TOSHIBA

TOSHIBA Barcode Printer

B-SX600 SERIES

Product Description

Document No. **EO10-33021**

Original **Sep., 2008**

(Revised)

TOSHIBA TEC CORPORATION

TABLE OF CONTENTS

CAUTION!

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2. *The contents of this manual may be changed without notification.*

1. OUTLINE

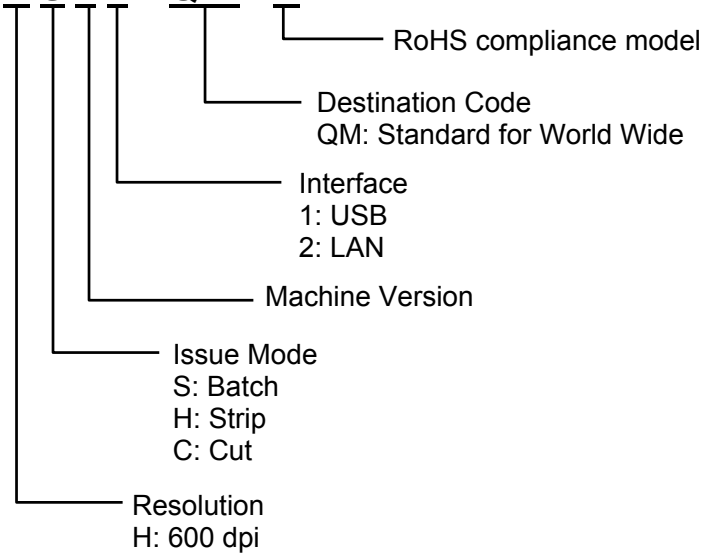
1.1 PRINTER SPECIFICATIONS

1) High quality and resolution
   - The resolution in the media feed direction is 1200 dpi, the highest resolution for label printers.
   - This printer can precisely print on a 3-mm long label, also can peel off 10-mm long label.
   - Prevents change of the ribbon tension which causes ribbon wrinkles.
   - Prevents an imbalance contact of the print head with the media and blurred print at the media edges.
2) Interface
   • Use of the printer driver eliminates the need of learning any printer specific commands. Also, it is possible to develop a general-purpose system according to the standard specification.
   • Bi-directional communication feature and status monitor API enable the host application to correctly obtain a end of print job status even when using the printer driver.
   - For network printing, the standard print protocol (LPR, Raw) has been adopted.
     Bi-directional communication feature of Raw enables obtaining an end of print job status via network. Like the USB interface model, it realizes complete management of print jobs. Network printing can be performed without any special printing software.
3) User friendliness
   - Very easy supply loading due to the pop-up mechanism of the print head block.
   - Easy-to-understand operation menus enable user intuitive operations.
   - Large LCD panel displays the printer status or operating procedures. (Language is selectable between Japanese and English.)
   - Print head and platen roller can be replaced without any tools.
   - Simple driver installer enables easy and secure installation of the printer driver.
4) Safety and environment consciousness
   Interlock switch:
   While the cover is opened, printing operation is stopped and the power supply to the print head is shut down.
   User protection:
   This printer is designed so that users cannot touch the moving parts such as the platen roller or the cutter unit.
   EMC (Electromagnetic compatibility):
   Emission of electromagnetic noise, which influences other electronics devices, is reduced. Also, the immunity to electromagnetic noise generated by surrounding devices is enhanced.
   No use of hazardous chemical substances
   Compliance with EU RoHS directive
5) Option
   A variety of options are provided to meet your needs.
   - Cutter module (Factory option)
   - Strip module (Factory option)
   - Network adapter (Factory option)
     Network interface: 10BASE-T/100BASE-TX (Automatic sensing), Protocol: TCP-IP

Notes:
1. B-SX600 Series does not support TPCL (TEC Printer Command Language).
2. Printable bar code, two-dimensional code, and font type depend on PC's operating environment and application software.
3. In the Low Power Mode, the fan motor pauses as a proper operation.
4. When the power is on, the ribbon motor works for applying proper tension to the ribbon.

