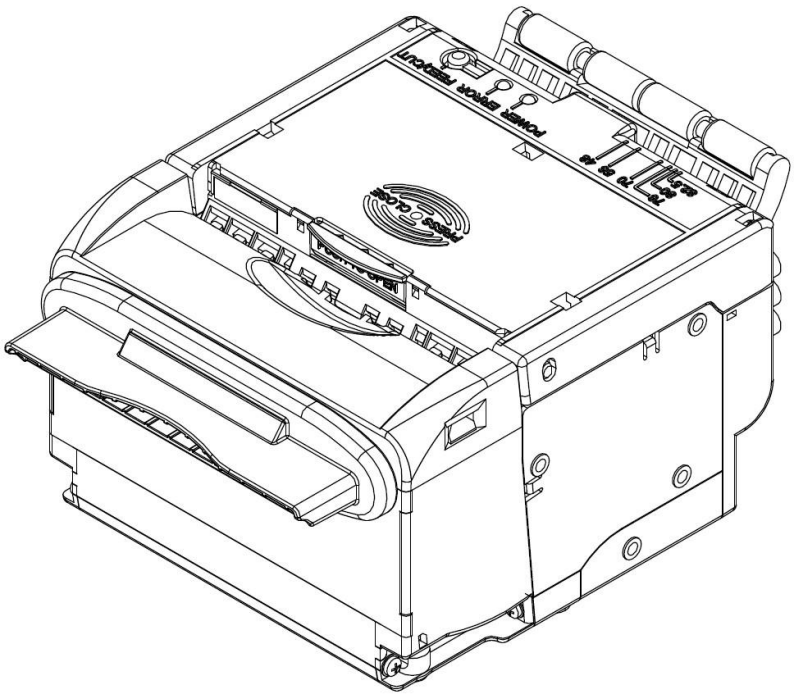
OPERATOR'S MANUAL

Embedded Thermal Printer 315M



Microcom Corporation, Lewis Center, Ohio

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Proprietary Statement

Product Enhancements

Microcom Corporation is committed to the continual improvement of performance and quality in our products. For this reason, specifications are subject to change without notice.

Liability Disclaimer

Microcom Corporation makes every effort to assure that all information and specifications contained in this manual are accurate; however, mistakes are sometimes made. Microcom Corporation shall not be liable for any damages resulting from the use or misuse of this product. The exclusion or limitation involving consequential or incidental damage does not apply to all states, therefore, the limitation mentioned above may or may not apply.

Warning and caution


Warning: Items should be strictly followed to avoid injury or damage to body and equipment.


Caution: Items with important information and prompts for operating the printer.


Caution: Thermal elements. Do not touch.


Warning: Do not touch to avoid damage due to static electricity.

Certifications:

ISO9001 Quality Control System Certification

ISO14001 Environmental Management System Certification

OHSAS18001 Occupational Health and Safety Management System Certification

IECQ QC 080000 Hazardous Substance Process Management System Certification

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Safety instructions

Before installing and using the printer, please read the following items carefully:

1) Install the printer on a flat and stable surface;
2) Reserve adequate space around the printer so that convenient operation and maintenance can be performed;
3) Keep the printer far away from water, and do not expose the printer to direct sunlight, strong light and heat;
4) Do not use or store the printer in a place exposed to high temperature, high humidity or serious pollution;
5) Do not place the printer in a place exposed to vibration or impact;
6) Avoid water condensation in the printer. In case of such condensation, do not turn on the power until it has completely gone away;
7) Connect the printer power to a grounded outlet. Avoid sharing the printer's electrical outlet with large power motors or other devices that may cause fluctuation of voltage;
8) Disconnect the power when the printer is not in use for a long time;
9) Don't spill water or other liquids into the printer. In case this happens, turn off the power immediately;
10) Do not allow the printer to start printing when there is no paper installed; otherwise the print head and platen roller will be damaged;
11) To ensure quality print and normal lifetime, use recommended paper or its equivalent;
12) Shut down the printer when connecting or disconnecting interfaces to avoid damage to the control board;
13) Set the print contrast to a lower setting as long as the print quality is acceptable. This will help to prolong the print head life;
14) Do not disassemble the printer without permission of a technician;
15) Keep this manual handy for reference.

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1. Summary

1.1 Introduction

The 315M printer is a high performance thermal printer equipped with a cutter and presenter. It can accept an up to 300mm paper roll and the widest print width is 80mm (for the cantilever paper holder, the default paper roll diameter is 150mm). It can be widely used in various fields like finance, retail, lottery, etc.

The 315M printer consists of the following modules:

- Thermal printing unit
- Presenter
- Paper holder
- Control board
- Cutter

The 315M printer can be connected via USB or serial interface. Drivers for Windows 2000/XP/2003/Vista/2008/Win7/Win8/Win8.1, WindowsXP, Embedded operating systems, and the software development kit based on DLL are available, as well as the CUPS drivers for Linux system.

1.2 Main Features

- Printing
  - High-speed
  - Low-noise thermal printing
  - High reliability
- Presenter
  - Paper holding
  - Paper retraction
  - Paper ejection

  Note: The Presenter is a paper accommodation mechanism located at the front end of the printer;
- Special functions
  - Anti-jam
  - Anti-pull
  - Detect the last ticket
- Applications
  - Command set is compatible with ESC/POS standard;
  - Characters handling: zoom 1 to 6 times horizontally or vertically, rotation print (0°, 90°, 180°, 270°), bold, black/white reverse, underline, upside-down print;
  - Barcode print: print barcode by commands in horizon and vertical direction;
  - Character size (Font A or Font B) can be set by commands;

- Can repeat printing by macro definition.

- Printer maintenance
  - Replace paper roll easily;
  - The top cover of printer can be opened, which is convenient for maintenance;
  - The top cover of Presenter module can be opened, which is convenient for maintenance;
  - Characteristics and parameters can be set by software;
  - Single USB interface or single serial interface is optional;
  - Mark identification and checkout;
  - Lower mark sensor for non-thermal side is adjustable;
  - Semi-auto paper loading;
  - Firmware can be updated on-line.

2. Main Technical Index

2.1 Technical Specification

Items		**Parameter**
		203 DPI model
Printing	Print method	Direct thermal line
	Resolution	203×203DPI
	Paper width	48~82.5mm
	Print width	Maximum:80mm (3.2 "); default: 80mm
		Maximum: 640 dots
	Ticket length	Maximum length: support ticket with maximum length of 600mm under Pre mode; support ticket with maximum length of 5m under the mode of printing while feeding paper; Minimum length: (with paper outlet mouth) support ticket with minimum length of 70mm (front paper output) /85mm(lower paper output) under Pre mode
	Print speed	High quality: 150 mm/s, accept up to 300mm paper roll; High speed: 230 mm/s, accept up to 120mm paper roll;
	RAM memory	2MB
	Flash memory	4MB
	Print head temperature detection	Thermal resistor
	Print head position detection	Micro switch
	Paper detection	Mechanical photoelectric sensor (optional)
	Upper/Lower mark detection	Photoelectric sensor
	Paper near end detection	Photoelectric sensor
	Communication interface	USB, RS-232
Barcode Fonts Graphics	Barcode	1-D barcode: UPC-A, UPC-E,JAN8 (EAN8), JAN13 (EAN13), CODE 39, CODE 93, CODE 128, ITF, CODABAR, GS1-128, GS1 DataBar 2-D barcode: PDF417,QR,Maxicode,2D GS1 DataBar,CompositeSymbology
	Fonts	Standard ASCII, compressed ASCII Optional Asian character set(Simplified Chinese, traditional Chinese, Japanese, Korea)
	Fonts Process	All fonts can be enlarged 1 to 6 times vertically and horizontally respectively, Rotation Print (0°, 90°, 180°, 270°),Bold, white/black reverse, underline, upside-down
	Graphics	Support bitmap to be downloaded to RAM and FLASH Support direct bitmap print
Media	Paper type	Continuous paper/marked paper
	Paper roll OD	Max.150mm (Cantilever paper holder)
	Paper roll ID	ф18, ф25, ф40mm
	Paper thickness	45-100 g/m^2 (configured with anti-jam function, paper thickness range is 45g-80 g/m^2)
	Thermal layer	Outward/Inward
Power consumption	24VDC input / room temperature / rated current	2.5A(12.5% duty ratio)
PRESENTER	Presenter paper output detection	Mechanical photoelectric sensor
	Presenter paper output speed	600mm/s
	Presenter paper pull detection	Photoelectric sensor (Optional)
	Presenter paper jam detection	Photoelectric sensor
	Presenter paper retraction detection	Photoelectric sensor (Optional)

Items		Parameter
		203 DPI model
	Presenter paper retraction speed	600mm/s
	Presenter paper output mode	Paper holding/Paper retraction/Paper ejection (optional)
Reliability	Print head lifetime	150KM (12.5% duty ratio, 60g recommend paper, paper type is OJI PD15/PD150R, 25℃ room temperature)
	Cutter lifetime	1 million cuts (60g recommend paper, paper type is OJI FD210, 25℃ room temperature)
	MTBF of main control board	360,000 hours
	MTBF of whole machine	5000 hours
Environment	Operation environment	Operation environment（no power）：0～50℃，20～90%RH（40℃） Operation environment（include power）：0～45℃，20～90%RH（40℃）
	Storage environment	Temperature:-25°C ～60°C Humidity: 15%～ 98% RH(40°C)
Physics Character	Overall size	No bigger than 116(W) x 146.8(L) x 76.7(H)mm(mechanism module, excluding paper holder)
	Weight	2kg

Table 2.1 Technical specification

Caution:

- ✧ DPI: dots printed for each inch. (One inch is about 25.4mm)
- ✧ The real print speed is related with data transmission speed, speed darkness, print duty, control commands and input voltage, which may be lower than that in above table.
- ✧ PRESENTER is a mechanism accommodating paper, and locates at the front of the printer.
- ✧ The relationship between the working status of print unit and the environment is shown in the figure:

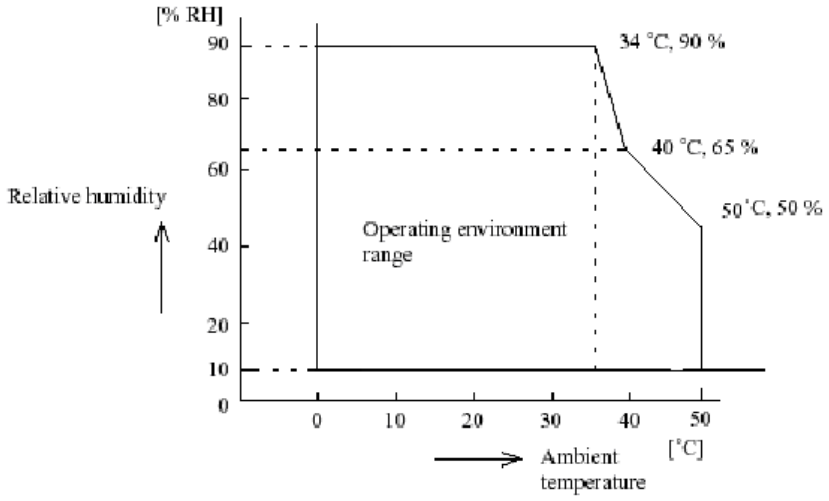


Fig. 2.1-1Relationship between working status of print unit and environment

2.2 Paper Specification

- Paper type: Continuous /marked paper
- Paper supply method: Paper roll
- Paper width: 48-82.5mm
- Paper weight: 45g～100g
- Thermal layer: Outward/Inward
- Paper roll specification:

  Optional ID of paper roll core: ф10, ф18, ф25, ф40mm

  Minimum ID of paper roll: ф16, ф24, ф31, ф46mm

  Maximum OD of paper roll: ф300mm

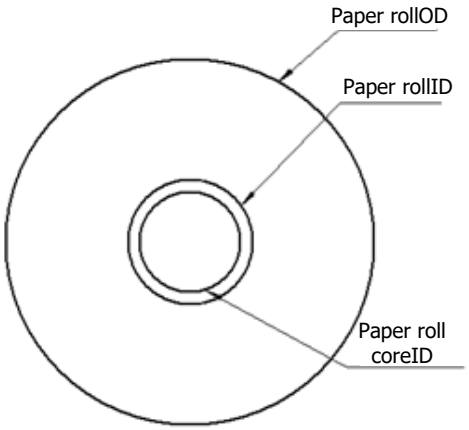


Fig. 2.2-1 Paper roll diagram

Note: The supported paper thickness and paper roll diameter is as followings when there is Presenter module:

Paper thickness	Minimum paper roll ID	Remarks
45-80 um	Φ16	Outward paper
80-100 um	Φ31	
45-100 um	Φ16	Inward paper

- Recommended paper
  - Recommended continuous paper:

Paper type	Manufacturer
FD200	OJI Paper CO., LTD.
FD210	OJI Paper CO., LTD.
ADP78	OJI Paper CO., LTD.
PD150R	OJI Paper CO., LTD.

