# CLP-2001

## User's Manual

CITIZEN®

## FCC COMPLIANCE STATEMENT
## FOR AMERICAN USERS

This equipment has been tested and found to comply with the limits for a Class A 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.

"DESIGNED AND MANUFACTURED TO BE EQUIVALENT TO EUROPEAN STANDARD FOR ITE, EN60950."

## EMI COMPLIANCE STATEMENT FOR CANADIAN USERS

This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications. This equipment is designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

**CAUTION**: Use shielded cables to connect this device to computers.

Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment.

## ETAT DE CONFORMITE EMI A L'USAGE DES UTILISATEURS CANADIENS

Cet équipment produit et utilise l'énergie à radiofréquences et s'il n'est pas installé et utilisé correctment, c'esst à dire en accord strict avec les instructions du fabricant, il risque de provoquer des intérferences avec la réception de la radio et de la télévision.

Le présent appareil numérique n'émet pas de bruite radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Réglement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

Cet équipment est conçu pour fournir une protection satisfaisante contre de telles interférences dans une installation résidentielle. Cependant, il n'y a pas de garantie contre les interférences avec les réceptions radio ou télévison, provoquées par la mise en et hors circuit de l'équipment; aussi, il est demandé a l'utilisateur d'essayer de corriger l'interférence par l'une ou plus des mesures suivantes:

- Réorienter l'antenne de réception.
- Installer l'ordinateur autre part, par égard pour le récepteur.
- Brancher l'ordinateur dans une prise de courant différente de façon à ce que l'ordinateur et le récepteur soient branchés sur des circuits différents.

## Important Safety Instructions

1. Read all of these instructions and save them for later reference.
2. Follow all warnings and instructions marked on the product.
3. Unplug this product from the wall outlet before cleaning. Do not use liquid or aerosol cleaners. Use a damp cloth for cleaning.
4. Do not use this product near water.
5. Do not place this product on an unstable cart, stand or table. The product may fall, causing serious damage to the product.
6. Slots and openings on the cabinet and the back or bottom are provided for ventilation. To ensure reliable operation of the product and to protect it from overheating, do not block or cover these openings. The openings should never be blocked by placing the product on a bed, sofa, rug or other similar surface. This product should never be placed near or over a radiator or heat register. This product should not be placed in a built-in installation unless proper ventilation is provided.
7. This product should be operated from the type of power source indicated on the marking label. If you are not sure of the type of power available, consult your dealer or local power company.
8. This product is equipped with a three-pronged plug, a plug having a third (grounding) pin. This plug will only fit into a grounding-type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the grounding-type plug.
9. Do not allow anything to rest on the power cord. Do not locate this product where the cord will be walked on.
10. If an extension cord is used with this product, make sure that the total of the ampere ratings on the products plugged into the extension cord do not exceed the extension cord ampere rating. Also, make sure that the total of all products plugged into the wall outlet does not exceed 15 amperes for 120V outlet and 7.5 amperes for 220V-240V outlet.
11. Never push objects of any kind into this product through cabinet slots as they may touch dangerous voltage points or short out parts that could result in a risk of fire or electric shock. Never spill liquid of any kind on the product.
12. Except as explained elsewhere in this manual, don't attempt to service this product yourself. Opening and removing those covers that are marked "Do Not Remove" may expose you to dangerous voltage points or other risks. Refer all servicing on those compartments to service personnel.
13. The mains plug on this equipment must be used to disconnect mains power. Please ensure that the socket outlet is installed near the equipment and shall be easily accessible.
14. Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:
    A. When the power cord or plug is damaged or frayed.
    B. If liquid has been spilled into the product.
    C. If the product has been exposed to rain or water.
    D. If the product does not operate normally when the operating instructions are followed. Adjust only those controls that are covered by the operating instructions since improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to normal operation.
    E. If the product has been dropped or the cabinet has been damaged.
    F. If the product exhibits a distinct change in performance, indicating a need for service.

## Notice

1. Before use, be sure to read this manual.  And keep it handy for reference when needed.
2. The contents of this manual may be changed without prior notice.
3. Reproduction, transfer, or transmission of the contents of this manual without prior consent is strictly prohibited.
4. We are not liable for any damage resulting from the use of the information contained herein, regardless of errors, omissions, or misprints.
5. We are not liable for any problems resulting from the use of optional products and consumable supplies other than the designated products contained herein.
6. Do not handle, disassemble or repair the parts other than those specified in this manual.
7. We are not liable for any damage caused by user's erroneous use of the printer and inadequate environment.
8. Data residing in the printer is temporary.  Therefore, all data will be lost if power is lost.  We are not liable for any damage or loss of profits cause by data loss due to failures, repairs, inspections, etc.
9. Please contact us if there are any mistakes or ambiguities within this manual.
10. If there are missing or incorrectly collated pages in this manual, contact us to obtain a new manual.

# SAFETY SIGNS
# — must be strictly observed !

- **To prevent personal injury or property damage, the following shall be strictly observed.**
- **The degree of possible injury and damage due to incorrect use or improperly following instructions is described below.**

**⚠ WARNING**

**Indicates a situation which, if not observed and handled properly, could result in death or serious injury.**

**⚠ CAUTION**

**Indicates a situation which, if not observed and handled properly, could result in injury.**

# WARNING

- Never perform the following. If not avoided, these may cause damage or trouble to the printer or cause the printer to overheat and release smoke and cause burns or an electrical shock. If the printer is damaged or is malfunctioning, be sure to turn the power off immediately and remove the power cord from the outlet, then consult our service personnel.

  - Do not jolt or impact to the printer by stepping on, dropping or hitting the printer.
  - Do not place the printer in a poorly ventilated area, or shut off the air vent of the printer.
  - Do not place the printer where chemical reactions occur, such as in laboratories or where air is mixed with salt or gas.
  - Do not use a power voltage or frequency other than those specified.
  - Do not plug/unplug the power cord or attach/detach the interface cable by simply grabbing the power cord or interface cable. Do not pull or carry the printer when the tension of the power cord or interface cable is increased.
  - Do not drop or put foreign matter such as clips and pins into the printer. This may cause problems.
  - Do not plug the power cord into an outlet with many loads.
  - Do not spill drinks such as tea, coffee and juice on the printer or spray insecticide on the printer. If drink or water is spilled, first be sure to turn the power off and remove the power cord from the outlet, then consult our service personnel.
  - Do not disassemble or modify the printer.

- Discard or safely store the plastic packing bag. This bag should be kept away from children. If the bag is pulled over a child’s head, it may cause suffocation.

## General precautions

1. Prior to operation, read the safety instructions carefully and observe them.
2. Do not drop any clips, pins or similar metals onto the printer, which may cause problems.
3. Be careful when moving or carrying the printer. Dropping the printer may cause injury or property damage.
4. Do not open the printer cover during printing.
5. When cleaning the surface of the printer case, do not use the cloth soaked in thinner, trichloroethylene, benzine, ketone or similar chemicals.
6. Do not use the printer where there is a lot of oil, iron particles, waste or dust.
7. Do not spill a liquid down the printer or do not spray chemical liquids over the printer.
8. Do not step on or drop or hit the printer; the impact or vibration must be avoided.
9. Operate the control panel properly. A careless, rough handling may cause problems or malfunction. Also, do not use such a sharp-edged tool as ballpoint for operation of the control panel.
10. When installing the auto-cutter drive board, be sure to unplug the power cord from the outlet.
11. If a problem occurs during printing, stop the printer immediately and unplug the power cord from the outlet.
12. When the printer is not in good condition, do not disassemble it. Instead, consult our service personnel.

## Precautions when installing the printer

1. Prior to operation, read the safety instructions carefully and observe them.
2. Do not use or store the printer near fire, excessive moisture, in direct sunlight, near an air conditioner or heater or other source of unusually high or low in temperature or high humidity or excessive dust.
3. Do not place the printer where chemical reactions occur, such as in a laboratory.
4. Do not place the printer where air is mixed with salt or gas.
5. The printer must sit on a firm, level surface where there is ample ventilation. Do not allow the printer's air vent to be blocked by a wall or other item.
6. Do not put anything on top the printer.
7. Do not place the printer near a radio or television, and do not use the same wall outlet for the printer and a radio or television. Radio or television reception could be adversely affected.
8. Do not use the voltage and frequency other than the specified values.
9. Do not put anything on top the power cord or do not step on it.
10. Do not pull or move the main body by taking the power cord and interface cable.
11. Avoid putting may loads on one outlet for the power cord.
12. Do not bundle up the power cord when using.
13. Grip by the plug housing, not the cord, to plug/unplug the power cord.
14. Connect the connectors properly. If they are connected in the wrong polarity, the internal elements may be damaged.
15. Be sure to turn off the power before connecting/disconnecting the interface cable.
16. Avoid extending the interface cable or connecting the printer to any noise-producing computer. If it is unavoidable, take measures, e.g. use the shielded-conductor cable or twisted pair.
17. Ensure that the outlet is near the printer and the power cord is plugged/unplugged easily.
18. Use the three-pin (including grounding prong) outlet. Otherwise, you may get a shock by static electricity.

## Chapters in this manual

**Chapter 1 Setup**

Describes the packed items after opening the carton as well as the names and functions of parts.

**Chapter 2 Control Panel**

Describes the necessary items for operations, such as the control panel, printer settings and indications on the LCD/LEDs.

**Chapter 3 Paper and Ribbon**

Describes the procedures for loading the paper and ribbon including the notes on the use of paper and ribbon.

**Chapter 4 Troubleshooting**

Describes corrective actions when problems occur.

**Chapter 5 Options**

Describes the optional accessories for this printer.

**Chapter 6 Specifications**

Describes the basic specifications and commands for this printer.

# Table of Contents

# Chapter 1

# Setup

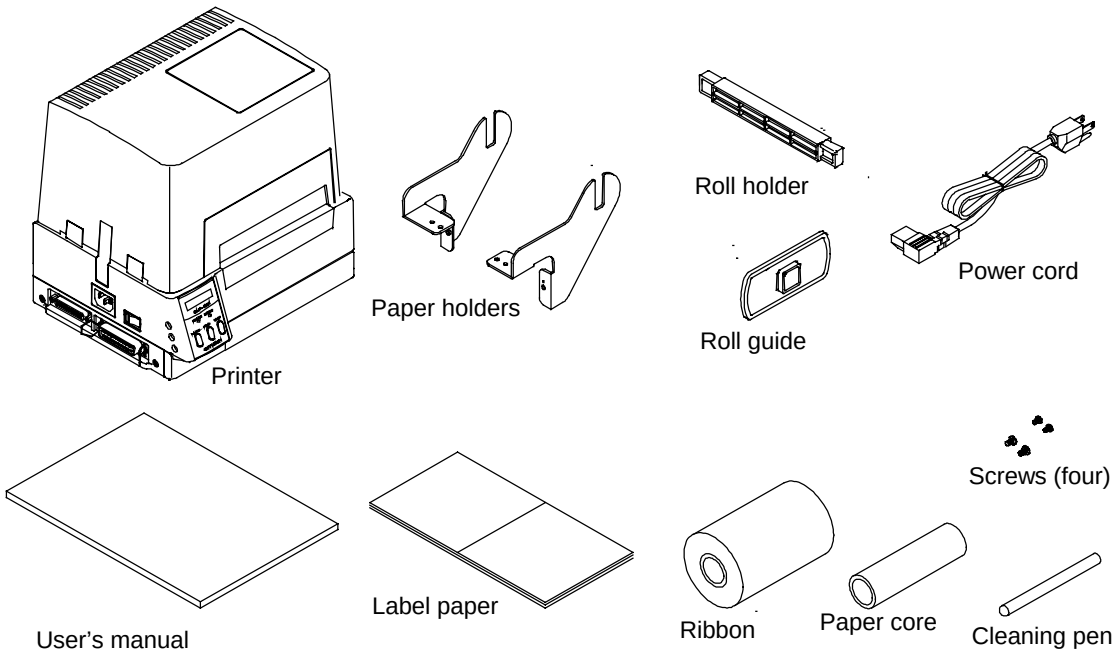
## 1.1 Confirmation of Carton Contents

**CAUTION** Be careful when moving or carrying the printer and when taking the printer out of the carton. The printer may cause injury or property damage if dropped. Be sure to hold the printer firmly when taking it out of the carton. Do not grip the printer by the foam packing materials, which may break, causing the printer to drop.

