

# DC800 Series

## Service Manual



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# Introduction


## About the manual

This service manual is written for maintenance technicians of the DC800 series inkjet machine. The service manual includes component descriptions, services, and troubleshooting procedures.

## Warning:

The warning statements indicate dangerous or unsafe operations that may cause personal injury.


For example:

 Poisoning hazard. If inhaled with cleaning agents, it can cause poisoning. Do not drink! If swallowed, seek medical attention immediately.

## Cautions:

The Caution statements indicate a danger or unsafe operation that may cause equipment damage.

For example:

 Equipment damage. When powered on, do not connect or remove any connectors on the inkjet machine, as this may damage the printer.

# Safety

## Introduction

The expected use of the DC800 series inkjet machine is to print information directly onto the product. Using this device in any other way may result in serious personal injury.

The purpose of the safety guidelines provided in this chapter is to provide technical education on safety issues in order to maintain and operate the inkjet machine in a safe manner.

## General safety guidelines

Please refer to the correct service manual for the specific inkjet machine model.

Only personnel who have received training on inkjet machines can carry out installation and maintenance work. Any such work carried out by unauthorized personnel may damage the inkjet machine and lose the warranty.

To avoid damaging the components of the inkjet machine, only use a soft brush or cloth for cleaning. Do not use high-pressure air, waste cotton thread, or frosted items.

Before starting the inkjet machine, the nozzle must be completely dry, otherwise it may be damaged.

## Power supply

 Warning

When the device is connected to the main power supply, there is a fatal voltage present. Only trained and authorized personnel can perform maintenance work.

 Warning

When this device is connected to a power supply, there will be a fatal voltage present. Unless it is necessary to operate the inkjet machine, the power supply of the inkjet machine should

be disconnected before removing the hood or attempting maintenance or repair activities, otherwise it may cause death or personal injury.

## Power cable

### Warning

Only the original power cable of the inkjet machine can be used. The plug of the cable must have three poles with a protective grounding connection.

Power cables, sockets, and plugs must be kept clean and dry.

The socket must be installed near the device and must be easy to access by operators.

### Warning

Regularly inspect cables for damage, wear, corrosion, and deterioration. Ensure that all grounding connections are good without paint, ink accumulation, and corrosion.

## Grounding

### Warning

This device must be connected to an AC power supply with a grounding wire, and the power supply must comply with IEC requirements or applicable local regulations. Disconnection of protective grounding wires can pose a danger to the equipment.

### Warning

If the protective grounding conductor is interrupted or disconnected, do not use the inkjet machine. Not following this warning may result in electric shock.

### Warning

In order to eliminate all potential static discharge, be sure to use approved cables that comply with electrical safety standards,

### Warning

The circuit board contains electrostatic sensitive devices. When operating or handling circuit boards, it is necessary to wear a properly grounded anti-static wristband.

### Warning

Have a good connection with other machines to keep the same potential and minimize static discharge.

### Warning

Always empty the repair tray regularly. Most inks and solvents are flammable. Ensure that the waste liquid is disposed of in accordance with local regulations.

## Consumable

Before using any ink, solvent, or cleaning agent. Understand each type of ink, solvent, and cleaning agents. If you have any questions or need assistance, please contact the company, local distributor or office for necessary assistance.

### Warning

All users mustn't wear the contact lens because consumable vapors can corrode the contact lens!!!

## **Ink and solvents**



Warning

Ink and supplements can irritate the eyes and respiratory system. To avoid personal injury when handling these substances:

1. Be sure to wear protective clothing and rubber gloves.
2. Be sure to wear goggles with side shields or face shields. It is also recommended to wear safety glasses during maintenance.
3. If ink or solvents contaminate the skin, immediately wash with soap and water. Do not use rinsing solution or solvent to clean ink stains on the skin.



Warning

Ink and solvents are volatile and flammable. They must be stored and handled in accordance with local regulations.

Do not smoke or use open flames near these substances.

Immediately remove all tissues or cloths soaked in these substances after use. Please handle all such items in accordance with local regulations.



Warning

Only use the inkjet machine in well ventilated areas.

## **Cleaning agents**



Warning

They are toxic and should not be consumed, if cleaning agents are drunk by mistake, please seek medical attention immediately.



Warning

Cleaning agents irritate the eyes and respiratory system. To avoid personal injury when handling this substance, always wear protective rubber gloves and clothing.

Be sure to wear protective goggles with side shields or face shields, and it is also recommended to wear safety glasses during maintenance.

If the cleaning agent contaminates the skin, rinse with running water for at least 15 minutes.



Warning

Cleaning agents are volatile and flammable. Storage and handling must be carried out in accordance with local regulations.

Do not smoke or use open flames near cleaning agents.

Immediately remove all paper towels or cloths soaked in cleaning agents after use. Please handle all such items in accordance with local regulations.



Warning

Equipment damage. Before performing print head cleaning, please ensure that the cleaning agent is compatible with the ink used, otherwise it may damage the ink core and nozzle.



Cautions

Equipment damage: Any cleaning agents containing chlorides, including hypochlorite bleach or hydrochloric acid, may cause pitting and stains on the surface of the machine.

## Others

### Cautions

Excessive use of solvents. Repeatedly stopping and starting the ink line may lead to excessive use of solvents. This will cause the viscosity too low and may cause a high liquid level alarm in the mixer tank.

### Cautions

The gutter is damaged. Do not attempt to bend the recycling tube, its position is fixed.

### Cautions

Equipment damage. When using any external input or output devices on the inkjet machine, please comply with the prescribed circuit limitations.

### Cautions

Equipment damage. After power on the machine, do not install or remove any connectors of the inkjet machine, otherwise the inkjet machine may be damaged.

### Cautions

The risk of data loss. When you choose the option of deleting all printing information, all information except for "Test Message" will be deleted.

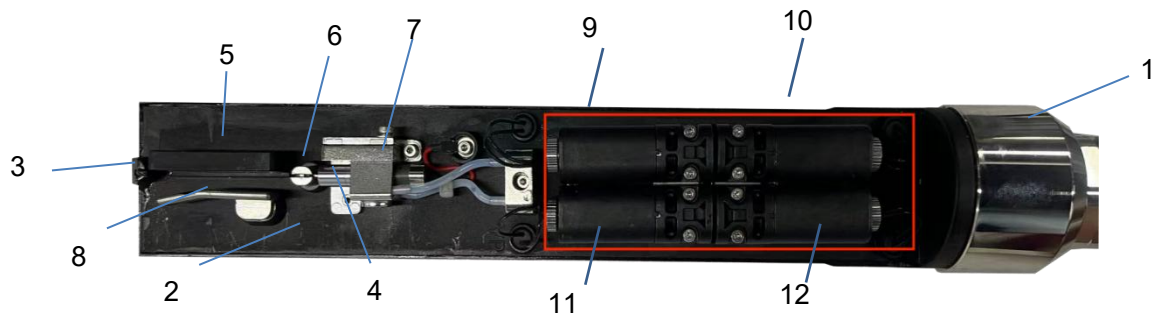
# 1. Main parts

## 1.1 Inkjet machine overall view



1. Print head
2. Ink circuit cabinet
3. Electric circuit cabinet
4. Hose
5. Connectors

## 1.2 Print head overall view



1.Print head	2.Front cover
3.Gutter	4.Nozzle
5.Phase detector	6.Charger pole
7.Nozzle frame	8.High voltage deflection plate
9.VR valve (solvent supply)	10.VF valve (ink supply)
11.VP valve (back flow)	12.VG valve (recycle flow)

### 1.2.1 Valves on print head

#### VG valve (recycle flow)

It is located between the gutter and the Venturi, and is used to switch on/off recycling of ink and solvent .

#### VP valve (back flow)

The VP valve installed on the heater module , normally, it is switched off, and only be switched on during nozzle cleaning and startup and shutdown.

#### VF valve (ink supply)

It is used to switch on/off the ink to nozzle.

#### VR valve (solvent supply)

It is used to switch on/off the solvent to nozzle.

These valves are driven by DC24V and maintained at DC6-7V. They can be disassembled. Valve testing can be performed during the ink line is switch off.



## 1.2.2 Heating circuit

The heating circuit maintains the temperature of the ink at the print head, it consists of a heating element and a temperature sensor.



## 1.2.3 Nozzle

The core of the nozzle is a piezoelectric crystal oscillator, which oscillates under the action of an electric field.

This oscillation generates pressure waves, it influences the ink line out of the nozzle, and further more it forms tiny jet ink droplets because of the surface tension force.

The generation speed of ink droplets is the same as the modulation frequency, with uniform size and equal distance. Some nozzle crystal oscillator cables may have different resistance.



## 1.2.4 Nozzle front filter

Filter in front of the nozzle. It can prevent particles from entering the nozzle and even blocks the nozzle.



## 1.2.5 Crystal oscillator

The crystal oscillator causes the wave on the ink line, and further forms the tiny droplets because surface tension, the tiny droplets have the same size and distance. The modulation frequency on the standard DC810 printhead is 76.8 kHz. The crystal oscillator wire is directly connected to the JZ-GHG1 socket on the main board.

The crystal oscillator is included in the nozzle kit.

## 1.2.6 Ink line adjustment

Ink line should be shoot at the gutter, it is necessary to adjust the ink line's position when the ink line is not at the middle of charge pole or not aim at the gutter or even causes ink leakage.

(1) Left and right fastening screws of the nozzle

It is used for locking and fastening the left and right positions of the nozzle.