1.2 DESCRIPTION OF MODEL NUMBER

B – S X 6 0 0 – H S 1 1 – Q M - R

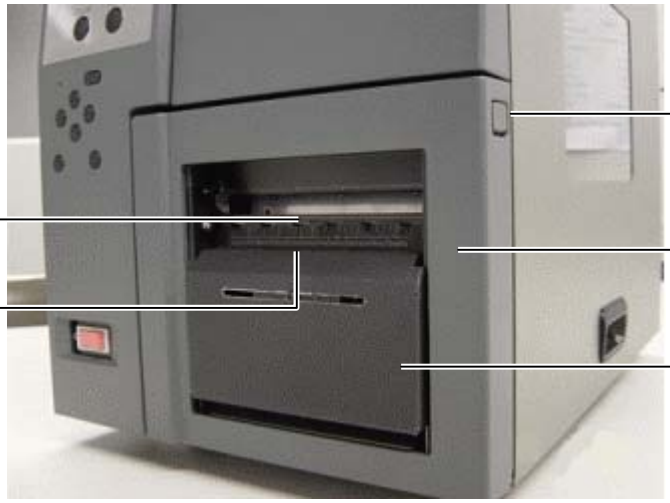


1.3 PART NAMES AND FUNCTIONS

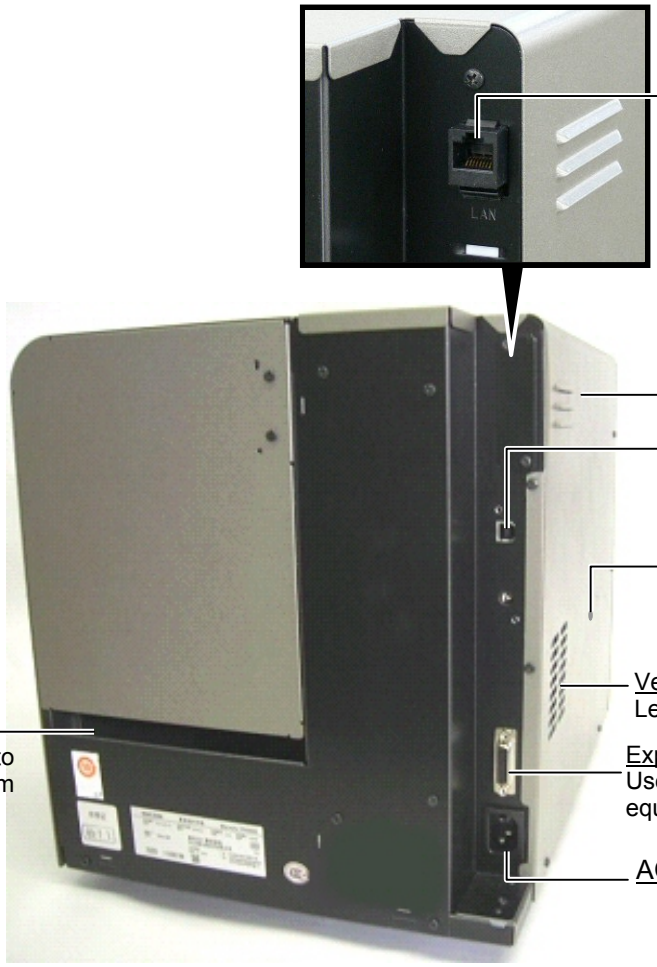
Front View

Standard model or Cutter model

Strip model



Rear View



LAN Interface Connector
Used to connect the printer to a PC with a LAN cable.
(LAN Interface model only)

Left Side Panel

USB Interface Connector
Used to connect the printer to a PC with a USB cable.
(USB Interface model only)

Reset Switch
Used to reset the print server to the factory default by the insertion of the reset pin into the hole.

Ventilation Slot
Lets trapped heat pass out of the printer.

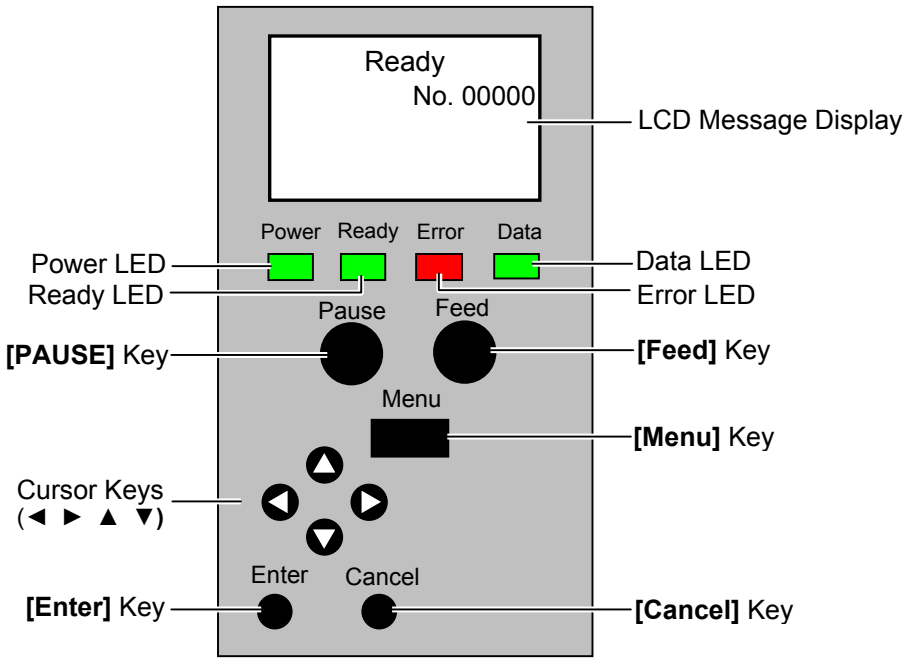
Fanfold Paper Slot
Allows fanfold paper to feed into the printer from the printer back.