Table 2.2-1Recommended paper

- Recommended marked paper:

  The marked paper should meet the following requirement besides that of standard paper:

  ✧ Mark position

  There are three positions for mounting the mark sensor on the thermal side, and the left and the right positions can be adjusted along with the paper guide block while the middle position is fixed. The position for mounting the mark sensor on the non-thermal side is continuously adjustable. The above mark sensor has requirements for the mark position (see Fig. 2.2-2);

  ✧ In using marks, it is recommended to use the following parameter:

  L1 mark width: 8mm≤L1≤paper width

  L2 mark width:: 4mm≤L2≤8mm

  ✧ The reflectivity of marks is less than 15%; The reflectivity of other part of the ticket within mark width along paper feed direction is over 75%.There should not be any characters, graphics as advertisement between marks space

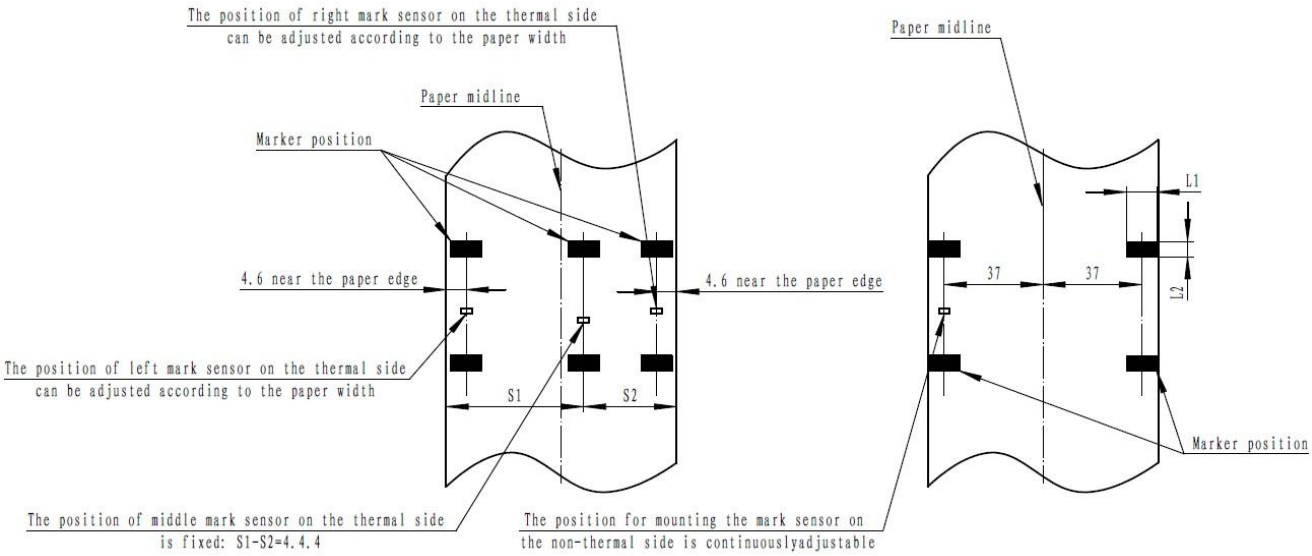


Fig. 2.2-2 Mark position diagram

Caution:

✧ Due to dithering during paper feeding and tolerance of paper parameters, the mark positioning position may have a tolerance of ± 1mm.

✧ Only one mark sensor is mounted on the non-thermal side when the printer is delivered from the factory (default position is on the non-thermal side of paper path) and the mark sensor position is continuously adjustable.

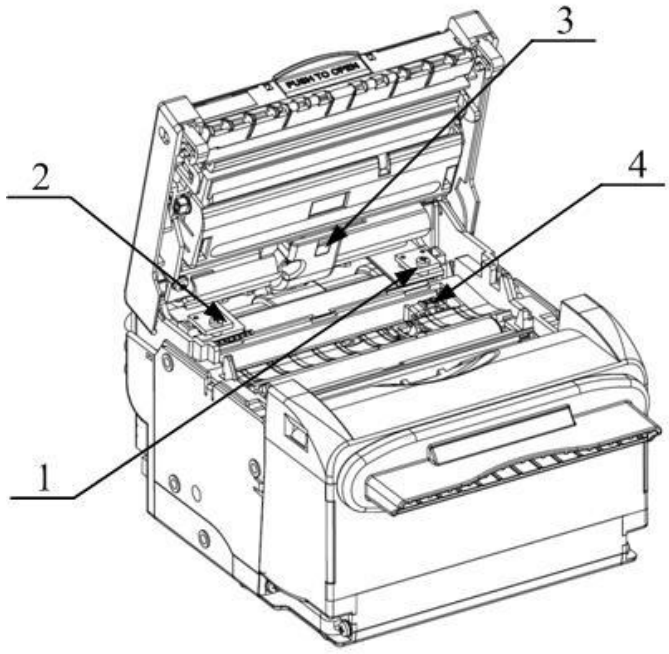


Fig. 2.2-3 Mark sensor

1- Right mark sensor on the thermal side
2- Left mark sensor on the thermal side
3-Middle mark sensor on the thermal side
4-Mark sensor on the non-thermal side

Caution:

- ✧ The mark sensor on non-thermal side is the default sensor as delivered from the factory, and the middle mark sensor on thermal side is used as paper feeding sensor;
- ✧ The middle mark sensor on thermal side is optional, while only one of the other three sensors can be installed.

Caution:

- ✧ Please use the recommended paper or its equivalents. Using other types of paper may affect print quality and reduce the print head life;
- ✧ Do not paste the paper to the shaft core;
- ✧ If the paper comes in contact with chemical or oil, it may discolor or be less heat sensitive, which will greatly affect the print quality;
- ✧ Do not rub the paper surface with a hard object. Otherwise it may discolor;
- ✧ When the temperature goes up to 70C, paper will discolor. Take care to the effect of temperature, humidity and sunlight in environment.

3. Structure and Functions

3.1 Appearance

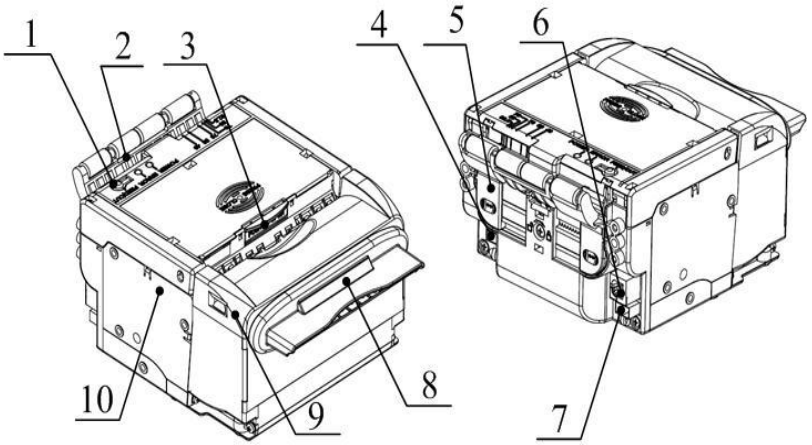


Fig. 3.1-1 Printer appearance

1 —Button

2 —Buffer module (optional)

3 — Button for opening and closing the top cover

4 —Paper near sensor socket

5 —Paper guide block

6 —Communication interface (USB or serial interface is optional)

7 —Power interface

8—Paper exit

9—Presenter

10 —Print module

3.2 External Dimension

Overall size of the printer

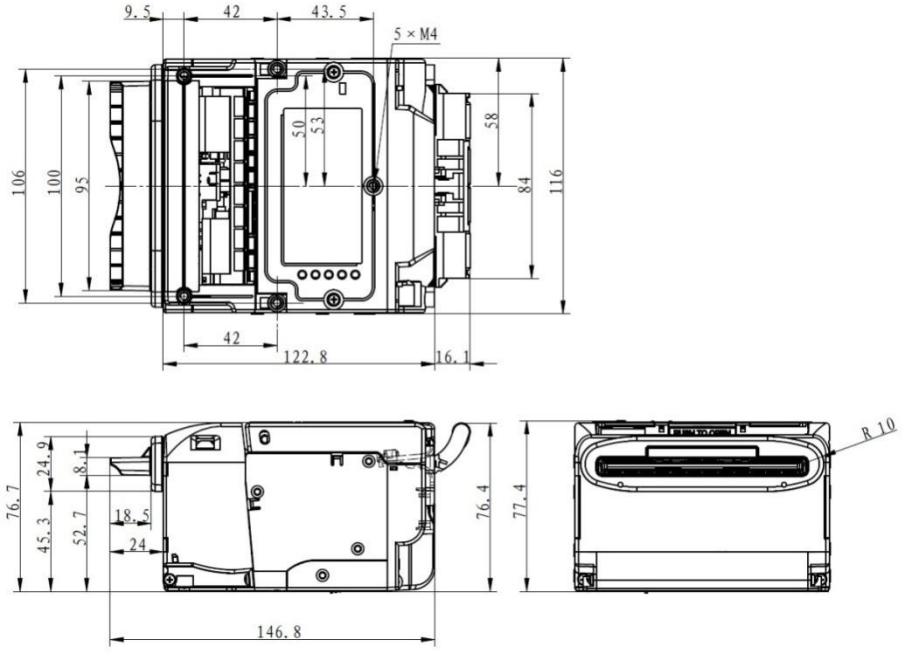


Fig. 3.2-1Overall size of printer with buffer

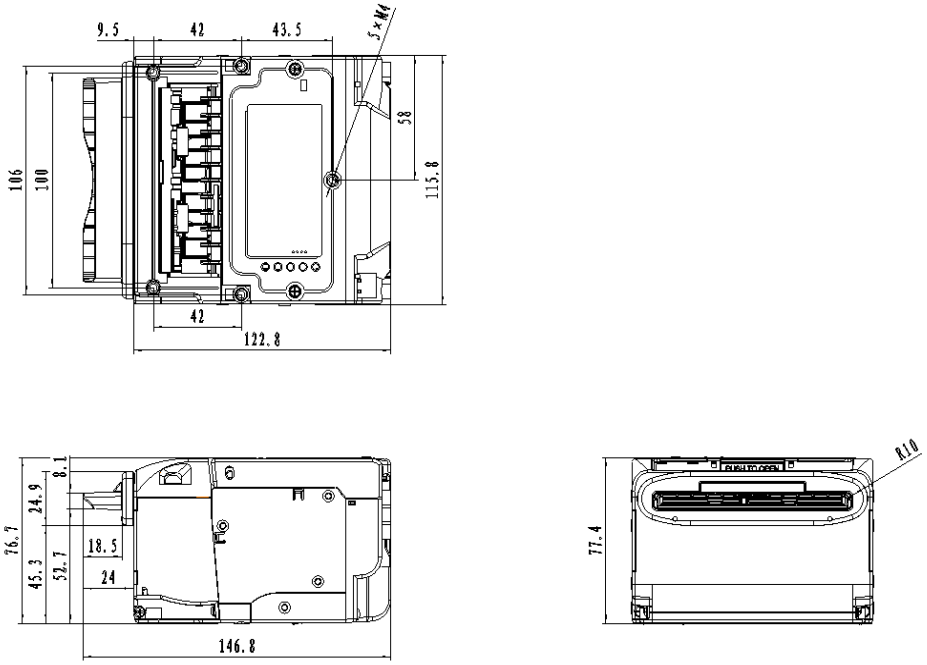


Fig. 3.2-2 Overall size of printer without buffer

3.3 Print Unit and Controlling Parts

The controlling parts include circuit board and corresponding adjustment buttons and interfaces.