(2) Front and back fastening screws of the nozzle

It is used for locking and fastening the front and rear positions of the nozzle.

(3) nozzle fastening screws

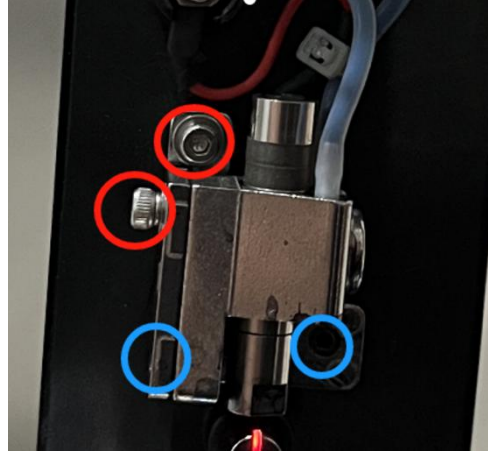
It is used to secure the nozzle to the print head module.

(4) Adjusting screws for the front and back positions of the nozzle

It is used to fine tune the front and back position of the ink line entering the gutter. (Move the ink line to the middle position of the gutter)

(5) Adjusting screws for the left and right positions of the nozzle

It is used to fine tune the left and right positions of the ink line entering the gutter. (Adjust the ink line to the right 1/3-1/4 of the gutter).



### 1.2.7 Charge pole

The charging electrode applies a charge to each individual ink droplet. The charge voltage applied to the droplet is variable and affects the position of each ink droplet deflected on the product. The charging electrode is directly connected to the JZ-GHG1 socket on the main board.

The ink line should be in the center of the gap of charge pole.



### 1.2.8 High-voltage deflection plate

After passing through the charging electrode, the droplet will pass through the electrostatic field maintained by the deflecting plate, which is connected to a high-voltage power source (usually 6 kV).

Droplets with negative charges are deflected by an electric field towards a high-voltage deflection plate. The distance of ink droplet deflection is proportional to the charge carried, and the charge is proportional to the voltage applied to the charging electrode.



### 1.2.9 Gutter

The gutter is where the ink line returns to the ink system.

Because the ink is conductive, so if there is ink in the gutter can be detected by sensor, if machine detects there is no ink in gutter, the ink line will be switched off in case of leakage.



### 1.2.10 High-voltage switch

By opening and closing the nozzle cover, use the loose screws of the nozzle cover to turn on/off the high-pressure switch of the nozzle.



## 1.3 Ink system overall view

The ink system continuously supplies ink to the print head at the correct pressure, temperature, and viscosity settings.



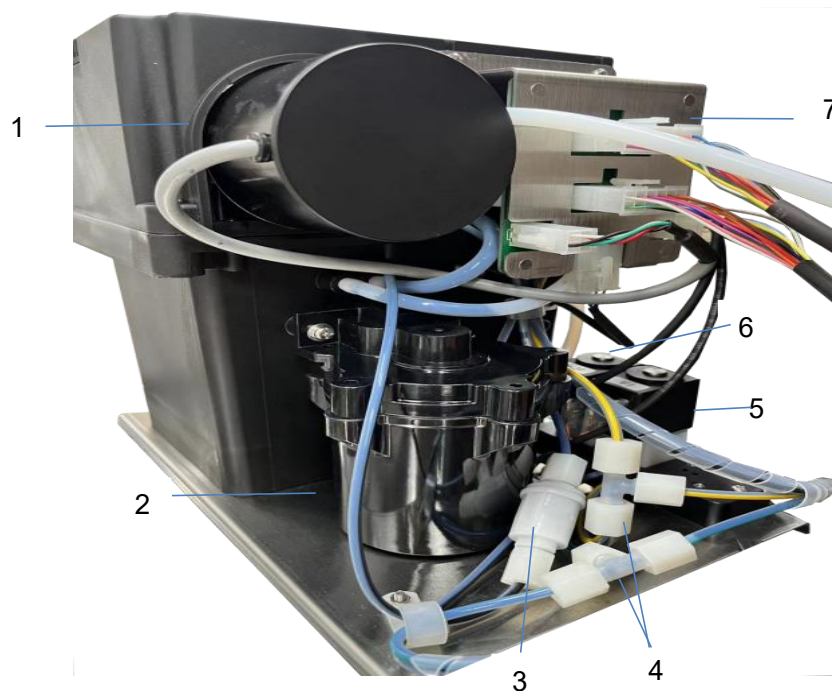
1. Fan
2. Ink/solvent socket
3. Solvent cartridge
4. Ink cartridge
5. Ink module
6. Pressure buffer, Cleaning agents pump

### 1.3.1 Fan in the ink cabinet

Ventilate and cool the ink cabinet.



### 1.3.2 Ink module

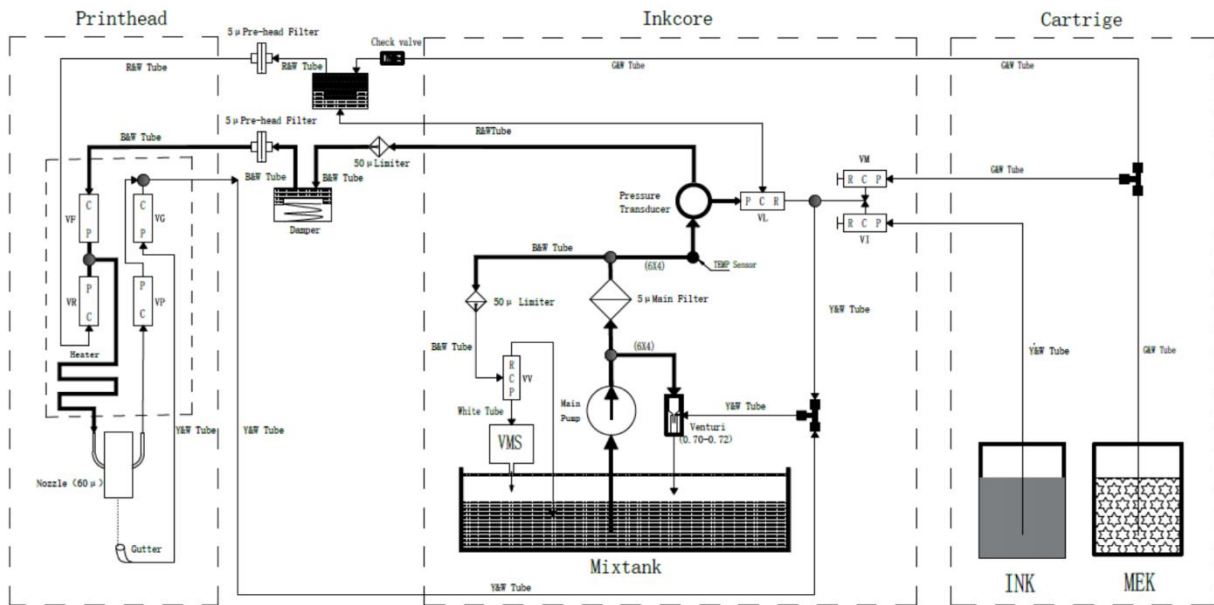


Ink module (Back view)

Items	Descriptions
1 Gear pump	Replaceable gear pump
2 Main filter	Main filter for ink system
3 Damping filter	Secondary filter for ink system
4 Tee connector	Three ways connector
5 VM valve	Valve for solvent addition
6 VI valve	Valve for ink addition
7 Adaptor board	Adaptor for connectors

### 1.3.3 DC800 ink schematic

## Ink Schematic



Y&W Tube: Yellow & White Tube, B&W Tube: Black & White Tube, G&W Tube: Green & White Tube, R&W Tube: Red & White Tube

VI: Ink add Valve  
VR: Purge Valve

VM: Mek add Valve  
VF: Feed Valve

VV: Viscosity Valve  
VP: Reflow Valve

VL: Flush pump Valve  
VG: Gutter Valve

Valve OFF: C-R Connect  
Valve ON : C-P Connect

### 1.3.4 Ink system running principle

#### Function of ink system

Transport ink to the nozzle under constant pressure and temperature.

Ensure there is sufficient ink and solvent.

Ensure that the ink maintains a specific viscosity corresponding to the ink temperature and the type of ink used.

Generate vacuum for the recycling ink from gutter.

#### Running mode

The pump draws ink from the ink module and then circulates it into a system divided into several paths. After cycling, unused ink returns to the ink cartridge.

The cycle ensures that the ink remains thoroughly mixed, and any added ink or solvent will quickly mix.

Ink is transported from the pump to three subsystems:

- Viscosity testing.
- Spray nozzle.
- Venturi tube, which generates vacuum for gutter and nozzle to perform the following operations:
  - a. Remove ink residue from the nozzle during the nozzle cleaning process.
  - b. During switch on/off the ink line, clean the nozzle by suction solvent through the pipes.
  - c. Collect unused ink droplets through the gutter during printing.
  - d. The returned ink or solvent enters the ink module and a board with holes in the ink module can reduce foaming.

## Name of valves

Valve	Name	Valve	Name
VM	Solvent addition valve	VR	Rinsing valve
VI	Ink addition valve	VG	Gutter valve
VV	Viscosity valve	VL	Solvent pump valve
VF	Ink supply valve	VP	Purging valve

### 1.3.5 Viscosity measurement

Whenever the inkjet machine is running, the system will automatically check the viscosity of the ink through the viscosity measure system (VMS).