Expansion I/O Interface Connector
Used to interface with an external equipment (Refer to Section 4.)

AC Power Inlet

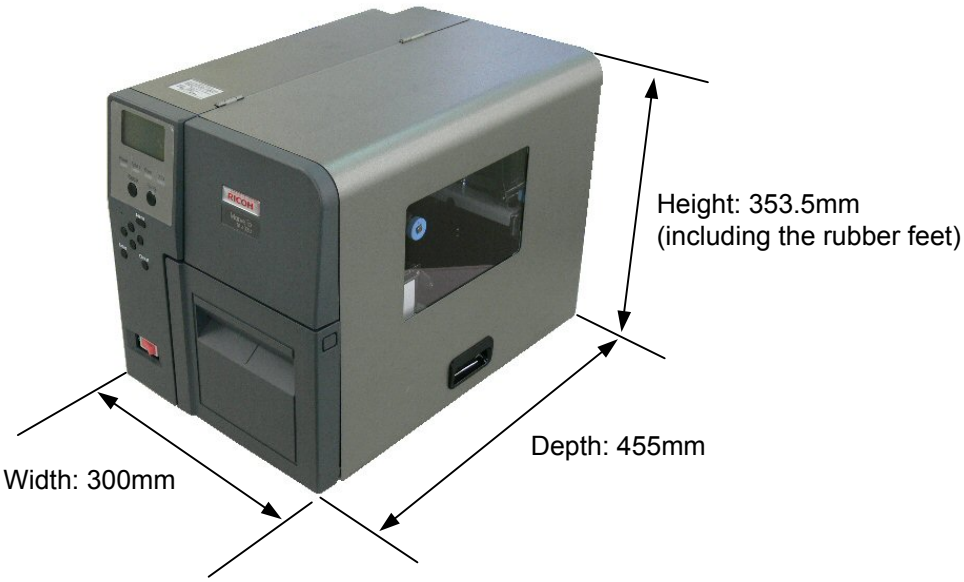
1.4 OPERATION PANEL

The Operation Panel is equipped with the LCD Message Display, which is used to indicate the state of the printer, 4 LED's, and 9 keys. Please see the table below for details.



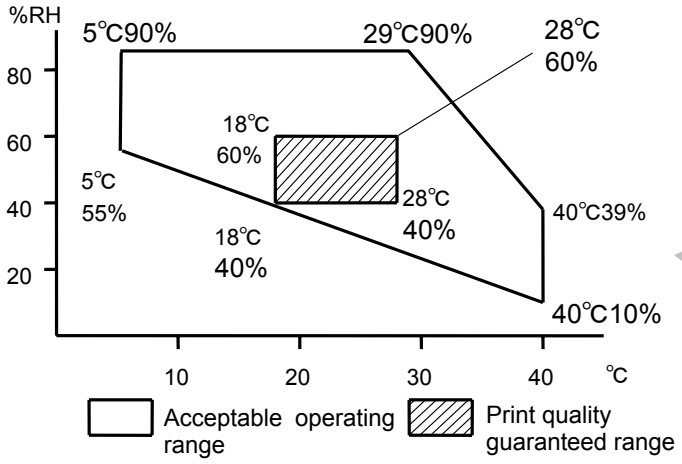
Name	Functions (Purposes)
LCD Message Display	Shows the menu or error information.
Power LED	Illuminates in green when the printer is turned on.
Ready LED	Illuminates in green when the printer is ready, and goes out when the printer is in a pause state or while the menu is being displayed.
Error LED	Illuminates in red when an error occurs, and flashes in red in the event of a warning.
Data LED	Flashes in green when data is received, and illuminates in green when data is in the receive buffer.
[Pause] key	Used to place the printer in a pause or ready state.
[Feed] key	Used to feed the media for a single page or label length.
[Menu] key	Used to display the menu when the printer is in a ready or pause state. When held down, the [Menu] key will be locked, and when held down again, it will be unlocked.
◄key	Used to choose an item on the left while the menu is being displayed.
►key	Used to choose an item on the right while the menu is being displayed.
▲key	Used to choose an item above while the menu is being displayed.
▼key	Used to choose an item below while the menu is being displayed. When the model with the Cutter Unit is used, holding down this key in a ready or pause state causes the media to be cut.
[Enter] key	Used to determine the settings while the menu is being displayed.
[Cancel] key	Used to clear an error when it occurs. When held down, print data is cleared.