Check that the following accessories are included with the printer in the carton.

| | | | | | |
|---|---|---|---|---|---|
| • Printer | 1 unit | • Paper holders | 1 set | • Cleaning pen | 1 pc |
| • Power cord | 1 pc | • User's manual | 1 copy | | |
| • Parallel cable | 1 pc | • Roll holder | 1 pc | | |
| • Screws | 4 pcs | • Roll guide | 1 pc | | |

**Note**: The empty carton and packing materials should be stored for future shipping of the printer.

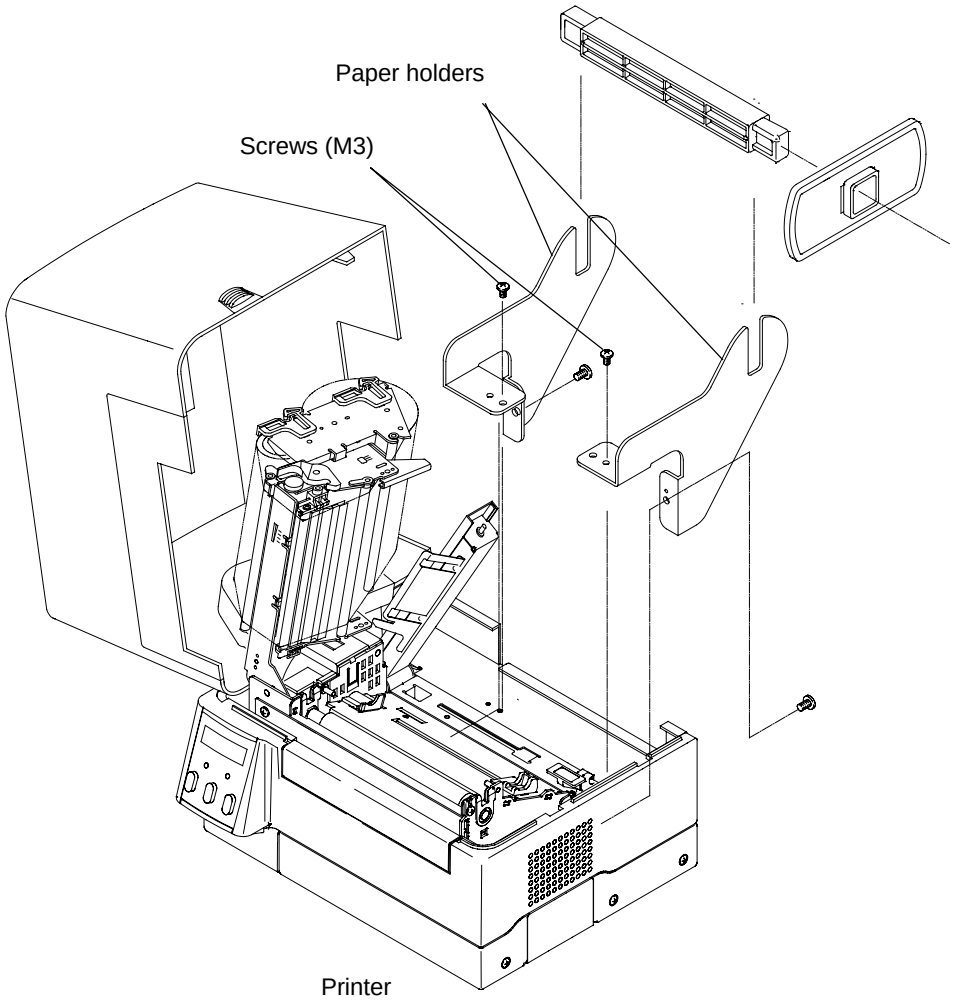


## 1.2 Installing the Paper Holders

The roll paper of 4 in. diameter (102 mm diameter) is set on the back of the printer.

Installation

1) Open the printer cover.
2) Set the paper holders as shown in the figure.
3) Secure the paper holders with screws M3 from the top and M4 from the back.



## 1.3 Names and Functions of the Parts

### Front view

- Control panel

  The control panel is a center of the printer that displays printer messages through the LCD and LEDs.

1) LEDs

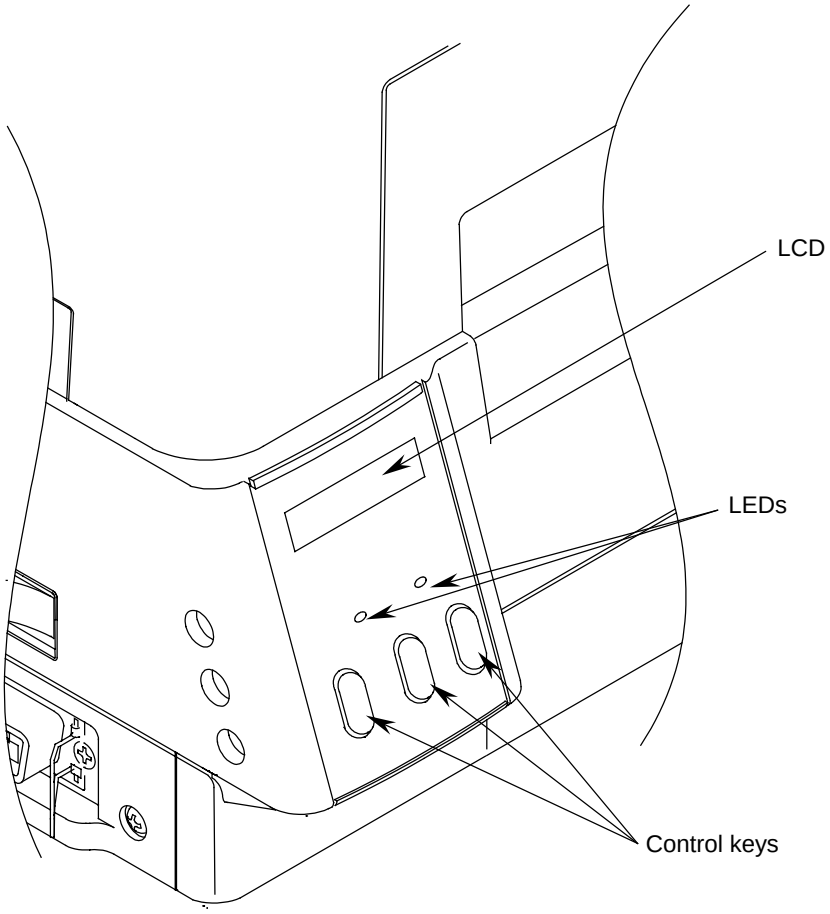
   One LED is the power indicator and the other is the error indicator.

2) LCD

   Displays the current printer status, configuration settings and errors.

3) Control keys

   The Pause, Feed and Stop keys are arranged from left to right and are used to facilitate printer operating. (For details, see Chapter 2 Control Panel.)



**Inside view**

- Printer cover

  Opens to allow loading of the paper and ribbon.

- Ribbon holder

  Holds the ribbon. (See Chapter 3.)

- Ribbon winder

  Winds the ribbon after printing. (See Chapter 3.)

- Roll holder

  Holds the roll paper.

- Roll guide

  Guide the roll paper to be set on the roll holder. The roll guide can be adjusted in accordance with the width of the paper. (See Chapter 3.)

- Paper holders

  Hold the roll holder to be inserted in the paper core.

- Head open lever

  Opens and closes the print head. This is used when loading the paper and ribbon or when cleaning the print head.

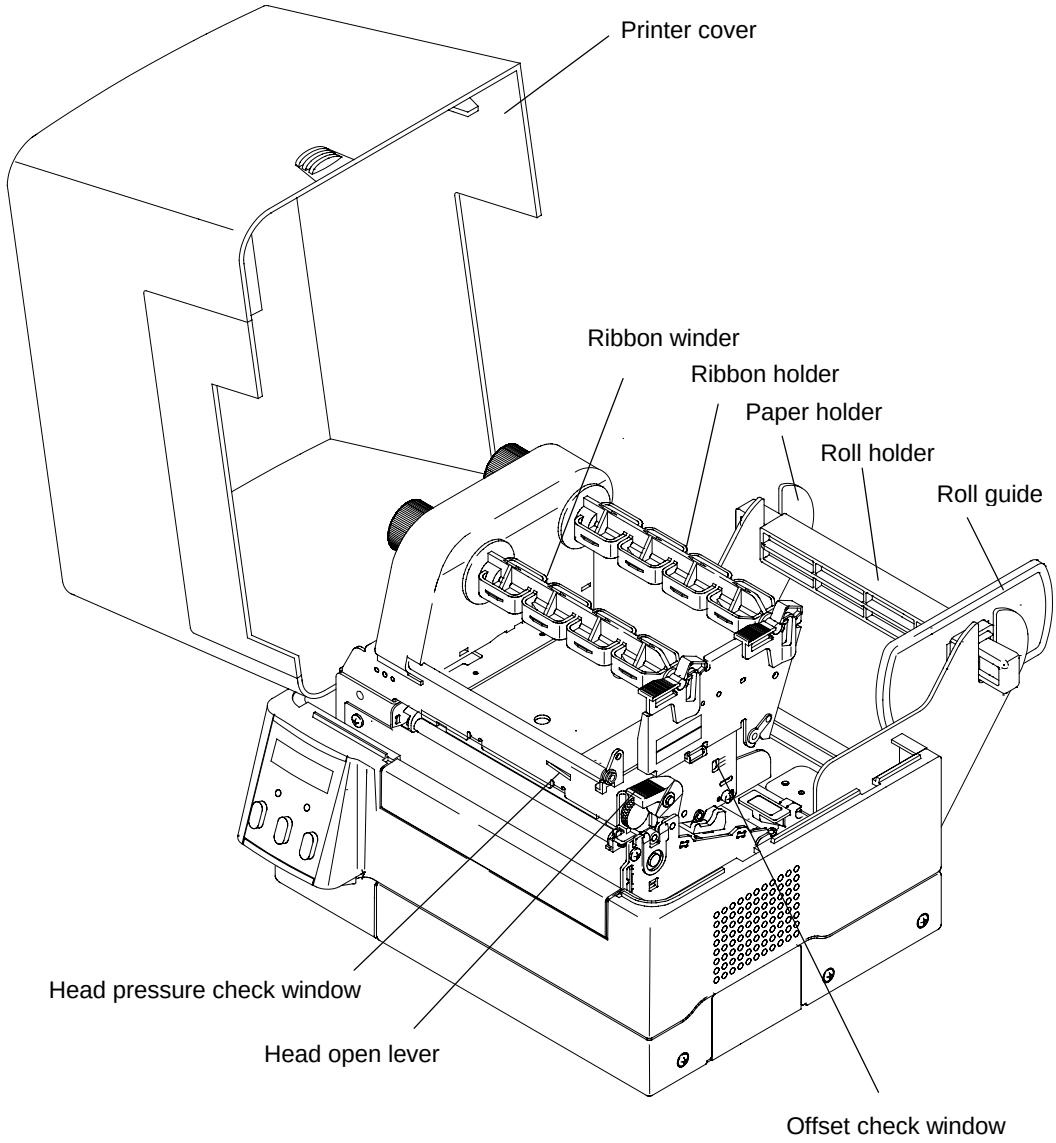
- Offset check window

  Facilitates adjusting the print head position to match the thickness of the paper.

- Head pressure check window

  Facilitates adjusting the print head pressure to match the width of the paper and the paper quality.

(See figure on next page)


Printer cover
Ribbon winder
Ribbon holder
Paper holder
Roll holder
Roll guide
Head pressure check window
Head open lever
Offset check window

**Side view**

- Interface connectors

  Connect the interface cables.

- PCMCIA memory card cover

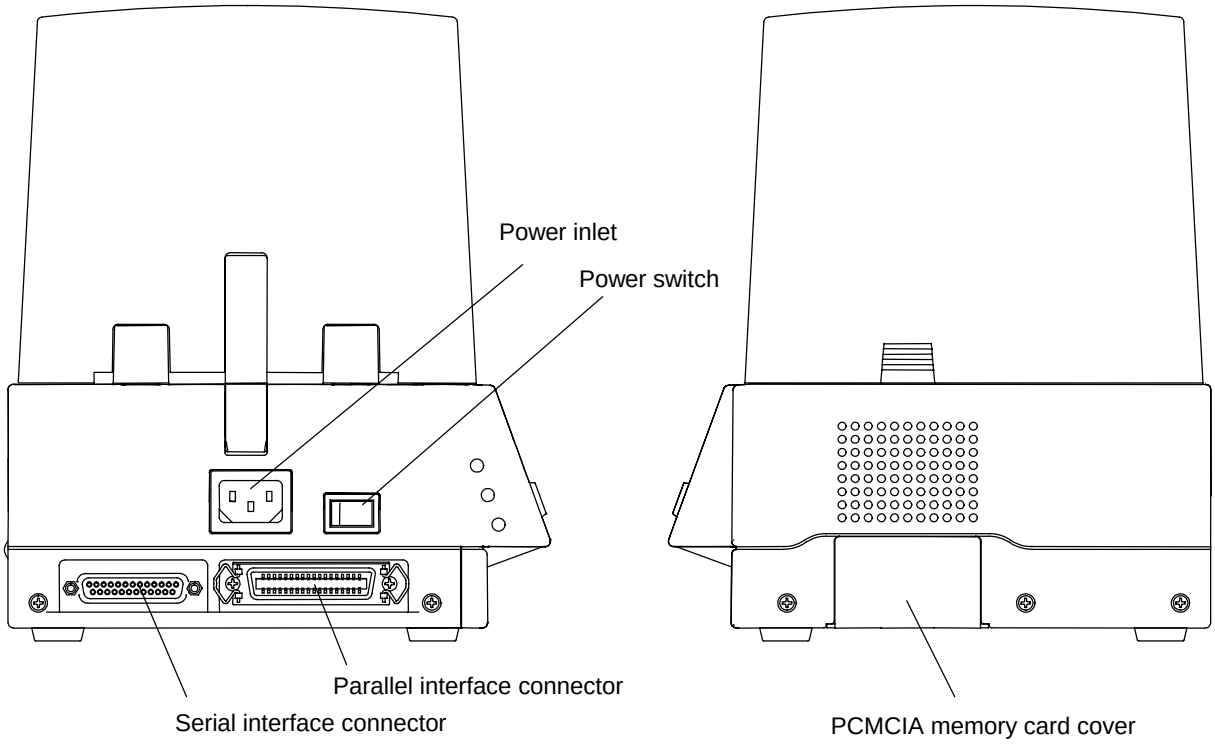
  To protect the PCMCIA memory card from exposure to dust and foreign matter. To install a PCMCIA memory card, first unhook this cover, then slide it out.

- Power switch

  Turns on and off the power to the printer.

- Power inlet

  Connects the power cord.



