

HYBRID PRINTER HSP7000 SERIES

Hardware Manual



star 

“This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.”

**Federal Communications Commission
Radio Frequency Interference
Statement**

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

For compliance with the Federal Noise Interference Standard, this equipment requires a shielded cable.

This statement will be applied only for the printers marketed in U.S.A.

Trademark acknowledgments

HSP7000: Star Micronics Co., Ltd.

Notice

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- The above notwithstanding, STAR can assume no responsibility for any errors in this manual.

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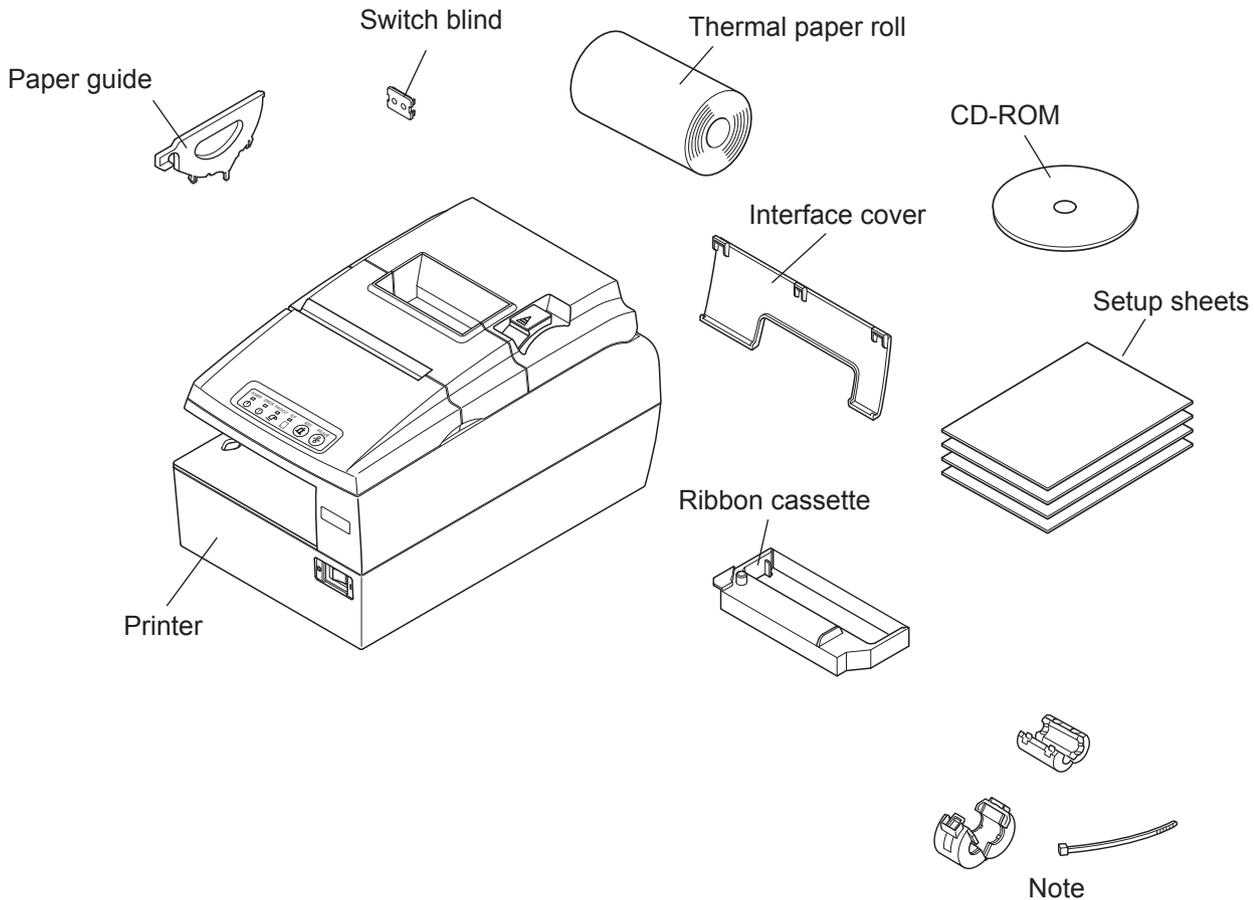
Please access the following URL

<http://www.star-m.jp/eng/dl/dl02.htm>
for the latest revision of the manual.

1. Unpacking and Installation

1-1. Unpacking

After unpacking the unit, check that all the necessary accessories are included in the package.



Note: The ferrite core and fastener provided with your printer depend on your printer configuration.

Fig. 1-1 Unpacking

If anything is missing, contact the dealer where you bought the printer and ask them to supply the missing part. Note that it is a good idea to keep the original box and all the packing materials just in case you need to pack the printer up again and send it somewhere at a later date.

1-2. Choosing a place for the printer

Before actually unpacking the printer, you should take a few minutes to think about where you plan to use it. Remember the following points when doing this.

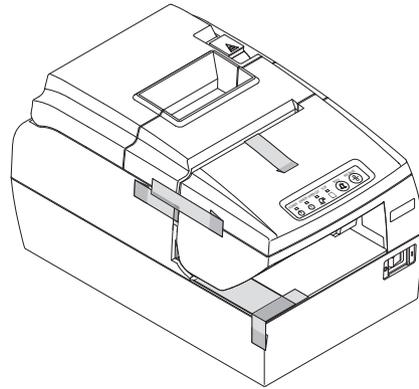
- ✓ Choose a firm, level surface where the printer will not be exposed to vibration.
- ✓ The power outlet you plan to connect to for power should be nearby and unobstructed.
- ✓ Make sure that the printer is close enough to your host computer for you to connect the two.
- ✓ Make sure that the printer is not exposed to direct sunlight.
- ✓ Make sure that the printer is well away from heaters and other sources of extreme heat.
- ✓ Make sure that the surrounding area is clean, dry, and free of dust.
- ✓ Make sure that the printer is connected to a reliable power outlet. It should not be on the same electric circuit as copiers, refrigerators, or other appliances that cause power spikes.
- ✓ Make sure that the room where you are using the printer is not too humid.

⚠ WARNING

- ✓ Shut down your equipment immediately if it produces smoke, a strange odor, or unusual noise. Immediately unplug the equipment and contact your dealer for advice.
- ✓ Never attempt to repair this product yourself. Improper repair work can be dangerous.
- ✓ Never disassemble or modify this product. Tampering with this product may result in injury, fire, or electric shock.

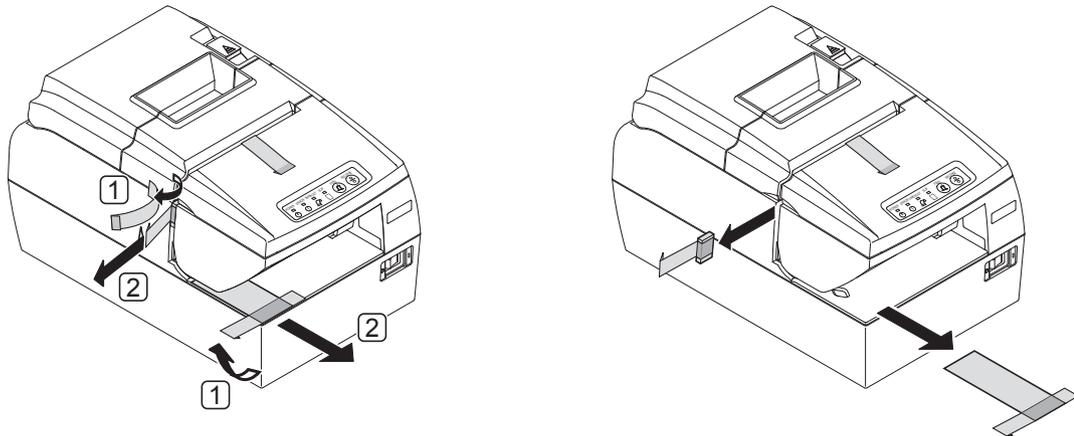
1-3. Removing the protective materials

Four protective materials are inserted into the printer to protect components during shipping.



Before using the printer, be sure to remove all protective materials as shown in the illustration.

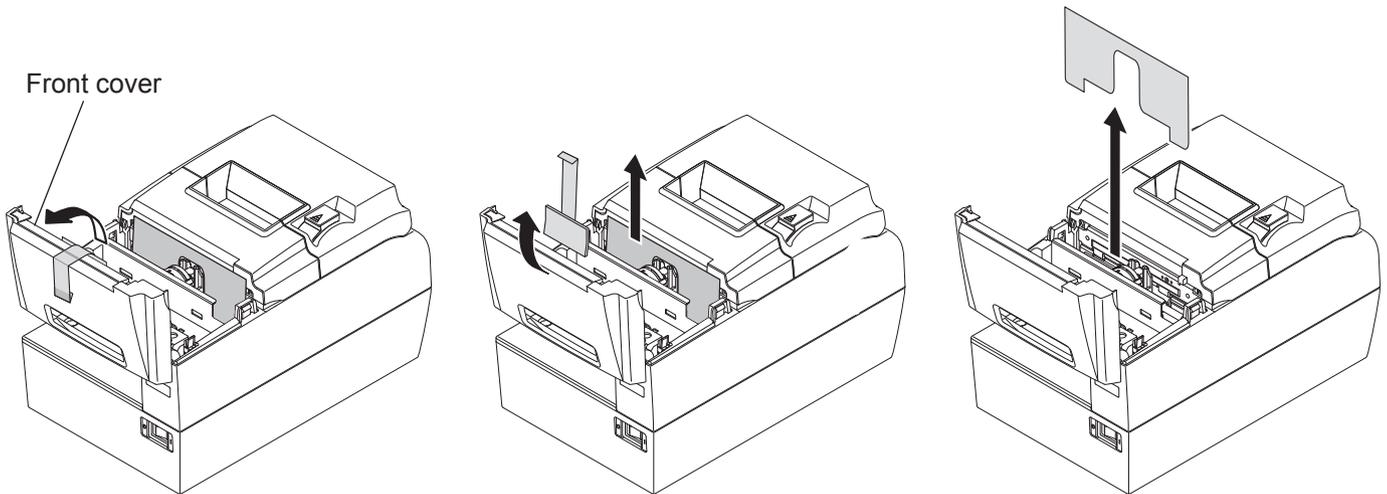
(1) Remove the three tapes and pull the two protective sheets.



(2) Open the front cover.

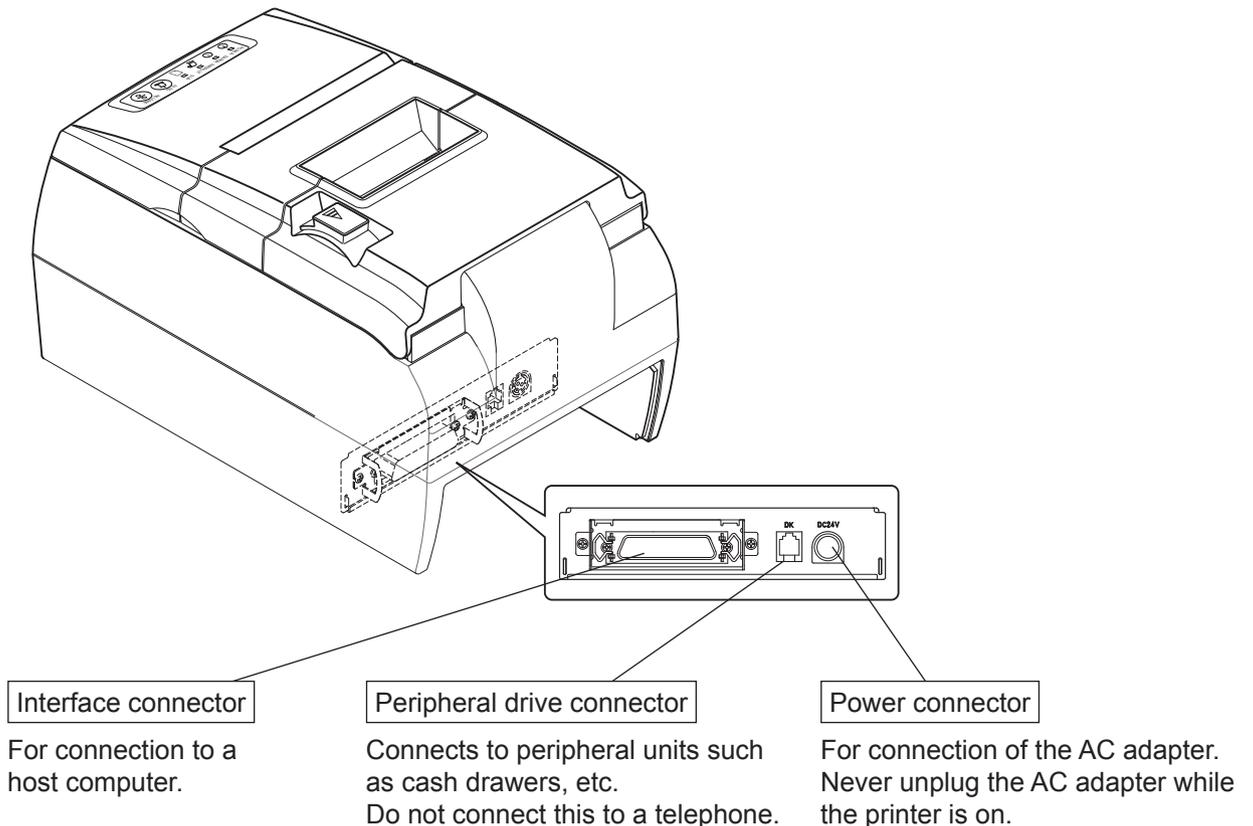
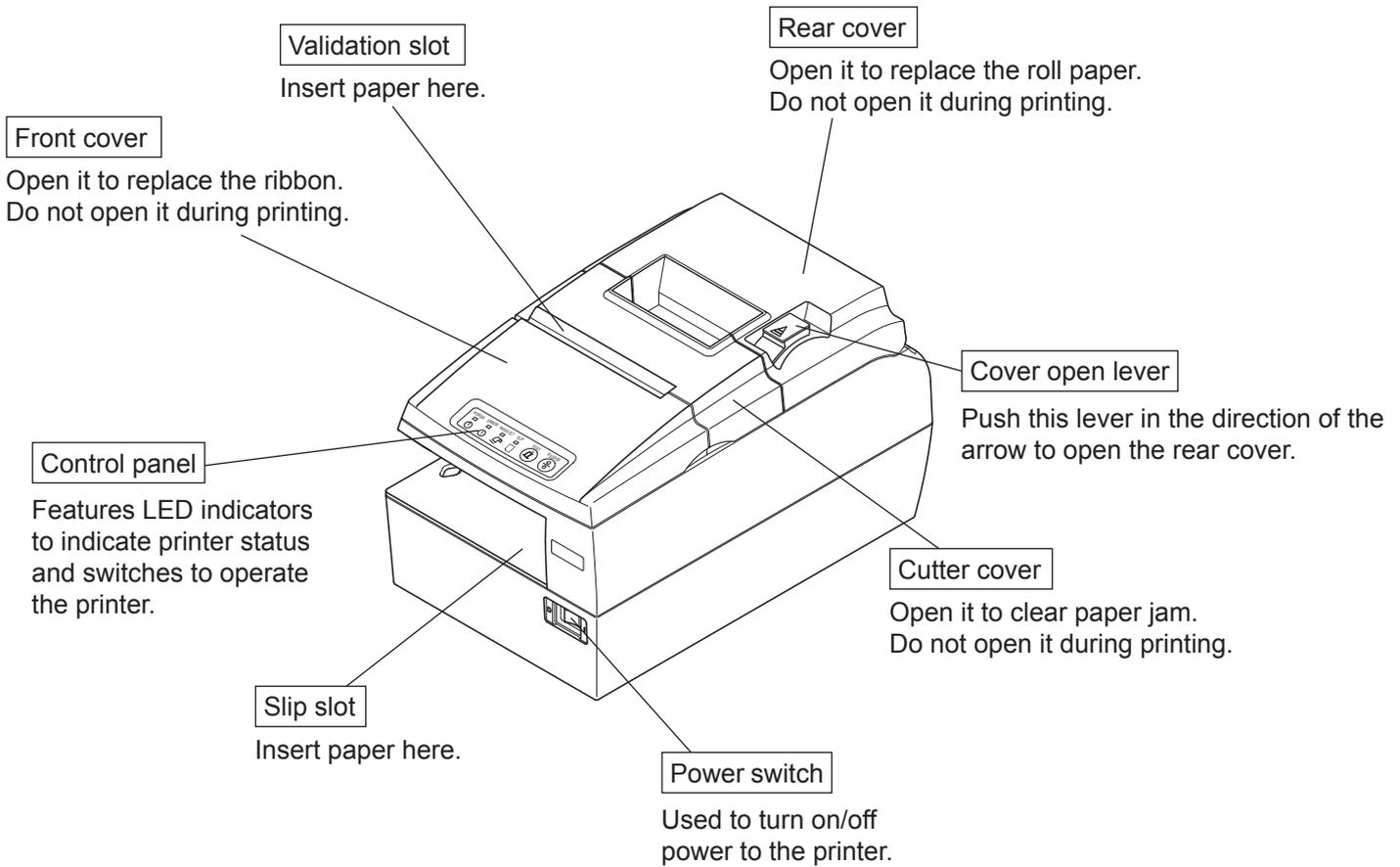
Remove the tape on the front cover, and then remove the sheet.

Next, pull the protective sheet that is securing the head straight out of the unit.



Note: That it is a good idea to keep all protective materials in case you will need to pack the printer up again and send it somewhere at a later date.

2. Parts Identification and Nomenclature



3. Setup

3-1. Connecting the Interface Cable to the PC

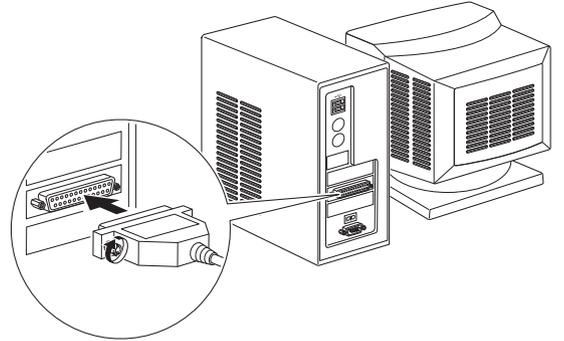
⚠ CAUTION

The optional USB, PoweredUSB, and LAN cables have been designed specifically for this unit (HSP7000).

Other USB, PoweredUSB, and LAN cables may not meet the EMC technical standards.

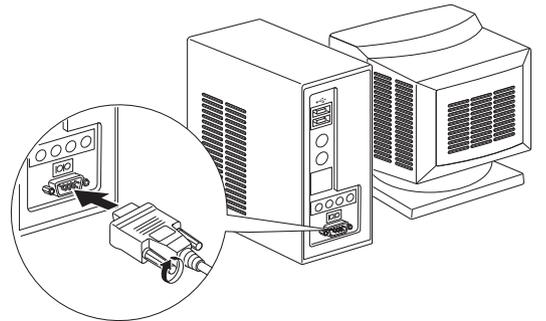
3-1-1. Parallel Interface Cable

Connect the parallel interface cable to a parallel port of your PC.



3-1-2. RS-232C Interface Cable

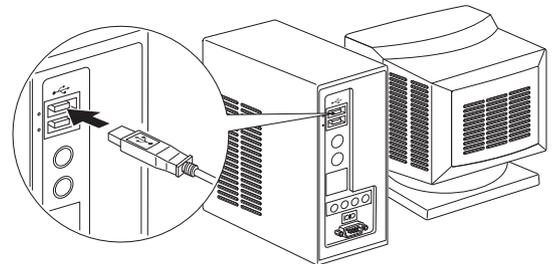
Connect the RS-232C interface cable to a RS-232C port of your PC.



3-1-3. USB Interface Cable

Connect the USB interface cable to a USB port of your PC.

Option: USB cable 1.8M TSP1 (P/N: 30729100)

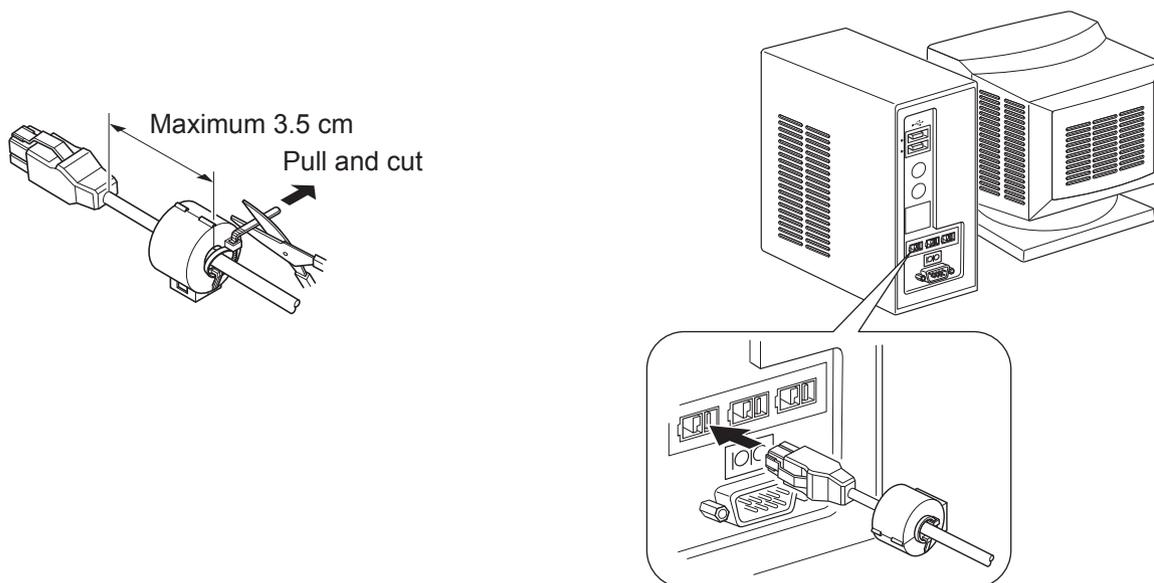


3-1-4. PoweredUSB Interface Cable

Attach the ferrite core to the PoweredUSB interface cable, and connect the cable to a PoweredUSB port of your PC.