3.3.1 Exterior of Print unit and Controlling Parts

The print unit consists of print mechanism and cut mechanism, referring to the fig.3.3-1:

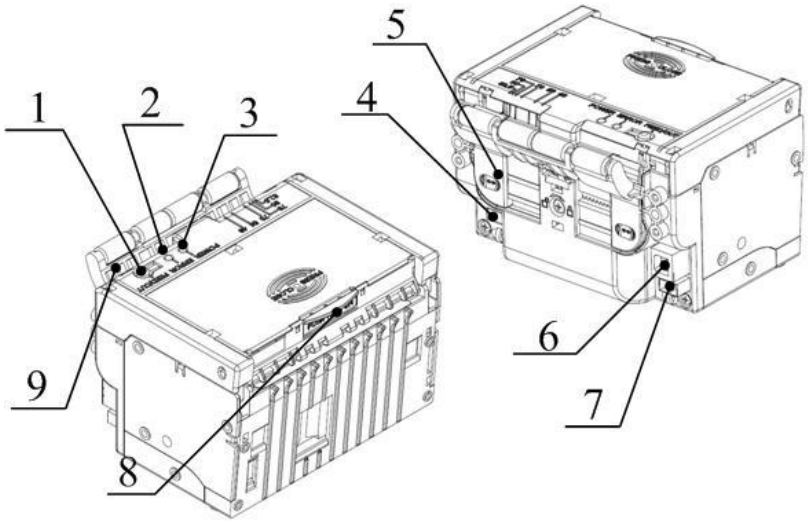


Fig.3.3-1 Print unit and controlling parts

1 —Feed/Cut button 2 —Error LED
3 —Power LED 4 —Paper near sensor socket
5 —Paper guide block 6 —Communication interface (USB or serial interface is optional)
7 —Power interface 8—Button for opening and closing the top cover
9—Paper entry

3.3.2 Modules of Print Unit

- **Feed/Cut Button**
  - Print self-test page: press and hold the FEED button while turning on the power for 1s, the printer will print the self-test page;
  - Feed paper: under normal conditions, press the FEED / CUT button, the printer will feed paper, and the printer will stop feeding paper when releasing the FEED / CUT button. During paper feeding, the Presenter will start when the leading edge of the paper enters the Presenter, and the Presenter will stop running when the paper is held by the Presenter;
  - Cut paper: the printer will cut paper if the FEED / CUT button is pressed two times continuously.

Caution:

✧ The printer will not run when press the FEED button under error status.

- **Button for Opening and Closing the Top Cover**

  The top cover module can be opened for maintenance work, such as clear jammed paper jam or cleaning the print head/platen rollers.

- **Power Switch**

  Press "O" to turn off the power, or press "—"to turn on the power.

- **Error LED (Red)**

  Indicates the status of printer. Normally, it is off; under error status (like paper end), it will flash.

  Note: Error LED also flashes when the printer executes macro definition.

- **Power LED (Green)**

  Indicate whether the power is on or off. It is always on when the printer is turned on.

Heating:

✧ The print head and the motor get hot when printing, please do not touch it after operation.

✧

3.4 Presenter

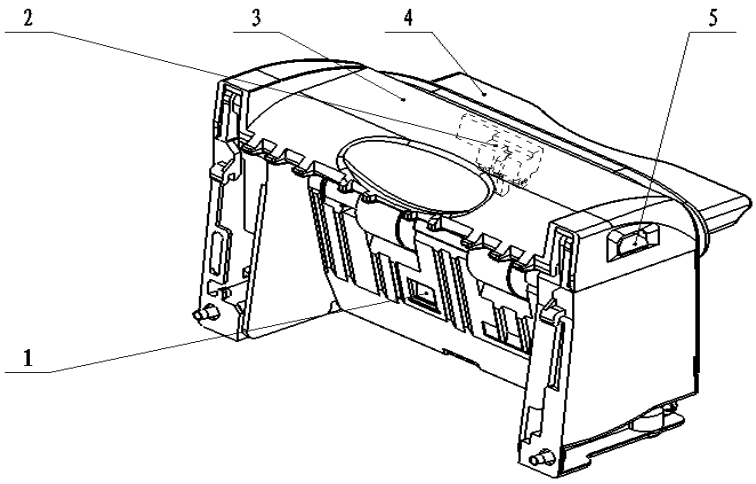


Fig. 3.4-1 Appearance of Presenter

1- Paper retraction sensor: Checks whether the paper is retracted correctly.
2- Paper out sensor: Detects the status of print paper and confirms whether the print paper has been taken away or not.
3- Presenter top cover: The cover can be opened for clearing Presenter jammed paper.
4- Paper outlet mouth.
5- Snap-fit for fixing the top cover.

4. Installation

4.1 Unpacking

Open the carton and check whether all items listed on the packing list are included or have any damages. In case of damage or missing items, please contact Microcom Corporation for assistance.

4.2 Adjust the Paper Guide Block

After unpacking the printer, adjust the paper guide block to adapt to the corresponding paper width. The 315M printer can use paper of 48-82.5mm width. Adjust the paper guide block to the corresponding scale as shown in the following figure. There are six scales: 82.5,80,76,70,56 and 48mm. Move the paper guide block until its gap aligns with the round dot of target scale.

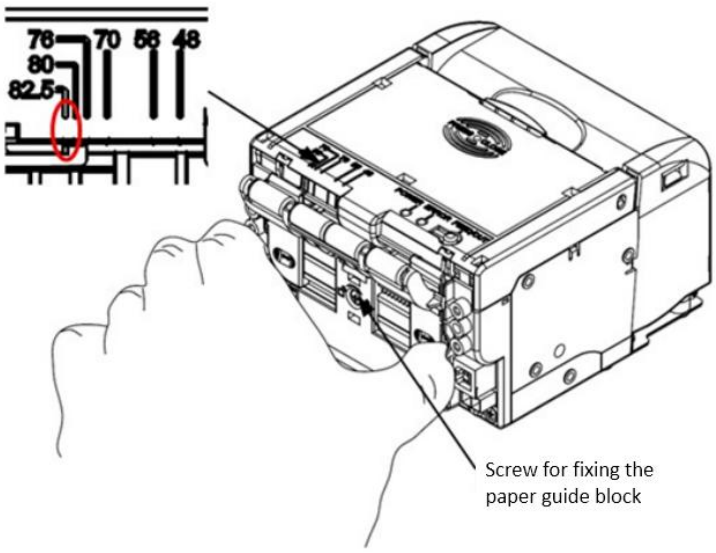


Fig. 4.2-1 Paper guide block adjustment diagram

⚠ Caution:

✧ Refer to the following figure, release the screw fixing the paper guide block in counterclockwise direction (do not need to remove the screw completely) before adjusting it, and then tighten the screw after moving the paper guide block in place.

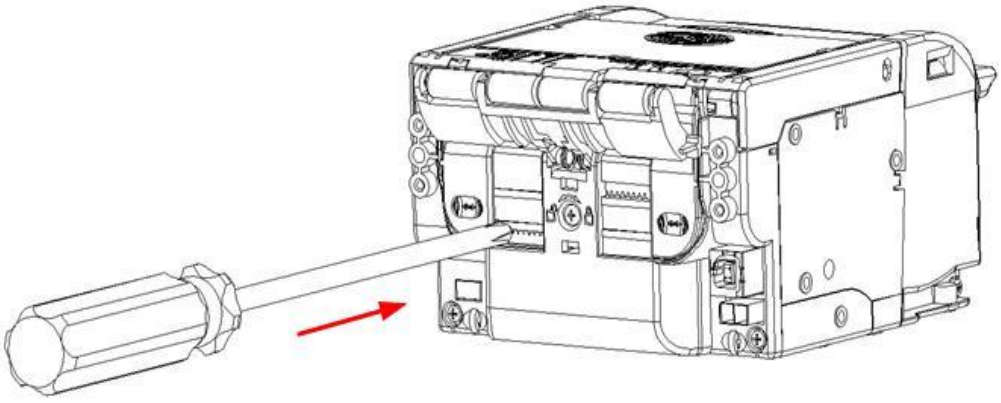


Fig. 4.2-2 Adjust the screw fixing paper guide block

4.3 Adjust the Position of Mark Sensor

There are four mark sensors on the 315M printer and their positions on the left/right side or thermal/non-thermal side can be adjusted. Detail mounting positions please refer to the following figure:

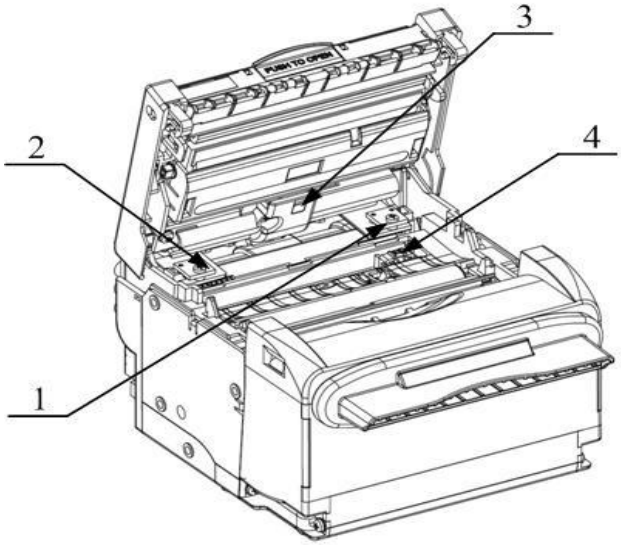


Fig. 4.3-1 Mounting positions of mark sensors

No. of mark sensor	Name of mark sensor	Adjustment method
1	Right mark sensor on the thermal side	The sensors are installed on the left/right paper guide block, and the adjustment method is the same as that of paper guide block.
2	Left mark sensor on the thermal side	
3	Middle mark sensor on the thermal side	The mark sensor is fixed and its position is not adjustable.
4	Mark sensor on the non-thermal side	The mark sensor position is continuously adjustable and the adjustment method is shown below.

Table 4.3-1 Adjustment method of mark sensors

The position of the mark sensor for the non-thermal side of paper can be continuously adjusted in following steps:

1) Open the top cover of printer, and then remove the lower mark sensor cover as shown in the Fig. 4.3-2.

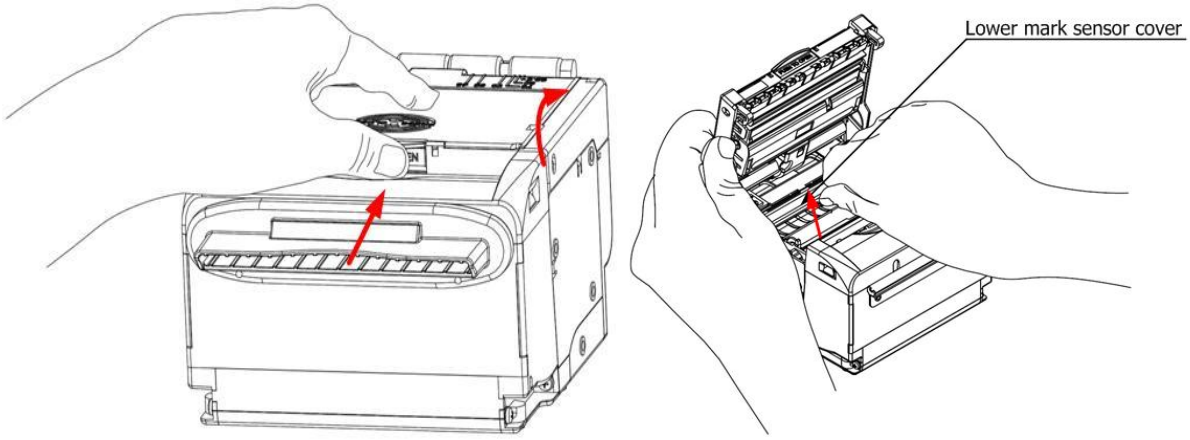


Fig. 4.3-2 Remove the lower mark sensor cover

2) Adjust the lower mark sensor position to align it with the mark on paper as shown in the Fig.4.3-3.

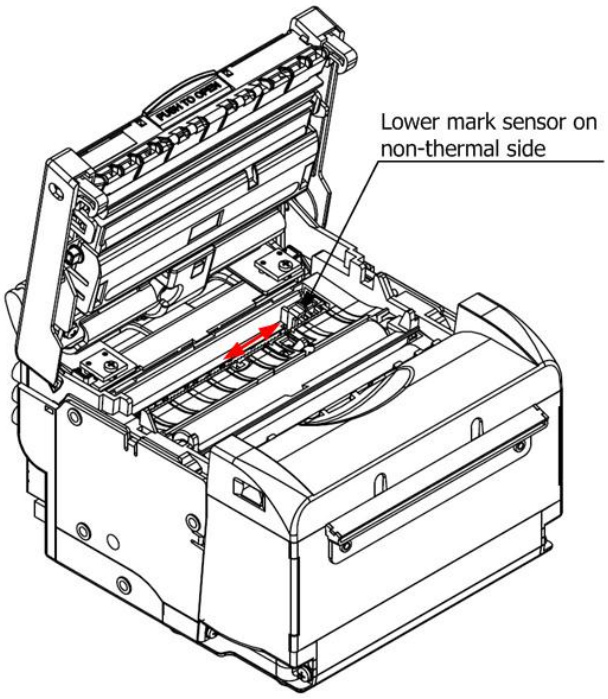


Fig. 4.3-3 Adjust the lower mark sensor position

3) Install the lower mark sensor cover and close the top cover.

4.4 Connect the Power Adapter

1) Ensure the printer is turned off;
2) Insert the 2P power cord plug into the power interface of printer as shown in the Fig.4.4-1;
3) Connect the power adapter to an electrical outlet.