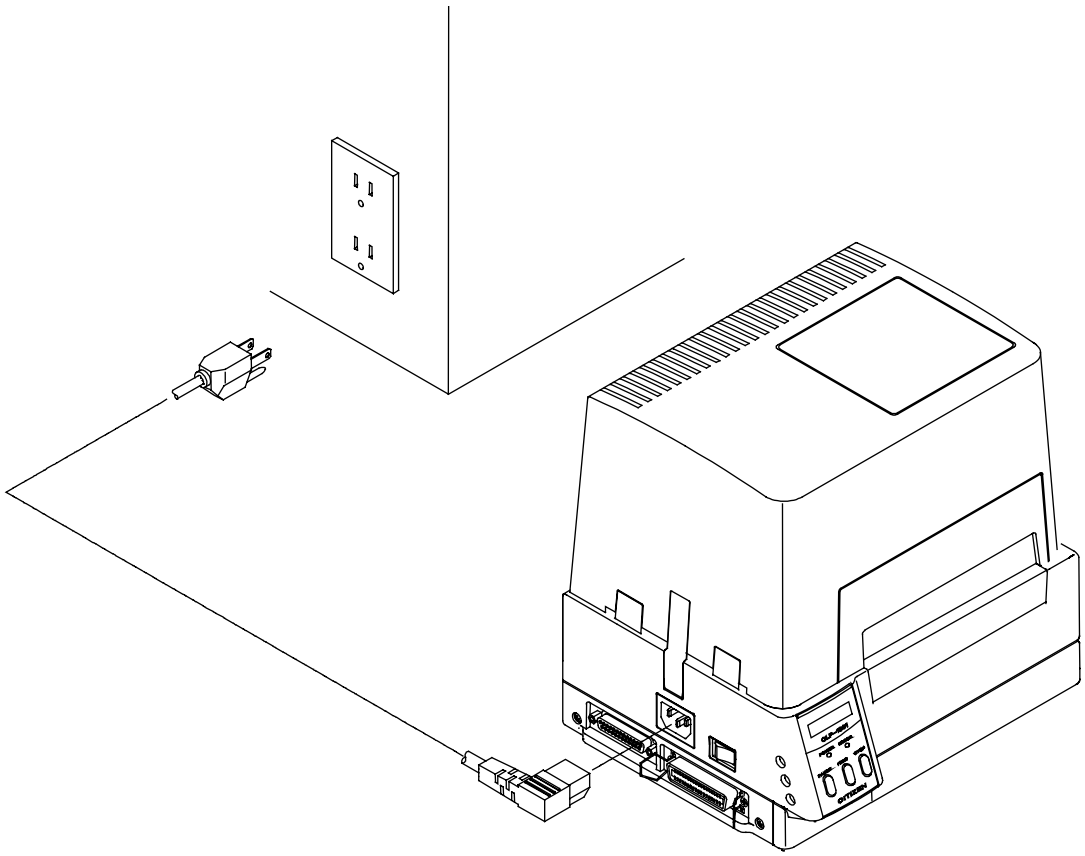
## 1.4 Connection to Power

**CAUTION** Use the three-pin (including grounding) outlet. Otherwise, you may get a small shock by static electricity.

Also, you may get an electric shock when the printer breaks down or short circuit occurs or a thunderbolt falls.

Connect to power as follows:

1) Check that the power switch on the printer is turned off.
2) Connect the connector of the power cord to the power inlet on the printer.
3) Insert the plug of the power cord in the outlet.

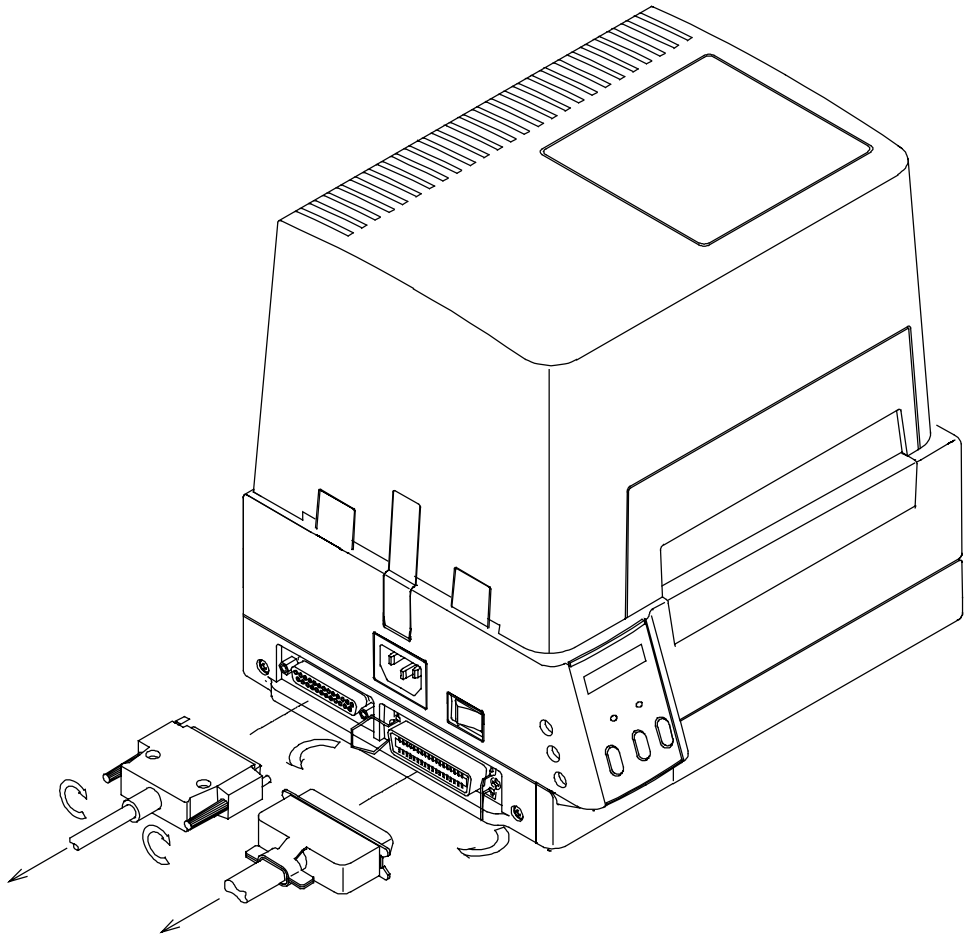


## 1.5 Connection to a Computer

An interface cable is necessary for connecting the printer to a computer.

Connect the printer to a computer as follows:

1) Check that both printer and computer power switches are turned off.
2) Insert the connector of the interface cable in the interface connector on the printer and secure it with lock screws.
3) Insert the connector on the other side of the interface cable in the interface connector on the computer and secure it with lock screws.



To a computer

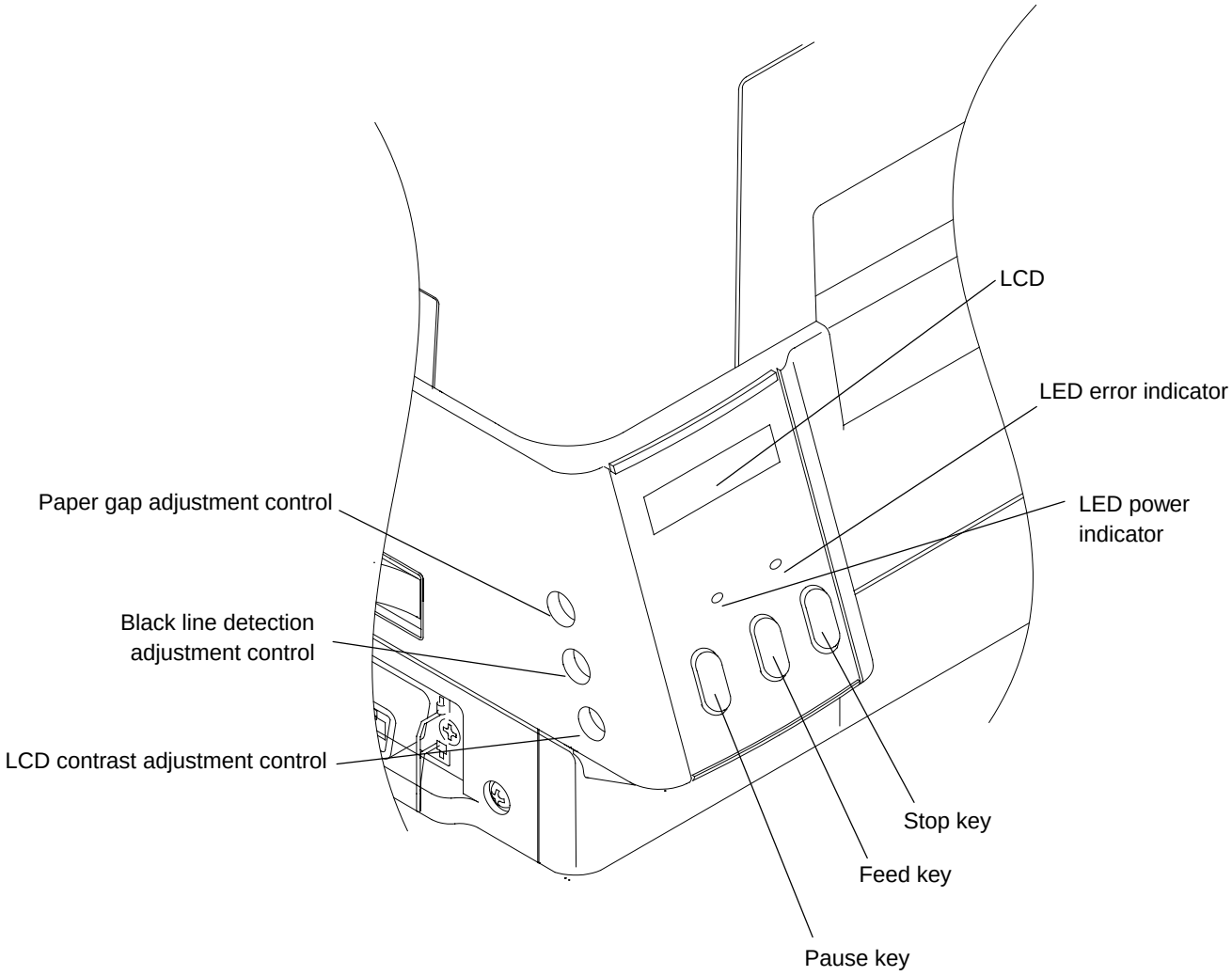
# Chapter 2

# Control Panel

## 2.1 Control Panel

The control panel consists of the three control keys (Pause, Feed and Stop), two LED indicator lights (Power and Error), and LCD message screen. On the left side of the control panel there are three adjustment controls (paper gap sensor, black line sensor and LCD contrast).

Exterior view



## 2.2 LCD/LED Indications and Adjustment Controls

1) LCD

The eight-character LCD screen displays the current printer status, configuration settings, or an error message.

2) LEDs

Power: Lights when the power is tuned ON.

Error: Lights or blinks when an error occurs.

3) Adjustment controls

The three adjustment controls are used to adjust the paper gap (transparent type) sensor sensitivity, black line (reflective type) sensor sensitivity, and LCD contrast.

## 2.3 Normal Operating Mode

When the power is turned on, the printer enters the normal operating mode. The control keys function as follows:

- Pause key

  Temporarily pauses printing. "Pause" is displayed on the LCD screen. If pressed during printing, printing will stop after the current label is printed. Press the Pause key again to resume printing.

- Feed key

  Advance to the top of the next label. When using continuous paper, make sure the Sensor selection is set to ContinuP or a Paper error will result.

- Stop key

  With this key, the operator can stop and cancel the current print job. Pressing the Stop key during printing stops the printing immediately. Pressing the Stop key again cancels the print job. If pressed when the Error LED is illuminated, the error will be cleared and the printer will pause. But if the error is not cleared, the Error LED will remain illuminated.

## 2.4 Printer Setup Mode

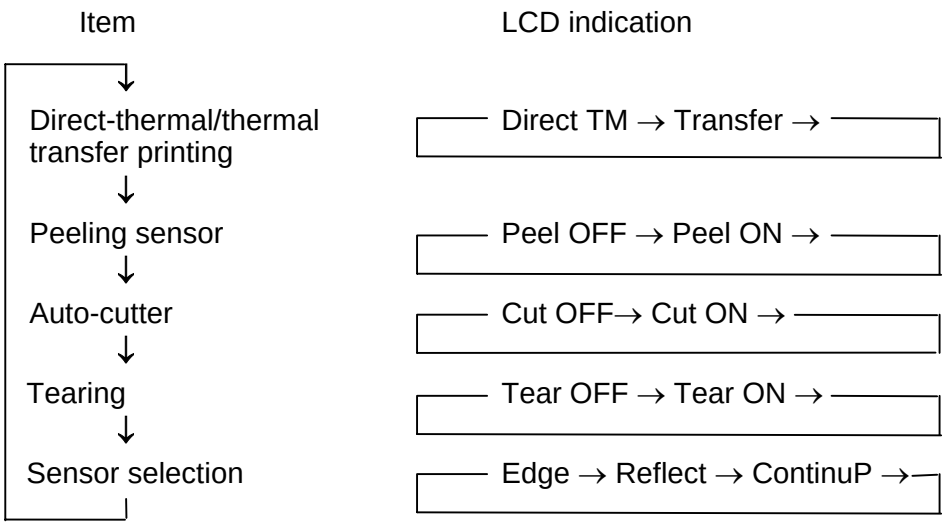
The printer enters the printer setup mode when both Pause and Feed keys are pressed simultaneously. The control key functions at this time are described below.

Settings of the printer setup mode are stored in nonvolatile memory, so once they are set, they are remained even when the power is turned off.

[Functions]

Set the print mode selection, peeling sensor ON/OFF, auto-cutter ON/OFF etc.

- Pause key: Selects the mode.
- Feed key: Selects the mode item.
- Stop key: Saves settings and returns the printer to normal operating mode.




## 2.5 Self-Test Mode

The printer enters the self-test mode when the Feed key is pressed and held down while turning the printer on.

[Functions]

The printer performs the test print and enters the data dump mode (prints communication data with ASCII codes). The printer returns to the normal operating mode when the power is turned off.