Option: POWERED USB CABLE 1X8LNL 1.2M (P/N: 30729130)

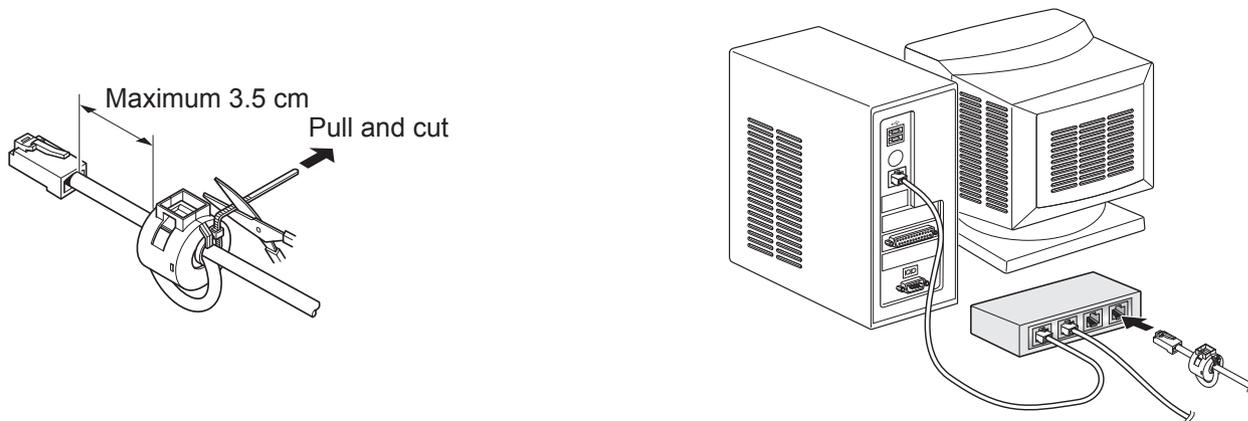
Star Recommended PCI Card: PCI to 4 Port PoweredUSB Card (Model: 301-1150-01; manufacturer: Digi)



3-1-5. Ethernet Interface cable

Attach the ferrite core to the Ethernet interface cable, and connect the cable to an Ethernet port of your PC.

Option: LAN cable 1.0M TSP1E (P/N: 30729200)



3-2. Connecting the Interface Cable to the Printer

Note that the interface cable is not provided. Please use a cable that meets specifications.

⚠ CAUTION

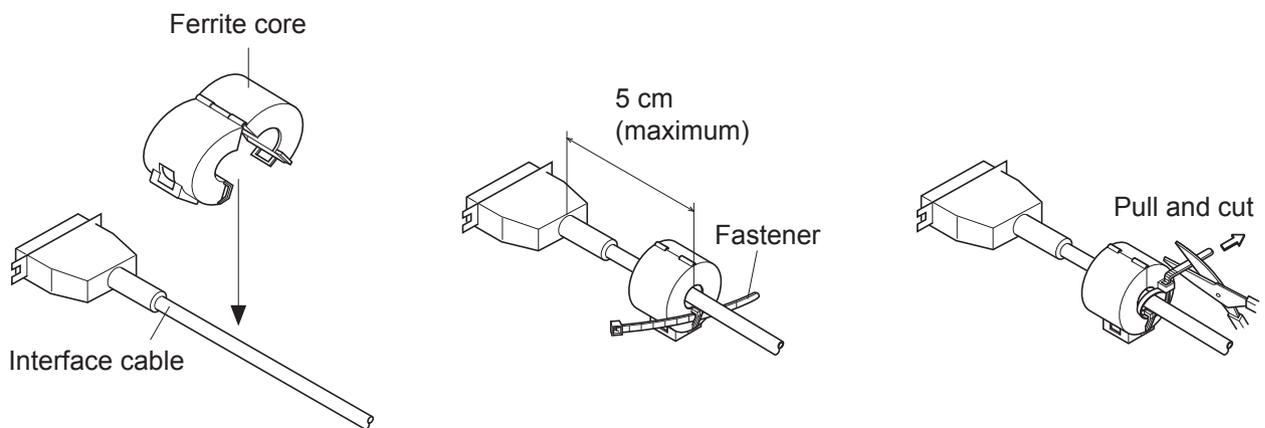
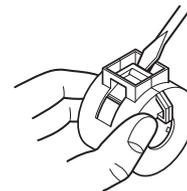
The optional USB, PoweredUSB, and LAN cables have been designed specifically for this unit (HSP7000).

Other USB, PoweredUSB, and LAN cables may not meet the EMC technical standards.

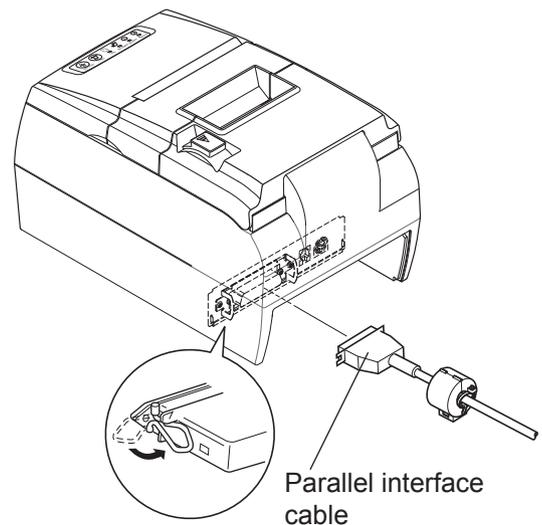
Before connecting or disconnecting an interface cable (except when using a PoweredUSB cable), be sure to disconnect the plug of the AC adapter power cable from the outlet.

3-2-1. Parallel Interface Cable

- (1) Make sure the printer is turn off.
- (2) Affix the ferrite core onto the cable as shown in the illustration.
- (3) Pass the fastener through the ferrite core.
- (4) Loop the fastener around the cable and lock it. Use scissors to cut off any excess.



- (5) Connect the interface cable to the connector on the rear panel of the printer.
- (6) Fasten the connector clasps.



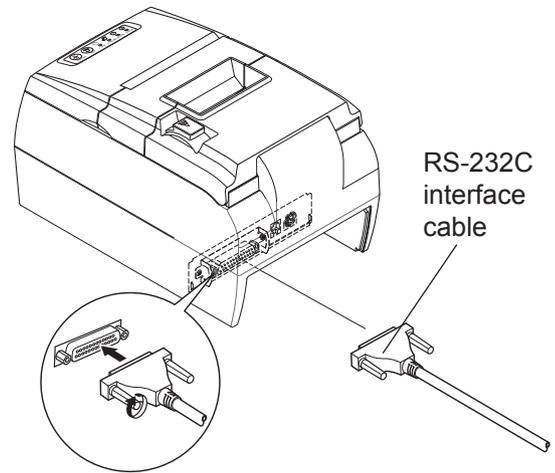
3-2-2. RS-232C Interface Cable

- (1) Make sure the printer is turn off.

⚠ CAUTION

Before connecting/disconnecting the interface cable, make sure that power to the printer and all the devices connected to the printer is turned off. Also make sure the power cable plug is disconnected from the AC outlet.

- (2) Connect the interface cable to the connector on the rear panel of the printer.
- (3) Tighten the connector screws.

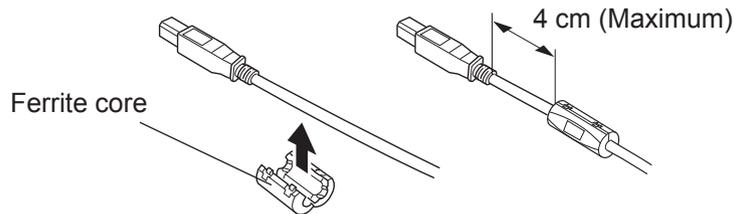


3-2-3. USB Interface Cable

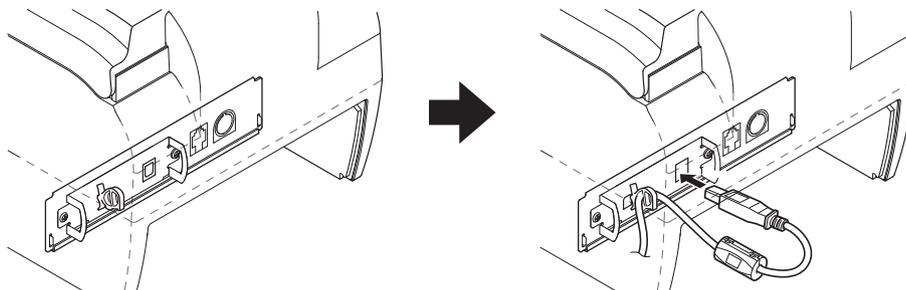
Affix the ferrite core onto the USB cable as shown in the illustration below and make sure to pass the cable through the cable support as shown in the illustration.

Option: USB CABLE 1.8M TSP1 (P/N: 30729100)

- (1) Affix the supplied ferrite core onto the USB cable as shown in the illustration.



- (2) Secure the cable with the cable hook.
- (3) Insert the plug of the USB interface cable into the USB interface connector of the printer as shown in the illustration.



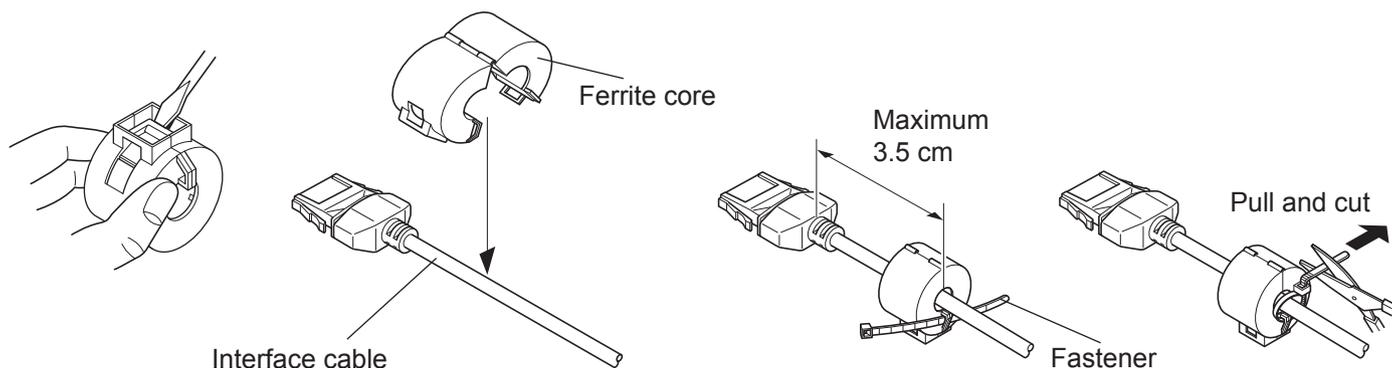
3-2-4. PoweredUSB Interface Cable

- (1) Turn the power switch off.
- (2) If connected to an AC adapter, pull the power cord plug from the outlet and then pull the plug from the power connector on the printer side.

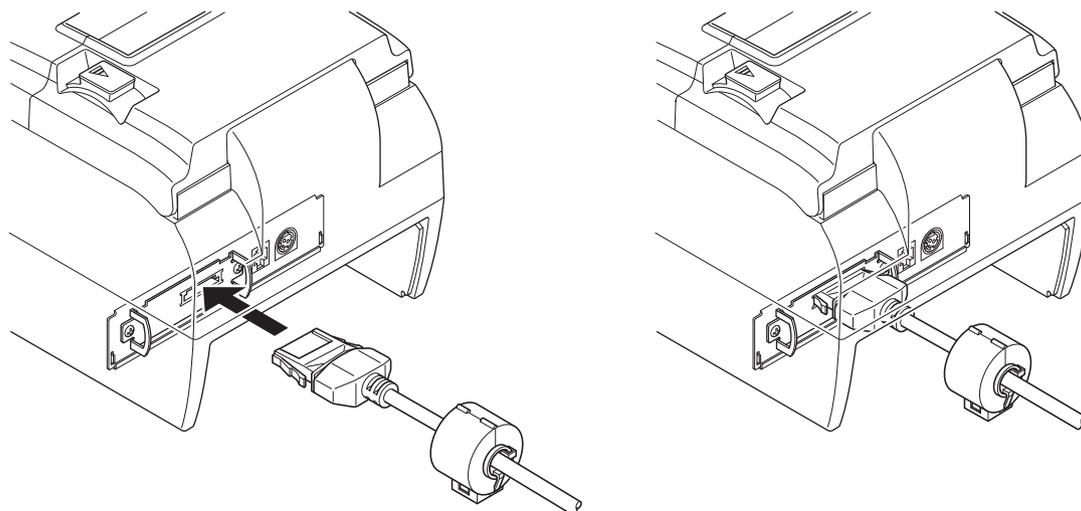
⚠ CAUTION

If connecting a PoweredUSB cable, do not connect the AC adapter because this can cause a malfunction.

- (3) Affix the ferrite core onto the cable as shown in the illustration.
Option: POWERED USB CABLE 1X8LNL 1.2M (P/N: 30729130)
- (4) Pass the fastener through the ferrite core.
- (5) Loop the fastener around the PoweredUSB interface cable and lock it.
Use scissors to cut off any excess.



- (6) Connect the interface cable to the connector on the rear panel of the printer.

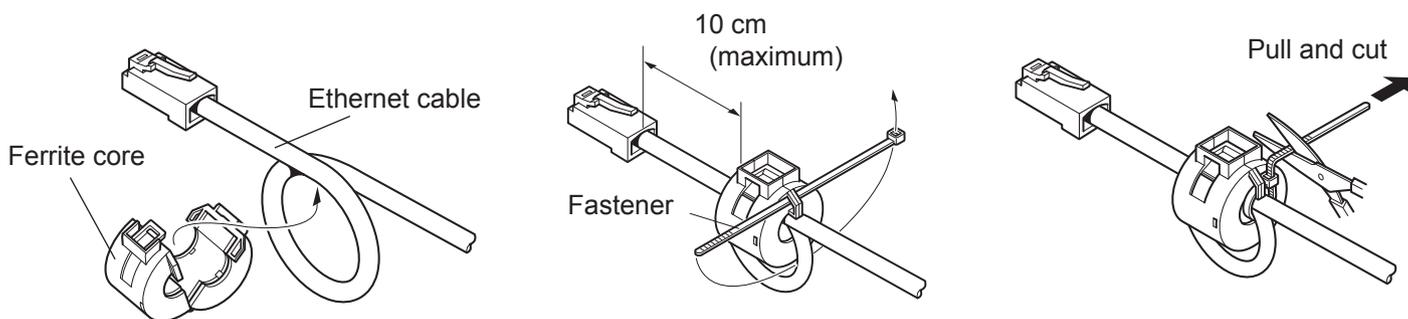
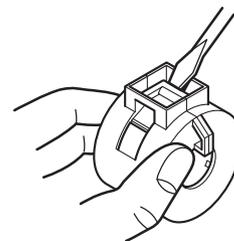


3-2-5. Connecting Ethernet Interface Cable

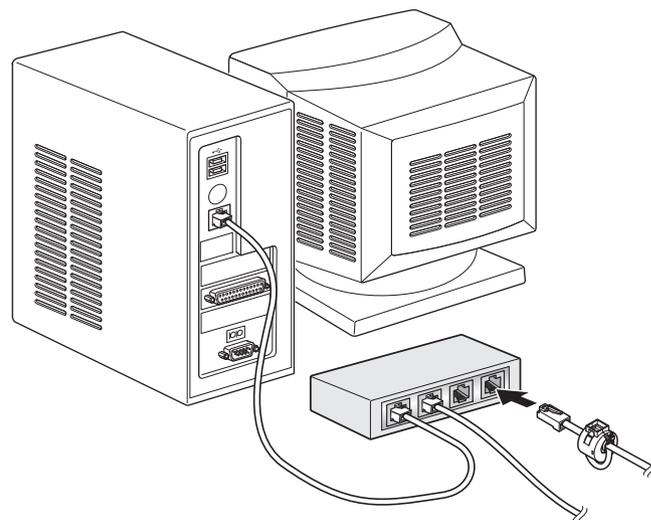
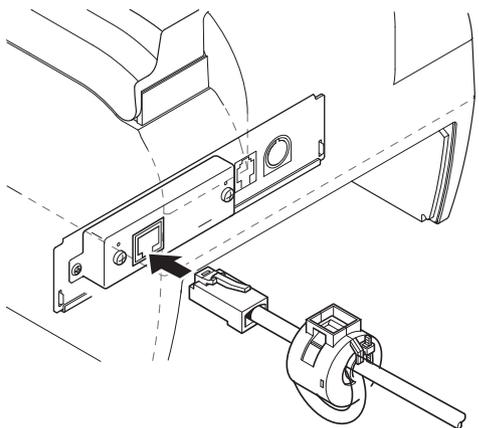
To protect the unit from electromagnetic interference, affix the two supplied ferrite cores to the printer and router (hub) sides of the cable, respectively. Follow the instructions given below.

Option: LAN CABLE 1.0 M TSP1E (P/N: 30729200)

- (1) Make sure the printer is turned off.
- (2) Affix the ferrite core onto the Ethernet cable as shown in the illustration below.
- (3) Pass the fastener through the ferrite core.
- (4) Loop the fastener around the cable and lock it. Use scissors to cut off any excess.



- (5) Connect the interface cable to the connector on the rear panel of the printer.



3-3. Installing the Printer Software

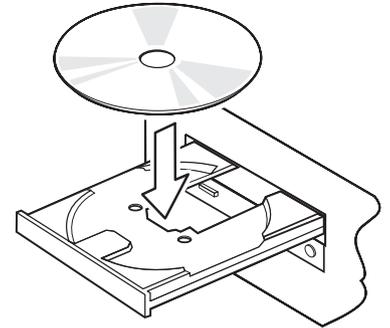
Here is the procedure for installing the printer driver and utility software, which are stored on the supplied CD-ROM.

The procedure applies to the Windows operating systems shown below.

For Macintosh and Linux, refer to the software manual in the Mac folder or Linux folder of the CD-ROM.

- Windows 2000
- Windows XP
- Windows Vista 32-Bit/64-Bit

- (1) Turn ON the power to your PC to start Windows.
- (2) Insert the supplied CD-ROM (Drivers and Utilities) into the CD-ROM drive.
- (3) Follow the instructions that appear on the screen.
- (4) The dialog shown in the illustration indicates that the procedure has been completed. Click “Finish”.



The dialog that appears on the screen varies with your system. This completes the installation of the printer software. A message will appear, prompting you to restart. Restart Windows.

For instruction on the Windows Vista 64-Bit, refer to the software manual located in the “Documents” folders on the CD-ROM.

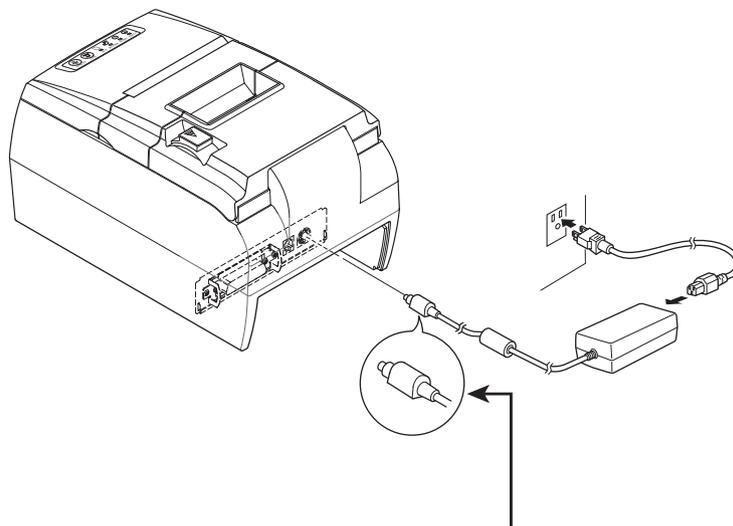
3-4. Connecting the Optional AC Adapter

Note: Before connecting/disconnecting the AC adapter, make sure that power to the printer and all the devices connected to the printer is turned off. Also make sure the power cable plug is disconnected from the AC outlet.

- (1) Connect the AC adapter to the power cable.

Note: The optional AC adapter has been designed specifically for this unit (HSP7000). Other AC adapters may not meet the EMC technical standards.
Option: PS60A-24A

- (2) Connect AC adapter to the connector on the printer.
- (3) Insert the power cable plug into an AC outlet.



⚠ CAUTION

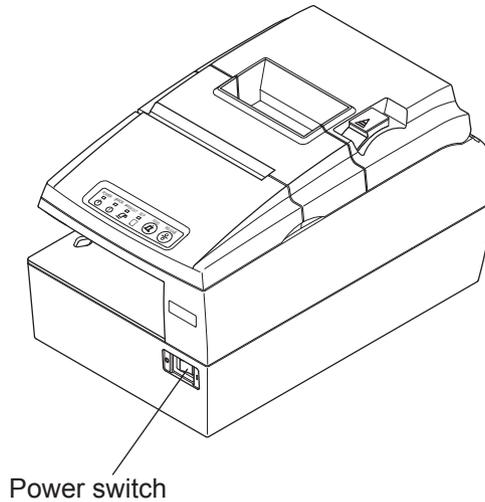
When disconnecting the cable, take hold of the cable connector to pull it out. Releasing the lock makes it easy to disconnect the connector.

Pulling the cable excessively could cause damage to the connector.

3-5. Turning Power On

Make sure that the Power cord has been connected as described in 3-4.

Turn ON the power switch located on the front of the printer.
The POWER lamp on the control panel will light up.



⚠ CAUTION

We recommend that you unplug the printer from the power outlet whenever you do not plan to use it for long periods. Because of this, you should locate the printer so that the power outlet it is plugged into is nearby and easy to access.

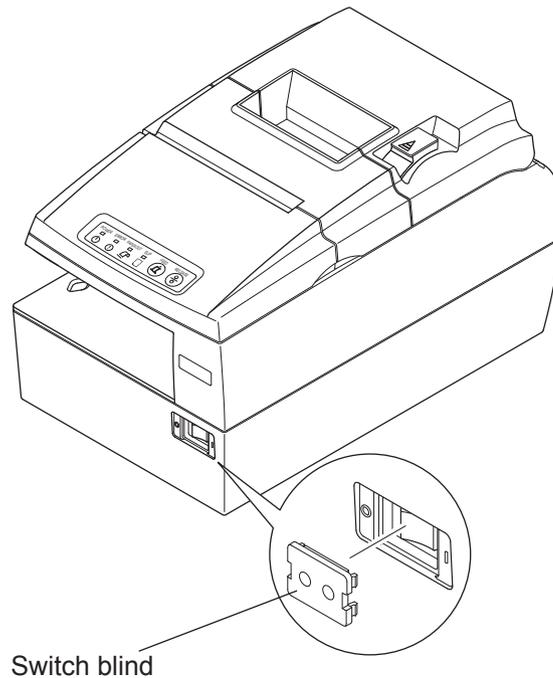
When an Switch blind is affixed to the printer above the power switch, the ON/OFF marks of the power switch may be hidden. If this occurs, remove the power cord from the outlet to turn the printer OFF.

3-6. Switch Blind Installation

It is not necessary to install the switch blind. Only install it if it is necessary for you. By installing the switch blind, the following become possible.

- Preventing the power switch from being operated by mistake.
- Ensuring that other people can not easily operate the power switch.

Install the switch blind as shown in the diagram below.



The power switch can be turned ON (I) and OFF (O) by inserting a narrow instrument (ball pen etc.) in the holes in the switch blind.