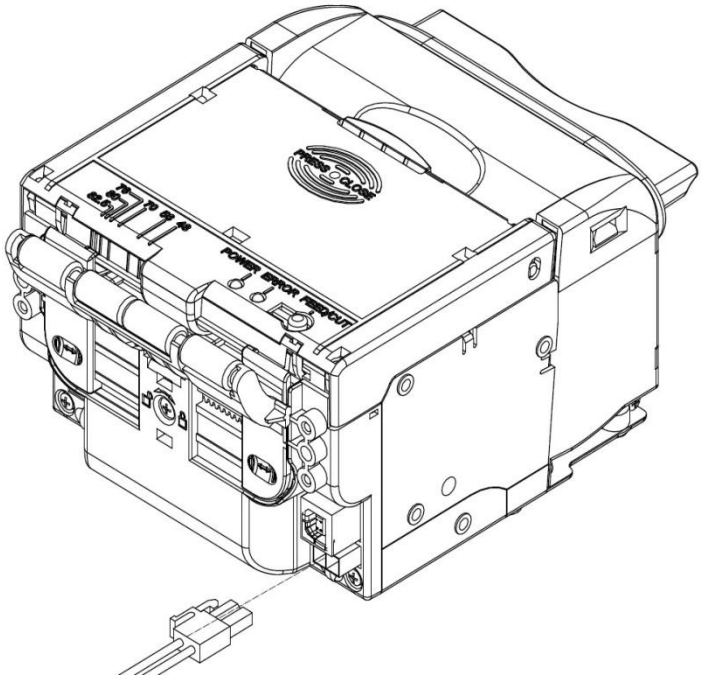


Fig. 4.4-1 Power adapter connection

Caution:

- ✧ Use the power adapter recommended by the manufacturer;
- ✧ Select appropriate power supply according to the power input parameters recommended by the manufacturer;
- ✧ When connecting or disconnecting the connector of AC power adapter, always hold the connector shell and don't pull the cable forcibly.
- ✧ Avoid dragging or pulling the cable of AC adapter, otherwise the cable may be damaged.
- ✧ Avoid placing the power adapter near an overheating device, otherwise the surface of cable may melt and cause a fire or electric shock.
- ✧ If leaving the printer idle for a long time, please disconnect the power adapter.

✧

4.5 Connect Interface Cable

The 315M printer communication interface is USB or serial interface (optional), and customer can choose the interface according to actual usage.

4.5.1 Connect USB Interface Cable

1) Ensure the printer is turned off;
2) Insert the USB cable into corresponding socket (only for printer configured with USB interface) as shown in the Fig. 4.5-1;
3) Connect the other end of interface cable to the host.

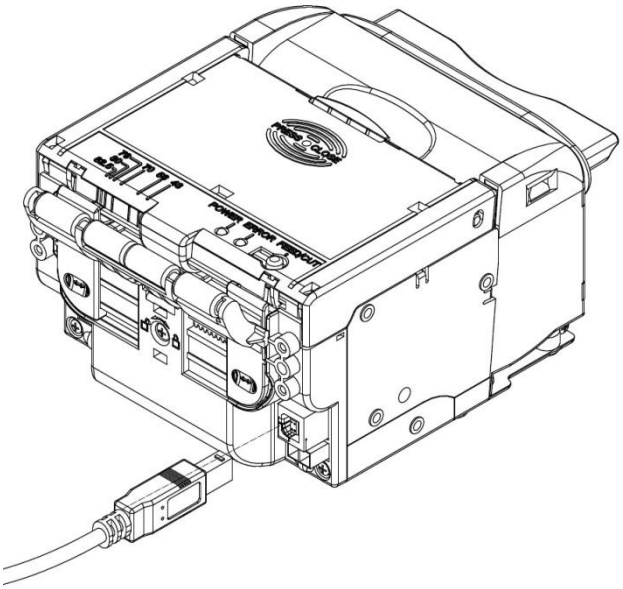


Fig. 4.5-1 Connect USB cable

Caution:

- ✧ Make sure the interface cable is connected in correct direction.
- ✧ When connecting or disconnecting the interface cable, make sure to hold the plug shell instead of dragging the cable forcibly.

✧

4.5.2 Connect Serial Interface Cable

1) Ensure the printer is turned off;
2) Insert one end of serial connecting cable into corresponding socket (only for printer configured with serial interface) as shown in the Fig. 4.5-2;
3) Connect the straight-through cable to the serial connecting cable as shown in the Fig.4.5-3;
4) Connect the other end of the straight-through cable to the host.

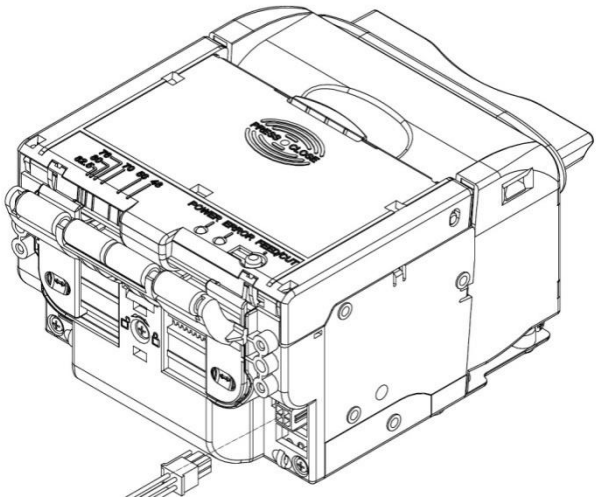


Fig. 4.5-2 Connect the serial connecting cable to the printer

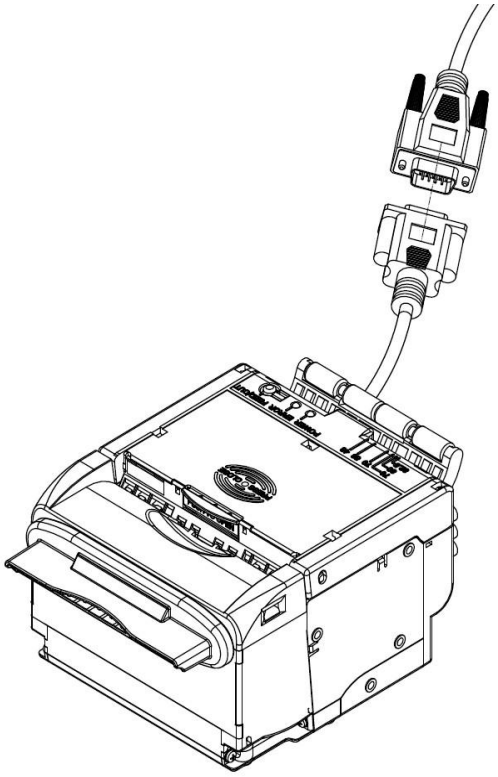


Fig. 4.5-3 Connect the straight-through cable to the serial connecting cable

⚠ Caution:

- ✧ Make sure the interface cable is connected in correct direction;
- ✧ When connecting or disconnecting the interface cable, make sure to hold the plug shell instead of dragging the cable forcibly;
- ✧ You must use the straight-throughcable for cable connecting, otherwise the communication is disabled;
- ✧ Do not connect or disconnect the serial connecting cable before disconnecting the power supply.

4.5.3 Connect Paper Near End Sensor Cable

Connect the paper near end sensor cable as shown in the following figure:

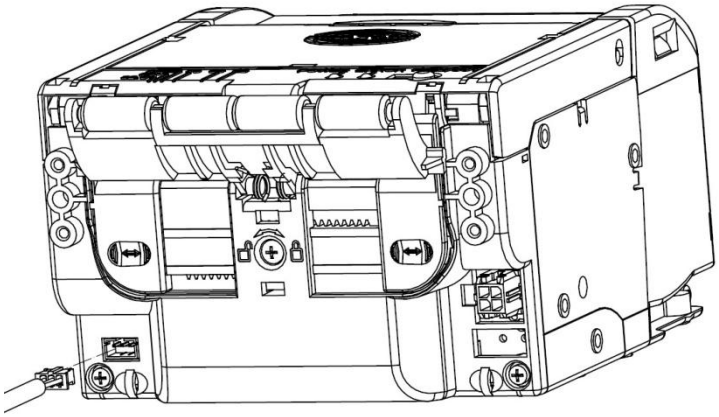


Fig. 4.5-4 Connect paper near end sensor cable

4.6 Install and Load the Paper Roll

Before installing the paper roll, make sure the specification of paper roll is in conformity with requirements of printer (refer to 2.2 Paper specification).

4.6.1 Steps to Install the Paper Roll

1) Turn on the power and then place the paper head in the paper feeding path as shown in the Fig.4.6-1:

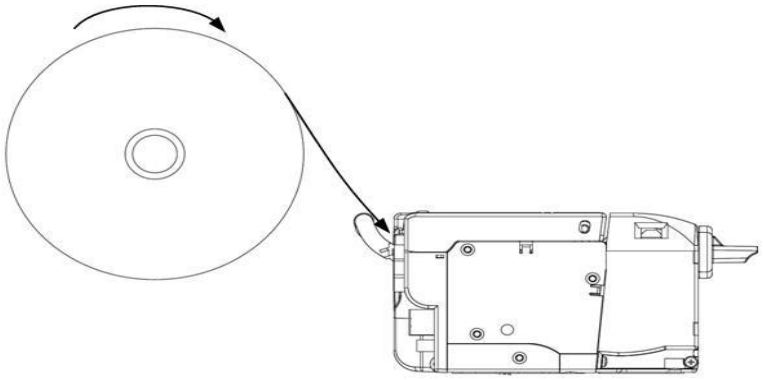


Fig. 4.6-1 Paper loading

2) When the paper sensor detects paper, the platen rollers will start rotation to complete the semi-automatic paper loading.

⚠ Caution:

✧ Before loading paper, cut the paper's leading edge according to the figure below:

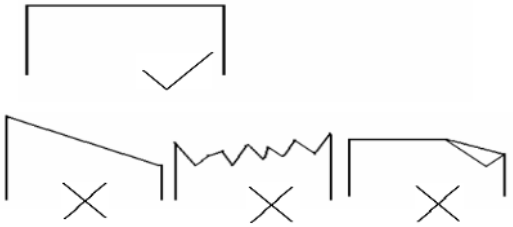


Fig. 4.6-2 Paper head

✧ Before loading paper, make the paper is flat to ensure that the paper will be fed smoothly into the path.

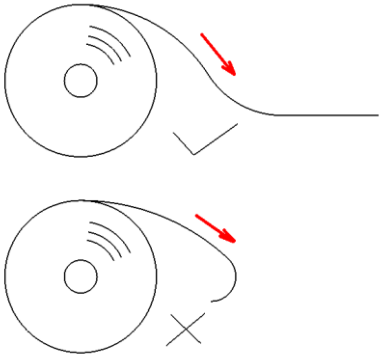


Fig. 4.6-3 Radian of paper head

4.6.2 Semi-automatic Paper Loading

1) Turn on the power and the ERROR LED alarms for paper end;
2) Refer to Figure 4.6-4, push paper into the paper inlet and release your hands when the platen roller starts rotating and holds the paper.

⚠ Caution:

Push the paper into the paper feeding path with well-distributed and gentle force and try to make the paper head parallel to the paper feeding path.

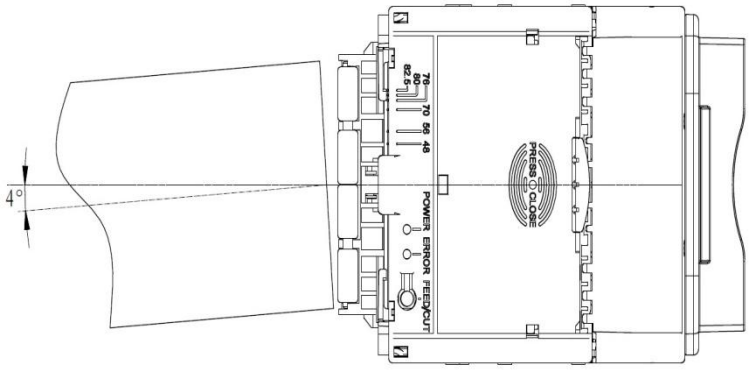


Fig. 4.6-4 Paper loading

4.7 Install the Printer

The operation of 315M printer is reliable and easy, has good adaptability of installation, and good maintainability. It adopts a modular design and active connection, combining with embedded installation; it also adopts flexible maintenance and operation points. Please refer to the content in this section when designing the whole machine, in order to ensure the reliable and effective work of 315M printer.

4.7.1 Notices

- ✧ Install the printer on a flat and stable place. Horizontal installation is recommended. The inclination angle should not exceed ±15° (paper feeding direction). Inclination in other directions is not allowed;
- ✧ The flatness of the surface for fixing the printer should have no more than 0.3mm deflection;
- ✧ Keep the printer far away from any water source;
- ✧ Do not place the printer in a place exposed to vibration and impact;
- ✧ Ground the printer safely.