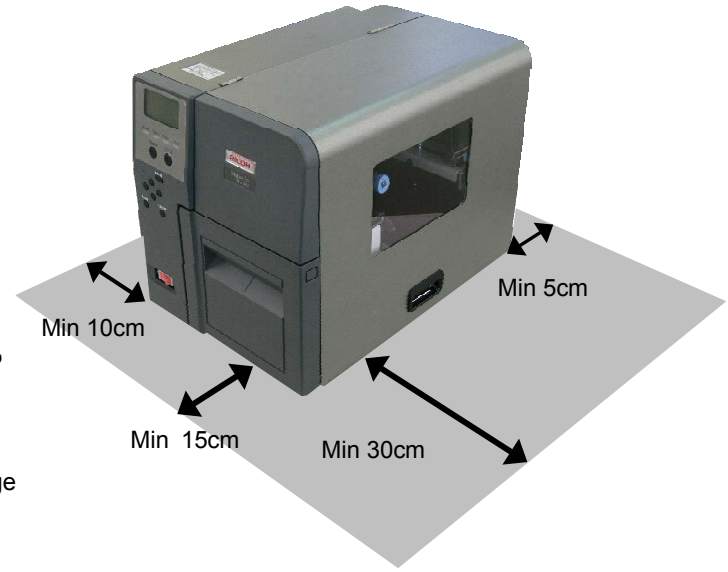
1.5 DIMENSIONS (APPROXIMATE)



1.6 OPERATING ENVIRONMENT

Install the printer in a place where ample space is reserved for the operation. Also, place the printer on a well ventilated, smooth, level desk or rack specifically designed for the printer. Make sure that the 4 feet of the printer make full contact with the surface of the desk or rack.
Be sure that there is sufficient space around the printer, as illustrated below.





1.7 BASIC SPECIFICATIONS

(1) Printing method: Thermal direct printing or thermal transfer printing

(2) Resolutions (dot density): 600 dpi (23.6 dots/mm)

(3) Print speed: Max. 150 mm/second (6ips)
There are limitations on a print speed depending on the media or ribbon type and an image to print.
Note: *Print speed is selectable from 1 ips to 6 ips by the printer driver.*

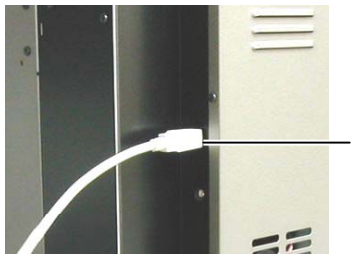
(4) Media alignment: Center

(5) Max. effective print width: 104 mm (Approximate 4")

(6) Max. print length: 1,000 mm

(7) Available media width: 15 to 120 mm

(8) Host interface: USB model: B-SX600-HS11/HH11/HC11-QM-R
- USB 2.0 High Speed



LAN model: B-SX600-HS12/HH12/HC12-QM-R
- 10BASE-T / 100BASE-TX (IEEE802.3)
- Print Protocol: LPR, PORT9100 (unidirectional), PORT9100 (bi-directional)
- LPR queue name: lp
- Control protocol: HTTP

(9) Operating system: Windows 2000, Windows XP, Windows Server 2003, Windows Vista

(10) Weight: 20.6 kg (USB model: B-SX600-HS11/HH11/HC11-QM-R)
21.0 kg (LAN model: B-SX600-HS12/HH12/HC12-QM-R)

(11) Rating: Input Voltage: 100 VAC to 240 VAC
Frequency: 50/60 Hz (48 to 62 Hz)
Power consumption: 250 W or less under normal operation
20W or less under low power mode operation

(12) Noise:	75 dB or less
(13) Operating temperature range:	5 to 40 °C (Print quality guaranteed at temperatures between 18 and 28 °C)
(14) Relative humidity:	10 to 90% (Print quality guaranteed at humidity between 40 and 60%)
(15) Storage temperature range:	-20 to 70 °C
(16) Storage humidity range:	5 to 90%
(17) Safety and EMC Standard:	CE, TÜV GS, C-Tick, UL, CUL, FCC, ICE, CCC
(18) Environmental standard:	RoHS Directive compliant

1.8 CUTTER UNIT SPECIFICATIONS (B-SX600-HC11/HC12-QM-R MODEL)

(1) Acceptable media thickness:	0.08 mm to 0.26 mm
(2) Acceptable label pitch:	10 mm to 1,000 mm
(3) Cut mode:	Continuous cut
	Cut after printing
	Batch cut
(4) Restrictions:	Cutting self-adhesive labels is not allowed.
	Cutting within 1 mm around perforation is not allowed.
	Cutting fabrics or films is not allowed.

Note: *The cutter unit is a factory option.*

1.9 STRIP UNIT SPECIFICATIONS (B-SX600-HH11/HH12-QM-R MODEL)

(1) Effective print speed:	101.6 mm/second or less (same as a feed speed)
(2) Peeling method:	Tensioning
(3) Peeling detection system:	A reflective photo sensor is used to detect a label.
(4) Restrictions:	Peel-off operation is not allowed when:
	Perforated labels are used
	Fanfold labels are used.
	Fabrics or films are used
	Outside wound labels are used
	Labels other than rectangular die-cut labels are used.

