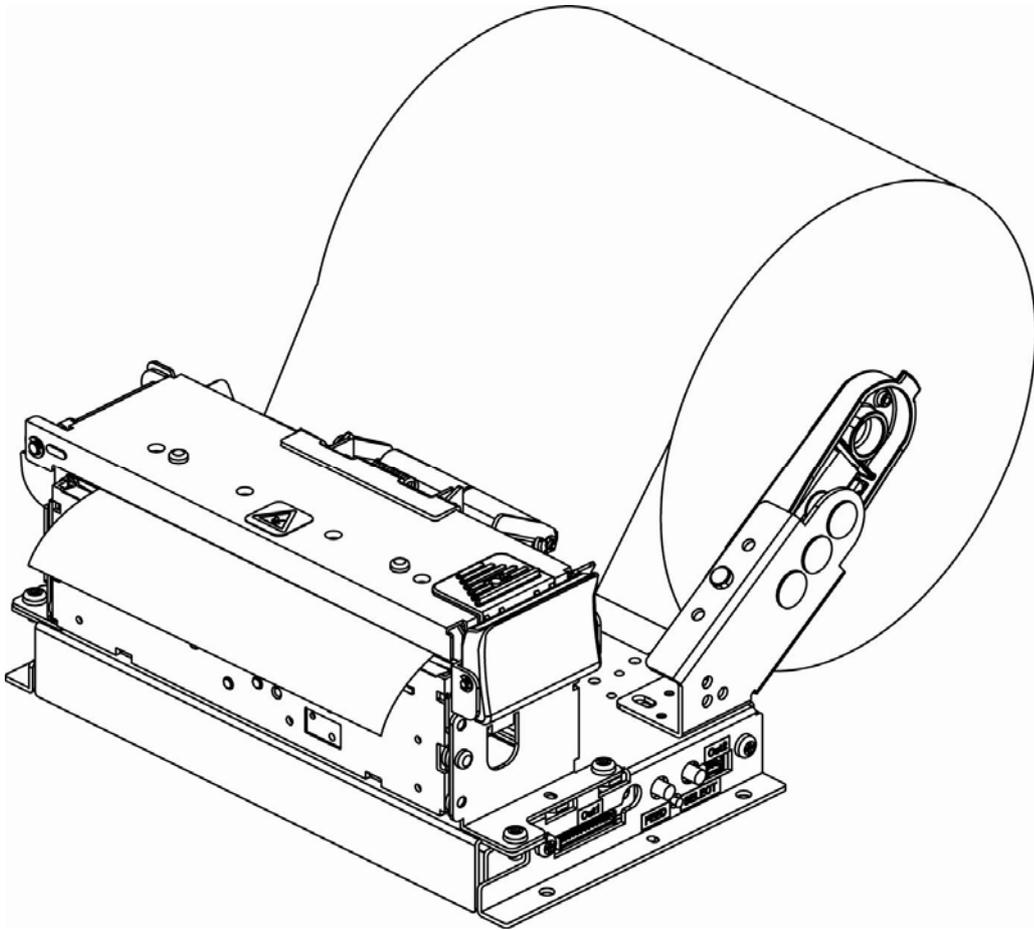


Technical Guide

KIOSK PRINTER

SK1-41A



 **SANEI ELECTRIC INC.**

Rev2.1E

General notice

- * The specifications may be changed for product improvement without notice.
- * Updated information listed on our website. <http://www.sanei-elec.co.jp>
- * Sanei shall not be responsible for any damages attributable to incorrect operation, handling or improper operation environments, except those specified in this manual.
- * Sanei shall not be responsible for any claim of infringement or alleged infringement of patents, designs, trademarks, copyrights or other rights brought by a third party in relation to its products.
- * Operate this printer only in the manners as described in the Technical guide.
Otherwise, accidents or problems could possibly occur.
- * Data are basically temporary; they cannot be stored or saved either for a long time or permanently. Please note that Sanei Electric shall not be responsible for any damages or lost profits resulting from the loss of data attributable to accidents, repairs, tests, and so on.
- * If you have any questions, or notice any clerical errors or omissions regarding the information in the technical guide, please contact your dealer.
- * Please note that Sanei Electric shall not be responsible for any results or effects resulting from operation of this Printer even if the information in the Technical guide.

Precautions

Symbol display

To use this equipment safely, or to protect the equipment from damage, the following symbols are used throughout this manual to highlight safety information

| | |
|---|--|
|  Warning | The symbol indicates that failure to observe these instructions or mishandling of this equipment could lead to severe injury or death |
|  Caution | The symbol indicates that failure to observe these instructions or mishandling of this equipment could lead to injury or only property damage. |

Samples of symbol

| | |
|---|---|
|  | The symbol indicates caution(including DANGER or WARNING). |
|  | The symbol indicates the action is prohibited. |
|  | The symbol indicates a required operation that must be performed. |

When using the printer

| | |
|---|---|
|  | Do not subject the printer to strong shocks by dropping or hitting it. |
| | Avoid using the printer at the following location. It may cause failure. Locations with much dust, particles, water or oil. Locations with slanted surfaces or strong vibration. Locations with direct sunlight. near heating/warming equipments, or temperature over 60 . Locations with temperatures of below -20 , a relative humidity of 85% or more, dew condensation caused by extreme temperature change. Location with electromagnetic noise or corrosive gas. |
| | Do not touch the dot line on the thermal head and driver IC with metal and sandpaper etc. There is a possibility for damage of those parts. |
| | Do not touch the dot line on the thermal head with your fingers. The contamination may reduce the printing quality. |
| | Do not use the printer if there is condensation occurs on the thermal head. If the condensation occurs, keep the power off until condensation evaporates completely. |
| | Do not block the paper exit of the printer. |
| | Do not use a volatile chemical such as thinner or benzene.for maintenance work. |

| | |
|---|---|
|  | Do not pull the paper end from the exit forcedly when the printer cover is closed. |
| | Turn off the printer power when trouble such as a paper jam occurs. |
|  | Do not use loose paper. It may cause paper jam. |
| | Be careful of handling the thermal head to prevent heat elements and driver IC from exposure to static electricity. |

When setting the printer

| | |
|---|--|
|  | The details such as the setting positions of the printer shall be referred to “3-7 . Dimensions”. Set the printer horizontally to the level, and make sure so the level not to be slanted. |
|---|--|

Handling printer unit

|  Warning | |
|---|---|
|  | <p>Never disassemble or repair the printer ,AC adapter or power cord by yourself. Do not use any AC adapter and power cord other than those specified. Do not bend the AC power cord or place heavy objects on it. Doing so may damage the cord and cause fire or electric shock. Never use a damaged AC power cord. It may cause fire or electric shock.</p> |
| | <p>Do not drop any metallic objects nor spill coffee,water or any other liquid. Do not use the printer in a places where it will be exposed to excess moisture or water spray. It may result in electric shock, short circuit and failure. Do not connect or disconnect the ACadapter with wet hands. It may result in electric shock, short circuit and failure.</p> |

|  Caution | |
|---|---|
|  | <p>As the thermal head may be very hot immediately after printing, do not touch it to avoid burning your fingers. Be sure that the thermal head is cool before replacing a paper or cleaning the thermal head.</p> |
| | Do not open the paper cover while printing. |
| | Do not pull the paper when the cover is closed. |
|  | <p>In the following cases, turn the printer power OFF and unplug the AC power cord from the outlet.</p> <ul style="list-style-type: none"> • Smoke, unusual noises or odd smells are emitted by the printer. • When metallic objects is dropped or any liquid is spilled inside the printer. <p>Continuous use may lead to printer failure,fire and electric shock. Make sure the fault does not continue and contact dealers for further assistance.</p> |
| | If the printer is not to be used, turn the printer power OFF and leave the AC adapter disconnected from the outlet. |

| | |
|--|---|
| | <p>Remove the interface cable or AC adapter from the connector or the receptacle by gripping the connector or the AC plug. Never pull the cable itself. Doing so may damage the cable or adapter.</p> |
|--|---|

Handling Paper Roll

| | |
|---|---|
|  | <p>Use the specified paper or equivalent. Use of other paper may reduce life of the thermal head and cause a decrease in printing quality Especially sodium(Na+), potassium(K+) and chlorine(Cl-) containing substances can remarkably reduce the life of the thermal head.</p> |
| | <p>Store the paper in a dry, cool and dark place.</p> |
| | <p>When pasting printed pages, use water-based glue. (starch glue, synthetic glue, etc.)</p> |
|  | <p>The surface of thermal paper has been specially treated with a chemical agent to produce coloring by thermal chemical reaction.</p> <ul style="list-style-type: none"> Do not expose the paper for a long time under bright light. Avoid storing in high temperature, high humidity, damp area and direct sunlight. Do not rub the paper with hard objects. Keep the paper away from organic solvents. Do not let the paper touch vinyl chloride film, erasers or adhesive tapes for hours. Do not place the paper on diazo print paper or wet, freshly made paper copies. Do not touch the paper with wet hands. It may cause fingerprint to be marks on the paper or smudges. |

Table of contents

| | |
|---|------------|
| 1 . General Outlines..... | 9 |
| 1- 1 . Product Outlines | 9 |
| 1- 2 . Features..... | 9 |
| 1- 3 . Classification | 1 0 |
| 2 . Handling Method..... | 1 1 |
| 2- 1 . Options..... | 1 1 |
| 2- 2 . Appearance..... | 1 2 |
| 2- 3 . Inside Structures | 1 3 |
| 2- 4 . Setting Paper Roll | 1 4 |
| 2- 5 . Paper near-end sensor | 1 5 |
| 2- 6 . Changing 1-inch core adapter | 1 6 |
| 2- 7 . Adjust the paper position | 1 6 |
| 2- 8 . Clear paper jams | 1 7 |
| 3 . General specifications | 1 8 |
| 3- 1 . Specifications | 1 8 |
| 3- 2 . Sensor..... | 2 0 |
| 3- 3 . Printing area | 2 1 |
| 3- 4 . Print head and cutter position | 2 1 |
| 3- 5 . Paper sensor position | 2 2 |
| 3- 6 . Paper feeding | 2 3 |
| 3- 7 . Dimensions..... | 2 4 |
| 3- 8 . Dimensions (With Presenter) | 2 5 |
| 4 . Functions..... | 2 6 |
| 4- 1 . Self test printing | 2 6 |

| | |
|---|------------|
| 4- 2 . HEX Dump mode | 2 7 |
| 4- 3 . Function setting mode | 2 7 |
| 4- 4 . Setting the memory switch | 2 9 |
| 4- 5 . Memory switch setting menu | 3 0 |
| 4- 6 . Adjusting printing density | 3 2 |
| 4- 7 . Error display | 3 2 |
| 4- 8 . Memory..... | 3 4 |
| 5. Presenter | 3 5 |
| 5- 1. Specification | 3 5 |
| 5- 2. Mounting presenter | 3 5 |
| 5- 3. Setting Paper Roll | 3 6 |
| 5- 4. Removing paper jam | 3 7 |
| 5- 5. Paper detection sensor | 3 7 |
| 5- 5. Operating specification | 3 8 |
| 5- 6. Stock space | 3 9 |
| 6. Large diameter holder | 4 0 |
| 6- 1. Specification | 4 0 |
| 6- 2. Bundled items | 4 0 |
| 6- 3. Assembling holder | 4 1 |
| 6- 4. Adjusting shaft | 4 1 |
| 6- 5. Adjusting paper near end | 4 2 |
| 6- 6. Connecting near-end sensor to printer | 4 2 |
| 6- 7. Setting up roll paper | 4 3 |
| 6- 8. Restrictions for setting up | 4 3 |
| 6- 9. Dimension..... | 4 4 |
| 7 . Interfaces..... | 4 5 |

| | |
|---|------------|
| 7- 1 . USB..... | 4 5 |
| 7- 2 . Serial..... | 4 6 |
| 7- 3 . Power supply | 4 8 |
| 8 . Label print..... | 4 9 |
| 9 . Maintenance..... | 5 2 |
| 9- 1 . Maintenance | 5 2 |
| 9- 2 . Service for trouble shooting | 5 3 |
| 9- 3 . Command Reference | 5 3 |
| 10 . Data code table..... | 5 4 |

1 . General Outlines

1- 1 . Product Outlines

SK1-41 Series is the thermal type Kiosk Printer for the data to be input by computers and other host systems through Serial(RS232C) and USB. The versatile functions built in the series make it possible to use for several data output applications.

1- 2 . Features

- Small and Ultra-Light Weight, Designed for wide variety of systems and equipments
- Max 150mm/sec high-speed printing
- Variety of paper core holders (adjustable for 2 different rolls)
- Available for Barcode printing and 2-dimensions code printing
- Max ϕ 120mm paper roll as standard specifications
- Max ϕ 254mm paper roll as large paper holder specifications
- Various Sensors built-in : Paper near end, Paper empty, Head open sensor, Black-Mark sensor (Option), Gap sensor (Option)
- Wide variety of paper size (80, 83, 112mm)
- Auto-loading function
- Versatile operating environment (-20 to 60 degree)

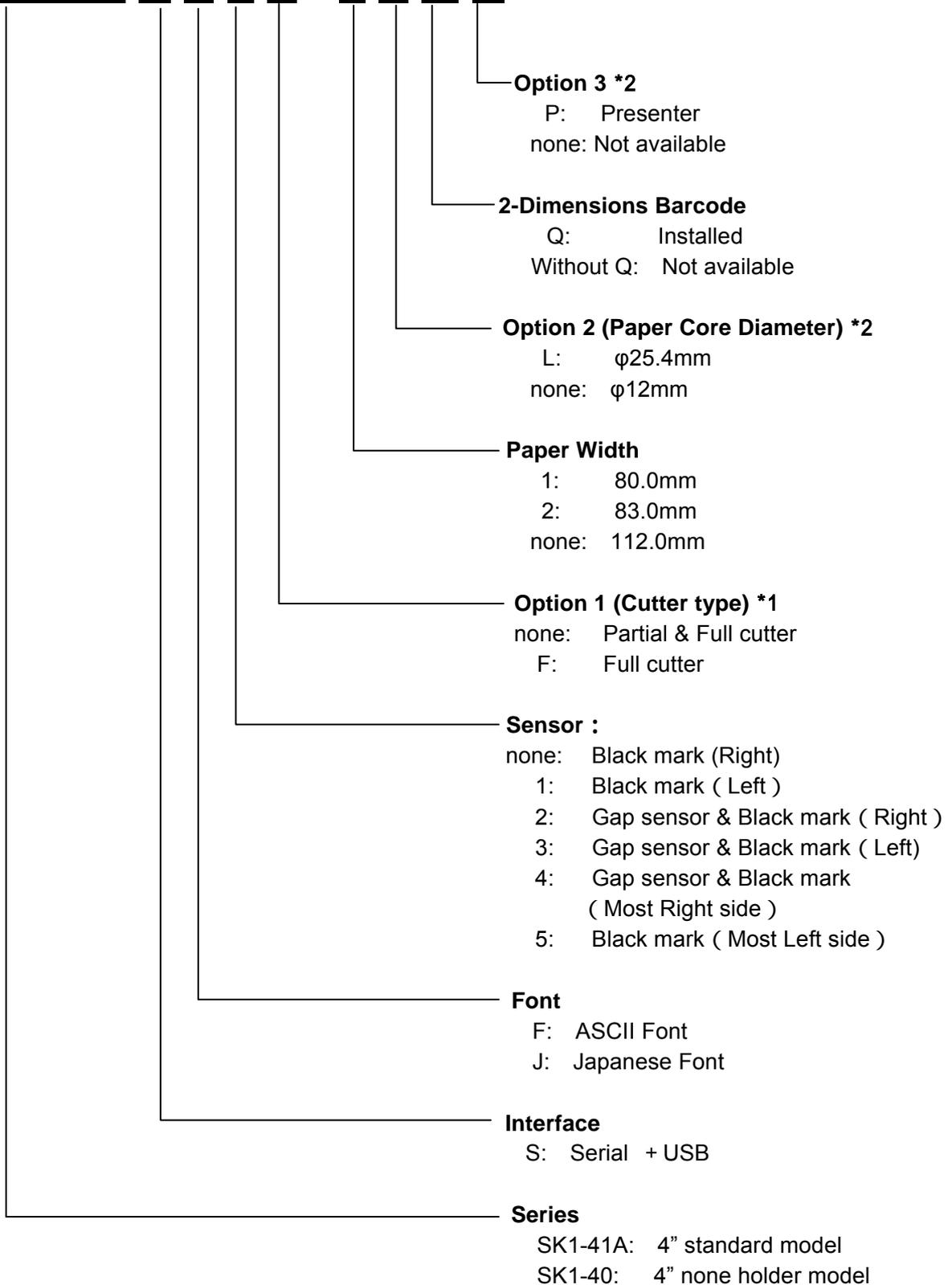
< Other functions >

- Capable of HEX dump printing and test printing.
- Various settings, such as enlarged characters, are available.
- Line spacing can be freely adjusted.
- Graphic printing by bit image.
- Downloaded characters and user-defined characters can also be printed.
- Paper feed amount can be set freely.
- With Ruled Line command, table layouts can be easily printed.
- Page Mode allows erect/inverse images, clockwise 90 degrees/counterclockwise 90 degrees and overlapping printing.
- Page Mode allows setting the paper length to a maximum of 250mm.
- Using the Image Registration command, the printing layout can be set up beforehand.
- With the Printing Density command, the printing density can be changed.
- The command system conforms to ESC/POS.
- Capable of registering print images in internal flash memory.

1- 3 . Classification

The product is classified according to the Product Number, as an example as below:

SK1-41A S F 1 F - 2 L Q P



*1. When the presenter model "3" is selected, the cutter type is equipped with full cut blade.

*2. Option is supported for the SK1-41A standard model.

2 . Handling Method

2- 1 . Options

This Series provides the following parts as options:

(These parts can be purchased through the stores/shops you have purchase, and the details of the optional parts can be inquired to the stores/shops and/or distributors.)

1. Paper Rolls

Make sure to use the paper roll specified as below:

| Specifications | Standard paper | |
|----------------------|--------------------------------------|------------|
| Part No. | HP220AB-1 | TF50KS-E2D |
| Sensitivity | Standard duration | |
| Paper width | 111.5 ± 0.5mm | |
| Thickness | 75µm | 59µm |
| Roll diameter | Φ120mm | |
| Core | Internal dia. Φ12×External dia.Φ18mm | |
| Thermal paper side | External | |
| Internal paper end | No adhesion · No fold | |
| External paper front | Cut straight and put a seal | |

| Specifications | Large diameter paper | |
|----------------------|--|--|
| Part No. | HP220AB-1 | |
| Sensitivity | Standard duration | |
| Paper width | 111.5 ± 0.5mm | |
| Thickness | 75µm | |
| Roll diameter | Φ254mm | |
| Core | Internal dia. Φ25.4×External dia.Φ31.4mm | |
| Thermal paper side | External | |
| Internal paper end | No adhesion · No fold | |
| External paper front | Cut straight and put a seal | |

2. Selectable option parts

It is available for the following option by equipping to this product unit.

The option product name is shown as following.