4.7.2 Printer Fixing

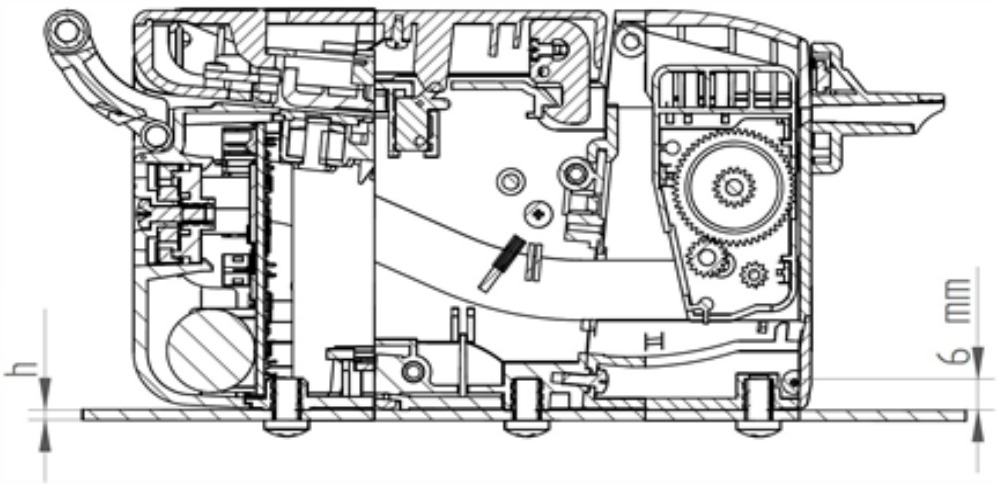


Fig. 4.7-1 Printer fixing diagram

- ➢ Refer to Fig. 3.2-1 or Fig. 3.2-2 for printer fixing holes;
- ➢ The screw length H is ≤bottom plate thickness h + 6mm;
  For example, if the bottom plate thickness is 4mm, then the screw length is≤10mm.

4.7.3 Operation Space

- Open the top cover: Press the center of button for opening/closing the top cover as shown in the figure.

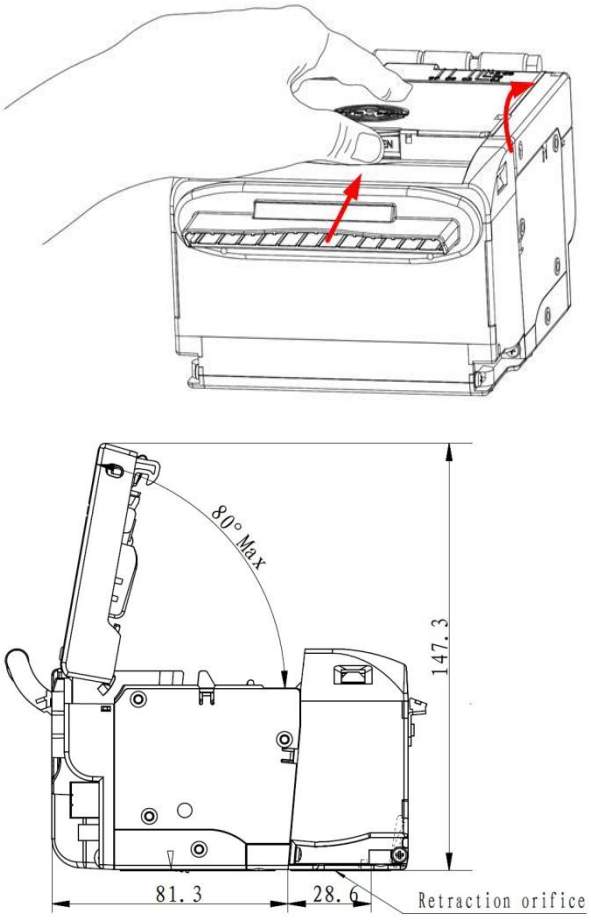


Fig. 4.7-2 Operation space for printer with standard paper holder

- Retraction orifice: Used for retracting the tickets that have not been taken away by users.

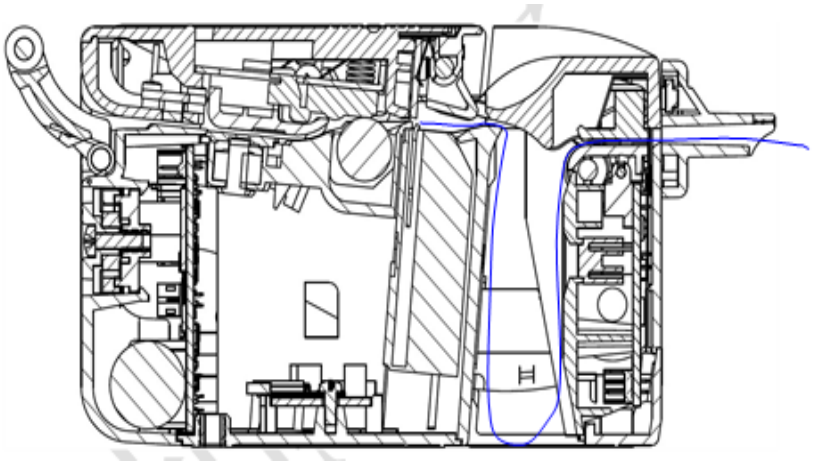


Fig. 4.7-3 Paper accommodation space inside the Presenter

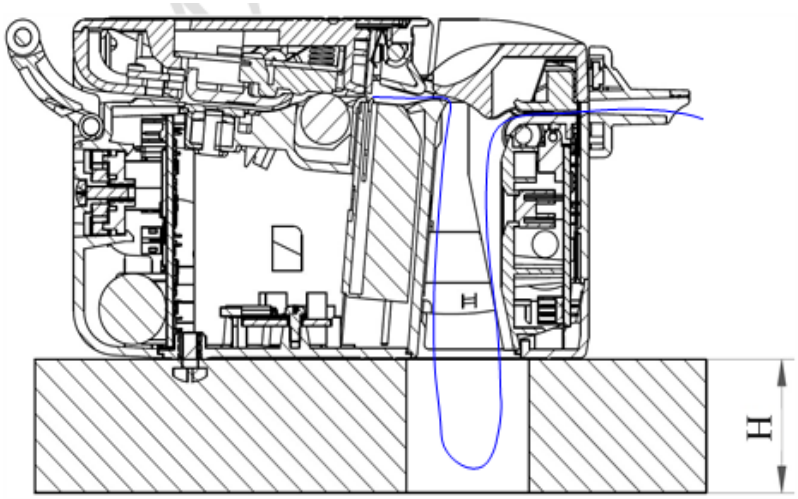


Fig. 4.7-4 Presenter expanded paper accommodation space

- Presenter paper accommodation space: The Presenter paper accommodates a ticket with a maximum length of 180mm; if the ticket length is longer than 180mm, then space should be reserved at the bottom of printer.
  Height of reserved space (H) ≥(Ticket length -180mm)/2。

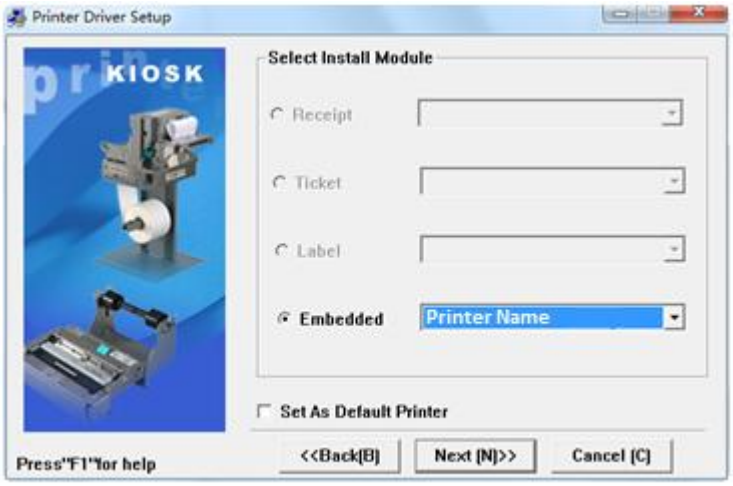
4.8 Install Windows Driver

315M printer drivers for Windows 2000/ Windows XP/ Windows server 2003/Windows Vista/Windows Server 2008/Windows 7/Windows 8/Windows 8.1/Windows 10/Windows XP Embedded operating systems and the software development kit based on DLL are available, as well as the CUPS drivers for Linux system.
Drivers' installation steps are as following:

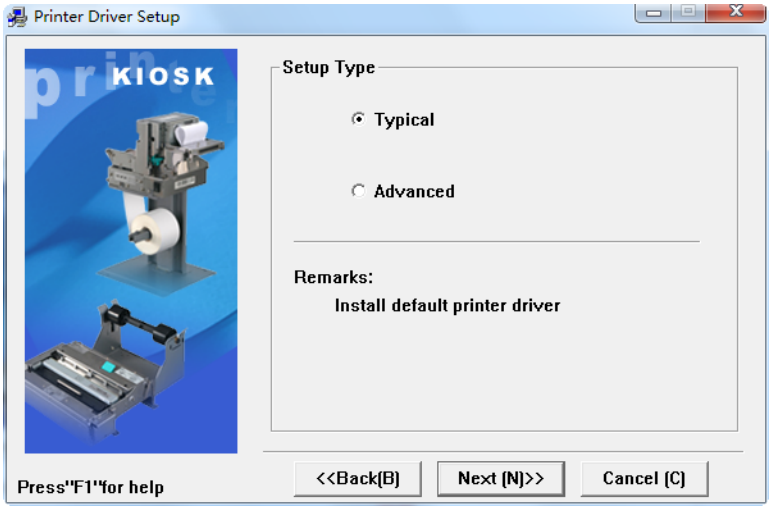
4.8.1 Typical Installation

1) First run Setup.exe in the driver installation package, then read the relative software license protocols. If you accept the agreement, click "I Accept" and the "Next" button;

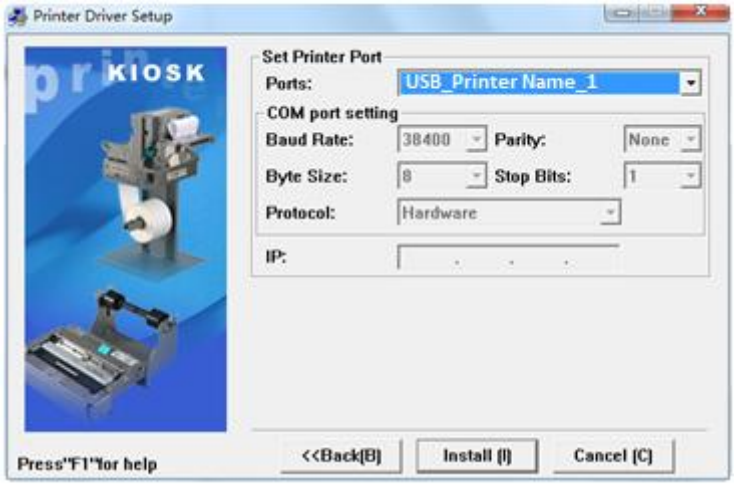
2) Choose the printer type and name to be installed. If you set this printer as a default in the system, choose the button "Set As Default Printer", and then click "Next" button;



3) Select the Setup Type: "Typical" and click "Next";



4) Set the printer port. Users should choose the installing port according to its use. Select "BYCOMx" as driver (X equals to 1, 2, 3, 4, 5, 6, 7 or 8), choose the USB port "USB_BK-C310_1", and then click "Install" to end the installation.