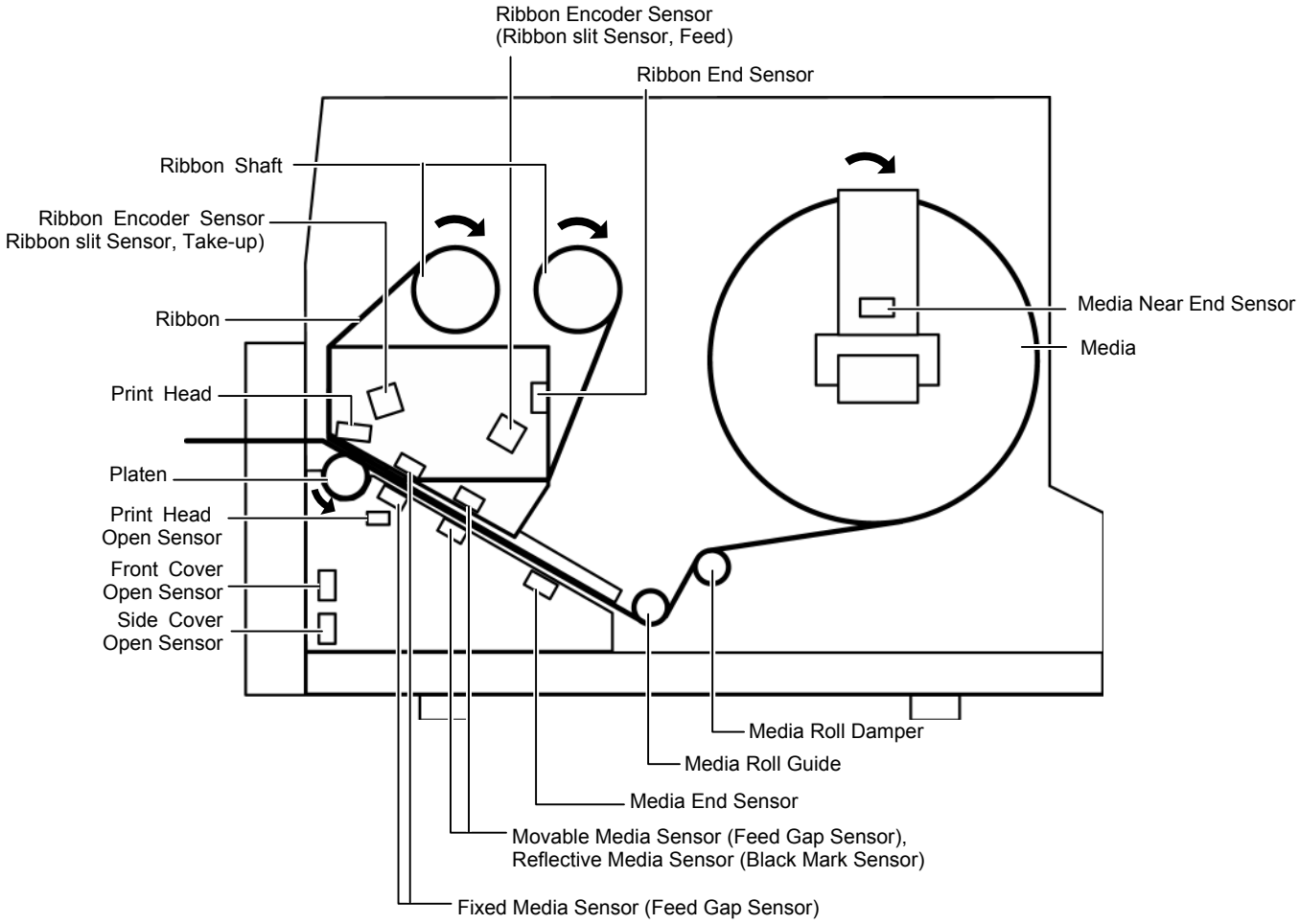
Note: *The strip unit is a factory option.*

