

User's Manual

Embedded Printer

BT-T080R

Shandong New Beiyang Information Technology Co., Ltd.

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Warning and Caution

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

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

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ISO14001 Environmental Management System Certification

OHSAS18001 Occupational Health and Safety Management System Certification

IECQ QC080000 Hazardous Substance Process Management System Certification

Safety Instructions

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

1. Safety warnings



Warning: Do not touch the cutter and tear-off bar of printer.



Warning: The print head is a thermal element and it is at a high temperature during printing or just after operation, therefore do not touch it or its peripherals for reasons of safety.



Warning: The print head is an ESD-sensitive device. To avoid damage, do not touch either its printing parts or connecting parts.

2. Caution

- 1) Install the printer at a flat and stable place.
- 2) Reserve adequate space around the printer so that the operation and maintenance can be performed conveniently.
- 3) Keep the printer far away from water source, and do not expose the printer to direct sunlight, strong light and heater.
- 4) Do not use or store the printer in a place exposed to heat of fire, moisture and serious pollution.
- 5) Do not place the printer in a place exposed to vibration and impact.
- 6) No dew condensation is allowed with the printer. In case of such condensation, do not turn on the power until it has completely gone away.
- 7) Connect the AC power adapter to an appropriate grounding socket. Avoid sharing one electrical socket with large power motors and other devices that may cause the fluctuation of voltage.
- 8) Disconnect the DC adapter when the printer is deemed to idle for a long time.
- 9) Don't spill water or other electric materials into the printer. If this case happens, turn off the power immediately.
- 10) Do not allow the printer to print when there is no paper installed, otherwise the print head and platen roller will be damaged.
- 11) To ensure printing quality and products lifetime, use recommended paper or its equivalent.
- 12) Turn off the power when connecting or disconnecting interfaces to avoid damages to control board.
- 13) Set the printing darkness in a lower grade as long as the print quality is acceptable. This will help to keep the print head durable.
- 14) Do not disassemble the printer without permission of a technician, even for repairing purpose.
- 15) Keep this manual carefully for reference.

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1 Outline

1.1 Brief introduction

BT-T080R printer is a high performance thermal printer with high adaptability and strong adjustability. It can be widely used in various circumstances that need real-time printing on the spot, like financing, telecommunication, etc.

BT-T080R can be connected with other devices through USB interface, and it provides drivers for operating systems under Windows 2000/Windows XP/Windows Server 2003/Windows Vista/Windows Server 2008/Windows 7.

1.2 Main features

- Low noise, high printing speed;
- Support continuous paper and marked paper (Do not recommend using inside paper because there is risk of paper jams.);
- Support paper width ranging from 48mm to 82.5mm;
- Support paper roll with the maximum OD 180mm;
- Support the paper roll with the ID ranging from 18mm to 60mm;
- The mounting mode of paper roll adopts cantilever structure, and the cantilever supports the adjusting angle of +90°, +60°, +30°, 0°, -30°, -60° and so on;
- The paper outlet and the anti-pull and anti-jam module are optional, or there is no paper out module;
- The communication interface USB, serial interface plus USB, and parallel interface are optional;
- Convenient and quick paper loading;
- Easy operation and maintenance;
- Compatible with ESC/POS command.

2 Main technical index

2.1 Technical specifications

Item		Parameter (203dpi)
Printing	Print method	Thermal printing
	Resolution	203DPI
	Paper width	48~82.5±0.5 mm
	Print width	Max. 80mm (3.2")
		Max. 640 dots
	Print height	Max.: 480 mm, Min.: 5 mm
	Print speed	150 mm/s
	RAM memory	SDRAM:128KB
	Flash memory	1M/2M/4M
	Print head temperature detection	Thermal resistor
	Print head position detection	Microswitch
	Paper/mark detection	Photoelectric sensor
	Paper near end detection	Photoelectric sensor
	Communication interface	Serial interface plus USB, USB, parallel interface (optional)
Barcode Fonts Graphics	Barcode	CODE128, ITF, UPC-A, UPC-E, EAN13, EAN8 CODE39, CODE93, CODABAR, PDF417
	Character set	Standard ASCII, compressed ASCII Optional Asian character set (Simplified Chinese, traditional Chinese, Japanese, Korean)
	Character processing	All characters can be enlarged 1 to 6 times in vertical and horizontal direction respectively; Rotation Print (0°, 90°, 180°, 270°) Bold, white/black reverse, underline
	Graphics	Support BMP bitmap download to RAM, FLASH and direct bitmap printing
Medium	Paper type	Continuous paper/marked paper
	Paper roll OD	Max. 180mm
	Paper roll core ID	φ18~60mm
	Paper thickness	60~100 um
	Thermal layer	Outward/Inward
Power	+24V power supply , room temperature, average value	2.37A (25% duty ratio)
Reliability	Print head lifetime	≥150 Km
	Cutter lifetime	≥1,500,000 cuts (65um thermal paper)

Item		Parameter (203dpi)
	MTBF (main control board)	360,000 hours
	MTBF (printer)	5000 hours
Environment	Operation environment	0~50℃, 20~90%RH (40℃)
	Storage environment	-40~60℃, 20~93% RH (40℃)
Physics Character	Overall size	100(L) X 157(W) X 123(H) (printer mechanism)
	Weight	About 1.7Kg (without paper roll)

Table 2.1 Technical specification parameters
Notes:

- 1) DPI: dots printed for each inch (One inch is about 25.4mm);
- 2) The real printing speed is related with data transmission speed, print darkness, print duty ratio, control commands and input voltage, which may be lower than that in the above table.

2.2 Cutter technical parameters

Item	Parameter	Remark
Cut method	Slide blade	
Cut time	252ms	Time for every cut
Cut interval	3s	20 times every minute (Max.)
Paper type	60~100μm	Thermal paper or common paper with the same thickness
Work voltage	24VDC	
Max. current	1.5A	24VDC
Cutter lifetime	1,000,000 times	Including full cut and partial cut

Table 2.2 Cutter technical parameters

Full cut: The paper is cut off completely;

Partial cut: The paper is not cut off completely, with a little connection in the central area of the paper.

2.3 Status detection

No.	Detecting content	Sensor type
1	Paper status	Mechanical photoelectric sensor
2	Mark	Photoelectric sensor
3	Print head position	Microswitch
4	Print head temperature	Thermal resistor

Table 2.3 Status detection

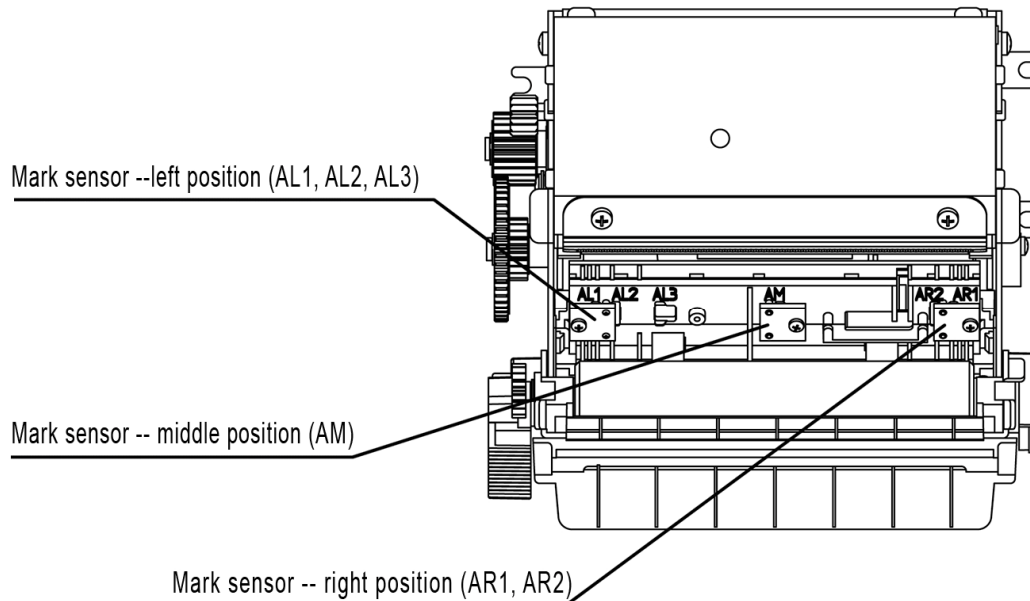


Figure 2.3.1 Mark sensor 1

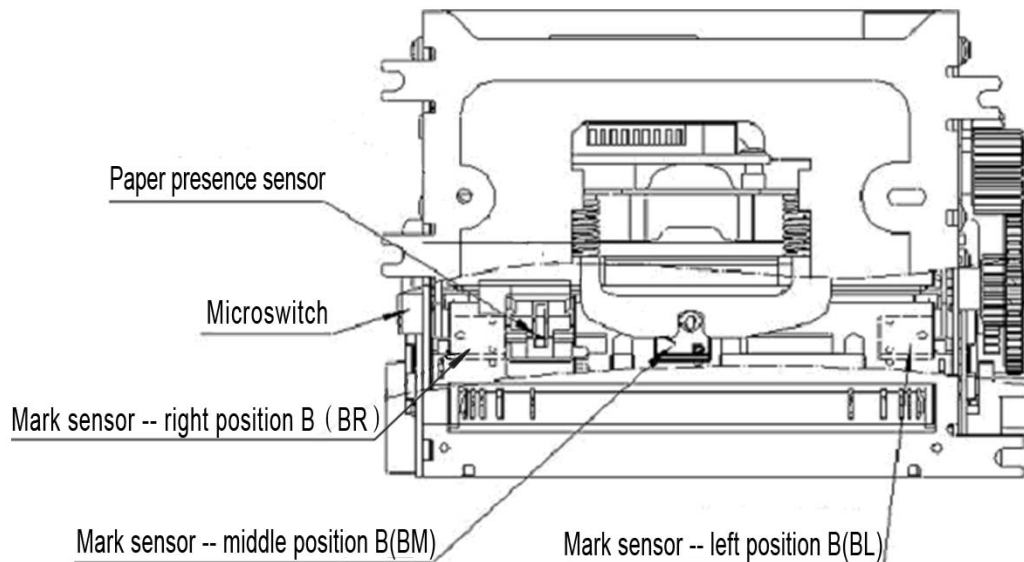


Figure 2.3.2 Mark sensor 2

Note:

When the mark sensor is located in position A, the mark is located in non-thermal layer;
When the mark sensor is located in position B, the mark is located in thermal layer.

2.4 Print paper technical index

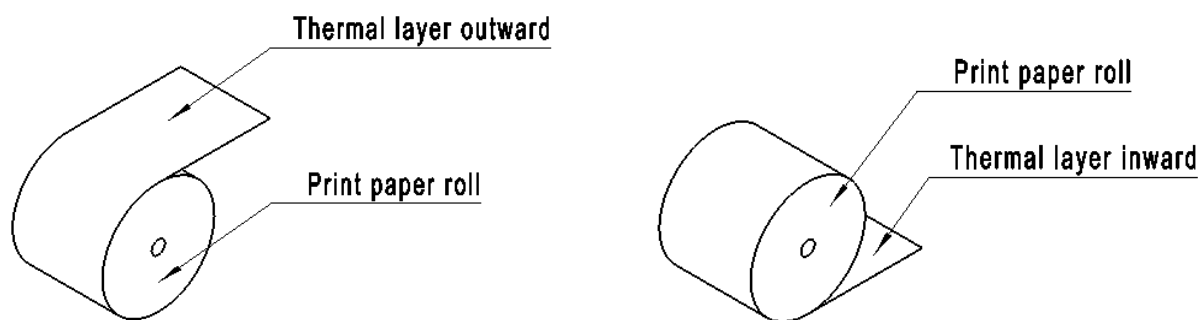


Figure 2.4.1 Paper roll with thermal layer outward

Paper roll with thermal layer inward

2.4.1 Continuous paper parameter

Item	Parameter	Remark
Paper width	48~82.5mm	Recommended: 70~82.5mm
Paper thickness	60~100μm	
Paper roll OD	≤180mm	
Paper roll ID	18~60mm	Recommended: 18~25.4mm
Thermal layer position	Inward, outward	The anti-pull and anti-jam module doesn't support paper roll with thermal layer inward.

Table 2.4.1 Continuous paper parameters

Note:

Paper width: The mark width of paper holder includes 82.5mm, 80mm, 76mm, 70mm, 56mm and 48mm, among which the 56mm and 48mm width paper need to adjust the firmware.

2.4.2 Marked paper parameter

Item	Parameter	Remark
Paper width	48~82.5mm	Recommended: 70~82.5mm
Paper thickness	60~100μm	
Paper roll OD	≤180mm	
Paper roll ID	18~60mm	Recommended: 18~25.4mm
Thermal layer position	Inward, outward	The anti-pull and anti-jam module doesn't support paper roll with thermal layer inward.

Table 2.4.2 Marked paper parameters

Note:

Paper width: The mark width of paper holder includes 82.5mm, 80mm, 76mm, 70mm, 56mm and 48mm, among which the 56mm and 48mm width paper need to adjust the firmware and only adapt to Mark position 2 (see Figure 2.4.2 Mark position).

1) Mark position

- ✓ For the paper mark over 79mm width, you can select thermal layer/non-thermal layer left, middle and right (seven positions) as shown in Figure 2.4.2. Ensure beside marks cover mark sensor completely (The space between mark sensor and the paper midline is 38.2 mm);
- ✓ For paper mark less than 79mm width, you can select thermal layer/non-thermal layer middle,

position 4 (three positions). Ensure the midlines of mark and paper coincide;

- ✓ Mark position 4 can only be located in non-thermal layer.

2) In using marks, it is recommended to use the following parameters:

- ✓ L1 mark width: $8\text{mm} \leq L1 \leq \text{paper width}$
- ✓ L2 mark height: $4\text{mm} \leq L2 \leq 8\text{mm}$

3) The reflectivity of marks is less than 10%, and the reflectivity of other parts of the ticket within mark width along paper feed direction is over 85%.

