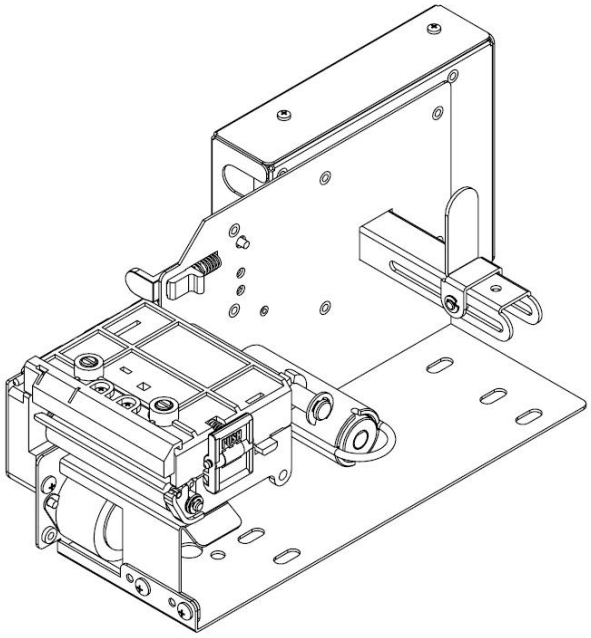
User Manual

BT-UC156
Embedded Printer

V1.0



Shandong New Beiyang Information Technology Co., Ltd.

Declaration

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Safety warning

Caution: Must comply with warning to avoid bodily harm or damage to device

Notice: Provides important information and prompts for printer operation.

- The quality control system of SNBC has been approved of the following certification.

DNV ISO9001: 2000

- The environment control system of SNBC has been approved of the following certification.

DNV ISO14001:2004

Safety Information

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

1. Safety instructions

The print head and step motor are calorific and their temperatures are high when printing or just after operation, so please don't touch them and their peripherals for safety purpose.

The thermal head is ESD sensitive device. Don't touch its printing parts and connecting parts to keep it from damages.

2. Caution

1) Install the printer on 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 on a place exposed to vibration and impact.
6) No dew condensation is allowed to the printer. In case of such condensation, do not turn on the power until it has completely gone away.
7) Disconnect the AC adapter when the printer is deemed to spare for a long time.
8) Don't spill water or other electric materials on the printer. In case that this happens, shut down the power immediately.
9) Do not allow the printer to start printing when there is no recording paper in, otherwise the print head will be damaged.
10) To ensure quality print and normal lifetime, use recommended paper or paper roll with same quality.
11) Shut down the printer before connecting or disconnecting interfaces connectors to protect control board from damages.
12) Set the print darkness to a lower grade as long as the print quality is acceptable. This will help to keep the print head durable.
13) Do not disassemble the printer without permission of a technician, even for repairing purpose.
14) Keep this manual carefully at hand for ready reference.

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1. Overview

1.1Outline

BT-UC156 printer is an embedded printer equipped with an auto-peel off module and a rewinder. It can support thermal label and thermal continuous paper up to 56mm printable width. This product is mainly used in applications where real-time label or receipt printing is necessary, like label scale, electric scale and so on.

BT-UC156 is connected with other devices via serial interface.

1.2 Main features

- ✧ Low noise and direct thermal printing
- ✧ Label peel-off and rewinding
- ✧ Open paper path design (easy media load)
- ✧ Support thermal label and thermal continuous paper
- ✧ Label checkout
- ✧ Update firmware on-line
- ✧ User can download FLASH bitmap

2. Main specifications

2.1 Technical specifications

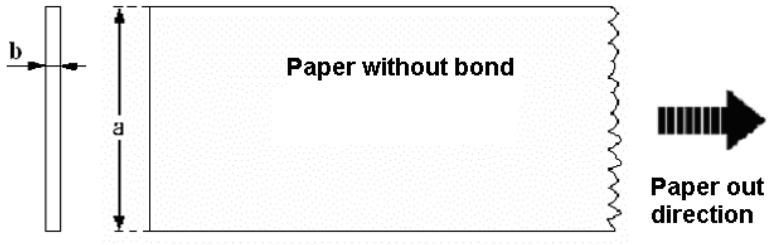
Item		Spec.	
Print mode		Direct thermal line	
Print speed		Max.75mm/s	
Print width		Max.56mm	
Paper	Type	Thermal label and continuous paper	
	Paper width	30mm to 62mm	
	Thickness	0.06 mm to 0.16mm	
Barcode	Sort	UPC-A, UPC-E, EAN-13, EAN-8, ITF, CODE39, CODE93, CODE128, CODABAR	
Characters	Type	FONTA: 12×24 FONTB: 9×17 SIMPLE CHINAESE:24×24	
	Characters/line (CPL)	FONTA	37
		FONTB	49
Data buffer	Receiving buffers	1KB or 45bytes	
	NV image data	64KB	
	RAM image data	8KB	
Communication interface		RS-232C	
Power supply		DC 24V±5%, average current 2.5A	
Print head lifetime		50Km	
Operating temperature and humidity		5 to 45℃，20 to 90%RH (40℃)	
Storage temperature and humidity		-40 to 60℃，20% to 93%RH(40℃)	
Overall size		255(L)ｘ119（W）ｘ116（H）	
Weight		About 1.7Kg	

2.2 Media specifications

2.2.1 Paper roll Spec.

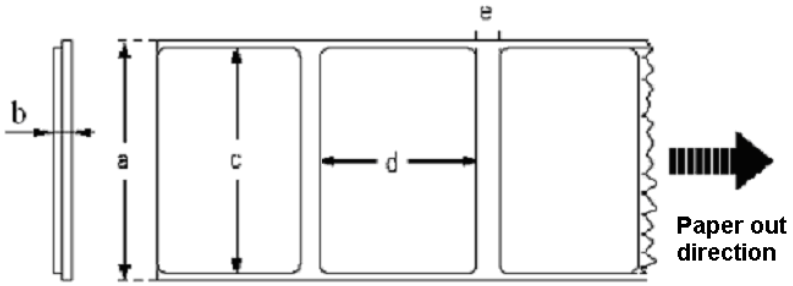
- ✧ Type: Thermal labels and continuous paper
- ✧ Roll outer diameter: Maximum 85 mm
- ✧ Paper thickness: 0.06 mm to 0.16mm
- ✧ Thermal surface: Outside
- ✧ Core shaft inner diameter: Φ25.4mm
- ✧ Paper width： 30mm-62 mm

2.2.2 Continuous paper specification:



Code	Meanings	Max. (mm)	Min. (mm)
a	Paper width	62	30
b	Paper thickness	0.16	0.06

2.2.3 Label specification



Code	Meanings		Max. (mm)	Min. (mm)
a	Paper width		62	30
b	Paper thickness		0.16	0.06
c	Label width		60	28
d	Label height	Tear-off mode	90	25
		Peel-off mode	90	25
e	Mark height		10	2

Caution：

✧ Do not paste paper to the paper supply hanger or base paper rewinder.