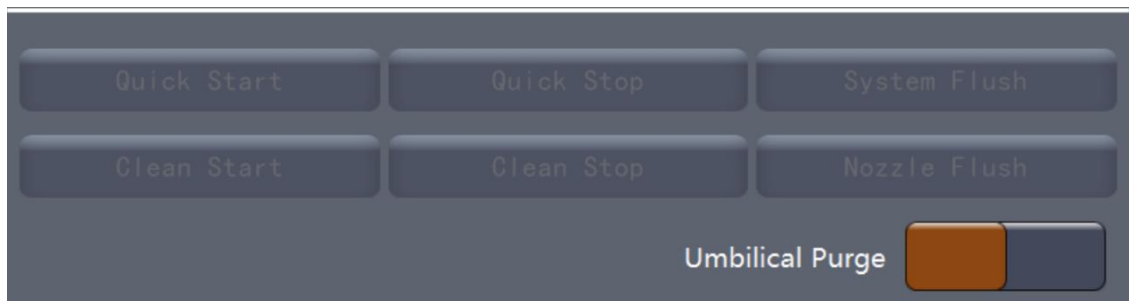
This process is as follows:

1. The solenoid valve VV opens and guides the ink to the VMS chamber, which is a component in the ink module.
2. The ink passes through the VV valve until the high liquid level sensor detects the ink. At this point, VV closes to stop ink from flowing into the VMS chamber anymore.
3. Ink flows out of the chamber through a hole at the bottom and back to the ink core until the low liquid level sensor does not detect ink. The time is counted. And then the VV is powered on again, and the VMS detection chamber begins to fill again.


The time required for ink to flow out of the VMS chamber depends on its viscosity. The thicker the ink, the longer it takes.

5. The system compares the time consumed by ink flow out the VMS chamber with the value set by the user.

6. If the ink is too thick (i.e. the ink flow consumes longer time than the system set value), the VM valve switches on, and the solvent flows into the ink module from the solvent cartridge, thereby increasing the solvent content of the ink in the ink module until the viscosity is correct.



### 1.3.6 Starting with cleaning

It is default to be start with cleaning process after pressing the button .

### 1.3.7 Starting without cleaning

In this way, the ink line starts without the nozzle cleaning, it is normally used during maintenance

### 1.3.8 Shutdown with cleaning

The default program when the button  is pressed during device operation is to clean and shut down.

### 1.3.9 Shutdown without cleaning

Pay attention: This program is used to manually stop ink line for a short period of time, or automatically stop the ink line in case of charging and recycling port failures.

This method turns off the ink line supply system without cleaning the nozzle, so when the ink line stops, the nozzle will be filled with ink.

Do not leave the machine in this state for a long time, because the ink in the nozzle may get stuck and make restarting fault.

This program is mainly used for situations where the machine may stop and restart quickly and continuously, especially during maintenance. In these cases, if a cleaning shutdown is used, it will use too much solvent and lead to ink dilution.

### 1.3.10 Nozzle cleaning

When selecting "nozzle cleaning", vacuum from the Venturi tube will be applied to the nozzle, generating suction force at the nozzle hole. Manually flush the solvent at the nozzle hole to remove blockages.

The nozzle cleaning will automatically stop after about 2 minutes, but it can be stopped at any time by pressing the cancel button.

The nozzle cleaning should be performed while the inkjet machine is running. If "nozzle cleaning" is selected while the machine is running, it will switch off the ink supply valve VF to stop ink supply.

### 1.3.11 Add ink to ink module

Ink flowing from the ink cartridge to the ink module is as follows:

When the liquid level in the ink module drops below the low level sensor, the ink replenishment valve VI will intermittently power on, and the ink will flow from the ink cartridge to ink module by the vacuum generated from the Venturi tube until the ink level in the ink cartridge reaches the middle level.



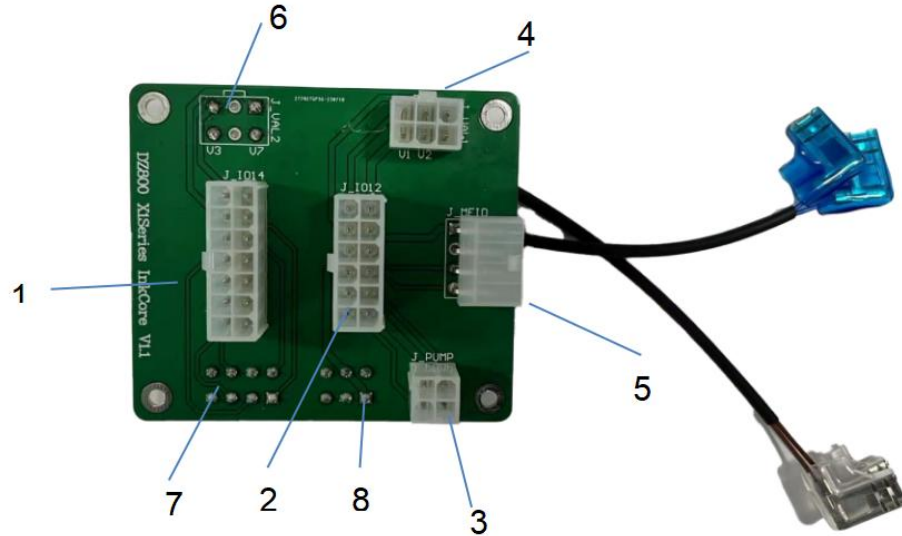
### 1.3.12 Add solvent to ink module

The solvent flows into the ink module from the solvent cartridge as follows:

When the actual VMS value is higher than the set value, the solvent addition valve VM will intermittently power on, and solvent will flow from the solvent cartridge to ink module by vacuum generated from the Venturi tube until until the ink viscosity in the ink core returns to normal.

When the actual VMS value is lower than the set value, the machine will do nothing but wait for solvent evaporation to increase the VMS value.

### 1.3.13 Ink system adapter board



Definition of adapter board interface:

Items	Position	Description
1	J-IO14	Connect to J3 on the main board.
2	J-IO12	Connect to J2 on the main board.
3	J-PUMP	Connect to VV and VL solenoid valve.
4	J-VAL1	Connect to V I and VM solenoid valve.
5	J-MFID	Connect to main filter clipper Chip.
6	J-VAL2	Connect to pump.
7	J-SAMP	Connect to pressure sensor and temperature sensor.
8	J-LEV	Connect to level detectors for viscosity and ink module.

Definition of J-IO14:

Pin No.	Color	Description
1	Blue	Connect to VV solenoid valve V-.
2	Bule/White	Connect to VV solenoid COM (V+).
3	Orange	Connect to VL solenoid valve V-.
4	Grey	Connect to VL solenoid valve COM (V+).
5	Red	Connect to ink module level detector HIGH.
6	Pink	Connect to ink module level detector MIDDLE.
7	Green/White	Connect to ink module level detector LOW.
8	Red/White	Connect to viscosity level detector HIGH.
9	Green	Connect to viscosity level detector LOW.
10		Not used.
11	Brown	Connect to pressure and temperature sensor +5V
12	Black	Connect to pressure and temperature sensor 0V
13	Yellow	Connect to signal from pressure sensor.
14	Purple	Connect to signal from temperature sensor.

Definition of J-IO12:

Pin No.	Color	Description
1	Orange	Connect to VM solenoid valve V-.
2	Grey	Connect to VM solenoid valve COM (V+).
3	Brown	Connect to VL solenoid valve V-.
4	Bule/White	Connect to VL solenoid valve COM (V+).
5	Red	+5V.
6	Yellow	Synchronize signal.
7	Purple	Location signal.
8	Black	0V.
9	Pink	0V.
10	Blue	Control motor speed signal.
11	White	Control motor voltage signal.
12	Green	DC+24V for motor.

Definition of J-PUMP (Pump):

Pin No.	Color	Description
1	White	Connect to pin 11 of J-IO12.
2	Red	Connect to pin 12 of J-IO12.
3	Black	0V.
4	Green	Connect to pin 10 of J-IO12.

Definition of J-MFID (Main filter):

Pin No.	Color	Description
1	Red	+5V.
2	Black	0V.
3	Yellow	Synchronize signal.
4	Purple	Communicate signal.

Definition of J-VAL1 (VM & VI):

Pin No.	Color	Description
1		Not used.
2		Not used.
3	Orange	Connect to VI solenoid valve.
4	Orange	Connect to VI solenoid valve.
5	Brown	Connect to VM solenoid valve.
6	Brown	Connect to VM solenoid valve.

Definition of J-VAL2 (VV& VM):

Pin No.	Color	Description
1	Blue	Connect to VL solenoid valve.
2	Blue	Connect to VL solenoid valve.
3		Not used.
4		Not used.
5	Brown	Connect to VV solenoid valve.
6	Brown	Connect to VV solenoid valve.

Definition of J-SAMP (Pressure & temperature sensor):

Pin No.	Color	Description
1	Yellow	+5V.
2	Purple	Temperature signal.
3	Black	0V.
4	Red	+5V.
5	Yellow	Pressure signal.
6	Black	0V.

Definition of J-LEV (Pressure & temperature sensor):

Pin No.	Color	Description
1	Red	High level in ink module.
2	Pink	Middle level in ink module.
3	Green	Low level in ink module.
4	Black	0V.
5	Red/White	High level in VMS.
6	Green/White	L level in VMS.
7	Brown	0V.
8		Not used.