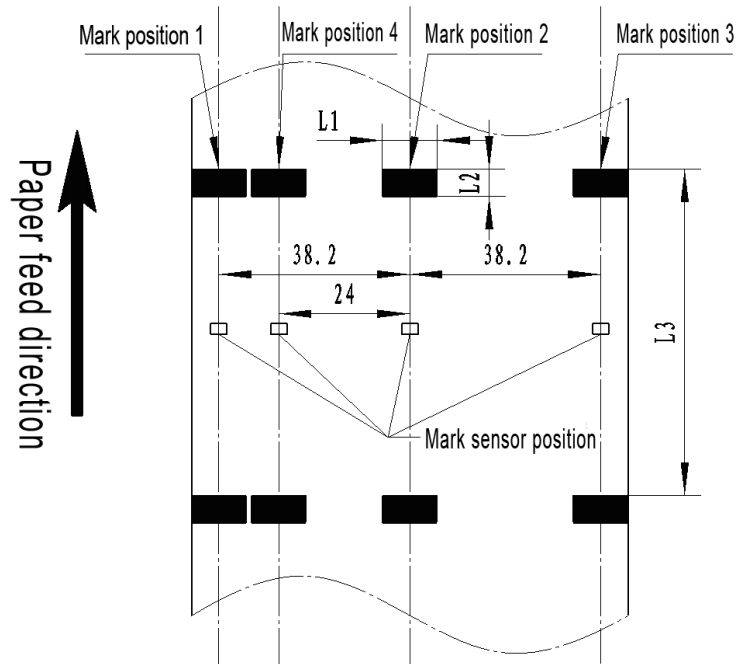


Figure 2.4.2 Mark position

Note:

Because of the paper shaking in the feeding and paper difference in parameter, the position fixed by mark may have a tolerance of $\pm 1\text{mm}$.

2.4.3 Recommended paper

Paper type	Manufacturer
TF50KS—E2C	Nippon Paper Industries CO., LTD.
F240AC/F220-VP	Mitsubishi Paper Mill CO., LTD.
KF060-FEAH	NEW OJI Paper CO., LTD.
F70NA	FUJI PHOTO FILM CO., LTD.
FV230A1	MITSUBISHI PAPER MILL CO., LTD.

Table 2.4.3 Recommended paper

Caution:

- Please use the recommended paper or its equivalents. Using other types of paper may affect print quality and reduce the print head lifetime.
- Do not paste the paper to the shaft core.
- If the paper comes in contact with chemicals 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 nail or hard metal. Otherwise it may discolor.

- When the temperature goes up to 70 degrees, paper will discolor. So please be careful to the effect of temperature, humidity and sunlight in environment.

2.5 Print and cut position

2.5.1 Print area

BT-T080R embedded print mechanism can be set according to user's requirements, making the path adapt to paper of various width.

L0: Paper width ($48 \sim 82.5 \pm 0.5$ mm);

L1: The maximum print width: 80mm;

L2: Print left margin (Adjustable)

L3: Print right margin (Adjustable)

L4: Top margin (Recommend no less than 5mm)

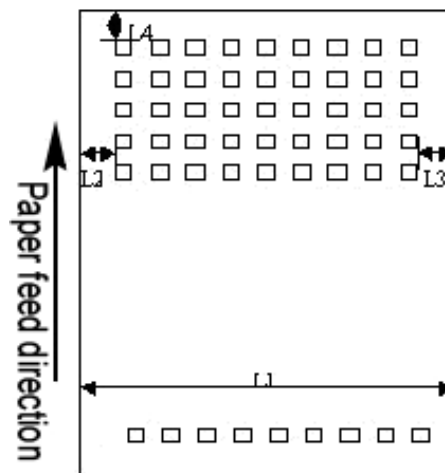


Figure 2.5.1 Print width

Note:

The path width of BT-T080R is wider than that of paper. While the paper is moving in the path, there is some movement in the horizontal direction. In this way, there is some tolerance for print position in the horizontal direction, which is normal and does not have an effect on using.

2.5.2 Print and cut position

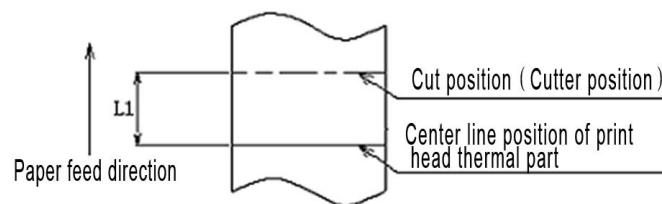


Figure 2.5.2 Print and cut position

L1: 14.5mm

3 Appearance and modules

3.1 Appearance and modules

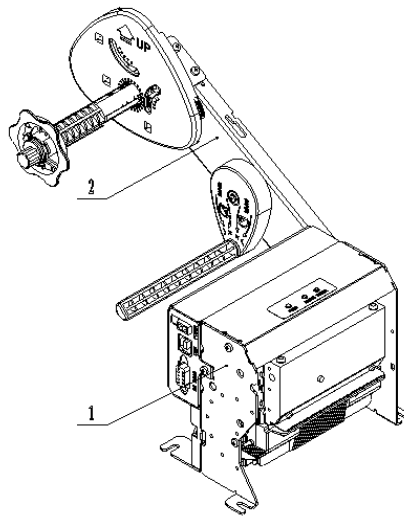


Figure 3.1.1 BT-T080R printer

1. Print mechanism module 2. Cantilever paper shaft module

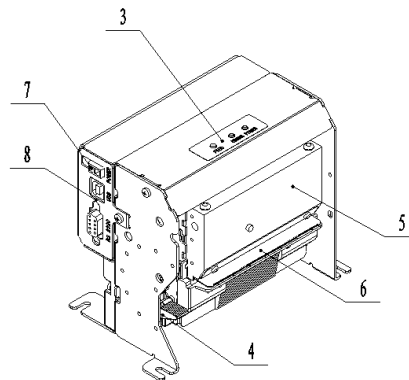


Figure 3.1.2 Print mechanism module

3. Button and LED 4. Mechanism spanner 5. Cutter
6. Tear-off bar 7. Power interface 8. Communication interface:
serial interface plus USB

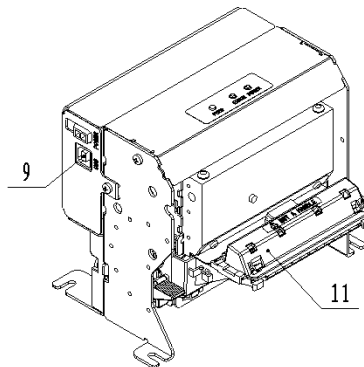


Figure 3.1.3 Print mechanism module (with anti-pull and anti-jam module)

9. Communication interface: USB (optional)
11. Paper out module: anti-pull and anti-jam module (optional)

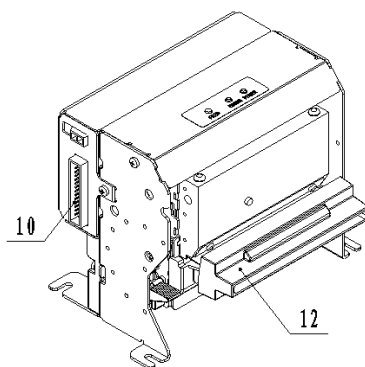


Figure 3.1.4 Print mechanism module (with paper outlet module)

10. Communication interface: parallel interface (optional)

12. Paper out module: paper outlet (with LED) (optional)

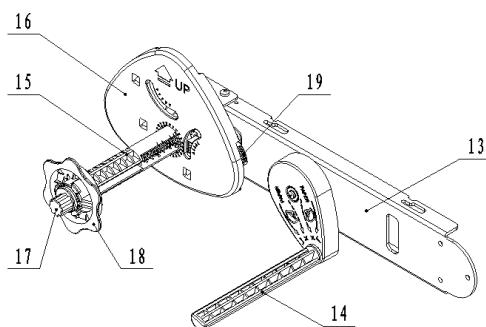


Figure 3.1.5 Cantilever module

13. Cantilever

14. Buffer shaft

15. Paper roll shaft

16. Paper roll guide

17. Paper roll guide
moving knob

18. Paper roll baffle

19. Paper near end spanner

3.2 Overall size of printer

3.2.1 Without paper outlet module

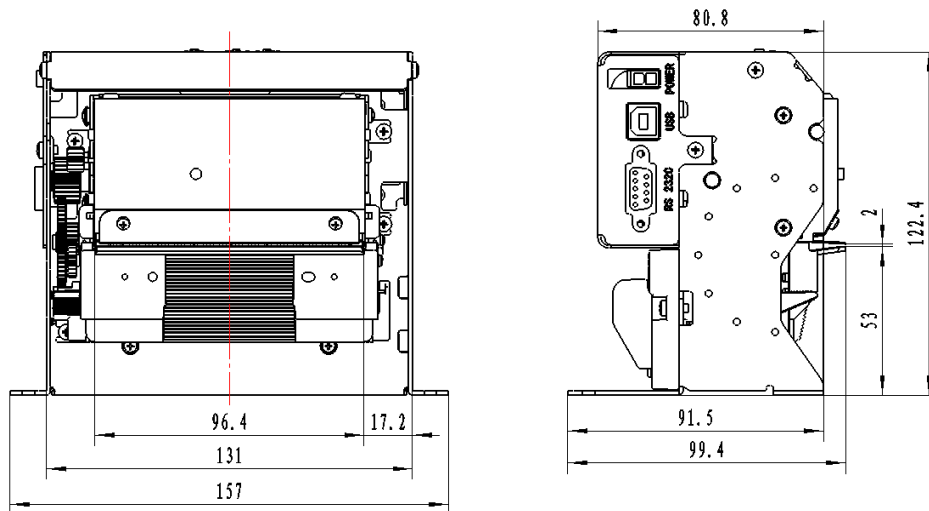


Figure 3.2.1 Overall size of printer without paper out module

3.2.2 With paper outlet module (optional)

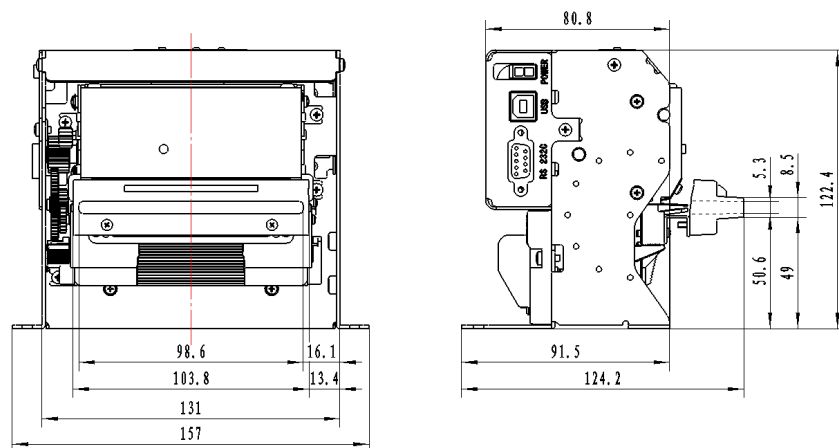


Figure 3.2.2 Overall size of printer with paper outlet module

3.2.3 With anti-pull and anti-jam module

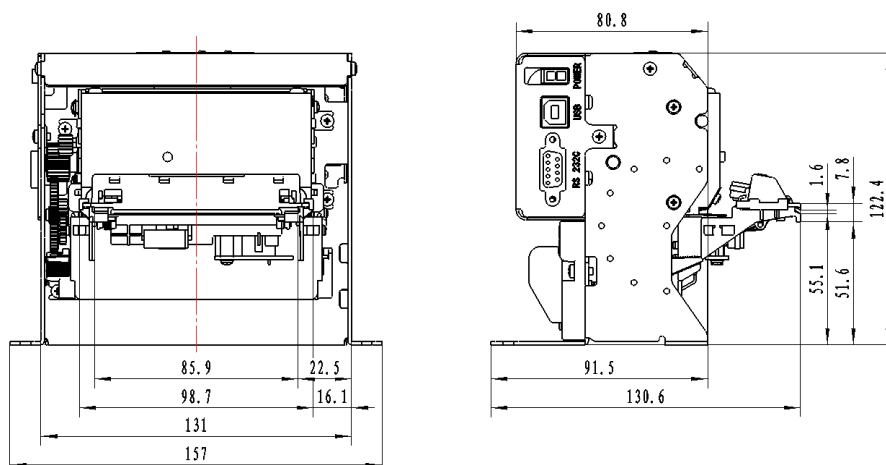


Figure 3.2.3 Overall size of printer with anti-pull and anti-jam module

3.3 Button and LED

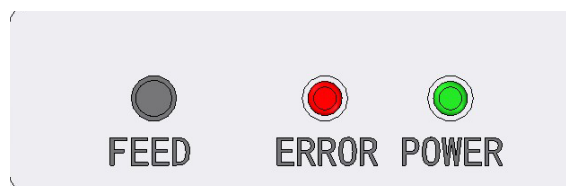


Figure 3.3.1 Button and LED

Button function explanation:

Button	Function	Description
FEED	Printer feeds paper after this button is pressed down.	FEED button

LED status explanation:

LED	Status	Description
ERROR	flash/off	The printer is abnormal. / The printer is normal.
POWER	on/off	The printer is powered on. /The printer is powered off.

3.4 Paper outlet module with LED (optional)

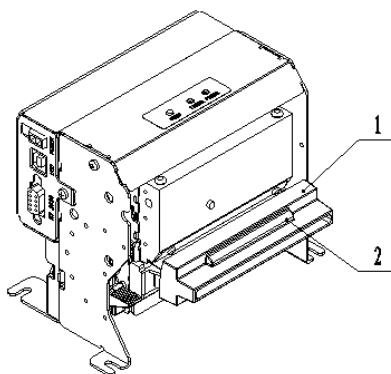


Figure 3.4.1 Print mechanism module (with paper outlet module)

1. Paper outlet (transparent) 2. LED

The function of the module:

- 1) Increase the length of paper outlet;
- 2) LED flashes and prompts.

Please refer to 3.2.2 for its overall size.

3.5 Anti-pull and anti-jam module (optional)

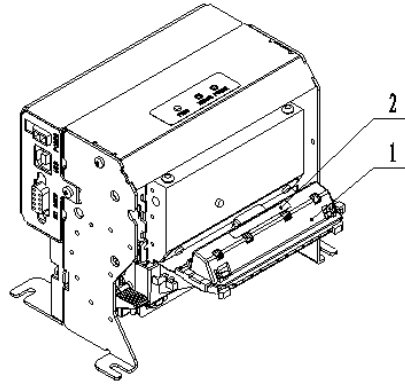


Figure 3.5.1 Print mechanism module (with anti-pull and anti-jam module)

1. Anti-pull and anti-jam module 2. Alarm label



Figure 3.5.2 Alarm label

Module function explanation:

- 1) When there is paper jam in the paper outlet, the module works and stops feeding paper to avoid influencing user's use and mechanism lifetime caused by mechanism paper jams.
- 2) When pulling paper in the horizontal or downwards direction, the module works and cuts paper to avoid damaging printer.