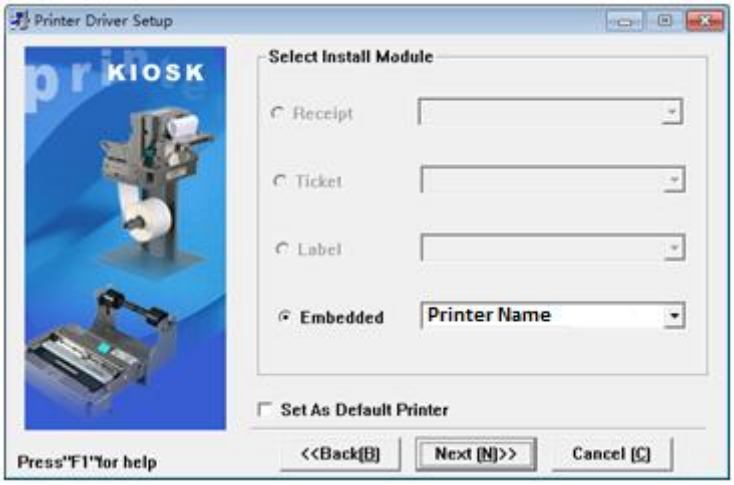


4.8.2 Advanced Installation

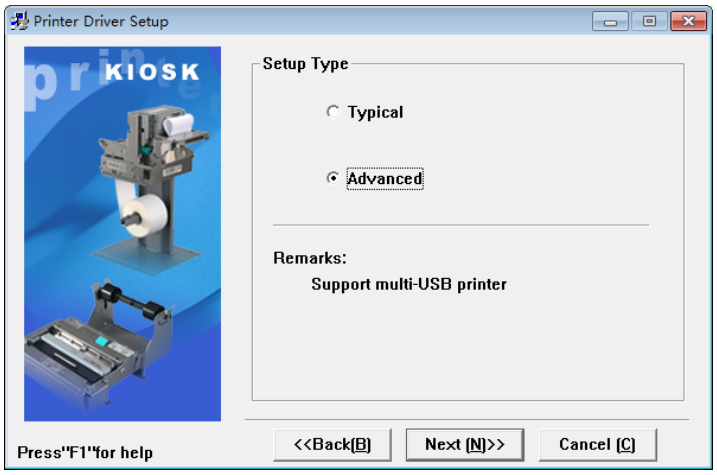
The advanced installation is mainly used for users who have special requests of the printer driver. It adds functions. To support the installation of several USB printers driver and set the driving mode with the following steps:

1) First run Setup.exe in the driver installation package, then read the relative software license protocols. If you accept all the agreement, click "I Accept" and the "Next" button;

2) Choose the printer type and name to be installed (take 325M as an example). If you want to set the printer as a default, choose "Set As Default Printer";



3) Choose the Setup Type: "Advanced" and click "Next";



4) Set the printer driving mode and printer port. The system supports several USB installation, then click "Install" to end the installation;

Notes:

- ✧ The USB driver is also installed during printer driver installation.
- ✧ Ensure the following services start before printing:
  Location: Computer Management -> Services and Applications -> Services
  a) Print Spooler
  b) Remote Procedure Call (RPC)
  c) Remote Procedure Call (RPC) Locator

5. Routine Maintenance

Caution:

- ✧ Before starting routine maintenance for the printer, make sure the power is turned off.
- ✧ Do not touch the surface of print head with hands or hard objects to prevent scratches.
- ✧ Do not use organic solvents like gasoline, acetone, etc.
- ✧ When cleaning print head or sensors, please wait for alcohol to evaporate totally before starting to print.
- ✧ It is recommended to do routine maintenance monthly.

5.1 Clean the Mark Sensor

The mark sensors should be cleaned when marks are not recognized. Locate mark sensors as shown below:

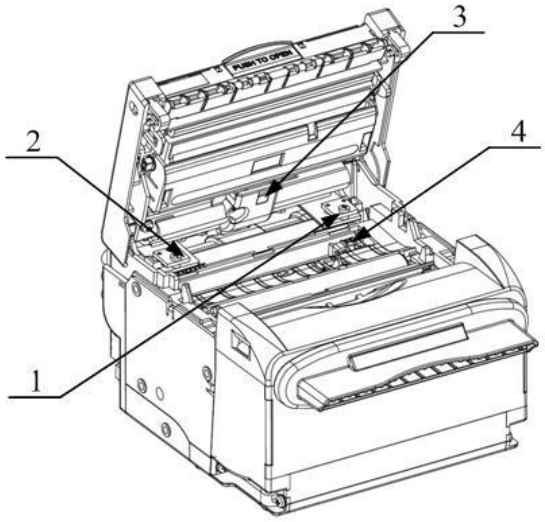


Fig. 5.1-1 Mark sensor

1-Right mark sensor on the thermal side
2-Left mark sensor on the thermal side
3- Middle mark sensor on the thermal side
4- Mark sensor on the non-thermal side

Caution:

- ✧ The mark sensor on the non-thermal side is the default sensor as delivered from the factory, and the middle mark sensor on thermal side is used as paper feeding sensor;
- ✧ The left and right mark sensors on thermal side are optional, customers can choose according to actual need;
- ✧

5.1.1 Clean the Left/right Mark Sensor on Thermal Side

Cleaning steps for the left/right mark sensor on thermal side are as follows:

1) Remove the buffer module, rear cover fixing screws, and rear cover module in the order and directions shown in the Fig. 5.1-2;

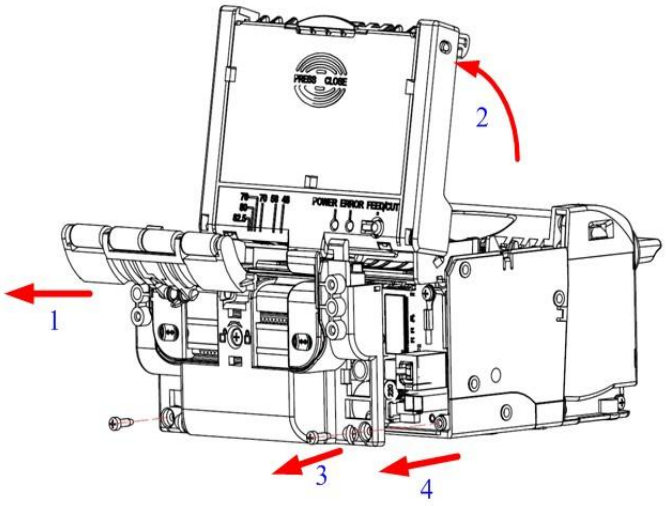


Fig. 5.1-2 Mark sensor cleaning

Caution:

✧ Disconnect the mark sensor cables from the main control board after disassembling the modules according to the above method.

2) Remove the paper guide fixing screws, transmission gear, protective plate and paper guide block in the order and directions shown in the Fig. 5.1-3;

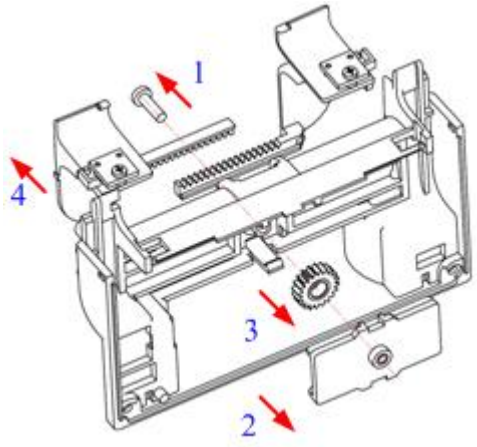


Fig. 5.1-3 Mark sensor cleaning

3) Wipe off the dust and stains on the surface of the sensors with a soft cotton cloth dampened with alcohol. Wait for 5-10 minutes until the alcohol evaporates completely, and then install the parts in the reverse sequence.

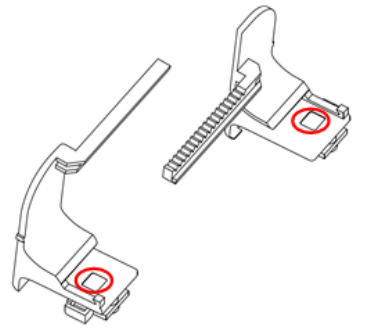


Fig. 5.1-4 Mark sensor cleaning

5.1.2 Clean the Middle Mark Sensor on Thermal Side

Cleaning steps for the middle mark sensor on thermal side are as following:

1) Open the top cover as shown in the Fig. 5.1-5;

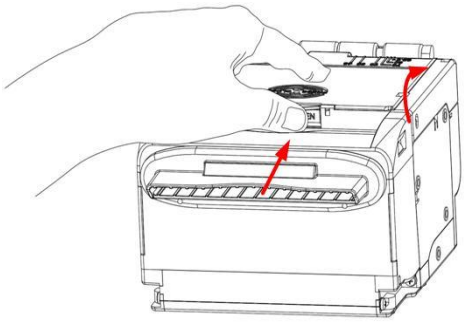


Fig. 5.1-5 Mark sensor cleaning

2) Wipe off the dust and stains on the surface of the sensor with a soft cotton cloth dampened with alcohol. Wait for 5-10 minutes until the alcohol evaporates completely, and then close the top cover.

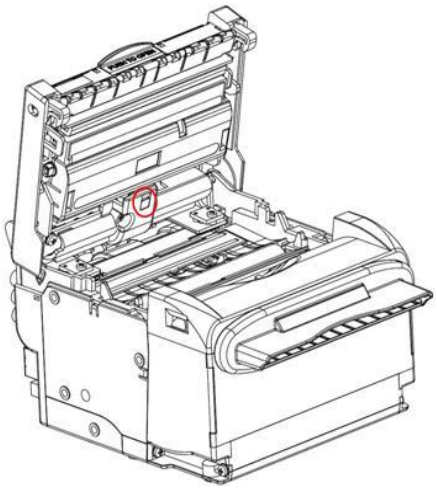


Fig. 5.1-6 Mark sensor cleaning

5.1.3 Clean the Mark Sensor on Non-thermal Side

Cleaning steps for the mark sensor on non-thermal side are as following:

1) Open the top cover as shown in the Fig. 5.1-5;
2) Remove the mark sensor cover as shown in the Fig. 5.1-7;

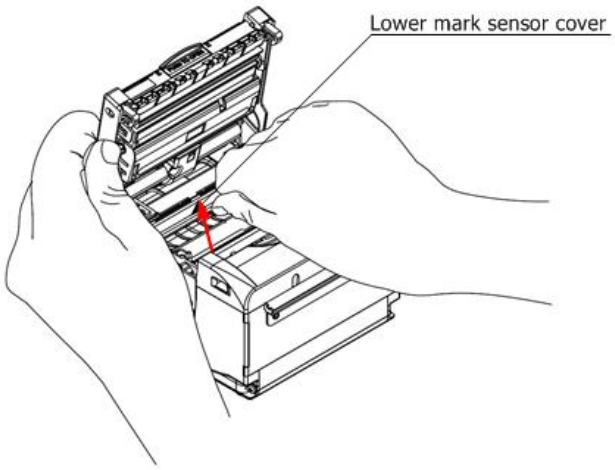


Fig. 5.1-7 Mark sensor cleaning

3) Wipe off the dust and stains on the surface of the sensor with a soft cotton cloth dampened with alcohol. Wait for 5-10 minutes until the alcohol evaporates completely, and then install the mark sensor cover in reverse sequence.

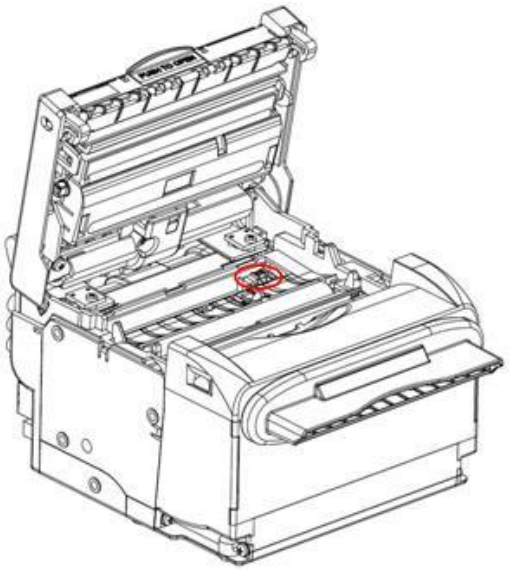


Fig. 5.1-8 Mark sensor cleaning

5.2 Clean the Print Head and the Platen Roller

- When the following cases occur, the print head and the platen roller should be cleaned:
  - Printout is not clear;
  - Some columns on the page are not clear;
  - Irregular Paper feeding or retraction.
- Cleaning steps for the print head and the platen roller are as follows:

1) Turn off the printer power.
2) Press the spanner slightly with hand as shown in Fig. 5.2-1 to open the top cover;

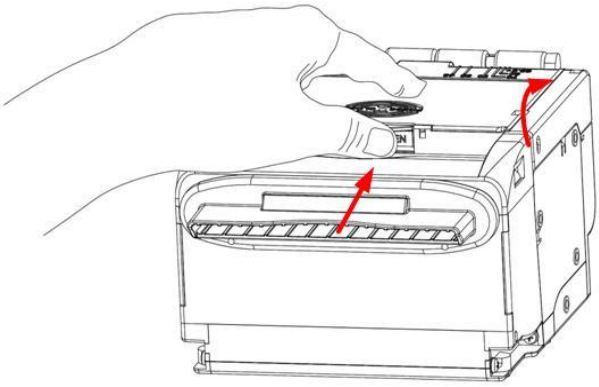


Fig. 5.2-1 Print head and platen roller cleaning

3) Refer to Fig.5.2-2, number 1 is the platen roller and number 2 is the print head. Wipe the surface with a soft cotton cloth dampened with alcohol.