If the Feed key is pressed further for five seconds after the printer has entered the self-test mode, the test print will be performed in the continuous paper mode, regardless of sensor selection stored in backup memory.

## 2.6 System Maintenance Mode

The printer enters the system maintenance mode when the Pause, Feed and Stop keys are pressed and held down simultaneously while turning the printer on.

If those keys are pressed further for five seconds after the printer has entered the system maintenance mode, the system will be reset and the settings in the backup memory will be reset to the following default values:

- RS-232C communication setting

  Baud rate: 9600 bps
  Data length: 8 bits

- Print mode setting

  Print mode: Thermal-transfer printing

- Optional function setting

  Peeler: OFF
  Cutter: OFF
  Ejector: OFF

- Paper sensor type setting

  Sensor: Transparent type (paper gap detection)

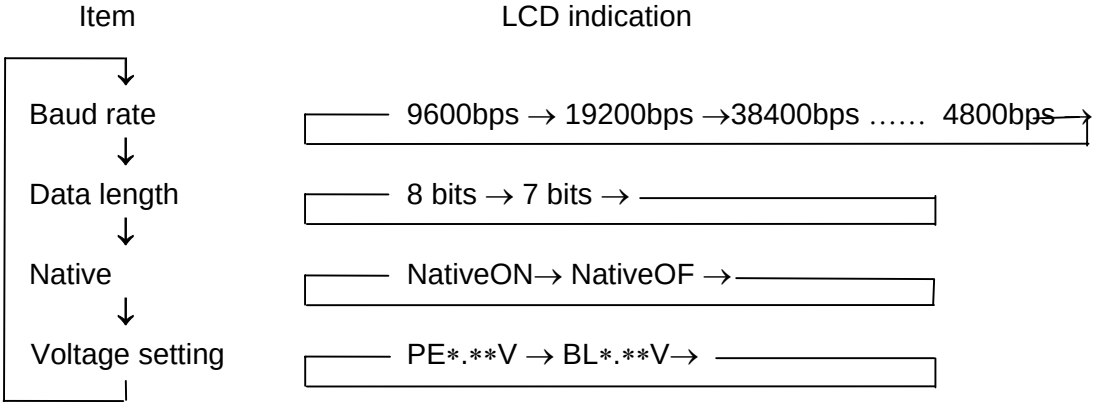
- Compatible model setting

  Native: ON

[Functions]

Set the RS-232C communication parameter and enter the paper sensor sensitivity adjustment mode.

- Selects the mode when the Pause key is pressed.
- Selects the mode item when the Feed key is pressed.
- Stores the selected settings in the backup memory when the Stop key is pressed and the printer comes on-line.



■ Voltage setting

In the voltage setting mode, operate the paper gap and black line adjustment controls in the following way:

For the standard paper gap voltage, both "PE" and "BL" displayed on the LCD screen are set to 3.0 V–3.3 V.

Setting procedure:

1) Sets only the liner peeled off the label. (For the black line paper, set it so that black lines are off the paper sensor.)
2) Sets the paper gap level to 3.0 V–3.3 V by operating the adjustment controls.

# Chapter 3

# Paper and Ribbon

## 3.1 Kinds of Paper

1) Kinds of paper

   A thermal-transfer or direct-thermal printing paper can be used.

   The paper must be of high quality. Otherwise, the clear print quality and the longer life of the print head will not be guaranteed.

2) Type of paper

   - Labels (continuous, die-cut, fanfold)
   - Tags
   - Tickets

   Both in-wound and out-wound paper rolls may be used.

3) Size of paper

   Width of paper: 25.4 mm–118 mm (1 in–4.65 in)

   Thickness of paper: 0.063 mm–0.254 mm (0.0025 in–0.01 in)

   Max. printing width: 104 mm (4.1 in)

   Max. printing length: 406 mm (16 in)

   Max. outer dimension of roll paper:
   203 mm (8 in) when using optional roll paper holder
   101.6 mm (4 in) when using standard paper holder

4) Inner diameter of paper core

   Inner diameter of paper core for roll paper: 38 mm–102 mm (1.5 in–4 in)
   Note: The paper core inner diameter for installing the standard paper holders is 38 mm (1.5 in)

## 3.2 Label and Tag Specifications

The position of the label or tag is detected by the printer's transparent and reflective type photosensors.

| | |
|---|---|
| Transparent type photosensor: | Detects paper gaps between labels or tag notches. |
| Reflective type photosensor: | Detects black lines. |

■ Paper specifications

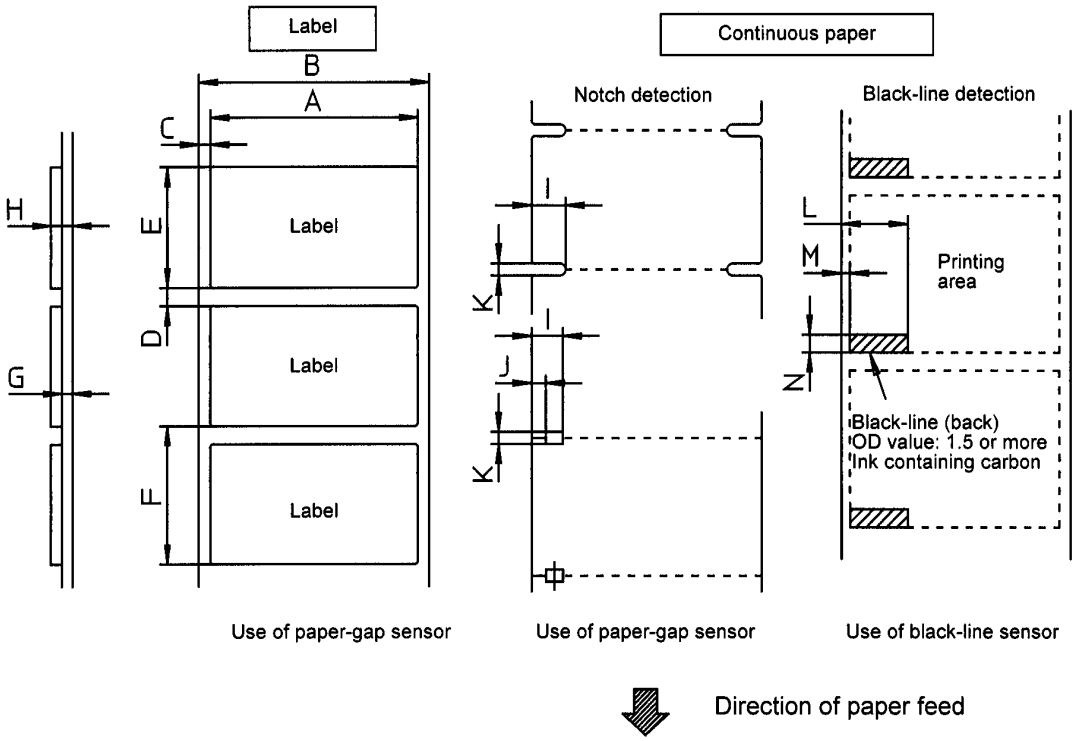
For dimensions of the paper gaps between labels, tag (label) notches or black lines, see the table and figure.

| | | Minimum value mm (in) | Maximum value mm (in) |
|---|---|---|---|
| A | Width of label | 25.4 (1.0) | 118 (4.65) |
| B | Width of liner | 25.4 (1.0) | 118 (4.65) |
| C | Left edge of label | 0 | 2.54 (0.10) |
| D | Length of paper gap between labels | 2.54 (0.10) | 2539 (99.96) |
| E | Length of label | 12.7 (0.50) | 2539 (99.96) |
| F | Pitch of label | 12.7 (0.50) | 2539 (99.96) |
| G | Thickness of liner | 0.06 (0.0025) | 0.125 (0.0049) |
| H | Overall thickness of paper | 0.06 (0.0025) | 0.25 (0.01) |
| I | Right end of notch | 8.3 (0.32) | 11 (0.43) |
| J | Left end of notch | 0 | 4.7 (0.19) |
| K | Length of notch | 2.54 (0.10) | 17.8 (0.70) |
| L | Right end of black line | 15 (0.59) | — |
| M | Left end of black line | 0 | 1.5 (0.06) |
| N | Width of black line | 3.18 (0.125) | 17.8 (0.70) |

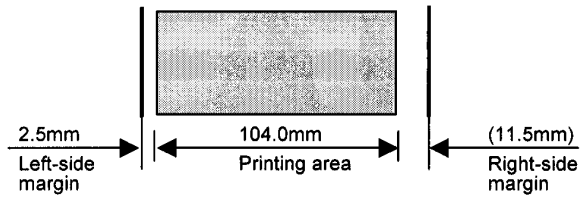
Note: Use the paper gap sensor when the paper has paper gaps between labels and black lines.

Use the paper gap sensor for the fanfold.

## Size of paper




## Printing area



**Units for specifying position and length**

The print position may be specified in either inch or metric system. Switching between the two systems is accomplished through software. The print position can be freely designated within the maximum label size, regardless of which system you wish to use.

■ Inch system

Basic unit (point): 0.01 in (0.254 mm)

The position of each row address (in direction of main scanning) and column address (in direction of sub-scanning) is designated in 0.01-inch units. In case of the 203 dpi head, if the print position changes by 1 point, it changes by 2 dots.

| | | | | |
|---|---|---|---|---|
| 1 point | = | 0.01 in | ≒ | 2 dots |
| 100 point | = | 1.00 in | ≒ | 203 dots |

■ Metric system

Basic unit (point): 0.1 mm

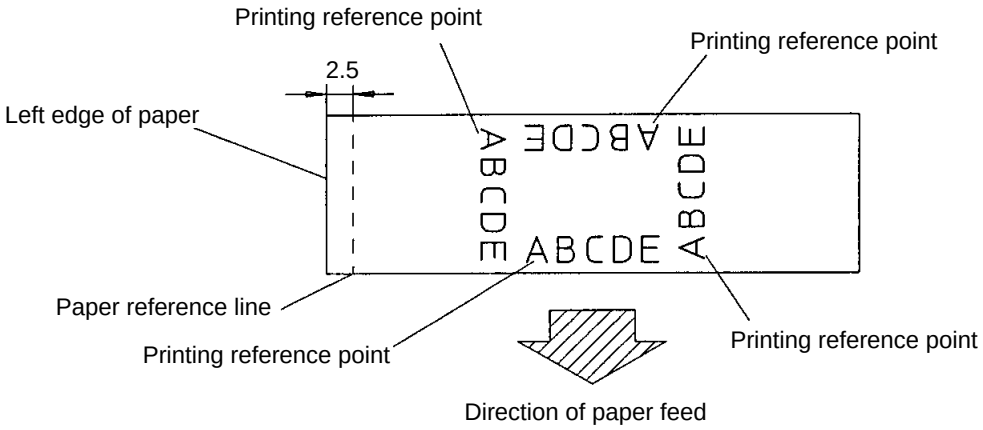
The position of each row address and column address is designated in 0.1-mm units. Since a slight difference between the main and sub-scanning density and the point value exists, the nearest dot number to the designated address is selected in one dot (0.125 mm) units.

| | | | | |
|---|---|---|---|---|
| 1 point | = | 0.1 mm | ≒ | 1 dot |
| 100 point | = | 10.0 mm | ≒ | 80 dots |

The basic unit is common to all label format and system level commands. The label format commands are used to specify the position, length, whole screen offset etc. And the system level commands are used to specify the maximum paper length, home position offset etc.

**Reference points**

The reference points are described in the figure. The position of 2.5 mm from the left edge of the paper is the reference point. The left bottom is the reference point for the printed characters and bar codes. The concept of this reference point is common to such commands as ruled line and graphic.




## 3.3 Ribbon

Size of ribbon:

Width of ribbon: 25.4–114.3 mm (1–4.5 in). The ±10% of the width of the paper to be used is recommended for the width of the thermal-transfer ribbon.

Use the inner diameter of 25.4 mm (1 in) for the ribbon paper core.

The ribbon with inking surface rolled inward or outward can be used.

The maximum outer diameter of the ribbon roll is 74 mm (2.9 in).

A single roll of ribbon (360 m) can be used for printing on about two rolls with an outer diameter of 203 mm (8 in).

## 3.4 Loading the Paper

**CAUTION** Be careful of the edges of the plates so injury or property damage is possible.

The printer is designed to easily load the paper and ribbon. After opening the cover, set the register paper as follows:

1) Push down the open lever (1) to have the head open (see the figure).

2) Push the lever (3) to have the guide rail upper (2) open.

3) Insert the roll holder (4) in the roll paper and roll guide (5) and set on the paper holder (6). Adjust the roll guide (5) to match the width of the paper. The roll paper must be positioned into the reference plane.

4) Slide the moving paper guide (7) to the right end to secure the paper insertion course.

5) Set the paper as shown in the figure.