2.3 Print and tear-off position

2.3.1 Print position

Paper is located by margin, the location of paper and TPH is as figure below showed. The distance between effective print start point and paper margin is about 3mm.

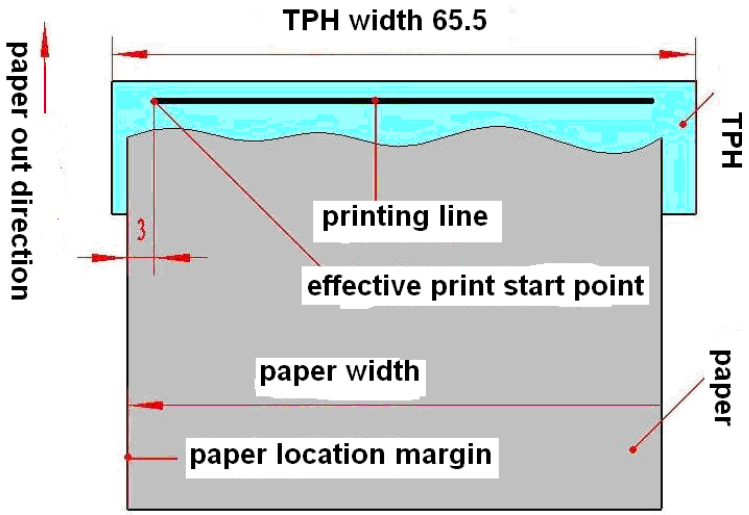


Figure 2.3.1 Printing Position

2.3.2 Tear-off position

No tear-off bar is equipped with this printer.

3. Appearance and Parts

3.1 Appearance and parts

● The appearance of the printer is shown as figure 3.1.1.

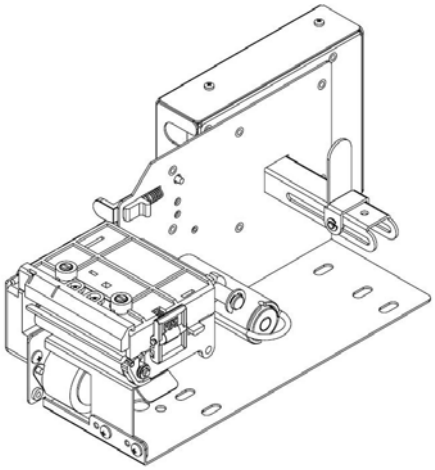


Figure 3.1.1 Appearance

● Its structure is shown as figure 3.1.2 and include parts as below:

1. base cover of control board
2. Paper roll shaft
3 Middle board
4. retraction shaft
5. paper guide ring
6. motor protection panel
7. motor module
8. press adjustment knob
9. Mechanism
10. Top cover limit
11. Key LED
12. Keyboard
13. Top cover of control board

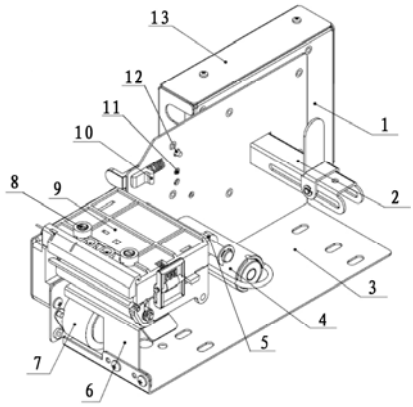


Figure 3.1.2 Structure

● Some parts' function

1) Paper guide ring (5)

It is a paper guide organ which can be adjusted according to paper width.

2) Pressure adjusting knob(8)

It is a Printhead pressure adjusting organ in stepless mode ranged from 15N to 22N. The Printhead pressure can be increased when rotating the knob in clockwise, otherwise the Printhead pressure shall be decreased.

Notice:

- In order to increase Printhead lifetime we suggest that users should select lower Printhead pressure in case of satisfied use.
- Paper guide ring is an accessory which can help the printer adjust different paper width. Users should keep it carefully.

3.2 Key Function Button

In continuous paper mode

- In standby status, printer feed paper after pressing this key.
- Press this key and power the printer, printer will print configuration sample.

In label paper mode

- In standby status, printer will locate next label to printing position after pressing this key.
- Press this key and power the printer, printer will perform paper checkout.
- Press this key to get rid of error status under paper location error or paper checkout failure status.

3.3 LED and Buzzer Explanation

The table as below shows the relations among errors, buzzer and LED.

Error	Buzzer	Error LED
Printhead overheated	Six sounds	6 flashes
Voltage abnormal	Five sounds	5 flashes
Paper end	Two sounds	2 flashes
Adequate paper	/	1 flash
Paper checkout error	One sound	1 flash
Paper orientation error	One sound	1 flash

⚠ Notice:

- The printer uses thermal resistance to test Printhead temperature. If Printhead is overheated, protecting circuit shall shut off Printhead power and stop printing at the temperature of 65℃.
- Paper checkout error shall happen only when the checkout fails.

4. Printer mount

4.1 Unpacking

When unpacking, check if parts are short or damaged according to packing list. Once this case happens, please contact with your local distributor or SNBC.

4.2 Fixing the printer

- This printer has fixing hole and side cover fixing hole. You should select suitable space and fixing position of the printer referred to figure 4.2.1