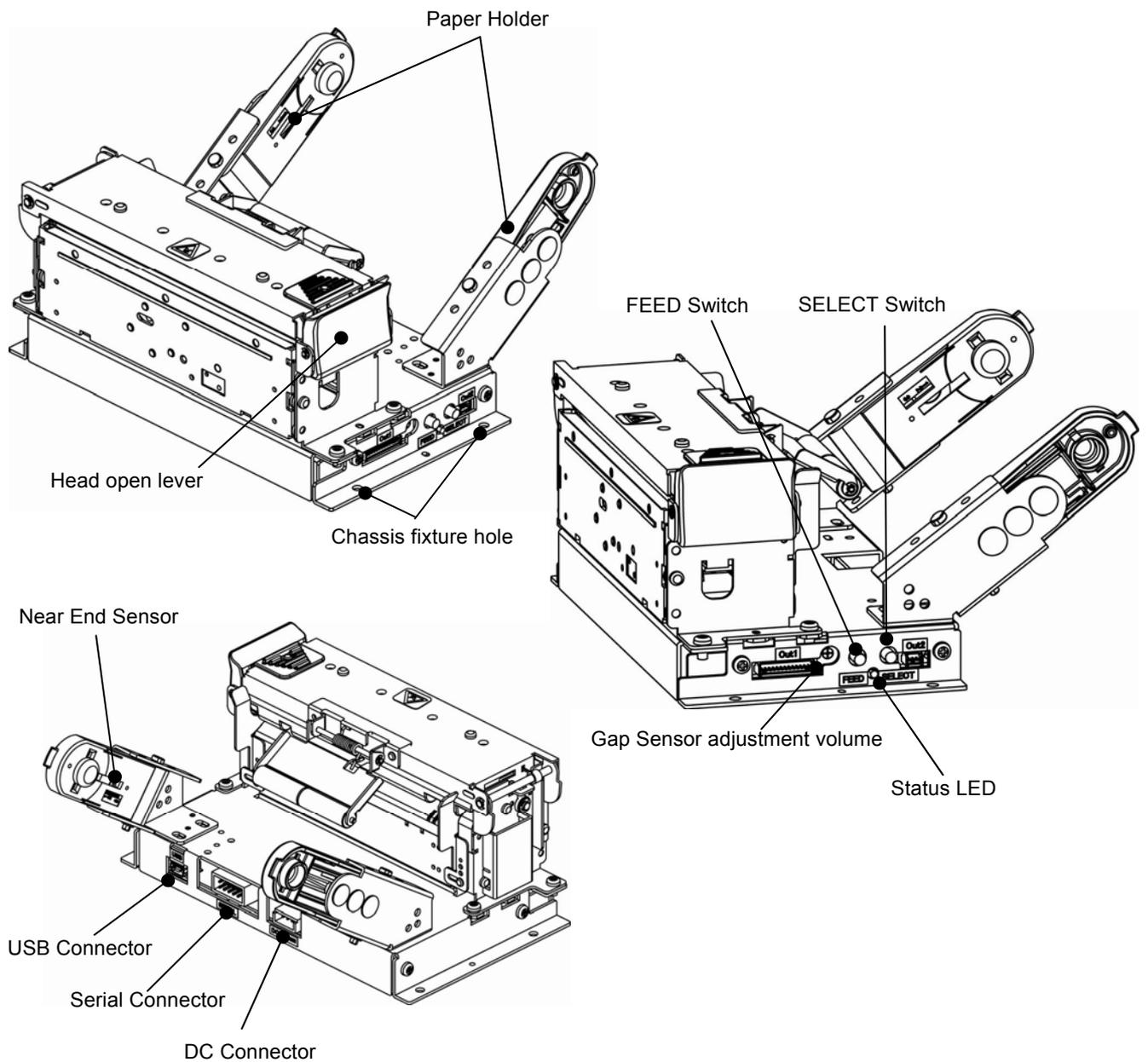
| Option contents | Name | Specifications |
|---------------------|--------------|---|
| Large paper holder | HL3-SK141 | Paper holder for φ254mm diameter |
| 1-inch Core adapter | BUSH 24.9 | Attachment core holder for φ25.4mm diameter |
| Serial cable | CB-SK1-S4 | Cross connection, approx 60cm, D-Sub9 |
| DC cable | CB-SK1-D1 | DC cable, approx 1m |
| USB cable | BLM-1.5U | USB cable, approx 1.5m |
| AC adapter | SA3-27A24O-1 | Standard adapter |

3. 1-inch Core adapter

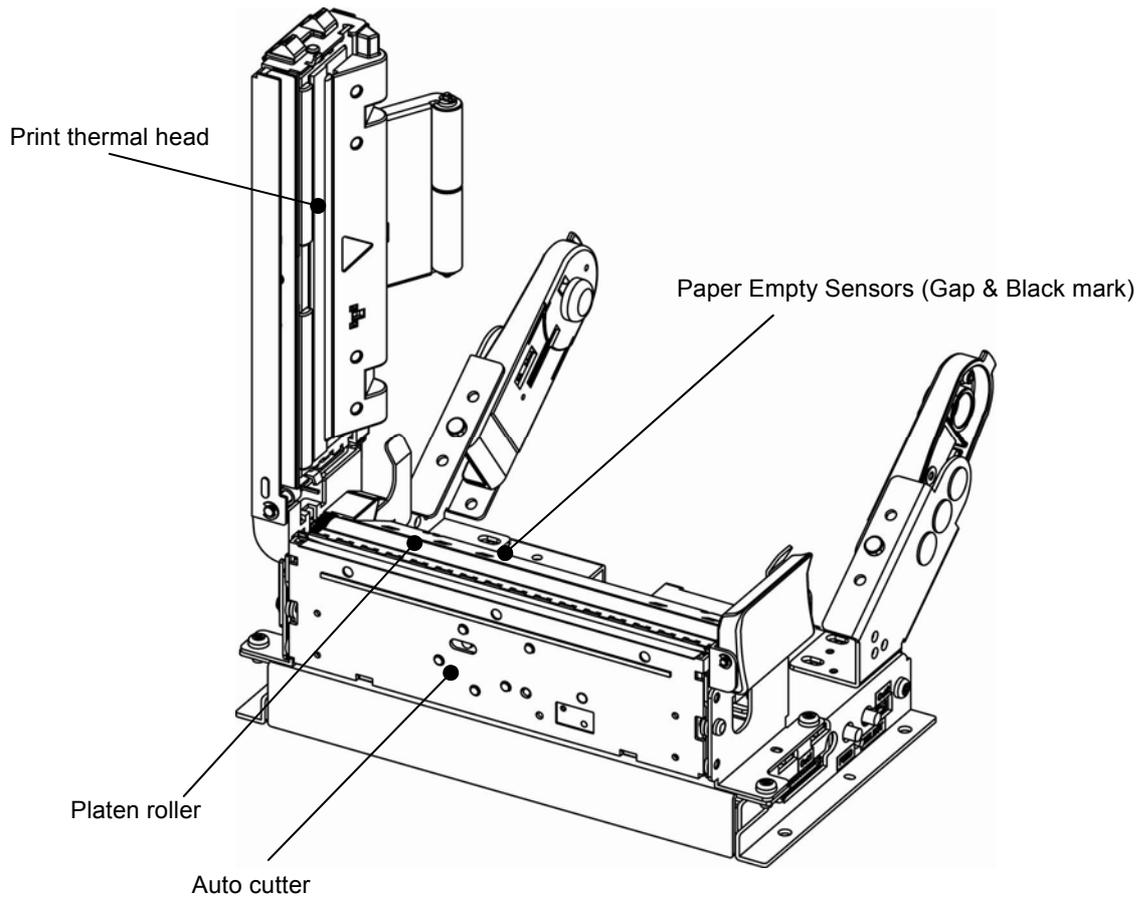
Standard roll paper φ12mm in diameter can be mounted on SK1, and that of φ25.4mm in diameter can also be mounted when an attachment holder is equipped to printer.

The way of attaching the holder is described in “2 - 6 . Changing 1-inch Core adapter”.

2- 2 . Appearance



1. Head open lever
Printer head is opened by pushing the lever when Paper Roll is set
2. Interface connector (USB & Serial)
Connect the interface cable for serial or USB.
3. DC connector
Connect the power supply cable (DC24V)
4. Chassis fixture hole
Fix the chassis fixture hole to customer's main body by attaching screw

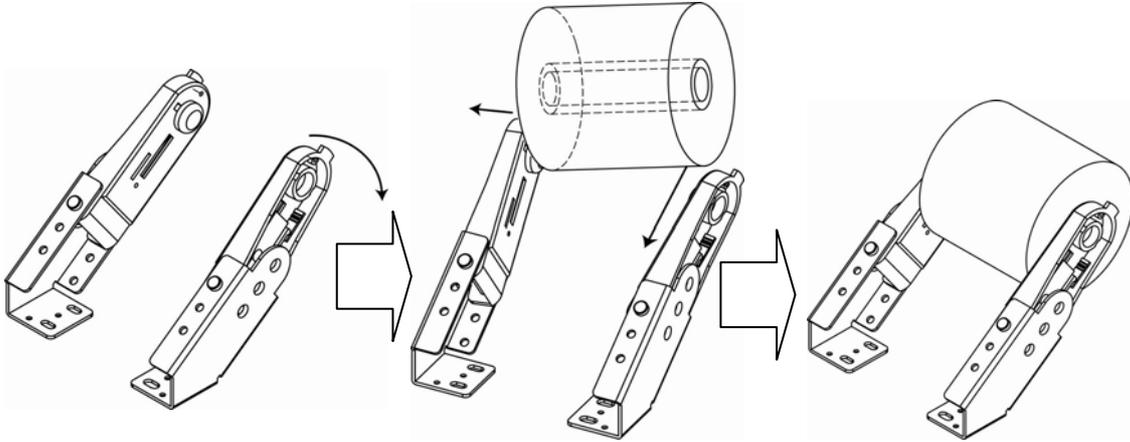


1. Print thermal head
Prints characters and graphics to thermal papers.
2. Paper end sensor
Detects paper empty. If the sensor detects paper empty, the printer stops printing.
3. Platen roller
Feeds the thermal paper on friction with the print head.
4. Auto cutter
Cuts the thermal paper (Selectable for full cut or partial cut)

2-4 . Setting Paper Roll

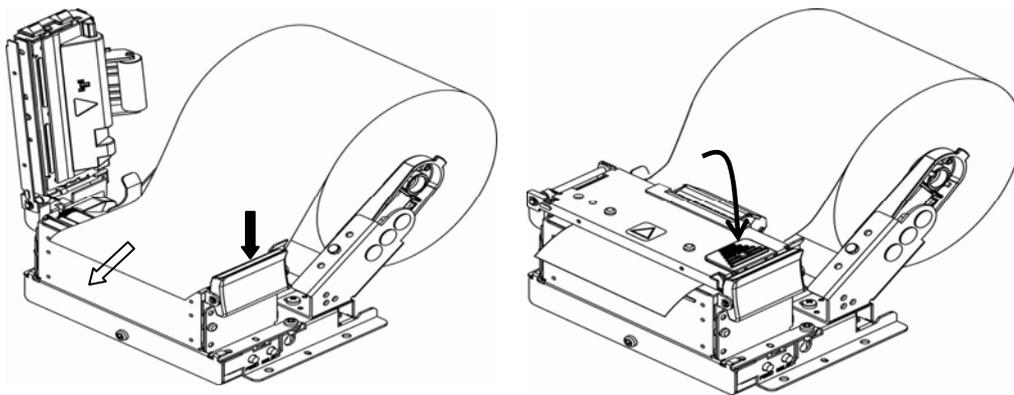
1. Set a roll paper to paper holder.

Widening one side of paper holder, next putting in the roll paper, and finally setting the paper to holder.



2. Use head open lever

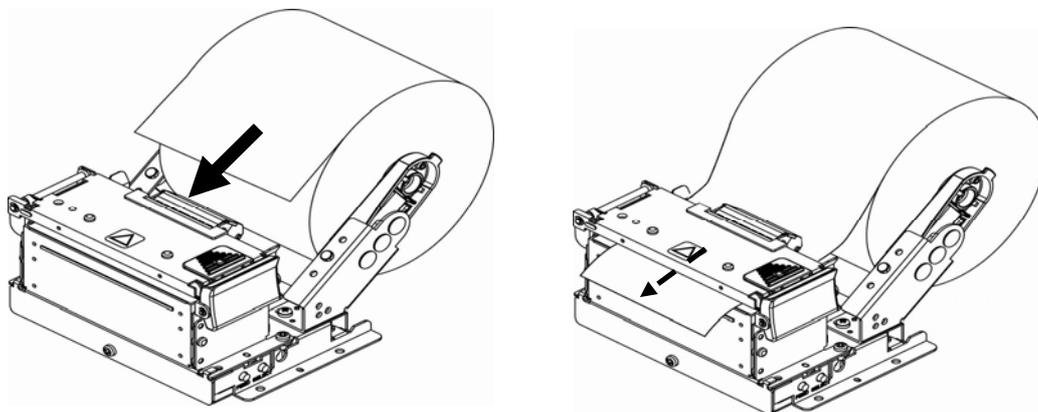
Press the head open lever to lift up the print head, Install the paper roll as shown in the picture (Printing surface: External (top) side)



3. Auto-loading system

Install the paper roll to the holder, Insert the roll end toward the print head.

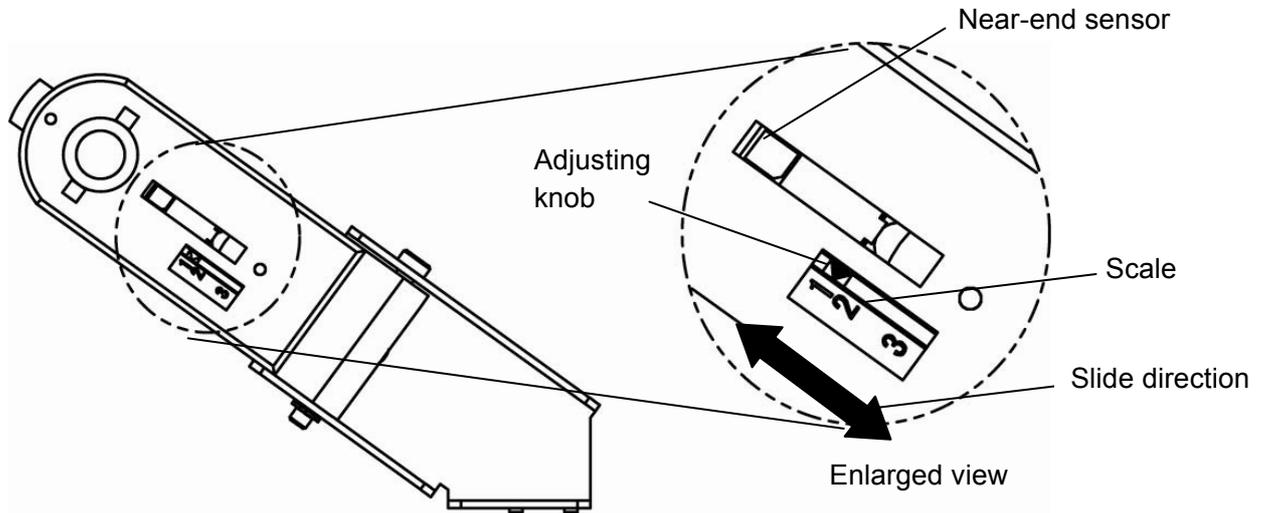
Finally, the paper feeds automatically when the paper-empty sensor detects the paper.



2- 5 . Paper near-end sensor

Sensing roll paper's remaining amount can be adjusted in three levels by sliding near-end-sensor. The level is set based on core's diameter in factory default.

Adjusting knob on the holder must be slide in the direction of an arrow by using a fine-tipped tool like tweezers.



(Unit : mm)

| Position | Detectable paper diameter |
|----------|----------------------------|
| 1 | $\phi 21.0 \pm 2\text{mm}$ |
| 2 | $\phi 24.5 \pm 2\text{mm}$ |
| 3 | $\phi 35.0 \pm 2\text{mm}$ |



- Do not mount the printer on vibrating or slanted surfaces.
- The external diameter should be used as a reference value.

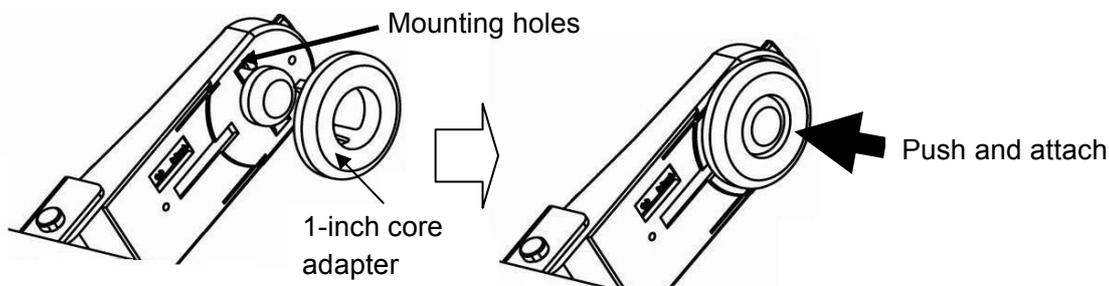
2- 6 . Changing 1-inch core adapter

1. How to change 1-inch core adapter

Roll paper can be replaced by changing from standard $\phi 12\text{mm}$ to $\phi 25.4\text{mm}$.

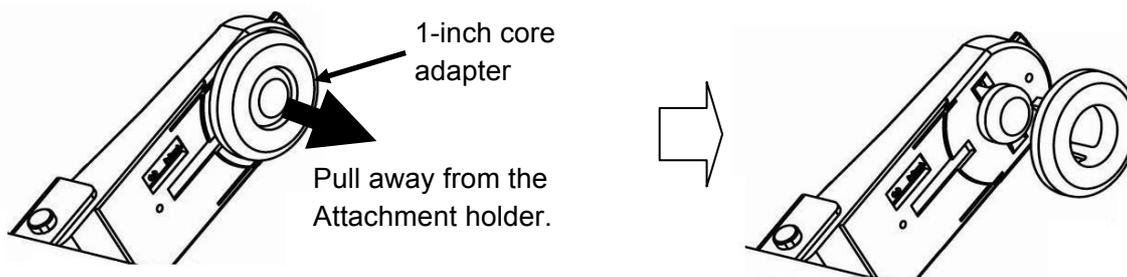
1-1. How to attach the the attachment holders

Mount attachment holders to mounting holes.



1-2. How to detach attachment holder

Clip the attachment holder and pull away in the direction of an arrow below.



2- 7 . Adjust the paper position

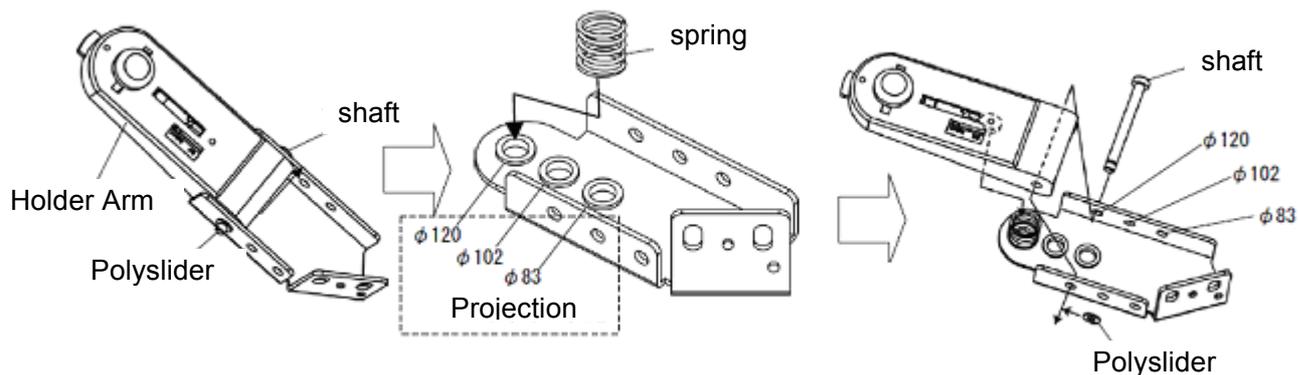
Three types of roll paper ($\phi 120\text{mm}$, $\phi 102\text{mm}$, $\phi 83\text{mm}$ in diameter) are available by setting position of holder arms.

1. How to setting

Detach polyslider and pull out shaft, and then detach holder arm.