### 1.3.14 Gear pump



Pin No.	Color	Signal	Function
1	White	PUMP-CTRL	Control voltage signal of pump.
2	Red	PUMP-PWR	Control voltage input of DC24V.
3	Black	0V.	0V.
4	Green	PUMP-SPD	Control speed signal.

### 1.3.15 Pressure buffer & cleaning pump combination device

The cleaning pump is a diaphragm pump consisting of two pump housings, a flexible diaphragm, and two one-way valves.

When two shells are bolted together, the edge of the diaphragm ( between the two housings) acts as a sealing gasket. One side is connected to the ink, by switch on/off the VL valve, the pressure or vacuum generated on this side will make the diaphragm to move back and forth.

It contains two one-way valves:

\* The inlet only allows solvents to enter; A pipeline is connected to the solvent cartridge, and the solvent is extracted from the solvent cartridge and stored in the cleaning pump. The solvent level can be checked on the diagnostic interface.

\* The outlet only allows solvents to flow out; these solvents can flow to print head to clean the pipelines and nozzle.

When vacuum is applied to the diaphragm, the solvent will be extracted from the solvent cartridge and enter the pump chamber.

During the process of “cleaning stop”, positive pressure is applied to the diaphragm through the VL switch. Due to the presence of the one-way valve, the solvent is forced to reach the nozzle through the outlet and clean the nozzle through VR valve.

The pressure buffer is to maintain a stable pressure.

The pressure buffer is located on the rear side of the lower cabinet.

### 1.3.16 Venturi

It is a device for generating negative pressure.



### 1.3.17 Filters

The main purpose of the main filter is to provide filtered ink to the nozzle for printing.

This main filter is 5 microns (if using special ink, it is recommended to replace it with 20 microns).



### 1.3.18 Pressure and temperature sensor

They are used to detect the pressure and temperature of the ink system.



Pin No.	Color	Signal	Function
1	Blue	+5V	+5V.
2	Purple	Temp.	Temperature signal.
3	Black	0V	0V.
4	Red	+5V	+5V.
5	Yellow	Pres.	Pressure signal.
6	Black	0V	0V.

### 1.3.19 Solenoid valve

VM solvent addition valve:

When the actual viscosity exceeds the set viscosity and VM is powered on, the solvent is drawn from the solvent cartridge to the ink module by vacuum from Venturi.

VI ink addition valve:

When the liquid level of the ink module is below the middle position and VI is powered on, the ink is drawn from the ink cartridge to the ink module by vacuum from Venturi.

VV viscosity valve:

When the ink level in the viscosity detection chamber is lower than the low level of VMS, VV is powered on. When the VMS "high level" pin detects ink, VV is powered off after a short delay.

The time required for ink to flow through the flow hole at the bottom of the viscosity detection chamber is the viscosity of the ink, measured in seconds.

When VV is powered off, the ink flow is directly guided to the ink module.

VF ink supply valve:

The ink supply valve is used to control the flow of ink to the nozzle.

When VF is powered on, ink will jet out from the nozzle.

VL solvent pump valve:

The VL valve controls the supply of vacuum or pressure to the cleaning pump kit, which controls the cleaning pump kit to push the solvent to the nozzle during the "cleaning on/off" process.

When VL is powered off, by applying vacuum to the diaphragm of the cleaning pump to allow solvent to be sucked from the cleaning solvent cartridge into the cleaning pump chamber.

When VL is powered on, the system ink pressure will be applied to the cleaning pump diaphragm to push the pressurized solvent to the nozzle.

VG gutter valve:

When VG is powered on, negative pressure will be applied to the gutter to recycling the unused ink to the ink module.

VP purging valve:

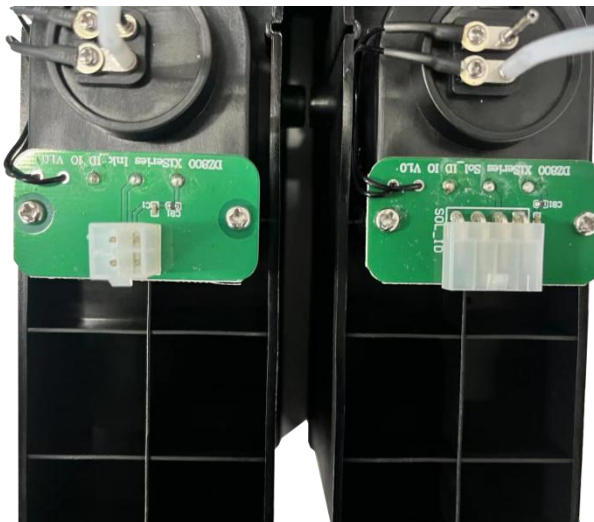
When powered on the VP valve, vacuum is introduced to nozzle. During the process of "nozzle cleaning", "starting ink line", "cleaning shutdown", "flushing nozzle" and "nozzle cleaning", VP will be switched on.

### **1.3.20 Ink & solvent cartridge and level detect board**

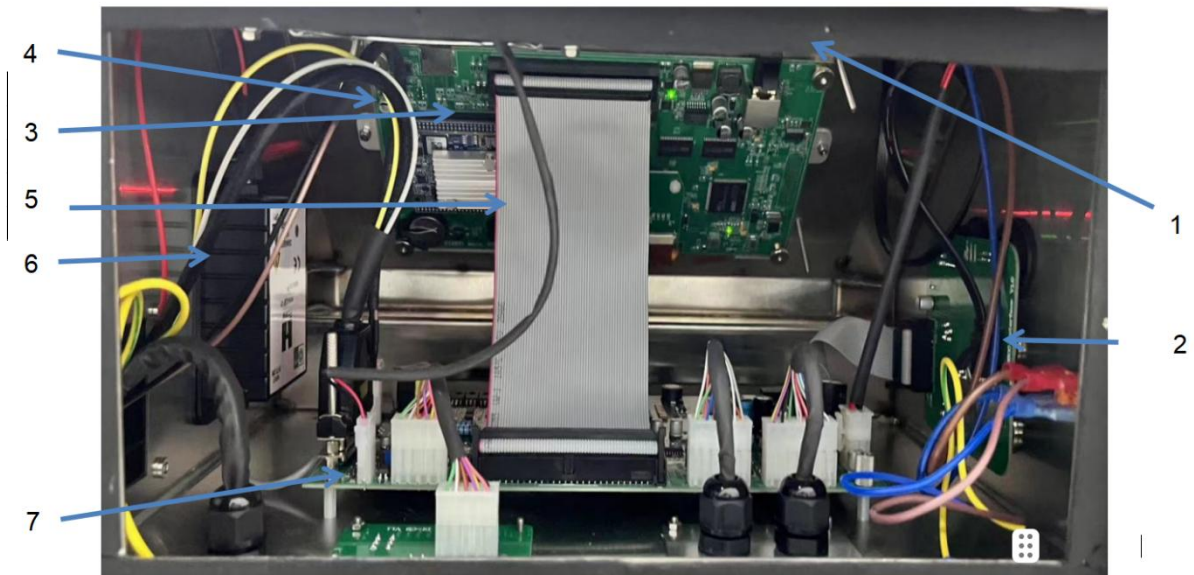


Please refer to the factory label for the expiration date of the ink/solvent cartridge. If expired ink or solvent is used, the inkjet machine will not function.

### 1.3.21 Level detect board



### 1.4 Overview of circuit system



Items	Name	Description
1	Power supplier	DC24 power supplier.
2	Communicate board	Adapt board for inputs and outputs.
3	Main board	Controlling all the systems.
4	Display	Touch screen.
5	Flat cable	Connect main board and adaptor board
6	EHT module	Generator 5800V.
7	Adaptor board	Connect to pressure sensor and temperature sensor.

### 1.4.1 Power supplier

The power functions are as follows:

- \* The power supply provides +24 VDC to the main board.
- \* The input power range of the power supply is 100 to 240 VAC, 50-60 Hz.



Items.	Color	Signal	Function
1	Brown	L	Input AC 100~240V.
2	Blue	N	0V.
3	Yellow/Green	PE	Earth connection.
4	Red	+24V	Output DC +24V.
5	Black	0V	0V.

### 1.4.2 EHT module

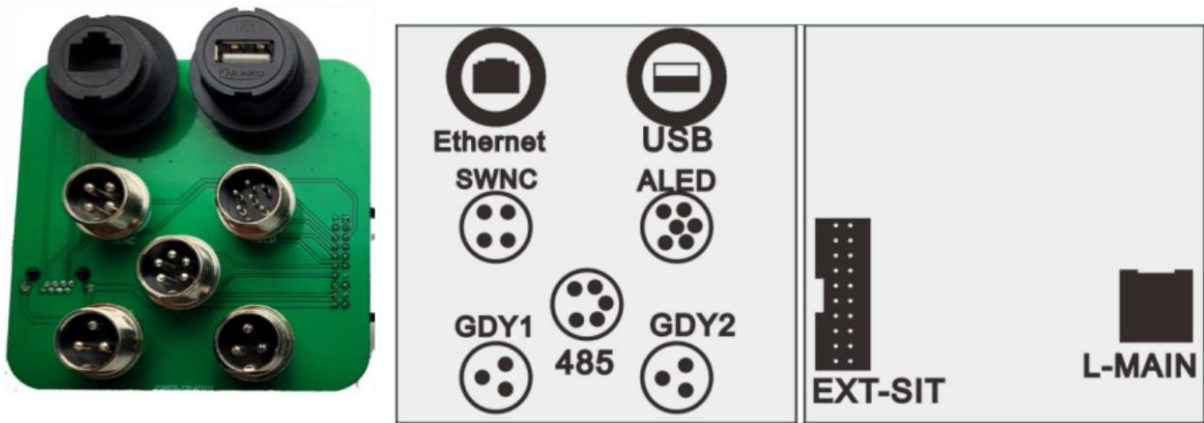
The Ultra High Voltage (EHT) module is used to generate high voltage (0 to 7000 VDC), which is output to the positive deflection plate at the print head.