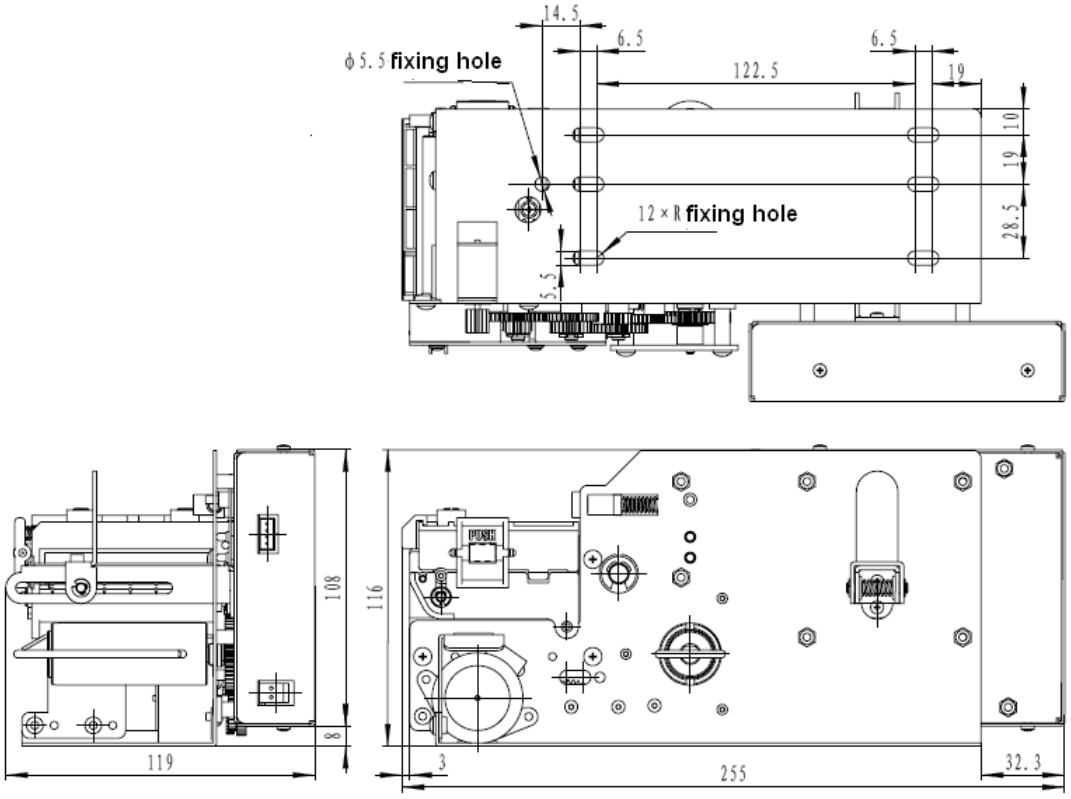


Figure 4.2.1 Dimension

⚠ Notice:

1) The printer should be mounted on a fixed plane less than 0.5mm flatness;
2) It is recommended that the slanting range for horizontal mount should be $-10^{o} \leqslant B \leqslant 10^{o}$;
3) Do not place the printer on a surface exposed to vibration or risk from impact;
4) The part of screws entering the printer shall not be longer than 5 mm;

- Enough space should be reserved around the printer for easy paper load, key operation, daily maintenance, printing pressure adjustment and cable connection/disconnection.