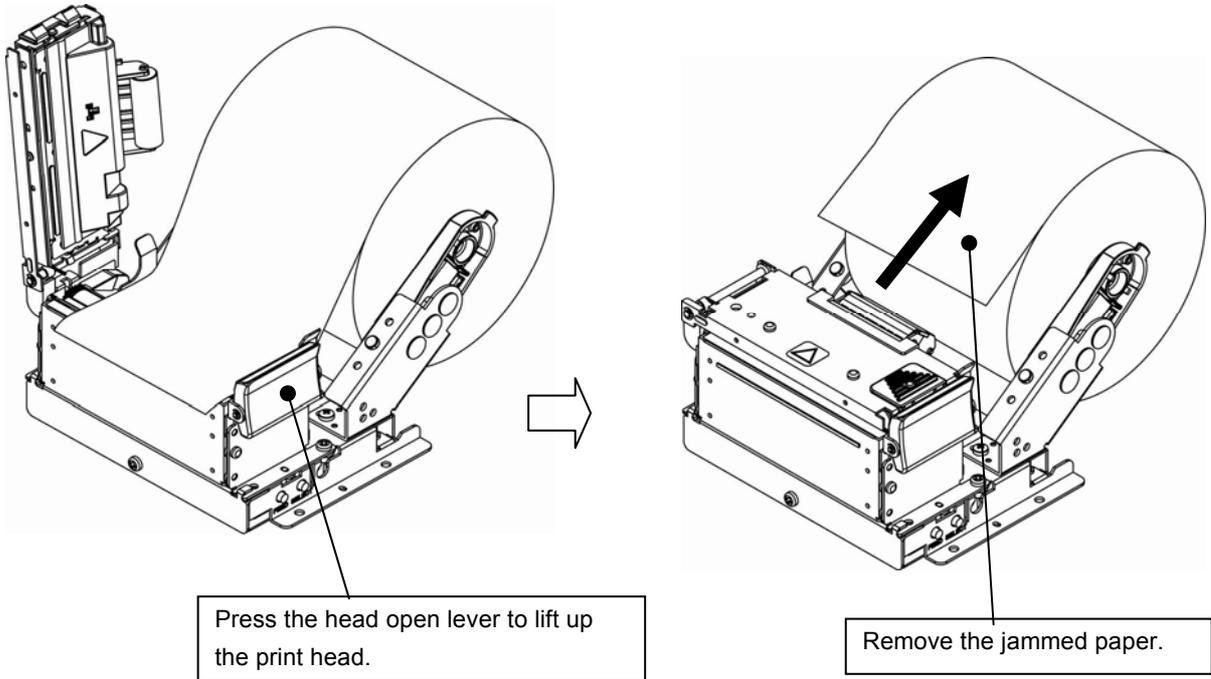
Next, put a spring on a projection and set the holder arm on the spring.

Finally, put the shaft and fix it by the polyslider.



2- 8 . Clear paper jams

- 1 . First of all, turn OFF the printer power.
- 2 . Press the head open lever to lift up the print head.
- 3 . Remove the jammed paper.



Turn the printer power OFF.
Don't put fingers into paper exit.

3 . General specifications

3- 1 . Specifications

| Model | | SK1-41AS F | SK1-41AS J |
|----------------------|---------------------|--|-----------------|
| Printing method | | Direct line thermal | |
| Printing speed | | Max. 150mm/sec *Note 1 | |
| Resolution | | 8dot/mm(203dpi) | |
| Paper | Dimensions | Max.φ120mm(Standard holder), φ254mm(Large diameter holder) | |
| | Thickness | 59 to 120um | |
| | Core diameter | Internal φ12mm & 25.4mm(Standard holder) Internal φ25.4mm(Large diameter holder) | |
| | Width | 80/83/112mm (Fixed variableness) *Note 5 | |
| | Print width | 72/80/104mm(Fixed variableness) *Note 5 | |
| Paper Sensors | | Near end Sensor/Reflection Sensor (OPTION) Gap Sensor | |
| Paper near-end | | φ21.0 & 24.5 & 35.0mm (Standard holder) φ33.5 to 41.0mm (Large diameter holder) | |
| Paper holding method | | Paper Holder | |
| Cutter | | Partial & Full cut (Option) Full cut only model | |
| Presenter | Feeding speed | Max. 300mm/sec | |
| | Receipt length | 50 to 350mm (Paper thickness 70um or more) 50 to 250mm (Paper thickness less than 70um) | |
| | Paper thickness | 59 to 75um | |
| | Core diameter | Internal φ25.4mm & External φ31.4mm or more | |
| | Operating mode | Clamp mode/Retract mode/Continuous issuance mode | |
| | Stock direction | Upper | |
| | Motor type | Stepping motor | |
| | Ticket issuing life | 1.0 million ticket or more *Note 2 | |
| Interface | | Serial (Max speed 115.2kbps), USB2.0 | |
| Characters | ASCII | Katakana/PC437/850/852/857/858/860/862/863/864/865/866/ WPC1250/WPC1251/WPC1252/ WPC1252_2/WPC1254/ Download character | |
| | Japanese Font | none | JIS X 0208-1990 |
| | Printing figures | Max 69/lines (ASCII 12×24dot) & 34/lines (Jfont 24×24dot) Max 104/lines (ASCII 8×16dot) & 52/lines(Jfont 16×16dot) | |
| Receipt length | | Max 350mm (Page memory & Form overlay) | |
| Memory | | Data buffers 16k byte, User memory, Form overlay | |
| Barcode | | UPC-A/E, JAN13/8, CODE39, ITF, CODABAR, CODE128 | |
| 2D barcode(Optional) | | QR, MicroQR, MaxiCode, MicroPDF417, PDF417, DataMatrix | |
| Command systems | | ESC/POS compatible *Note 3 | |
| Regulation | | VCCI, FCC, CE CLASS A | |
| Printing life | | Pulse activation 200million pulses or more Abrasion resistance 150Km or more *Note 1 & 4 | |
| Cutter life | | Cutting life 1.0million cuts or more (Thickness 75um or less) *Note 1 & 4 | |
| Power supply | | DC 24V±5% / TYP 3A (Peak 7.5A) | |
| Current consumption | | Standby : 70mA or less Printing : Average 2.5A *Note 1 | |

| Model | | SK1-41AS F | SK1-41AS J | | | | | | | | | | | | | | | | | | |
|---|-----------------------------------|--|------------|----------|-----------|---------------|-----------|------|-----|------------|------|-----|-----------|-------|-----|--------|-------|-----|-------|------|------|
| Operating environment | | Temperature: -20 to +60 Printing quality is guaranteed from +5 to +40 Humidity: 20%RH to 80%RH (No condensation) 80%RH is area of acceptable to 34 or less | | | | | | | | | | | | | | | | | | | |
| ㊦ Guaranteed area of acceptable temperature and humidity ㊧ <div style="text-align: center;"> </div> | | | | | | | | | | | | | | | | | | | | | |
| Storage environment | | Temperature : -30 to +70 Humidity : 10%RH to 90%RH (No condensation) | | | | | | | | | | | | | | | | | | | |
| Weight | Printer | 885g (Without paper roll) | | | | | | | | | | | | | | | | | | | |
| | Presenter | 260g | | | | | | | | | | | | | | | | | | | |
| | Large holder | 830g (Without paper roll) | | | | | | | | | | | | | | | | | | | |
| Dimensions (without protruding parts) | Printer | 160.9 × 143.1 × 76.3mm (φ83mm) | | | | | | | | | | | | | | | | | | | |
| | | 160.9 × 151.2 × 82.2mm (φ102mm) | | | | | | | | | | | | | | | | | | | |
| | | 160.9 × 159.3 × 88.1mm (φ120mm) | | | | | | | | | | | | | | | | | | | |
| With presenter | 160.9 × 191.1 × 76.3mm (φ83mm) | | | | | | | | | | | | | | | | | | | | |
| | 160.9 × 199.2 × 82.2mm (φ102mm) | | | | | | | | | | | | | | | | | | | | |
| | 160.9 × 207.3 × 88.1mm (φ120mm) | | | | | | | | | | | | | | | | | | | | |
| Large holder | 164.2 × 137.4 × 164mm | | | | | | | | | | | | | | | | | | | | |
| Paper roll | | Recommended paper HP220AB-1 Mitsubishi TF50KS-E2D Nippon paper Standard of print density <table border="1"> <thead> <tr> <th>Part No.</th> <th>Thickness</th> <th>Print density</th> </tr> </thead> <tbody> <tr> <td>HP220AB-1</td> <td>75μm</td> <td>1.0</td> </tr> <tr> <td>TF50KS-E2D</td> <td>59μm</td> <td>1.0</td> </tr> <tr> <td>TF11KS-ET</td> <td>145μm</td> <td>1.2</td> </tr> <tr> <td>P220AC</td> <td>105μm</td> <td>1.1</td> </tr> <tr> <td>PD160</td> <td>75μm</td> <td>1.05</td> </tr> </tbody> </table> Fan fold The printer prints fan fold paper. For further information, please contact a local dealer. | | Part No. | Thickness | Print density | HP220AB-1 | 75μm | 1.0 | TF50KS-E2D | 59μm | 1.0 | TF11KS-ET | 145μm | 1.2 | P220AC | 105μm | 1.1 | PD160 | 75μm | 1.05 |
| Part No. | Thickness | Print density | | | | | | | | | | | | | | | | | | | |
| HP220AB-1 | 75μm | 1.0 | | | | | | | | | | | | | | | | | | | |
| TF50KS-E2D | 59μm | 1.0 | | | | | | | | | | | | | | | | | | | |
| TF11KS-ET | 145μm | 1.2 | | | | | | | | | | | | | | | | | | | |
| P220AC | 105μm | 1.1 | | | | | | | | | | | | | | | | | | | |
| PD160 | 75μm | 1.05 | | | | | | | | | | | | | | | | | | | |

*Note1 : Use AC adapter, printing rate less than 12.5%.

*Note2: Thicket length less than 100mm

*Note3 : ESC/POS is registered trademark of Seiko Epson Corporation.

*Note4 : In the case our recommended paper is not used, the guarantee life may not be possible.

*Note5 : Not permitted with the smaller width paper roll.

Friction between the head and the platen roll in the no paper area may degrade print quality.

3-2 . Sensor

(1) Paper-end sensor

The paper-end sensor is installed into the paper path and the photo-interrupter detects the existence of paper in the printer. When the paper runs out, the red LED lights and the printer goes into error mode and stops in the printing process.

After the paper is replaced, the printer resumes printing.



- Once the paper end sensor sends the paper empty signal, the printer stops printing.
- As soon as the paper end strip appears, replace the paper roll.

(2) Head open sensor

The head open sensor detects whether the print head is open or closed. Once the sensor detects the head open signal, the printer stops printing and goes OFF-Line, the Error LED lights Red.

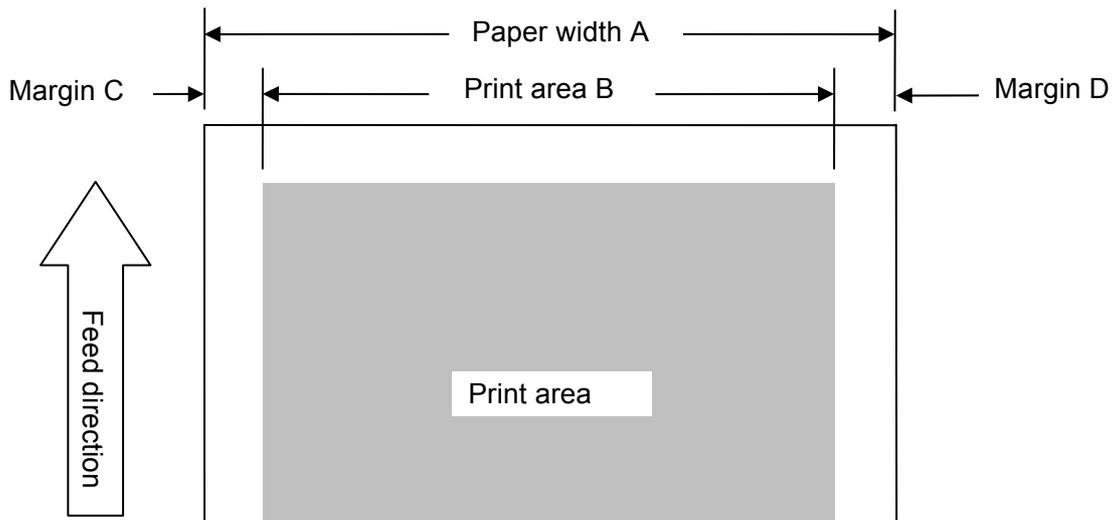
The printer resumes printing after the head is closed.

(3) Thermister

The thermister built in the print head detects the temperature of the print head.

If printing at a high printing rate for a long time, the print head temperature rises and the head may become overheated. To prevent overheating, the printer stops printing when the temperature is beyond a certain level, and blinks the red Error LED.

3- 3 . Printing area



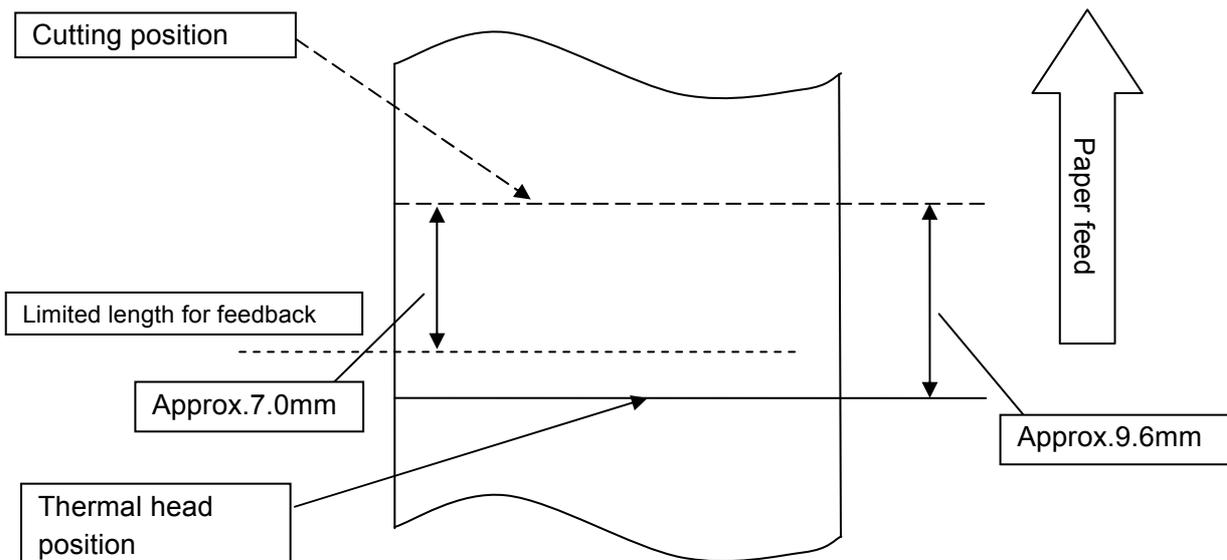
| Paper width/Printing width | A | B | C | D |
|----------------------------|-----|-----|---|---|
| 80mm / 72mm | 80 | 72 | 4 | 4 |
| 83mm / 80mm | 83 | 80 | 1 | 2 |
| 112mm / 104mm | 112 | 104 | 4 | 4 |

(Unit: mm)

The left and right margins are approximate distance from paper edge and will shift about ± 1 mm depending on the paper path, paper position and tolerances.

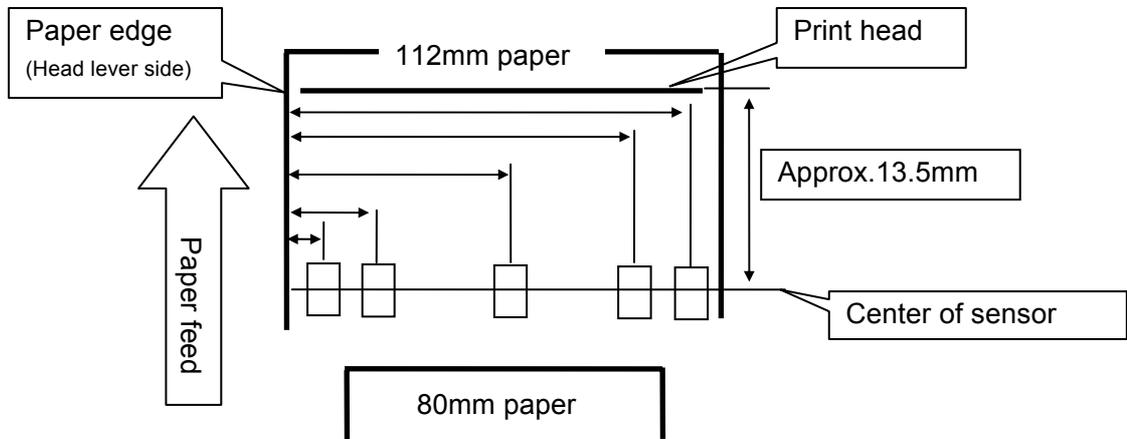
3- 4 . Print head and cutter position

Print head and cutter position



3- 5 . Paper sensor position

Position of paper sensor is shown as following figure.



| Sensor | Distance from paper edge (±1.0mm) |
|-------------------------------------|--|
| Reflection sensor (Most left side) | 7.5mm |
| Reflection sensor (Left side) | 23.4mm |
| Gap sensor | 76.0mm |
| Reflection sensor (Right side) | 88.6mm |
| Reflection sensor (Most right side) | 104.5mm |

Note1: Black mark sensor and gap sensor are embedded in the factory as options.

Note2: Black mark on reverse of thermal paper is detected.

Note3: Reflection sensors (1) & (5) are no available for the 80mm and 83mm of paper wide.

3- 6 . Paper feeding

(1) Avoid deterioration by backlash feeding

Backlash in the paper feed mechanism may lead to under feeding and crowding of characters on adjacent lines. Be sure to always turn the paper feed motor 241 steps (3mm) at the start printing and initialization, and after opening and closing the thermal head.

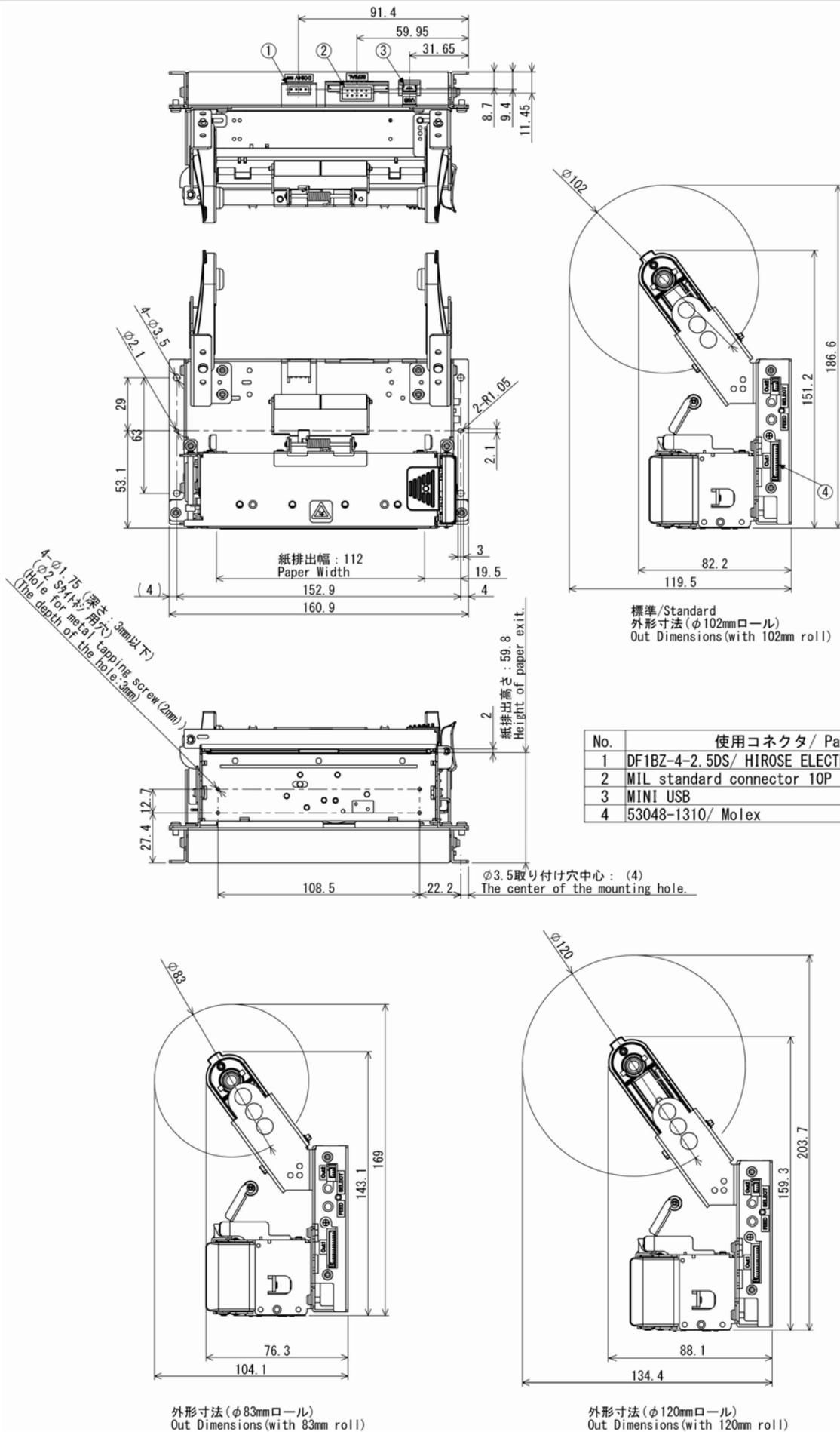
(2) Notice on graphic printing

If the printer must wait for data from host systems while printing, it will temporarily stop printing and feeding paper. After the printer receives new data and resumes printing, the paper feeding of 1 to 3 lines may become irregular, especially if it is printing a bit image. In graphic printing, you may see irregular printing if the single lines of data are specified for Raster bit images. Specify a minimum of 16 lines or more when graphic data is printed.