⚠ CAUTION

We recommend that you unplug the printer from the power outlet whenever you do not plan to use it for long periods. Because of this, you should locate the printer so that the power outlet it is plugged into is nearby and easy to access.

3-7. Connecting to a Peripheral Unit

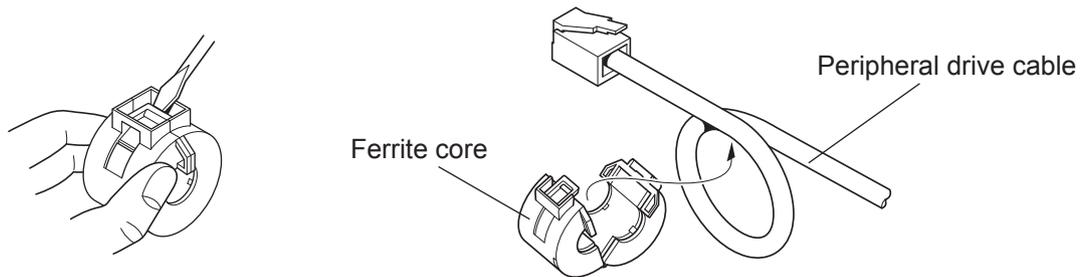
You can connect a peripheral unit to the printer using a modular plug.

See “15. Peripheral Unit Drive Circuit” for details about the type of modular plug that is required. Note that this printer does not come with a modular plug or wire, so it is up to you to obtain one that suits your needs.

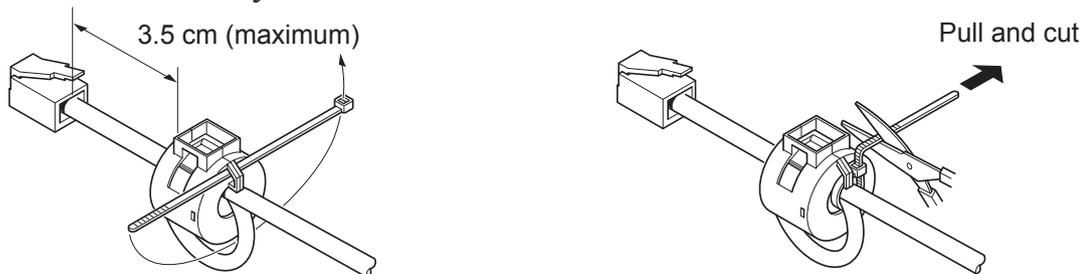
⚠ CAUTION

Make sure that the printer is turned off and unplugged from the AC outlet and that the computer is turned off before making connections.

- (1) Make sure the printer is turned off.
- (2) Affix the ferrite core onto the peripheral drive cable as shown below.



- (3) Pass the fastener through the ferrite core.
- (4) Loop the fastener around the peripheral drive cable and lock it.
Use scissors to cut off any excess.

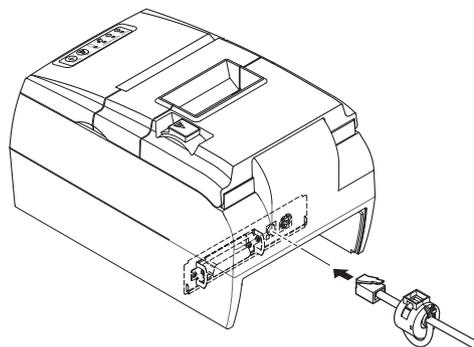


- (5) Connect the peripheral drive cable to the connector on the rear panel of the printer.

⚠ CAUTION

Do not connect a telephone line into the peripheral drive connector. Failure to observe this may result in damage to the printer.

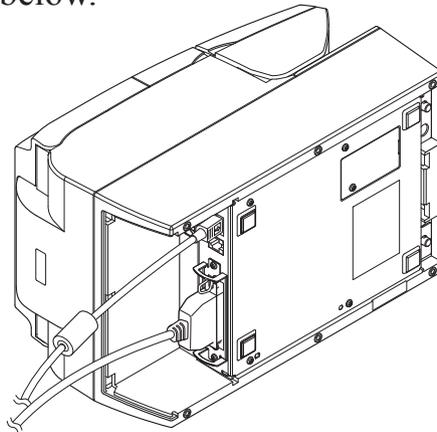
Also, for safety purposes, do not connect wiring to the external drive connector if there is a chance it may carry peripheral voltage.



3-8. Attaching the Interface Cover

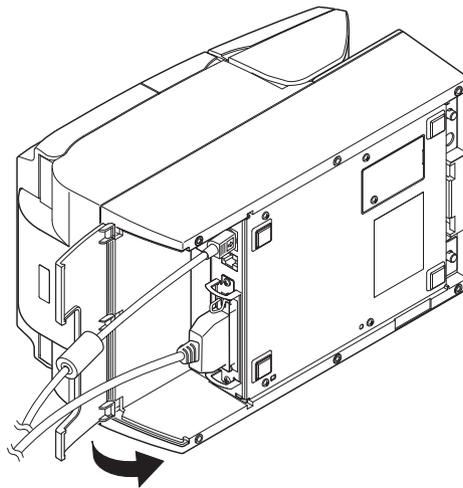
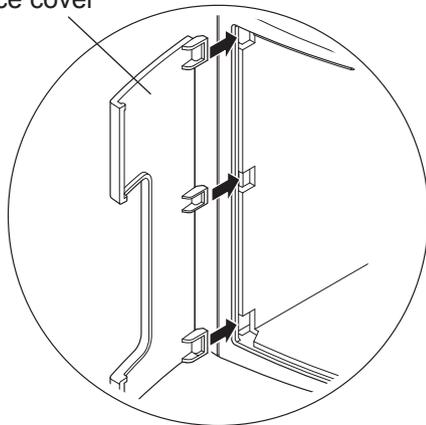
It is not necessary to attach the interface cover. Only attach it if it is necessary for you. Attach the interface cover as shown in the illustration.

- (1) Place the printer as shown below.

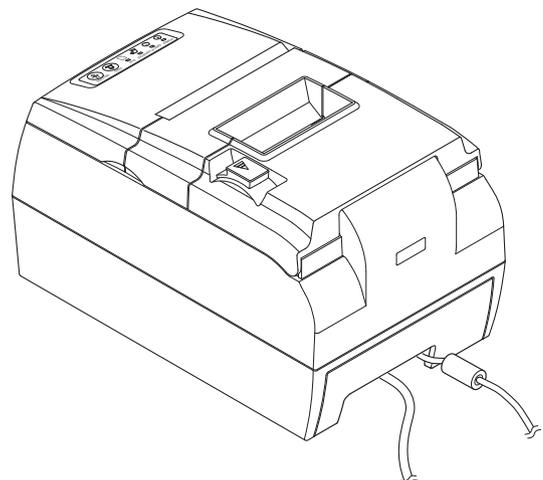
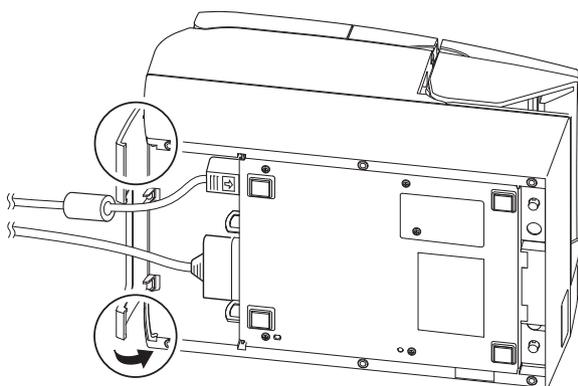


- (2) Install the interface cover by aligning the tabs on the interface cover with the grooves in the printer case.

Interface cover



- (3) Place the AC cable and the interface cable in the cutout of the interface cover. Then, install the interface cover until the both ends of the interface cover click into place.



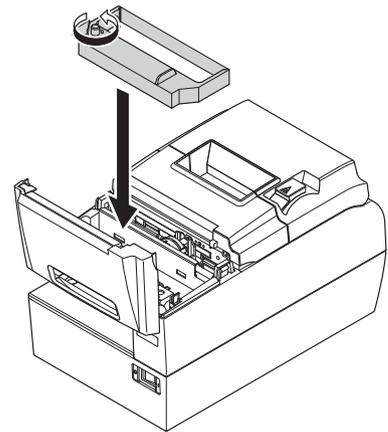
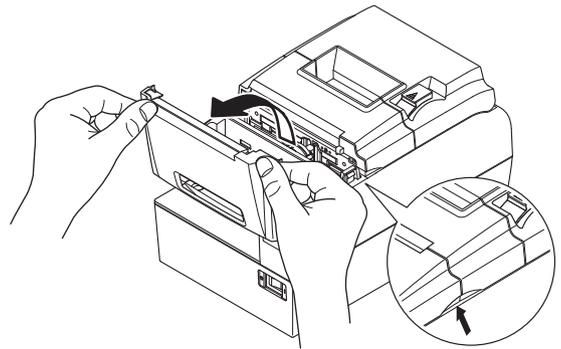
4. Loading the Ribbon Cartridge and Paper

4-1. Loading the Ribbon Cartridge

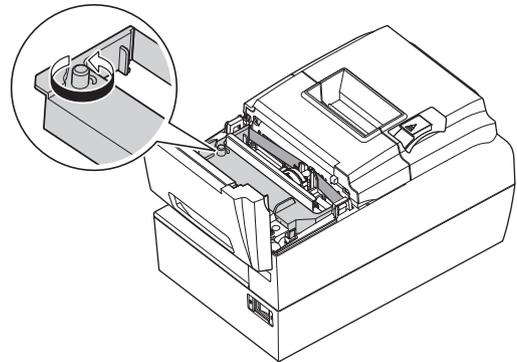
- (1) Turn off power to the printer.
- (2) Open the front cover by holding the finger grips on both ends of the cover and lifting it up.

Important!

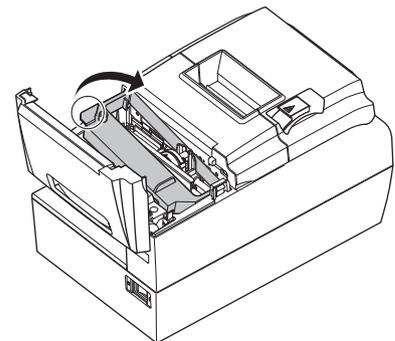
1. Do not touch the print head immediately after printing as it can be extremely hot.
2. Do not touch the cutter blade.
 - There is a cutter inside the paper outlet slot. Not only should you not put your hand in the paper outlet slot while printing is in progress, never put your hand into the outlet even when printing is not in progress.



- (3) Place the ribbon cartridge in the direction shown in the figure and press it down to load it. If loading of the ribbon cartridge is not satisfactory, press down the cartridge while rotating the ribbon feed knob in the direction of the arrow.
- (4) Turn the ribbon feed knob of the ribbon cartridge in the direction of the arrow to remove slack in the ribbon.



- (5) Close the front cover.
Note: When removing the ribbon cartridge, raise the finger grip as shown in the figure.



4-2. Loading the Paper Roll

4-2-1. Using 79.5 mm Width Paper Roll

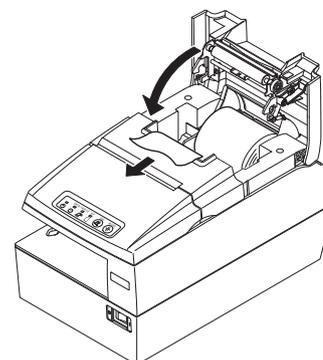
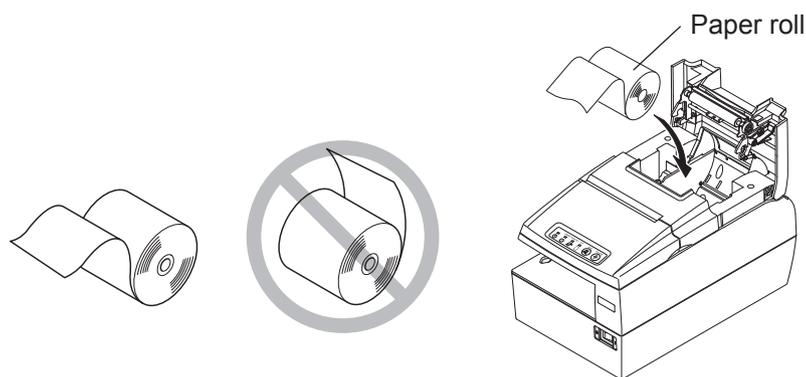
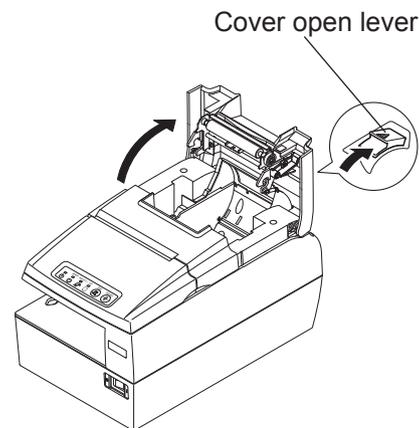
Be sure to use roll paper that matches the printer's specification.

When using a paper roll with an 57.5 mm width, install the paper guide as described on the following page.

- (1) Push the cover open lever, and open the printer cover.
- (2) While observing the direction of the roll, set the paper roll into the hollow, and pull on the leading edge of the paper toward you.

⚠ CAUTION

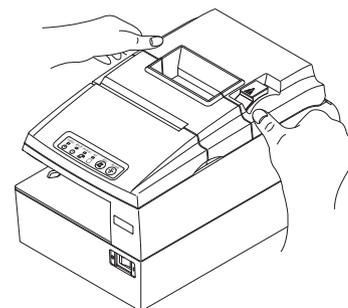
Do not pull out the end of the paper diagonally, as it will cause the paper to become jammed or skewed.



- (3) Push down both sides of the printer cover to close.

Note: Make sure that the printer cover is securely closed.

- (4) If the printer cover is closed after turning on the power, the cutter operates automatically and the front end of the paper is cut.



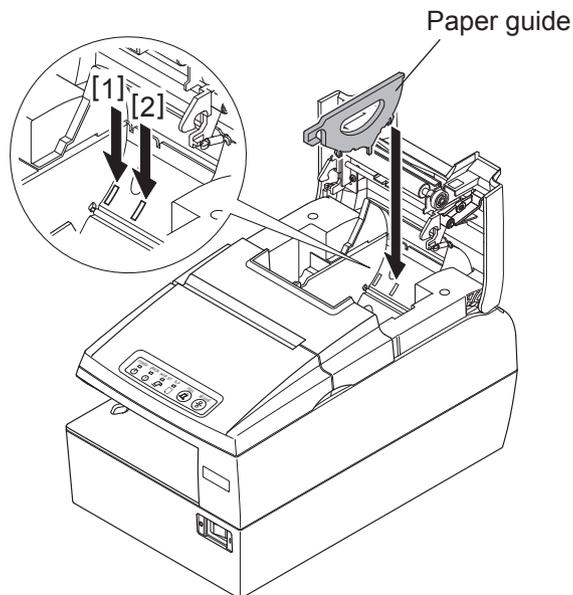
4-2-2. Using 57.5/75.5 mm Width Paper Roll

When using a paper roll with 57.5 or 75.5 mm width, install the supplied paper guide on the printer.

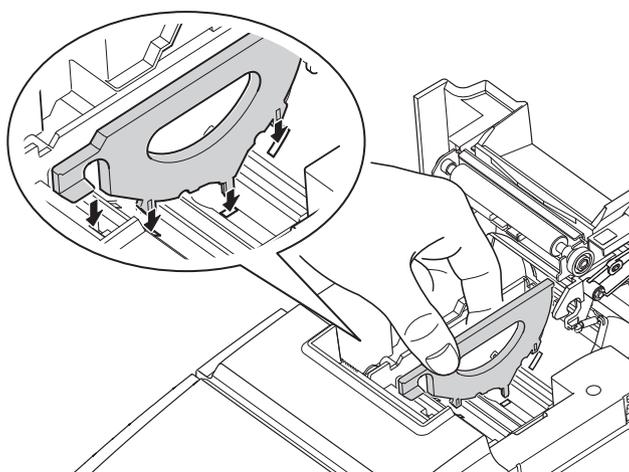
To change the effective print width (roll paper width), change the setting at memory switch configuration Utility. For details on the setting of the memory switches, refer to the software manual located in the “Documents” folders on the CD-ROM.

(1) Install the roll paper guide in the unit as illustrated below.

To use a 75.5 mm width paper roll, align the roll paper guide in hole [1], and to use a 57.5 mm width paper roll, align it in hole [2].



(2) Install the roll paper guide in the unit by aligning it with the holes and grooves as illustrated below.



Note: After using a paper roll with a width of 57.5 mm, do not change to a paper roll with a width of 79.5 or 75.5 mm. (This is because the printer head has deteriorated as a result of a portion of the head having been in direct contact with the platen.)

After using a paper roll with a width of 75.5 mm, do not change to a paper roll with a width of 79.5 mm. for same reason.

4-3. Loading the Slip Paper or Validation Paper

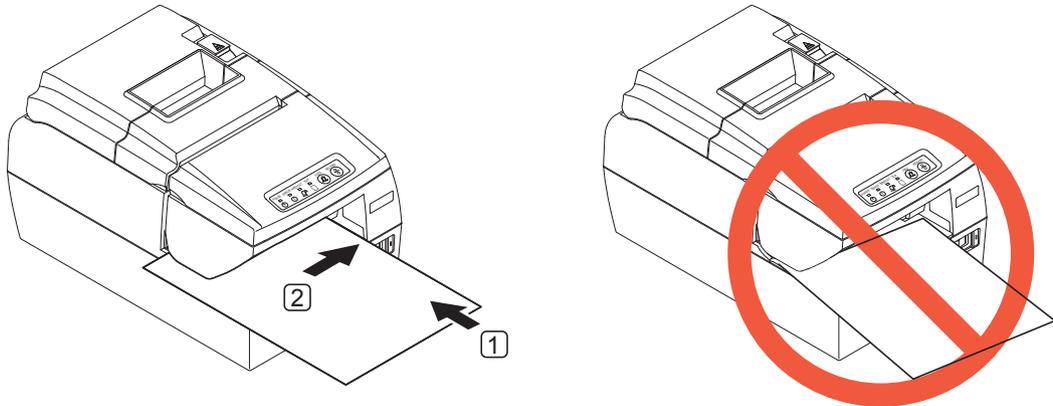
Before starting printing, make sure the ribbon cassette is placed in the printer. (See “4-1. Loading the Ribbon Cartridge” for details.)

Insert the paper as follows:

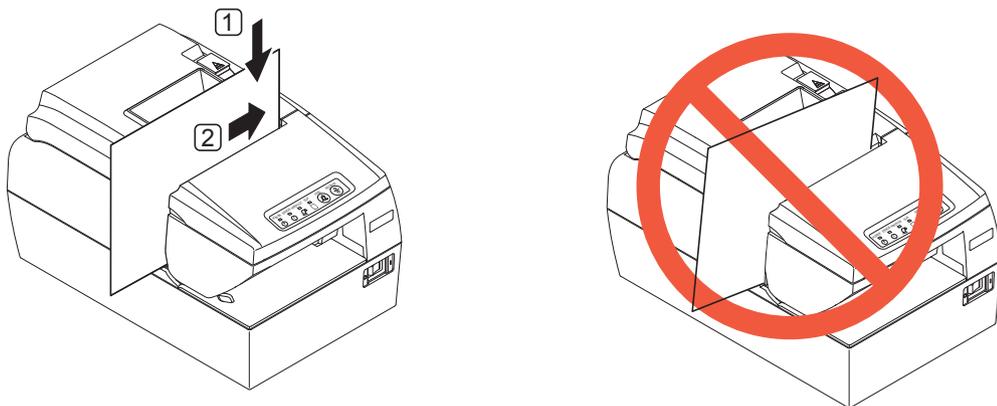
- (1) Turn the printer power switch ON.
- (2) Insert the paper as illustrated below. Facing the printer, insert the paper straight, while sliding the right end of the paper against the right end of the slip paper slot. Alternatively, insert the paper straight from the top.

Note: Sliding the paper diagonally can cause a paper jam. If the paper gets jammed, press the RELEASE button to remove the paper. Then, insert the paper again. (See “8-2. Removing Paper Jam” for details.)

Inserting Slip Paper



Inserting Validation Paper



- (3) When the printer detects a paper, it automatically feeds the paper and starts printing.
- (4) After completing printing, the printer will automatically release the paper.

Note: Be sure to use a type of paper that matches the printer’s specifications. (See “5-2-1. Specifications”.) Do not use paper that is curled, kinked, wrinkled, warped, or torn.

4-4. Scanning MICR Characters

The insertion direction for MICR paper varies according to the model.

HSP7543 (no MICR scanning head): MICR characters cannot be scanned.

HSP7643 (MICR scanning head installed above):

Insert the MICR paper with the MICR characters facing up.

HSP7743 (MICR scanning head installed below):

Insert the MICR paper with the MICR characters facing down.

Insert a MICR paper as follows:

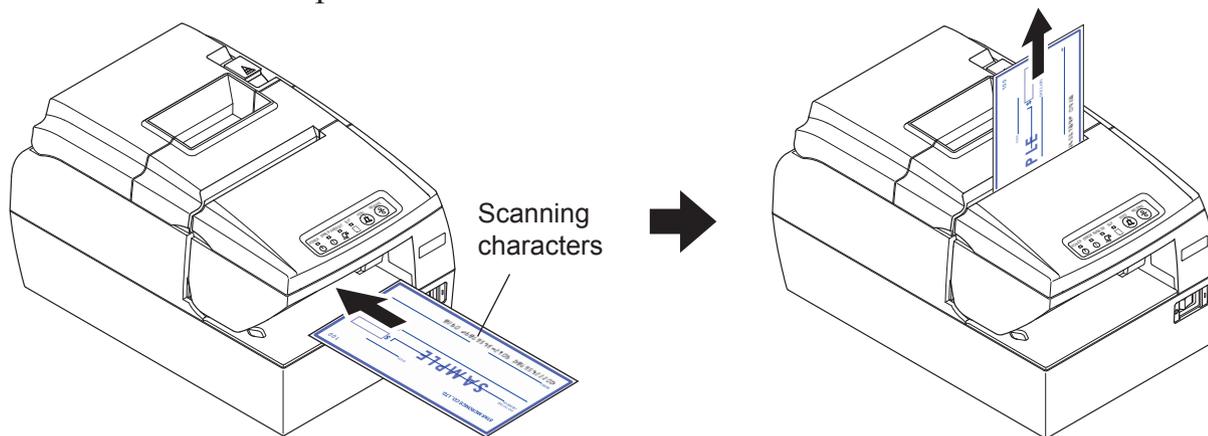
- (1) Turn the printer power switch ON.
- (2) Make sure the SLIP lamp is flashing.
- (3) As you face the printer, insert the paper straight, while sliding the right end of the MICR paper against the right end of the slip paper slot.