1.10 MECHANICAL BLOCK

1.10.1 Mechanism

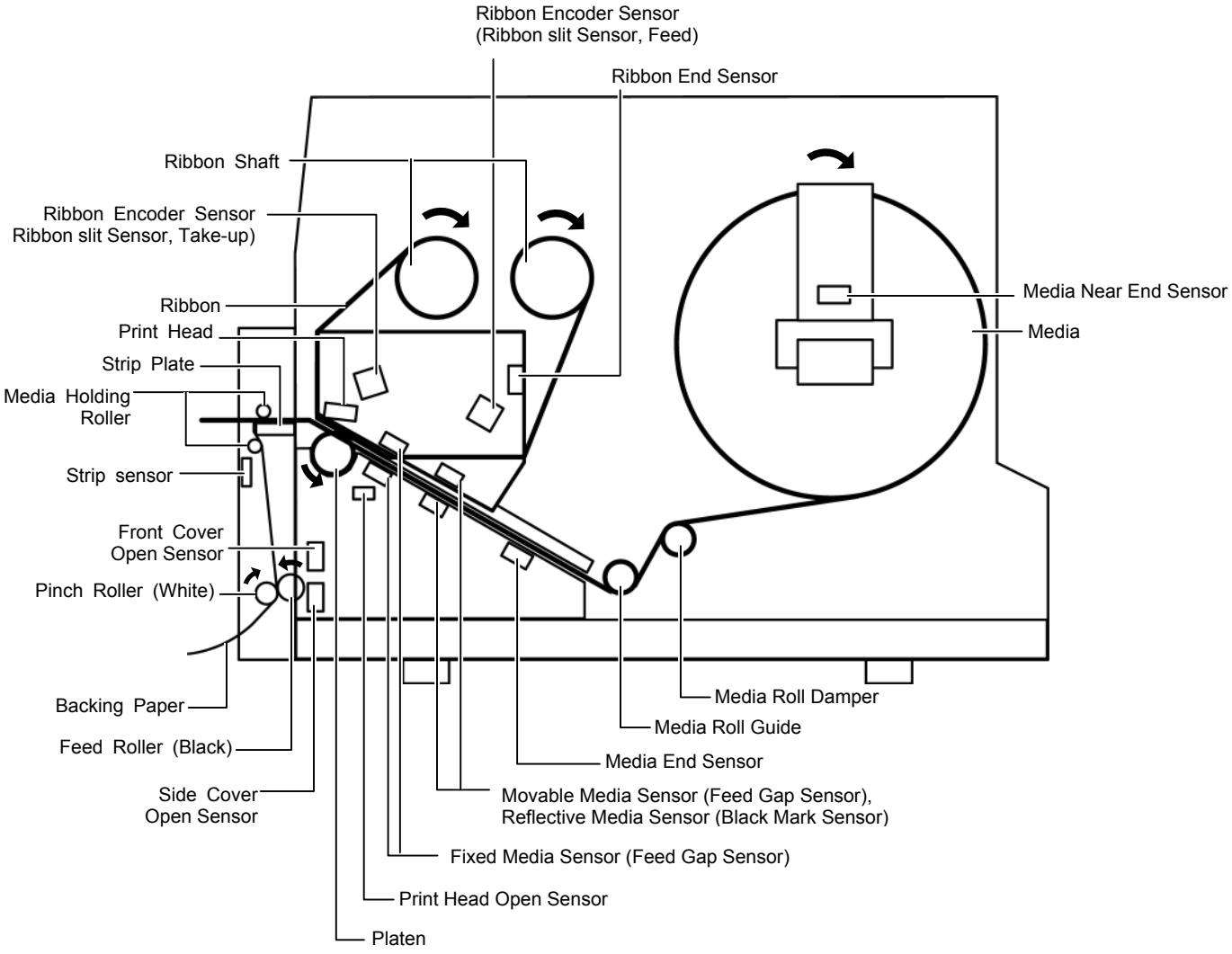
(1) Batch Mechanism (HS11/HS12 model)

This is the standard mechanism which lets the printer print continuously until the number of media specified in the label issue command has been printed.