Note: Anti-pull and anti-jam module can not be applied to paper roll with thermal layer inward.

Please refer to 3.2.3 for its overall size.

3.6 Product label

The content of the product label is as follows:

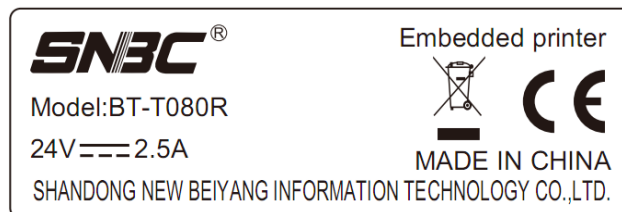


Figure 3.6.1 Product label content

4 Installing the printer

4.1 Unpacking

Open the carton and check whether all items listed on the package list are included or have any damages. In case of damages or missing items, please contact your dealer or the manufacture for assistance.

4.2 Installing print mechanism

4.2.1 Reserving paper roll loading space

The printer adopts the way of installing paper roll on one side. While operating and maintaining the printer, reserve the extreme space for paper roll installation according to the space explanation of [4.3 Installing cantilever module](#). Furthermore, you need to reserve the space for installing paper roll and connecting or disconnecting power cable and interface cable as shown in the following figure, in order to effectively ensure the reliability and convenience of printer operation.

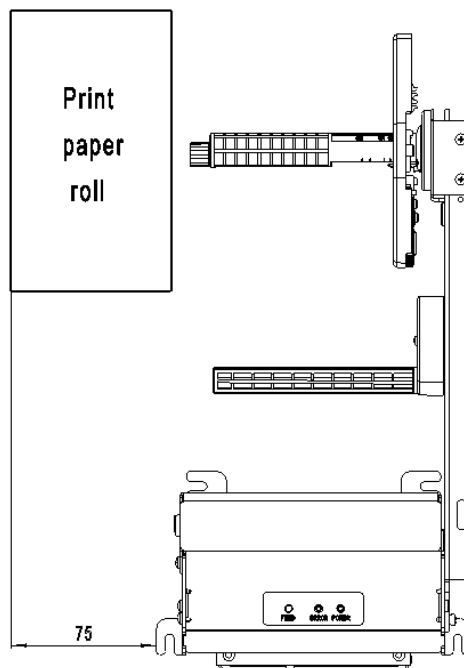


Figure 4.2.1 Size of paper roll loading space reserved

Note: The size shown in the above figure is the minimum suggested size, which can be enlarged according to real space.

4.2.2 Installing and fixing print mechanism

There are holes for fixing on BT-T080R printer mechanism holder, so the holder can be connected with the customer's printer reliably and conveniently. The printer should be placed horizontally.

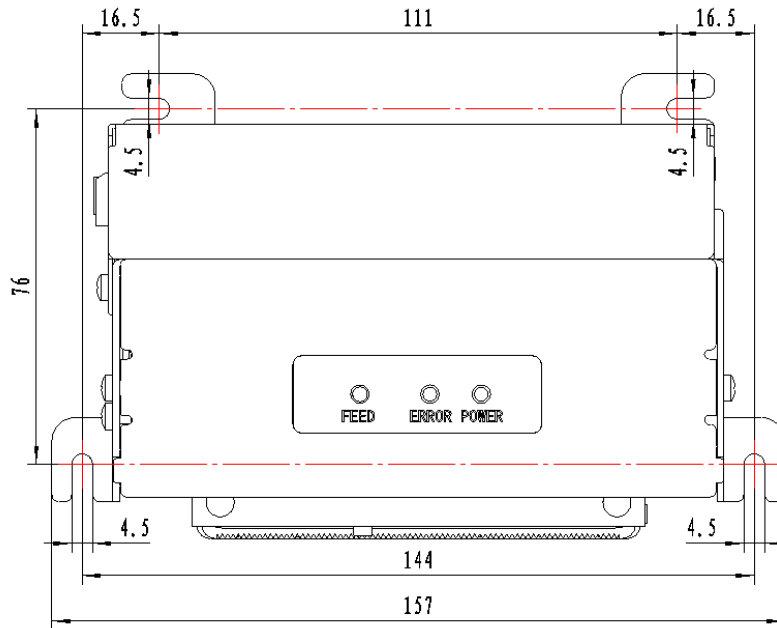


Figure 4.2.2 Size of print mechanism installation

Note: Recommend using M4×8 pan head screw for fixing.

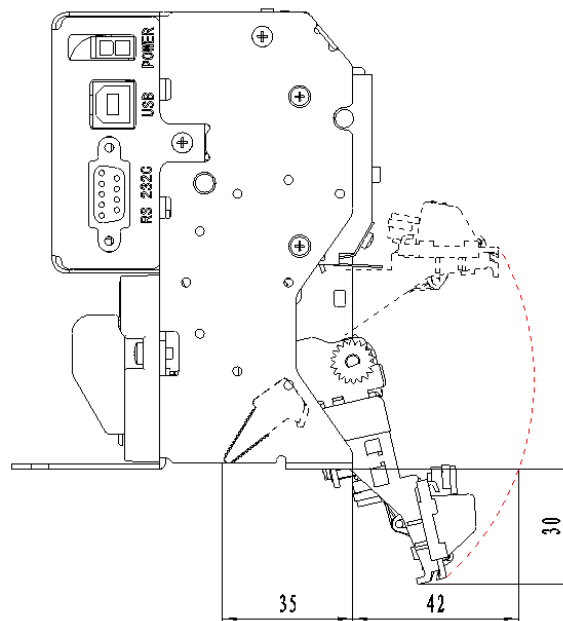


Figure 4.2.3 Paper out module avoidance space

When assembling anti-pull and anti-jam module and paper outlet module, it is suggested to reserve space under the mechanism for opening and closing mechanism fixed blade in order to carry out the maintenance of product conveniently. (see figure 4.2.3)

4.3 Installing cantilever module (including the installation of the buffer module)

There are six positions for installing the cantilever paper shaft module on the mechanism module, and fix the cantilever paper shaft module onto the mechanism module using three randomly promotional screws. When you adopt different cantilever angle and use different thermal-layer paper roll, the installation of cantilever and buffer module need to select different positions. Detailed installation positions and corresponding size are as follows:

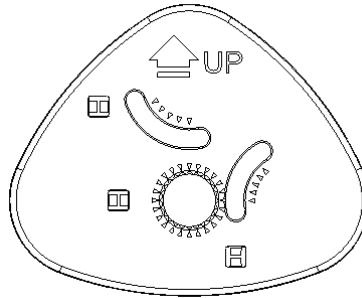


Figure 4.3.1 Always upward paper roll guide

Notes:

- 1) Keep the paper roll guide always upward (see Figure 4.3.1);
- 2) Keep an eye on the angle of the buffer shaft while adjusting, and refer to 3.1 for the drawing of the buffer shaft. The serial number of the part is 14;
- 3) Please refer to 2.3 for the drawing of paper roll with thermal layer outward and paper roll with thermal layer inward;
- 4) The installation of the cantilever paper shaft module doesn't have an effect on the printer width.

4.3.1 Cantilever angle: 0°

The cantilever angle is 0°, that is, the intersection angle between the cantilever and the horizon is 0°. The following drawing indicates the relative position of the print mechanism to fixing holes marked by solid circle and the extreme size after installing the paper roll.

Following is the explanation for the modules corresponding with the paper roll with thermal layer outward and the paper roll with thermal layer inward.

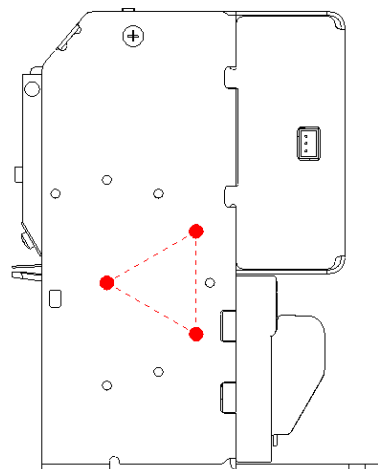


Figure 4.3.2 Installation position with the cantilever angle 0°

1) Paper roll with thermal layer outward

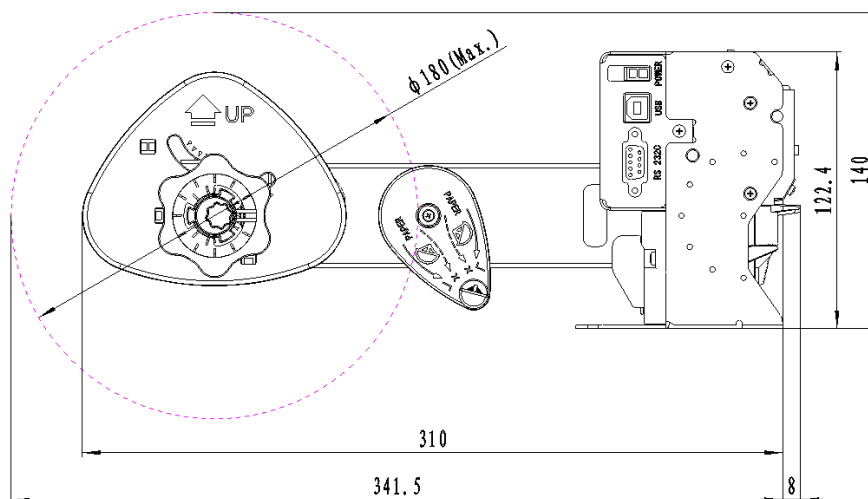
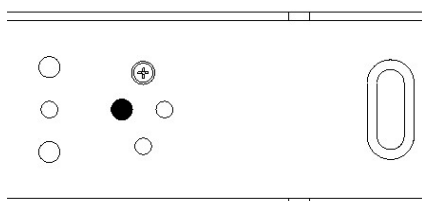
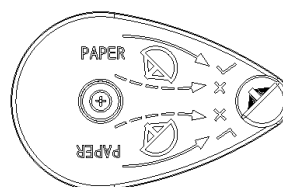


Figure 4.3.3 Module installation setting and size



Position 1 for installing buffer



Buffer shaft position 1

2) Paper roll with thermal layer inward

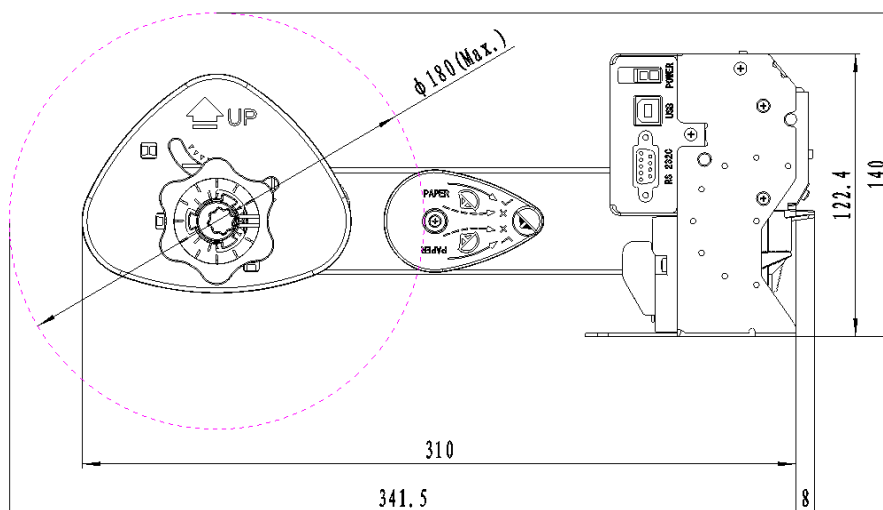
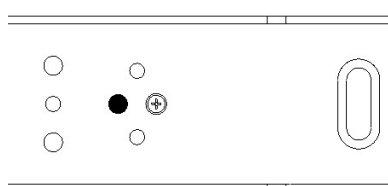
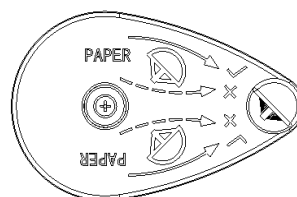


Figure 4.3.4 Module installation setting and size



Position 2 for installing buffer



Buffer shaft position 2

4.3.2 Cantilever angle: 30°

The cantilever angle is 30°, that is, the intersection angle between the cantilever and the horizon is 30°. The following drawing indicates the relative position of the print mechanism to fixing holes marked by solid circle and the extreme size after installing the paper roll.

Following is the explanation for the modules corresponding with the paper roll with thermal layer outward and the paper roll with thermal layer inward.