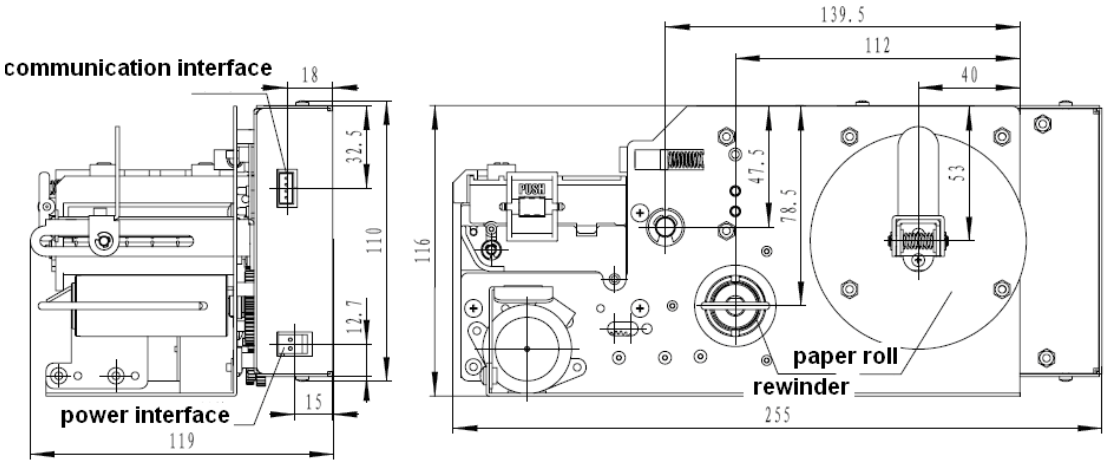


Figure 4.2.2 Operating Space—paper loading

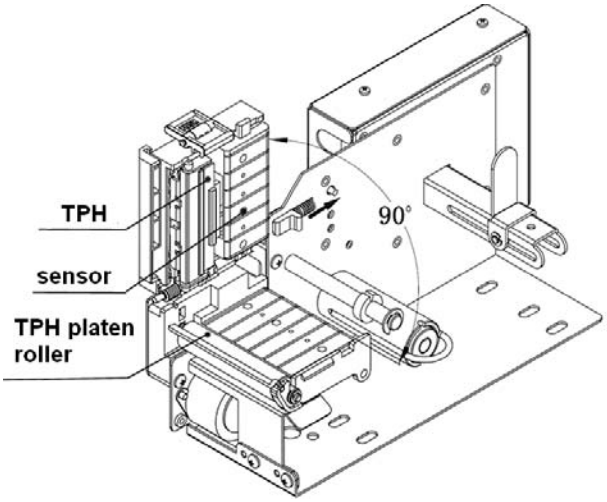


Figure 4.2.3 Operation Space—TPH Maintenance

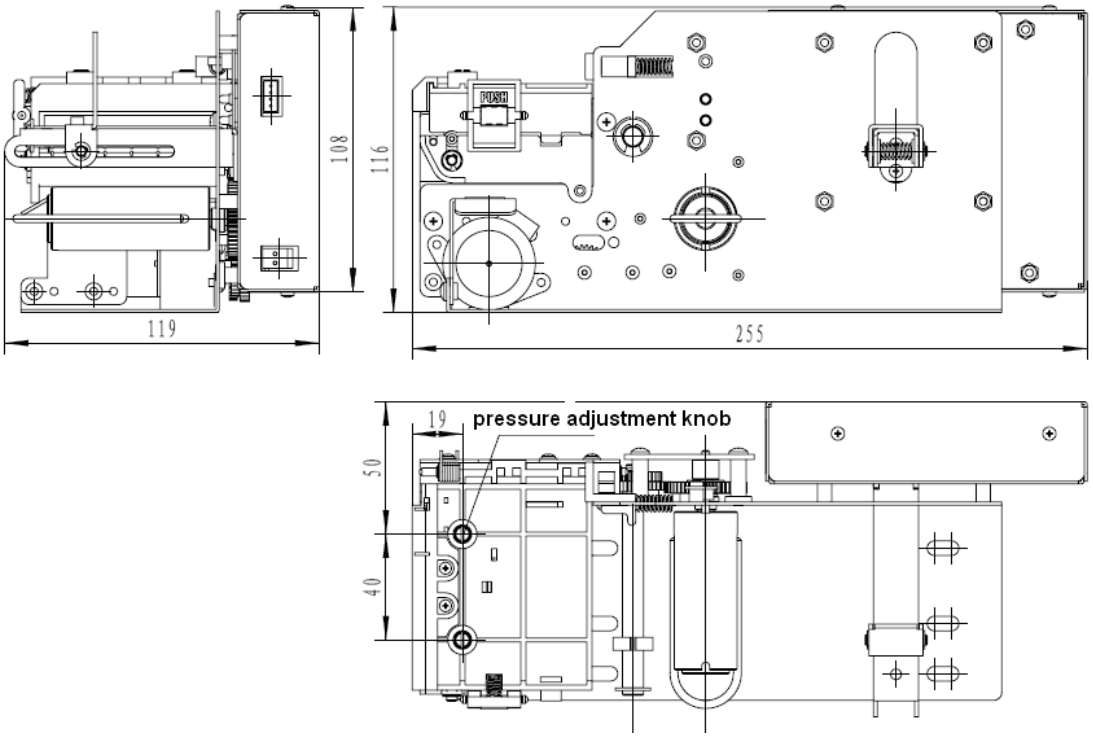


Figure 4.2.4 Operation Space——pressure adjustment

- Outlet position and width are shown in Figure 4.2.5. To ensure paper feed smooth, the outlet of printer casing shall be aligned with the printer outlet and reserve suitable space to avoid paper impacting the outlet edge of the casing. Due paper is somewhat curl, dimension A should be set reasonable to avoid paper impacting outlet down edge; in addition, space B between outlet down edge and printer case should assure the load of paper.

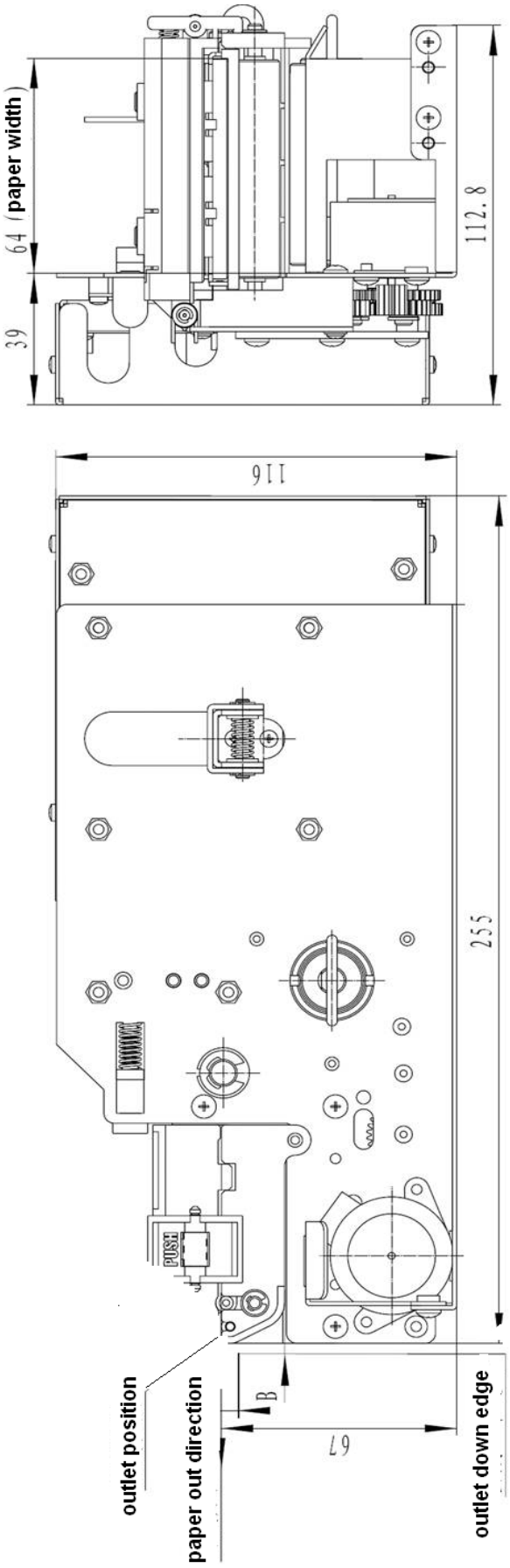


Figure 4.2.5 Outlet position

4.3 Earthing

The printer has one M3 earthing hole (figure 4.3.1). We suggest that the printer shall be earthed for safety and reliable operation.

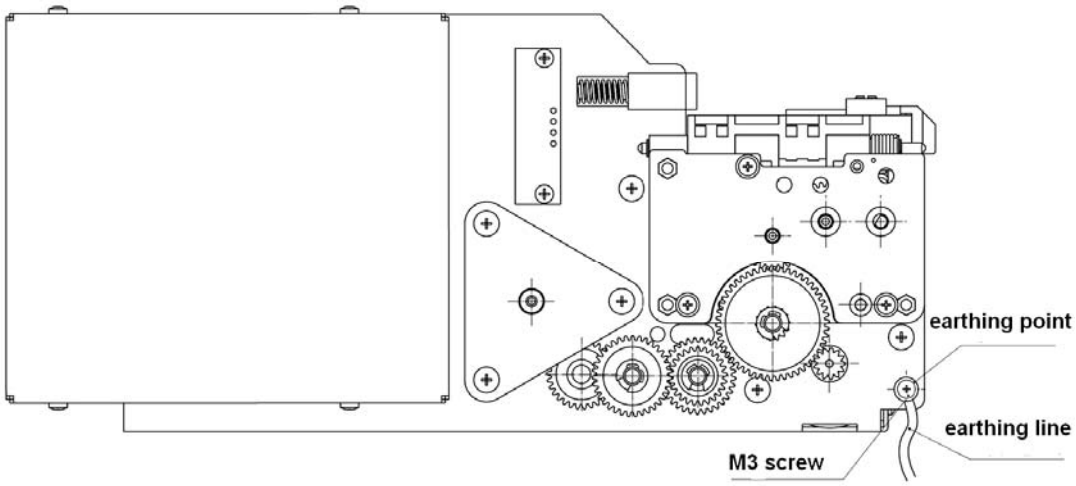


Figure 4.3.1 Earthing

4.4 Connecting interface cable

1) Make sure the printer power is off;
2) Put matched interface cable into corresponding socket (figure 4.4.1).

