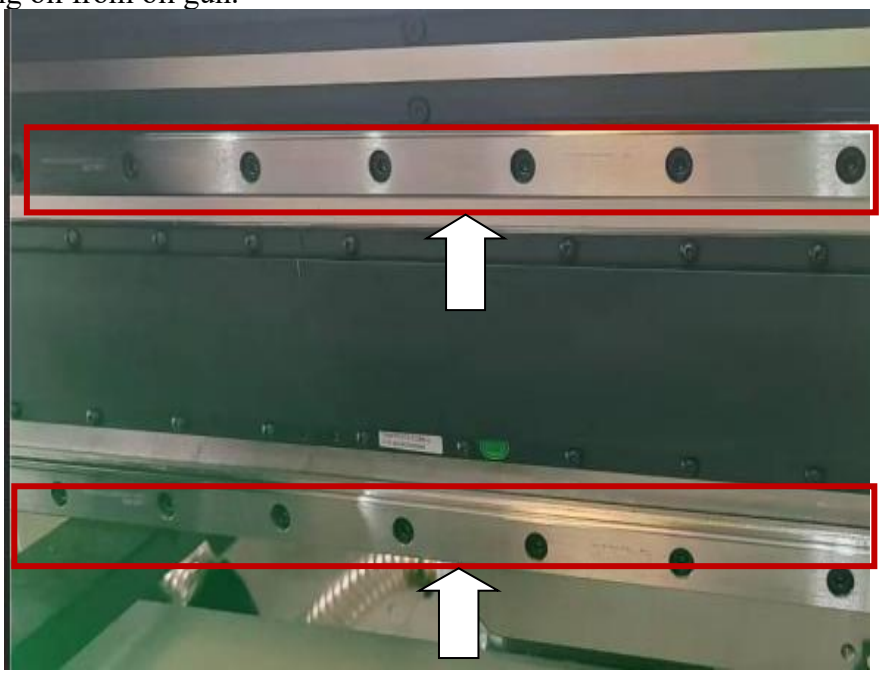


Fig.162: Lead screw and guide rail lubricated with the lubricating oil

2. Dust in the metal or magnetic gratings on the beam of the machine are wiped by clean cloth suitable for wiping the print head with small amount of alcohol every other week.

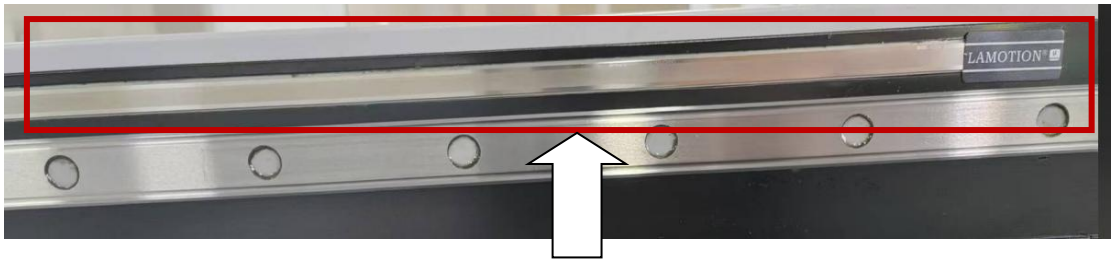


Fig.163: Wipe the metal / magnetic gratings

3. Prolonged printing may generate static electricity between the baseboard and the materials, or wool on the edge of the baseboard. The clean cloth suitable for wiping the print head with alcohol can be used to wipe the baseboard, so as to improve the print quality.
4. If the machine keeps power on for 24 hours, it is necessary to turn on the flash spray for idle time in the software to avoid the blockage of the nozzle caused by the machine that does not work in a certain period of time.
5. Prolonged printing may generate static electricity between the baseboard and the materials, or wool on the edge of the baseboard. The clean cloth suitable for wiping the print head with alcohol can be used to wipe the baseboard, so as to improve the print quality.
6. The dirt on the surface of the guiding belt should be regularly cleaned because it may influence the size of suction.
7. If the machine keeps power on for 24 hours, it is necessary to turn on the flash spray for idle time in the software to avoid the blockage of the nozzle caused by the machine that does not work in a certain period of time.
8. White ink is easily to deposit. Because of it, it is recommended to add color bar when printing pictures to make the white print head out of ink. The main white ink tank shall be set to circulate and mix.
9. When the machine stops working in holiday or vacation, it is recommended to drain the ink of the print head, clean it with the cleaning fluid and moisturize by the moisturizing tray.
10. Maintenance of the motor screw rod: Be sure to apply advanced grease to the screw rod and guide rail every month.

DQS20 Series UV Hybrid Printer

Operator Training

Operator training

Operator training is executed by installation engineers. The adoption of specific training depends on the understanding and experience of the customer operators to this product.

A proposed training syllabus is listed below.

It is recommended to schedule 3 days for operator training. Based on the machine types and the experience of the operator, especially for UV ink and RIP, an extra day may be required.

If the RIP training is required, it should be considered separately and may be provided by the RIP suppliers or application experts.

It is recommended to train a maximum of 3 personnel at a time. More than three trainees are difficult to manage and potential safety risks may be caused.

Because the correct operation will keep the machine working in a good condition, correct use of safe procedures and devices (such as personal safety equipment) should be emphasized all the time during the operator training.