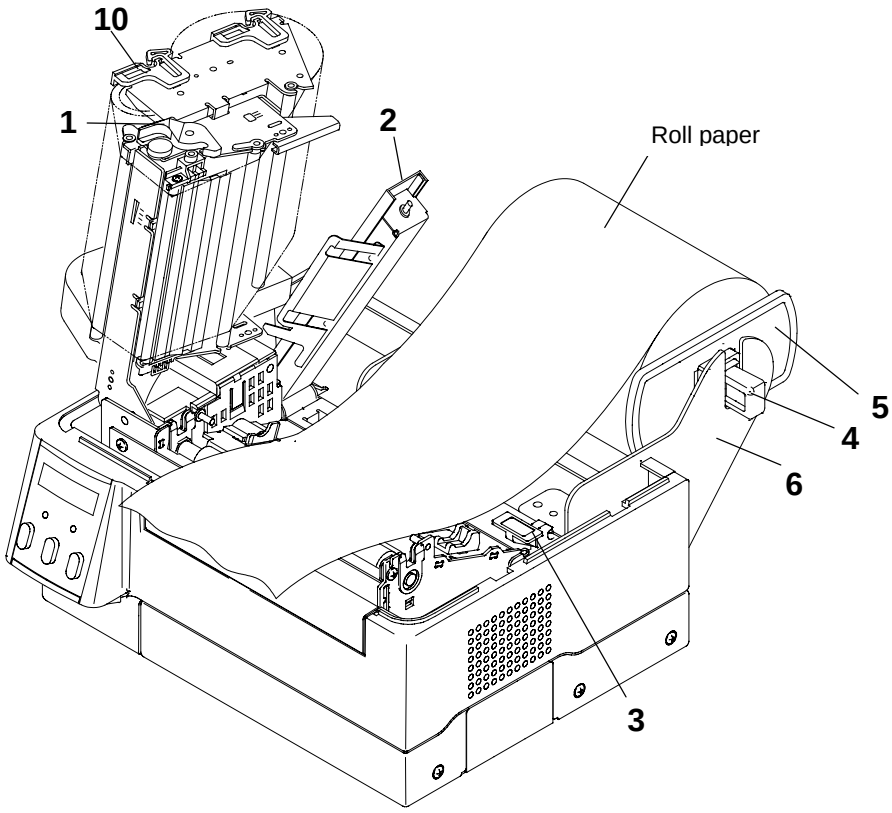
6) Align the left edge of the paper with the stationary paper guide (8) and put the moving paper guide to the edge of the paper so that the paper does not shift sideways.

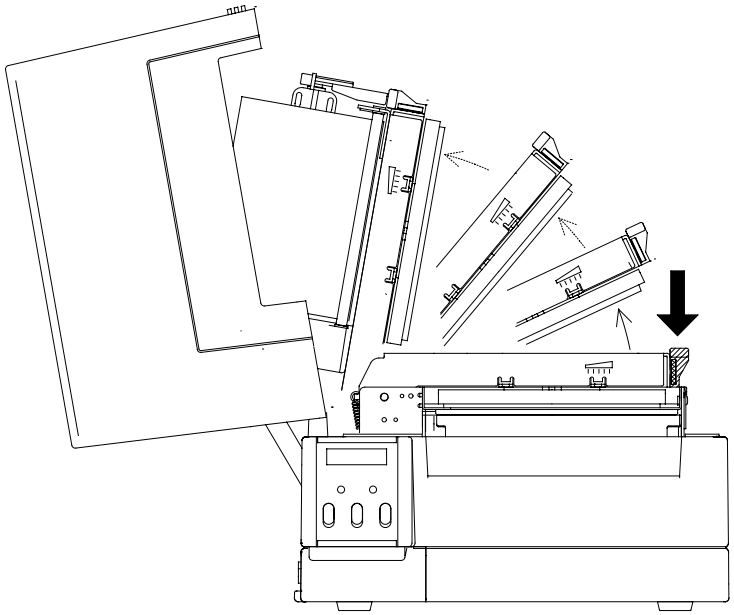
7) Push down the guide rail upper until the lever is hooked and lock it.

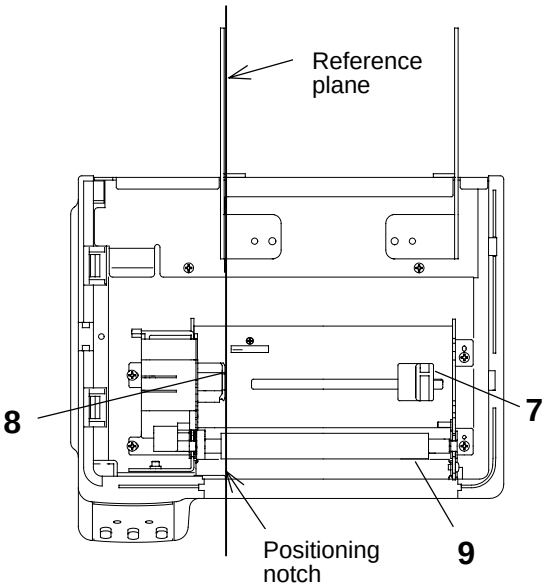
8) Align the paper with the peeling plate (9) positioning notch and push down the ribbon bearing flat (10) to close the print head. The open lever is hooked.

9) Close the cover.

10) Turn on the power to the printer. The LCD screen on the control panel will show the "On line." Press the Feed key. The paper will advance to the next label and stop there.


10
1
2
Roll paper
5
4
6
3



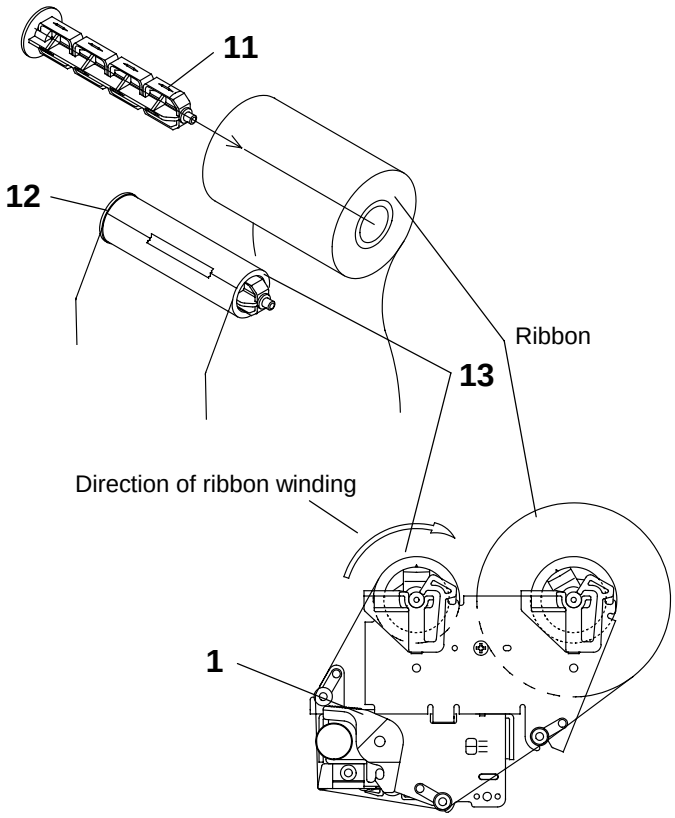

Reference plane
8
7
Positioning notch
9

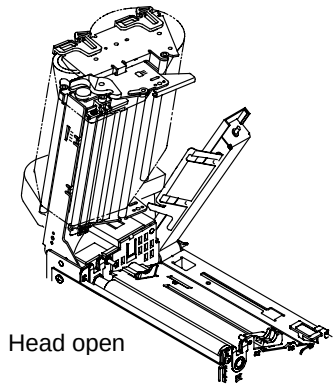
## 3.5 Loading the Ribbon

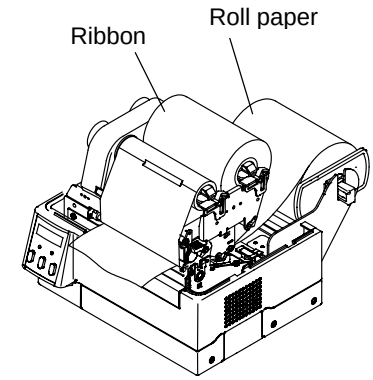
**CAUTION** Be careful of the edges of the plates so injury or property damage is possible.

After opening the cover, set the ribbon as follows:

1) Push down the open lever (1) to have the head open (see the figure).
2) Insert the ribbon shaft (11) in the ribbon until it reaches the end. Then set the ribbon holder as shown in the figure.
3) Insert the ribbon shaft (12) in the paper core (13) until it reaches the end. Then set the ribbon winder as shown in the figure.
4) Attach the ribbon to the paper core with an adhesive tape etc. Turn the ribbon winder in the direction of ribbon winding to remove slackness and wrinkles of the ribbon.
5) Push down the ribbon bearing flat to close the print head. The open lever is hooked.
6) Turn on the power to the printer. The LCD on the control panel will show "On line." Press the Feed key. The paper will advance to the next start position of the label printing and stop there.



## 3.6 Print Head Offset Adjustments

**CAUTION** Ensure the print head offset adjustments are correct for your type of print media (thickness & width). Incorrect adjustments can cause premature failure of the print head.

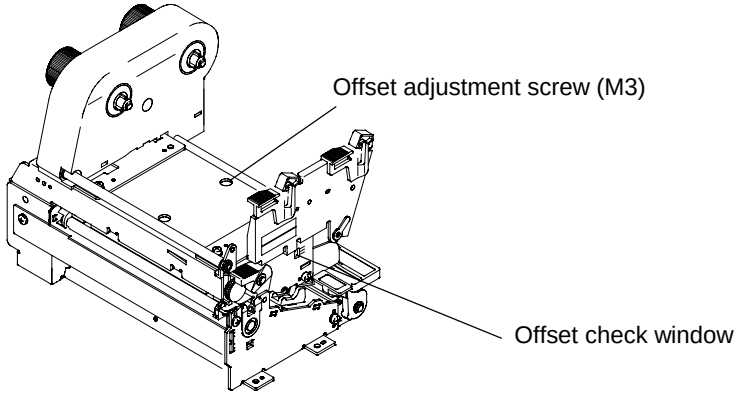
The printer has already been factory-set to the label paper with a width of 112 mm (4.4 in). However, the print head offset adjustments might be necessary depending on the width of the paper and the paper quality. If the print quality becomes inferior because of the use of the paper other than the standard, adjust it according to the following:

1. When the print is unclear or blurred because of poor paper quality:

   Adjust the offset of the print head and platen by turning the offset adjust-screw. The print head offset adjustments are made by changing the inclination of the print head to the platen. This has already been factory-set, but the offset may have been changed if the print head was replaced or disassembled. Also, it may change when using a different type of paper. In those cases, make adjustments according to the criteria below.

   a) Standard or label paper (slick paper, craft paper etc.) and thermal paper

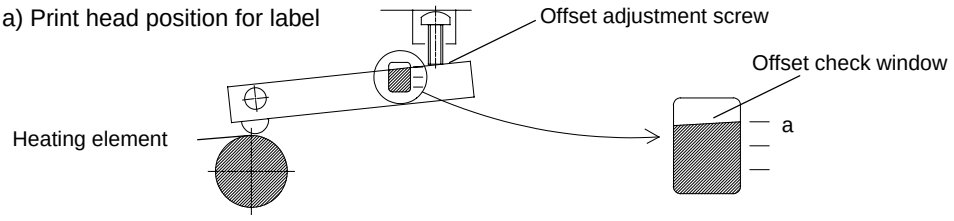
   b) Thick paper (tag or other similar paper)



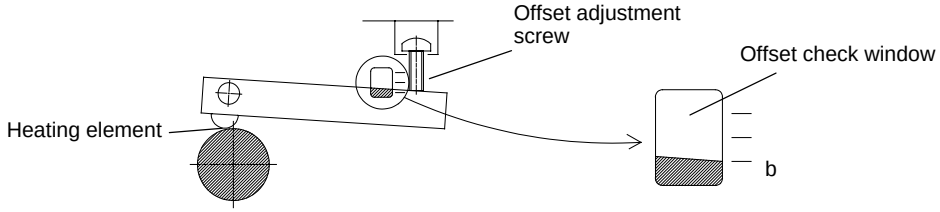

   The relationship between the offset check window and the print head heating element is shown as follows:

   The relationship between the offset adjustment screw and the print head heating element is shown below:

a) Print head position for label




b) Print head position for tag



2. When the print density on the left and right sides is not equal (when the paper with a different width has been used):

   The right head pressure viewed from the front of the panel can be adjusted with the head pressure adjust-screw. Turning the adjust-screw clockwise decreases the head pressure and turning the adjust-screw counterclockwise increases the head pressure. And the condition of the right side of the print head can be checked through the upper frame window, which is located at the front of the printer mechanism unit.

■ Adjustments

   Normally, the left and right head pressure has already been factory-set to same loads. The check marks of the upper frame window are located at the right side of the printer viewed from the front of the printer.

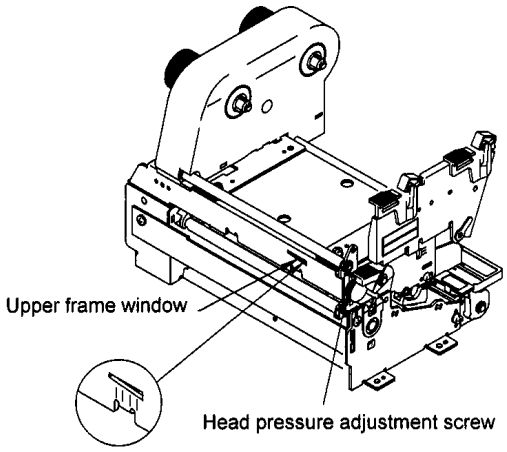
   Adjustments are needed in the following cases:

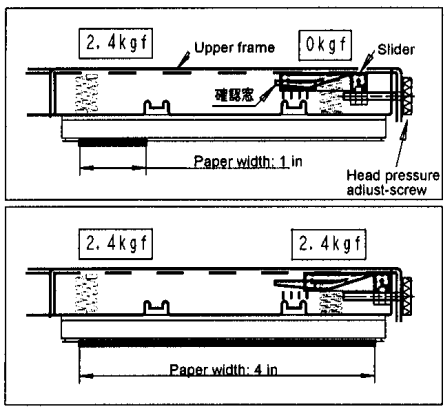
   1) When the print on the left side is too light, turn the head pressure adjust-screw clockwise.

   2) When the print on the right side is too light, turn the head pressure adjust-screw counterclockwise.

   3) When the paper with a different small width is used, the contact between the print head and the platen becomes large, so the stepping motor will take a heavy load or the print head may scrape the platen. To avoid this, turn the head pressure adjust-screw clockwise to decrease the right head pressure.