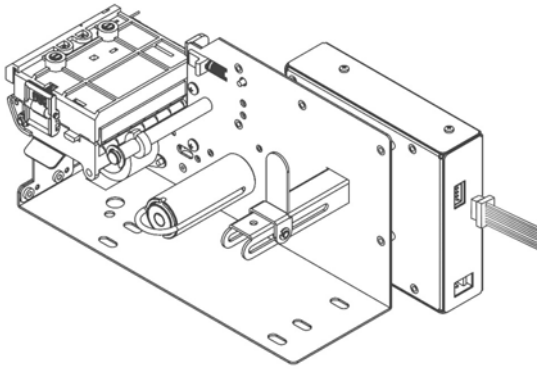


Figure 4.4.1 Connecting Cable

4.5 Loading media

4.5.1 Check media specification

Media type: BT-UC156 printer supports thermal label and continuous paper. Please check the media type used by the printer and select peel-off mode or tear-off mode;

Media specification: The roller of BT-UC156 printer is simple structure. Outer bushing diameter of paper roll shaft is 23.5 mm, only paper roll with inner diameter over $\phi 24\text{mm}$ can be used.

4.5.2 Media loading way

A paper load mark is made on printer holding plate for user to load media easily (see figure 4.5.1). Before loading media, please first familiar with the loading way referred to paper load label.

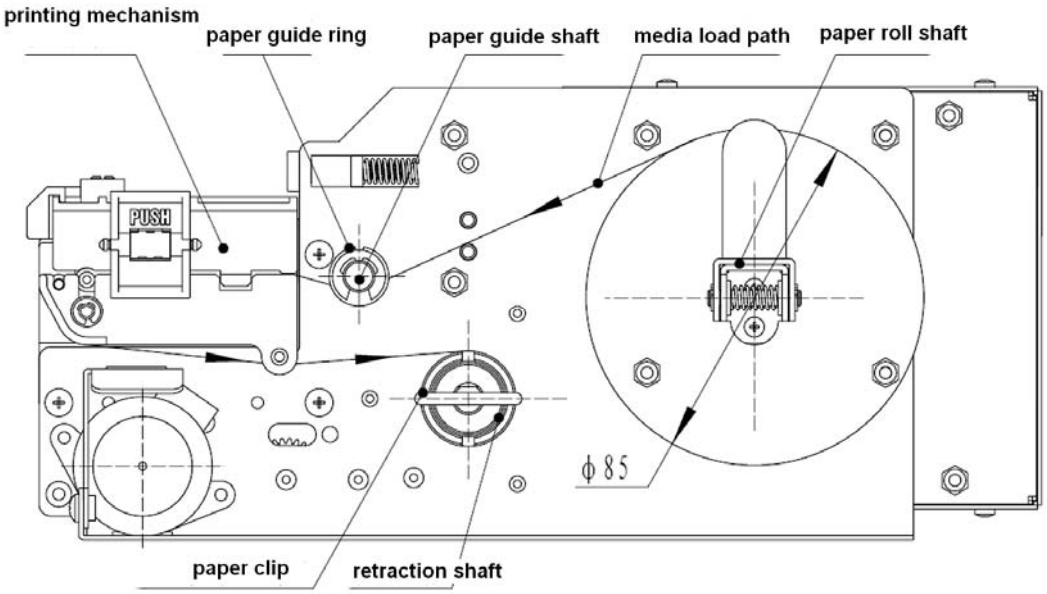


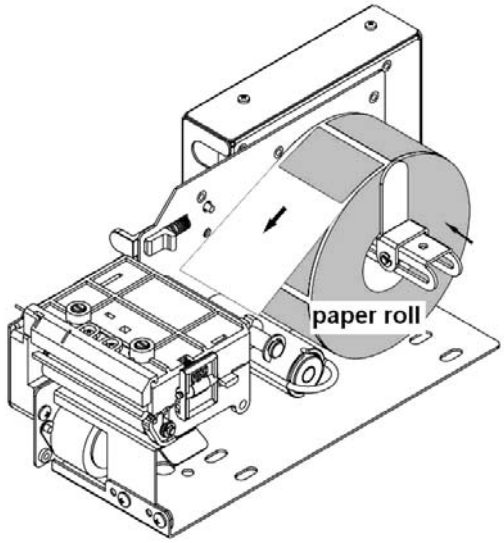
Figure 4.5.1 Media load path

4.5.3 Loading media

- Thermal label load
  It has peel-off mode and tear-off mode.

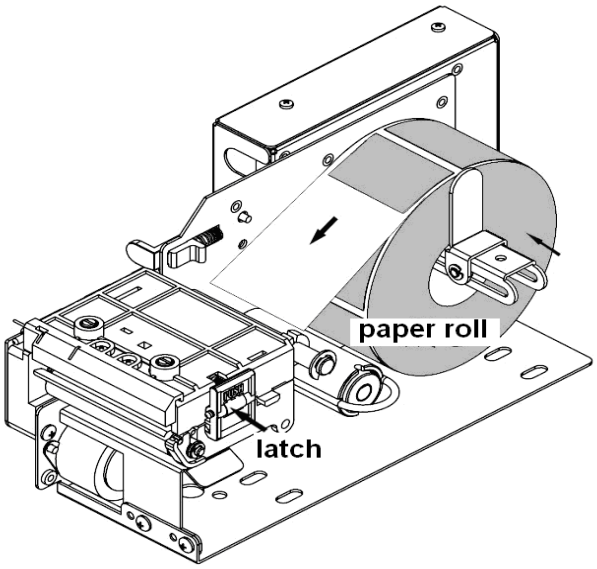
1. Peel-off mode

1) Load the selected thermal label onto paper roll shaft.

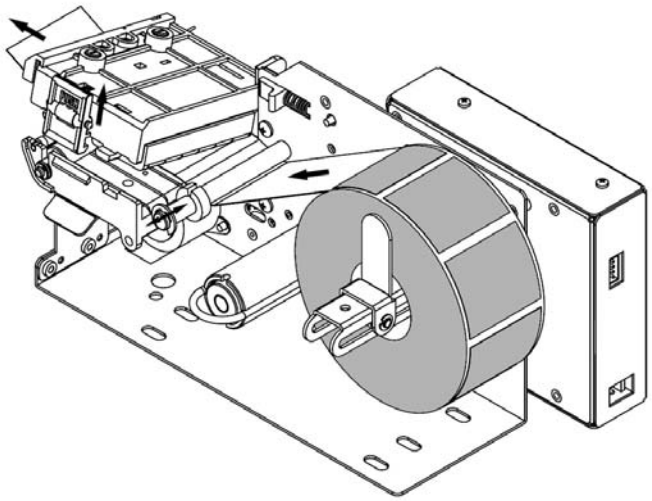


Notice: Paper roll should drop to the end of paper roll shaft. Paper shall move according to above figure during the print. Pay attention to paper roll direction when loading.

2) Press the latch to open top cover of TPH.