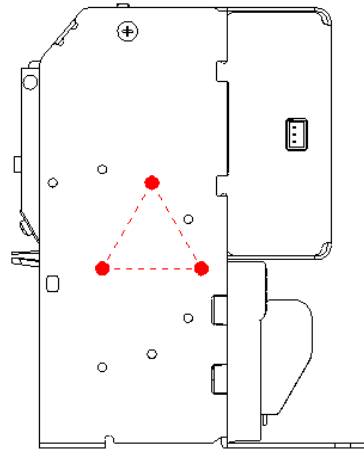


Figure 4.3.5 Installation position with the cantilever angle 30°

1) Paper roll with thermal layer outward

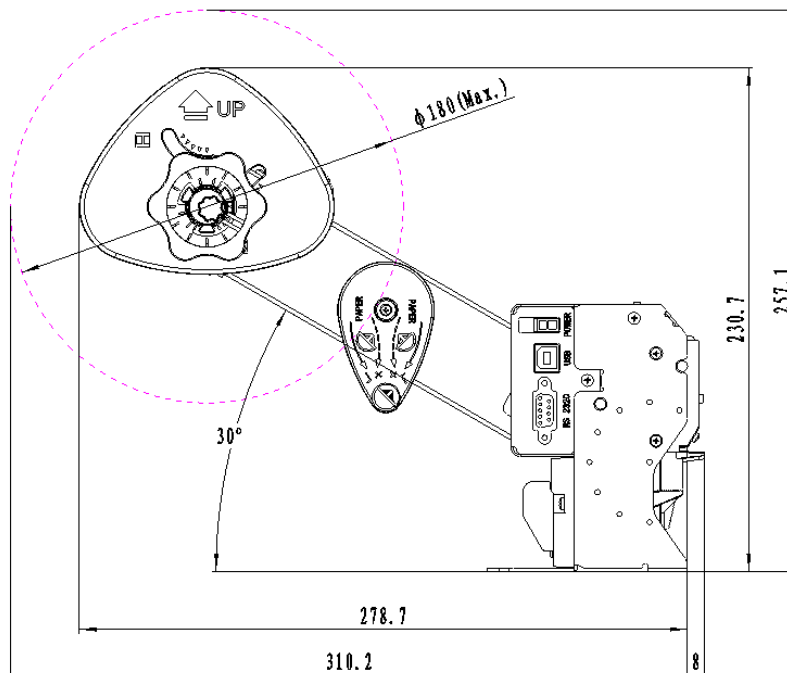
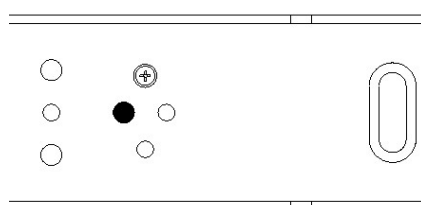
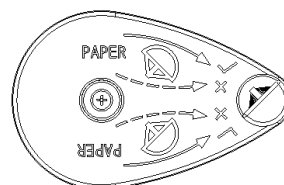


Figure 4.3.6 Module installation setting and size



Position 1 for installing buffer



Buffer shaft position 1

2) Paper roll with thermal layer inward

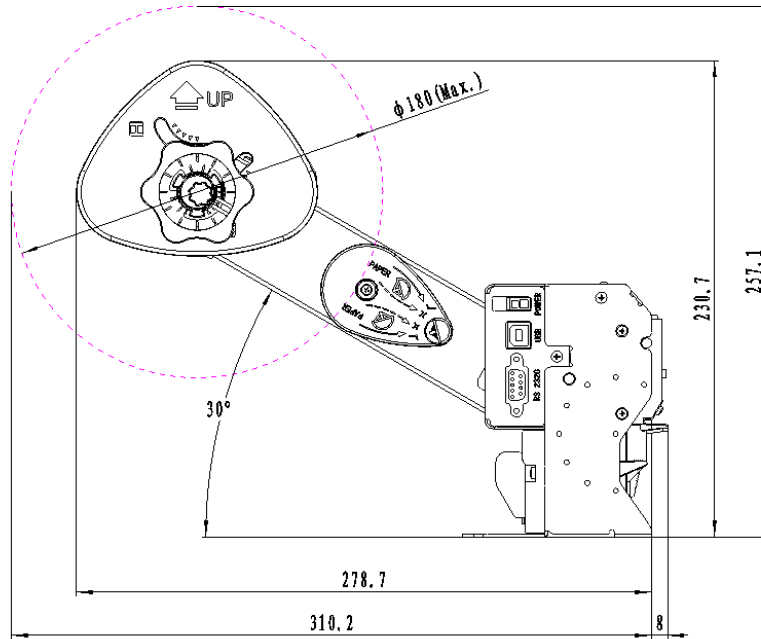
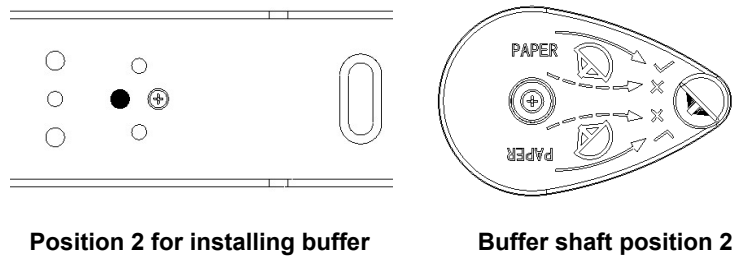


Figure 4.3.7 Module installation setting and size



Position 2 for installing buffer

Buffer shaft position 2

4.3.3 Cantilever angle: 60°

The cantilever angle is 60°, that is, the intersection angle between the cantilever and the horizon is 60°. The following drawing indicates the relative position of the print mechanism to fixing holes marked by solid circle and the extreme size after installing the paper roll.

Following is the explanation for the modules corresponding with the paper roll with thermal layer outward and the paper roll with thermal layer inward.

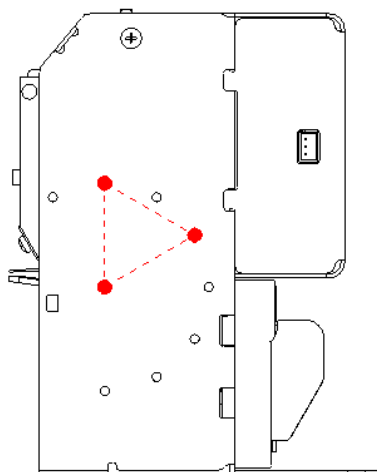


Figure 4.3.8 Installation position with the cantilever angle 60°

1) Paper roll with thermal layer outward

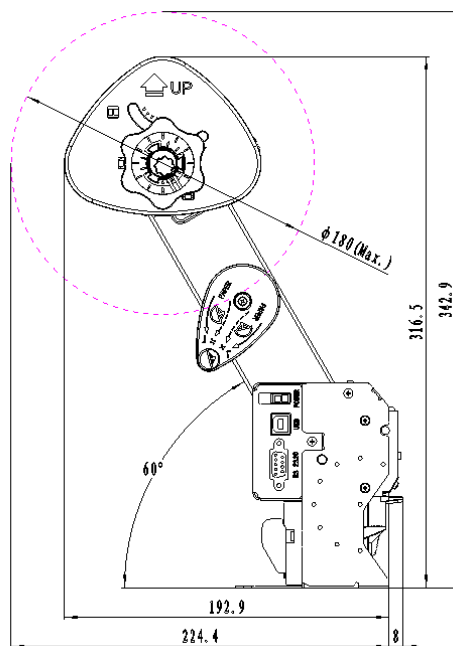
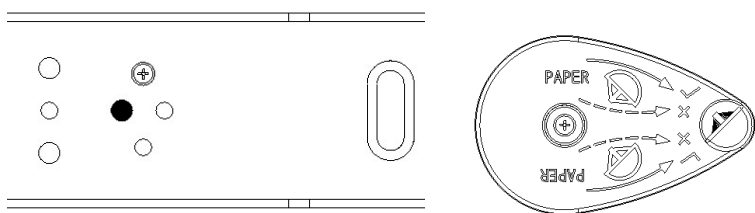


Figure 4.3.9 Module installation setting and size



Position 1 for installing buffer

Buffer shaft position 1

2) Paper roll with thermal layer inward

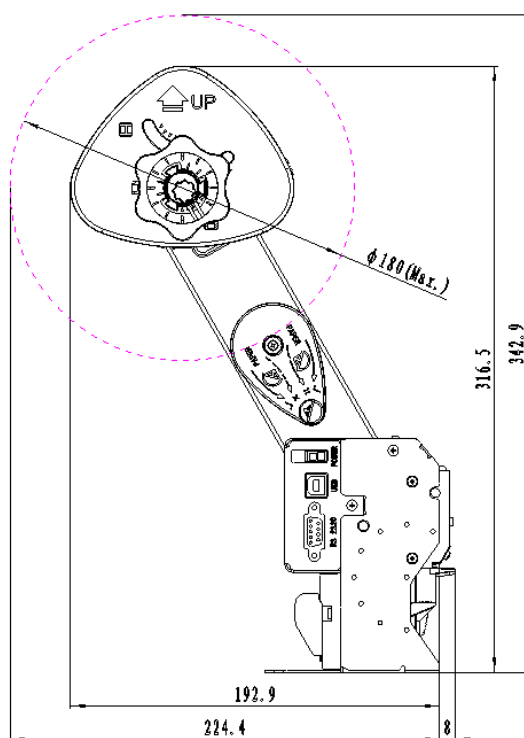
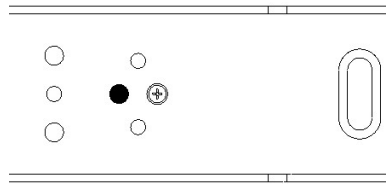
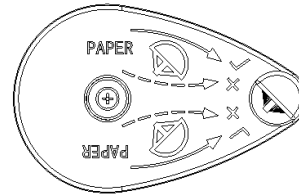


Figure 4.3.10 Module installation setting and size



Position 2 for installing buffer



Buffer shaft position 2

4.3.4 Cantilever angle: 90°

The cantilever angle is 90°, that is, the intersection angle between the cantilever and the horizon is 90°. The following drawing indicates the relative position of the print mechanism to fixing holes marked by solid circle and the extreme size after installing the paper roll.

Following is the explanation for the modules corresponding with the paper roll with thermal layer outward and the paper roll with thermal layer inward.

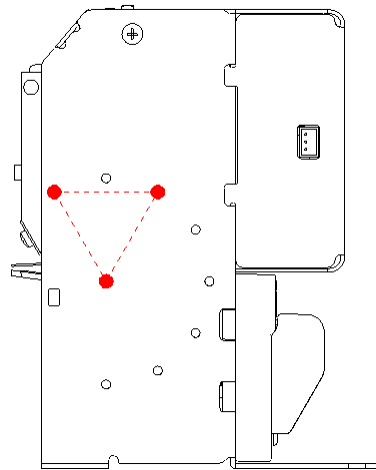


Figure 4.3.11 Installation position with the cantilever angle 90°

1) Paper roll with thermal layer outward

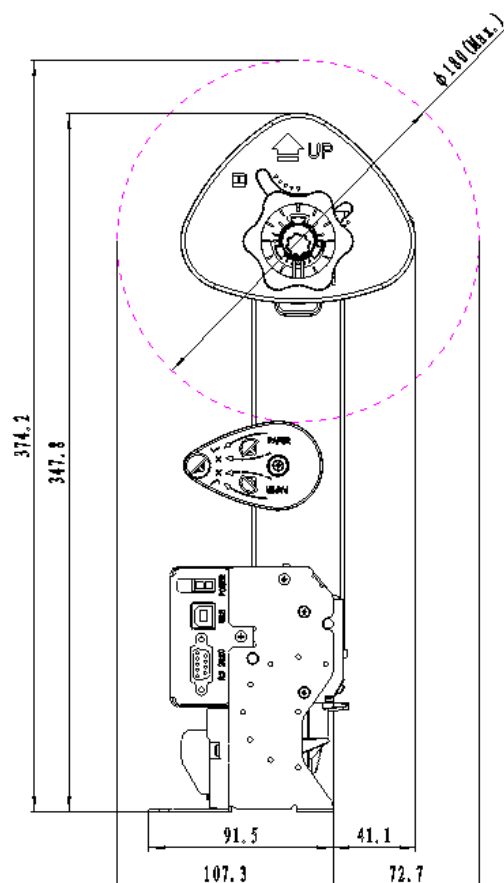
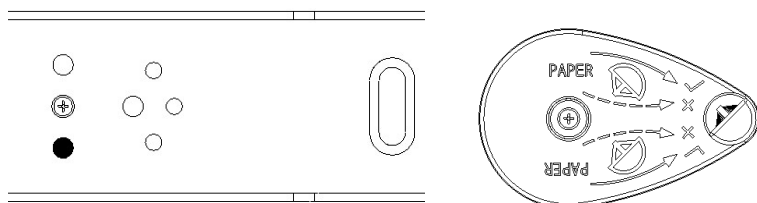


Figure 4.3.12 Module installation setting and size



Position 1 for installing buffer

Buffer shaft position 1

2) Paper roll with thermal layer inward

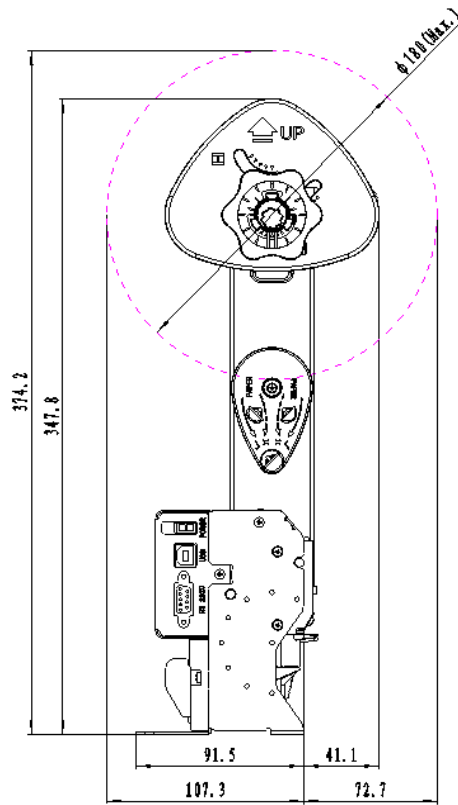
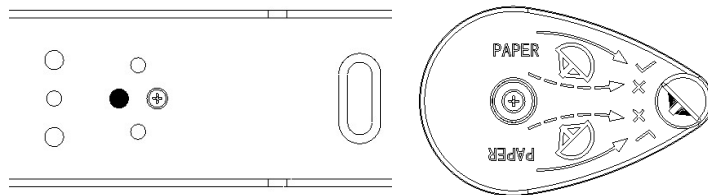


Figure 4.3.13 Module installation setting and size



Position 2 for installing buffer

Buffer shaft position 2

4.3.5 Cantilever angle: -30°

The cantilever angle is -30° , that is, the cantilever is located below the print mechanism and the intersection angle between the cantilever and the horizon is 30° . The following drawing indicates the relative position of the print mechanism to fixing holes marked by solid circle and the extreme size after installing the paper roll.

Following is the explanation for the modules corresponding with the paper roll with thermal layer outward and the paper roll with thermal layer inward.