   In addition, adjustments will be useful for preventing the ribbon wrinkling or the paper skew. For more information, contact our service personnel.




| Check window | Paper width | Right head pressure |
|---|---|---|
|  | 1 inch | 0 kgf |
|  | 2 inches | 0.5 kgf |
|  | 3 inches | 1 kgf |
|  | 4 inches | 2.4 kgf |
|  | Used for adjustment when ribbon wrinkles or skews with paper width of 4 inches | |
|  | Factory setting | |

Note: These values are just for criteria.

## 3.7 Ribbon Tension Adjustments

When the ribbon slips or wrinkles during printing, adjust the ribbon tension. The printer has already been factory set with the ribbon width of 114 mm. When using ribbon with a different width, adjust it according to the following procedure:

a) Hold the ribbon roll with one hand so that it does not turn.

b) Slightly push the knob toward the ribbon roll with the other hand and rotate the knob until the stopper comes to the desired position.

c) Gradually release the knob so that the stopper fits in the groove on the knob.

Set values to each ribbon width:

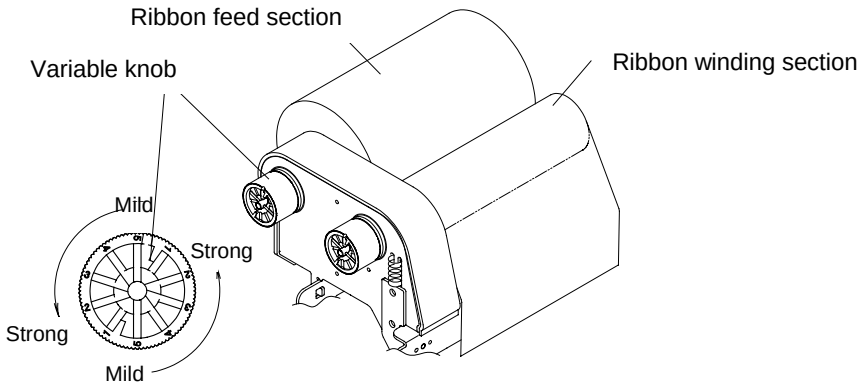
| Ribbon width | Ribbon winding section | Ribbon feed section | Tension |
|---|---|---|---|
| Adjustment when ribbon slips | 5 | 5 | Mild |
| 25.4 mm (1 in) | 4 | 4 | ⇕ |
| 50.8 mm (2 in) | 3 | 3 | |
| 76.2 mm (3 in) | 2 | 2 | |
| 101.6 mm (4 in): factory setting | 1 | 1 | Strong |

d) After printing, check for ribbon wrinkle or slipping. If it occurs, adjust it further according to the following procedure:

(1) When the ribbon wrinkles, the tension on the ribbon winding section should be increased.

(2) When the ribbon slips, the tension on the ribbon feed section should be decreased. If the problem is not resolved even when the tension on the ribbon feed section is set to 5, the tension on the ribbon winding section should be increased.

If ribbon problems are not resolved, consult our service personnel.



# Chapter 4

# Troubleshooting

## 4.1 Error Messages

When there is a problem with the printer, a buzzer sounds, and the LED error indicator on the control panel lights. An error message is displayed on the LCD screen. Error descriptions and corrective actions are shown below.

### 4.1.1 Error descriptions and indications

| Description | LCD indication | LED | Buzzer |
|---|---|---|---|
| Battery dead (for clock and backup RAM) | Battery | Lights | Sounds long |
| Low head temperature | ColdHead | Lights | Sounds long |
| Low PCB temperature | Cold PCB | Lights | Sounds long |
| Abnormal head resistance value | | Lights | Sounds long |
| Error contents and head information repeatedly displayed | Head Err | | |
| Rank: Rank of head resistance value | Rank *** | | |
| Average: Average of resistance values (A/D reading value decimal system) | Ave.*** | | |
| Maximum: Max. value of resistance | Max.*** | | |
| Minimum: Min. value of resistance | Min.*** | | |
| Communication error (receive buffer overrun) | OverFlow | Lights | Sounds long |
| Communication error (parity, framing) | S/I Err | Lights | Sounds long |
| Communication error (transmit buffer overflow | HostBusy<br>T.D.Full | Blinks | Sounds short 3 times |
| Pause key pressed | Pause | – – | – – |
| Pause command reception (remote control) | Pause | – – | – – |
| Head overheat | OverHeat<br>Cooling | Blinks | Sounds short 3 times |
| Stop key pressed | Stop | – – | Sounds short 3 times |
| Stop command reception (remote control) | Cancel | – – | – – |
| Mechanism head open | HeadOpen | Lights | Sounds short 3 times |
| Paper end (no paper left) | PaperEnd | Lights | Sounds short 3 times |

(continued)

| Description | LCD indication | LED | Buzzer |
|---|---|---|---|
| Paper out (paper position can't be detected)<br>Error contents and sensor information repeatedly displayed<br>M command: Sets length for detection miss checking with system command M<br>Maximum: Max. value of sensor reading voltage<br>Minimum: Min. value of sensor reading voltage | PaperErr<br>M CMND<br>Max*.**V<br>Min*.**V | Lights | Sounds short 3 times |
| Ribbon end | RibbonOut | Lights | Sounds short 3 times |
| PCB overheat<br>(PCB or sensor abnormality) | OverHeat | Lights | Sounds short 3 times |
| Motor overheat | MotorHot<br>Cooling | Blinks | Sounds short 3 times |
| Option board abnormality | OP Err | Lights | Sounds short 3 times |
| Auto-cutter abnormality<br>(such as poor engagement) | Cut Err | Lights | Sounds short 3 times |
| ROM checksum error | ROM Err | Lights | Sounds long |
| RAM checksum error | RAM Err | Lights | Sounds long |
| System error (such as timer or CPU running out of control) System is protected and all printer functions are stopped. | – – | – – | – – |

### 4.1.2 Error indications and corrective actions

| LCD indication | Description | Corrective actions |
|---|---|---|
| Battery | Battery dead | Automatically returned after displaying the error for a certain time.<br><br>Change the lithium battery (CR2032).<br><br>**Note:** Contact our service personnel for replacing the battery<br><br>If the battery runs down, the real-time clock will stop and the contents of the memory switch will be lost. |
| ColdHead | Low head temperature | Automatically returned after displaying the error for a certain time.<br><br>Raise the temperature around the printer.<br><br>Print density becomes low and print quality becomes inferior when the head temperature is low. |
| Cold PCB | Low PCB temperature | Automatically returned after displaying the error for a certain time.<br><br>Raise the temperature around the printer.<br><br>Print density becomes low and print quality becomes inferior when the head temperature is low. |
| Head Err | Abnormal head resistance value | Check the contents and clear with the Stop key.<br><br>Replace the print head.<br><br>Print quality is affected in the section with abnormal head resistance value. |
| OverFlow | Communication error (receive buffer overrun) | Check the contents and clear with the Stop key.<br><br>Correct the communication control system or faulty communication cable. |
| S/I Err | Communication error (parity, framing) | Check the contents and clear with the Stop key.<br><br>Correct the communication parameter or faulty communication cable. |
| HostBusy<br>T.D.Full | Communication error (transmit buffer overflow) | Automatically returned if the computer receives data and the buffer becomes empty. |
| Stop | Stop key pressed | Enters the pause after displaying the stop by the Stop key.<br><br>If the Pause key is pressed, the printing will resume.<br><br>If the Stop key is pressed again, the stored printing contents will be lost and the printer will be "on line." |

(continued)

| LCD indication | Description | Corrective actions |
|---|---|---|
| Pause | Pause key pressed | Press the Pause key once again to resume printing.<br><br>If the Stop key is pressed, the stored printing contents will be lost and "on line" will turn on. |
| Pause | Pause command reception (communication control) | Same as above. |
| OverHeat Cooling | Head overheat | Wait until the head temperature goes down. When the temperature becomes low, the remaining printing resumes. |
| MotorHot Cooling | Motor overheat | Wait until the motor temperature goes down. When the temperature becomes low, the remaining printing resumes. |
| Cancel | Stop command reception | Displays the stop by the stop command, discards the remaining printing contents, and enters the pause.<br><br>If the Pause key is pressed, the printer will be "on line." |
| HeadOpen | Mechanism head open | Close the mechanism head. |

(continued)

| LCD indication | Description | Corrective actions |
|---|---|---|
| PaperEnd | Paper end (no paper left) | Install the paper. |
| PaperErr | Paper out (paper position can't be detected) | Check the contents and clear with the Stop key.<br><br>Correct the faulty setting of the paper detection (paper gap, black line, continuous paper).<br><br>Correct the faulty parameter for paper (max. length, continuous paper).<br><br>Adjust the sensor or change for the paper that can accept the paper position detection.<br><br>Specify the length of the detection miss checking with the M command.<br><br>When the paper position can't be detected during paper feeding by the specified length, it is judged error. Generally specify the length about three times the label length.<br><br>In case of the continuous paper, specify the label length with the C command.<br><br>Difference between the maximum and minimum values of the sensor reading voltage is 0.8 V or more.<br><br>Sensor can be adjusted and paper characteristic (voltage checking) can be verified with the Maintenance mode. |
| RibbonOut | Ribbon end | Check the contents and clear with the Stop key.<br><br>Install the ribbon.<br><br>Check that the ribbon is wound properly.<br><br>Correct the print mode (direct-thermal or thermal-transfer) setting failure. |
| OverHeat | PCB overheat | Turn off the power and reset the printer. If this recurs, contact our service personnel. |
| OP Err | Option board abnormality | Turn off the power and reset the printer. If this recurs, contact our service personnel. |
| Cut Err | Auto-cutter abnormality (such as poor engagement) | Check the contents and clear with the Stop key.<br><br>If this can't be cleared, turn off the power and remove foreign matter from the auto-cutter.<br><br>If this recurs, contact our service personnel. |

(continued)

| LCD indication | Description | Corrective actions |
|---|---|---|
| ROM Err | ROM checksum error | Turn off the power and reset the printer. If this recurs, contact our service personnel. |
| RAM Err | RAM checksum error | Turn off the power and reset the printer. If this recurs, contact our service personnel. |
| – – | System error (such as timer or CPU running out of control). System is protected and the printer is reset | First protect the system, then reset the printer. |

## 4.2 Power Troubleshooting

| Problem | Cause and remedy |
|---|---|
| No power even with power switch turned ON. | • Power cord is not properly connected to the outlet. → Turn off the power switch and properly reconnect the power cord to the outlet.<br>• Power cord is not properly connected to the power inlet. → Turn off the power switch and properly reconnect the power cord to the power inlet.<br>• Input voltage is not correct; input voltage is greater or less than the rated voltage. → Set input voltage within the rated voltage (puncture voltage may occur. Contact our service personnel).<br>• Proper RS-232C cable is not used. → Turn off the power switch and unplug the interface cable. Check that power is delivered by turning on the power switch and use the proper RS-232C cable. |

## 4.3 Paper Feed Troubleshooting

| Problem | Cause and remedy |
|---|---|
| Paper doesn't feed. | • Paper path is wrong. → Use the proper path.<br>• Mechanism head is open. → Close the mechanism head. |
| Paper is skew. | • Paper end is not in contact with the paper guide. → Slightly push the paper guide against the paper end.<br>• Roll guide is not in contact with the roll paper. → Slightly push the roll guide against the roll paper.<br>• Head pressure is not proper. → Adjust it with the offset adjust-screw according to the width of the paper. |
| Paper doesn't align with print position. | • Setting mode is not proper. → Check whether the setting mode is the paper gap or black line detection and if it is not proper, change it.<br>• Paper gap (black line) sensor adjustment failure. → Adjust the voltage of the paper gap and black line sensor in the system maintenance mode.<br>• Transfer data is abnormal. → If the contents of the transfer data are not set properly, set them again. |

## 4.4 Ribbon Feed Troubleshooting

| Problem | Cause and remedy |
|---|---|
| Ribbon is not wound. | • Ribbon path is wrong. → Use the proper path.<br>• Direction of ribbon winding is reverse. → Set it to the right winding direction.<br>• Tension of ribbon winding is not proper. → Set it properly. |
| Printing continues even when ribbon is out. | • Print mode is the direct-thermal. → Set it to the thermal-transfer if necessary. |
| Ribbon wrinkles. | • Tension of the ribbon holder and winder is not proper. → Set it properly.<br>• Print density (heating factor) is not proper. → Correct the parameter of the Hnn command in the printing contents definition mode.<br>• Angle of ribbon guide bar is not correct. → Adjust the ribbon guide bar. Contact our service personnel.<br>**Note:**<br>If a narrow paper is used, the ribbon may wrinkle. To avoid this, decrease the right head pressure with the head pressure adjust-screw. |

## 4.5 Print Troubleshooting

| Problem | Cause and remedy |
|---|---|
| Printing doesn't start. | • Power to the printer is off. → Turn on the power switch. If power is not still turned on, follow the steps in the Power Troubleshooting.<br>• Printer is not properly connected to a computer. → Turn off the power switch and connect it properly.<br>• Printer setting is not proper. → Correct the printer setting. |
| Missing all lines. | • Print head connector connection failure. → If the print head connector is not properly connected, insert it correctly.<br>• Paper and ribbon are not set properly. → Set them properly. |
| Partially dropouts. | • Print head is dirty. → Check the print head heating element for dirt. If it's dirty, wipe the surface of the print head heating element with a soft clean cloth soaked in ethylalcohol etc.<br>• Platen roller is dirty. → Remove any dirt or label or tape on the platen.<br>**Note:** If it can't be removed, contact our service personnel for general maintenance. |

(continued)

| Problem | Cause and remedy |
|---|---|
| Print is too light or dark. | • Paper and ribbon are not the specified type. → Change to the specified type after checking the paper and ribbon makers and identification numbers if necessary.<br>• Present paper quality doesn't match the print head offset. → Adjust the offset. See Print head offset adjustments.<br>• Present width of the paper doesn't match the print head offset. → Adjust the offset. See Print head offset adjustments.<br>• Printer setting mode is different. → Check whether the setting mode is the direct-thermal or thermal-transfer and change it if necessary.<br>• Setting of printing energy level is not proper. → Check the setting value of the printing energy level and adjust it if necessary. |
| Other print abnormalities | • Check the error messages on the control panel and correct them, referring to Section 4.1 Error Messages. |

## 4.6 Interface Troubleshooting

| Problem | Cause and remedy |
|---|---|
| Printer doesn't print.<br>Print disordered.<br>Error message is displayed and printer doesn't print. | The following should be considered as probable causes:<br>• Interface cable is not properly connected. → Check that the interface cable is connected properly.<br>• Interface cable is not the standard type. → Use the standard type.<br>• Communication parameter setting is not proper. → Set the system maintenance mode from the control panel and check/correct the communication parameter value. |

# Chapter 5

# Options

Factory or reseller (dealer) options:



User options:

## 5.1 Auto-Cutter Unit

The auto-cutter unit that has been installed on the printer will be available. See the operation manual of the auto-cutter for details.