The operator training is tried to satisfy the expectation of customers for the usage mode of the machine.

Besides, management personnel must keep the trainees from the external disturbance, as it is common for trainees to be asked to complete other tasks. If the training is uncompleted and trainer's satisfaction is not achieved, which means operators do not sign the permission of operating the UV hybrid printer properly and safely.

During training, operators will be encouraged to read the user's manual as a reference guide when operating the UV hybrid printer.

Proposed training syllabus

Notes:
The following list gives you a suggestion about what topics should be included during the operator training.

If you do not want to follow this list, the user's manual is a good template, because it includes required safe and efficient information for operating machine.

After trainees accept the training of specific topics and indicate they understand the areas covered, please make sure they sign on the right side of the training form.

The key areas (electric appliance, ultraviolet light, collision, and fragmentation) of machine should be highlighted.	
The key areas that exist risks should be highlighted.	
The importance of the insulation of power supply should be emphasized for the work with electricity.	
It should be emphasized that only trained electrical engineers can check the electrical system.	
Personal protective equipment-the protective measures and processes about the treatment of UV ink and cleanout fluid should be discussed.	
The material safety data sheet of UV ink and cleaning fluid should be highlighted and discussed.	
Emphasize the importance of ink and cleaning fluid that should be put next to the machine in an emergency.	
The conditions of the secure storage of UV ink and cleanout fluid should be discussed.	
The importance of the storage conditions for the shelf life of product should be emphasized.	
The risk of UV ink and cleaning fluid should be emphasized--cleaning up in time in the case of leakage.	
Keep the working area clean and tidy with no danger of tripping.	
The location of LED ultraviolet ray should be highlighted and its operating time should be discussed-operating only for printing and power off when not printing	
The safety of the radiation of ultraviolet ray should be emphasized - no looking directly at the lamp source during printing.	
Safe disposal of heavy-duty material	
The marking and surface contamination of material should be avoided before printing.	
Static electricity caused by removing protective gasket should be prevented.	
Sharp corners and edges	

Emergency stop button - location, operation and reset	
Anti-collision system	
Light curtain	
Based on the customers situation, residual risks should be avoided.	
Operators are guided to inspect machine	
The key areas of the machine should be emphasized (such as ink cartridge and electrical cabinet)	
The safety of the key areas should be emphasized (such as electrical cabinet)	
The areas accessible to operators and only recommended for engineers should be pointed out.	
Power on	
Restart after power off	
Demonstrate the isolation of the main power supply and air compression.	
Demonstrate the system of emergency stop and reset.	
Demonstrate the anti-collision and reset.	
Check and assess the nozzles after the outage for a period of time.	
Clean the nozzles if necessary.	
Demonstrate the cleaning of print heads Click the maintenance button to stop the carriage in the waste ink area. Press the button of ink pressing, observe the surface of the print head and the button is pressed until every color of ink can smooth drip. The ink on the surface of the print head can be wiped by the clean cloth suitable for wiping the print heads. Click the maintenance button again to stop the carriage at the	

Retest the print nozzle to check it is ready for printing.	
Power off at night Turn off the three-way valve inside the head of the carriage. Turn off the control software Press “EMERGENCY STOP” button of the machine. Cover the baseboard of the print head with the moisturizing tray.	
Import files to RIP.	
Applied color management (including spot color of file), size and rotation.	
Define the use of white and special colors.	
Send files to the UV hybrid printer	
Description of any other functions of RIP that are useful or relevant to operators.	
Turn on and off the control software.	
Demonstrate the icon position and main functions of the home page.	
Explain the purpose of each function.	
Description of printing process	
Explain the printing modes and the speed and quality of printing in these modes. Draft mode Production mode High accuracy mode	
File management - explain the location of printed files imported from RIP on the UV hybrid printer.	
Printing job loading Create a folder for files completed by RIP Click Add job to add PRT in the RIP folder by control software.	
Place printing materials into the printing platform.	

Turn on the absorption fan of the platform	
Measure the material thickness	
Printing job	
Turn off the absorption fan cabinet after printing and take away the materials.	
Explain the mode of white and special colors	
Demonstrate how to use special color such as white ink varnish to print on materials.	
Define white in the control software of the UV hybrid printer - different settings.	
Define white in the RIP software - different settings.	
Precautions for using white	
The effect of layered printing on output speed.	
White and varnish effect and the effect on the quality of printing performance.	
Personal protective equipment - many tasks require operators to touch the ink, cleaning fluid or lubricating grease. The importance of the need and the correct use of the personal protective equipment in operating should be emphasized.	
User' manual is used to describe the task of regular maintenance. Daily Monthly Semiannually On demand	
Daily - Clean the moisturizing area of the print head	
Daily - Clean the surface of machine workbench	
Daily - Clean the print head	
Daily - Test and check the print nozzle	
Monthly - Check and grease the linear guide and slide on the beam	

Monthly - Check and grease the linear guide and ball screw on the Y-axis	
Monthly - Check and grease the linear guide and screw on the Z-axis	
Guide operators to learn the relevant chapters of the operating manual.	
Make sure the operators know how to contact with the local service teams to solve the problems emerging from UV hybrid printer.	

DQS20 Series UV Hybrid Printer

Engineer's Notes

Engineer's Notes

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