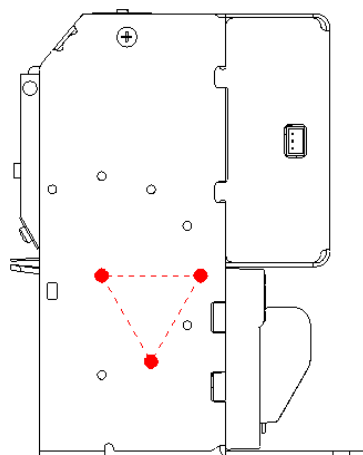


Figure 4.3.14 Installation position with the cantilever angle -30°

1) Paper roll with thermal layer outward

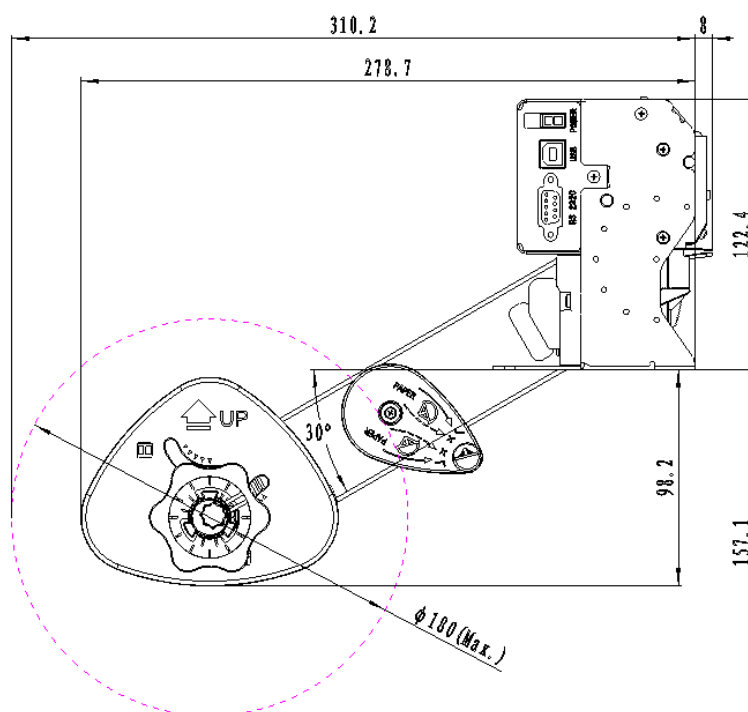
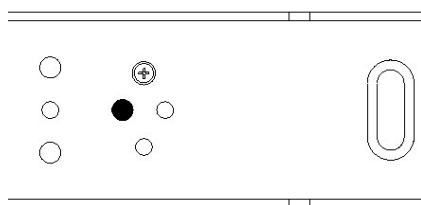
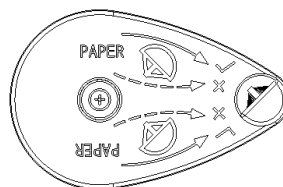


Figure 4.3.15 Module installation setting and size



Position 1 for installing buffer



Buffer shaft position 1

2) Paper roll with thermal layer inward

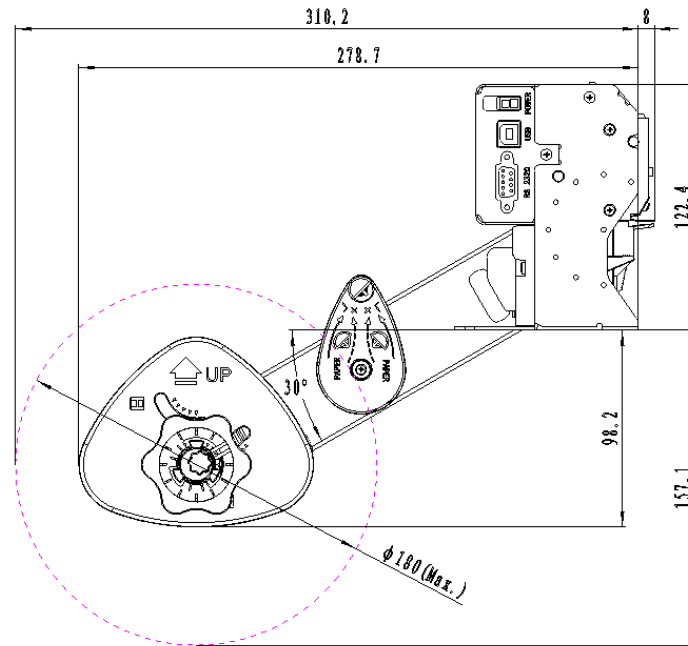
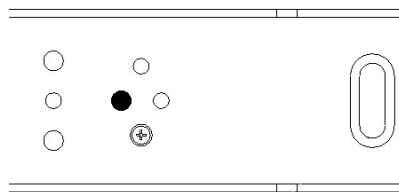
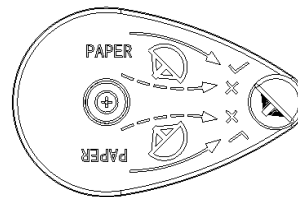


Figure 4.3.16 Module installation setting and size



Position 3 for installing buffer



Buffer shaft position 2

4.3.6 Cantilever angle: -60°

The cantilever angle is -60°, that is, the cantilever is located below the print mechanism and the intersection angle between the cantilever and the horizon is 60°.The following drawing indicates the relative position of the print mechanism to fixing holes marked by solid circle and the extreme size after installing the paper roll.

Following is the explanation for the modules corresponding with the paper roll with thermal layer outward and the paper roll with thermal layer inward.

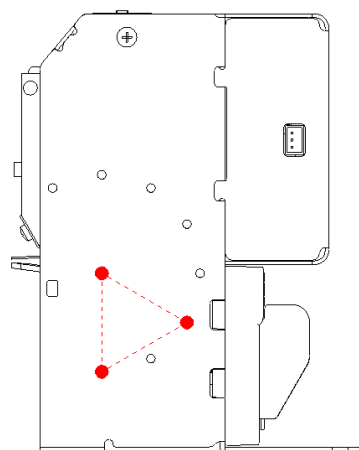


Figure 4.3.17 Installation position with the cantilever angle -60°

1) Paper roll with thermal layer outward

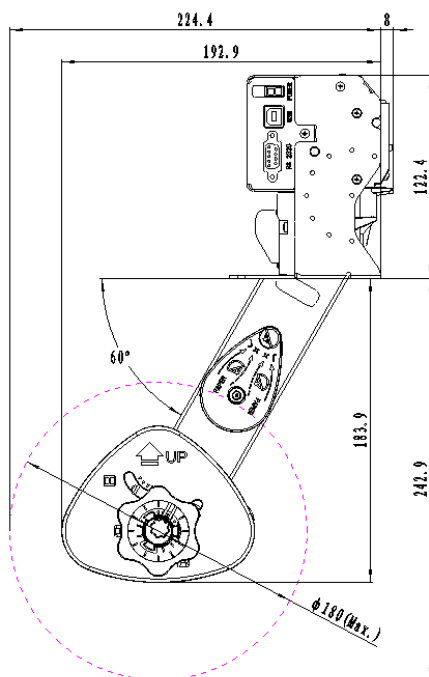
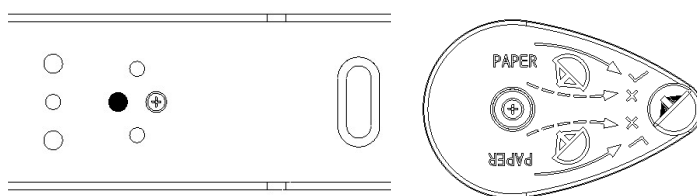


Figure 4.3.18 Module installation setting and size



Position 2 for installing buffer

Buffer shaft position 1

2) Paper roll with thermal layer inward

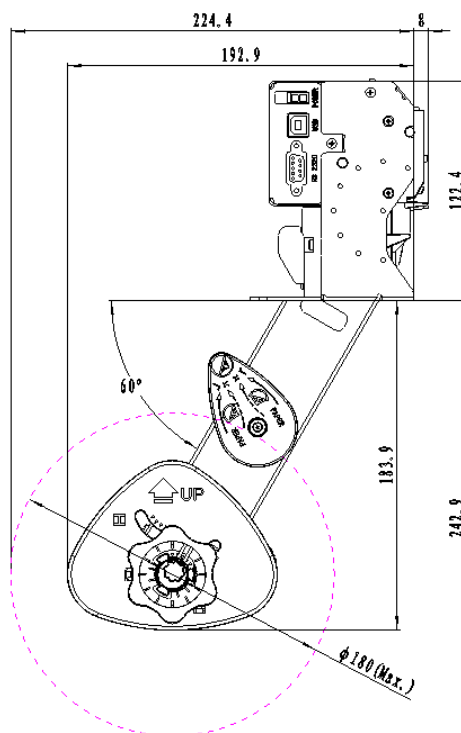
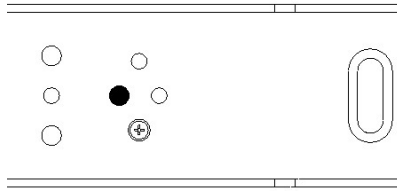
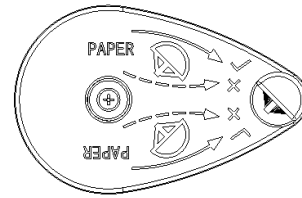


Figure 4.3.19 Module installation setting and size



Position 3 for installing buffer



Buffer shaft position 2

4.3.7 Installing the paper roll baffle

1) Refer to the following figure, install the paper roll baffle onto the baffle connection film.

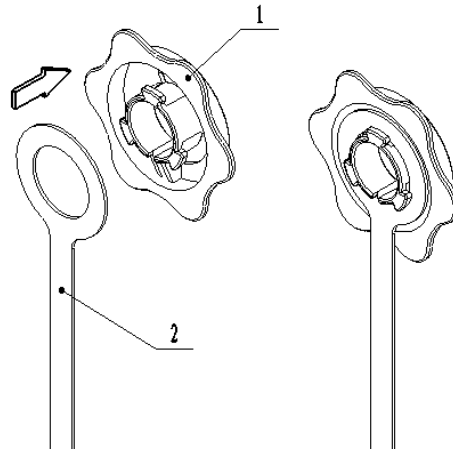


Figure 4.3.20 Installing the paper roll baffle

1. Paper roll baffle 2. Paper roll baffle connection film

2) Refer to the following figure, install the baffle connecting film onto the print mechanism module.

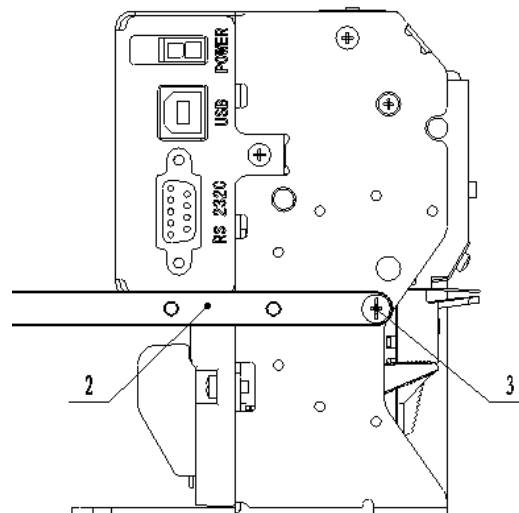


Figure 4.3.21 Installing the baffle connection film

2. Baffle connection film 3. Screw (provided with mechanism)

Note: The angle of installing baffle connecting film can be adjusted according to the angle of cantilever, but be careful to avoid the power interface and communication interface.

4.4 Installing and adjusting paper near end sensor

4.4.1 Installing paper near end sensor

Refer to the following figure, plug the paper near end sensor into the outward paper near end sensor socket after installing the cantilever module on print mechanism.

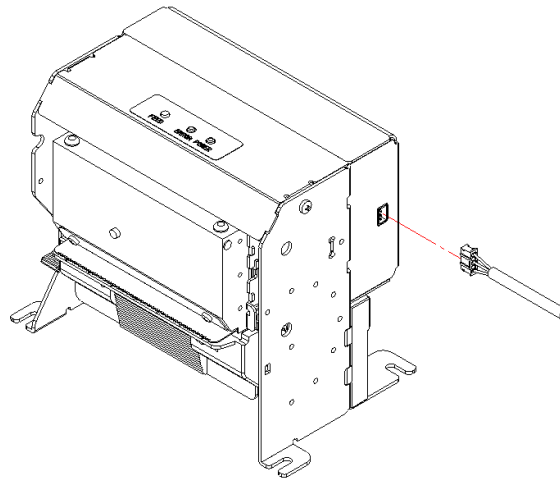


Figure 4.4.1 Installing paper near end sensor

4.4.2 Adjusting paper near end sensor

The paper near end sensor module is located on the paper roll guide of the cantilever holder, and we need to install the cantilever holder onto the print mechanism firstly. Refer to the following figure, the paper near end sensor has five levels. Rotate the paper roll guide while using to ensure that the direction mark of the paper roll guide is always upward.

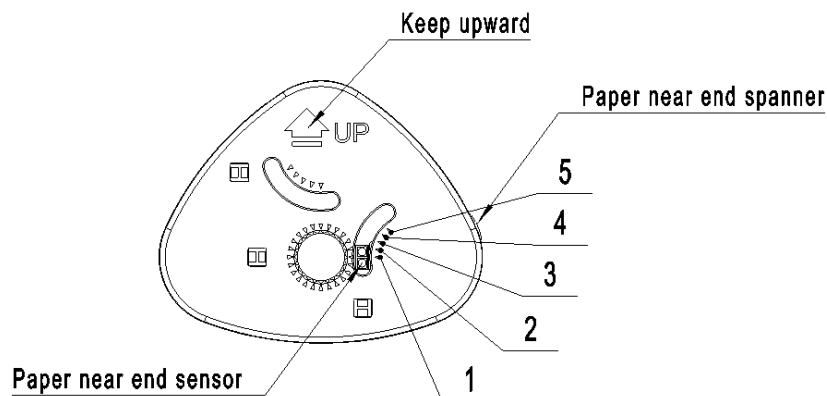


Figure 4.4.2 Adjusting paper near end sensor

Refer to the above figure, push the paper near end spanner by hand, and make the sensor reach the scheduled level.

The minimum remaining paper of different specifications detected by different levels of paper near end sensor is as follows (theoretical value):

		Paper thickness (μm)	Level 1	Level 2	Level 3	Level 4	Level 5
Paper roll core ID $\phi 18\text{mm}$ Paper roll core OD $\phi 24\text{mm}$	Remaining paper roll diameter		29.8m m	31.6m m	36.4m m	43mm	50.5m m
	Remaining paper length	60 μm	4.1m	5.5m	9.8m	16.7m	25.8m
		70 μm	3.5m	4.8m	8.4m	14.3m	22.1m
		80 μm	3.1m	4.2m	7.4m	12.5m	19.4m
		90 μm	2.7m	3.7m	6.6m	11.1m	17.2m
		100 μm	2.4m	3.3m	5.9m	10m	15.5m
Paper roll core ID $\phi 25\text{mm}$ Paper roll core OD $\phi 31\text{mm}$	Remaining paper roll diameter			34.1m m	40mm	47.1m m	54.7m m
	Remaining paper length	60 μm		2.7m	8.3m	16.4m	26.6m
		70 μm		2.3m	7.1m	14.1m	22.8m
		80 μm		2m	6.m	12.3m	19.9m
		90 μm			5.6m	10.9m	17.7m
		100 μm			5m	9.8m	16m
Paper roll core ID $\phi 40\text{mm}$ Paper roll core OD $\phi 46\text{mm}$	Remaining paper roll diameter				50.1m m	57.1m m	65.4m m
	Remaining paper length	60 μm			5.1m	15.8m	28.3m
		70 μm			4.4m	13.6m	24.2m
		80 μm			3.8m	11.9m	21.2m
		90 μm				10.5m	18.9m
		100 μm				9.5m	17m
Paper roll core ID $\phi 50\text{mm}$ Paper roll core OD $\phi 56\text{mm}$	Remaining paper roll diameter					65.7m m	73.4m m
	Remaining paper length	60 μm				15.4m	29.4m
		70 μm				13.2m	25.2m
		80 μm				11.6m	22.1m

		90μm				10.3m	19.6m
		100μm				9.3m	17.6m
Paper roll core ID φ60mm Paper roll core OD φ66mm	Remaining paper roll diameter					74.2m m	81.8m m
	Remaining paper length	60μm				15m	30.5m
		70μm				12.9m	26.2m
		80μm				11.3m	22.9m
		90μm				10m	20.4m
		100μm				9m	18.3m

Table 4.4.2 Minimum remaining paper detected by paper near end sensor

Note: The minimum remaining paper detected by paper near end sensor in the above table is theoretical, and there is tolerance in the real work. Furthermore, it is related with paper roll core OD.