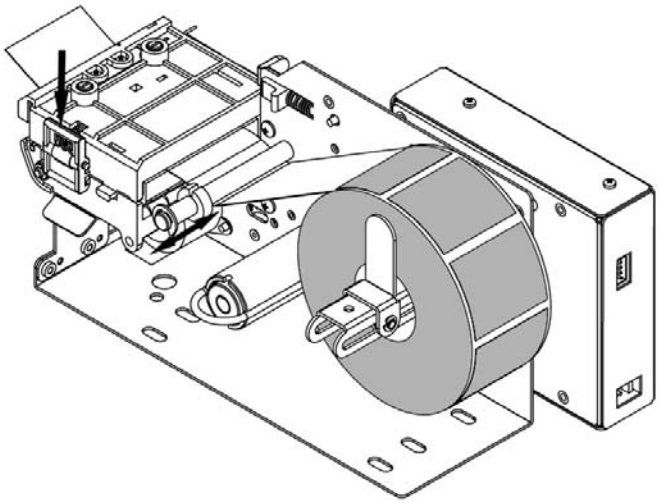


3) Tear off several front labels to make front mount long about 200 mm. Then according to the figure below, put thermal label round paper guide shaft to enter paper path and press the first label head on the platen.

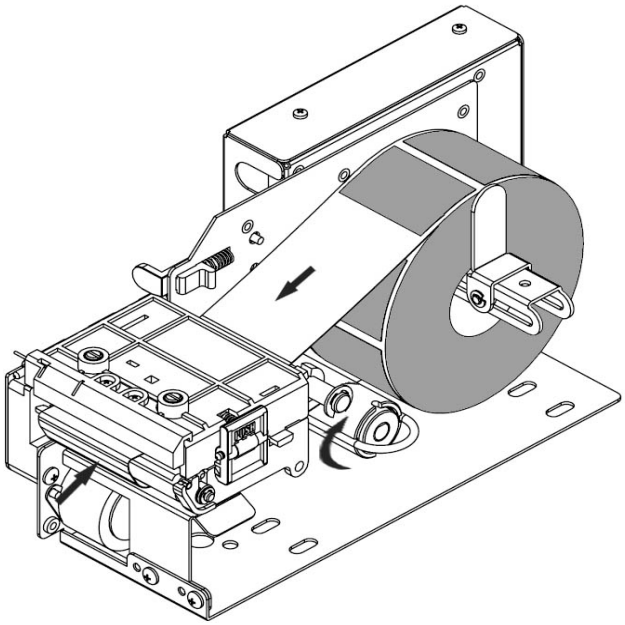


Notice: Be sure that the lower edge of label should reach the holding surface and the end of first label shall not exceed the tear-off bar of the platen.

4) Close top cover of the printer. According to thermal label width, adjust the paper guide ring up and down until a suitable position. It is recommended that paper guide path should be 0.5 ~1 mm wider than paper.



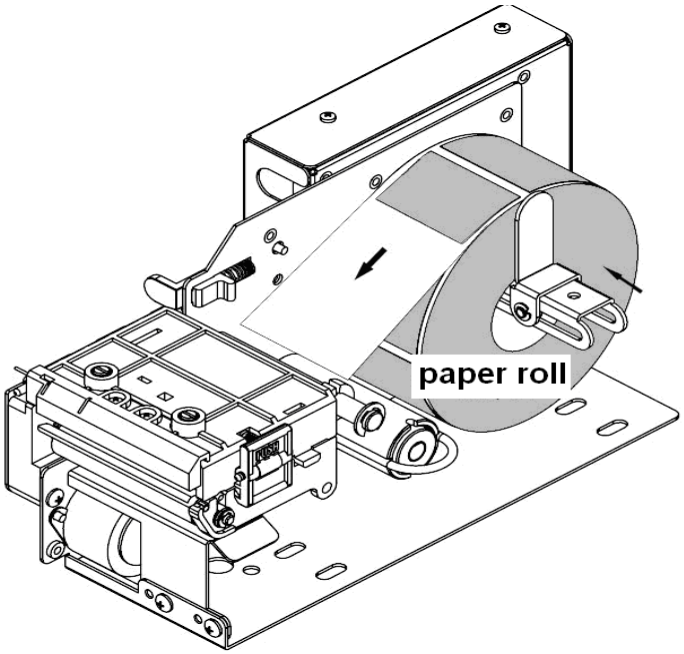
5) Let the mount of thermal label round the tear-off bar, the platen and mount shaft according to the figure as below. Then fix the mount on rewinding shaft with the clip and turn the rewinding shaft to tight the mount according to the direction in the figure as below.



Notice: There is a matched groove of paper rewinding clip which should be put in.

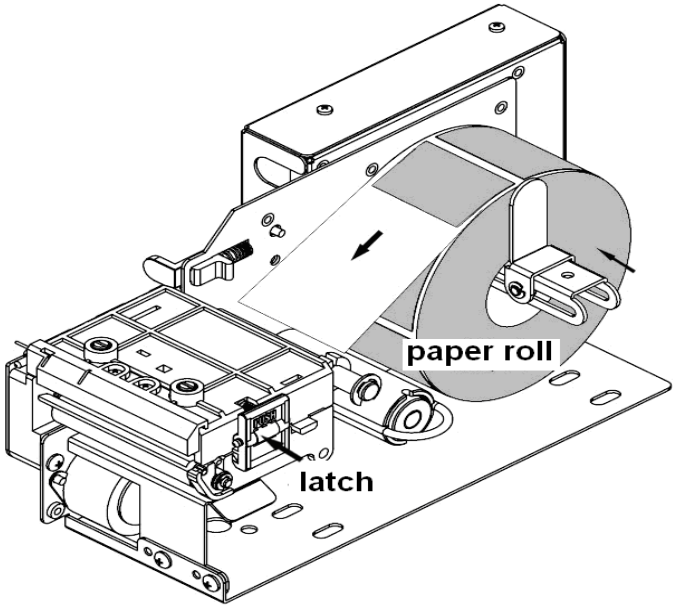
2. Tear-off mode

1) Load thermal label roll onto paper roll shaft.

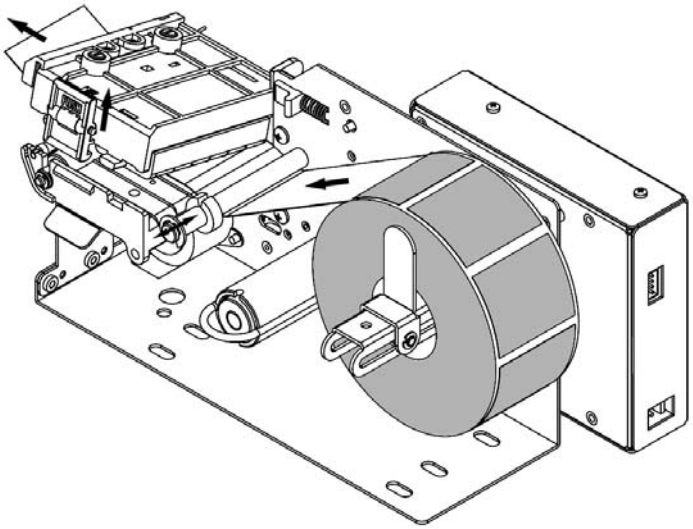


Notice: Paper roll should drop to the end of paper roll shaft. Paper shall run according to above figure during the print. Pay attention to paper roll direction when loading.