Items.	Color	Signal	Function
1	Red	+24V	Input DC .
2			No use.
3	Black	0V	0V.
4			No use.

## 1.4.3 Communicate board

Encoder, photoelectric sensor, USB, Ethernet port, serial port, alarm light interface.



Items.	Name	Function
1	Ethernet	Used for connecting external network.
2	USB	Used for external data replication/transmission.
3	SWNC	Used for connecting encoder.
4	ALED	Used for connecting alarm device.
5	RS485	Used for communication.
6	GDY1	1: +15V 2:Signal 3:0V.
7	GDY2	1: +15V 2:Signal 3:0V.
8	EXT-SIT	Used for connecting EXT-SIT socket on main board.
9	L-MAIN	Used for connecting network port on main board.

### A. Ethernet:

RJ-45 connector is a normal plug used for Ethernet network connections, which provides physical connector to connect computers, switches, routers, and other network devices to the inkjet machine for communication.

The network port connector can be connected using CAT6 Ethernet cable.

### B. USB:

USB is a common port used for connecting computers to external devices.

The USB port of the inkjet machine is used for mutual transmission external TXT data, logos, and inkjet documents between the computer and the inkjet machine.

### C. Encoder:

Encoders typically consist of a rotating part and a stationary part. Rotating parts are usually attached to the rotating mechanical axis and rotating according to the equipment, while the stationary part is fixed to the equipment.

When the rotating part rotates, the encoder generates pulses or analog signals to represent the position, speed, or direction of rotation.

Pin.	Color	Signal	Function
1	Brown	+15V	Input DC +15V .
2	Red	Signal A	Signal phase A.
3	Orange	0V	0V.
4	Green/Yellow	Signal B	Signal phase B.

#### D. Alarm light:

The alarm light adopts three color lights: red, yellow, and green. In order to distinguish between different types of emergency situations or warnings.

Pin.	Color	Function
1	Red	Connect to red wire of alarm light .
2	Yellow	Connect to yellow wire of alarm light.
3	Green	Connect to green wire of alarm light.
4	Brown	Connect to DC +24V for alarm light.

#### E. RS485:

Serial port 485 (RS-485) is a serial communication protocol used for reliable data communication in electrical noisy environment. It is an improved version of RS-232 with stronger anti-interference ability and longer transmission distance.

Pin.	Color	Function
1	RS485-A	Transmitting positive voltage signals.
2	0V	0V.
3	RS485-A	Transmitting negative voltage signals.
4	+5V	DC +5V.
5	RS485-CS	Shielding wire.

#### F. photoelectric sensor:

The commonly used photoelectric sensors in inkjet machine are divided into two types:

Infrared sensors, optical fiber sensors.

Infrared sensor: Infrared sensors use infrared light to sense the presence or activity of objects.

This type of sensor typically includes an infrared light emitter and an infrared light receiver.

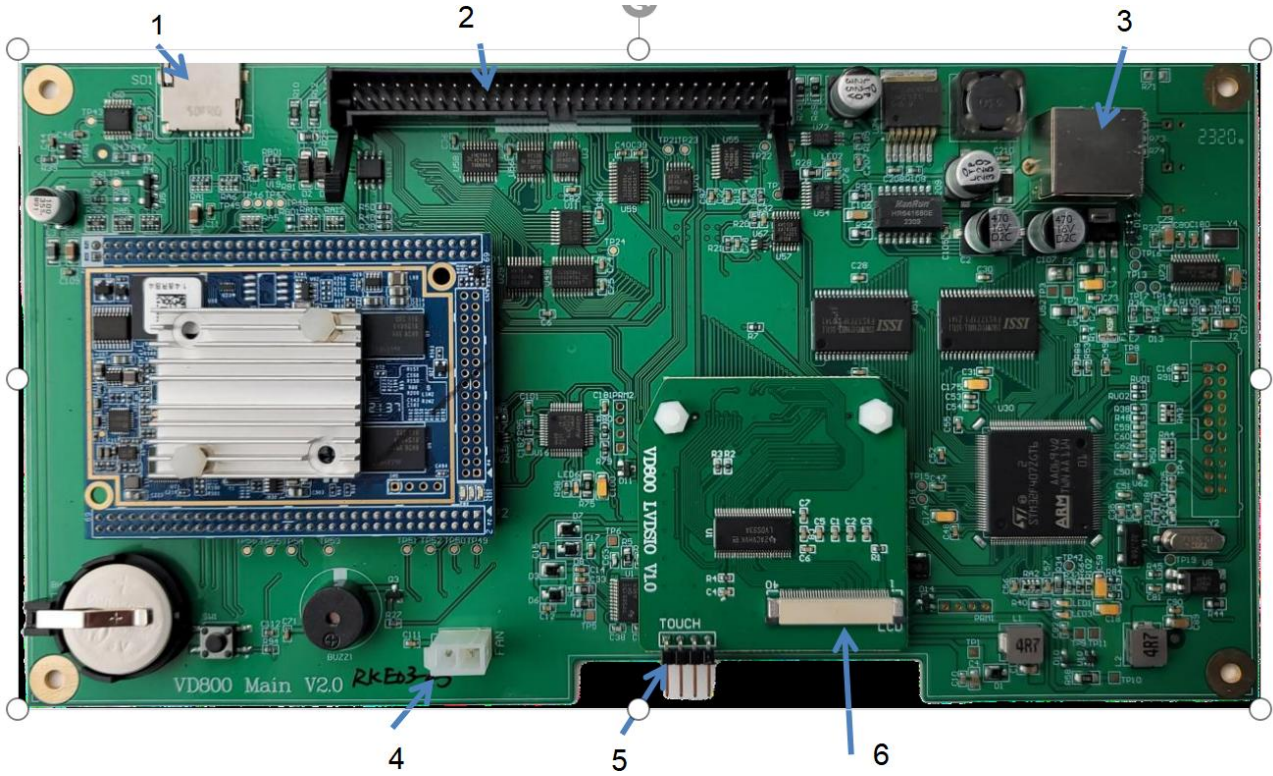
Infrared sensors have a short sensing distance and average sensing accuracy. Suitable for using on larger objects or low-speed production lines.

Optic fiber sensor: optic fiber sensors use optical fibers to transmit optical signals to sense the presence or activity of objects.

Optic fiber sensors have small light spots and high sensing accuracy, making them suitable for small products and high-speed production lines

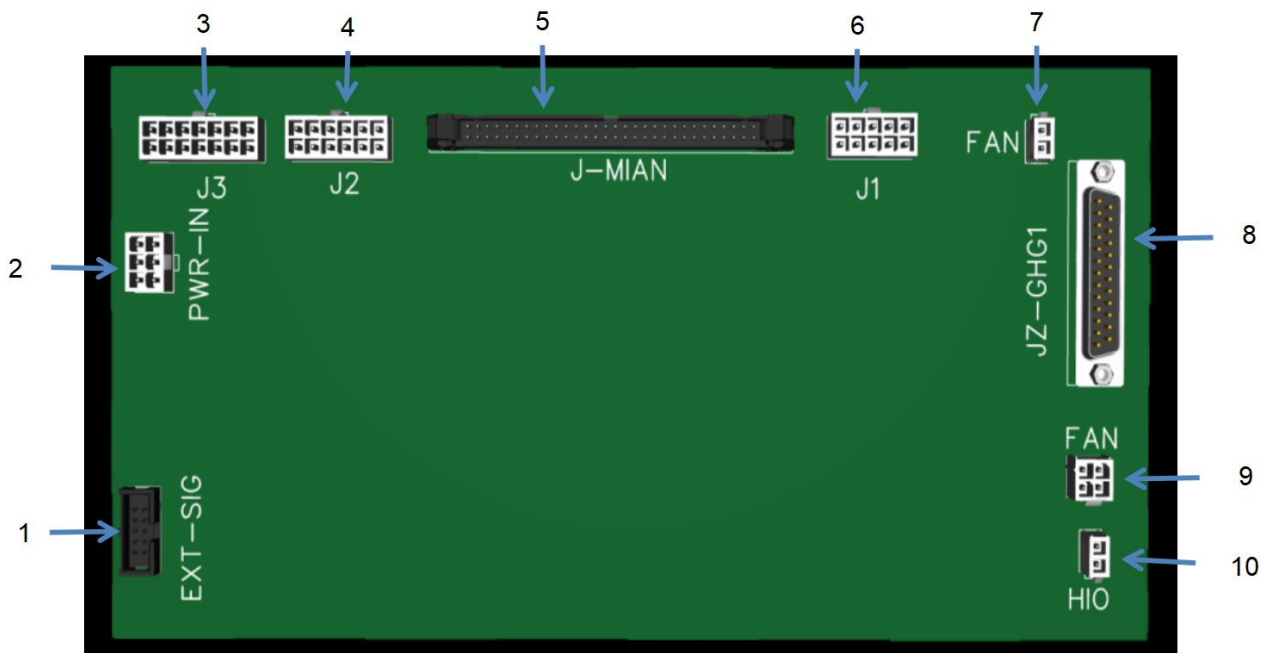
Pin.	Color	Signal	Function
1	Green	+15V	Output for DC +15V .
2	Blue	Signal A	Signal input.
3	Black	0V	0V.