Note: Sliding the paper diagonally can cause a paper jam.

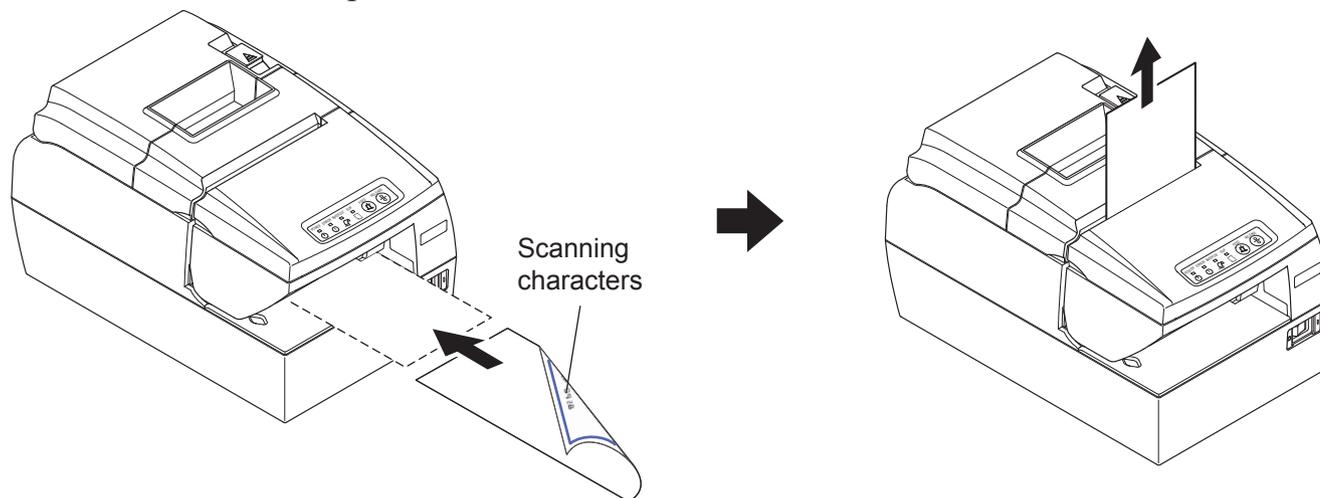
If the paper gets jammed, press the RELEASE button to remove the paper. Then, insert the paper again. (See “8-2. Removing Paper Jam” for details.)

- (4) When the MICR paper reaches the scanning position, the SLIP lamp will turn ON.

<Direction of MICR Paper on HSP7643>



<Direction of MICR Paper on HSP7743>



Notes:

- 1) For MICR scanning, do not place the printer near devices that generate magnetism or in an area that can expose the printer to shocks or vibration. Placing the printer in such areas can negatively affect its scanning performance. Before putting the printer into actual operation, verify the printer's scanning performance by performing trial scans at its installed location.
- 2) Use flat MICR paper that is not curled, kinked, wrinkled, warped, or torn. Otherwise, the ink ribbon could become abraded or soiled, or it could cause a paper jam.
- 3) Do not use MICR paper with clips, staples, or debris attached to it. Otherwise, it could damage the MICR scanning head, in addition to causing a paper jam.

Caution Symbol



This symbol is placed near the slip print head to indicate that it may be hot. Never touch the slip print head immediately after the printer has been used. Let the print head cool for a few minutes before touching it.



This symbol is placed near the thermal print head to indicate that it may be hot. Never touch the thermal print head immediately after the printer has been used. Let the print head cool for a few minutes before touching it. Observe the precautions for handling electrostatic sensitive devices.



This symbol is placed near the cutter. Never touch the cutter blade, as you could injure your fingers.



This symbol is placed near the peripheral drive connector. Do not connect this to a telephone.

WARNING

- ✓ *Shut down your equipment immediately if it produces smoke, a strange odor, or unusual noise. Immediately unplug the equipment and contact your dealer for advice.*
 - ✓ *Never attempt to repair this product yourself. Improper repair work can be dangerous.*
 - ✓ *Never disassemble or modify this product. Tampering with this product may result in injury, fire, or electric shock.*
 - ✓ *Do not touch the cutter blade.*
 - *There is a cutter inside the paper outlet slot. Not only should you not put your hand in the paper outlet slot while printing is in progress, never put your hand into the outlet even when printing is not in progress.*
 - *The printer cover can be opened when replacing the paper. However, since the cutter blade is on the inside of the printer cover, be careful not to place your face or hands too close to the cutter blade.*
 - ✓ *During and immediately after printing, the area around the print head is very hot. Do not touch it, as you could be burned.*
 - ✓ *Since working on the cutter may be dangerous, be sure to turn off the printer first.*
-

⚠ CAUTION

- ✓ *We recommend that you unplug the printer from the power outlet whenever you do not plan to use it for long periods. Because of this, you should locate the printer so that the power outlet it is plugged into is nearby and easy to access.*
- ✓ *If the voltage shown on the label on the of your printer does not match the voltage for your area, contact your dealer immediately.*
- ✓ *Make sure that the printer is turned off and unplugged from the AC outlet and that the computer is turned off before making connections.*
- ✓ *Do not connect a telephone line into the peripheral drive connector.
Failure to observe this may result in damage to the printer.
Also, for safety purposes, do not connect wiring to the external drive connector if there is a chance it may carry peripheral voltage.*
- ✓ *Do not operate the open lever while pressing on the rear cover with your hand.*
- ✓ *Do not pull the open lever and open the rear cover when printing is in progress or when the auto cutter is operating.*
- ✓ *Do not pull out paper while the rear cover is closed.*
- ✓ *If liquids, foreign objects (coins and paper clips), and so on enter the printer, turn off the printer, unplug it from the AC outlet, and contact your dealer for advice.
Continued use could cause a short circuit, which may result in fire or electric shock.*
- ✓ *The heating element and the driver IC of the thermal head are easily damaged. Do not touch them with metal objects, sandpaper, etc.*
- ✓ *Printing quality may suffer if the thermal head heating element becomes soiled by being touched with your hands. Do not touch the thermal head heating element.*
- ✓ *There is a risk of damage to the driver IC of the thermal head from static electricity. Never directly touch the IC.*
- ✓ *The printing quality and working life of the thermal head cannot be guaranteed if any thermal paper other than that recommended is used. In particular, thermal paper containing [Na⁺, K⁺, Cl⁻] may drastically reduce the working life of the thermal head. Please exercise caution.
The use of paper with a maximum ion density of Na⁺ 500 ppm, K⁺ 150 ppm, and Cl⁻ 300 ppm is recommended.*
- ✓ *Do not operate the printer if there is moisture on the front surface of the head from condensation, etc.*

⚠ Notes on Using the Auto Cutter

- ✓ *To print after a cut, feed 1 mm (8-dot line) or more of paper.*
 - ✓ *If the cutter is not in its home position after an error, first eliminate the cause of the error; then, turn the power back ON.*
 - ✓ *A margin of 5 mm or more is recommended from the end of the printed area to the cutting position.*
 - ✓ *Do not attempt to remove the paper during a cut, as this can cause a paper jam.*
-

5. Consumable Parts and AC Adapter

Use paper that meets the specifications.

5-1. Thermal Paper Roll

5-1-1. Paper roll specification

- (1) Thickness: Normal paper 65~85 μm (excluding Mitsubishi HiTec F5041)
Label paper 65~150 μm (cutter is not supported)
- (2) Width: General thermal paper 79.5 \pm 0.5 mm (57.5 \pm 0.5 mm/75.5 \pm 0.5 mm when the paper roller holder is used)
Label paper 76.5 \pm 0.5 mm
- (3) Outer roll diameter: \varnothing 83 mm or less
Take up paper roll width: 80 $^{+0.5}_{-1}$ mm or (58 $^{+0.5}_{-1}$ mm/76 $^{+0.5}_{-1}$ mm when the paper roller holder is used)
- (4) Core outer/inner diameter
- | Paper type | Core outer | Core inner |
|---------------|-----------------------------|-------------------------------|
| Normal paper: | \varnothing 18 \pm 1 mm | \varnothing 12 \pm 1 mm |
| Label paper: | \varnothing 32 \pm 1 mm | \varnothing 25.4 \pm 1 mm |
- (5) Printed surface: Outer edge of roll * Do not use an inner wrapped roll paper.

CAUTION

- 1) Do not glue or tape the roll paper and shaft core together.
- 2) Do not use paper rolls that have the tail end folded.
- 3) The trailing edge should not be folded.

5-1-2. Recommended paper

Manufacturer	Product name	Quality characteristics/Use	Paper thickness (μm)
Mitsubishi Paper Mills Limited	P220AG	normal type paper	65 (thickness)
	HP220AB-1	high image stability paper	75 (thickness)
	P220AGB	normal type paper, card ticket	80 (thickness)
	PB670	2 color paper: Red & Black	75 (thickness)
	PB770	2 color paper: Blue & Black	75 (thickness)
Mitsubishi HiTec Paper Flensburg GmbH	F5041	normal type paper	60 (thickness)
Oji Paper Co., Ltd.	PD150R	normal type paper	75 (thickness)
	PD160R	high image stability paper	65/75 (thickness)
	PD170R	high image stability paper	75 (thickness)
	PD190R	middle image stability paper	75 (thickness)
	PD750R	2 color paper: Red & Black	75 (thickness)
	PD700R	2 color paper: Blue & Black	75 (thickness)
Nippon Paper Industries	TF50KS-E2D	normal type paper	65 (thickness)

Manufacturer	Product name	Quality characteristics/Use	Paper thickness (μm)
Kanzaki Specialty Papers Inc. (KSP)	P320RB	2 color paper: Red & Black	65 (thickness)
	P320BB	2 color paper: Blue & Black	65 (thickness)
Lintec	LD2114	Label	115 (thickness)

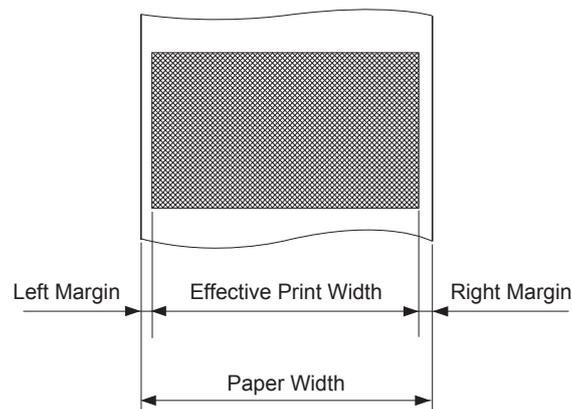
Note:

- 1) Depending on the type and thickness of the paper, it may be necessary to change the settings for printing darkness. To change the darkness settings, use the printing darkness settings command <ESC><RS> 'd' n or the memory switch. Please consult the dealer for details.
- 2) The print density may vary depending on the type of paper roll, operating environment, and power consumption mode.
- 3) A reader or scanner may not be able to scan a printed bar code or characters depending on the print density.
Make sure that your reader or scanner is able to scan correctly beforehand.

5-1-3. Effective Print Width

Paper Width (mm)	Right / Left Margin (mm)	Effective Print Width (mm)	Number of Print Columns (12 × 24 Font)
79.5 ± 0.5	3.75	72	48
75.5 ± 0.5	3.75	68	45
57.5 ± 0.5	Left 2.75, Right 3.75	51	34

Label Width (mm)	Right / Left Margin (mm)	Effective Print Width (mm)	Number of Print Columns (12 × 24 Font)
76.5 ± 0.5	2	72	48



5-2. Slip Paper

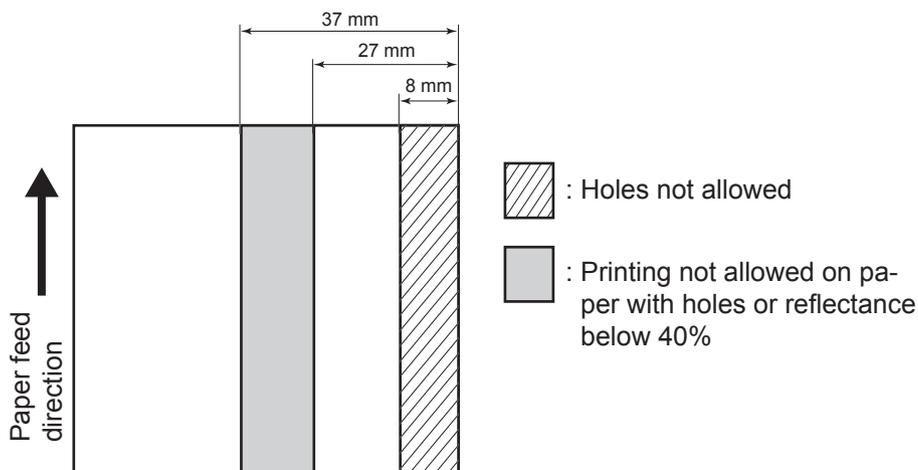
5-2-1. Specifications

- (1) Width: 68 ~ 230 mm
- (2) Length: 75 ~ 297 mm
- (3) No. of copies: original + 3 copies
- (4) Total thickness: 1 sheet 0.09 ~ 0.15 mm (up to A4 portrait)
0.09 ~ 0.20 mm (up to A6 portrait)
4 sheets 0.09 ~ 0.31 mm
- (5) Copy slippage: 1.5 mm or less per 15 lines (between original and bottom-most paper)
- (6) Adhesive: top-bound = good; right-bound = acceptable;
left-bound = acceptable; bottom-bound = unacceptable

Note: Be particularly careful with paper that has adhesive on the left end because it might feed diagonally.

Note:

- 1) Do not use paper that is curled, kinked, wrinkled, warped, or torn.
- 2) Do not use paper that has holes in the positions shown below, and do not print on the back of paper that has low reflectance, because they can cause the paper sensor to operate improperly.

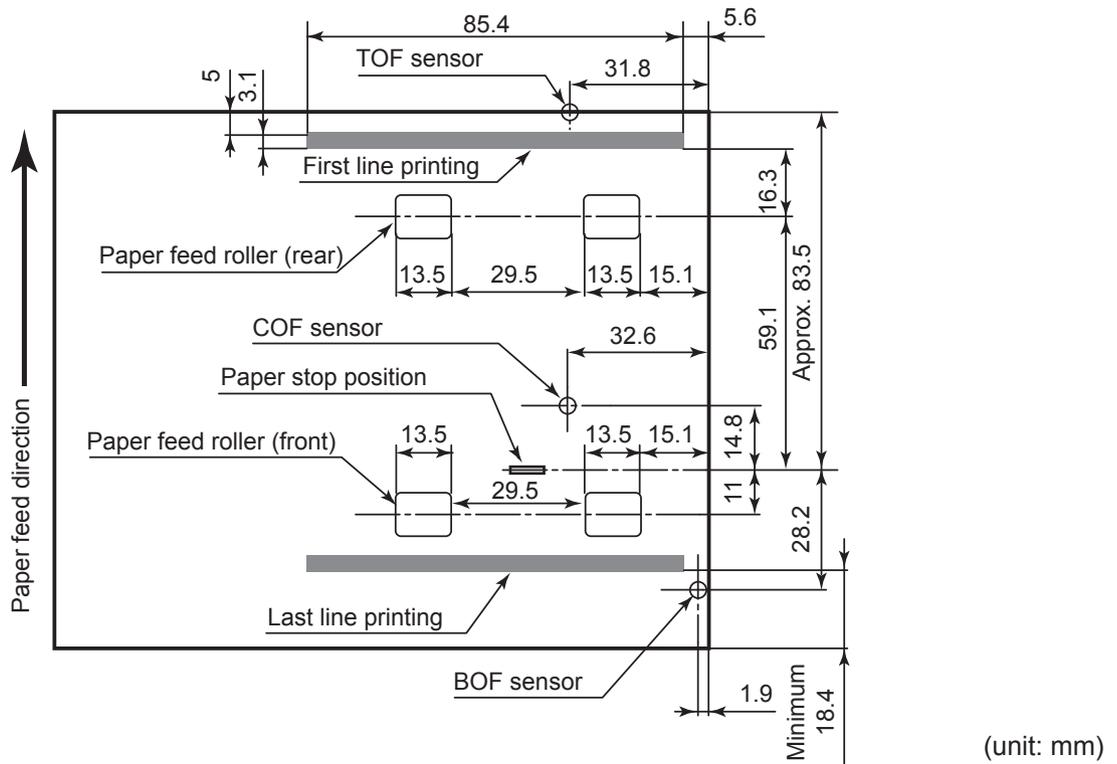


- 3) The copying performance of the printer is greatly affected by the ambient temperature. Therefore, print under the conditions described below.

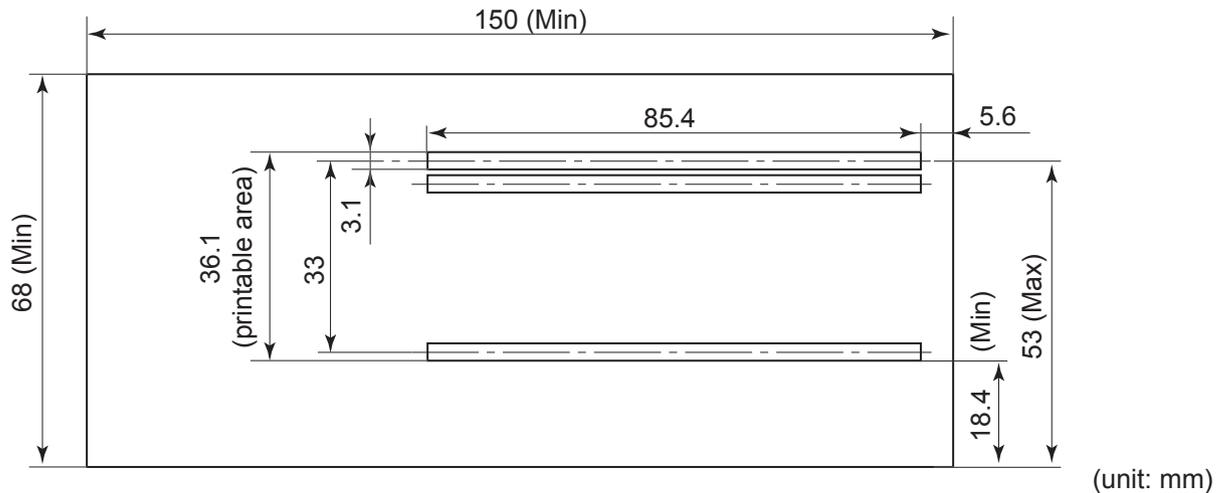
Number of copies	Ambient temperature
Original + 3 copies	10 ~ 40°C
Original + 1 copy	5 ~ 45°C

5-2-2. Slip Printing Area

The printing position is as shown in the diagram below.



5-2-3. Validation Printing Range



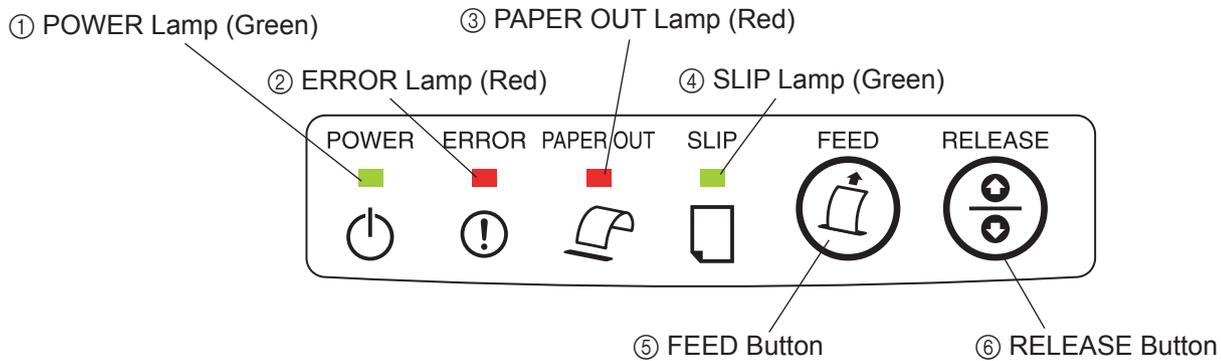
5-3. AC adapter (option)

Note: The optional AC adapter has been designed specifically for this unit (HSP7000). Other AC adapters may not meet the EMC technical standards. In addition, use of other AC adapters may result in damage to the printer, fire or electric shock.

Model name: PS60A-24A
 Input: 90 to 264 V AC, 50/60 Hz
 Output: DC24 V \pm 5%, 2.0 A (5.0 A Load 10 sec. Max.)

6. Control Panel and Other Functions

6-1. Control Panel



- ① POWER Lamp (Green)
Lights when the printer is online.
Describes various errors in combination with other lamps.
- ② ERROR Lamp (Red)
Lights when the cover is open.
Describes various errors in combination with other lamps.
- ③ PAPER OUT Lamp (Red)
Describes the condition of the roll paper.
Describes various errors in combination with other lamps.
- ④ SLIP Lamp (Green)
Describes the condition of the slip paper when SLIP is selected.
Describes various errors in combination with other lamps.
- ⑤ FEED Button
While the printer is online, feeds the roll paper.
- ⑥ RELEASE Button
Releases the slip paper.

6-2. Errors

(1) Recoverable errors

Error Description	POWER Lamp	ERROR Lamp	PAPER OUT Lamp	SLIP Lamp	Recovery Conditions
Thermal head high temperature detection error	Flashes at 2 second intervals.	OFF	OFF	OFF	Automatically recovered after the thermal head has cooled.
Impact head high temperature detection error	Flashes at 2 second intervals.	OFF	OFF	ON	Automatically recovered after the impact head has cooled.
Roll paper near-end detection	ON	OFF	Flashes at 4 second intervals.	OFF	Indicates that the end of the roll paper is approaching. Recovered by loading a new paper roll and closing the rear cover.
Thermal (rear) cover open error	ON	ON	—	OFF	Recovered by closing the thermal (rear) cover.
Slip (front) cover open error	ON	ON	—	ON	Recovered by closing the slip (front) cover.
Thermal paper out or jam error	ON	OFF	Flashes at 1 second intervals	OFF	Recovered by loading a paper roll or clearing the paper jam, reloading the paper roll, and closing the rear cover.
Slip paper jam/TOF/BOF/COF error	ON	OFF	—	Flashes at 0.25 second intervals	Recovered by loading paper or clearing the paper jam, reloading the paper, and closing the rear cover.
Cutter error (cutting error)	OFF	Flashes at 0.5 second intervals	OFF	OFF	Recovered when the cutter returns to its home position after the power is turned OFF and then ON. (See notes 1 and 2)

Note:

- 1) If the cutter doesn't return to the home position or doesn't perform the initial movement, it cannot be recovered. See "8-3. Releasing a Locked Cutter" for details.
- 2) If the paper is jammed, turn the power off, clear the jammed paper, then turn the power ON.
See "8-2. Removing Paper Jam" for details.