2) Press the latch to open top cover of TPH.

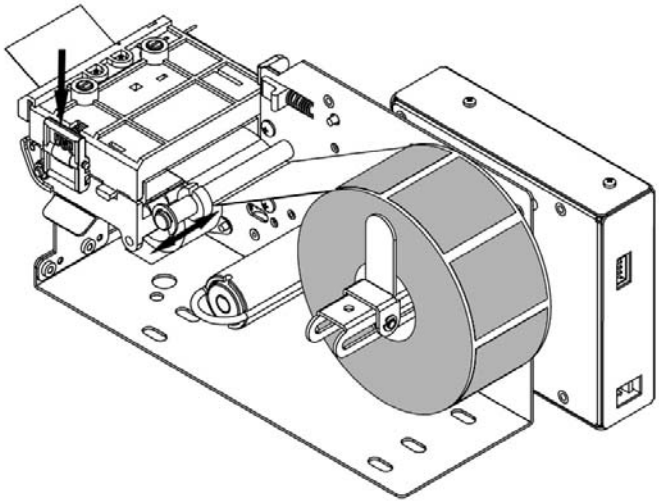


3) Put thermal label round paper guide shaft to enter paper path and press the first label head on the platen.



Notice: Be sure that the lower edge of label should reach the holding surface and the end of first label shall not exceed the tear-off bar of the platen.

4) Close top cover of the printer. According to thermal label width, adjust the paper guide ring up and down until a suitable position. It is recommended that paper guide path should be 0.5 ~1 mm wider than paper.



- Loading thermal continuous paper

  The way of thermal continuous paper load is same with that of thermal label in tear-off mode.

4.6 Printer self-test

1) Be sure that a paper roll is loaded in the printer and top cover is closed;
2) Send checkout command, then the printer shall start paper checkout operation.

5. Routine maintenance

5.1 Cleaning Printhead

When one or more of the following cases occur, clean the Printhead.

- ✧ Printout is not clear.
- ✧ Paper feeds or backs with large noises.
- ✧ Printhead sticks with dirt.

To clean the print head, follow steps given below. (See figure 5.1.1)

1) Turn off the power, glide top cover limitation block and open top cover module to be vertical.
2) Allow a few minutes for print head to cool down if it has just finished printing.
3) Wipe off stains and dust on the heating element of the print head by using a cotton swab dipping with ethyl alcohol.
4) Wait for 5 ~ 10 minutes until alcohol volatilize completely, then close top cover of the printer.

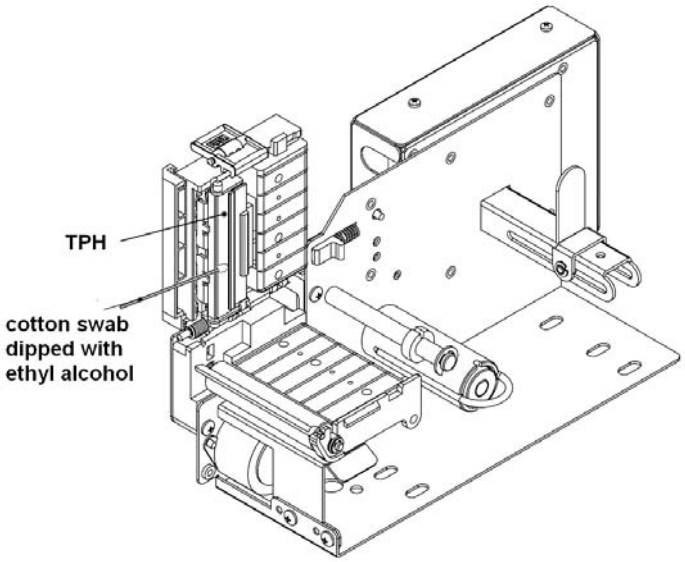


Figure 5.1.1 Cleaning TPH

5.2 Cleaning sensors

When one or more of the following cases occur, clean the sensors.

- ✧ During printing, the printer sometimes stops printing and alarms paper end when there is paper in fact.
- ✧ Doesn’t alarm paper end when paper is used out.
- ✧ Marks cannot be identified correctly.
- ✧ Doesn’t alarm when paper is near end.

To clean sensors, follow steps given below. (See figure 5.2.1)

- ✧ Turn off the power, glide top cover limitation block and open top cover module to be

vertical.

- ✧ With a cotton swab dipping with ethyl alcohol, wipe off stains and dust on the surface of sensors.
- ✧ Wait for 5 ~ 10 minutes until alcohol volatilize completely, then close top cover of the printer.

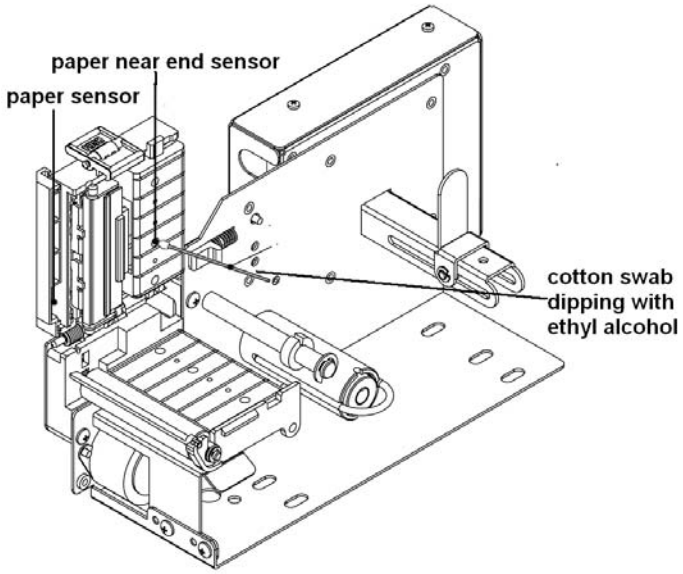


Figure 5.2.1 Cleaning Sensor

5.3 Cleaning platen

When one or more of the following cases occur, clean the platen.

- ✧ Printout is not clear.
- ✧ Page feeds with large noises.