### 1.4.4 Main board



Items.	Name	Function
1	SD1	Socket for mini SD card.
2	Flat socket	Connect to J-MIAN cable from I/O adaptor board.
3	Ethernet connector	Socket for Ethernet.
4	Fan	Power for fan.
5	Touch	Connect to touch screen.
6	LCD	Connect to cable for display.

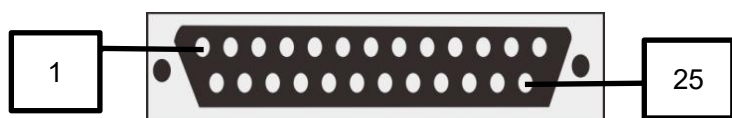
### 1.4.5 I/O adaptor board



Items.	Name	Function
1	EXT-SIG	Socket for cable from communicate board.
2	PWR-IN	Socket for power input.
3	J3	Socket for cable from J-L014 at ink module.
4	J2	Socket for cable from L-L012 at ink module.
5	J-MIAN	Socket for cable from main board.
6	J1	Socket for cable from COM-CB.
7	Fan	Socket for fan in ink cabinet.
8	JZ_GHG1	
9	Fan	Socket for DC24V to print head.
10	HIO	Socket for DC24V to ETH.

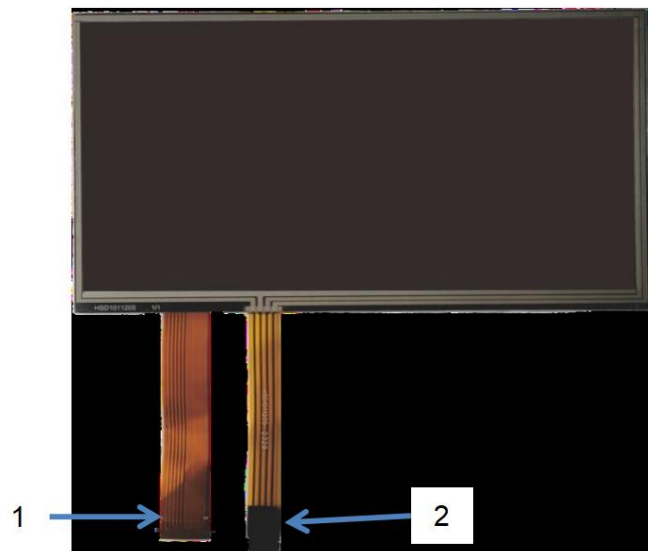
The interface is for connecting wires to the nozzle, including the nozzle solenoid valve group and phase detection.

(Schematic diagram: from left to right, from top to bottom)



Pin.	25 Pin female.	Color	Pin.	25 Pin female.	Color
1	Phase +15V	Brown	14	No use	
2	Phase -15V	Red	15	Gutter signal	Green/White
3	Phase 0V	Yellow (Shielding layer)	16	VF valve +24V	Orange
4	Phase signal	Yellow (core wire)	17	VR valve 0V	Yellow
5	Phase signal 2	Green (No use)	18	VP valve 0V	Blue/White
6	Temperature sensor +5V	Blue	19	VF valve 0V	Deep green
7	Temperature sensor signal	Purple	20	VG valve 0V	Transparent
8	Temperature sensor 0V	Black	21	VR VG VP valve +24V	Yellow/White
9	Heating +24V	White	22	Led 0V	White (Shielding layer)
10	Heating 0V	Grey	23	Led +5V	White (core wire)
11	Switch for EHT	Red/White	24	No use	
12	No use		25	Earth	Earth
13	No use				

## 1.4.6 LCD Screen



Items.	Name	Function
1	LCD display cable	Connect to socket TOUCH at main board.
2	Touch screen cable	Connect to socket LCD at main board..

## 2. Maintenance

The preventive maintenance projects mentioned in this chapter must be operated by trained and authorized person.

The actual interval depends on the running time of the machine. The table below is based on the usage of eight hours per day. If the actual usage is much more, the interval time should be more short.

\* The actual time interval depends on the operating environment conditions and can be set during installation.

Time interval	Tasks
Every week	Check and clean printer head.
Every 2 weeks	Clean the inkjet machine; Check the ink systems and connectors.
Every month	Clean the printer head with Cleaning agent.
* Every 2000 hours	Replace the filter and clean dust in the cabinet.
* Every 2000~9999 Hours	Replace the ink module, clean the ink circuit.

### 2.1 Replace the main filter

Normally, replacing the filters should be done after inkjet machine maintenance and pipelines cleaning.

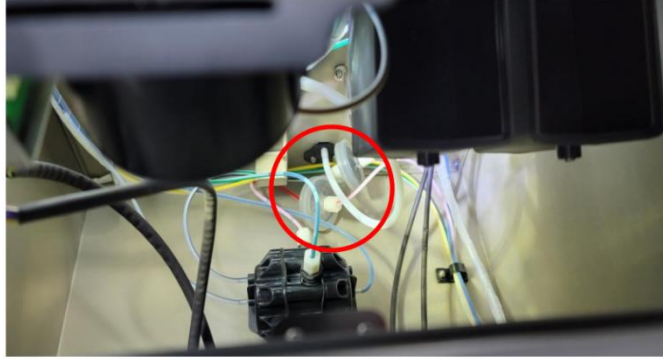


Replace the main filter:

1. Switch off the inkjet machine;
2. Remove the fixing screws of the filter system located on the back of the ink module, and the main filter can be removed.
3. Pay attention to collecting the residual liquid in the main filter to avoid contamination;
4. Taking out the new filter from the packaging, and making ensure that the sealing ring is fully inserted into the groove.
2. Tighten the screws of the new filter to complete the installation.

## 2.2 Replace the fine filter

The fine filter is an auxiliary filter of ink system. During maintenance, when replacing the main filter system, pollutants may accidentally enter the pipeline, and the fine filter can filter out these particles. The filter material is stainless steel, with an aperture size of 5 microns.



Replace the fine filter:

1. Switch off the inkjet machine;
2. They are located behind the ink core and connected to the green stripe (ink supply) and red stripe (cleaning) tubes.
3. Use a wrench to directly remove the filter, paying attention to the contamination of residual ink inside the filters.
4. Pay attention to the direction of the filter.
5. Carefully put back the new filter onto the corresponding pipes.

# 3. Troubleshooting

## 3.1 Read the user manual

The DC800 series user manual contains some troubleshooting instructions that allow the inkjet machine operators to perform them.

Except for these information. Please refer to the operator manual for more details.

This chapter contains troubleshooting steps that are only allowed to be performed by trained or authorized technicians.

## 3.2 Important guidance

Before performing troubleshooting or carrying out some of the repairs described in this section, it is recommended to move the inkjet machine from the production line to a clean place.

The first step in troubleshooting must be checking the following:

Find the corresponding warning and fault icon troubleshooting table, and follow the recommended measures in the table, if necessary, please contact the after-sales service engineer for consulting.

When you need to replace a part and are unsure how to replace it, please refer to the relevant replacement instructions or contact the after-sales service engineer for consulting.

## 3.3 Booting failure

### 3.3.1 No power

Power cable disconnected or damaged.

1. Check if the power cable is damaged? If it is damaged, please replace it;
2. Ensure that the power cable is properly connected to the socket, even to the button switch.

The connection between the switch and the power supply is disconnected

1. Check if the cable connection is OK?
2. Use a multimeter to check if the cable is damaged? If there is a fault, please replace it.

The connection between the power supply and the main board is disconnected

1. Check if the cable connection is OK?
2. Use a multimeter to check if the cable is OK? If there is a fault, please replace it.

Main board malfunction: Replace the main board.

Power supplier damage: replace the power supplier.

### 3.3.2 No display

1. Power failure.
2. Cables connections are loose .
3. Program error, reboot the inkjet machine.
4. The LCD screen driver board is damaged , replace the LCD screen driver board.
5. Main board malfunction, replace the main board.

### 3.4 Icons of status



The status icons of the inkjet machine are divided into three groups:

Status icons - These icons display the status of inkjet machine;


Fault icons - These icons indicate that the inkjet machine is in a faulty condition. In the situation, the inkjet machine will stop printing.

Warning icons - These icons indicate that the inkjet machine is in a warning condition. The inkjet machine will continue to print, and the warning state can be changed to a fault state.


#### 3.4.1 Status icons

Icon.	Name	Description
	Inkjet machine is running.	Inkjet machine is running, and preparing for printing.
	Inkjet machine is stopped.	Inkjet machine has been stopped, if the machine is stopping, this icon twinkles.