2) Non-recoverable errors

Error Description	POWER Lamp	ERROR Lamp	PAPER OUT Lamp	SLIP Lamp	Recovery Conditions
RAM error	OFF	Flashes at 0.5 second intervals	Flashes at 0.5 second intervals	Flashes at 0.5 second intervals	This is not a recoverable error.
EEPROM error	OFF	Flashes at 1 second intervals	Flashes at 1 second intervals	Flashes at 1 second intervals	This is not a recoverable error.
Flash memory error	OFF	Flashes at 2 second intervals	Flashes at 2 second intervals	Flashes at 2 second intervals	This is not a recoverable error.
Clamp error	OFF	Flashes at 0.5 second intervals	OFF	ON	This is not a recoverable error.
Validation color	OFF	Flashes at 0.5 second intervals	Flashes at 0.5 second intervals	ON	This is not a recoverable error.
Thermal head error	OFF	Flashes at 1 second intervals	OFF	OFF	This is not a recoverable error.
Impact head error	OFF	Flashes at 1 second intervals	OFF	ON	This is not a recoverable error.
Home position error	OFF	Flashes at 1 second intervals	Flashes at 1 second intervals	ON	This is not a recoverable error.
Power voltage error	OFF	Flashes at 2 second intervals	Flashes at 2 second intervals	OFF	This is not a recoverable error.

Note:

- 1) If a non recoverable error occurs, turn the power OFF immediately.
- 2) When Power supply error occurs, there is a possibility that the power supply unit has a trouble.

For other non recoverable errors, please consult the dealer for repairs.

6-3. Self-Printing

6-3-1. Test Printing

- **Thermal paper roll**

- (1) Place a paper roll on the printer.
- (2) With the rear cover closed, turn the power switch ON while keeping the FEED button depressed.
- (3) The printer will run a test print in the following order: version number, DIP switch settings, memory switch settings, etc.
After the test print is completed, the printer will revert to the normal mode.

- **Slip paper**

- (1) With the front cover closed, turn the power switch ON while keeping the RELEASE button depressed.
- (2) Insert a paper into the slip slot. The printer will automatically feed the paper; then, it will run a test print.
The printer will run a test print in the following order: version number, DIP switch settings, memory switch settings, etc.
After completing the test print, the printer will release the paper and revert to the normal mode.

```
*** HSP7000 Ver1.1 -b1.1 ***
```

```
Interface : Parallel
```

```
-- Dip Switch 1 -
```

```
Sw 123456789A
```

```
On *****
```

```
Off
```

```
-- Dip Switch 1 Detail --
```

```
1 = Emulation : Star Line/T
```

```
5 = INIT Reset : Enable
```

```
6 = BUSY : All
```

```
7 = ASB : Invalid
```

```
9 = P.Mode : Standard
```

```
<3>4 = ANK Pitch : 12 dot  
<3>2 = Feed Pitch : 4mm  
<3>1,0 = <CR> : Ignore  
<4>9,8 = Print Mode : Monochrome  
<4>2-0 = Printable Area : 72mm  
<5>B-8 = Validation Timer : 2000mS  
<5>2-0 = MICR : Bottom  
<7>A-8 = ESC 4 (Kanji) : Normal  
<7>3 = <SP> Red : Valid  
<7>1,0 = ESC 4 (Ank) : Highlight  
<8>7 = Kanji Size : Narrow  
<8>6 = ANK-5x9 Size : Normal  
<8>5 = ANK-7x9 Size : Narrow  
<8>3-0 = Print Width : 540 DPL
```

```
*** FLASH DATA ***
```

```
F/W Version  
HSP7000 PP 1.0
```

```
SBCS Font Version  
Font-A : 1.0  
Font-B : 1.1  
Large Font-A : 1.0  
Large Font-B : 1.0  
OCR-B : 1.0
```

```
CRC Check Code  
Boot Program : E2ED  
Main Program : 085E  
SBCS Font : 31AE  
DPCS Font : 8DBA  
Logo Data : 80FE  
All Area : D943
```

```
*** END ***
```

6-3-2. Hexadecimal Dump Mode

- (1) Place the thermal paper roll on the printer.
Open the rear cover, then turn the power on while holding the FEED button.
- (2) When the rear cover is closed, “*** HEX DUMP PRINTING ***” is printed, and the printer enters the Hexadecimal Dump Mode.
- (3) Each of the signals sent from the computer to the printer will be printed out in hexadecimal code.

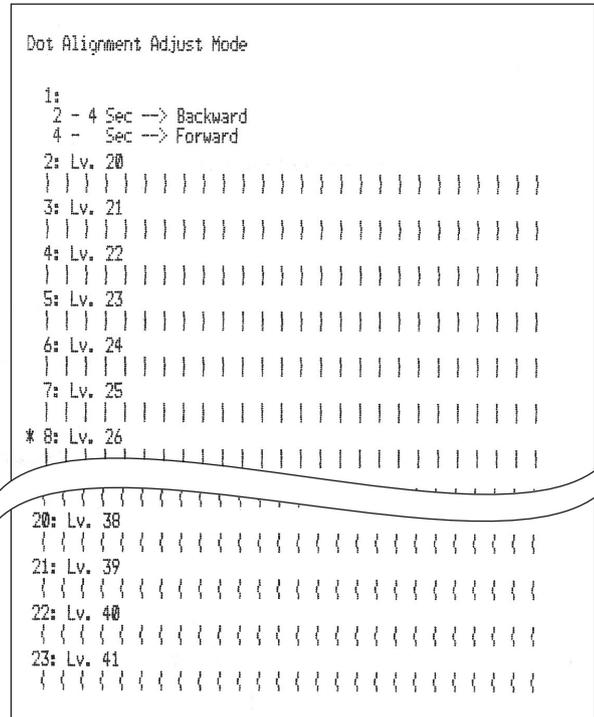
This function allows you to check if a control code sent to the printer by the program being used is correct or not.

- (4) The final line is not printed if its data is less than one full line. However, if the FEED button is pushed, the final line is printed. To turn off the mode, it is necessary to turn off the printer completely.

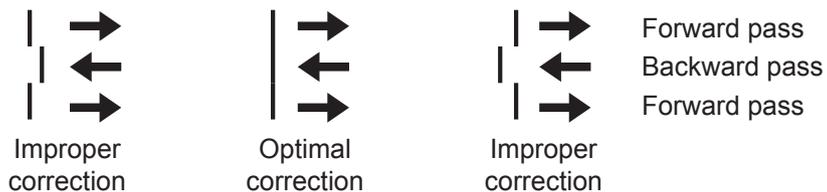
```
*** HEX DUMP PRINTING ***  
  
00 01 02 03 04 05 06 07      .....  
08 09 0A 0B 0C 0D 0E 0F      .....  
10 11 12 13 14 15 16 17      .....  
18 19 1A 1B 1C 1D 1E 1F      .....  
20 21 22 23 24 25 26 27      !"#$/&?  
28 29 2A 2B 2C 2D 2E 2F      ()*+,-./  
30 31 32 33 34 35 36 37      01234567  
                               89:;<.
```

6-3-3. Impact Head Printing Dot Alignment Adjustment Mode

- (1) With the front cover open, turn the power ON while keeping the RELEASE button pressed.
- (2) Close the front cover and place the paper in the printer. Then, the printer will print "Dot Alignment Adjust Mode" and enter the impact head dot alignment adjustment mode. The printer will continue printing a total of 22 patterns of dot alignment adjustments as shown below. The patterns are staggered in 1/8-dot increments. The printed line above each pattern shows a number between 1 and 23 and its setting value (Lv.xx). The pattern preceded by a "*" mark indicates the present setting value.



- (3) As shown below, the adjustment patterns that are printed consist of a three-dot bar each at the top and bottom for the forward pass, and a three-dot bar in the middle for the backward pass. Check the patterns visually and select a pattern with the three bars forming the straightest line.



- (4) To set up a pattern, press the RELEASE button as many times as the number (1 to 23) of the desired pattern. In the process, a buzzer will make a short sound (0.1 second) with each pressing of the RELEASE button.

- (5) Repeat step (4). At the pattern number that you wish to accept, keep the RELEASE button depressed (approx. 2 seconds) until the buzzer makes a long (0.5 second) sound. This completes the acceptance of the setting.

Example: To accept the No. 4 setting, short-press the RELEASE button three times. At the fourth time, keep the RELEASE button depressed.

Note: If you press the RELEASE button 24 or more times, it will exceed the available range of settings. This will cause the warning buzzer (0.1 second) to sound four times, and will delete the number of pressings of the button. Go back to step (4) to resume the setup process.

- (6) If you do not find an optimal correction pattern among the printed patterns, perform the “Backward” or “Forward” operation as indicated in No. 1. These operations will allow you to make printing pattern adjustments with a greater range of dot corrections. After performing steps (1) to (3), perform the respective operations as follows:

For a “Backward” operation, keep the RELEASE button depressed (approx. 2 seconds) until the buzzer makes a long (0.5 second) sound.

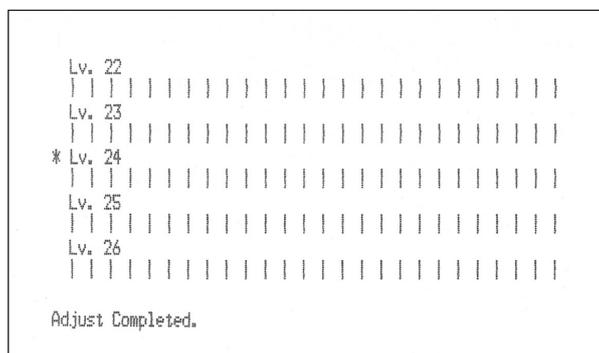
→ The printer will release the paper with a printing pattern in which the backward pass is corrected rightward of the current printing pattern.

For a “Forward” operation, keep the RELEASE button depressed until the buzzer makes a long (0.5 second) sound. Then, continue pressing and holding (approx. 4 seconds) the RELEASE button until the buzzer makes a short (0.1 second) sound and another long (0.5 second) sound.

→ The printer will release the paper with a printing pattern in which the backward pass is corrected leftward of the current printing pattern.

- (7) The printer will write the setting value, which you have accepted, on the nonvolatile memory. For confirmation, the printer will print out five patterns (which includes the setting value that you have accepted, as well as the preceding and succeeding patterns) and an “Adjust Completed” message.

This is followed by the release of the paper and the resetting of the printer.



Note: During the period between the time you accepted the setting value and the printer starts to print as described above, the printer will write the setting value on the memory. Never turn the power OFF or reset the printer during this period. Doing so will corrupt the dot adjustment settings as well as other settings.

If you make a mistake in the settings, do not turn the power OFF in the middle of the process. Instead, wait until the printer completes the final reset and start the dot adjustment mode from the beginning.

6-4. Cleaning Mode

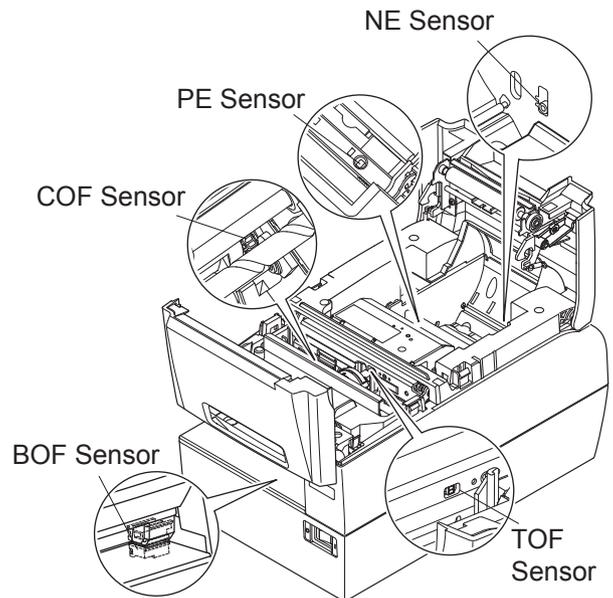
Perform the following procedure to enter the cleaning mode. See “9-3. MICR Head” in “9. Maintenance” for details on cleaning the MICR head.

- (1) With the rear cover closed, turn the power switch ON while keeping both the FEED button and RELEASE button depressed.
- (2) Insert the cleaning sheet. Cleaning starts.
- (3) The printer is reset when the cleaning is complete.

6-5. Sensor Adjustment

This printer is equipped with the following five paper sensors:

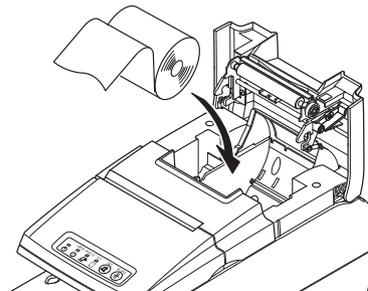
- PE (Paper End) Sensor
Detects whether a roll paper is loaded on the printer.
- NE (Near End) sensor
Detects whether the roll paper is nearing its end.
- BOF (Bottom of Feed) Sensor
Detects whether a slip paper is placed on the printer.
- COF (Center of Feed) Sensor
Detects the feed position for printing on a slip of paper.
- TOF (Top of Feed) Sensor
Detects the top of feed of a slip paper.



The aforementioned sensors can be adjusted as follows.

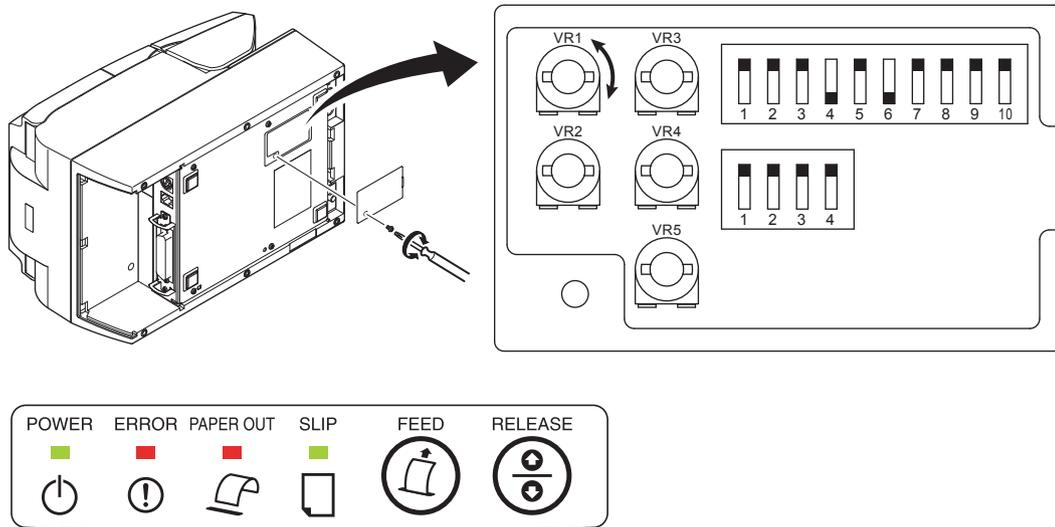
6-5-1. PE Sensor Adjustment Mode

- (1) Make sure the printer power is turned OFF.
- (2) Open the rear cover and set a paper roll in place, thus setting the printer in the “paper present” state.



- (3) Undo the screws and remove the DIP switch cover from the bottom of the printer.
- (4) Using the tip of a ballpoint pen or a similar object, set the DIP switches as follows: DIPSW1-4 OFF, DIPSW1-5 ON, DIPSW1-6 OFF, DIPSW1-7 and DIPSW1-8 ON. Turn the printer power ON.
The lamps on the control panel will flash, and the printer will enter the sensor adjustment mode.

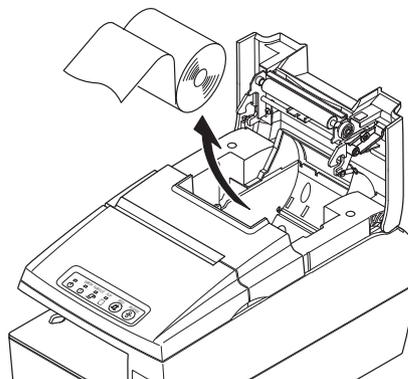
- (5) Using a small slot screwdriver, turn VR1 as shown below, and adjust it so that all the lamps are lit: POWER lamp (green: constant ON), ERROR lamp (red), PAPER OUT lamp (red), and SLIP lamp (green).



- (6) Turn the printer power OFF, and restore the DIP switches DIPSW1-4, DIPSW1-5, DIPSW1-6, DIPSW1-7, and DIPSW1-8 to their original settings.

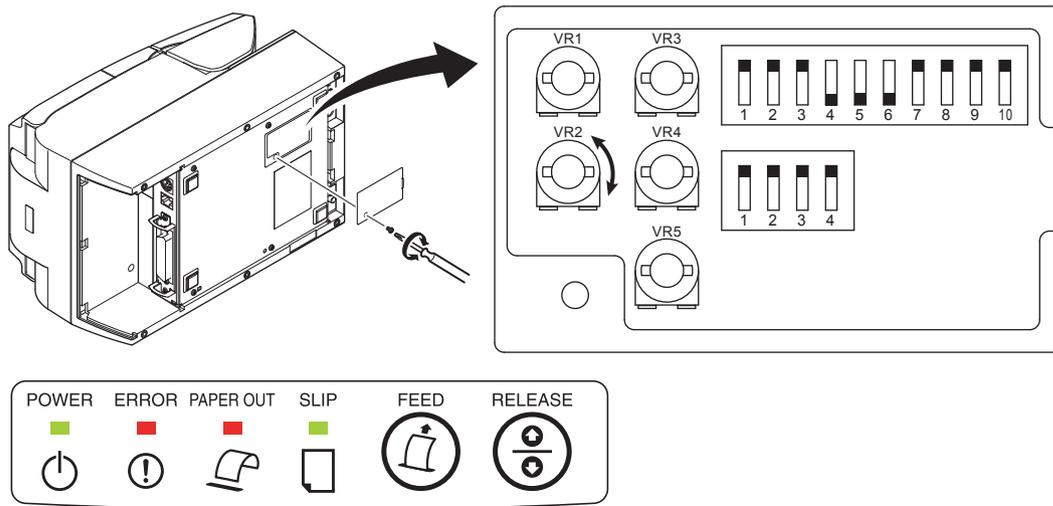
6-5-2. NE Sensor Adjustment Mode

- (1) Make sure the printer power is turned OFF.
- (2) Open the rear cover and remove the paper roll, thus setting the printer in the “paper absent” state.



- (3) Undo the screws and remove the DIP switch cover from the bottom of the printer.
- (4) Using the tip of a ballpoint pen or a similar object, set the DIP switches as follows: DIPSW1-4, DIPSW1-5 and DIPSW1-6 OFF, and DIPSW1-7 and DIPSW1-8 ON. Turn the printer power ON.
The lamps on the control panel will flash, and the printer will enter the sensor adjustment mode.

- (5) Using a small slot screwdriver, turn VR2 as shown below, and adjust it so that all the lamps are lit: POWER lamp (green: constant ON), ERROR lamp (red), PAPER OUT lamp (red), and SLIP lamp (green).



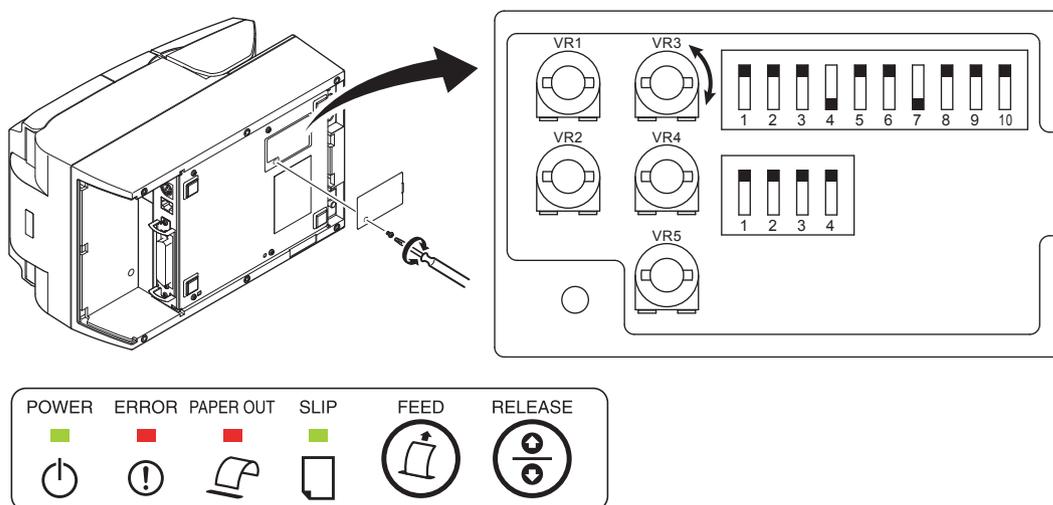
- (6) Turn the printer power OFF, and restore the DIP switches DIPSW1-4, DIPSW1-5, DIPSW1-6, DIPSW1-7, and DIPSW1-8 to their original settings.

6-5-3. BOF Sensor Adjustment Mode

- (1) Make sure the printer power is turned OFF.
- (2) Set the slip slot in the “paper absent” state.
- (3) Undo the screws and remove the DIP switch cover from the bottom of the printer.
- (4) Using the tip of a ballpoint pen or a similar object, set the DIP switches as follows: DIPSW1-4 OFF, DIPSW1-5 and DIPSW1-6 ON, DIPSW1-7 OFF, and DIPSW1-8 ON. Turn the printer power ON.

The lamps on the control panel will flash, and the printer will enter the sensor adjustment mode.