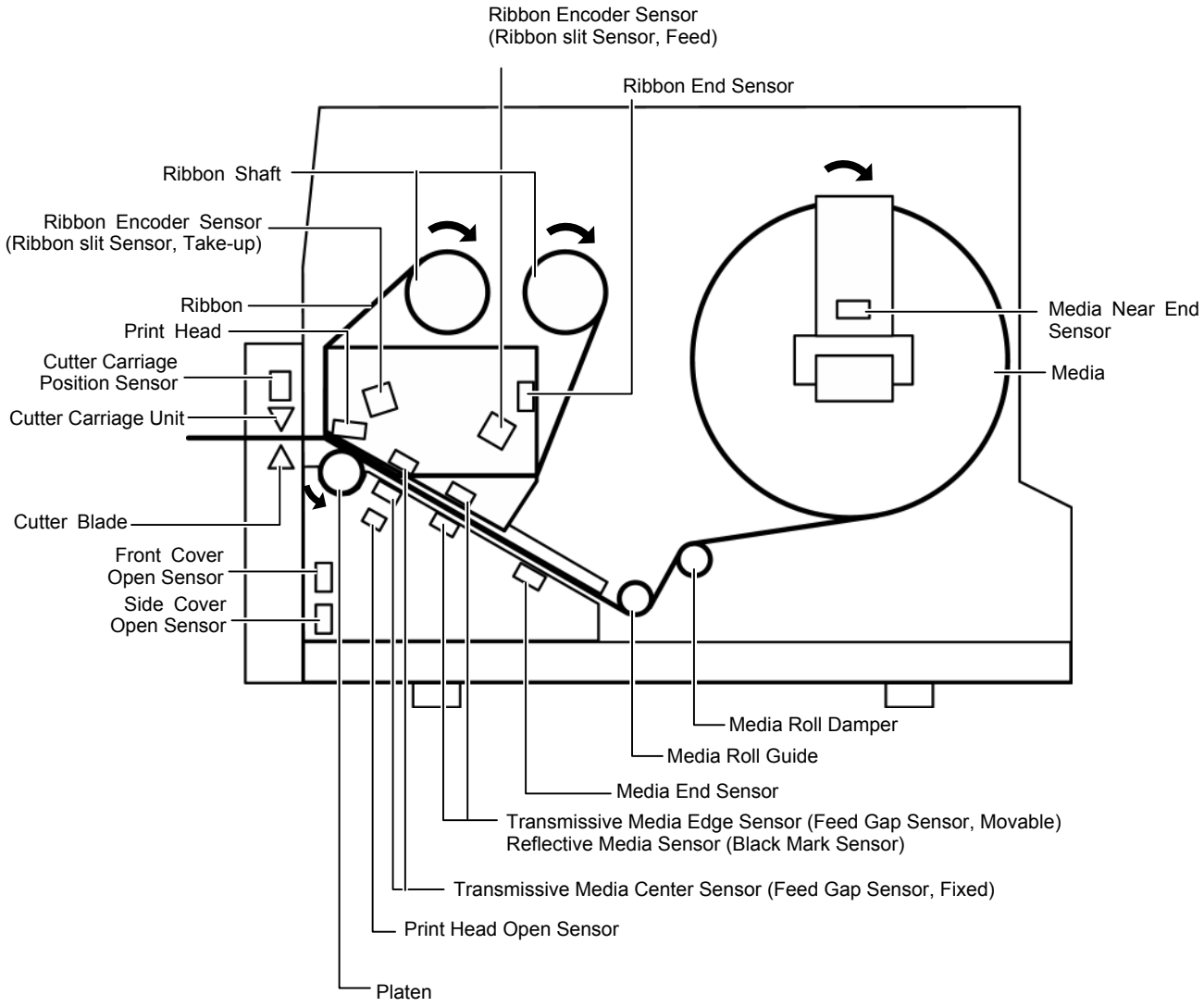
(2) Strip Mechanism (HH11/HH12 model)

When an factory optional strip module is attached, a label is stripped from the backing paper by the strip shaft, and the backing paper is drawn into the strip module. The nextlabel will not be printed until the preceding label is removed, as a presence of the label at the strip shaft is monitored by the strip sensor.



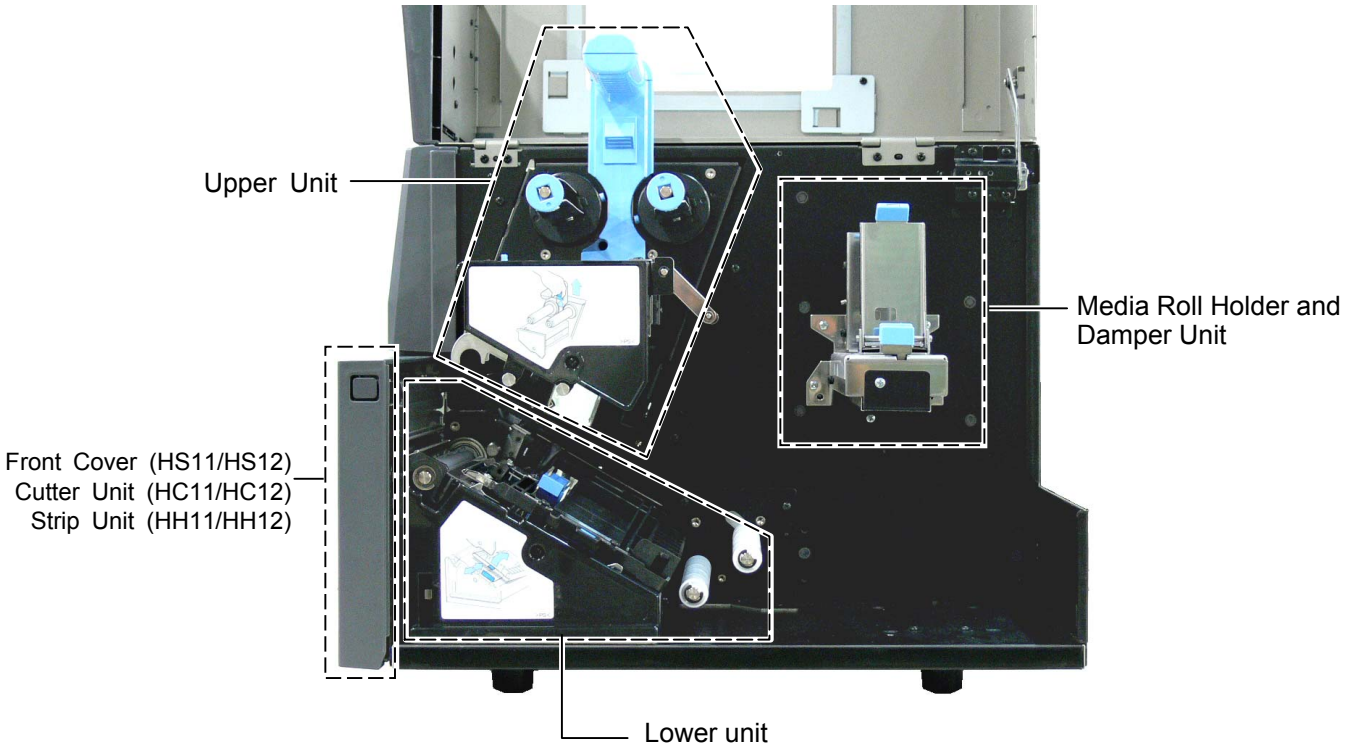
3) Cutter Mechanism (HC11/HC12 model)