■ Specifications

- Cutting method: Circlular cutter
- Max. thickness of cut paper: 0.01 in (0.25 mm)
- Min. length of cut paper: 1.0 in (25.4 mm)

## 5.2 Peeler Unit

The peeler unit that has been installed on the printer will be available. See the operation manual of the peeler unit for details.

■ Specifications

- Width of paper: 1–4.65 in (25.4–118 mm)
- Max. diameter for roll paper: 8 in (203 mm)
- Inner diameter for roll paper: 4 in (102 mm), min.
- Min. length of label: 1 in (25.4 mm)
- Thickness of paper: 0.0067 in (0.17 mm), max.
- Thickness of liner of label: 0.0027 in (0.07 mm), max.
- Unusable paper: Special paper (Whitepet etc.) or too flexible and easy-to-jam paper

## 5.3 Adjustable Sensor

The adjustable sensor that has been installed on the printer will be available. See the operation manual of the adjustable sensor for details.

■ Specifications

- Adjustable sensor travel: 59 mm (2.3 in) from the left edge of the paper (reference position of setting paper)

## 5.4 PCMCIA Memory Card

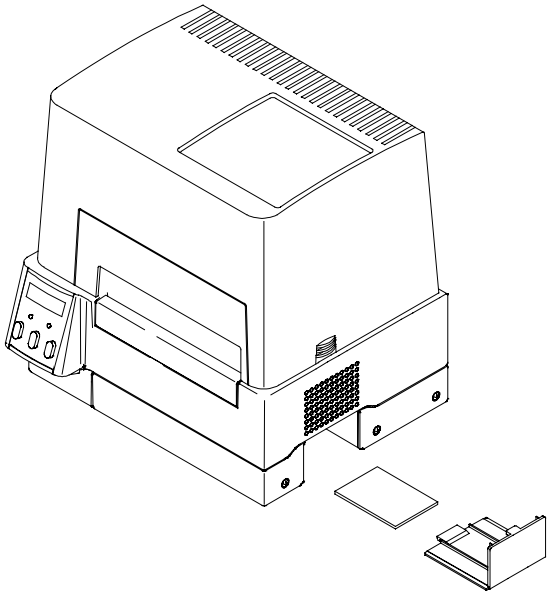
The PCMCIA memory card is used to:

1) Store the print format files. Data in the field register area can be stored and loaded.
2) Store graphic data. For example, graphic data such as a corporate logo can be stored and recalled from the PCMCIA memory card and printed.

   **Note:** The maximum size of storing graphic data is 256K bytes.
3) Store downloaded HP Soft fonts.

■ Installation

1) Turn off the power to the printer.
2) Remove the PCMCIA memory card cover at the bottom of the printer (see figure).
3) Insert the memory card (make sure the card is not inverted).
4) Replace the PCMCIA memory card cover.



**Notes:**
- Before use, carefully read and understand the instructions regarding the PCMCIA memory card.
- Never try to insert or remove the PCMCIA memory card before the power to the printer is turned off.
- Always close the PCMCIA memory card cover to keep out dirt.
- If the PCMCIA memory card write failure occurs, check it with the test command (STX.w). (Also, check the write protection switch of the PCMCIA memory card.)

## 5.5 8-in Size Roll Paper Holder

8-in size roll paper holder

- Max. outer diameter: 8 in (203 mm)
- Paper core inner diameter: 1.5 in–3 in (38 mm–76 mm)

# Chapter 6

# Specifications

## 6.1 Basic Specifications

| Item | Description |
|---|---|
| Printing | • Direct-thermal or thermal-transfer<br>• 203 dpi (8 dots/mm) print head<br>(Main scanning line density: 8 dots/mm)<br>(Sub-scanning line density: 8 lines/mm)<br>• Max. printing width: 4.1 in (104 mm)<br>• Max. paper width: 4.65 in (118 mm)<br>• Max. printing length: 32 in (812 mm) |
| Printing speed | •2–4 inches/second in one-inch units |
| Print mode | • Batch mode: Normal printing (single or multi sheets)<br>• Peeling mode: Label peeling off the liner after printing<br>• Cut mode: Cutting and printing by the specified number of sheets (label feeding back enabled)<br>• Tear-off mode: Paper feeding back to the printing start position after cutting |
| Bar code generator | One-dimensional bar code:<br>• Code 3 of 9<br>• UPC-A<br>• UPC-E<br>• Interleaved 2 of 5<br>• ITF14<br>• ITF16<br>• Telepen<br>• Code 128<br>• EAN-13 (JAN-13)<br>• Codabar (NW-7)<br>• HIBC (Modulus 43-used code 3 of 5)<br>• EAN-8 (JAN-8)<br>• Int 2 of 5 (Modulus 10-used Interleaved 2 of 5)<br>• Plessey<br>• CASE CODE<br>• Code 93<br>• UPC2DIG ADD<br>• UPC5DIG ADD<br><br>Two-dimensional bar code:<br>• UPS Maxi Code<br>• PDF-417<br>• QR Code |

| Item | Description |
|---|---|
| Standard fonts | • Font No. 0–6 system font (alphanumeric and European font)<br>• Font No. 7–8: OCR-A OCR-B<br>• Font No. 9: CG Triumvirate smooth fonts; 6 pt, 8 pt, 10 pt, 12 pt, 14 pt, 18 pt, 24 pt, 30 pt, 36 pt, and 48 pt.<br>Character set in accordance with code page 850 |
| Media sensors | • Transparent type sensor:<br>Detects paper gap between labels, tag notch and paper out<br>• Reflective type sensor:<br>Detects black line on back of paper and paper out<br>• Paper top end position (home position) adjustable with software<br>• Label peeling sensor (optional) |
| Paper | • Type of paper: Roll or fanfold type (continuous label paper, die-cut label paper, tag paper and continuous ticket paper)<br>• Kinds of paper: Direct-thermal or thermal-transfer paper<br>• Max. paper width: 4.65 in (118 mm)<br>• Min. paper width: 1 in (25.4 mm)<br>• Max. printing length: 32 in (812 mm)<br>• Min. printing length: 0.500 in (12.7 mm)<br>• Max. paper thickness: 0.01 in (0.254 mm)<br>• Min. paper thickness: 0.0025 in (0.063 mm)<br>• Roll paper diam.: max. outer diam.: 4 in (102 mm): Standard; 8 in (203 mm): Optional<br>paper core: 1.5–4 in (38–102 mm)<br>• Print density: Adjustable with software |
| Ribbon | • Width: Freely set between 1.0–4.5 in (25.4–114 mm)<br>• Length: 1180 ft (360 m), max.<br>• Max. outer diam.: 2.9 in (74 mm)<br>• Paper core inner diam.: 1 in (25.4 mm) ±0.01 in (0.254 mm) |

| Item | Description |
|---|---|
| Communication interface | • Serial: RS-232C<br>• Parallel: Centronics |
| Indications, keys and switches | • LEDs: Power and Error<br>• LCD: Displays printer status, error contents, mode switch contents, etc<br>• Control panel keys: Pause, Feed and Stop<br>• Mode switch: Parameter setting for switching between direct-thermal and thermal-transfer, communication etc.<br>• Head up detection switch<br>• Power switch |
| Options | By factory:<br>• Auto-cutter unit • Peeler unit • Adjustable sensor unit<br>By user:<br>• 8-in size roll paper holder • PCMCIA memory card |
| Appearance and weight | • Height: 9.3 in (235.1 mm)<br>• Width: 9.6 in (245 mm)<br>• Depth: 11.4 in (289.8 mm)<br>• Weight: 11.2 lbs (5.1 kg) |
| Power | • Input voltage 120V: -10%+6%, 2.5A, 60Hz (U.S.A., Canada)<br>• Input voltage 220V–240V: -10%+6%, 1.2A, 50/60Hz (Europe) |
| Environment | • Operating conditions: Temperature: 5–35°C (41–95°F) Humidity: 30–80% (non-condensing)<br>• Storage: Temperature: -20–60°C (-4–140°F) Humidity: 5–85%<br>• Ventilation: Convective circulation. Air vent be away from wall etc (to prevent fire)<br>• Dust: Free from conductive or corrosive matter |

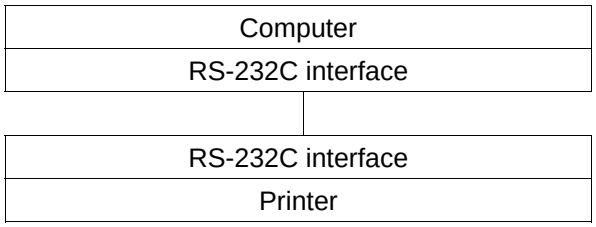
## 6.2 Interface

The printer is connected to a computer and prints labels according to the commands from the computer.

Two methods of interface with a computer are as follows:

### 6.2.1 Serial interface system configuration

Serial interface: RS-232C (standard)

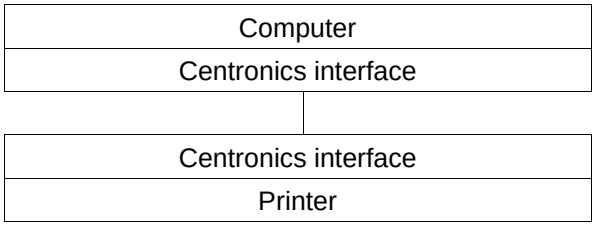



Serial interface specifications

| | |
|---|---|
| Method | Asynchronous serial interface<br>RS-232C |
| Connector | DSUB 25-pin |
| Protocol control | XON/XOFF and CTS/DTR |
| Receive buffer size | 12K bytes<br>Receiving data stops when the receive buffer reaches 2K bytes available and resumes when the receive buffer reaches 4K bytes available |
| Baud rate | 300, 600, 1200, 2400, 4800, 9600, 19200, 38400 bps |
| Bit length | 7- or 8-bit |
| Stop bit | Fixed<br><br>When printer receives data, stop bit is fixed at 1, and when printer transmits data, stop bit is fixed at 2. But computer can transmit and receive data, regardless of stop bit at 1 or 2 |
| Parity | Non |

### 6.2.2 Parallel interface system configuration

Parallel interface: Centronics (standard)




Parallel interface specifications

| | |
|---|---|
| Method | 8-bit parallel |
| Connector | 36-pin unphenol type |
| Synchronous system | Strobe pulse |
| Handshaking | ACKNLG and BUSY signals |
| Signal level | TTL |

### 6.2.3 RS-232C loopback test

After connector wiring as shown in the figure, turn on the test mode. The printer will receive data that has been transmitted by printer itself and the test of receiving and transmitting data will be performed.

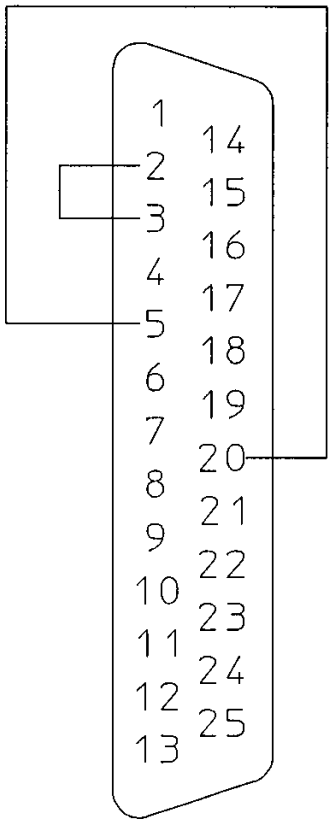



Fig. RS-232C loopback test

### 6.2.4 RS-232C protocol

(1) X-ON/X-OFF system (see figure)

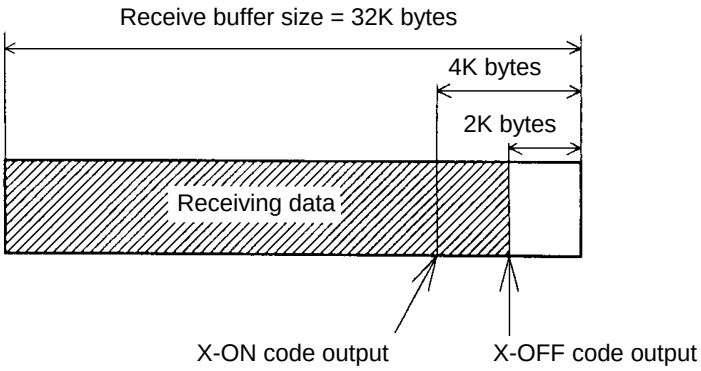
This is a control system in which the data transmitting request signal (X-ON (11H) code) and the data transmitting stop signal (X-OFF (13H) code) are output.