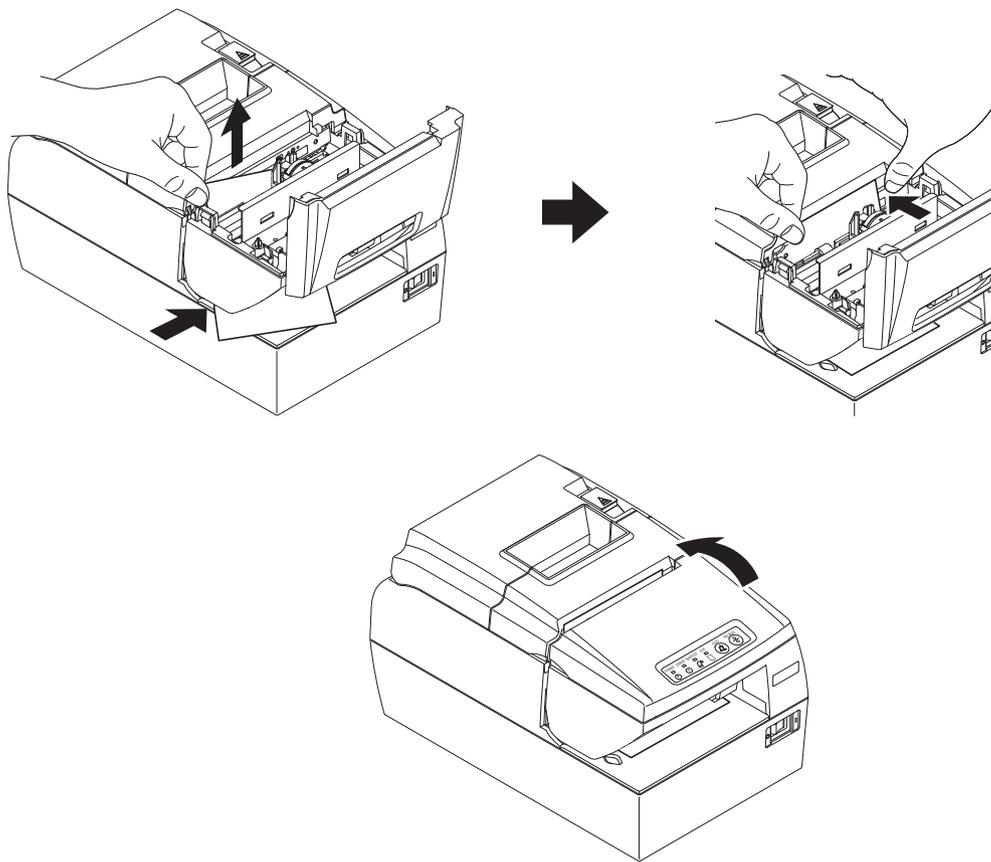
- (5) Using a small slot screwdriver, turn VR3 as shown below, and adjust it so that all the lamps are lit: POWER lamp (green: constant ON), ERROR lamp (red), PAPER OUT lamp (red), and SLIP lamp (green).



- (6) Turn the printer power OFF, and restore the DIP switches DIPSW1-4, DIPSW1-5, DIPSW1-6, DIPSW1-7, and DIPSW1-8 to their original settings.

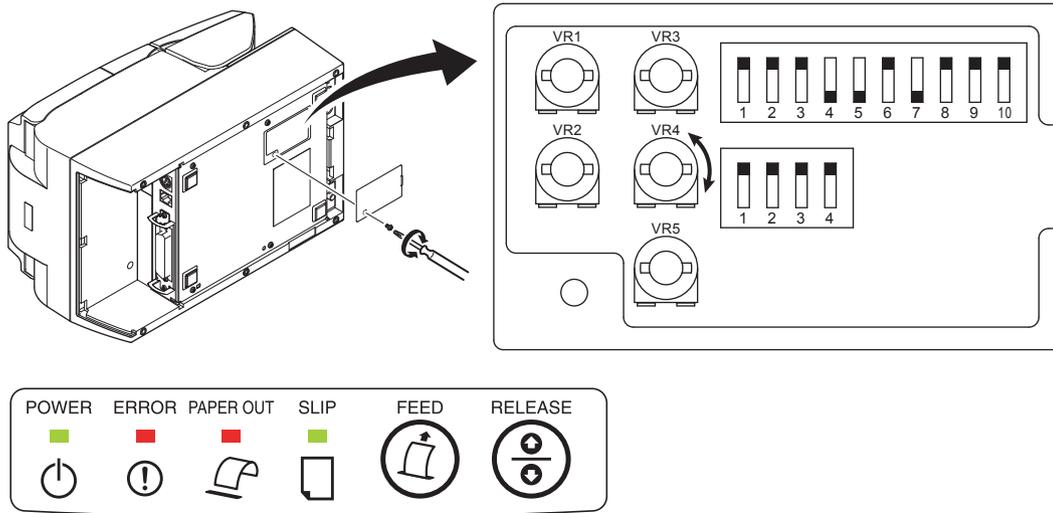
6-5-4. COF Sensor Adjustment Mode

- (1) Make sure the printer power is turned OFF.
- (2) Insert a slip paper to set the printer in the “paper present” state.
To do so, open the front cover as shown below and insert the paper diagonally from the left.
Set the paper straight while pressing on the platen. Then, close the front cover.



- (3) Undo the screws and remove the DIP switch cover from the bottom of the printer.

- (4) Using the tip of a ballpoint pen or a similar object, set the DIP switches as follows: DIPSW1-4 and DIPSW1-5 OFF, DIPSW1-6 ON, DIPSW1-7 OFF, and DIPSW1-8 ON. Turn the printer power ON. The lamps on the control panel will flash, and the printer will enter the sensor adjustment mode.
- (5) Using a small slot screwdriver, turn VR4 as shown below, and adjust it so that all the lamps are lit: POWER lamp (green: constant ON), ERROR lamp (red), PAPER OUT lamp (red), and SLIP lamp (green).

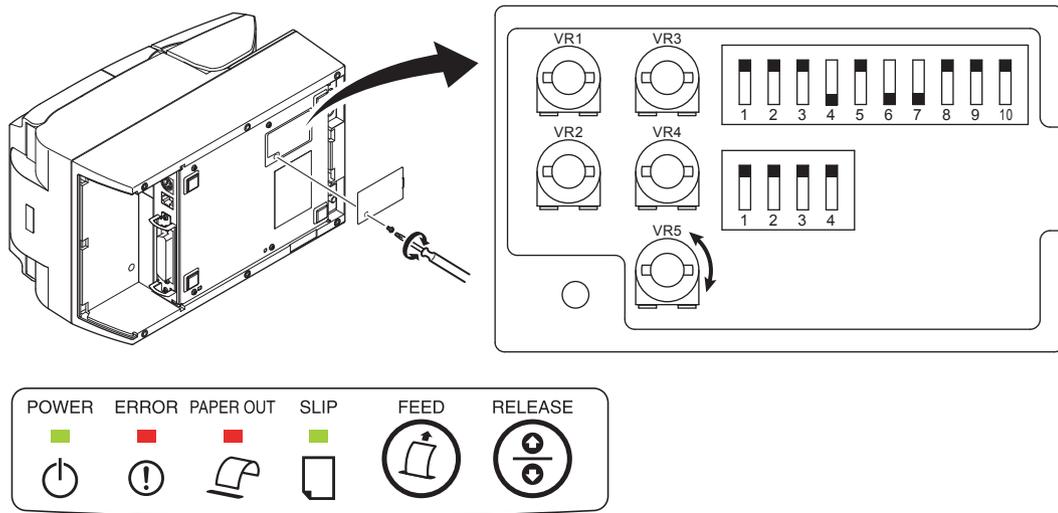


- (6) Turn the printer power OFF, and restore the DIP switches DIPSW1-4, DIPSW1-5, DIPSW1-6, DIPSW1-7, and DIPSW1-8 to their original settings.

6-5-5. TOF Sensor Adjustment Mode

- (1) Make sure the printer power is turned OFF.
- (2) Insert a slip paper to set the printer in the “paper present” state.
To do so, open the front cover and insert the paper diagonally from the left. Set the paper straight while pressing on the platen. Then, close the front cover.
See the illustration under “6-5-4. COF Sensor Adjustment Mode” for instructions on how to set the paper in place.
- (3) Undo the screws and remove the DIP switch cover from the bottom of the printer.
- (4) Using the tip of a ballpoint pen or a similar object, set the DIP switches as follows: DIPSW1-4 OFF, DIPSW1-5 ON, DIPSW1-6 and DIPSW1-7 OFF, and DIPSW1-8 ON. Turn the printer power ON. The lamps on the control panel will flash, and the printer will enter the sensor adjustment mode.

- (5) Using a small slot screwdriver, turn VR5 as shown below, and adjust it so that all the lamps are lit: POWER lamp (green: constant ON), ERROR lamp (red), PAPER OUT lamp (red), and SLIP lamp (green).



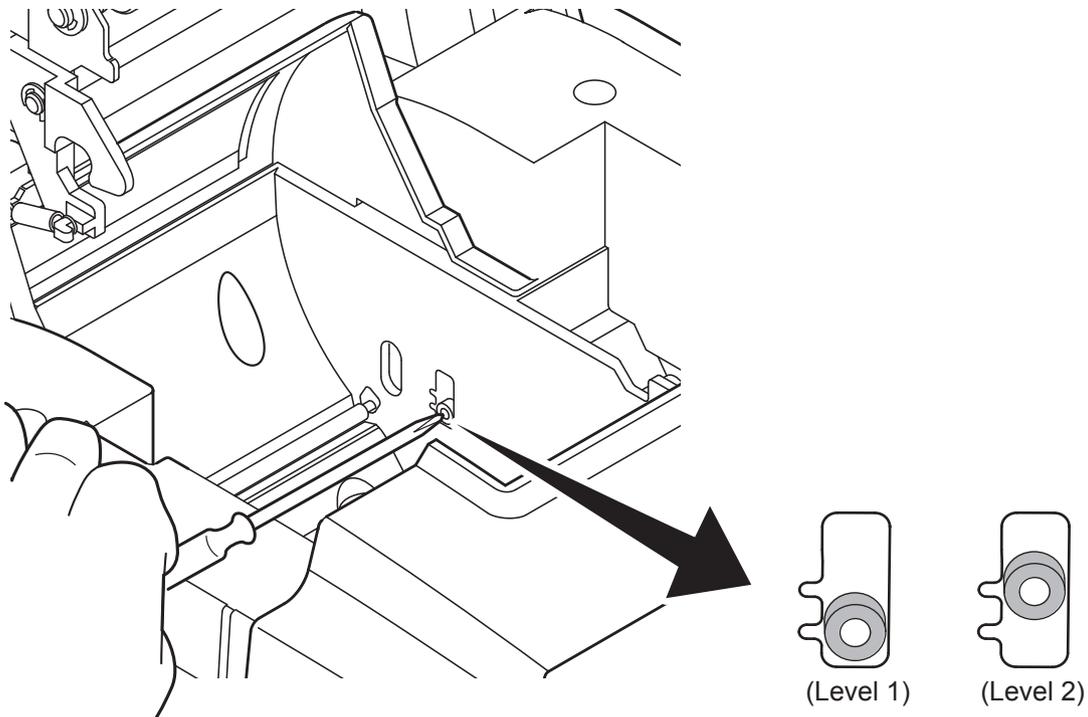
- (6) Turn the printer power OFF, and restore the DIP switches DIPSW1-4, DIPSW1-5, DIPSW1-6, DIPSW1-7, and DIPSW1-8 to their original settings.

7. Adjusting the Near-end Sensor

Use the following procedure to adjust the near-end sensor so it is compatible with the size of paper roll you are using.

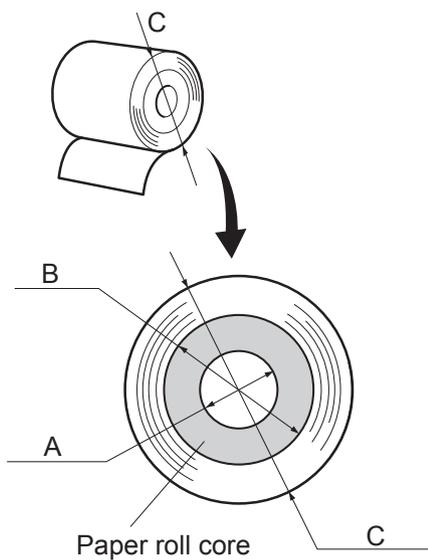
- (1) Open the rear cover.
- (2) Determine the diameter of the paper roll you are using and find the required setting in the table on the next page.
- (3) Insert the tip of a ballpoint pen or similar object into the hole of the adjuster, and then push and slide the adjuster to the desired setting.

When changing the setting, make sure that the position of the hole is aligned with the alignment mark indicated by the arrow.



Adjustment value according to the paper you are using

Paper Thickness (μm)	ø12 (A) inner diameter / ø18 (B) outer diameter core roll paper			
	Detected diameter (C) (mm)		Remaining paper length (m)	
	Level 1	Level 2	Level 1	Level 2
65	Approx. ø23	Approx. ø26	Approx. 2.5	Approx. 4.3
85	Approx. ø23	Approx. ø26	Approx. 1.9	Approx. 3.2



Notes:

- 1) The adjuster is factory-set at level 1.
- 2) The detected diameter and remained paper length given in the table are calculated values, and there are some variances depending on the rolled state of the paper, the actual mechanism, or the printing pattern.
- 3) If thick paper is used (paper thickness 80 μm or greater), the paper roll may loosen and cause variances in the detected values. Therefore, setting the adjuster to Level 2 is recommended.

8. Preventing and Clearing Paper Jams

8-1. Preventing Paper Jams

8-1-1. Roll paper

While placing a roll paper on the printer, do not pull out the end of the paper diagonally. Also, do not touch the roll paper while it is printing, releasing, or before completing cutting. If you hold or pull the paper with your hands while the paper is being released, it could cause the paper to jam, cut improperly, or place a line break improperly.

8-1-2. Slip paper

Do not use paper that is curled, kinked, wrinkled, warped, or torn. While loading the paper, place it straight.

Also, do not touch the paper while it is printing or is being released.

If you hold or pull the paper with your hands while the paper is being released, it could cause the paper to jam, cut improperly, or place a line break improperly.

8-2. Removing Paper Jam

If a paper jam occurs, clear it as described below.

8-2-1. Roll paper

(1) Set the power switch to off to turn off power to the printer.

(2) Push the lever toward you to open the printer cover.

(3) Remove the jammed paper.

Note: To prevent parts such as the thermal head or the rubber roller from damage or deformation, do not forcibly pull on the paper with the printer cover closed.

(4) Position the paper roll straight and close the printer cover gently.

Note:

1) Make sure that the paper is positioned straight. If the printer cover is closed with the paper skewed, a paper jam may result.

2) Lock the printer cover by pressing down on the sides. Do not try to close it by pressing down on the centre. The cover may not lock properly.

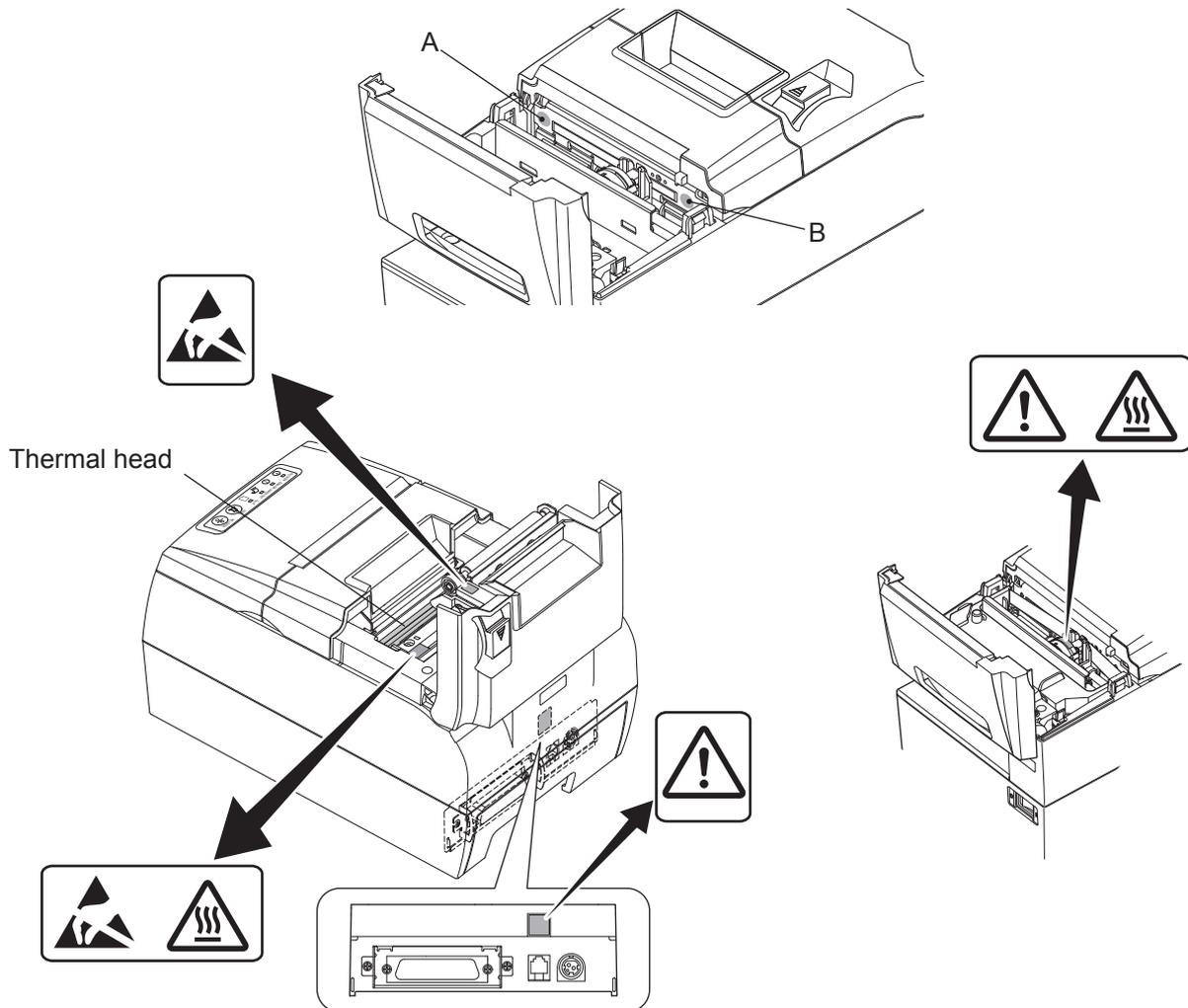
(5) Set the power switch to on to turn on power to the printer. Make sure that the ERROR lamp is not lit.

Note: While the ERROR lamp is lit, the printer will not accept any commands such as the print command, so make sure that the printer cover is locked properly.

8-2-2. Slip paper

Press the RELEASE button on the control panel in order to auto-release the paper.

If the paper cannot be removed by performing an auto-release, open the front cover, push the point A or B on the platen, and remove the paper.



Caution Symbol



This symbol is placed near the slip print head to indicate that it may be hot. Never touch the slip print head immediately after the printer has been used. Let the print head cool for a few minutes before touching it.



This symbol is placed near the thermal print head to indicate that it may be hot. Never touch the thermal print head immediately after the printer has been used. Let the print head cool for a few minutes before touching it. Observe the precautions for handling electrostatic sensitive devices.



This symbol is placed near the cutter. Never touch the cutter blade, as you could injure your fingers.



This symbol is placed near the peripheral drive connector. Do not connect this to a telephone.

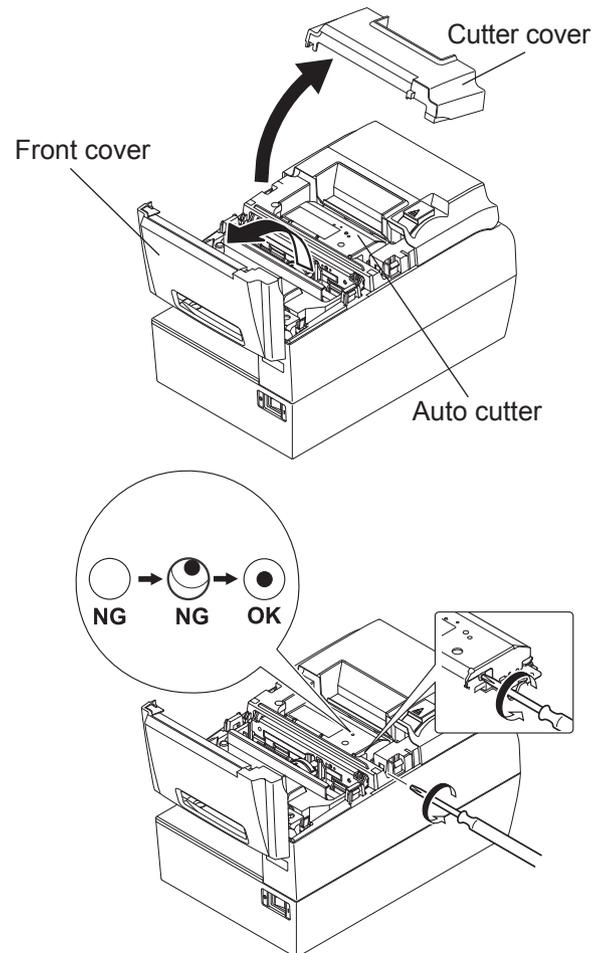
8-3. Releasing a Locked Cutter

If the auto cutter locks up or fails to cut the paper, follow the steps below.

⚠ WARNING

Since working on the cutter may be dangerous, be sure to turn off the printer first.

- (1) Turn the printer off and unplug the power cord from the AC outlet.
- (2) Open the front cover, and then the cutter cover.
- (3) Remove any jammed paper.
Note: Be careful not to damage the printer while removing any jammed paper.
Since the thermal print head is particularly sensitive, be sure not to touch it.
- (4) If the cutter is locked, insert a Philips screwdriver into the Philips screw hole on the side of the cutter, and turn it in the direction of the arrow shown on the right, in order to return the cutter to its normal position.
- (5) Open the rear cover, clear the paper jam, reload the paper, and close the rear cover.
- (6) Install the cutter cover and the front cover, and turn the power switch ON.



9. Maintenance

Printed characters may become partially unclear due to accumulated paper dust and dirt. To prevent such a problem, perform periodic maintenance, such as removing the paper dust in the paper transport section and on the surface of the thermal head.

⚠ CAUTION

Turn the printer's power switch OFF before performing maintenance.

9-1. Thermal Printer

Cleaning is recommended to be carried out once every six months or one million lines for general thermal paper and once every month or 200,000 lines for label paper.

9-1-1. Cleaning the Thermal Head

To remove the dark paper dust that has accumulated on the thermal head surface, wipe it clean with cotton swab (or soft cloth) dipped in alcohol (ethanol or methanol, or alcohol).

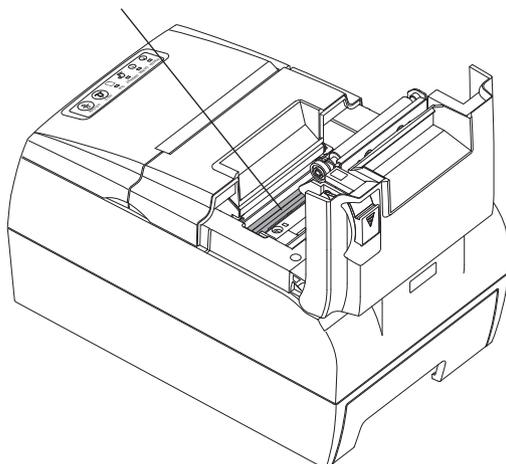
Note :

- 1) The thermal head is easily damaged, so clean it with a soft cloth, taking care not to scratch it.
- 2) Do not attempt to clean the thermal head immediately after printing, when the thermal head is hot.
- 3) Beware of the risk of damaging the thermal head as a result of static electricity that may be created during cleaning.
- 4) Turn the power ON only after the alcohol has dried completely.