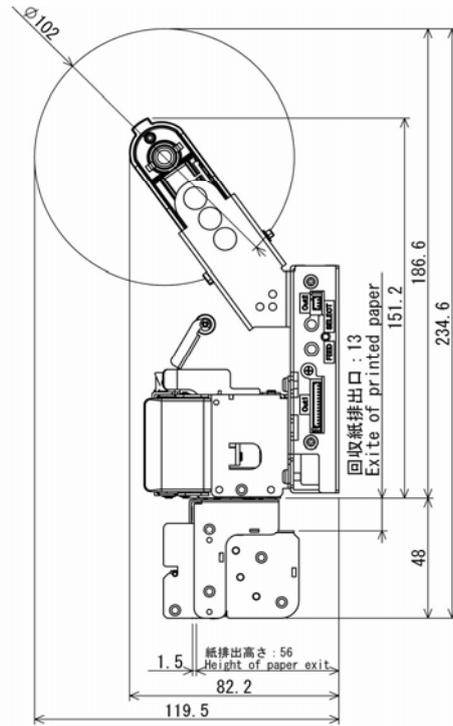
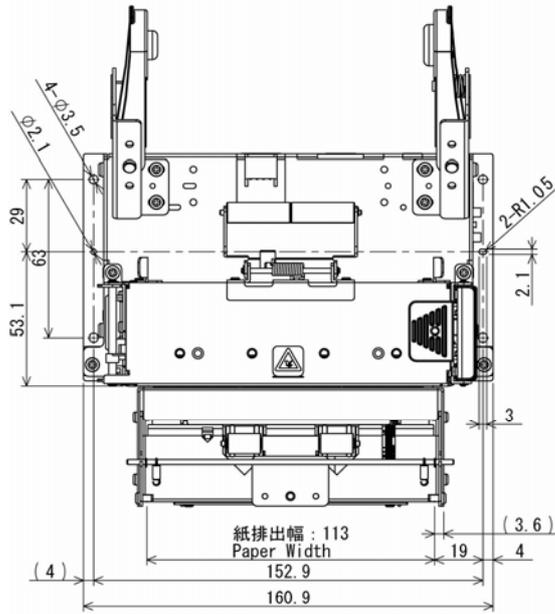
(3) About paper cut

To prevent the printer from paper jam, the printer automatically feeds the paper about 1mm after cutting process. Therefore printing position is added 1mm to cutting position

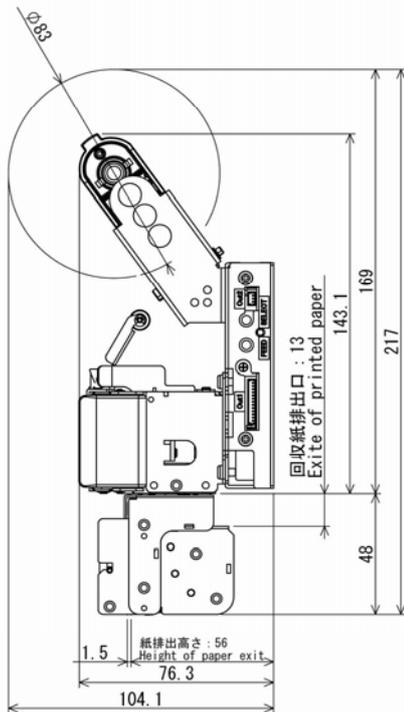
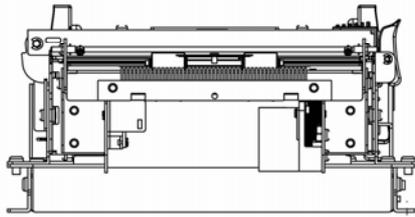
3-7 . Dimensions



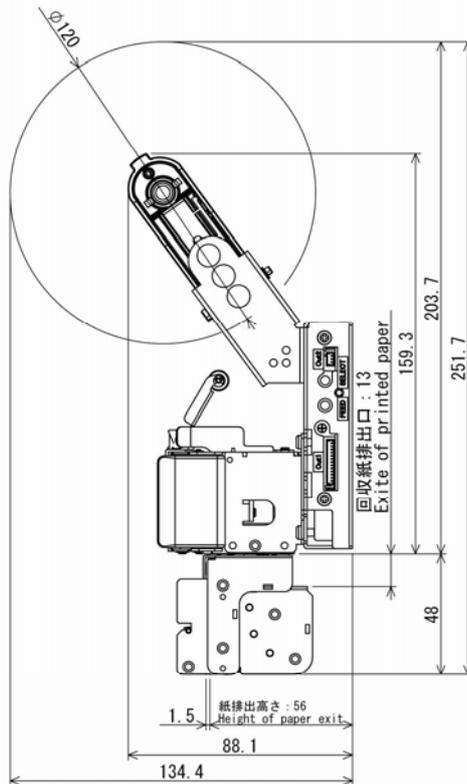
3- 8 . Dimensions (With Presenter)



標準/Standard
外形寸法 (φ102mmロール)
Out Dimensions (with 102mm roll)



外形寸法 (φ83mmロール)
Out Dimensions (with 83mm roll)



外形寸法 (φ120mmロール)
Out Dimensions (with 120mm roll)

4 . Functions

4- 1 . Self test printing

The printer prints characters and barcodes at self test printing.

Printing method

Turn ON the power switch while pressing the FEED switch.

When the LED lights up and the printer starts printing, release the FEED button.

After completing the self test printing, the printer goes to Standby mode.

[Printing samples]



4- 2 . HEX Dump mode

Data entered from the computer is printed in hexadecimal numbers and characters.

Printing method

With pressing the SELECT button, turn on the power switch.

When the LED lights up and printer starts printing, release the SELECT button.

After printing the following "HEX DUMP MODE", starts Hexadecimal mode.

Prints hexadecimal numbers and characters entered from the host system.

Press the power switch to cancel the HEX dump mode.

[Example]

[HEX DUMP MODE]

```
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
38 39 3A 3B 3C 3D 3E 3F  89:;<=>?
40 41 42 43 44 45 46 47  @ABCDEFG
48 49 4A 4B 4C 4D 4E 4F  HIJKLMNO
50 51 52 53 54 55 56 57  PQRSTUWV
58 59 5A 5B 5C 5D 5E 5F  XYZ[^\]^_
60 61 62 63 64 65 66 67  `abcdefg
68 69 6A 6B 6C 6D 6E 6F  hijklmno
70 71 72 73 74 75 76 77  pqrstuvwxyz
78 79 7A 7B 7C 7D 7E 7F  xyz{|}~.
```

4- 3 . Function setting mode

There is a function setting mode to switch register functions in the memory manually.

Functions are called up by the SELECT and FEED buttons and the printer prints registered functions.

(1) About memory switching

The memory switch is classified as follows.

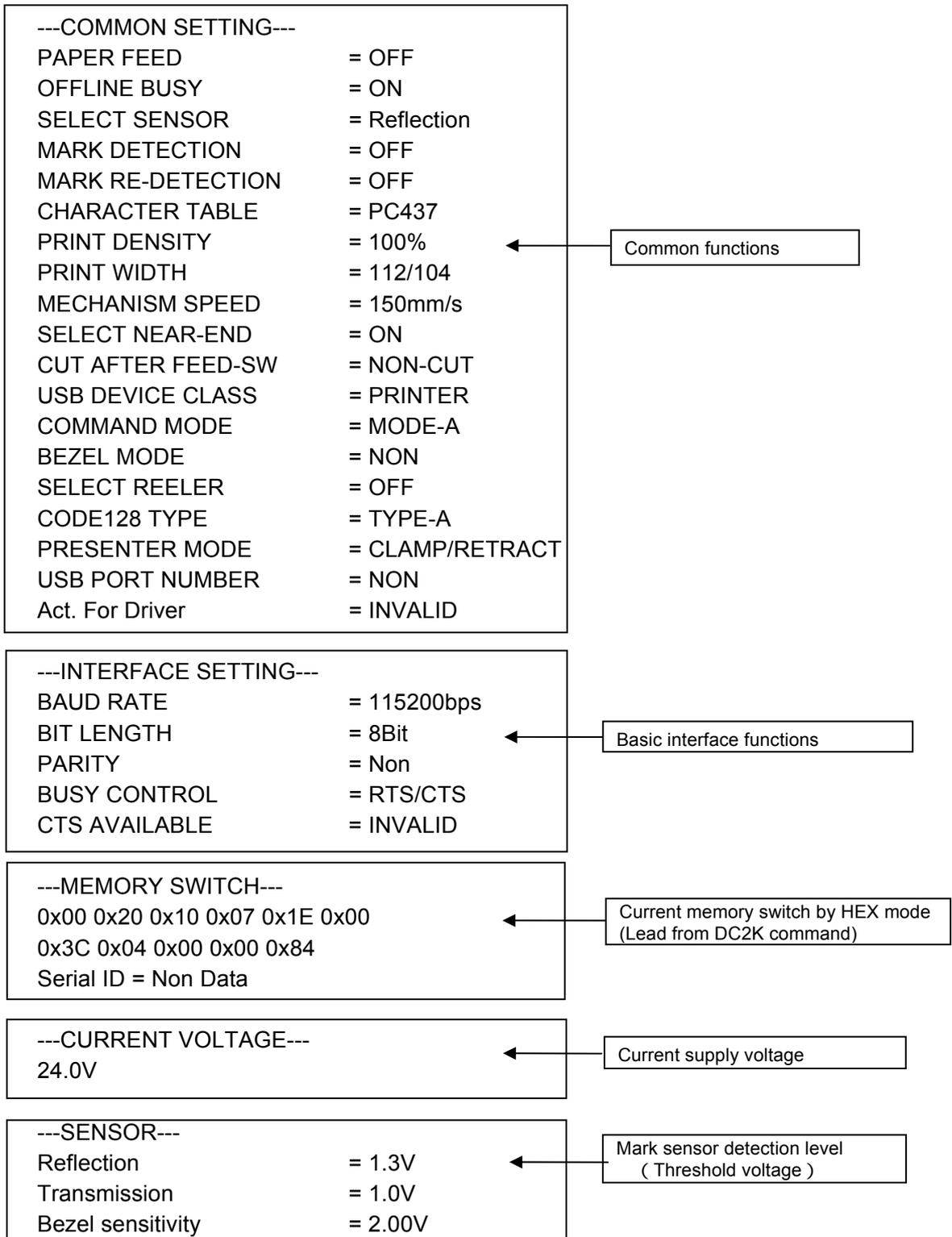
COMMON SETTING : Common functions

INTERFACE SETTING : Basic interface functions

(2) Function setting method

1. While pressing the FEED/SELECT button, turn ON the power switch.
2. When the LED lights up and printing starts, release the button.
3. The printer prints out the current setting mode and returns to that function setting.
4. To change the current function setting, press the feed button.
5. Refer to setting flow chart in "Setting of memory switch."

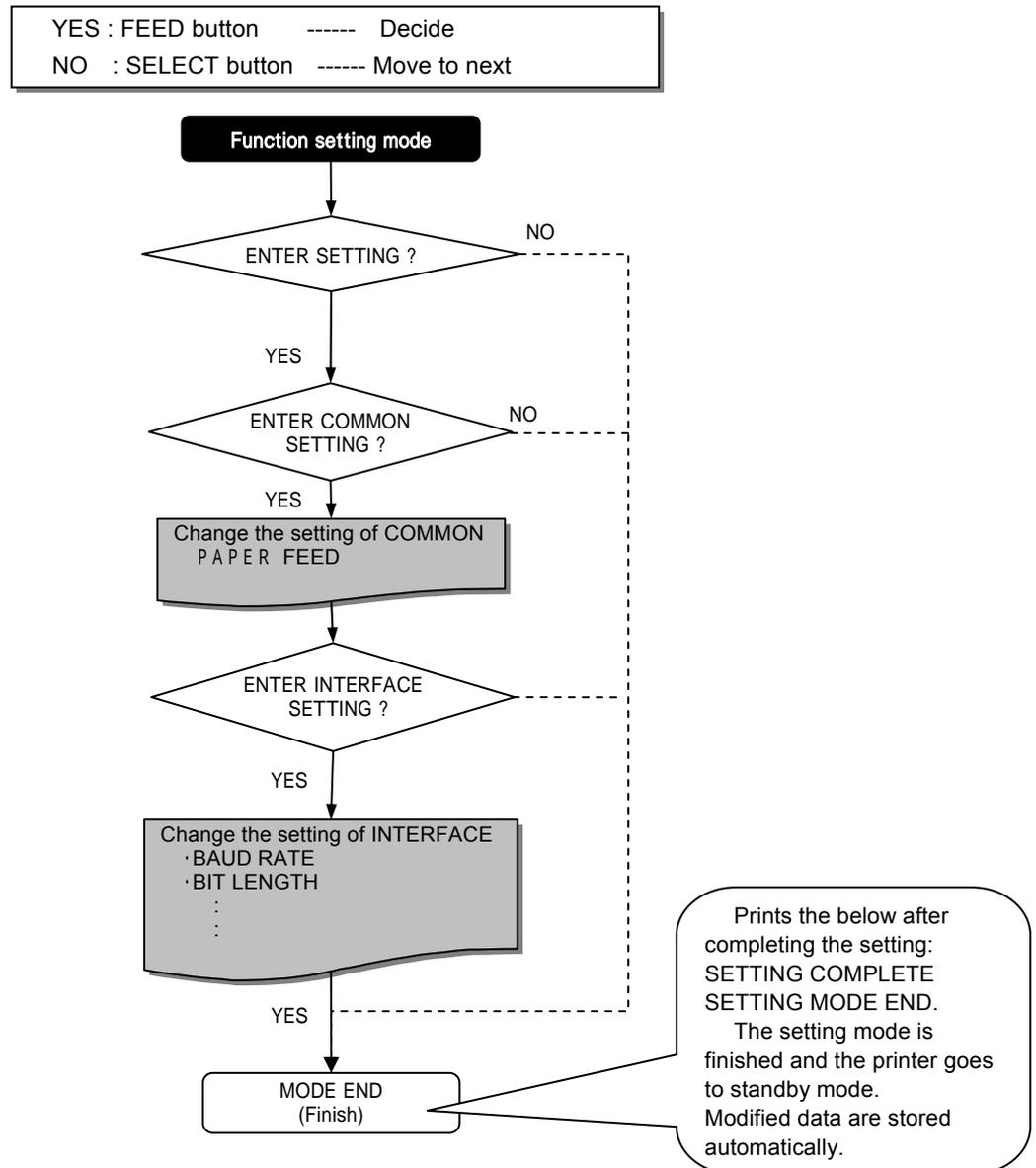
(Example)



4- 4 . Setting the memory switch

Follow the flow chart to change the parameter. As the setting parameter is printed, choose the right parameter by manipulating the FEED and SELECT buttons.

After completing the parameters set up, data are stored and the printer goes to standby mode.



4- 5 . Memory switch setting menu

(1) COMMON SETTING

| Menu | Default | Value | Description |
|-------------------|------------------------------------|---|--|
| PAPER FEED | OFF | OFF ON(10mm) ON(20mm) ON(30mm) ON(40mm) ON(50mm) ON(60mm) | Enables/disables paper feed after closing the print head. <ul style="list-style-type: none"> When paper feed is ON, print feed amount. (Cut the paper after feeding the paper) The value is changeable using the DC2K command. |
| OFFLINE BUSY | ON | ON OFF | Enables/disables OFFLINE when the error occurs. < At selecting ON > <ul style="list-style-type: none"> OFFLINE is enabled when an error occurs. The printer stops printing and holds received data until the error is cleared. < At selecting OFF > <ul style="list-style-type: none"> ONLINE is enabled when error occurs. Receiving data is continuously read and printing data is not stored. Setting the command and status response are enabled. |
| SELECT SENSOR | Reflection | Reflection Transmission | Selects the mark sensor for label printing. <ul style="list-style-type: none"> Reflection ··· Detect by Black mark sensor Transmission··· Detect by Gap sensor. |
| MARK DETECTION | OFF | OFF ON | Enables/disables the Black mark sensor/Gap sensor functions. * Enables Black mark and Gap sensor models. |
| MARK RE-DETECTION | OFF | OFF ON | Enables/disables re-detecting function after the paper setting. |
| CHARACTER TABLE | PC437 | KATAKANA PC437 / PC850 PC852 / PC857 PC858 / PC863 PC865 / PC866 WPC1252 / PC860 WPC1252_2 PC862 / PC864 WPC1254 / WPC1250 WPC1251 | Selects the characters. *PC862 font was added after V2.23 *PC864 font was added after V2.30 |
| PRINT DENSITY | 100% | 80% 90% 100% 110% 120% 130% 140% 150% | Specifies the printing density. |
| PRINT WIDTH | Comply with classified paper width | 80/72 83/80 112/104 | Selects the paper width. |

| Menu | Default | Value | Description |
|----------------------|-------------------|--|--|
| MECHANISM SPEED | 150mm/s | 110mm/s 130mm/s 150mm/s | Selects maximum speed |
| SELLECT NEAR-END | ON | ON OFF | Selects Near end sensor ON ... activate sensor OFF ... cancel sensor |
| CUT AFTER FEED SW | NON-CUT | NON-CUT PARTIAL-CUT FULL-CUT | Selects cutting operation after FEED switch is on. |
| USB DEVICE CLASS | PRINTER | PRINTER COMMUNICATION | Selects device operation mode USB |
| COMMAND MODE | MODE-A | MODE-A MODE-B | Selects command emulation |
| BEZEL MODE | NON | NON MODE-A MODE-B MODE-C | Selects bezel mode |
| SELECT REELER | OFF | OFF ON | Selects reeler mode |
| CODE128 TYPE | TYPE-A | TYPE-A TYPE-B | Selects command parameter specification for CODE-128 |
| PRESENTER MODE | CLAMP/ RETRACT | CLAMP/RETRACT CLAMP/EJECT CLAMP ONLY CONTINUOUS | Backward collecting operation Forward collecting operation Ejecting operation Continuous ejecting operation * function added after V2.26 |
| USB PORT NUMBER | NON | NON 1-9 | Selects USB Port Number • NON ... Selects arbitrary USB Serial ID • 1-9 ... Selects USB Serial ID 1-9 * function added after V2.26 |
| Act. For Driver | INVALID | INVALID VALID | Set driver's activity. * function added after V2.26 |

(2) INTERFACE SETTING

| Menu | Default | Value | Description |
|---------------|-----------|---|--|
| BAUD RATE | 115200bps | 1200bps 2400bps 4800bps 9600bps 19200bps 38400bps 57600bps 115200bps | Selects the baud rate. |
| BIT LENGTH | 8bit | 8bit 7bit | Selects the bit length of serial communication. |
| PARITY | Non | Non Odd Even | Selects the parity of serial communication. |
| BUSY CONTROL | RTS/CTS | RTS / CTS Xon / Xoff | Selects the flow control of serial communication. |
| CTS AVAILABLE | INVALID | INVALID VALID | Selects the CTS signal of the serial communication INVALID . . . CTS signal is invalid. VALID . . . CTS signal is valid. * function added after V2.30 |

4- 6 . Adjusting printing density

Paper sensitivity varies by type of thermal paper. Choose the right density to realize best printing quality and reliable printing. (The excess heating of the thermal head may cause the reduction of head life and contamination)

Allows setting density from 60 to 150%. The default value from the factory is 100% for maintaining proper printing quality. Details of the adjustment method are written in " Command systems **DC2** ~ (Set print density).