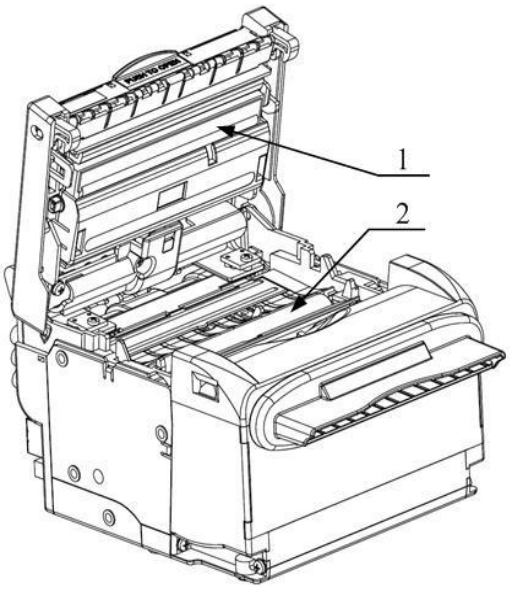


Fig. 5.2-2 Print head and platen roller cleaning

5.3 Clean the Retraction Sensor

- When the following case occurs, the retraction sensor should be cleaned.
  - ➢ When the Presenter fails to transmit paper retraction properly.
- Cleaning steps for the retraction sensor are as follows:
  - Turn off the power;
  - Refer to Fig. 5.3-1, you can see the retraction sensor at the retraction path of Presenter. Wipe off the dust or stains on the sensor surface with a cotton ball dampened with alcohol;

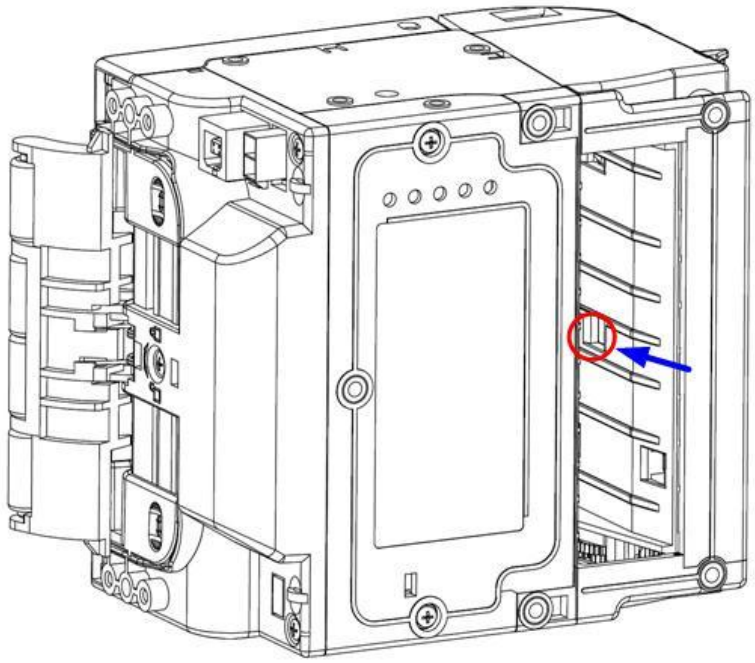


Fig. 5.3-1 Retraction sensor cleaning

  - Wait for 5-10 minutes until the alcohol evaporates completely, and then turn on the power.

5.4 Clean the Paper Loading Sensor

The paper loading sensor is the middle mark sensor on thermal side, and its cleaning method refers to Section 5.1.2 Clean the middle mark sensor on thermal side.

5.5 Clear the Jammed Paper in the Cutter

- When any of the following cases occurs, please remove jammed paper manually.
  - ➢ Paper jams between platen roller and cutter holder.
  - ➢ Paper accumulates at paper inlet of the cutter in the front of print head.
  - ➢ The cutter can't cut off paper.
- Remove the jammed paper manually in the following steps:
  1) Turn off the printer power;
  2) Refer to the step 2 in Section 5.2 Clean the print head and the platen roller, press the spanner

slightly with hand as shown in Fig. 5.2-1 to open the top cover;

3) Check whether there is waste paper under the cutter blade and print head. If so, please take it out;
4) When confirming there is no waste paper, close the top cover;

Caution:

✧ Turn off the power before removing the jammed paper.

5.6 Clear the Jammed Paper in the Presenter

- When any of the following cases occurs, please remove the paper manually:
  - Paper is jammed into the path of Presenter;
  - Paper does not enter the paper output path of presenter.
- Remove the jammed paper manually in the following steps:
  1) Press the snap-fit on Pre upper path as shown in the following figure and apply force upwardly to remove the Presenter top cover;

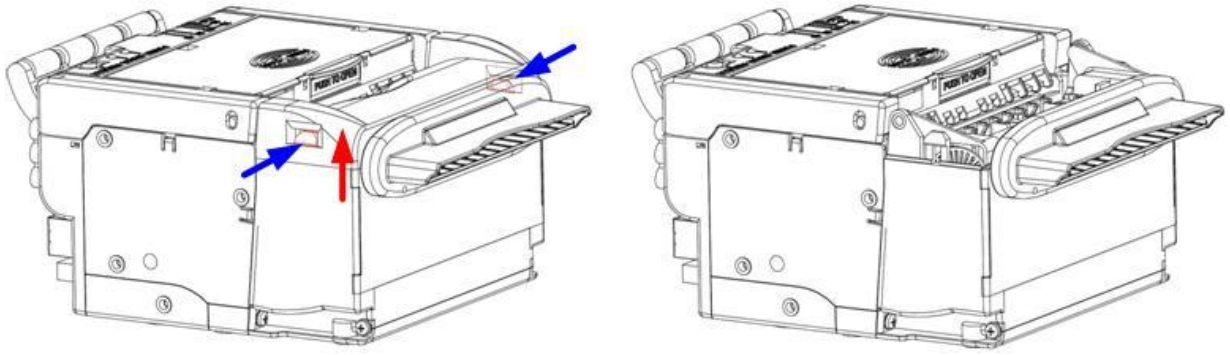


Fig. 5.6-1 Clean the jammed paper in the Presenter

2) Take out the jammed paper and install the Pre top cover to the printer.

6. Troubleshooting and Maintenance

If errors occur in the printer, consult the troubleshooting table below.

6.1 Errors

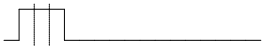
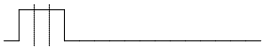
Errors	Description	Error LED
Print head overheating	Temperature of the print head is too high.	
Abnormal voltage	Input voltage is too low or too high.	
Cutter error/paper jam	Cutter can't work normally or Paper jams.	
Print head up	Print head is up.	
Paper end	Paper sensor detects paper end.	
Calibration failure	Marked paper calibration error.	
Paper near end	Paper sensor detects paper near end.	
Macro definition execution status	In the execution of a macro definition.	
Normal stand-by status		

Table 6.1-1 Error index

Note: In the default configuration, the printer will not stop printing when paper ends. The user can change the default configuration to stop printing when paper ends via the KIOSKUtility software. Under the new configuration, the error LED will flash and indicate paper end;

The printer executes the following activities when errors occur:

- Stop printing;
- Busy signal is available;
- Error LED flashes;

6.2 Solution for Common Errors

6.2.1 Problems during Paper Loading

Problem	Possible reasons	Solutions
Paper roll can't be loaded onto paper holder smoothly	The paper roll ID does not match the printer	Replace the paper roll.
The printer can't feed paper automatically	Paper leading edge is irregular; paper jams; The paper loading sensor is not covered by paper leading edge; Dust and wastepaper covers the paper loading sensor.	Trim the paper head according to requirements; Remove jammed paper; Check the paper leading edge to confirm that the paper loading sensor is covered fully by paper; Clean the paper loading sensor.
After automatic paper feeding, the paper can't stop in the normal print position	Dust or waste paper covers the paper loading sensor.	Clean the paper loading sensor.

Table 6.2-1 Errors during paper loading

6.2.2 Problems During Printing

Problems	Possible reasons	Solutions
The receipt can't be ejected out smoothly.	Paper jams.	Check paper feeding path, remove waste paper and reload paper.
Print out is not clear.	The paper is loaded in wrong direction or its quality is poor; Print head needs cleaning; The print contrast is set too low; Input voltage is too low.	Load the paper roll correctly; Use recommended paper or its equivalent; Clean the print head; Adjust print contrast (*); Use the power supply which meets requirements.
Cutter works abnormally.	Paper jams in cutter; The cutter is broken.	Check cutter path obstruction (*), contact Microcom Corporation
Printing data is lost and no printing.	The platen roller is not closed; Paper jams.	Close the platen roller properly; Remove jammed paper.

Table 6.2-2 Problems during printing

To adjust print contrast, contact Microcom Corporation.

If paper jams in cutter, please remove the jammed paper, and then press CUT button to reset the cutter.

6.2.3 Problems During Paper Output

Problems	Possible reasons	Solutions
The printer stops printing and warns errors during printing.	Paper end; Paper jams in cutter; dust or waste paper covers the paper near end sensor.	Install a new paper roll; Check if there are obstructions in the cutter path; Clean the paper near end sensor.

Table 6.2-3 Problems during paper output

Note: Contaminated paper may cause detection failure.

1.1.1 Other Problems

Problem	Possible reasons	Solutions
LED does not light and printer does not work.	The printer is not connected with the power correctly. The printer isn't turned on.	Connect the printer with power correctly. Turn on the printer.
The printer does not work after receiving commands.	Printer is in error status. The communication cable is not connected properly. Interface setting is wrong.	Remove the errors(＊) Make sure the communication cable is connected correctly. Set the interface again according to the self-test page.

Table6.2-4 Other problems

Note: Paper near end alarm acts only as a prompt for users, not an error status. Therefore when this alarm is given, printing task can still be sent.

7. Appendix

7.1 Self-test Page

Print self-test page in the following steps: Turn off printer power, then keep pressi and hold the FEED button for at least 1 second while turning on the printer. The printer will start to print a self-test page. (Take 203DPI/USB interface model for an example, and the self-test page is shown as follows).

*****315M TEST FORM*****

Boot Firmware	:FV1.030.01
Main Firmware	:FV1.040.01
H/W parameters	
Flash Memory Size	:4M Bytes
Flash Logos/Fonts	:128K Bytes
Resolution	:203×203DPI
Print Width(Max)	:80mm
Fixed LeftMargin	:2mm
Fixed RightMargin	:0mm
PrintSpeed(Max)	:150mm/s
Dark Scale	:110
Cutter	:Enabled
Presenter	:Enabled
Presenter Action Mode	:Ejection Mode
Presenter Wait Time	:3s
CRComand	:Disable
Current Code Pages	:PC437
Communication Interface	
Interface Type	:USB_BK-C310(U)1
Interface Mode	:API Mode
Rx Buffer Size	:4K Bytes
Resident Fonts	
Font0 (12X24)	:English
Font1 (9X17)	:English
Font3(24X24)	:GB18030
Code Pages	:PC437,PC850
	:PC852,PC858
	:PC860,PC863

	:PC865,PC866
	:1252,Katakana
	:More in
	Feed button
	Configuration
	…
International Character	
	:U.S.A.
	:France
	:German
	:U.K.
	:Denmart I
	:Sweden
	:Italy
	:Spain
	:Japan
	:Norway
	:Denmark II
	:Spain II
	:Latin America
Bar Code Available	:UPC-A
	:UPC-E
	:EAN-8
	:EAN-13
	:CODE39
	:CODE93
	:ITF
	:CODABAR
	:CODE128
	:PDF417
	:GS1
	:QRCODE
	:MAXICODE
STATISTICS:	
Printed paper length	:xxxxxxxx
Printed lines(Total)	:xxxxxxxx
Printed lines(Actual)	:xxxxxxxx

Number of Cuts(Total) :xxxxxxxx
Number of Cuts(Actual) :xxxxxxxx
Power On time :xxxxxxxx
Product date :xxxxxxxx
Note: xxxxxxxx represents the detailed contents or value of print item.