4.5 Connecting the AC power adapter

- 1) Make sure the printer is turned off.
- 2) Refer to the following figure, plug the power adapter cable pin into the power socket of print mechanism.
- 3) Connect the AC power adapter to an electrical outlet.

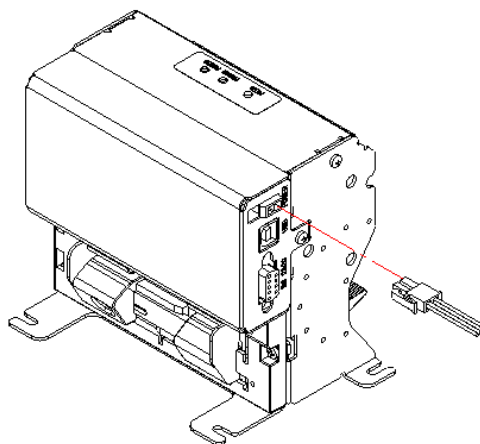


Figure 4.5.1 Connecting power adapter



Caution:

- Use recommended power adapter or its equivalent ones;
- Connect power adapter connector at right angle between pin and socket.
- When connecting or disconnecting the cable connector of the AC 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 or broken, and a fire and electric shock may be caused accordingly.
- 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 of printer.

4.6 Connecting interface cable

- 1) Make sure that the printer has been shut down;
- 2) Connect the USB cable into the relevant interface of printer, (see Figure 4.6.1);
- 3) Connect the other end of the interface cable to the host computer.

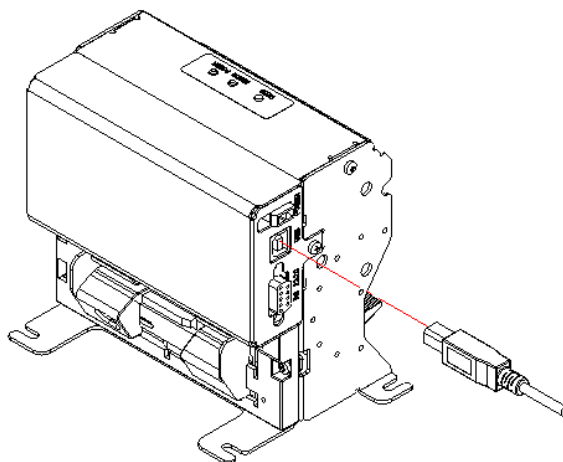


Figure 4.6.1 Connecting USB cable

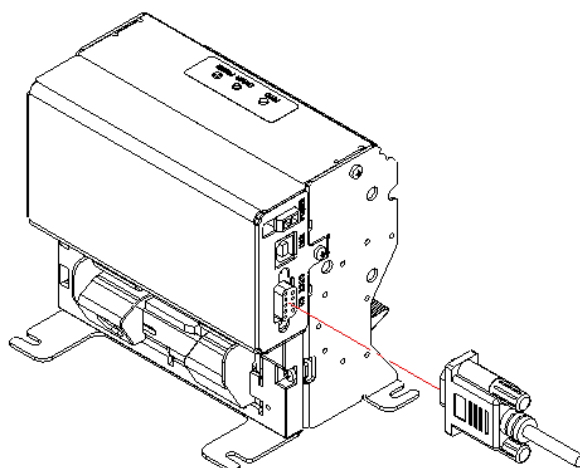


Figure 4.6.2 Connecting serial interface cable



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.

4.7 Installing and loading paper roll

Before installing the paper roll, please install the cantilever paper holder first according to the requirements of 4.3 and 4.4 and set position for relevant paper near end sensor, making sure the specification of paper roll is in conformity with the printer's requirements (Detailed requirements please refer to 2.3.).

4.7.1 Installing paper roll

Steps for installing paper roll:

- 1) Move the paper guide 1 and paper guide 2 left and right, and make the path width mark on paper guide 2 move to the scale corresponding with paper width.

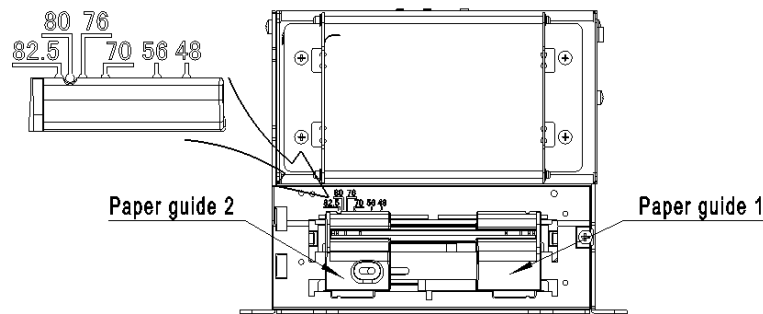


Figure 4.7.1 Adjusting paper guide

- 2) Fix the paper guide locking screw and lock the paper guide (optional) ;

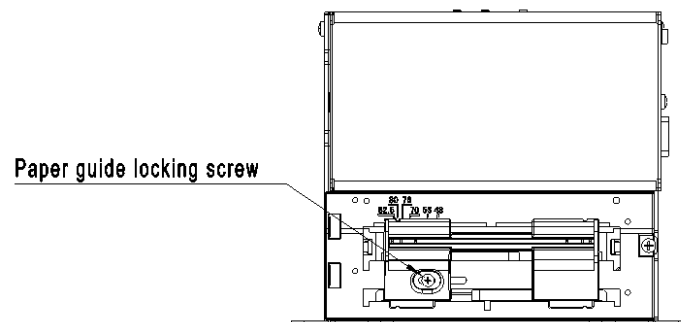


Figure 4.7.2 Fix paper guide locking screw

- 3) Rotate the paper roll guide to keep its mark direction always upward; Turn the paper roll guide moving knob to move the paper roll guide to the scale corresponding with paper width along the paper roll shaft;

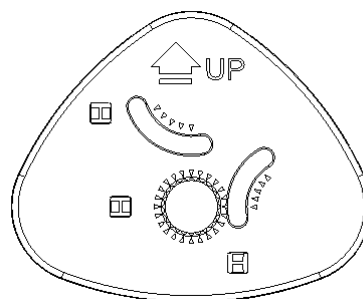


Figure 4.7.3 Always upward paper roll guide

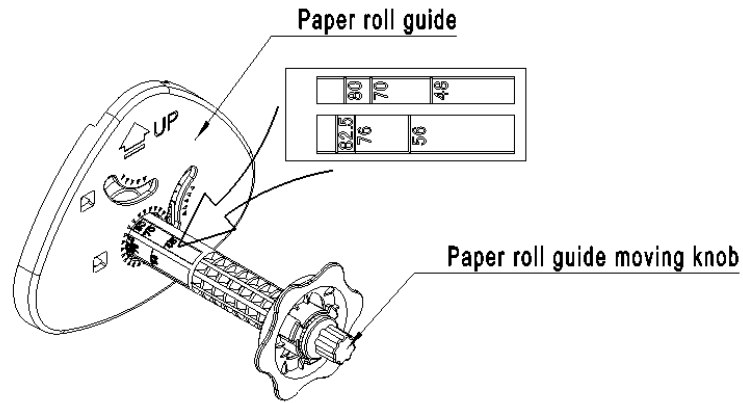


Figure 4.7.4 Adjusting paper roll guide

- 4) Remove the paper roll baffle, and install the paper roll onto the paper roll shaft to make one end face of the paper roll contact with the paper roll guide;

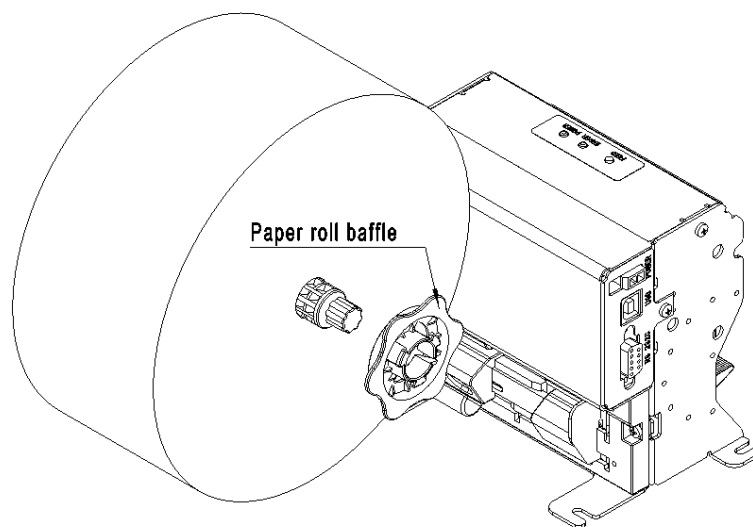


Figure 4.7.5 Install the paper roll onto the paper roll shaft

- 5) Install the paper roll baffle onto the paper roll shaft and fix the position of the paper roll.

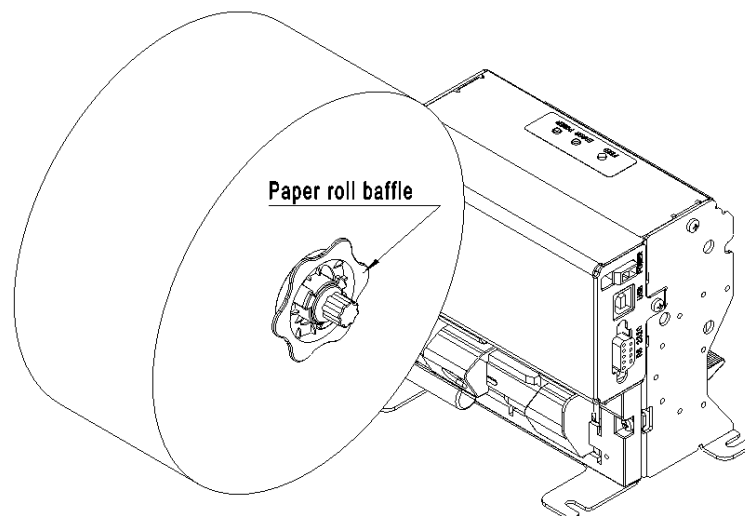


Figure 4.7.6 Installing paper roll baffle

Caution:

- While installing the paper roll baffle, you cannot tighten the paper roll and should reserve 1-3mm

space;

- After installing the paper roll baffle, rotate the paper roll and make sure the paper roll can rotate smoothly.
- While fixing paper guide locking screw, please don't use too much force to avoid the damage of parts.

4.7.2 Loading paper

Steps for loading paper:

- 1) Make sure that the cantilever module is installed in the correct position (Refer to [4.3 Installing cantilever module](#)).
- 2) Before loading paper, make sure that the print paper head meets correct requirements and the paper head is flat;

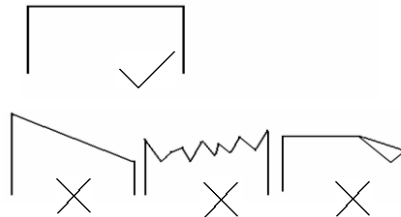


Figure 4.7.7 Print paper head

- 3) Make sure that the path width mark on paper guide 2 moves to the scale corresponding with paper width (You can move the path width mark to the needed position by moving paper guide 1 and paper guide 2 left and right;

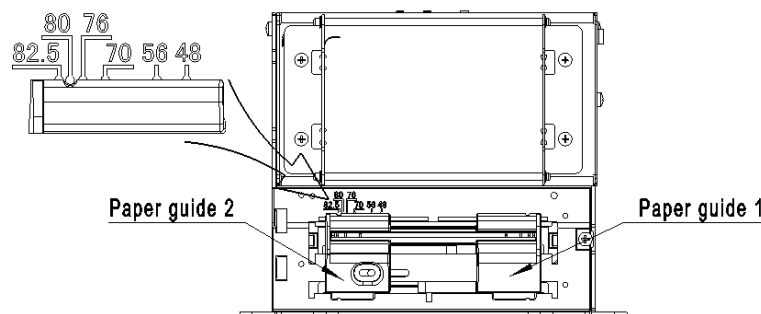


Figure 4.7.8 Adjusting paper guide

- 4) Fix the paper guide locking screw and lock the paper guide (optional) ;

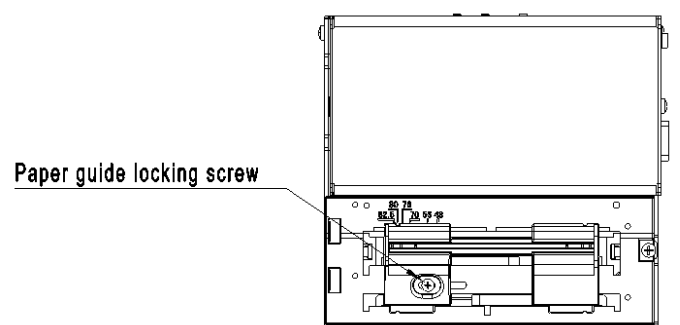


Figure 4.7.9 Fix the paper guide locking screw

- 5) The paper will pass by the buffer device when loading paper, and load paper along the circular surface of the buffer shaft according to the mark direction;

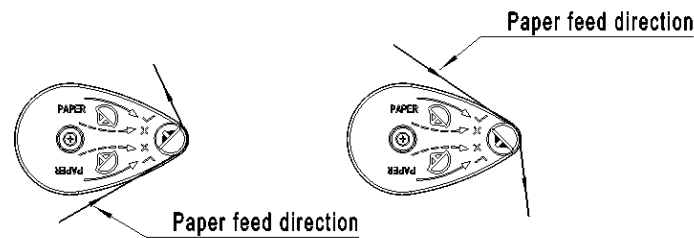


Figure 4.7.10 Paper passes by the buffer shaft while loading paper

- 6) Push the paper into the paper inlet for a certain distance along the arrow direction. When the print roller starts rotating and holding paper, release both hands. Ensure that the position of the paper's thermal side is as shown in the following figure.