4- 7 . Error display

When an error occurs, the STATUS LED lights or blinks depending on the type of errors as follows.

1. No error signal is detected.

Standby

It is possible to print and the printer waits for printing data by ONLINE.

Initialization

Initialize printer memories. The printer goes OFFLINE during initialization and status LED blinks. After completing initialization, the printer goes standby.

2. Auto-recovery error

Temperature error

The print head temperature is increased when heavy-duty printing is continuous. If the print head temperature exceeds 70 degrees C, operation of the print head is automatically stopped to prevent overheating. The status LED blinks and the printer goes OFFLINE. The printer resumes printing when the head temperature falls to 60 degrees C or lower.

Paper empty

Detect the paper empty through near end sensor and paper empty sensor. The status LED blinks at paper near end and keeps the printer ONLINE. After the paper runs out and the printer detects paper empty, the status LED turns On and the printer goes OFFLINE.

Print head open

When the print head is lifted up, the status LED turns ON and the printer goes OFF-LINE. After closing the print head, the printer goes on standby.

3. Unrecoverable error

Auto cutter lock

When the cutter is blocked by a paper jam, the status LED blinks. Press the head open button to return the cutter to its home position. If the cutter does not return, keep the print head closed and contact a local dealer.

Voltage error

When the printer detects abnormal voltage, the printer blinks the LED and goes OFFLINE. Check the power supply voltage and if the problem is not cleared, please contact a local dealer.

4. LED status

LED status / : Turn ON red and green for 0.1sec : Turn OFF for 0.1sec

No error signal is detected

| Status | LED |
|--------------|----------------|
| Standby | ON (Green LED) |
| Initializing | (Green LED) |

Auto-recovery error

| Status | LED |
|--------------------------------|--------------|
| Temperature error(70 or more) | (Red LED) |
| Detect near end | (Green LED) |
| Paper empty | ON (Red LED) |
| Print head open | ON (Red LED) |

Unrecoverable error

| Status | LED |
|---|---------------------|
| Auto cutter lock | (Red and Green LED) |
| Upper limit voltage error (27.0V or higher) | (Red and green LED) |
| Lower limit voltage error (18.0V or lower) | (Red and green LED) |

4- 8 . Memory

(1) Structure of memory

Table1. Capacity

| No | Memory | Size(Unit: Byte) |
|----|--------------|------------------|
| 1 | Input buffer | 16384 |
| 2 | User memory | 8192 |

(2) Input buffer

Buffer memory stores input data from the interface.

(3) User memory

User memory is used to store external characters, download characters and bit images.

Users are able to manipulate the area freely. Calculate the available memory size due to the limited amount of memory available.

If there is no available memory, erase the used memory to free up enough space.

(4) 2D barcode (option)

2D barcode printing is available as an option.

The 2D barcode is manipulated for editing and analysis of data within the assigned area.

For detailed information, refer to **GS Q** command.

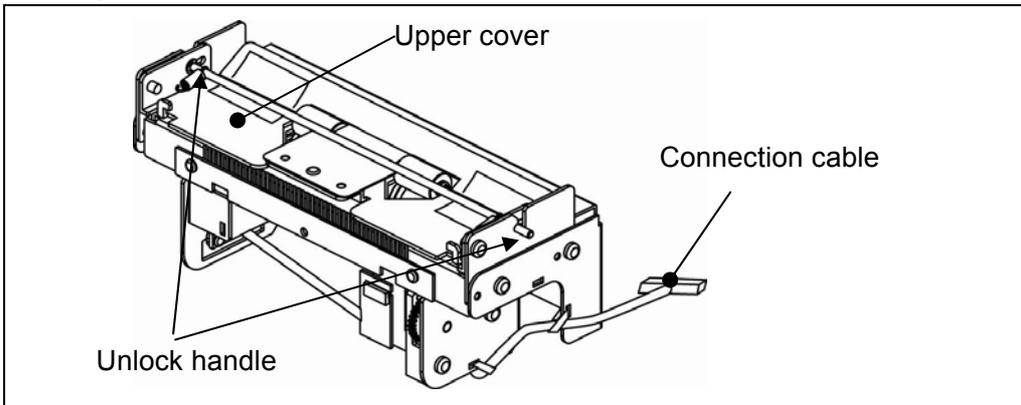
5. Presenter

Presenter unit module has a mechanism that prevent users from pulling paper during printing.

5- 1. Specification

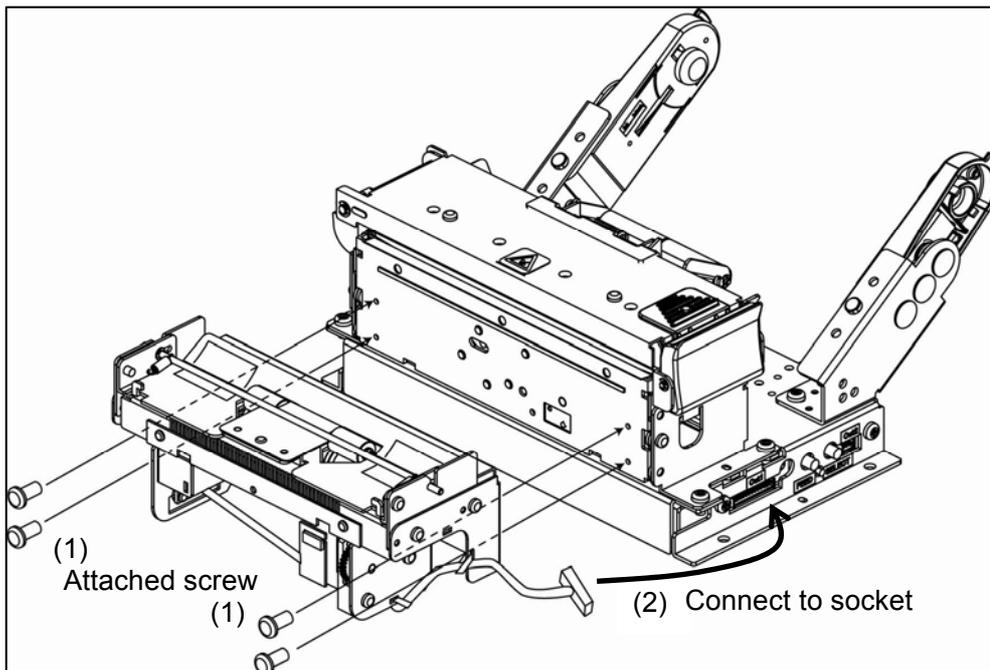
- Available for three operating mode (Clamp mode/Retract mode/Continuous issuance mode)
- Maximum 350mm for Paper issuing length.
- Maximum 300mm/sec for Paper issuing speed.
- Equip reflection-type photo sensor to detect paper.

<Each part's name>



5- 2. Mounting presenter

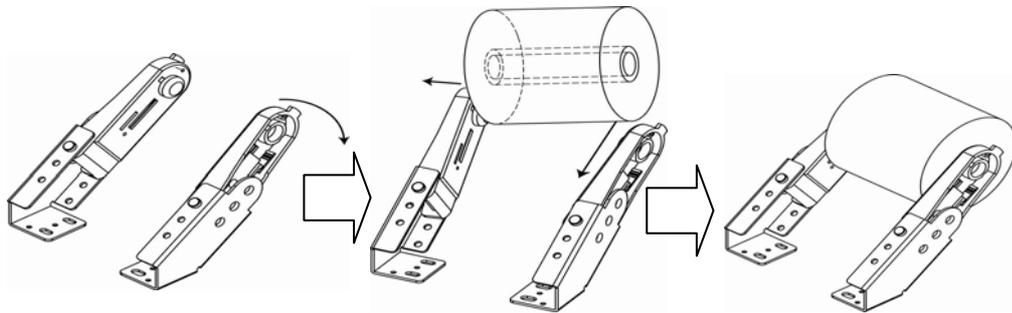
- (1) Mount a presenter on printer with screws.
- (2) Connect a cable to a printer connector (OUT 1).



5- 3. Setting Paper Roll

1. Set a roll paper to paper holder.

Widening one side of paper holder, next putting in the roll paper, and finally setting the paper to holder.

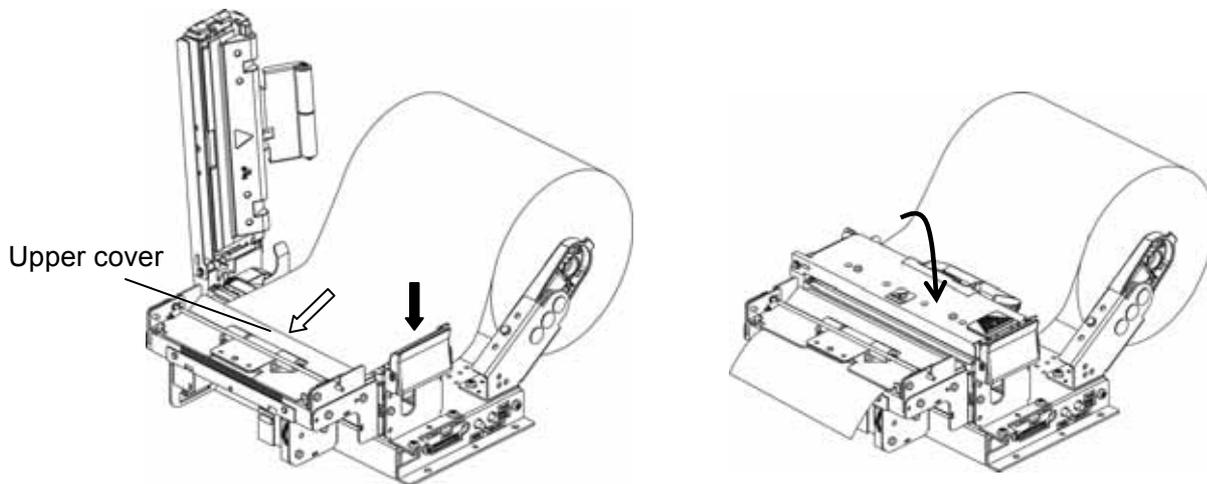


2. Hand set-up

Press the head open button, and lift up the print head,

As shown in the picture, put on the paper under upper cover and close the print head.

After that, the presenter is automatically paper-loading, and ejects the paper.

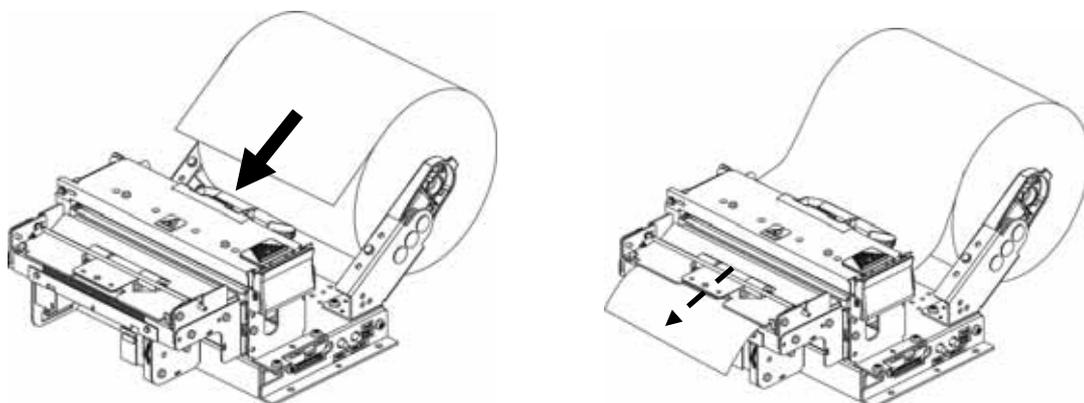


3. Auto-loading

Set-up the paper roll to the holder, Insert the roll end toward the print head.

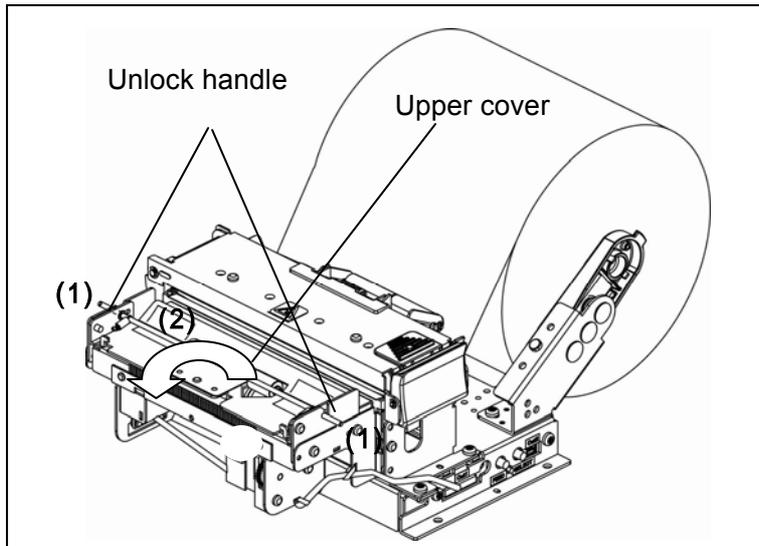
The paper feeds automatically when the paper-empty sensor is detected the paper.

After that, the presenter is automatically paper-loading, and ejects the paper.



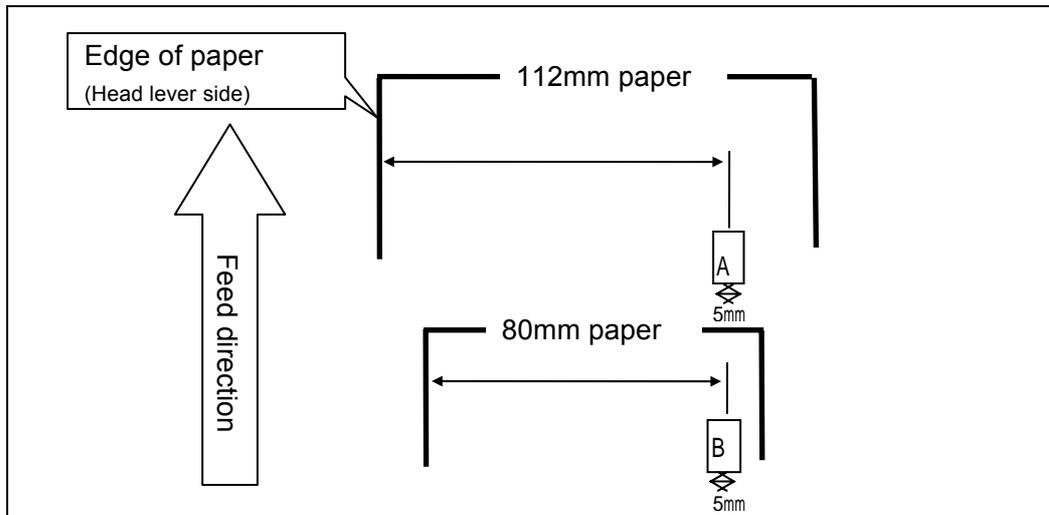
5- 4. Removing paper jam

The way to remove paper jam is that upper cover (2) is opened by pressing Unlock handle (1).



5- 5. Paper detection sensor

Reflection sensor is equipped to detect paper in paper course, so if a black mark is printed on reverse face of roll paper, the reflection sensor is afraid that issuing paper cannot be detected.

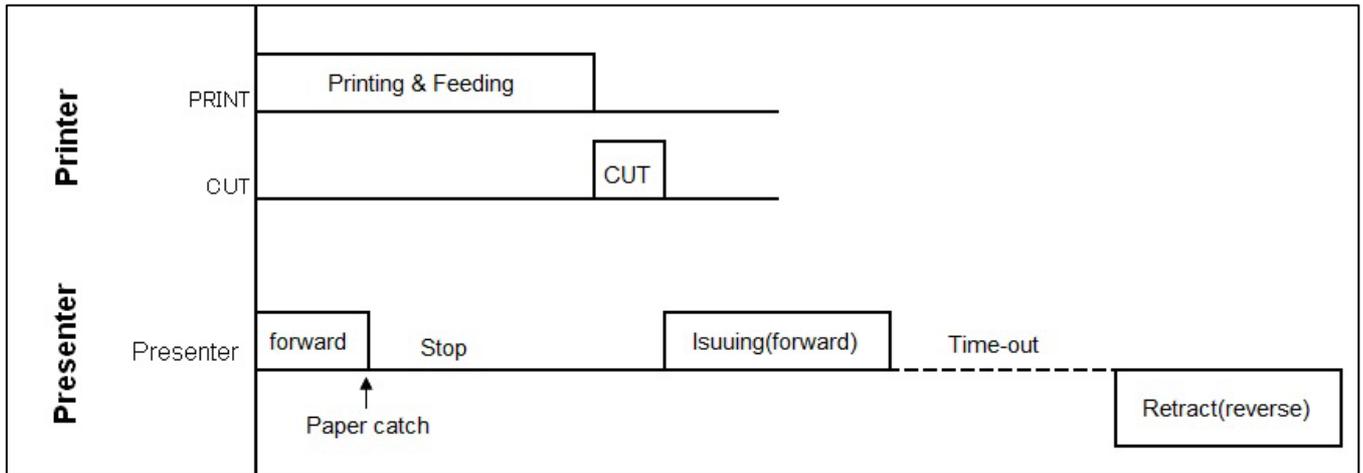


| Type of sensor | Sensor position ($\pm 1.0\text{mm}$) |
|------------------------------|--|
| 112mm paper detection sensor | 88.5mm |
| 80mm paper detection sensor | 72.5mm |

5- 5. Operating specification

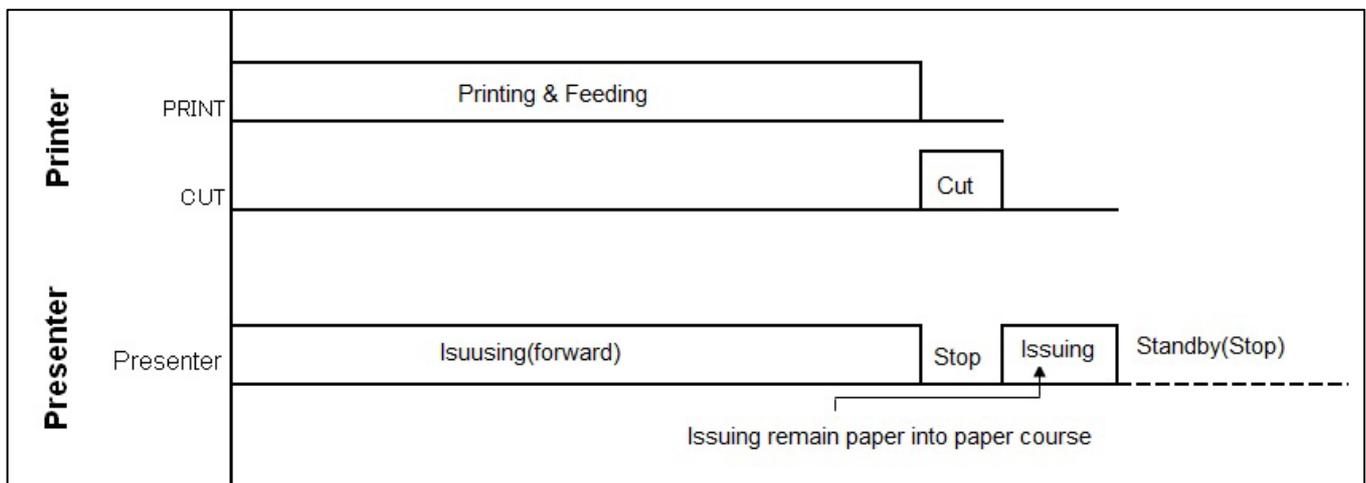
(1) Clamp mode & Retract mode

During printing and feeding, Paper automatically feed out synchronized with cutting while the paper is caught by clamp mode. After that, the paper is removed over the time-out timer by the retract mode. Timing chart is shown as follows:



(2) Continuous issuance mode

Presenter is continued to feed synchronized with cutting by Continuous issuance mode. This mode is recommended if 350mm paper is over. Timing chart is shown as follows:

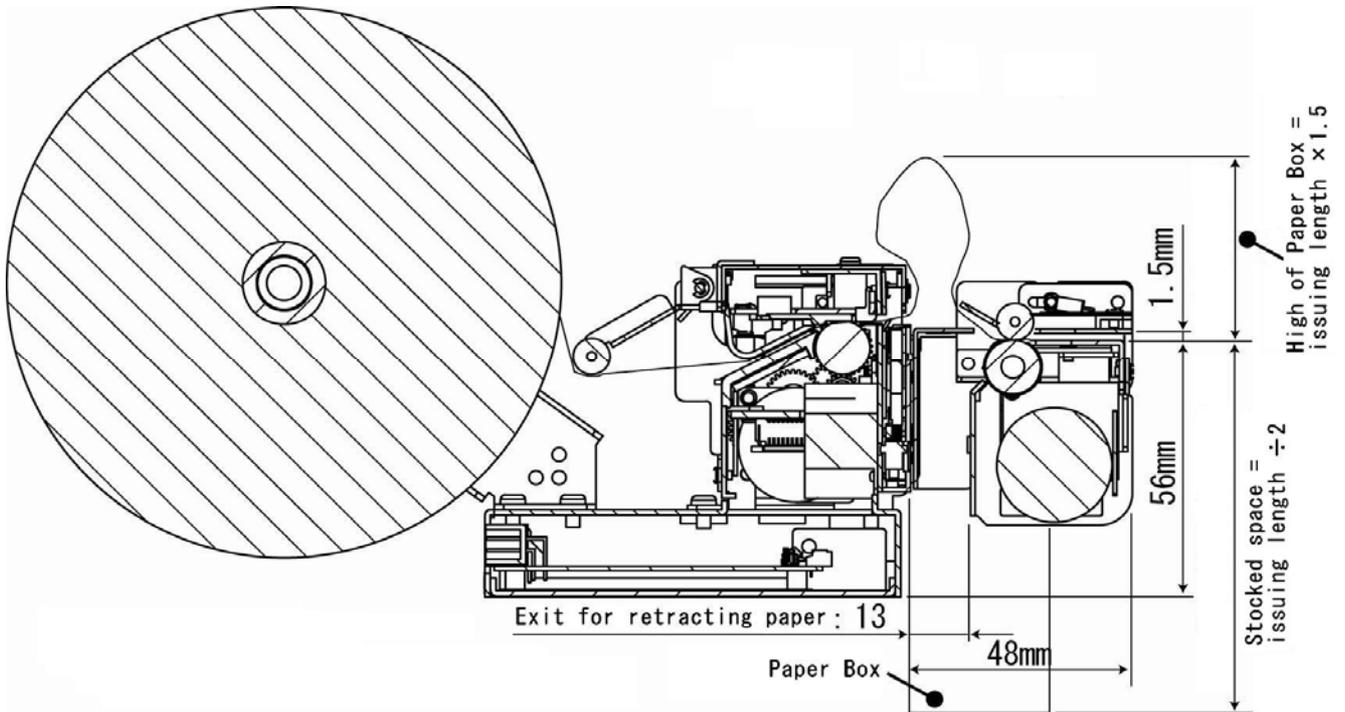


(3) The other specification

| Specification | Description |
|----------------------------|--|
| Paper feed calibration | When receipt length is less than 50mm, Cutting is worked with calibrating automatically to length more than 50mm. |
| Cutting | Cutting is operated by changing partial-cut to full-cut. |
| Waiting for removing paper | After cutting, issuing is stopped until paper is removed and all printing data transmitted is cleared. Status of paper can be read by a status command. |

5- 6. Stock space

Housing of printer is needed to reserve space, because paper is stocked with looping through upper side, when the paper is caught by clamp mode.



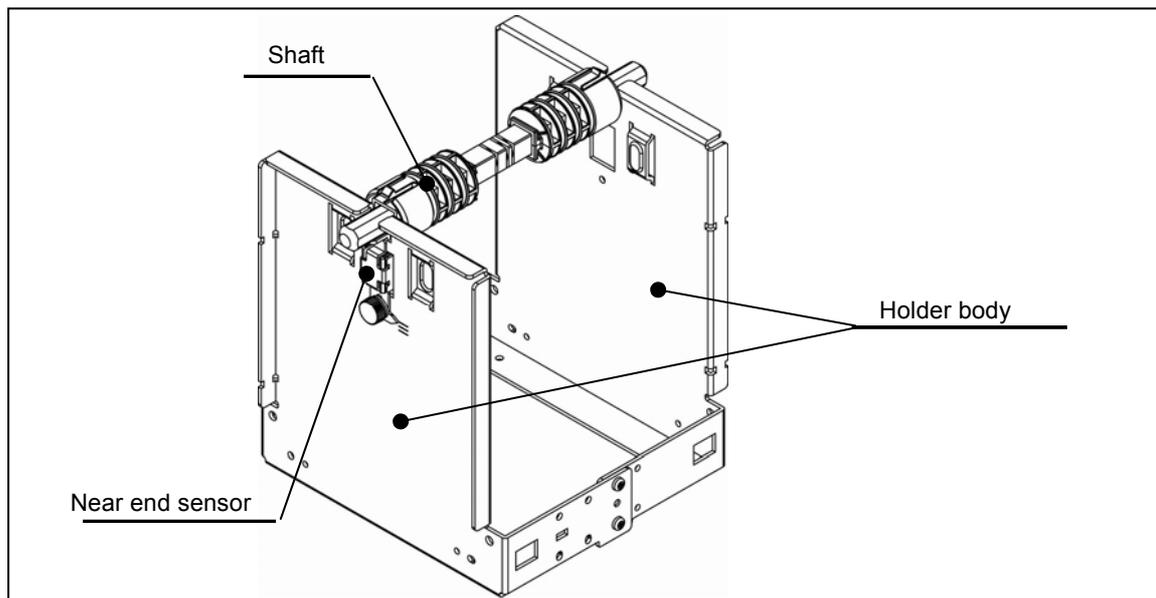
6. Large diameter holder

When a large diameter paper which cannot be put into a printer is used, the paper can be used by implementing large diameter holder rearward of the printer.

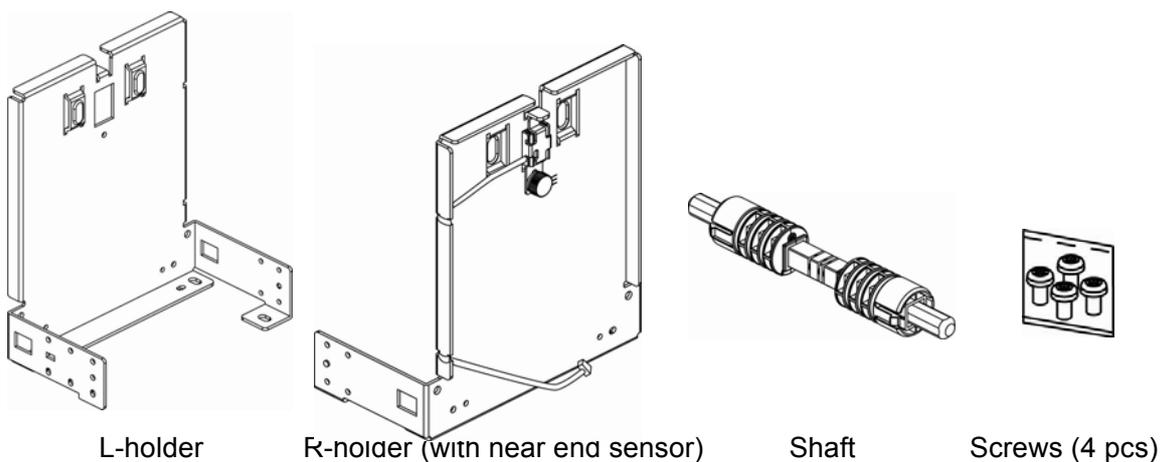
6- 1. Specification

- Applied to maximum diameter of $\phi 254\text{mm}$.
- Large diameter holder can be adjusted to 112mm, 83mm and 80mm for paper wide.
- Equip the Reflection photo sensor to detect the paper near-end.

<Each part's name>

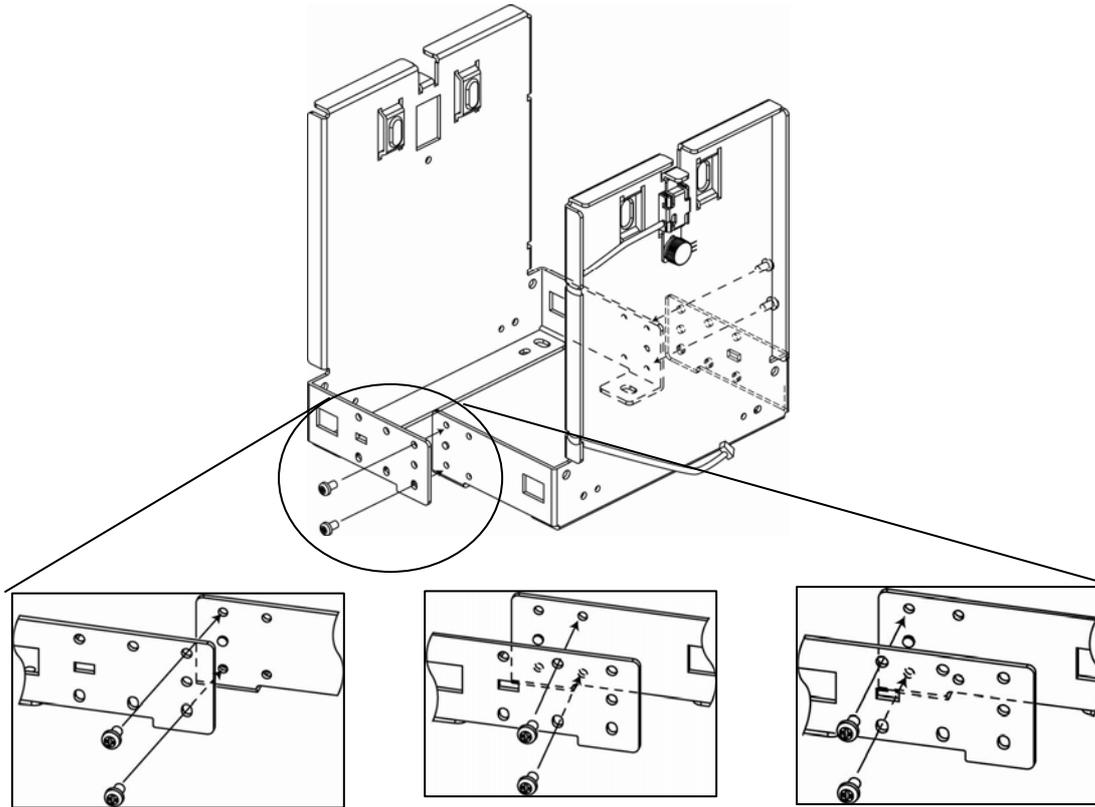


6- 2. Bundled items



6- 3. Assembling holder

L-holder and R-holder are fixed each other by screws to be suitable for width of paper.

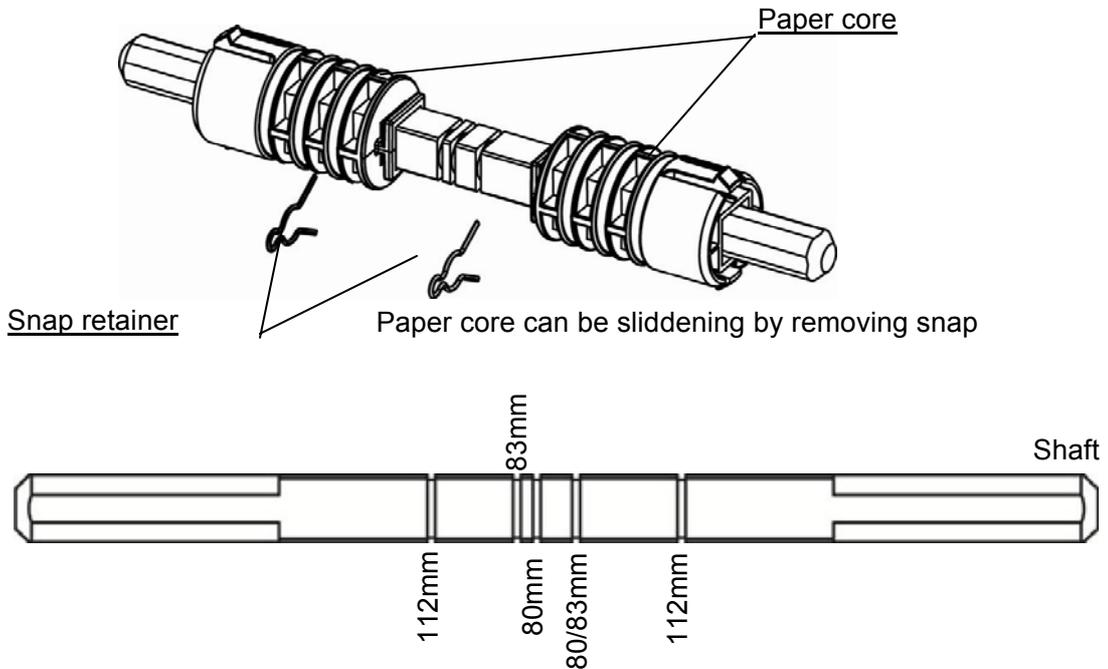


Position fixed for 112mm

Position fixed for 83mm

Position fixed for 80mm

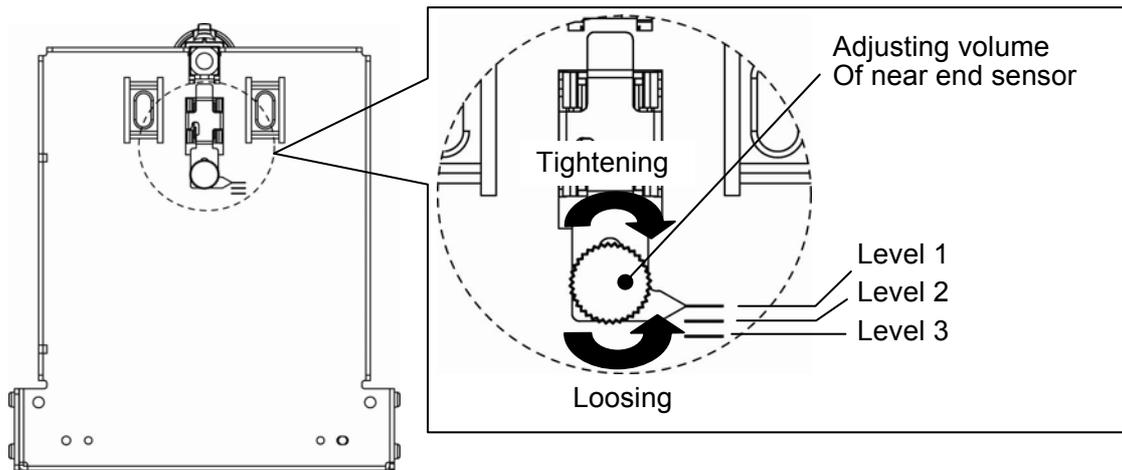
6- 4. Adjusting shaft



Paper retainer can be fixed with sliding paper core and adjusting to groove for paper

6- 5. Adjusting paper near end

Detecting remaining amount of paper can be adjusted by loosening screws and sliding near end sensor.



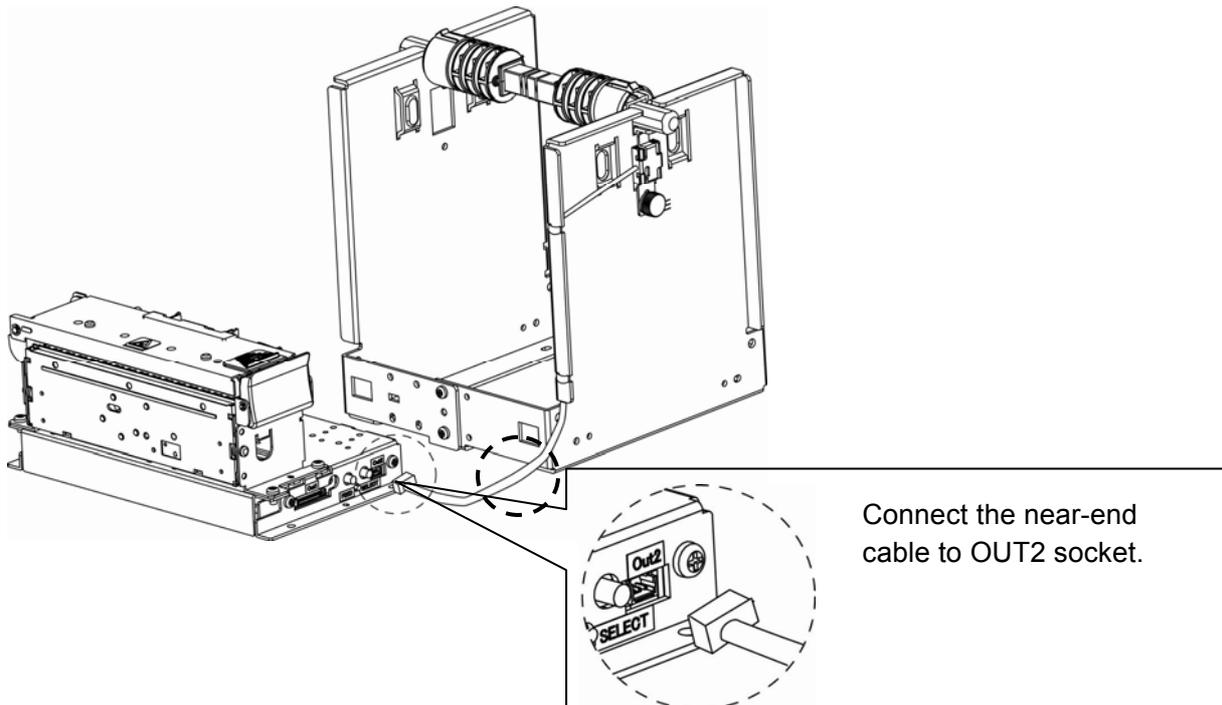
Position of level and detected diameter

| Level position | Diameter of detecting near end |
|----------------|-------------------------------------|
| 1 | $\phi 33.0\text{mm} \pm 2\text{mm}$ |
| 2 | $\phi 37.0\text{mm} \pm 2\text{mm}$ |
| 3 | $\phi 41.0\text{mm} \pm 2\text{mm}$ |



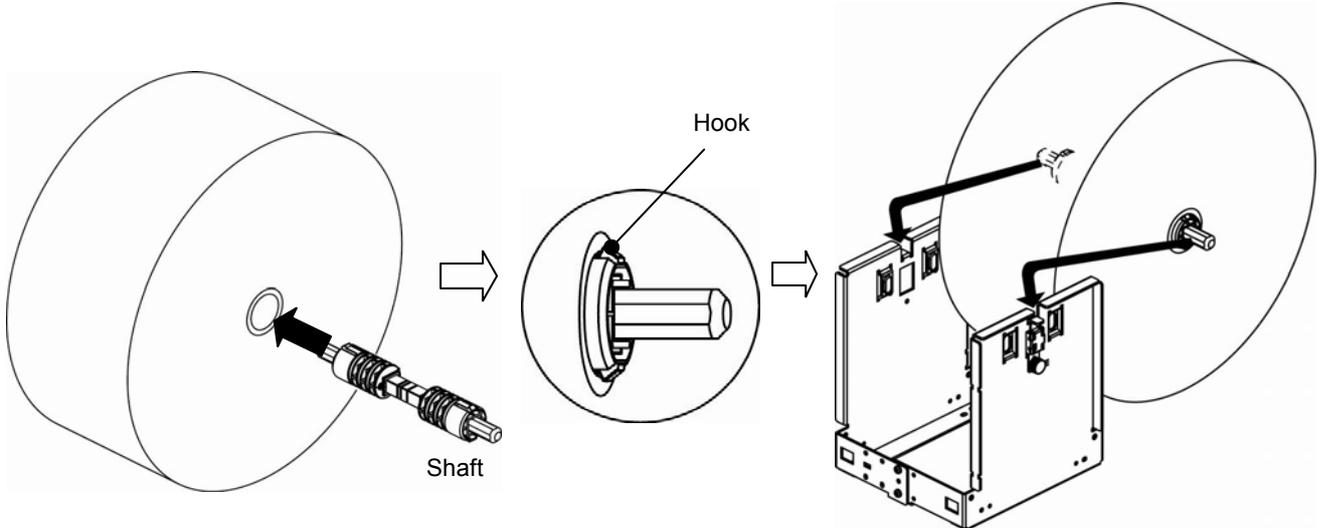
- When setting up holders, please avoid vibration and inclining the holders.
- Remaining amount of paper is just a reference.