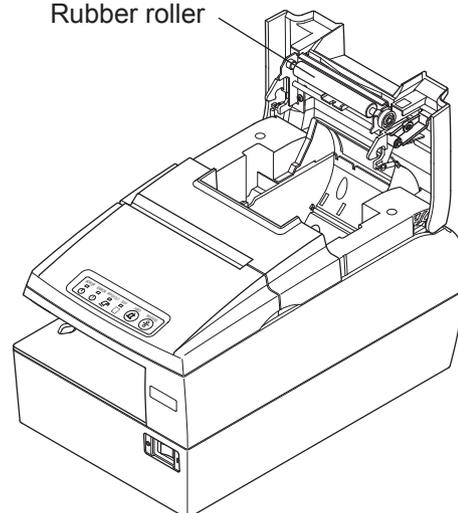
9-1-2. Cleaning the Platen Rubber Roller

Use a dry, soft cloth to wipe off the dust that may have accumulated on the rubber roller. Rotate the platen to clean the entire surface.

Thermal head



Rubber roller



9-2. Slip Printer

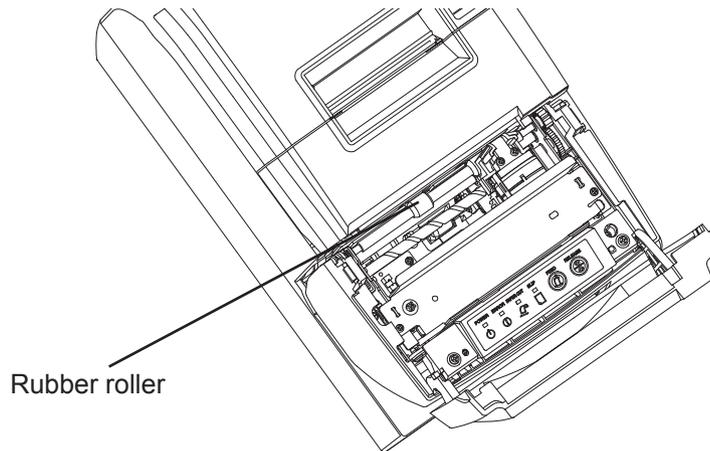
Cleaning is recommended to be carried out once every six months or one million lines.

9-2-1. Cleaning the Impact Platen

Use a dry, soft cloth to gently wipe off the paper particles that may have accumulated on the surface.

9-2-2. Cleaning the Rubber Roller

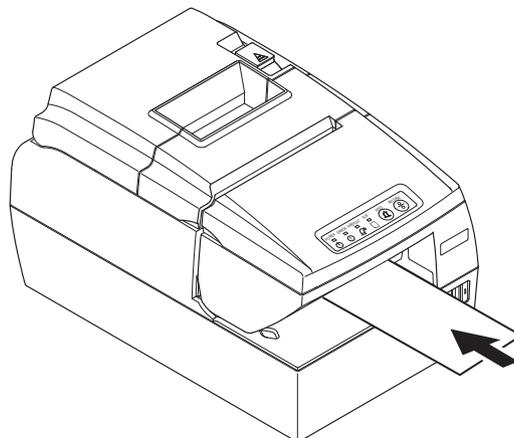
Use a dry, soft cloth to wipe off the dust that may have accumulated on the rubber roller. Rotate the rubber roller to clean the entire surface.



9-3. MICR Head

Cleaning is recommended to be carried out using the following procedure once every year or 70,000 passes.

- * The HSP7543 (no MICR scanning head) does not have a scanning head; therefore, this cleaning is unnecessary.
- (1) With the rear cover closed, turn the power switch ON while keeping both the FEED button and RELEASE button depressed.
 - (2) Insert the cleaning sheet. Cleaning starts.



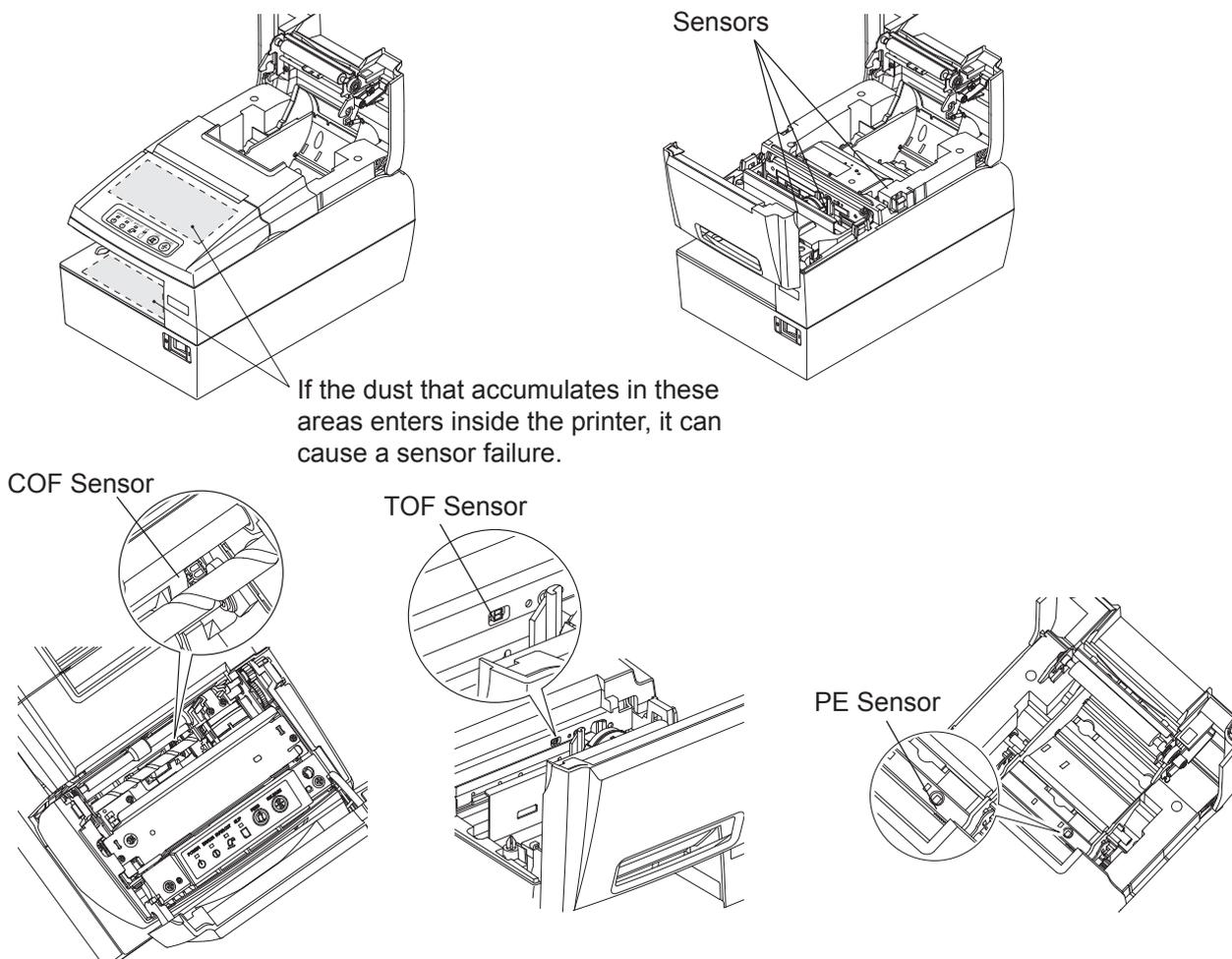
Use the following specified cleaning sheet.

Star Recommended Cleaning Sheet: PRESAT brand “CHECK READER CLEANING CARD”

(3) The printer is reset when the cleaning is complete.

9-4. Cleaning the Sensors and the Surrounding Area

Clean the sensors (particularly the reflection sensors) of debris, dust, paper particles, etc. Cleaning is recommended to be carried out once every six months or one million lines.



9-5. Cleaning the Paper Holder and the Surrounding Area

Clean the paper holder of debris, dust, paper particles, glue, etc. that may have accumulated. Cleaning is recommended to be carried out once every six months or one million lines.

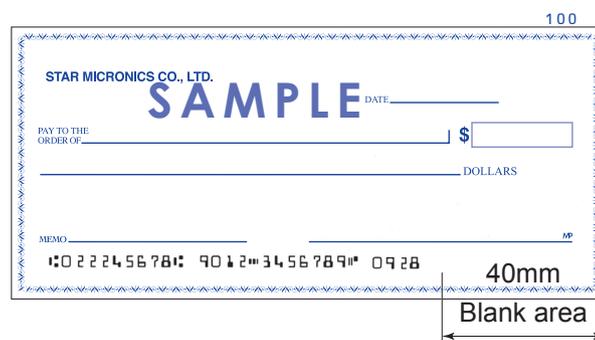
- ESC/POS mode
 - (1-byte)
 - Alphanumeric (ANK) 95 characters
 - Expanded graphics 128 characters × 9 pages
 - International characters 37 characters
 - (2-byte)
 - Kanji (JIS level 1) 3,489 characters
 - Kanji (JIS level 2) 3,390 characters
 - Special symbols 83 characters
- (6) Font configuration: 7 (half dot) × 9 or 5 × 9
- (7) Print width: 85.4 mm
- (8) Print columns: 60 columns (7 × 9 font)
45 columns (5 × 9 font)
- (9) Paper feed method: Friction feed
Feed pitch min. 0.176 mm (1/144 inch)
- (10) Paper feed speed: max. 141 mm/sec.
- (11) Ink ribbon:
 - Type Cartridge cassette
 - Color Black
 - Material Nylon #40 denier
- (12) Paper specifications: See “5-2. Slip Paper” in “5. Consumable Parts and AC Adapter” for details.

10-2. Auto Cutter Specifications

- (1) Cutting Modes Partial cut (leaves one uncut portion in center of paper)
- (2) Cutting Duty Min. 3 seconds/cut
- (3) Thickness of paper 0.065 ~ 0.085 mm

10-3. MICR Specifications

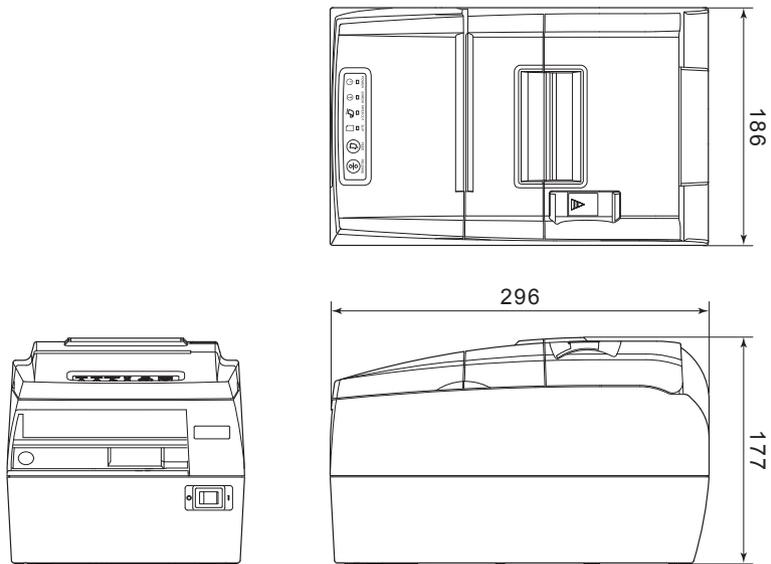
- (1) Read width: 8.1 mm
- (2) Read characters: ISO 1004: E-13B/CMC-7
- (3) Read rate: 98% or more
- (4) MICR character non-scannable area:



* The HSP7543 (no MICR scanning head) does not have a MICR character scanning function; therefore, the above specifications do not apply.

10-4. External Specifications

- (1) External dimensions: 186 mm (width) × 296 mm (depth) × 177 mm (height)
(2) Weight: 4.6 kg (without roll paper)



(unit: mm)

10-5. Interface Specifications

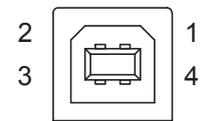
Selectable interface card type

- Parallel: Amphenol 36 pin
Conforming to IEEE 1284 (compatibility mode, nibble mode)
- Serial RS-232C: D-SUB25 pin
- USB: Type B
- Ethernet: RJ-45
- PoweredUSB: FCI 69913-104LF (1x8 right-angle type)

Type B connector:

DUSB-BRA42-T11 (D2)-FA (manufacturer: DDK)

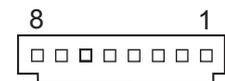
Pin number	Signal name	Function
1	VBUS	USB power pin (+5V DC)
2	D-	Serial data -
3	D+	Serial data +
4	GND	Signal ground



PoweredUSB connector:

69913-104LF (manufacturer: FCI)

Pin number	Signal name	Function
1	F-GND	Frame ground
2	+24V	+24V DC
3	GND	Signal ground
4	D+	Serial data +
5	D-	Serial data -
6	VBUS	USB power pin (+5V DC)
7	+24V	+24V DC
8	F-GND	Frame ground



10-6. Power Specs

10-6-1. Standard Mode (option: PS60A-24A)

- (1) Operating voltage: DC24V \pm 10%

- (2) Thermal printer current consumption (DC24V, room temperature)

Standby	Approx. 0.25A
ASCII printing	Approx. average 2.0A
100% duty printing (solid)	Approx. peak 0.8A
(Solid printing)	Approx. average 5.0A

Note: Continuous solid printing should be 10 seconds or less.

- (3) Slip printer current consumption (DC24V, room temperature)

Operating	
ASCII printing	Approx. average 1.4A
100% duty printing (solid)	Approx. peak 5.0A
(Solid printing)	Approx. average 3.0A
MICR scanning	Approx. average 0.7A

Note: Continuous solid printing should be 60 seconds or less.

10-6-2. Low Power Consumption Mode

- (1) Operating voltage: DC24V \pm 10%

- (2) Thermal printer current consumption (DC24V, room temperature)

ASCII printing	Approx. average 1.2A
100% duty printing (solid)	Approx. peak 5.0A
(Solid printing)	Approx. average 3.1A

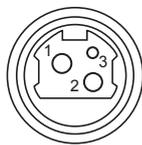
- (3) Slip printer current consumption (DC24V, room temperature)

Operating	
ASCII printing	Approx. average 1.4A
100% duty printing (solid)	Approx. peak 3.0A
(Solid printing)	Approx. average 1.7A

Note: When turning the power OFF and then ON again, there is a risk of a large surge current flowing into the unit. Therefore, after turning the power OFF, wait a minimum of 3 seconds before turning it back ON.

10-6-3. Power Connector Pin Layout

Pin No.	Function
1	Drive power (24 V)
2	Signal GND
3	N.C.
Shell	Frame ground



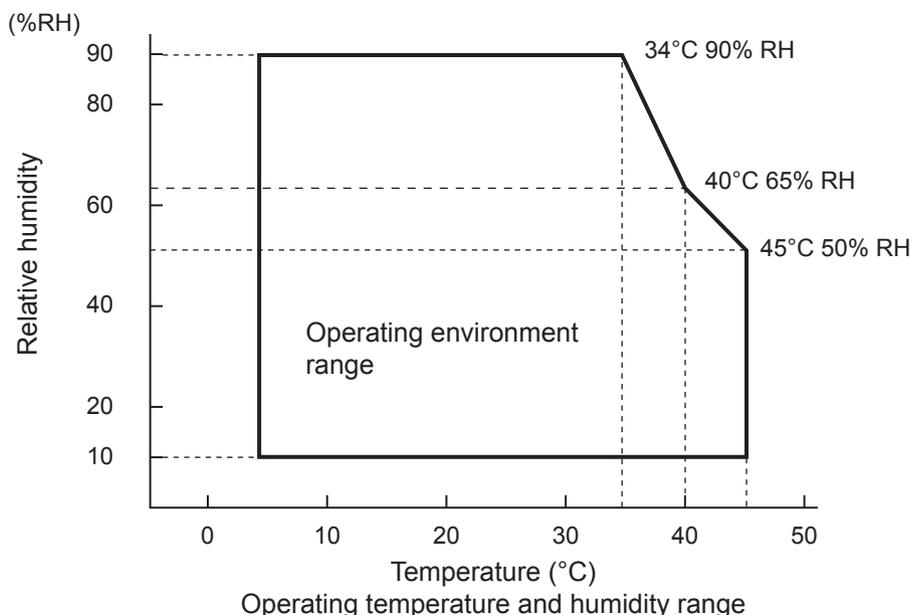
<Viewed from Connector Surface>

Note:

- The optional AC adapter (PS60A-24A) has been designed specifically for this unit (HSP7000). Other AC adapters may not meet the EMC technical standards. When using other AC adapters, be sure that the following cautions are observed when preparing the user's power supply.
 - When using a printer power supply other than the optional AC adapter (PS60A-24A series), be sure that the following cautions are observed.
 - Use a power supply of DC 24 V \pm 10% and more than 2.0 A (5.0 A Load 10 sec. Min.) with SELV output and LPS or Class 2 (double-insulation structure) output approved by IEC60950.
 - Be careful about installing the printer in an area where there is noise. Take the appropriate measures to protect against electrostatic AC line noise, etc.

10-7. Environmental Requirements

- (1) Operating
 Temperature 5°C to 45°C
 Humidity 10% to 90% RH (without condensation)



- (2) Transport/storage (except for paper)
Temperature -20°C to 60°C
Humidity 10% to 90% RH (without condensation)

Note: However, the combination of 40°C and 90% RH (no condensation) is considered the worst value regarding high temperatures and humidity.

10-8. Reliability Specifications

10-8-1. Thermal Printer

- (1) Life Mechanical: 20 million lines
 Head: 150 km, 150 million dots (for monochrome printing)

<Conditions>

Average printing ratio: 12.5%
Recommended thermal paper: 65 µm (when using the P220AG)

- (2) MCBF: 60 million lines

The Mean Cycle Between Failure (MCBF) is defined to be the overall failure cycle, which includes random or wear failures that occur until the printer reaches its mechanical life of 20 million lines.

Note: As the mechanical remains at 20 million lines, the MCBF of 60 million lines does not indicate its useful life.

- (3) Auto Cutter (Life)

Paper width of 79.5 mm: 1.5 million cuttings
Paper width of 75.5 or 57.5 mm: 1 million cuttings

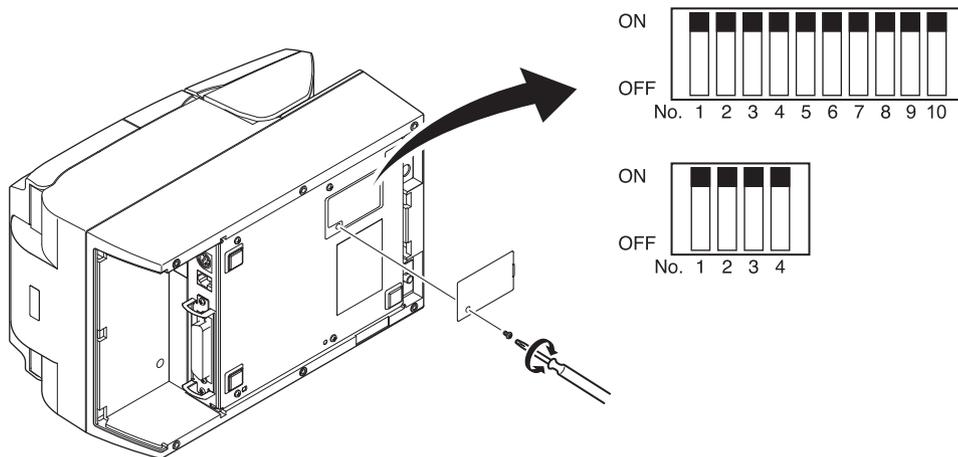
Note: All the reliability values indicated above are based on the use of the recommended thermal paper. No reliability can be guaranteed for the use of non-recommended thermal paper.

11. Dip Switch Setting

Two DIP switches are provided at the bottom of the printer, and can be set as given in the table below. Be sure to set the power switch to off before changing the settings. It is recommended to use a pointed item like a pen or flat-blade driver screw to change the settings. The settings will become effective when the power switch is set to on again.

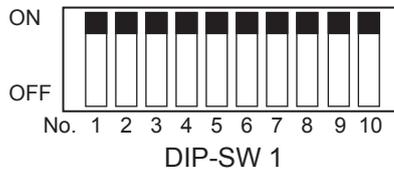
The following is the procedure for changing the settings on DIP switches.

- (1) Turn the printer off and unplug the power cord from the AC outlet.
- (2) Remove the screw from the DIP switch blind. Then take off the DIP switch blind, as shown in the illustration below.



- (3) Set the switches using a pointed tool, such as a pen or flat-blade screwdriver.
- (4) Replace the DIP switch blind. Then secure it with the screw.
Note: The new settings take effect when you turn on the printer.

11-1. Parallel Interface Model



DIP-SW 1

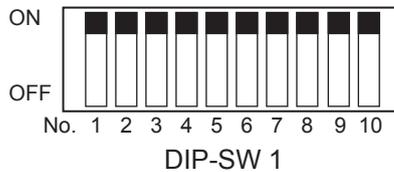
Switch	Function	ON	OFF
1-1	Emulation	STAR line mode	ESC/POS mode
1-2	STAR line mode	Reserved	Always ON
	ESC/POS mode	Resolution correction	203 dpi 180 dpi
1-3	Should not be changed (Should be set to on)		
1-4	Sensor adjustment	Invalid	Valid
1-5	Pin #31 (INIT) reset signal	Valid	Invalid
1-6	Handshaking conditions (conditions for BUSY)	Offline or receive buffer full	Receive buffer full
1-7	Automatic status back function	Invalid	Valid
1-8	Should not be changed (Should be set to on)		
1-9	Low-power consumption mode	Invalid	Valid
1-10	Validation	Valid	Invalid

DIP-SW 2

Switch	Function	ON	OFF
2-1	Always ON	Should be set to on	
2-2			
2-3			
2-4			

The factory settings of DIP switch are all on.