Requirements of output of X-ON code:

- When the power is switched to ON.
- When the receive buffer has less than 2K bytes available, the X-OFF code is output, and the receive buffer has at least 4K bytes available.

Requirements of output of X-OFF code:

- When the receive buffer has less than 2K bytes available.




**Note:** Even if each code is ready for output, the same code cannot be transmitted twice successively (except when the power is turned on or the printer is reset from the control panel).

Fig. Buffer in use

(2) Ready/Busy system (see figure)

This is a control system in which the DTR is output at Ready (High) or Busy (Low) level. The DTR, however, is always output at Ready (High) level except the following:

Requirements of output of DTR 'Busy (Low)':

- When the receive buffer has less than 2K bytes available. When this condition is detected, the printer keeps a 'Low' level until the receive buffer has at least 4K bytes available.

### 6.2.5 Interface pin assignment

Serial and parallel interface pin assignment tables are shown below.

■ Serial interface pin assignment table

| Pin No. | Signal | Input/Output | Description |
|---|---|---|---|
| 1 | F.GND | – | Frame ground |
| 2 | TXD | Output | RS-232C output data |
| 3 | RXD | Input | RS-232C input data |
| 4 | RTS | – | RS-232C (pull up to +5V with 2 KΩ) |
| 5 | CTS | Input | RS-232C data transmission on computer enabled |
| 6 | NC | – | Not connected |
| 7 | S.GND | – | Signal ground |
| 8 | NC | – | Not connected |
| 9 | NC | – | Not connected |
| 10 | NC | – | Not connected |
| 11 | NC | – | Not connected |
| 12 | NC | – | Not connected |
| 13 | S.GND | – | Signal ground |
| 14 | +5VDC | – | +5 V (max. load 100 mA) |
| 15 | NC | – | Not connected |
| 16 | NC | – | Not connected |
| 17 | NC | – | Not connected |
| 18 | NC | – | Not connected |
| 19 | NC | – | Not connected |
| 20 | DTR | Output | RS-232C data transmission on printer enabled (Busy) |
| 21 | NC | – | Not connected |
| 22 | NC | – | Not connected |
| 23 | NC | – | Not connected |
| 24 | NC | – | Not connected |
| 25 | NC | – | Not connected |

■ Parallel interface pin assignment table

| Pin No. | Signal | Input/Output | Description |
|---|---|---|---|
| 1 | $\overline{\text{STROBE}}$ | Input | Strobe signal for 8-bit data |
| 2–9 | DATA1-8 | Input | 8-bit parallel signal |
| 10 | $\overline{\text{ACKNLG}}$ | Output | 8-bit data request signal |
| 11 | BUSY | Output | Signal showing printer busy |
| 12 | PERROR | Output | Signal showing paper out |
| 13 | SELECT | Output | Signal showing printer "on line" (printing) or "off line" (pause) |
| 14 | $\overline{\text{AUTOFD}}$ | Input | Invalidness (ignorance) |
| 15 | NC | – | Not used |
| 16 | S.GND | – | Signal ground |
| 17 | FGND | – | Frame ground |
| 18 | P.L.H | Output | Signal showing peripheral logic high (pull up to +5V with 1.2 KΩ) |
| 19–30 | GND | – | Ground for twisted pair return |
| 31 | $\overline{\text{INIT}}$ | Input | Printer reset |
| 32 | $\overline{\text{FAULT}}$ | Output | Signal showing printer error |
| 33–35 | NC | – | Not used |
| 36 | $\overline{\text{SELECTIN}}$ | Input | Invalidness (ignorance) |

## 6.3 Outline of Command System

For details about command system, see the Command Reference separately available.

Commands for this printer consist of a string of ASCII codes and end with "CR" (decimal: 13, hex: 0D). Commands are generally classified into two types, system-level commands and label format commands.

System-level commands are used for system-level operations such as printer status output, sensor selection and memory card maintenance. On the other hand, label format commands are used for definition of printing contents such as character data, bar code data, printing speed, and print density.

System-level commands start with ASCII "SOH" or "STX."
Commands starting with "SOH" are required for real-time execution. When received, they are executed immediately even during printing. Commands starting with "STX" enter the buffer area once and then are executed in the order of data reception.

Label format commands end with "CR", following the system-level commands "STX" + "L."

| | |
|---|---|
| System-level commands<br>start with "SOH" or "STX" | Commands to start with "SOH"<br>Executed immediately after receiving data<br>(e.g. printing stop, printer status output etc.) |
| | Commands to start with "STX"<br>Executed in sequence after inputting into the receive buffer<br>(e.g. sensor switching, memory card maintenance etc.) |

"STX" + "L" ↓ ↑ "E" (with printing)
"X" (without printing)

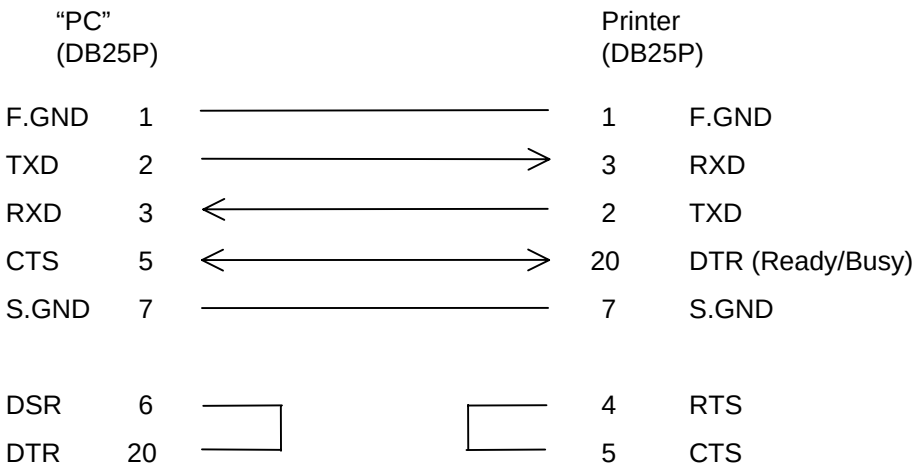
| | |
|---|---|
| Label format commands<br>end with "CR" | Print parameter control |
| | Character data definition commands |
| | Bar code definition commands |
| | Graphic commands |
| | Other commands |

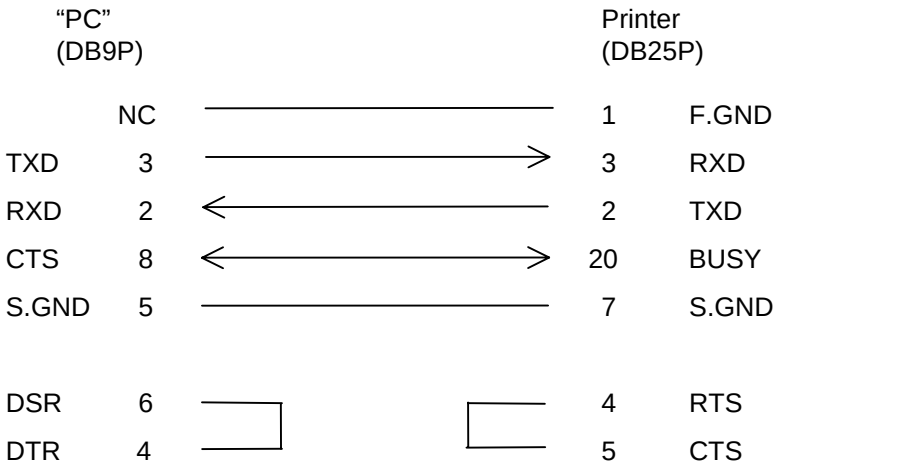
## 6.4 Example of Connection to a Computer

When RS-232C is used:

IBM PC compatible

Communication control: XON/XOFF or CTS/DTR



## 6.5 Tear-Off Function

The tear-off function eliminates the waste of labels when tearing manually. It allows the paper to automatically advance to the tear position after printing.

When this function is turned on, the paper will be fed to the manual tear position after printing. The printer will feed back paper to the start print position when the next print job is sent.

If data is transmitted continuously from the computer, the tear-off function will be suppressed to increase throughput.

### 6.5.1 Turning Tear ON/OFF

Tear can be turned to ON or OFF from the control panel. Default is OFF.

Indications on the control panel are as follows:

| | Tear-off invalid | Tear-off valid |
|---|---|---|
| LCD indication | "Tear OFF" | "Tear ON" |

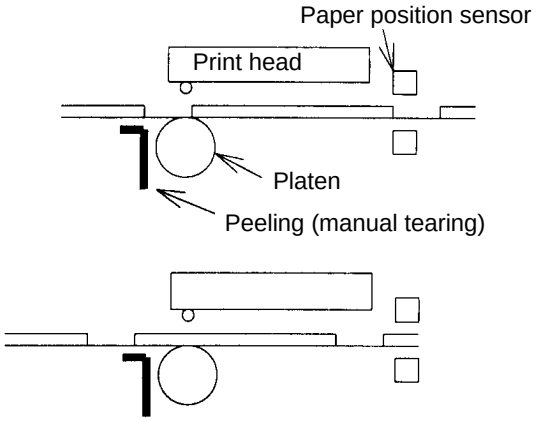
### 6.5.2 Tear-off when printing

If set, the tear-off will start if no data is transmitted from the computer for 0.5 second after printing. If data is transmitted continuously from the computer, the tear-off function will be suppressed.

Tear-off is only performed for the final label of each batch processing.

(The tear-off is not performed until the specified number of print sheets is completed.)

- The paper is fed to the tear position



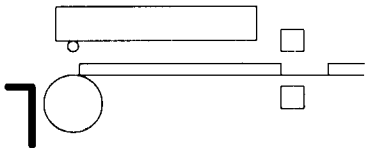

Tear-off function will start if no data is sent for 0.5 second after printing



Paper is fed to the position where manual tearing is possible

- When manual tearing is needed, tear the label at this time.
- Performs next label printing.

  When next print data is transmitted from the computer, the printer feeds back paper to the previous print completed position and resumes printing.



Paper is fed back to the previous print completed position and printing resumes

### 6.5.3 Tear-off when feeding

- If no print data is transmitted for 0.5 second after feeding, the tear-off function will start. If the Feed key is pressed again before starting the tear-off function, the printer will start feeding without tear-off function.

- Paper is fed to the tear position
- When manual tearing is needed, tear the label at this time.
- The printer performs the next feeding or label printing.

  If the Feed key is pressed or next print data is transmitted from the computer, the printer feeds back paper to the previous print completed position and resumes feeding or printing.

### 6.5.4 Tear-off and type of data

When the tear-off is valid, the printer monitors the print data for 0.5 second during or after printing. If print data is transmitted within 0.5 second during or after printing, the printer will start the next printing without tear-off. (When data is received during printing, the time of monitoring 0.5 second is not inserted.)

The commands for this printer are mainly classified into the immediately execution commands starting with "SOH" and the sequentially execution commands starting with "STX." In tear-off function, only the sequentially execution commands related to print processing contents are monitored but the immediately execution commands are not monitored.

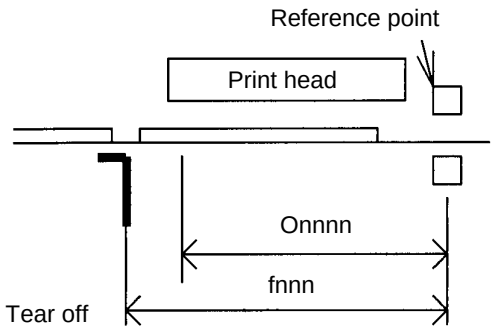
Therefore, even if the printer status or the remaining number of print sheets is read out by using the immediately execution commands during printing, the tear-off will be performed after printing. On the other hand, if the sequentially execution commands are used during printing or within 0.5 second after printing to transmit print-related data, the printer will start the next printing without tear-off. (For details, see the Command Reference.)

### 6.5.5 Cut position adjustments

- The cut position can be set with the "fnnn" of the system-level commands. When the tear-off function is turned on, the following initial value is set in the printer.

  Initial value: fnnn = f701 (70.1 mm)

  The values higher or lower will increase or decrease the amount of feeding in the tear-off function.




| | |
|---|---|
| Onnnn: | Paper position specifying |
| fnnn: | Feed position specifying |

fnnn <= Onnnn
Feeding or back-feeding is not performed

fnnn > Onnnn
Feeding or back-feeding is performed

- Parameter initial values

  Initial values of print and feed positions are described below.

Unit: mm (inch)

| | Normal printing | Auto-cutter | Peeling | Tear-off | Minimum value |
|---|---|---|---|---|---|
| Print position (Onnnn, form offset) | 55.9 (2.2) | 55.9 (2.2) | 55.9 (2.2) | 55.9 (2.2) | 12.7 (0.5) |
| Feed position (fnnn) | 55.9 (2.2) | * | * | 70.1 (2.8) | 12.7 (0.5) |

If values lower than the minimum values are set, initial values will be set instead. (For values with mark*, see the separate option operation manuals.)

### 6.5.6 When "fnnn" command is executed while tear-off is OFF

Even with the tear-off ‘OFF,’ the paper will be fed to the "fnnn"-specified position after printing if an "fnnn > Onnnn" value is set by using the "fnnn" command.

This function will be used for such case as another device is incorporated in the printer.

To perform operation with the FARGO, the following may be different from those in the tear-off ‘ON’:

- The paper is fed immediately after printing, and in the tear-off ‘ON’ the paper is fed when no data is transmitted for 0.5 second after printing.

  However, if the next print data is transmitted during printing, the printer will start the next printing without feeding or back-feeding.

### 6.5.7 Priority order

The following three functions (optional) cannot be performed simultaneously.

If commands for these three functions are received simultaneously, they will be executed in the following priority order:

1st: Auto-cutter

2nd: Peeler

3rd: Tear-off

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