6- 6. Connecting near-end sensor to printer



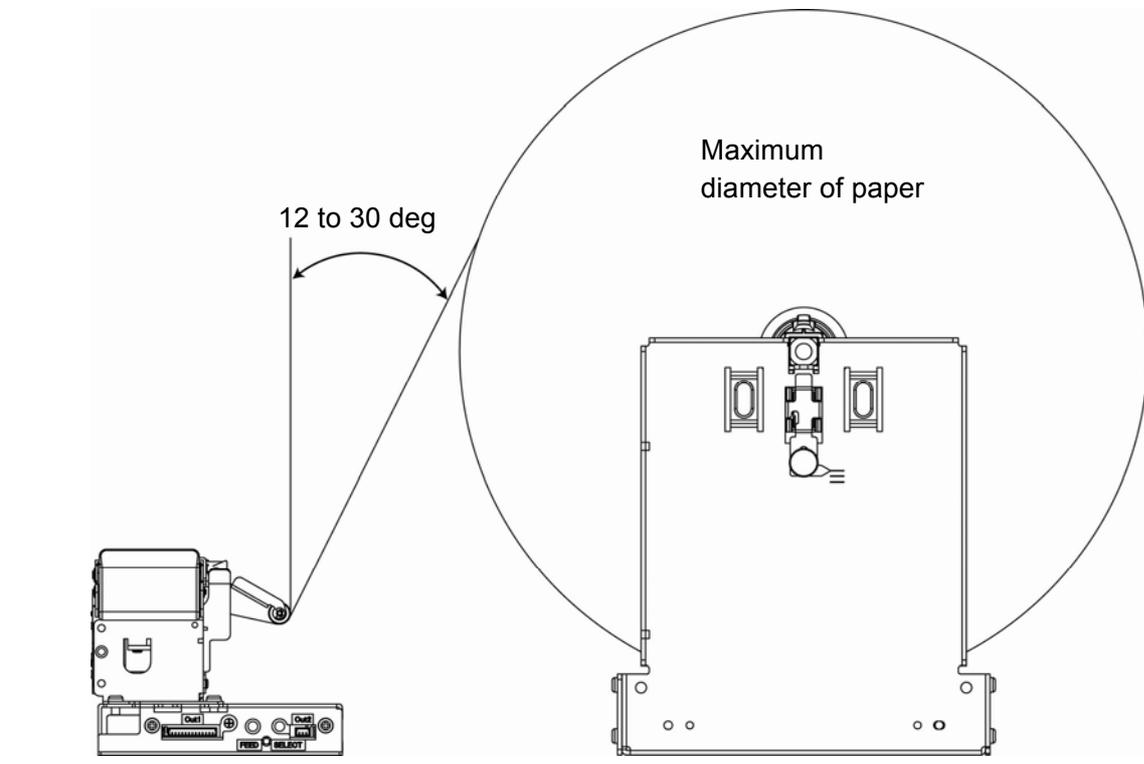
6- 7. Setting up roll paper

Shaft is passed through a roll paper until hook of the shaft is locked as figure below, and set up on mount of holders.



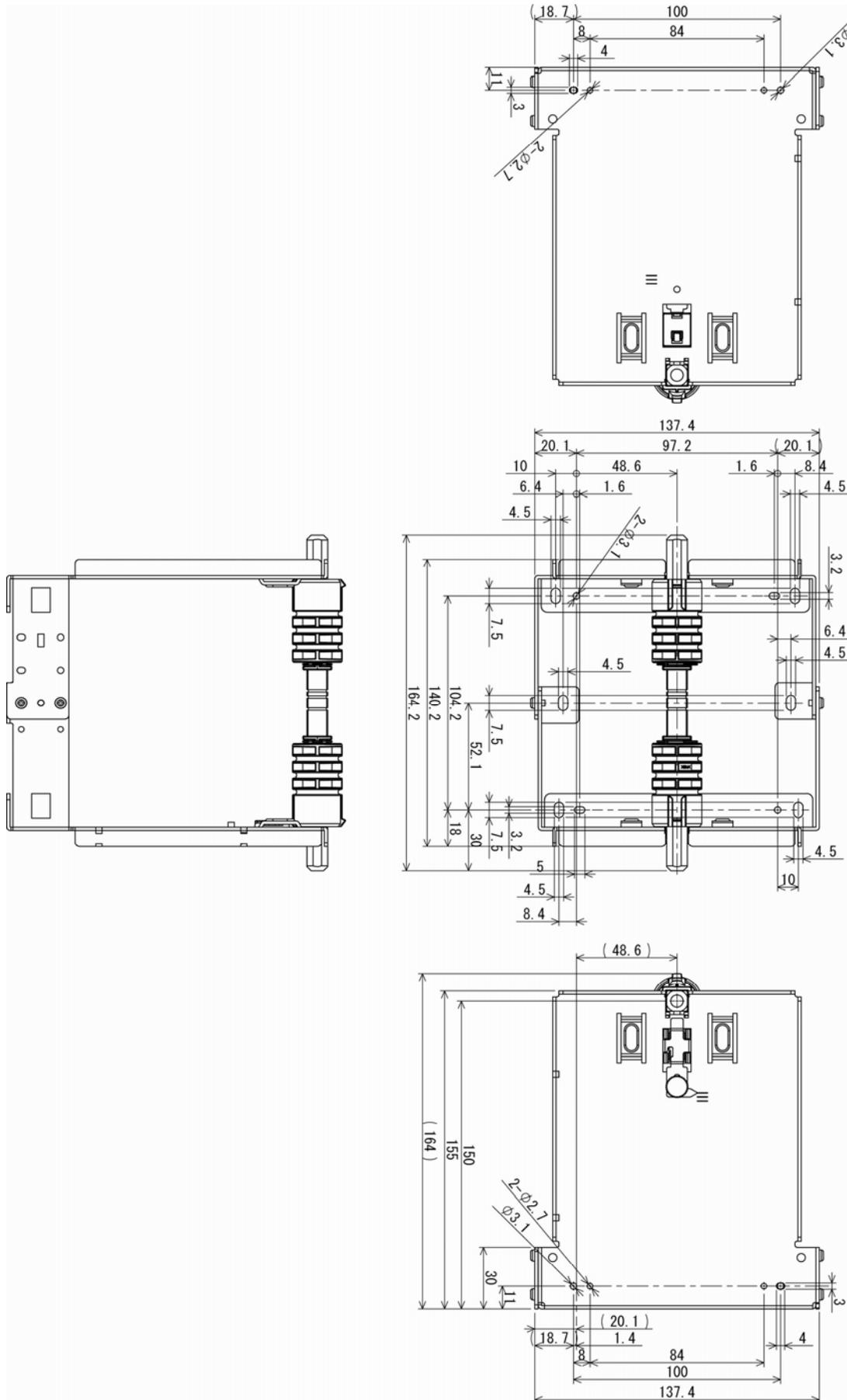
6- 8. Restrictions for setting up

Restriction of setting up large diameter holder is that angle of tension roller shall be within from 12 degree to 30 degree at maximum diameter of paper as figure below:



6- 9. Dimension

At paper width = 112mm



7 . Interfaces

7- 1 . USB

(1) Pin layout

Connector: Mini-B type 5-PIN

This printer is equipped with USB version 2.0 for high speed data transfer.
The device class is "Printing Device."



| Pin | Signal | Direction | Function |
|-----|--------|-----------|----------------------------------|
| 1 | VBUS | - | Detect connect/disconnect of USB |
| 2 | D- | I/O | USB data (-) |
| 3 | D+ | I/O | USB data (+) |
| 4 | N.C | | |
| 5 | GND | - | GND |

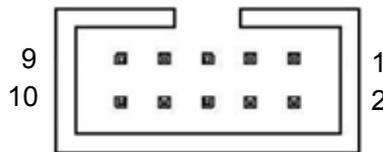
(2) Electronic characteristic

| Parameter | Signal | Conditions | Min. | Max. | Unit |
|--------------------------------|--------|---------------------|------|------|------|
| (Power supply voltage) | | | | | |
| | VBUS | | 4.40 | 5.25 | V |
| (Input level) | | | | | |
| Differential input sensitivity | VDI | (D+)-(D-) | 0.2 | | V |
| Differential common mode range | VCM | Including VDI | 0.8 | 2.5 | V |
| Single end receiver threshold | VSE | | 0.8 | 2.0 | V |
| (Output level) | | | | | |
| "L"Level | VOL | RL of 1.5kΩ to 3.6V | | 0.3 | V |
| "H"Level | VOH | RL of 15kΩ to GND | 2.8 | 3.6 | V |

7- 2 . Serial

(1) Pin layout

Connector: MIL-C-83503 (10pin MIL Standard)
Cvilux CH87102HA00 or equivalent
Recommendable plug
Cvilux CA2110SA1A0
Hirose HIF3BA-10D-2.54R
Amp 1658621-1 or equivalent socket



| Pin | Signal | Direction | Function |
|-----|--------|-----------|--------------------|
| 1 | N.C | --- | |
| 2 | DTR | --- | DSR loop connect |
| 3 | RxD | Input | Serial data input |
| 4 | RTS | Output | Request to send |
| 5 | TxD | Output | Serial data output |
| 6 | CTS | Input | Clear to send |
| 7 | DSR | --- | DTR loop connect |
| 8 | N.C | --- | |
| 9 | GND | --- | |
| 10 | N.C | --- | |

DTR is used to control data transmission to some host systems.
When the host system is communicated by DTR, use loop connect of the host system.

(2) Conditions

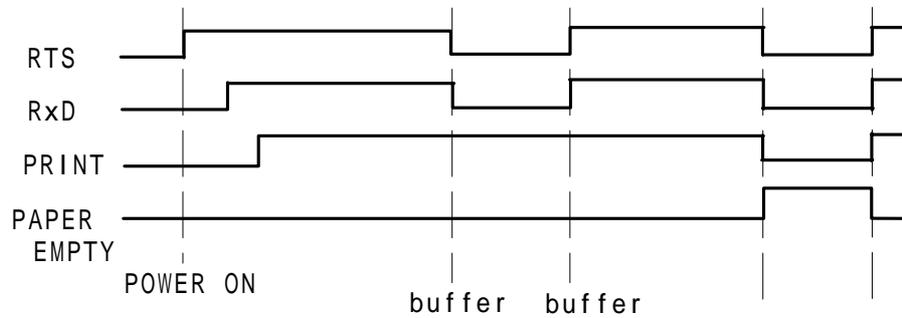
Baud rate: 1200 to 115200bps
Parity: None, Odd, Even
Bit length: 7, 8 bit
Busy control: Hardware control(RTS/CTS/Software control(XON/XOFF))

(3) Hardware control

High/Low of RTS signal is used to control data transmission to the host system.

RTS signal becomes low if the receiving buffer is filled out curtain level ()

The host side should stop sending data if RTS signal is low. If the data in the input buffer is reduced to curtain level, RTS signal goes high and re-start sending remained data ()

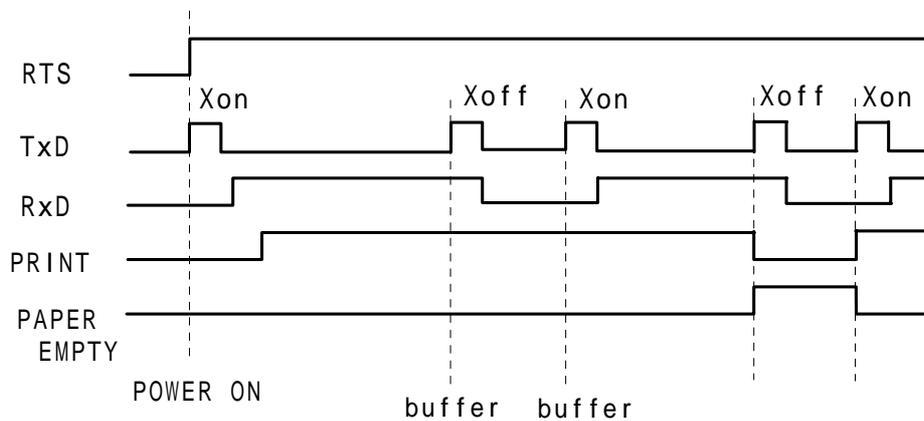


(4) Software control(XON/XOFF)

Xon(11H) / Xoff(13H) signal is used to control data transmission to the host system.

Xoff signal is sent to host system if the receiving buffer is filled out curtain level.()

The host side should stop sending data if Xoff signal is received. If the data in the input buffer is reduced to curtain level, Xon signal is sent to the host system and re-start sending remained data ()



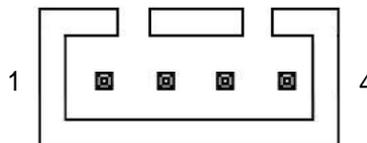
(5) Conditions of input / output signal

| Item | Condition | Rate value | | | Unit |
|---------------------|---------------------|------------|------|------|------|
| | | Min. | Typ. | Max. | |
| High input voltage | RxD、CTS | +2.8 | — | +15 | V |
| Low input voltage | RxD、CTS | -15 | — | -2.8 | V |
| High output voltage | TxD、RTS (RL=3KΩ) | +2.8 | — | +15 | V |
| Low output voltage | TxD、RTS (RL=3KΩ) | -15 | — | -2.8 | V |

7- 3 . Power supply

(1) Pin layout

Connector : Hirose DF1BZ-4P-2.5DS or equivalent



| Pin | Signal | Direction | Function |
|-----|--------|-----------|------------------|
| 1 | DC+ | - | Power supply (+) |
| 2 | | | |
| 3 | DC- | - | Power supply (-) |
| 4 | | | |

Depending on printing data, large peak current runs in the power cable.
Consider the voltage drop caused by cable impedance and allow enough margins
when choosing the power cable.

8 . Label print

It's possible to print on label paper and receipt paper with black mark. Gap sensor and black mark sensor is available to detect markings, and the sensors can be used by according to purpose.

(1) Set up label printing

1. Set COMMON SETTING in the memory switch. (Refer to 4-5 Memory switch)
 - Select the type of sensor by SELECT SENSOR.
 - Enable MARKING DETECTION
2. Set the default value of initial printing information by DC2 L command.
The information includes label length, gap, stopping position after printing label and top of form.
3. Sensitivity of embedded sensor is changed by the DC2 mrk command.
Adjust sensitivity according to labels. (Refer to command reference I-16)
4. Press FEED button or send DC2 B、 DC2 I when the sensor is enabled to re-detect marking position after replacing the paper or turn the printer power ON.
5. The sensor is detected as paper empty if marking width is beyond 8mm.
6. Command for labels are listed in “Command Reference -16. Label”

(2) Label mode

There are intermittent label mode and continuous label mode installed in the printer.

1. Intermittent label mode

Feed each label to the position of the paper cutter. The printer prints the next label after back feeding the label. This mode is useful to remove each label by each print.

Always retain the base paper. If the base paper is cut and the distance between edge of the base paper and the front of the label becomes shorter than 15mm, the label paper is peeled off while back feeding.

REM1: Setting value of **n4** of “**DC2 L**” shall be set within that of **n3** of “**DC2 L**”.

REM2: It is possible that paper jam is occurred by length and thickness of mat and label of user's choice, so please verify whether paper jam is occurred or not by back-feeding.

2. Continuous label mode

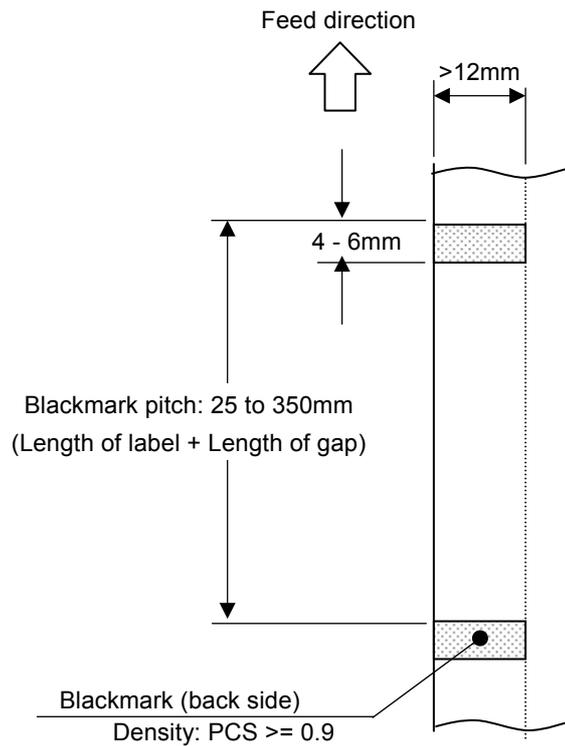
Prints each label continuously without back feed when label paper cannot be fed to the correct cutter position or it is hard to cut the label at the stopped position. It is recommended to choose this mode when the height of the label is relatively short or back feeding cannot be performed. Refer to the command setting for DC2 L / n3、 n4 parameter 0.

(3) Setting the media

Peel off labels within 15mm from the end of the media and set the end emerging 10mm from the cutter. This prevents the label from sticking inside of the printer.

(4) Receipt paper with black mark

Recommend designing black marks on the receipt as shown in below.
No gap type continuous label should use the same design.