11-2. RS-232C Interface Model



DIP-SW 1

Switch	Function	ON	OFF
1-1	Emulation	STAR line mode	ESC/POS mode
1-2	STAR line mode	Reserved	Always ON
	ESC/POS mode	Resolution correction	203 dpi 180 dpi
1-3	Should not be changed (Should be set to on)		
1-4	Sensor adjustment	Invalid	Valid
1-5	Should not be changed (Should be set to on)		
1-6	Handshaking conditions (conditions for BUSY)	Offline or receive buffer full	Receive buffer full
1-7	Automatic status back function	Invalid	Valid
1-8	Should not be changed (Should be set to on)		
1-9	Low-power consumption mode	Invalid	Valid
1-10	Validation	Valid	Invalid

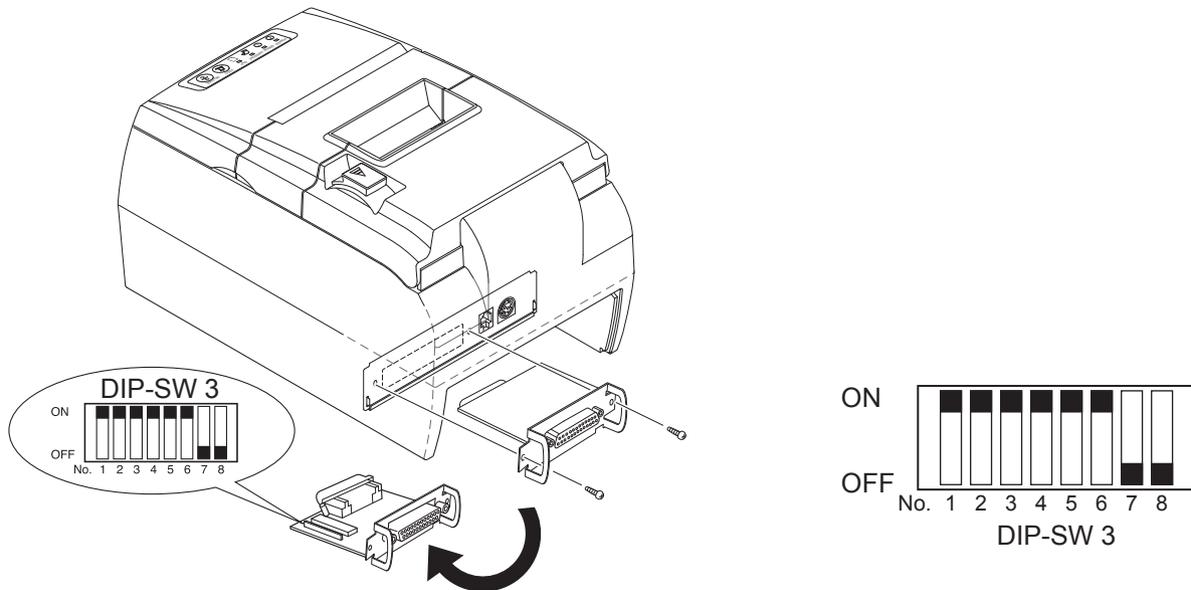
DIP-SW 2

Switch	Function	ON	OFF
2-1	Always ON	Should be set to on	
2-2			
2-3			
2-4			

The factory settings of DIP switch are all on.

The following is the procedure for changing the settings on DIP switch No. 3.

- (1) Turn off the printer and all components connected to it.
- (2) Remove the 2 screws.
- (3) Remove the serial interface board unit.
- (4) Change the setting of the DIP switches.



- (5) Replace the serial interface board unit.
- (6) Then secure it with the screws.
- (7) Turn on the printer and all components connected to it.

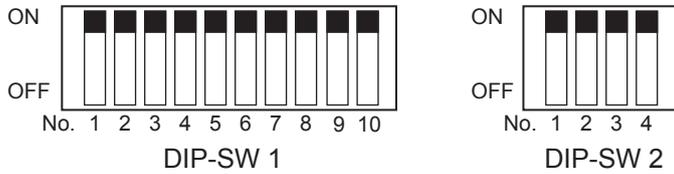
The factory settings of DIP switch are all on, except for switches 7 and 8.

DIP-SW 3

Switch	Function	ON	OFF
3-1	Baud Rate	See table below	
3-2			
3-3	Data Length	8 bits	7 bits
3-4	Parity Check	Disabled	Enabled
3-5	Parity	Odd	Even
3-6	Handshake	DTR/DSR	XON/XOFF
3-7	Should not be changed (Should be set to off)	—	—
3-8			

Baud Rate	Switch 3-1	Switch 3-2
4800BPS	OFF	ON
9600BPS	ON	ON
19200BPS	ON	OFF
38400BPS	OFF	OFF

11-3. USB/PoweredUSB Interface Model



DIP-SW 1

Switch	Function		ON	OFF
1-1	Emulation		STAR line mode	ESC/POS mode
1-2	STAR line mode	Reserved	Always ON	
	ESC/POS mode	Resolution correction	203 dpi	180 dpi
1-3	Should not be changed (Should be set to on)			
1-4	Sensor adjustment		Invalid	Valid
1-5	USB mode		Vendor class	Printer class
1-6	Handshaking conditions (conditions for BUSY)		Offline or receive buffer full	Receive buffer full
1-7	Automatic status back function		Invalid	Valid
1-8	Should not be changed (Should be set to on)			
1-9	Low-power consumption mode *1		Invalid	Valid
1-10	Validation		Valid	Invalid

*1 The settings will be invalid (always low-power consumption mode) when a PoweredUSB is being used.

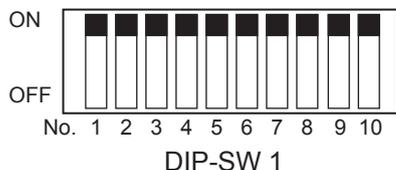
The factory settings of DIP switch are all on.

DIP-SW 2

Switch	Function	ON	OFF
2-1~2-4	Always ON	Should be set to on	

The factory settings of DIP switch are all on.

11-4. Ethernet Interface Model



DIP-SW 1

Switch	Function		ON	OFF
1-1	Emulation		STAR line mode	ESC/POS mode
1-2	STAR line mode	Reserved	Always ON	
	ESC/POS mode	Resolution correction	203 dpi	180 dpi
1-3	Should not be changed (Should be set to on)			
1-4	Sensor adjustment		Invalid	Valid
1-5	Should not be changed (Should be set to on)			
1-6	Handshaking conditions (conditions for BUSY)		Offline or receive buffer full	Receive buffer full
1-7	Should not be changed (Should be set to on)			
1-8	Should not be changed (Should be set to on)			
1-9	Low-power consumption mode		Invalid	Valid
1-10	Validation		Valid	Invalid

The factory settings of DIP switch are all on.

DIP-SW 2

Switch	Function	ON	OFF
2-1~2-4	Always ON	Should be set to on	

The factory settings of DIP switch are all on.

■ Initializing Settings

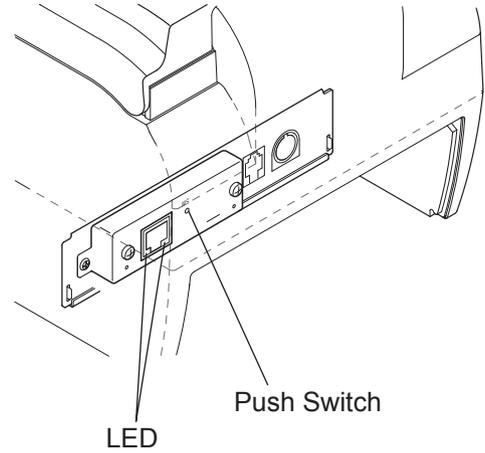
Set the push switch as described below to initialize the setting information.

- (1) Push the switch for one to five seconds while running under normal operating mode.
The green and red LEDs will flash with a regular pattern.
- (2) After that, push the switch once again in that state to turn OFF both of the red and green LEDs. This will return the settings of the interface board to their default, or ex-factory, settings.
- (3) After the interface board has been initialized, the printer will automatically reboot itself.

■ LED Display

Green : Lights when other party connection is recognized as 100BASE-TX.

Red : Lights when packets are received.



12. Parallel Interface

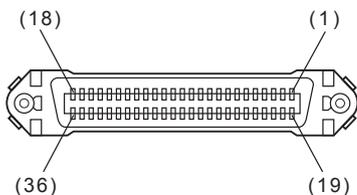
The two-way parallel interface is compatible with the IEEE1284 compatibility mode and nibble mode. Contact your dealer for details.

Table of Connection Signals for Each Mode

Pin No.	Direction	Compatibility Mode Signal Name	Nibble Mode Signal Name
1	In	nStrobe	Host Clock
2	In/Out	Data0	Data0
3	In/Out	Data1	Data1
4	In/Out	Data2	Data2
5	In/Out	Data3	Data3
6	In/Out	Data4	Data4
7	In/Out	Data5	Data5
8	In/Out	Data6	Data6
9	In/Out	Data7	Data7
10	Out	nAck	PtrClk
11	Out	Busy	PtrBusy/Data3,7
12	Out	PError	AckDataReq/Data2,6
13	Out	Select	Xflag/Data1,5
14		—	HostBusy
15		—	—
16		Signal GND	Signal GND
17		Frame GND	Flame GND
18	OUT	+5 V	+5 V
19~30		Twisted Pair Return	Twisted Pair Return
31	In	nInit	nInit
32	Out	nFault	nDataAvail/Data0,4
33		External GND	—
34	In	Compulsion status	—
35		—	—
36	In	nSelectIn	1284Active

Note:

- 1) The prefix “n” on the signal name refers to low active signals. If the host does not have any one of the signal lines listed above, two-way communication fails.
- 2) For interfacing, signal lines should always use twisted pair cables with the return sides connected to the signal ground level.



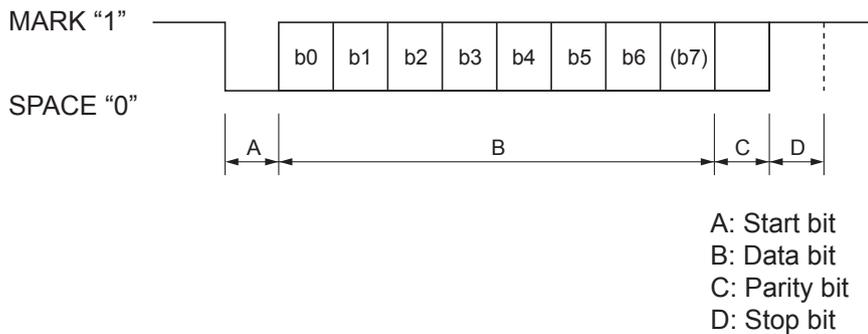
This connector mates with an Amphenol 57-30360 connector

Parallel interface connector (printer side)

13. RS-232C Serial Interface

13-1. Interface Specifications

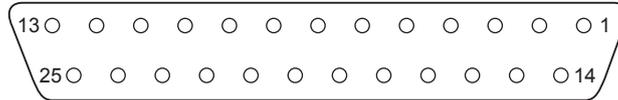
- (1) Data transmission method: Asynchronous
- (2) Baud rate: Selectable from 4800, 9600, 19200, 38400 bps
(Refer to “11. DIP Switch Setting”.)
- (3) Word length
Start bit: 1 bit
Data bit: 7 or 8 bits (selectable.)
Parity bit: Odd, even or none (selectable.)
Stop bit: 1 bit length
- (4) Signal polarity
RS-232C
MARK: Logic “1” (–3 V to –15 V)
SPACE: Logic “0” (+3 V to +15 V)



13-2. RS-232C Connector

Pin No.	Signal name	Direction	Function																										
1	F-GND	—	Frame ground																										
2	TXD	OUT	Transmission data																										
3	RXD	IN	Receive data																										
4	RTS	OUT	Same control as DTR																										
5	N/C		Not used.																										
6	DSR	IN	Reserved																										
7	S-GND	—	Signal ground																										
8~19	N/C		Not used.																										
20	DTR	OUT	<p>(1) STAR line mode</p> <p>a) DTR mode</p> <p>Indicates whether data from the host can be received by the printer.</p> <p>Space: Reception by printer enabled Mark: Reception by printer disabled</p> <p>b) X-ON/X-OFF communication mode</p> <p>Always space, except during the following conditions:</p> <ol style="list-style-type: none"> 1. Period between reset and communication enabled 2. During test printing <p>(2) ESC/POS mode</p> <p>a) DTR/DSR mode</p> <p>Indicates whether data from the host can be received by the printer.</p> <p>Space: Reception by printer enabled Mark: Reception by printer disabled</p> <p>The conditions for BUSY are changed according to the DIP switch settings.</p> <table border="1" data-bbox="842 1293 1474 1753"> <thead> <tr> <th rowspan="2">Printer status</th> <th colspan="2">DIP SW 1-6</th> </tr> <tr> <th>OFF</th> <th>ON</th> </tr> </thead> <tbody> <tr> <td>1. Period between reset, due to power switch being turned ON or interface reset, and communication enabled</td> <td>BUSY</td> <td>BUSY</td> </tr> <tr> <td>2. During test printing</td> <td>BUSY</td> <td>BUSY</td> </tr> <tr> <td>3. When cover is open</td> <td>—</td> <td>BUSY</td> </tr> <tr> <td>4. When printer stops because paper is out</td> <td>—</td> <td>BUSY</td> </tr> <tr> <td>5. When printer is waiting for switch input during a macro function</td> <td>—</td> <td>BUSY</td> </tr> <tr> <td>6. When other errors have occurred</td> <td>—</td> <td>BUSY</td> </tr> <tr> <td>7. When reception buffer is full</td> <td>BUSY</td> <td>BUSY</td> </tr> </tbody> </table> <p>b) X-ON/X-OFF communication mode</p> <p>Always space, except during the following conditions:</p> <ol style="list-style-type: none"> 1. Period between reset and communication enabled 2. During test printing 	Printer status	DIP SW 1-6		OFF	ON	1. Period between reset, due to power switch being turned ON or interface reset, and communication enabled	BUSY	BUSY	2. During test printing	BUSY	BUSY	3. When cover is open	—	BUSY	4. When printer stops because paper is out	—	BUSY	5. When printer is waiting for switch input during a macro function	—	BUSY	6. When other errors have occurred	—	BUSY	7. When reception buffer is full	BUSY	BUSY
Printer status	DIP SW 1-6																												
	OFF	ON																											
1. Period between reset, due to power switch being turned ON or interface reset, and communication enabled	BUSY	BUSY																											
2. During test printing	BUSY	BUSY																											
3. When cover is open	—	BUSY																											
4. When printer stops because paper is out	—	BUSY																											
5. When printer is waiting for switch input during a macro function	—	BUSY																											
6. When other errors have occurred	—	BUSY																											
7. When reception buffer is full	BUSY	BUSY																											

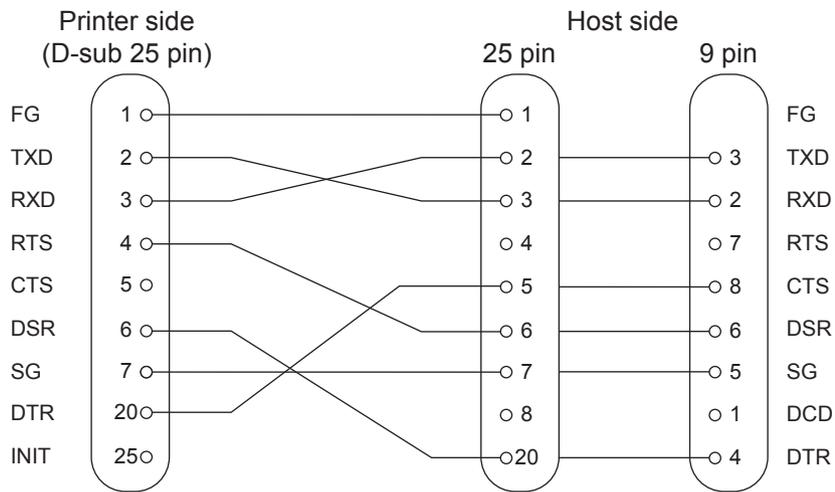
Pin No.	Signal name	Direction	Function
21~24	N/C		Not used.
25	INIT	IN	Reserved



D-sub 25 Pin

13-3. Cable Connections

The followings are a recommended interface cable connections.



Note: Use shielded wire less than 3 m in length.

14. USB/PoweredUSB and Ethernet

14-1. USB/PoweredUSB Interface Specifications

- | | |
|----------------------------|--|
| (1) General Specification: | Conforms to USB 2.0 Specifications |
| (2) Communication Speed: | USB Full Speed Mode (12 Mbps) |
| (3) Communication Method: | USB Bulk Transmission Mode |
| (4) Power Specifications: | USB Self-power Function |
| (5) Connector: | USB: USB Up-Stream Port Connector (USB Type-B)
PoweredUSB: 1 × 8 right-angle type |

14-2. Ethernet Interface Specifications

- | | |
|----------------------------|--|
| (1) General Specification: | Conforms to IEEE802.3 |
| (2) Communication Media: | 10 Base-T/100 Base-TX |
| (3) Communication Speed: | 10/100 Mbps |
| (4) Protocol: | TCP/IP |
| (5) TCP/IP detail: | ARP, RARP, BOOTP, DHCP, LPR, #9100, FTP,
HTTP, TELNET, TFTP |
| (6) Connector: | RJ-45 (8-pin modular) |

Note: Factory-set login password for administrator

One of the following protocols may be used for changing the settings on this product: HTTP (web), TELNET, or FTP. To do so, it is necessary to log in using an administrator account for the product.

Use the following administrator account information on HTTP (web), TELNET, or FTP.

Administrator account name: “root” (required)
Password: “public” (required)
The password may be changed after logging in.

15. Peripheral Unit Drive Circuit

Peripheral unit drive circuit connector only connects to peripheral units such as cash drawers, etc.

Do not connect it to a telephone.

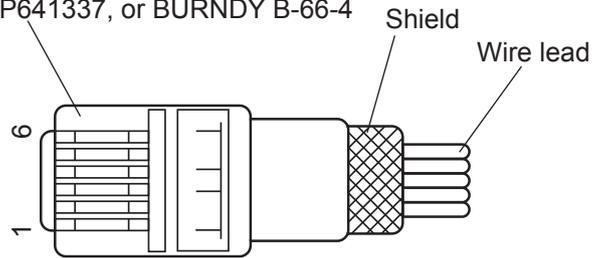
Use cables which meet the following specifications.

Peripheral Drive Connector

Pin No.	Signal name	Function	I/O direction
1	FG	Frame ground	—
2	DRD1	Drive signal 1	OUT
3	+24 V	Drive power	OUT
4	+24 V	Drive power	OUT
5	DRD2	Drive signal 2	OUT
6	DRSNS	Sense signal	IN

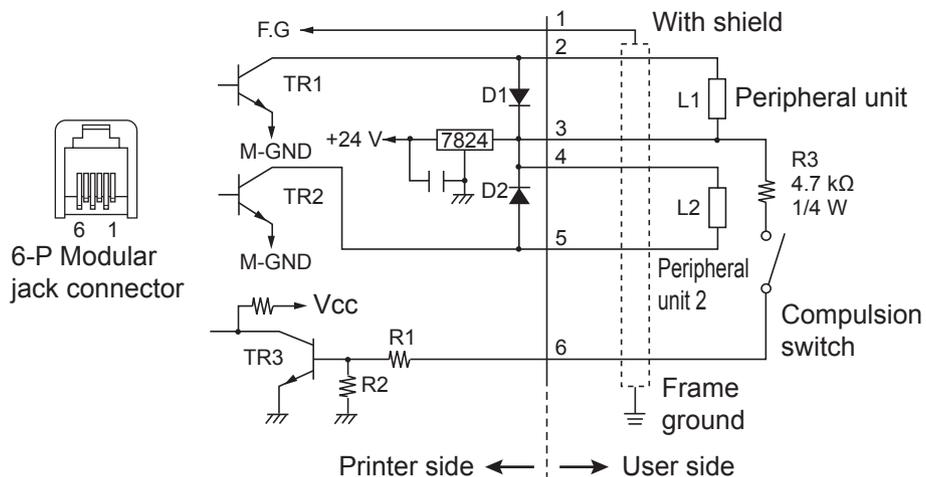
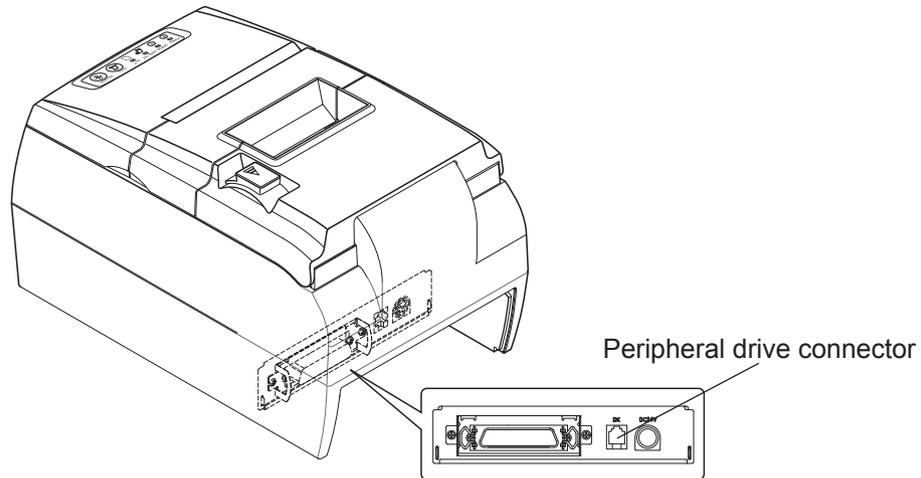
Modular plug

Modular plug: MOLEX 90075-0007, AMP641337, or BURNDY B-66-4

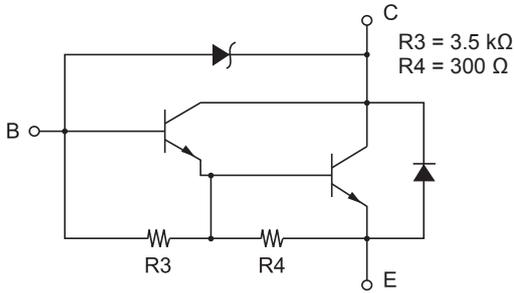


Drive circuit

The recommended drive unit is shown below.



Reference
2SD 1866 Circuit Configuration



Drive Output: 24 V, Max. 1.0 A
TR1, TR2: Transistor 2SD 1866 or equivalent

R1=10 kΩ
R2=33 kΩ

Notes:

- 1) Peripheral units 1 and 2 cannot be driven simultaneously.
- 2) To drive them continuously, set the duty cycle ratio to 20% or less (except when a peripheral buzzer is connected).
- 3) Never use the peripheral buzzer drive command if a device other than a peripheral buzzer is connected (i.e. cash drawer, etc.). Doing so can damage the connected device and this circuit.
- 4) The status of the compulsion switch can be known from the status command. Refer to the separate Programmer's Manual for details.
- 5) Minimum resistance for coils L1 and L2 is 24Ω.
- 6) Absolute maximum ratings for diodes D1 and D2 ($T_a = 25^\circ\text{C}$) are:
Average Rectified Current $I_o = 1\text{A}$
- 7) Absolute maximum rating for transistors TR1 and TR2 ($T_a = 25^\circ\text{C}$) are:
Collector current $I_C = 2.0\text{A}$

16. Memory Switch Settings

Each memory switch is stored in EEPROM. For details on the functions and settings of memory switches, please consult the dealer.

The table below shows the factory settings for the memory switches.

Memory Switch	Hexadecimal Code
0	0000
1	0000
2	0000
3	0000
4	0000
5	0001 (without MICR reader: HSP7543)
	0000 (with below MICR reader: HSP7743)
	0010 (with above MICR reader: HSP7643)
6	0000
7	0000
8	0000
9	0000

⚠ WARNING

Changing the memory switch settings can cause the printer to fail to operate correctly.



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Please access the following URL
<http://www.star-m.jp/eng/dl/dl02.htm>
for the latest revision of the manual.

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