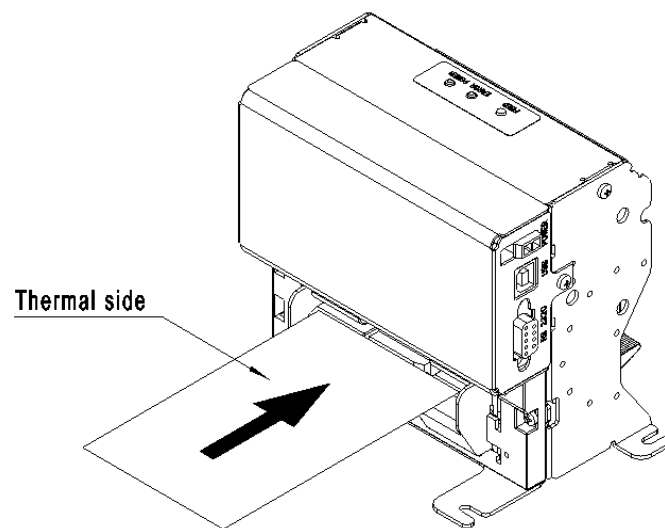


Figure 4.7.11 Paper feed printing

- 7) The printer starts loading paper automatically, and the printer starts printing after the printer finishes loading paper and the paper head stops at the normal print position.



Caution:

- Before loading paper, check and ensure that the position for installing the buffer device is correct;
- The paper must pass by the buffer device and contact with the circular surface of the buffer shaft while loading paper;
- Push the paper into the paper feeding path evenly and ensure that the paper head is parallel with the paper feeding path to avoid that the paper is slanting.
- While fixing paper guide locking screw, please don't use too much force to avoid the damage of parts.

4.8 Installing the driver

BT-T080R printer offers driver for the operation systems such as Windows 2000/ Windows XP/ Windows server 2003/Windows Vista/Windows Server 2008/Windows 7. Its current Chinese installation package is Setup_BT-T080R_CN V1.0, and the installation includes typical installation and advanced installation.

4.8.1 Typical installation

Steps for typical installation are shown as follows:

- 1) Run the Setup.exe in "Setup_BT-T080R_CN V1.0", and read the relative software license protocols. If you accept all the clauses, click "I Accept" and "Next" button;



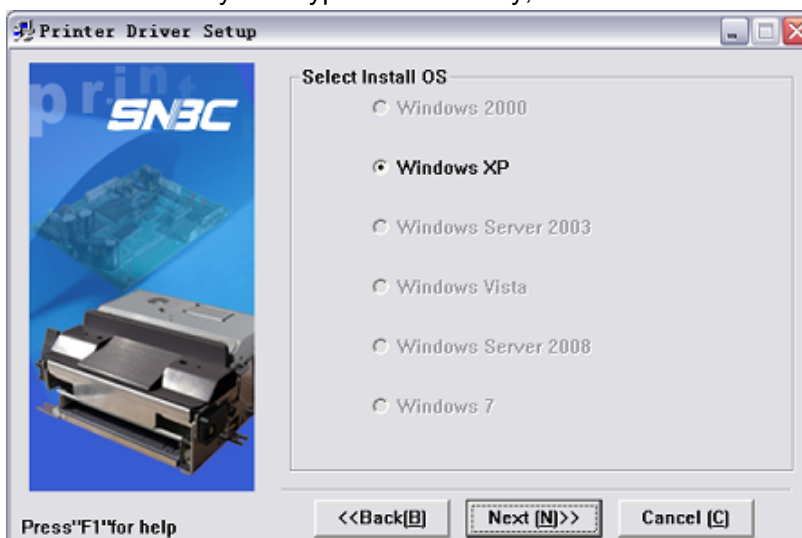
- 2) Select the printer type and name to be installed. If you set this printer as a default in the system, select the button "Set As Default Printer", and then click "Next" button;



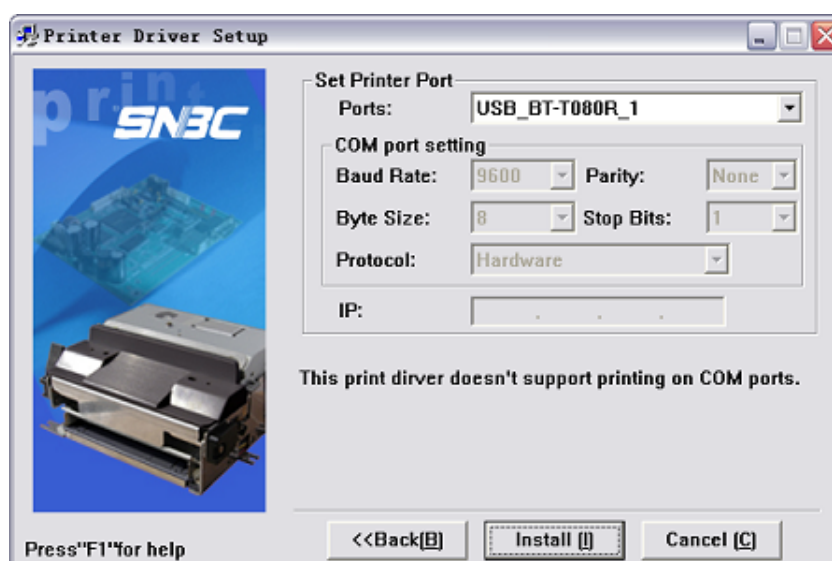
- 3) Select the Setup Type "Typical" and then click "Next" button;



- 4) The driver identifies the current system type automatically, and then click "Next" button;



- 5) Set printer port, and select "USB_BT-T080R_1" as the print port. Then click "Install" to end the installation.



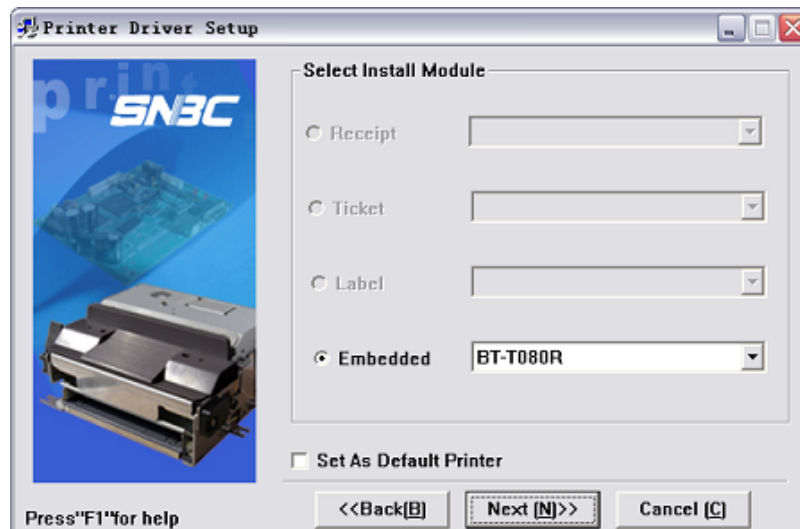
4.8.2 Advanced installation

Advanced installation is mainly used for the users who have special request to the printer driver, and it adds the function which supports several USB printers' driver. Set the driving mode with the steps as follows:

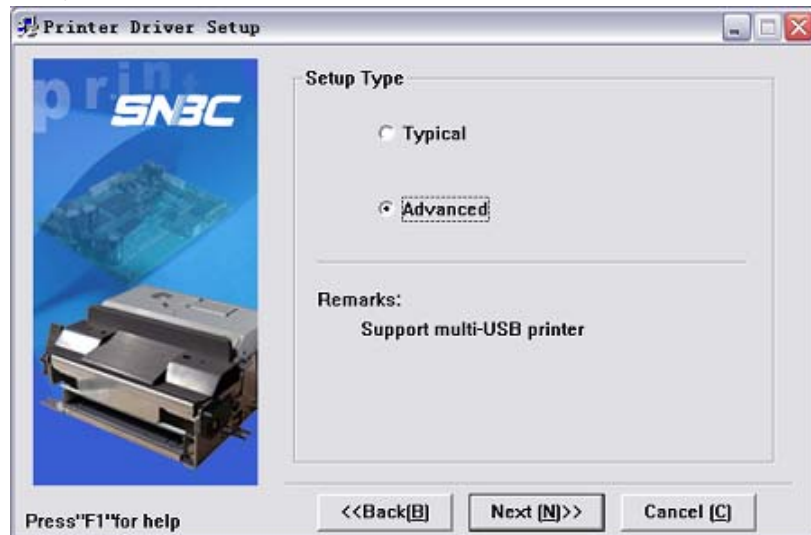
- 1) Run the Setup.exe in the file "Setup_BT-T080R_CN V1.0" and then read the relative software license protocols. If you accept all the clauses, click "I Accept" and "Next" button;



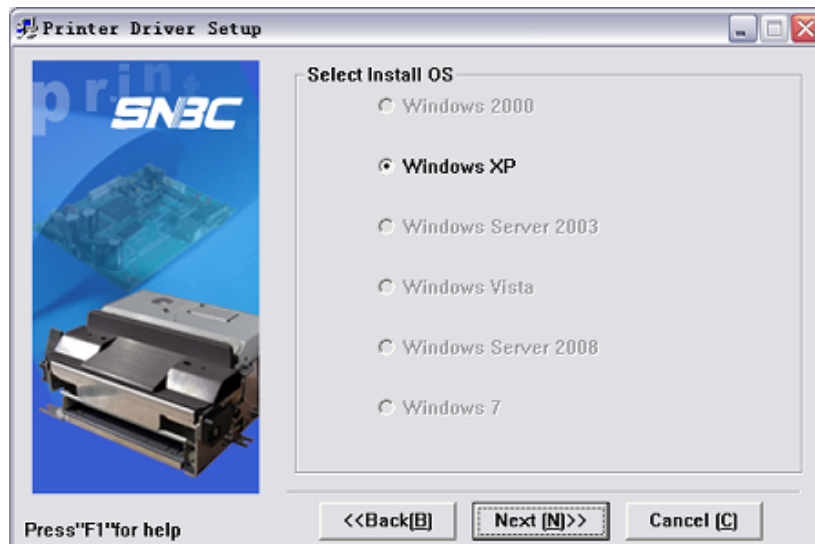
- 2) Select the printer type and name to be installed (Select BT-T080R). If you want to set the printer as a default in the system, choose "Set As Default Printer";



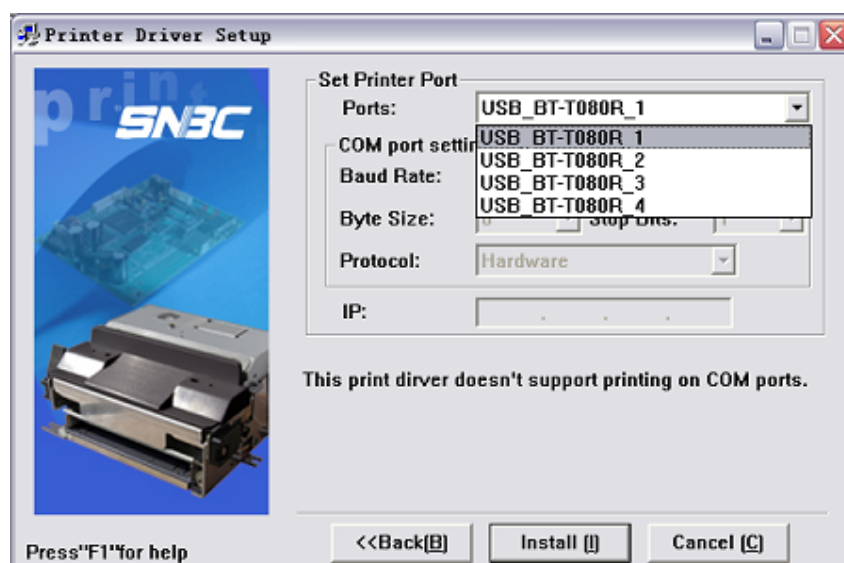
- 3) Choose the Setup Type "Advanced" and click "Next" button;



- 4) The driver identifies the current system type automatically, and then click "Next" button;



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



5 Routine maintenance

5.1 Cleaning print head and platen roller

When the following cases occur, the print head and platen roller should be cleaned.

- Printout is not clear;
- Some columns on the page are not clear;
- Paper feeds or retracts with big noises.

Steps for cleaning the print head are as follows:

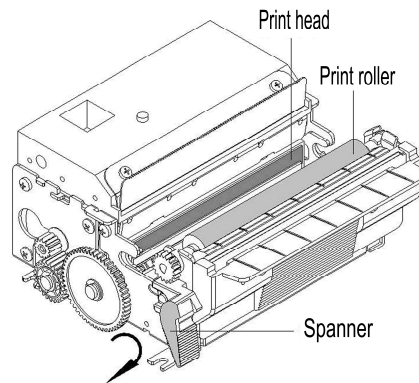


Figure 5.1.1 Cleaning the print head and platen roller

- 1) Turn off the printer power, turn the open spanner and pull out the platen roller (Refer to figure 5.1.1.);
- 2) Wipe off the dust or stains on the print head and platen roll with soft cotton cloth dipped with pure alcohol (it must be wrung out before using);
- 3) Wait for 5-10 minutes until the pure alcohol evaporates completely, and then close the spanner in the reverse direction.

Caution:

- If the print job is just over, please wait until the print head cools down completely.

5.2 Cleaning paper near end sensor

When the following case occurs, paper near end sensor should be cleaned.

- Paper near end sensor can not identify paper near end status.

Steps for cleaning paper near end sensor are as follows:

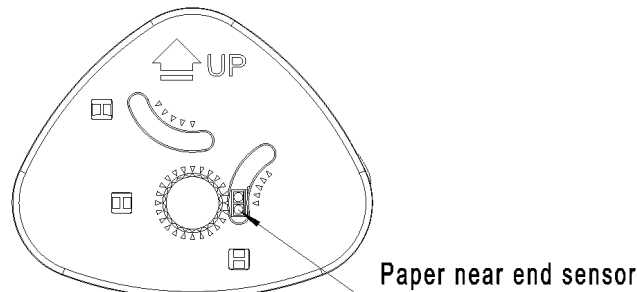


Figure 5.2.1 Cleaning paper near end sensor

- 1) Turn off the printer power;
- 2) Wipe off the dust or stains on the sensor with soft cotton cloth dipped with pure alcohol (it must be wrung out before using);
- 3) Wait for 5-10 minutes until the pure alcohol evaporates completely, check the connecting cable to ensure that the connection is correct, and then turn on the power.