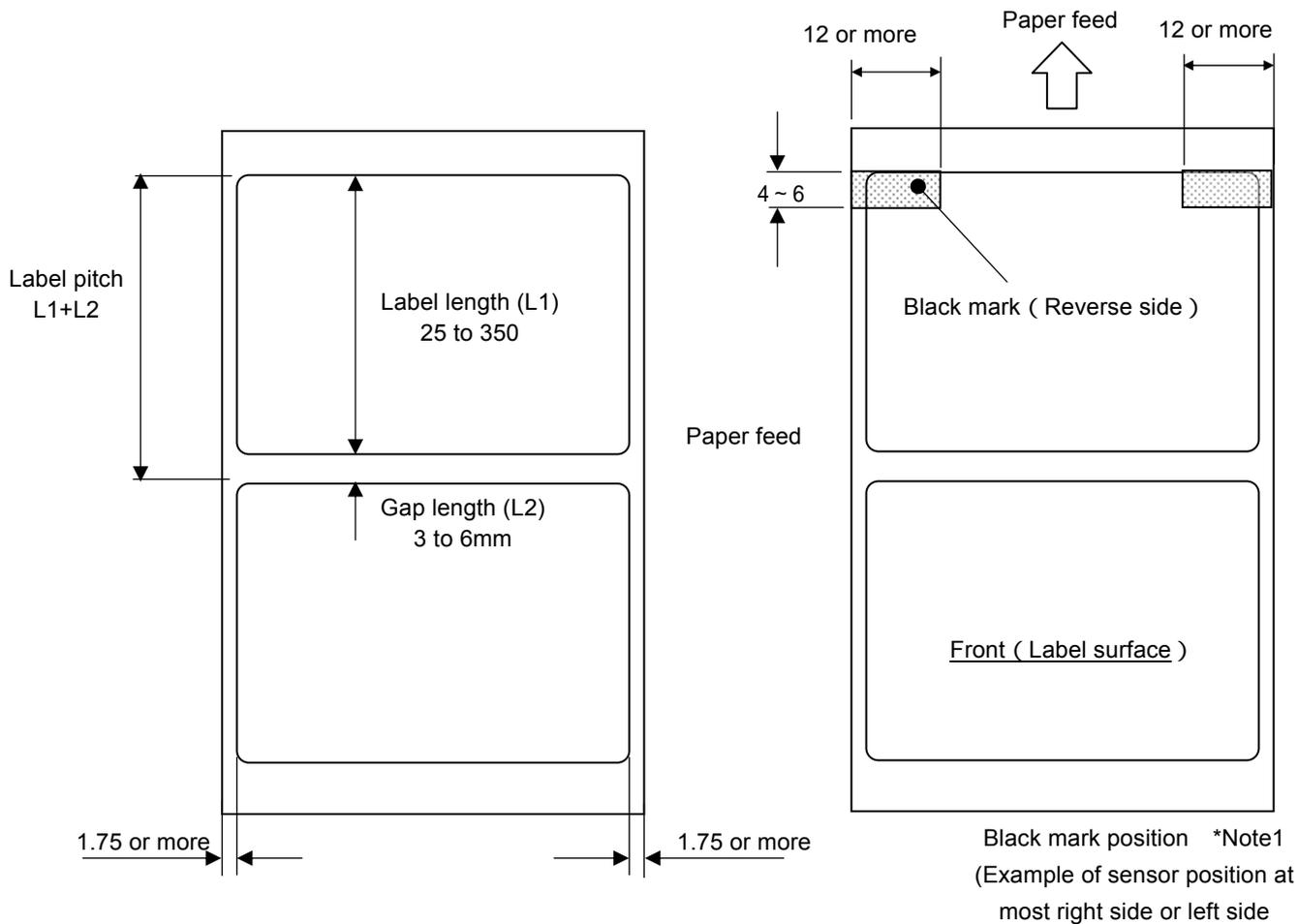


- | | |
|--|---|
| | <ul style="list-style-type: none"> - If PCS of black marks is less than 0.9, black marks are not sensed and the page might be skipped or the right length not detected. It causes the failure of sensing. - Prohibit pre-printing in the area designated for black marks. - There is a feed tolerance $\pm 2\%$ between calculated value and actual length. Please take into account this tolerance when pre-printed paper is used. |
|--|---|

(5) Label specifications

SK1-41 prints label paper with black marks and without black marks.
Use label paper complying with the following conditions.

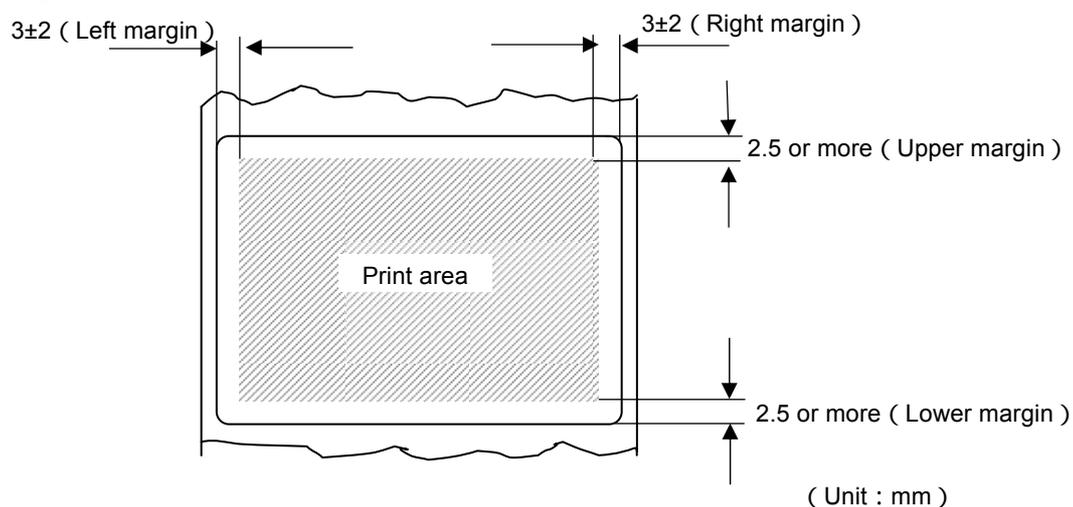
| Items | Without blackmark | With blackmark |
|-------------------------------|---|--|
| Recommended label paper | HW76B (made by Nippon paper Inc.) Length: 94 μ m Thickness of base paper: 60 μ m Color on base paper: White Total thickness: 154 μ m or less (incl. adhesive) | |
| Label diameter | Less than $\Phi 120$ mm | |
| Label core dimension | $\Phi 25.4$ (Internal) x $\Phi 31.4$ (External) mm | |
| Base paper width | Max. 111.5 \pm 0.5mm | |
| Label paper width | Max. 108.5 \pm 0.5mm | |
| Label length (L1) | 25 to 350mm | |
| Gap length (L2) | 3 to 6mm | 0 to 6mm |
| Rolling direction | Label surface is outside of a roll | |
| Blackmark size | - | Width: 12mm or more Length: 4 to 6mm |
| Printing density of blackmark | - | Ink : Reflective ratio should be 7% or less. |



*Note1. Position of BM mark is depended on left or right position of BM sensor.

(Unit : mm)

(6) Printing area



- The tolerance of the embedded sensor and initial printing position varies about $\pm 2\text{mm}$ from calculated position.
- Take into account the tolerance of paper feed about $\pm 2\%$ when a label is designed.

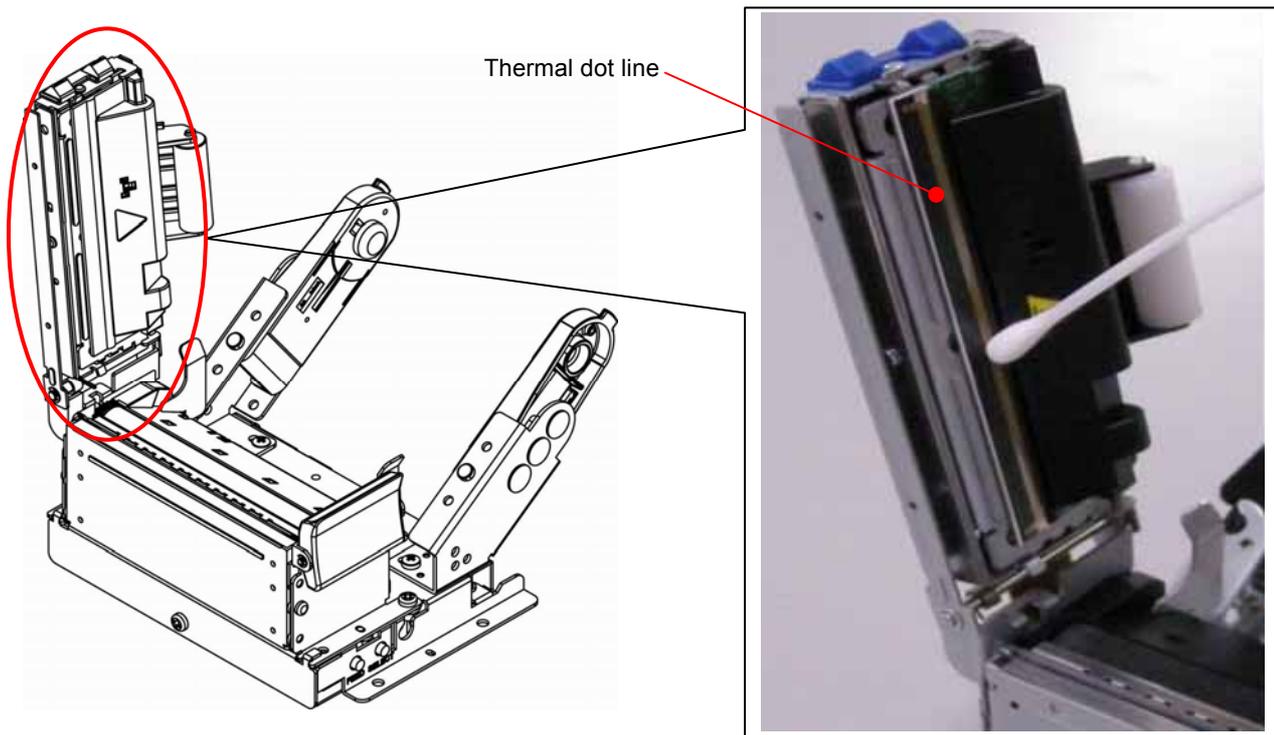
9 . Maintenance

9- 1 . Maintenance

Periodically clean the printer to maintain the printing quality and avoid failures. It is recommended to maintain the printer every 6 months or 1 million lines of printing.

(1) Print head

When cleaning the thermal dot line on the print head, use a cotton swab with alcohol (ethanol, methanol or Isopropyl alcohol) and wipe off stains and dust.



(2) Platen roller

When cleaning the platen roller, use a dry soft cloth and wipe off the stain with rotating the roller.

(3) Sensor and peripherals

Clean the stain, dust and paper powder on the paper empty sensor and paper cover sensor.



- Prior to maintenance work, be sure to turn OFF the printer.
- Avoid cleaning the print head immediately because the print head is hot. Start maintenance work after the thermal head becomes cool.
- Do not touch the print head with fingers directly. It may cause damage by electrostatic discharge and contamination.
- Do not touch the thermal head dot line with bare hands or metal objects.
- Do not use volatile chemical agents, such as thinner and benzene.
- Do not get moisture or spill liquids inside of the printer.
- Turn ON the printer only after alcohol is completely dried.

9- 2 . Service for trouble shooting

For maintenance and service, please contact your Sanei local distributors or the following address.

Sanei Electric Inc.

Overseas sales division

2-61-1 Ikebukuro, Toshima-Ku, Tokyo 171-0014, Japan

TEL: 81-3-3986-1188

FAX: 81-3-3988-5876

www.sanei-elec.co.jp

9- 3 . Command Reference

Command systems are compatible with ESC/POS.

The details please refer to separate volume “command reference”.

10 . Data code table

PC437

| High-order bit \ Low-order bit | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|--------------------------------|------|------|------|------|------|------|------|------|------|------|------|
| | | 0000 | 0001 | 0010 | 0011 | 0100 | 0101 | 0110 | 0111 | 1000 | 1001 |
| 0 | 0000 | | DLE | SP | 0 | @ | P | ' | p | Ç | É |
| 1 | 0001 | | | ! | 1 | A | Q | a | q | ü | æ |
| 2 | 0010 | | DC2 | " | 2 | B | R | b | r | é | Æ |
| 3 | 0011 | | DC3 | # | 3 | C | S | c | s | â | ô |
| 4 | 0100 | EOT | | \$ | 4 | D | T | d | t | ä | ö |
| 5 | 0101 | ENQ | | % | 5 | E | U | e | u | à | ò |
| 6 | 0110 | | | & | 6 | F | V | f | v | á | û |
| 7 | 0111 | | | ' | 7 | G | W | g | w | ç | ù |
| 8 | 1000 | | CAN | (| 8 | H | X | h | x | ê | ÿ |
| 9 | 1001 | HT | |) | 9 | I | Y | i | y | ë | ÿ |
| A | 1010 | LF | | * | : | J | Z | j | z | è | Ü |
| B | 1011 | | ESC | + | : | K | [| k | { | ï | ƒ |
| C | 1100 | FF | FS | . | < | L | \ | l | | î | € |
| D | 1101 | CR | GS | - | = | M |] | m | } | ì | ¥ |
| E | 1110 | | | . | > | N | ^ | n | ~ | À | Ŕ |
| F | 1111 | | | / | ? | O | _ | o | SP | Á | f |

| High-order bit \ Low-order bit | | A | B | C | D | E | F |
|--------------------------------|------|------|------|------|------|------|------|
| | | 1010 | 1011 | 1100 | 1101 | 1110 | 1111 |
| 0 | 0000 | á | ⌘ | ⌘ | ⌘ | α | ≡ |
| 1 | 0001 | í | ⌘ | ⌘ | ⌘ | β | ± |
| 2 | 0010 | ó | ⌘ | ⌘ | ⌘ | Γ | ≥ |
| 3 | 0011 | ú | ⌘ | ⌘ | ⌘ | π | ≤ |
| 4 | 0100 | ñ | ⌘ | ⌘ | ⌘ | Σ | ∫ |
| 5 | 0101 | Ñ | ⌘ | ⌘ | ⌘ | σ | ∫ |
| 6 | 0110 | â | ⌘ | ⌘ | ⌘ | μ | ÷ |
| 7 | 0111 | â | ⌘ | ⌘ | ⌘ | τ | ≈ |
| 8 | 1000 | ¿ | ⌘ | ⌘ | ⌘ | φ | ° |
| 9 | 1001 | ⌘ | ⌘ | ⌘ | ⌘ | θ | · |
| A | 1010 | ⌘ | ⌘ | ⌘ | ⌘ | Ω | - |
| B | 1011 | ½ | ⌘ | ⌘ | ■ | δ | √ |
| C | 1100 | ¼ | ⌘ | ⌘ | ■ | ∞ | n |
| D | 1101 | ¡ | ⌘ | ⌘ | ■ | ∅ | ² |
| E | 1110 | « | ⌘ | ⌘ | ■ | ∈ | ■ |
| F | 1111 | » | ⌘ | ⌘ | ■ | ∩ | SP |

- SP indicates space.
- A code in the blank section is ignored.
- The content in a bold frame is a function code.

Note: The character code table indicates bits arranged in the shape of a character and does not represent an actual printing pattern.

KATAKANA

| High-order bit \ Low-order bit | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|--------------------------------|------|------|------|------|------|------|------|------|------|------|------|
| | | 0000 | 0001 | 0010 | 0011 | 0100 | 0101 | 0110 | 0111 | 1000 | 1001 |
| 0 | 0000 | | DLE | SP | 0 | @ | P | ' | p | — | ⊥ |
| 1 | 0001 | | | ! | 1 | A | Q | a | q | — | ⊥ |
| 2 | 0010 | | DC2 | " | 2 | B | R | b | r | — | ⊥ |
| 3 | 0011 | | DC3 | # | 3 | C | S | c | s | — | ⊥ |
| 4 | 0100 | EOT | | \$ | 4 | D | T | d | t | — | — |
| 5 | 0101 | ENQ | | % | 5 | E | U | e | u | — | — |
| 6 | 0110 | | | & | 6 | F | V | f | v | — | |
| 7 | 0111 | | | ' | 7 | G | W | g | w | — | |
| 8 | 1000 | | CAN | (| 8 | H | X | h | x | | ⌈ |
| 9 | 1001 | HT | |) | 9 | I | Y | i | y | | ⌋ |
| A | 1010 | LF | | * | : | J | Z | j | z | | ⌌ |
| B | 1011 | | ESC | + | : | K | [| k | { | | ⌍ |
| C | 1100 | FF | FS | . | < | L | ¥ | l | | — | ⌎ |
| D | 1101 | CR | GS | - | = | M |] | m | } | — | ⌏ |
| E | 1110 | | | . | > | N | ^ | n | ~ | — | ⌐ |
| F | 1111 | | | / | ? | O | _ | o | | + | ⌑ |

| High-order bit \ Low-order bit | | A | B | C | D | E | F |
|--------------------------------|------|------|------|------|------|------|------|
| | | 1010 | 1011 | 1100 | 1101 | 1110 | 1111 |
| 0 | 0000 | SP | 一 | 夕 | ミ | 三 | × |
| 1 | 0001 | 。 | ア | チ | ム | フ | 円 |
| 2 | 0010 | 「 | イ | ツ | メ | 圭 | 年 |
| 3 | 0011 | 」 | ウ | テ | モ | ヨ | 月 |
| 4 | 0100 | 、 | エ | ト | ヤ | ▲ | 日 |
| 5 | 0101 | ・ | オ | ナ | ユ | ▼ | 時 |
| 6 | 0110 | ヲ | カ | ニ | ヨ | ◆ | 分 |
| 7 | 0111 | ァ | キ | ヌ | ラ | ■ | 秒 |
| 8 | 1000 | ィ | ク | ネ | リ | ♠ | 〒 |
| 9 | 1001 | ゥ | ケ | ノ | ル | ♥ | 市 |
| A | 1010 | ヱ | コ | ハ | レ | ♦ | 区 |
| B | 1011 | ォ | サ | ヒ | ロ | ♣ | 町 |
| C | 1100 | ャ | シ | フ | ワ | ● | 村 |
| D | 1101 | ュ | ス | ヘ | ン | ○ | 人 |
| E | 1110 | ョ | セ | ホ | ° | / | ■ |
| F | 1111 | ッ | ソ | マ | ° | \ | |

- SP indicates space.
- The code in the blank section is ignored.
- The content in a bold frame is a function code.

*A character in a row marked with * is not printed in the SHIFT JIS CODE.

| High-order bit \ Low-order bit | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|--------------------------------|------|------------|------------|------|------|------|------|------|------|------|------|
| | | 0000 | 0001 | 0010 | 0011 | 0100 | 0101 | 0110 | 0111 | 1000 | 1001 |
| 0 | 0000 | | DLE | SP | 0 | @ | P | ' | p | Ç | É |
| 1 | 0001 | | | ! | 1 | A | Q | a | q | ü | æ |
| 2 | 0010 | | DC2 | " | 2 | B | R | b | r | é | Æ |
| 3 | 0011 | | DC3 | # | 3 | C | S | c | s | â | ô |
| 4 | 0100 | EOT | | \$ | 4 | D | T | d | t | ä | ö |
| 5 | 0101 | ENQ | | % | 5 | E | U | e | u | à | ò |
| 6 | 0110 | | | & | 6 | F | V | f | v | á | û |
| 7 | 0111 | | | ' | 7 | G | W | g | w | ç | ù |
| 8 | 1000 | | CAN | (| 8 | H | X | h | x | ê | ÿ |
| 9 | 1001 | HT | |) | 9 | I | Y | i | y | ë | ÿ |
| A | 1010 | LF | | * | : | J | Z | j | z | è | Ü |
| B | 1011 | | ESC | + | : | K | [| k | { | ï | ø |
| C | 1100 | FF | FS | . | < | L | \ | l | | í | £ |
| D | 1101 | CR | GS | - | = | M |] | m | } | ì | Ø |
| E | 1110 | | | . | > | N | ^ | n | ~ | Ä | x |
| F | 1111 | | | / | ? | O | _ | o | | Å | f |

| High-order bit \ Low-order bit | | A | B | C | D | E | F |
|--------------------------------|------|------|------|------|------|------|------|
| | | 1010 | 1011 | 1100 | 1101 | 1110 | 1111 |
| 0 | 0000 | á | ☐ | ⌒ | Đ | Ó | – |
| 1 | 0001 | í | ☐ | ⊥ | Đ | β | ± |
| 2 | 0010 | ó | ☐ | ⊥ | Ê | Ô | ≥ |
| 3 | 0011 | ú | | ⊥ | Ê | Ò | ¼ |
| 4 | 0100 | ñ | ⊥ | — | Ê | ó | ¶ |
| 5 | 0101 | Ñ | Á | + | € | Õ | § |
| 6 | 0110 | ª | À | á | í | μ | ÷ |
| 7 | 0111 | ª | À | À | í | þ | , |
| 8 | 1000 | ¿ | © | ⌒ | ÿ | þ | ° |
| 9 | 1001 | ® | ⊥ | ⌒ | ⊥ | Ú | ” |
| A | 1010 | ⌒ | | ⊥ | ⌒ | Û | . |
| B | 1011 | ½ | ⌒ | ⊥ | ■ | Û | ¹ |
| C | 1100 | ¼ | ⌒ | ⊥ | ■ | ý | ³ |
| D | 1101 | ¡ | ⌒ | — | | Ý | ² |
| E | 1110 | « | ⌒ | + | | - | ■ |
| F | 1111 | » | ⌒ | α | ■ | ' | |

- SP indicates space.
- A code in the blank section is ignored.
- The content in a bold frame is a function code

Note: The character code table indicates bits arranged in the shape of a character and does not represent an actual printing pattern.