To clean platen, follow steps given below. (See figure 5.3.1)

- ✧ Turn off the power, glide top cover limitation block and open top cover module to be vertical..
- ✧ With a cotton swab dipping with ethyl alcohol, wipe off stains and dust on the surface of platen.
- ✧ Wait for 5 ~ 10 minutes until alcohol volatilize completely, then close top cover of the printer.

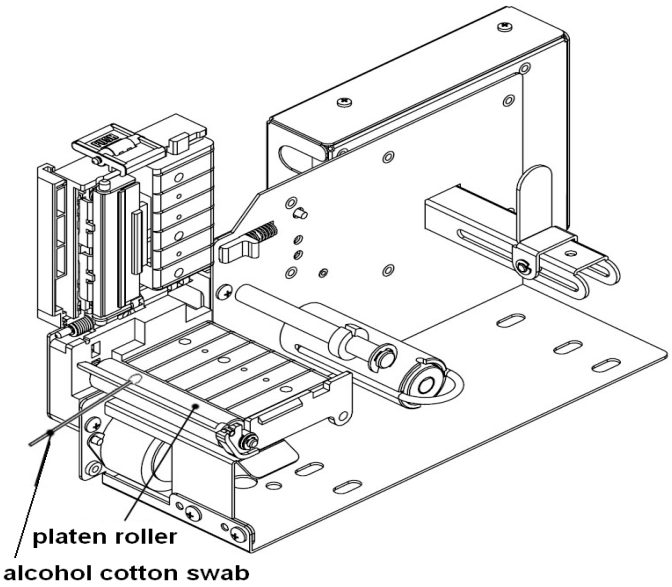


Figure 5.3.1 Cleaning Platen

5.4 Printout adjustment

After the Printhead and platen is cleaned or different media is replaced, you should adjust the pressure of Printhead when following cases still exist.

✧ Printout is light.

✧ Printout is not consistent.

The adjusting steps for Printhead pressure is given as below:

1) Load media in the printer and print a sample;

2) If the printout is light, turn two pressure-adjusting knobs synchronously in clockwise. For each cycle, review the printing sample and stop the adjustment until the printout is satisfied.

3) If the printout is not consistent, turn the pressure-adjusting knob at light side. For each cycle, review the printing sample and stop the adjustment until reaching a satisfied printout.

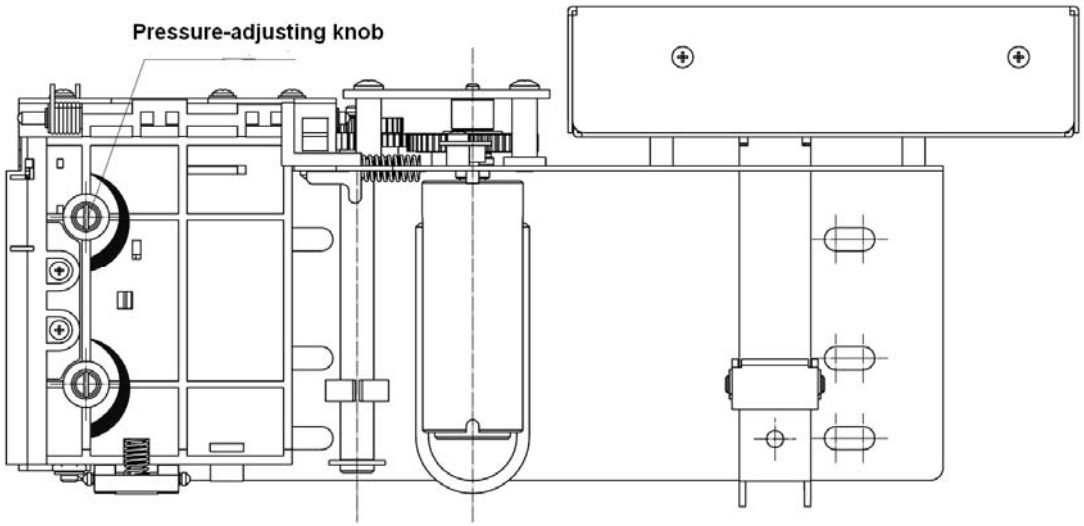


Figure 5.4.1 Pressure Adjustment

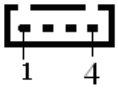
Notice:

- ✧ Before starting routine care, make sure that the printer has been shut down.
- ✧ Do not use organic solvent like gasoline, acetone and etc.
- ✧ Allow a few minutes for ethyl alcohol to evaporate before getting printer into use again.
- ✧ The adjusting mode of the Printhead is stepless. Set the print darkness to a lower grade as long as the print quality is acceptable. This will help to keep the print head durable.
- ✧ When adjusting the Printhead pressure, you should force on it properly. Especially when you reach the limit, do not turns it heavily to avoid the printer damaged.

6. Interface Signal

6.1 Serial interface

The interface cable is customerized and the interface connector is double socket with 4PIN 2.54mm between each other. Pin signal is defined as below figure:



Interface signal order is as below:

Pin No.	Signal name	Signal direction	Function
1	RTS/DTR	Output	Serial handshaking signal
2	TXD	Output	Serial data output port
3	RXD	Input	Serial data input port
4	GND	--	Signal ground

Users can check interface settings via printing configuration sample. The default Serial interface settings: 19200bps baud rate, 8 data bit, without checkout, 1 stop bit, hardware handshaking (shall not check handshaking signal when the printer returns data).

7. Troubleshooting

When the printer works in malfunction, consult the troubleshooting table below. If still problems can not be solved, please contact your local distributor or SNBC.

7.1 Print doesn't function

Problems	Possible causes	How to deal with
Power LED is off and the printer doesn't work	The printer is not powered on	Make sure printer is powered on
	Circuit board is damaged	Contact with your local distributor or SNBC

7.2 Error LED and Buzzer

Problems	Possible causes	Solutions
Error LED flashes and buzzer beeps	Printhead overheated	Turn off printer power and wait until Printhead temperature is normal.
	Input voltage is abnormal	Turn off printer power and check input voltage
	Paper end	Load a new paper roll and send command (0x10 0x05 0x01) or power on again.
	Label position detected is wrong	Send a command for removing the error or press down paper feed key
	Paper Checkout error	Make paper checkout again or replace paper
	Serious problem occurs	Contact with SNBC or your local distributor

7.3 Problems during printing

Problems	Possible causes	Solutions
Printout is light or spotty.	Printhead is damaged	Replace it with new one
The printer fails to position during the printing	Parameter of paper senor changed	Proceed paper checkout again
Paper sensor is disabled	Outside light is too strong or shine on paper sensor directly	Reduce outside ray or avoid it shining on paper sensor directly.