#### 3.4.2 Faulty icon - EHT

Icon.	Principle	Reason	Advice
	A leakage on printing head is detected.	Print head is dirty or wet.	<ol style="list-style-type: none"> <li>1. Clean and dry the print head.</li> <li>2. Check if there is an accumulation of ink on the print head.</li> <li>3. Check the ink line is in correct position.</li> <li>4. If this fault happened often, check the VP valve.</li> </ol>
		Wrong settings	The threshold is set too low.
		EHT damage	Replace the EHT.
		Main board damage	Check the version information and replace the main board.
		Wires in print hose damage	<ol style="list-style-type: none"> <li>1. Stop inkjet machine and turn off it.</li> <li>2. Disconnect the cable from the EHT.</li> <li>3. Measure the resistance between the high-voltage wire and the high-voltage positive plate (22 megaohms). Note that not all multi-meters can measure high resistance, and a parallel resistance can be used to measure and calculate the resistance.</li> <li>4. If there is an open or short circuit, replace the print head.</li> </ol>


### 3.4.3 Faulty icon - No cover

Icon.	Principle	Reason	Advice
	High voltage circuit break off.	Print head cover is removed.	1. Install the print head in the cover. 2. Make sure the print head is fixed in the cover.
		Print head cover switch damaged.	1. Turn off the inkjet machine. 2. Remove the cover nut, take out the print head and check the cover switch. 3. Replace the cover switch.
		Wire damaged.	Check the wire from cover switch to main board.
		Main board	Replace the main board.


### 3.4.4 Faulty icon - Charge fault

Icon.	Principle	Reason	Advice
	Ink droplet can't be charged correctly.	Print head is dirty or wet.	Clean and dry the print head.
		Ink line position is not correct.	1. Perform the "nozzle cleaning". 2. Restart the ink line. Switch off the settings "charge error shut down" and "Gutter fault shut down". 3. If the ink line position and nozzle are OK, please adjust the position of ink line.
		Wrong parameter settings.	1. Ink droplet modulation: 30 (set according to ink splitting) 2. Ink viscosity: 320 3. Ink dot charging: 150 4. Operating pressure: 280 5. Spray nozzle temperature: 35
		Abnormal ink viscosity.	Check the ink is light or thick. Check the VSM.
		Abnormal pressure.	1. Observe if the running pressure matches the set pressure. 2. If necessary, maintain the machine and replace the filters. 3. Check the main pump is OK or not. 4. Check if the pressure sensor is OK or not.
		Nozzle or modulation circuit problem.	Check if there is a short circuit or open circuit in the crystal oscillator connection, and use the status of the split point as a reference to determine if the nozzle is in a good condition.
		Charge pole or circuit problem.	1. The charging signal wire is broken 2. Replace the main board. 3. charge pole is damaged

### 3.4.5 Faulty icon - Gutter fault

Icon.	Principle	Reason	Advice
	Ink can't be detected in the gutter during running.	Nozzle is blocked.	Check if the ink line jets into the gutter.
		Ink line's position is not correct.	1. Perform "nozzle cleaning" and "cleaning shutdown" at least once a week. 2. Switch off the settings "charge error shut down" and "Gutter fault shut down". 3. If the ink line position is still incorrect, please adjust the ink line.
		Gutter or pipeline is blocked.	1. Check the gutter and its pipeline. 2. Switch on the settings "charge error shut down" and "Gutter fault shut down".
		No vacuum	1. Check the Venturi .
		Earth connection is bad.	Check the earth connection.
		Gutter detect circuit problem.	Check the circuit of gutter.
		Main board fault.	Replace the main board.

### 3.4.6 Faulty icon - ink module empty

Icon.	Principle	Reason	Advice
	Low level detect pin can't detect ink in ink module.	New machine.	Add ink into the ink module.
		VI valve is blocked.	1. Check the sound of VI valve by switch on/off the valve manually. 2. Clean the VI valve. 3. Check the ink cartridge level detect board.
		Gutter or pipeline is blocked.	1. Check the gutter and its pipeline. 2. Switch on the settings "charge error shut down" and "Gutter fault shut down".
		Bad connection.	1. Check the connection from J3 at main board to J-SAMP at ink module. 2. Check the connection from J-SAMP at adaptor board to J-LEV at ink module. 3. Clean the detect pins in ink module. 4. Replace the ink module.
		Leakage in ink system.	1. Check if there is a leakage in the ink system? 2. Check if there is a contamination at the ground or the bottom of inkjet machine.



### 3.4.7 Fault - no ink/solvent

Name	Principle	Reason	Advice
Solvent cartridge can not be recognized.	The solvent cartridge or ink cartridge can not be detected.	There is no ink/solvent cartridge in the machine.	Please insert the ink/solvent cartridge at the specific position.
		Ink/solvent is used up.	Please insert a new ink/solvent cartridge in the machine.
Ink cartridge can not be recognized.		The inkjet machine can not get signal from the level detect board.	1. Insert the ink/solvent cartridge correctly. 2. Check if the level detect board is contaminated by ink? 3. Try to solve this problem with a new ink/solvent cartridge if possible. 4. Check if the level detect pins are installed correctly.
		Bad connection.	1. Check the connection from the level detect board to main board.
		Main board damaged.	1. Please note down the software version of the machine. 2. Change a new main board.


### 3.4.8 Fault - expired ink/solvent

Name	Principle	Reason	Advice
Solvent cartridge is expired.	The solvent cartridge or ink cartridge is expired.	The solvent cartridge or ink cartridge is expired.	1. Check the expire date on the label. 2. Check the system date setting of inkjet machine.
Ink cartridge is expired.		Main board damaged	Please note down the software version of the machine. Change a new main board.

### 3.4.9 Faulty icon - empty ink/solvent cartridge


Icon.	Principle	Reason	Advice
	No solvent	ink/solvent cartridge is empty.	Please insert the ink/solvent cartridge at the specific position.
		Vacuum problem.	1. Check and clean the venturi. 2. Replace the venturi.
		Valve defective	1. Check the sound of VI&VM valve by switch on/off the valve manually. 2. Clean the VI&VM valve.
	No ink	Bad connection.	Check the connection from J3 at main board to COM-CB at level detect board.

### 3.4.10 Faulty icon - viscosity fault


Icon.	Principle	Reason	Advice
	The actual viscosity value differs from the setting viscosity value by more than 50 points	No solvent.	Please insert a new solvent cartridge.
		A malfunction in the piping system cause "0% solvent" warning was issued, And the machine continues to run.	Check the ink piping system between ink/solvent cartridge and ink module.
		mixing tank in ink module is full. And the machine continues to run.	The warning of "mixing tank full" is displayed on the screen, the ink in VMS can't flow out to mixing tank. Drain some ink from the mixing tank from the draining pipe at ink module, until the ink level in the mixing tank below the middle level.
		Printing effect is too light or thick.	<p>If the printing effect is too thick: The inkjet machine automatically adds solvent to the setting ink viscosity.</p> <p>Use the 'System Information' interface to monitor changes in viscosity values.</p> <p>If the solvent addition function is confirmed to be OK, but the ink is still too thick, please set viscosity values lower or replace the ink.</p> <p>If the printing effect is too light: Avoid cleaning the gutter directly with cleaning agents for a long time during running.</p> <p>Try to use the "Quick Start" and "Quick Shutdown" options as much as possible during maintenance.</p> <p>If it is confirmed that the viscosity of the ink has not continued to decrease, but the ink is still too light</p>

			please set the viscosity value higher or replace the ink.
--	--	--	---


### 3.4.11 Faulty icon - VMS cannot be emptied

Icon.	Principle	Reason	Advice
	In mixing tank, the high level pin detects ink all the time.	To much ink in the mixing tank.	1. After the warning of "mixing tank full" is displayed on the screen, the solvent will no longer be added to the mixing tank, Ink needs to be drained from the ink draining pipe. 2. If the viscosity of the ink is too high, it is recommended to drain the ink in the mixing tank below the middle level.
		The inkjet shakes while it is running	Please keep the device stationary while running.
		Mixing tank liquid level detection fault	1. Check if there is a short circuit. 2. Normally, unplug the J-LEV on the ink module all liquid levels in the mixing tank should shows "-" 3. Poor contact of the probe
		Main board damaged	Unplug the J-LEV at the main board side, but the liquid level of mixing tank still shows '+', it means the main board is defective. Please note down the software version of the machine. Change a new main board.


### 3.4.12 Faulty icon - VMS cannot be fully filled

Icon.	Principle	Reason	Advice
	In VMS, the low level pin can detect ink all the time.	Faulty valve.	1. Clean the VV valve. 2. When the VV valve is powered off, make sure that no ink flow into the VMS. 3. Replace a new VV valve.
		The hole at the bottom of VMS is blocked.	Check the hole at the bottom of VMS is clean.
		Bad connection	1. Check the connection between J-LEV at the ink module and the main board 2. normally, unplug the J-LEV at the ink module, the liquid level of VMS should be '-'. 3. unplug the J-LEV at the main board side, but the liquid level of VMS still shows '+', it means the main board is defective. 4. Poor contact of viscosity probe.
		Main board damaged	Please note down the software version of the machine. Change a new main board.


### 3.4.13 Faulty icon - mixing tank is full in ink module

Icon.	Principle	Reason	Advice
	In VMS, the high level pin can not detect ink all the time.	Faulty valve.	1. Clean the VV valve. 2. When the VV valve is powered off, make sure that no ink flow into the VMS. 3. Replace a new VV valve.
		Damping viscosity filter blockage.	Check and clean the damper.
		Bad connection	1. Check the connection between J-LEV at the ink module and the main board. 2. Shortcut the signal wires can be used to test the fault point. Example: Connect the green low-level line to the black ground line, the diagnostic screen should show low liquid level in VMS "+". 3. Poor contact of viscosity probe.
		Main board damaged	Please note down the software version of the machine. Change a new main board.