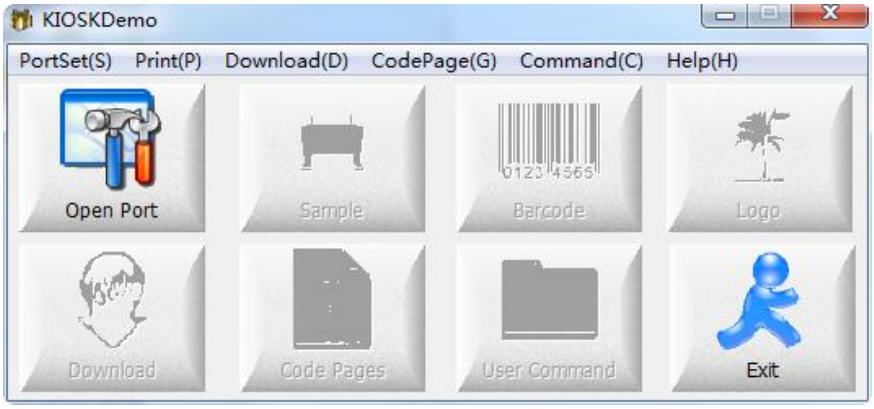
7.2 Explanation of Self-test Page:

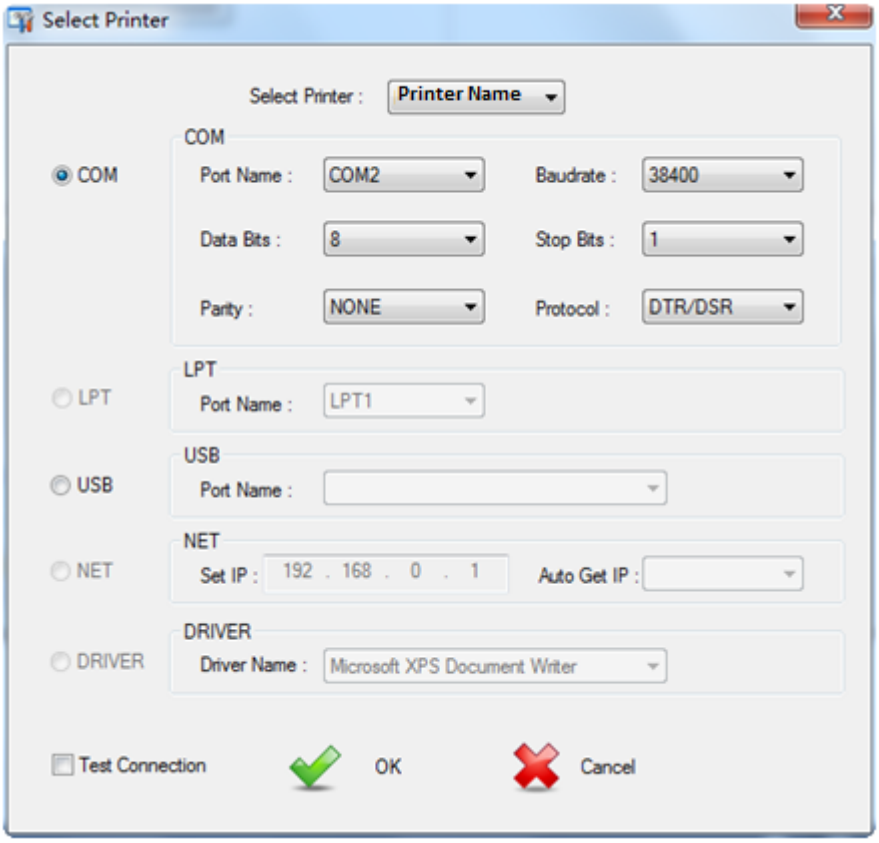
Boot Firmware----------Printer BOOTLOADER version
Main Firmware----------Printer monitor program version
H/W parameters----------Printer parameter setting
Flash Memory Size----------Printer FLASH capability
Flash Logos/Fonts----------Flash size for bitmap downloading
Resolution----------Printer resolution
Fixed Left Margin----------Printer fixed left margin
Fixed Right Margin----------Printer fixed right margin
Print Width(Max)----------Maximum printable width
Dark Scale----------Print darkness
PrintSpeed(Max)----------Print speed
Cutter----------Enable or disable cutter
Presenter----------Enable or disable Presenter
Presenter Mode----------Pre paper output mode
Presenter Wait Time---------Pre waiting time before retracting or ejecting paper
Communication Interface---Communication interface setting
Rx Buffer Size----------Data receiving buffer area size
Interface Type----------Interface type
Resident Fonts----------Font setting
BarCodeAvaliable----------Printable barcode type
STATISTICS:----------Statistic data of the printer
Printed paper length---------Total paper feeding length of printer
Printed lines(Total)----------Total printed lines of printer
Printed lines(Actual)---------Current printed lines of printer
Number of Cuts(Total)------Total cut times of printer
Number of Cuts(Actual)-----Current cut times of printer
Note: The content of self-test page changes according to different printer configurations.

7.3 Software Program

7.3.1 KIOSKDemo

This tool is designed specifically for the embedded printer, it can be used to update the printer firmware, edit and download logos and code pages, as well as print samples, etc.


KIOSKDemo
PortSet(S) Print(P) Download(D) CodePage(G) Command(C) Help(H)
Open Port
Sample
Barcode
Logo
Download
Code Pages
User Command
Exit


Select Printer
Select Printer :
Printer Name
COM
COM
Port Name :
COM2
Baudrate :
38400
Data Bits :
8
Stop Bits :
1
Parity :
NONE
Protocol :
DTR/DSR
LPT
LPT
Port Name :
LPT1
USB
USB
Port Name :
NET
NET
Set IP :
192 . 168 . 0 . 1
Auto Get IP :
DRIVER
DRIVER
Driver Name :
Microsoft XPS Document Writer
Test Connection
OK
Cancel

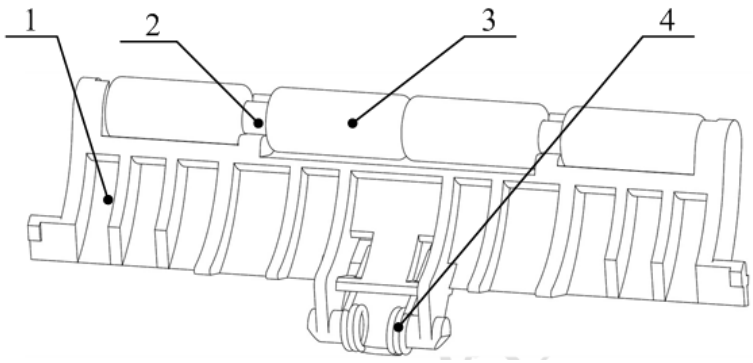
7.3.2 KIOSKUtility

This tool is used to set and control the printer.

7.4 Optional Parts

7.4.1 Buffer Module

Buffer module introduced in this section is the buffer module installed on the 315M print mechanism, it is an optional part, if the customers choose this module, then it will be installed directly on the print mechanism before delivery from the factory. Otherwise, the part is not installed. The buffer module consists of following parts:



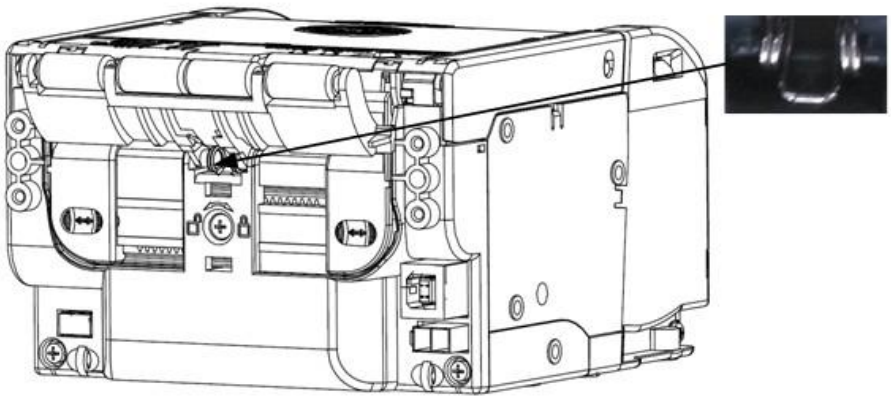
Appendix Fig.7.4-1 Structure of buffer module

1 —Buffer plate 2 —Platen roller shaft 3 —Platen roller 4 —Torsion spring

Note: The torsion spring should be at the correct position shown in the figure.

7.4.2 Buffer Module Installation

Buffer module installation:



Appendix Fig.7.4-2 Buffer module installation

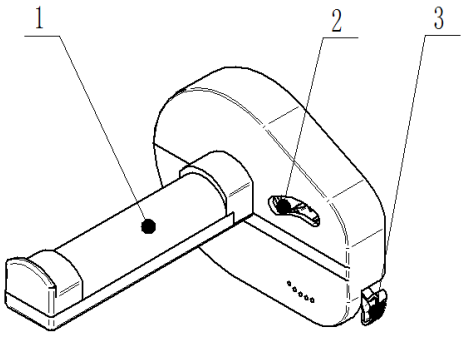
Note: Overall size of buffer module refer to Fig. 7.4-1.

7.5 Components of Paper Roll Shaft Module

7.5.1 Structure of Paper Roll Shaft Module

Currently, the configured 315M paper roll shaft is as follows and it can adapt to the paper

roll with the minimum ID 25mm.

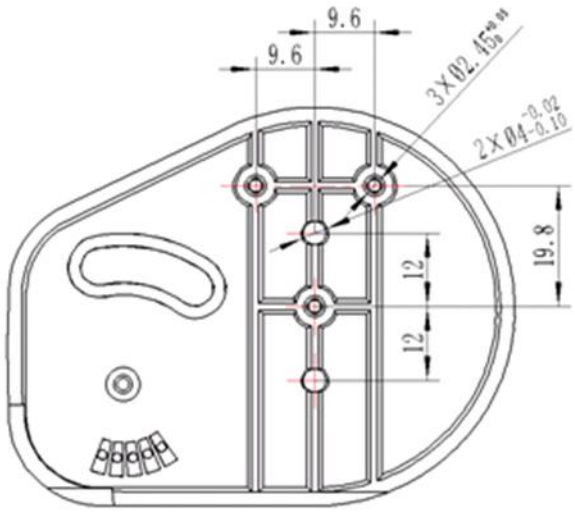


Appendix Fig. 7.5-1 Components of paper roll shaft

1—Paper roll shaft 2 —Paper near end sensor 4 —Paper near end adjustment spanner

7.5.2 Paper Roll Shaft Installation

The paper roll shaft module and the print mechanism are packed separately, which the customer needs to assemble. There are three st2.9 screws provided in the package.

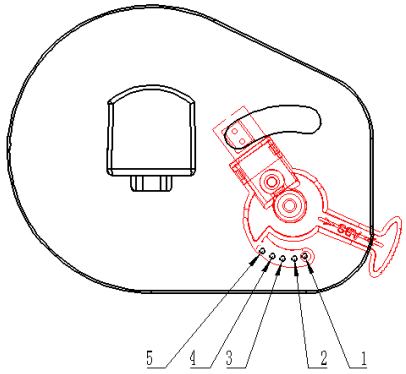


Appendix Fig.7.5-2 Components of paper roll shaft

After installing the paper roll shaft, connect the plug of paper near end sensor to the socket on the print mechanism.

7.5.3 Adjust the Paper Near End Sensor

Turn the green spanner to adjust the position of paper near end sensor as shown in the following figure. The paper near end sensor has 5 positions and position 1 is the default position when delivered from the factory.



Appendix Fig. 7.5-3 Adjusting the paper near end sensor of cantilever paper holder

The paper near end sensor has 5 positions, and the corresponding paper roll diameters are as following:

Position 1: detect φ39mm diameter paper roll;

Position 2: detect φ47mm diameter paper roll;

Position 3: detect φ55mm diameter paper roll;

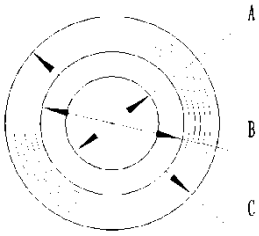
Position 4: detect φ63mm diameter paper roll;

Position 5: detect φ71mm diameter paper roll;

The minimum remaining paper amount (theory value) can be detected by the paper near end sensor is as follows:

Paper thickness (μm)	Position 1	Position 2	Position 3	Position 4	Position 5
45	9.6m	21.6m	35.9m	52.4m	71.1m
65	6.7 m	15m	24m	36m	49.1m
80	5.4m	12.2m	20.2m	29.5m	40m
100	4.3m	9.8m	16.2m	23.6m	32m

Appendix Table 7.5-1Judgment value table of remaining paper amount



Appendix Fig. 7.5-2 Paper roll

A: Paper roll core ID

B: Paper roll core OD

C: Paper roll diameter

Notes:

✧ The above value are calculated according to 25mm inner diameter and 31mm outer diameter of paper roll core;

✧ The above minimum remaining paper amount in the table is theory value, which will have a difference in the actual usage.

7.6 Safety Parts List

No.	Part name	Model or key characters	Qty.	Manufacturer
1	Main control board	KSKACV1.3/FR-4/6 layer	1	SHANDONG NEW BEIYANG INFORMATION TECHNOLOGY CO., LTD.
2	Motor for paper feeding during printing	PM35L-048-YHC8 or 35P048L0-00403/4.3Ω±10%	1	Minebea Co.,Ltd or SHANGHAI MOONS' ELECTRIC CO., LTD.
3	Presenter motor	FK-130SH-09450/ rated current 240mA	2	MABUCHI MOTOR CO., LTD.
4	Cutter motor	FP130-KT-09380/ rated current 240mA	1	STANDARD MOTOR CO.,LTD.