6 Interface signal

6.1 RS-232 interface (optional)

6.1.1 Parameter

- 1) Data transfer mode: asynchronous serial communication
- 2) Handshaking mode: RTS/CTS
- 3) Level: MARK= -3 to -15 V: Logic "1"/ OFF
 - i. SPACE = +3 to +15 V: Logic "0"/ ON
- 4) Baud rate: 1200, 2400, 4800, 9600, 19200, 38400, 57600 bps
- 5) Data bit: 8 bit or 7 bit
- 6) Parity checkout: None, even, or odd
- 7) Stop bit: 1bit
- 8) Connector: 9-pin serial interface connector (female type)

Note: Serial baud rate, data bit and parity bit are set by EEPROM.

6.1.2 Interface linking terminal distribution and signal function

Printer signal and status is described as the following table:

Pin	Signal name	Signal direction	Function
1	—		
2	RXD	Input	Receive data
3	TXD	Output	Transmit data
4	DTR	Output	Data terminal ready
5	SG	—	Signal ground
6	DSR	—	Data set ready
7	RTS	Output	Request to send
8	CTS	Input	Allow to send
9	FG	—	Frame ground

Table 6.1.2 Interface and pin explanation

6.1.3 Demonstration of interface connection

Host side	Printer side
TXD-----	RXD
RXD-----	TXD
DSR-----	DTR
CTS-----	RTS
RTS-----	CTS
DTR-----	DSR
FG -----	FG
SG -----	SG

Note: Please send data to the printer after the printer is powered on and finishes initializing.

6.2 USB interface

USB interface is the standard interface of the printer, which meets USB 2.0 protocol standard, and works in full speed mode (For interface position, please refer to Figure 3.1.1 BT-T080R printer). The data transfer bit rate is 12Mbps.

6.2.1 Interface specification

Data transmission: Support USB 2.0 protocol;

Connector (printer end): USB B series socket. Support connecting through USB HUB

6.2.2 Interface signal definition and functions

Pin No.	Signal name	Description
1	VBUS	+5V
2	DATA-	Data transmission negative end
3	DATA+	Data transmission positive end
4	GND	Grounding

Table 6.2.1 USB interface signal definition

6.2.3 USB interface connecting demonstration

Host side	Printer side
VBUS	VBUS
DATA-.....	DATA-
DATA+.....	DATA+
GND	GND

6.2.4 Interface connector

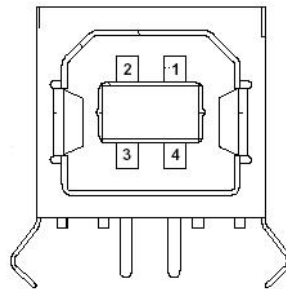
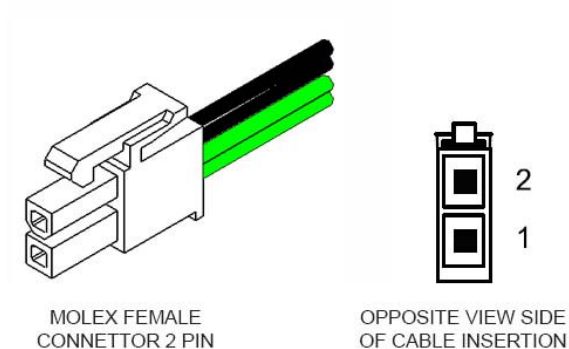


Figure 6.2.1 USB interface connector

6.3 Power interface

Adopt the 2 pin single bend socket whose space is 4.2mm and pin width is 1.6mm.



Pin definition:

Pin	Signal definition	Cable color
1	+24V	Green
2	GND	Black

7 Troubleshooting

If errors occur in the printer, please refer to this chapter for corresponding settlement. If the trouble still can't be settled, please contact with SNBC or the distributor.

7.1 Common errors and settlement

BK-T080 mode

Errors which can recover automatically:

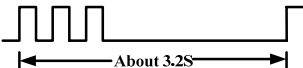
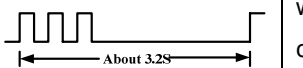
Error	Description	ERROR LED 	Buzzer 	Recovery
Print head overheating	Temperature of the print head is over 65℃.			Recover automatically when the temperature of the print head is less than 60℃.
Print head uplifting	Print head is uplifted, and the printing stops.			Recover automatically when the print head is closed, and the printing recovers automatically without losing print content.
Voltage is too high.	The voltage of the power is over 26.4V. / The voltage of the power is less than 21.6V.			Automatic recovery after the voltage is less than 26.4V. / Automatic recovery after the voltage is over 21.6V.

Table 7.1.1 Auto-recovery error

Errors which can recover possibly:

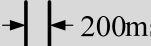
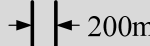
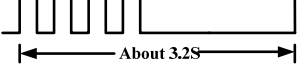
Error	Description	Error LED 	Buzzer 	Recovery
Auto cut error	The auto paper cutting is abnormal.			Exclude the error through DLE ENQ 1 or DLE ENQ 2 command after the paper jams in cutter is cleared.
Mark detection error	Can not detect the mark.			Exclude the error through DLE ENQ 1 or DLE ENQ 2 command after the marked paper is loaded.

Table 7.1.2 Possible recovery error

Note: The default configuration of the printer is that the printer doesn't stop printing when paper near end.

BT-T080 mode:

Errors which can recover automatically:

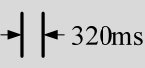
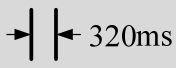
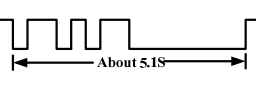
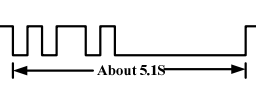
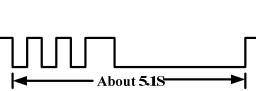
Error	Description	ERROR LED 	Buzzer 	Recovery
Print head overheating	Temperature of the print head is over 65℃.			Recover automatically when the temperature of the print head is less than 60℃.
Print head uplifting	Print head is uplifted, and the printing stops.			Recover automatically when the print head is closed, and the printing recovers automatically without losing print content.
Voltage is too high	The voltage of the power is over 26.4V			Automatic recovery after the voltage is less than 26.4V.
Voltage is too low	The voltage of the power is less than 21.6V.			Automatic recovery after the voltage is over 21.6V.

Table 7.1.3 Auto-recovery error

Errors which can recover possibly:

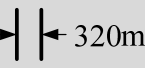
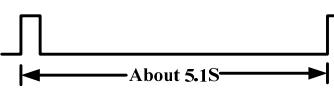
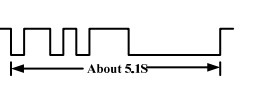
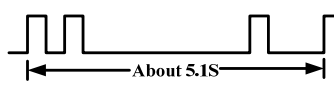
Error	Description	Error LED 	Buzzer 	Recovery
Auto cut error	The auto paper cutting is abnormal.			Exclude the error through DLE ENQ 1 or DLE ENQ 2 command after the paper jams in cutter is cleared.
Mark detection error	Can not detect the mark.		No buzzing.	Exclude the error through DLE ENQ 1 or DLE ENQ 2 command after the marked paper is loaded.

Table 7.1.4 Possible recovery error

7.2 Solutions for common errors

Problems during paper loading:

Problems	Possible reasons	Solutions
Paper roll can't be loaded onto paper holder smoothly.	The paper roll core ID does not match the printer.	Replace print paper.
The printer can't feed paper automatically.	Paper head is irregular; Paper jams; The paper loading sensor is not covered by paper head.	Trim the paper head according to requirements; Remove jammed paper; Check the front head of paper to confirm that the paper loading sensor is covered fully by paper.
The paper doesn't stop at the normal print position after loading paper automatically.	The dust or wastepaper covers the paper loading sensor.	Clean the paper loading sensor.

Table 7.2.1 Errors index in paper loading

Problems during printing:

Problems	Possible reasons	Solutions
The paper can't be ejected out smoothly.	Paper jams.	Check paper path, remove wastepaper and reload paper.
Printout is not clear.	The paper is loaded in wrong direction or its quality is poor; Print head needs cleaning; Print darkness is too low; The input voltage is too low.	Make sure the paper roll is loaded correctly; Use recommended paper or its equivalents; Clean the print head; Adjust print darkness(*); Use the power supply which meets requirements.
Cutter works abnormally.	Paper jams in cutter; The cutter is broken.	Check if there are sundries in cutter path(*), contact with SNBC or your local distributor.
Printing data is lost and no printing.	The platen roller is not closed; Paper jams.	Close platen roller properly; Remove jammed paper.

Table 7.2.2 Print problems index

* To adjust print darkness, contact with the distributor or SNBC.

Problems during paper out:

Problems	Possible reasons	Solutions
The printer stops printing and warns errors during printing.	Paper is end; Paper jams in cutter.	Install a new paper roll; Check if there are sundries in cutter path.

Table 7.2.3 Problems index during paper out

* Contaminated paper may cause detection failure.

Other problems:

Problems	Possible reasons	Solutions
LED isn't light and printer doesn't work.	The printer is not connected with the power correctly; The printer isn't turned on.	Connect the printer with the power. Turn on the printer.
The printer doesn't work after receiving commands.	Printer is in error status. The communication cable is not connected well. Interface setting is wrong.	Remove all errors(*); Make sure the communication cable is connected correctly. Print a self-test page and set the interface again according to information on it.

Table 7.2.4 Other problems index

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

Appendix

Appendix 1 Self-test page

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

*****BT-T080R TEST FORM*****

Boot Firmware	:FV1.000
Main Firmware	:FV1.020
 H/W Parameters	
H/W ID	:BT-T080R(U)1
Flash Memory Size	:1M Bytes
Flash Logos/Fonts	:64K Bytes
Resolution	:203×203DPI
Print Width(Max)	:80mm
Print Width(Real)	:78mm
Fixed Left Margin	:2mm
Fixed Right Margin	:0mm
Print Speed(MAX)	:150mm/s
Dark Scale	:110
Cutter	:Enabled
Paper Roll Width	:80mm
Presenter	:Disabled
Paper type	:without blackmark
CRCommand	:Disabled
CurrentFont	:Font0
 Communication Interface	
Rx Buffer Size	:4K Bytes
Interface Type	:USB_BT-T080R_1
 Resident Fonts	
Font0 (12X24)	:English
Font1 (9X17)	:English
 Current Code Page	:PC437
Code Pages	:PC437, PC850
	:PC852, PC858
	:PC860, PC863
	:PC865, PC866
	:1252, Katakana
	:More in

	feed button
	configuration
	...
Bar Code Available	:UPC-A
	:UPC-E
	:EAN-8
	:EAN-13
	:CODE39
	:CODE93
	:ITF
	:CODABAR
	:CODE128
	:PDF417

Explanation of self-test page content

Boot Firmware-----Printer BOOTLOADER version
 Main Firmware-----Printer monitor program version
 H/W Parameters-----Printer parameter setting
 H/W ID-----Printer ID setting
 Flash Memory Size-----Printer FLASH capability
 Flash Logos Size-----Flash size for bitmap downloading
 Resolution-----Printer resolution
 Fixed Left Margin-----Printer left margin
 Fixed Right Margin-----Printer right margin
 Print Width (Max.)-----Maximum print width
 Print Width (Real)-----Real print width
 Dark Scale-----Print darkness
 Print Speed (Max.)-----Print speed
 Cutter-----Enable or disable auto cutter
 Paper Roll Width-----Paper width
 Presenter-----Enable or disable PRESENTER
 Presenter Mode-----PRESENTER paper out mode
 Presenter Wait Time-----PRESENTER waiting time before
 retracting or ejecting paper
 Communication Interface---Communication interface setting
 Rx Buffer Size-----Data receiving buffer zone size
 Interface Type-----Interface type
 Resident Fonts-----Font setting
 Font0-----Font A (English)
 Font1-----Font B (English)
 BarCode Available-----Printable barcode model

Note: The content of the self-test page changes with printer configuration.

Appendix 2 Software tool

For BT-T080R, we provide the KIOSKUtility software tool, and the brief introduction is shown as follows. The program is mainly used for debugging and monitoring the printer, and monitoring the voltage of every sensor. It can send user-defined command and support updating firmware online. Meanwhile, it provides EEpromSet tool, which allows the user to change the relevant configuration of the printer according to requirements, which is convenient for the dealer to test the printer. The following is the main interface figure of the program (Detailed information please refer to the help file of the program.).

The **Port Setting** dialog box is used to configure the printer's communication settings. It features a 'Select Printer' section with a 'Printer Model' dropdown set to 'BT-T080R'. Below this, there are three radio buttons for 'COM', 'LPT', and 'USB'. The 'COM' option is selected, showing settings for 'Port Name' (COM1), 'Baudrate' (38400), 'Data Bits' (8), 'Parity' (None), 'Stop Bits' (1), and 'Protocol' (DTR/DSR). The 'LPT' section shows 'Port Name' (LPT1). The 'USB' section shows 'Port Name' (empty). A 'Net Setting' section has radio buttons for 'Set IP' (with four input fields: 0, 0, 0, 0) and 'Auto Get IP' (empty). At the bottom, there is a 'Communication Test' checkbox, 'OK' and 'Cancel' buttons, and a 'Status:' label.

The **EepromSet** dialog box is used to configure the printer's operation and printing settings. It is divided into several sections: 'Default Margin' with 'Left Margin' and 'Right Margin' set to 2; 'Print' with 'Speed' set to 100 and 'Darkness' set to 68; 'Code Page' with a dropdown set to 'PC437'; 'Feed in Mark Mode' with a dropdown set to '0' and a 'DotLine' checkbox; 'Paper Near-end' with 'Stop Printing' checkbox and 'Alarm' checked; 'Paper Type' with radio buttons for 'Receipt' (selected), 'Mark/Label'; 'Auto Cutter' with radio buttons for 'Enable' (selected), 'Disable'; 'Rx Buffer Size' with radio buttons for '4096 Bytes' (selected), '45 Bytes'; and an 'Operation' section on the right with buttons for 'Get Settings From Printer', 'Save Settings To Printer', 'Import Settings From File...', 'Export Settings To File...', and 'Exit'.