### 3.4.14 Faulty icon - printing speed is too fast

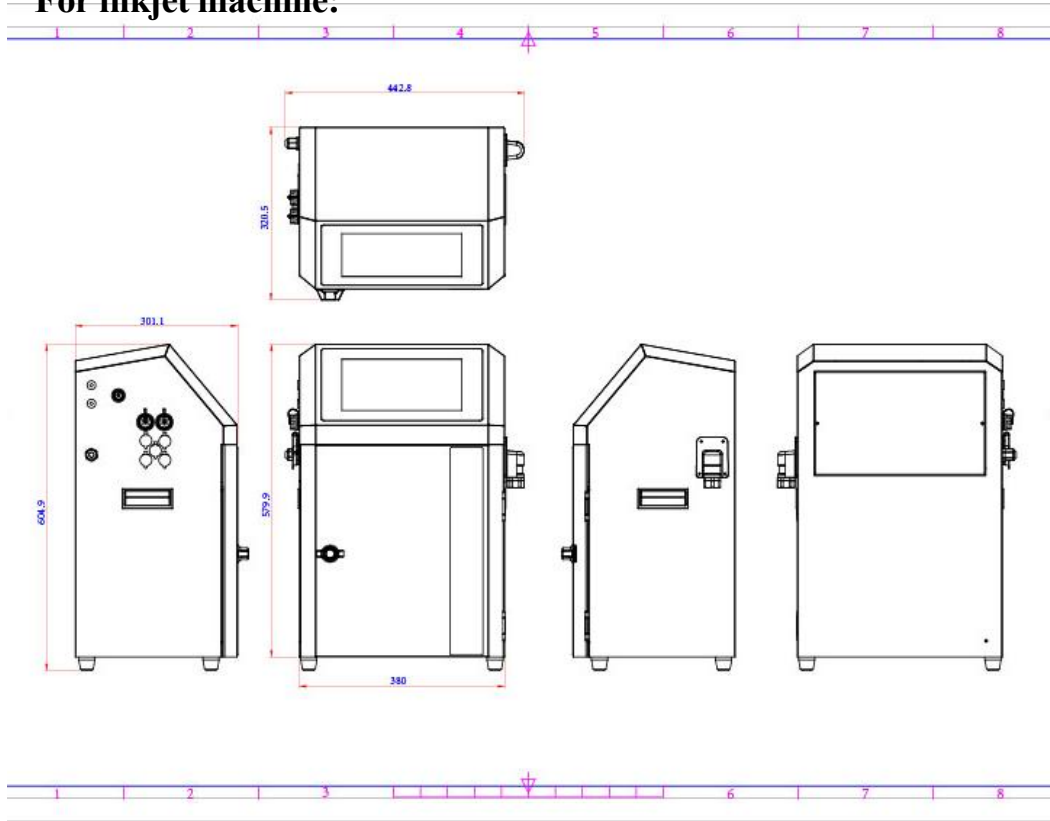
Icon.	Principle	Reason	Advice
	Unable to print information with the required width.	The number of printing points is set too high, and the font width is set too small.	1. Set the maximum printing point as small as possible. 2. Set the width larger.
		The font used in the information is too large	If possible, please use smaller fonts and fewer lines to edit the information. 2. Ensure that the number of printing points is set to the minimum allowed value, such as two lines of 7x5 information, with a minimum allowable value of 15.
		The current product line speed is too fast.	1. Reduce the product line speed. 2. It is recommended to use smaller diameter synchronous wheels or larger pulse encoders for more precise control of information width.

### 3.4.15 Faulty icon - maintenance expired

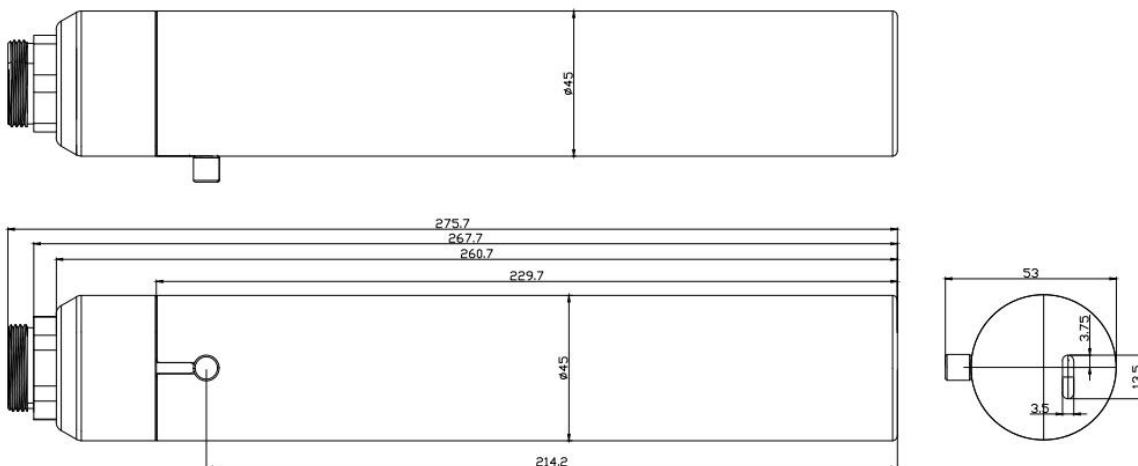
Icon.	Principle	Reason	Advice
	The inkjet machine needs maintenance	The setting maintenance time is due.	1. Carry out necessary maintenance work according to the actual situation. 2. Please contact the engineer to reset the maintenance time in the menu.

# Appendix: Dimensions

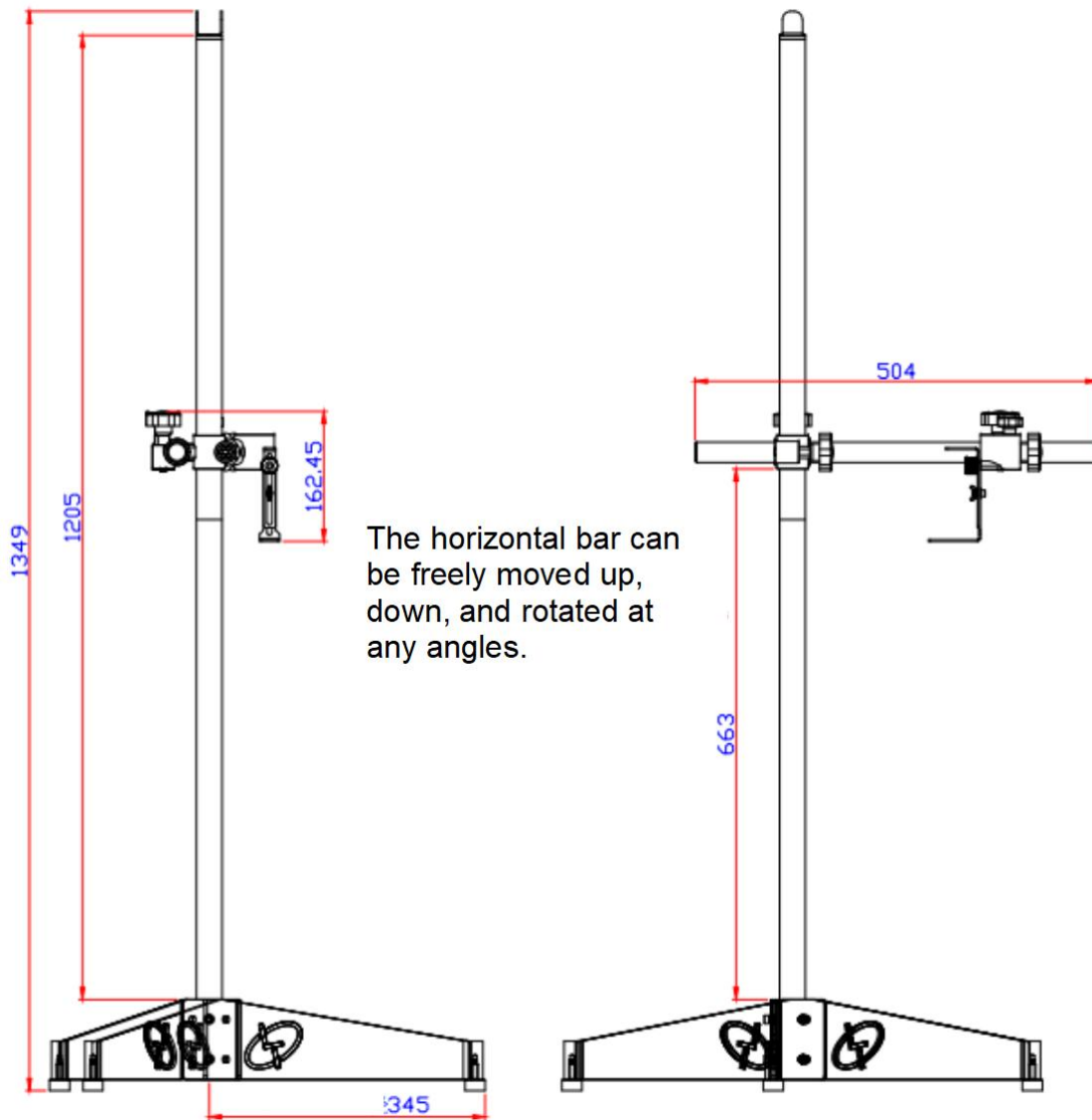
For inkjet machine:



For printer head:



**For stand frame:**



**DKPrint, Marks Each Moment!**

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