When an factory optional Cutter module is attached, printed media is fed to the cutter unit and cut off from the media roll.



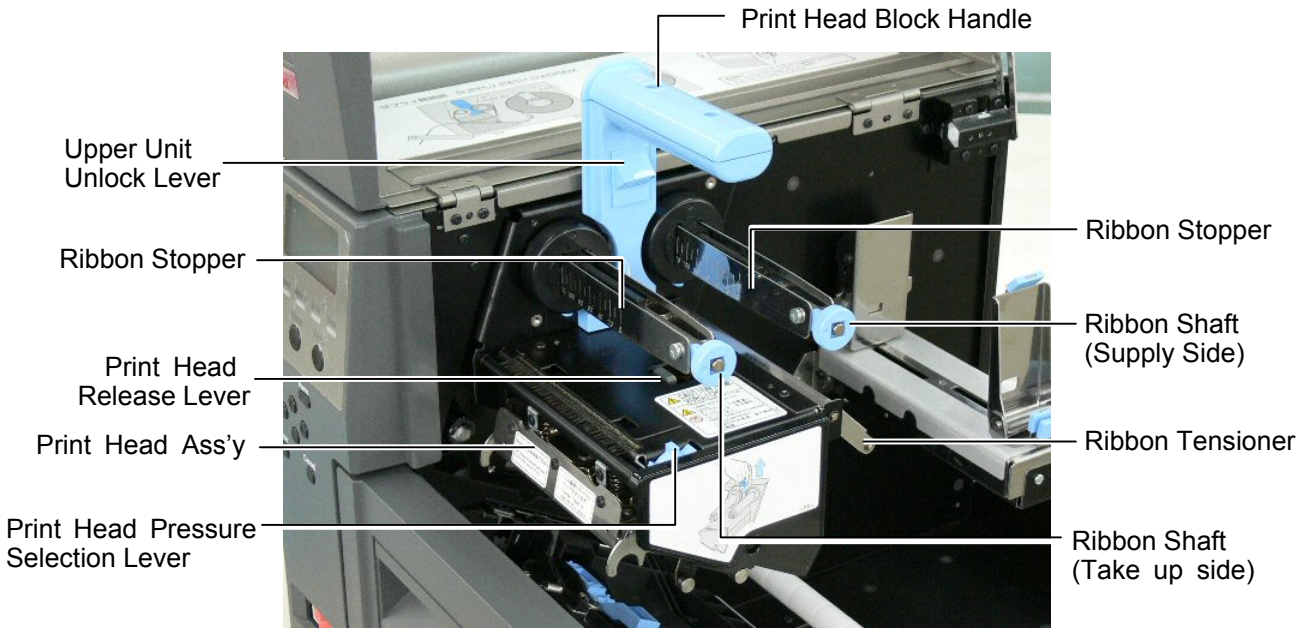
1.10.2 Outline of the Mechanical Block

The main Mechanical Blocks are as follows.



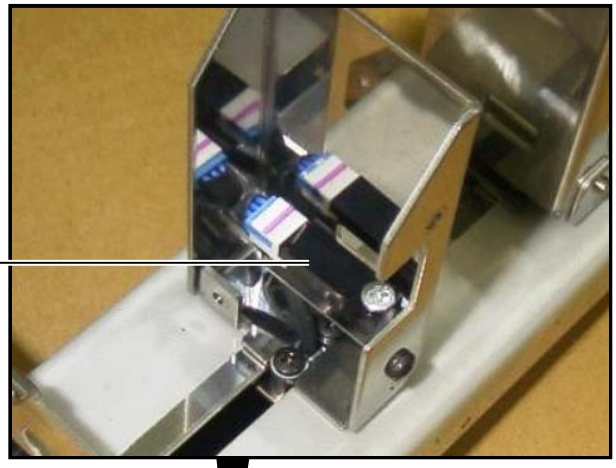
1.10.3 Print Head Block

The main parts of the Print Head Block are as follows.

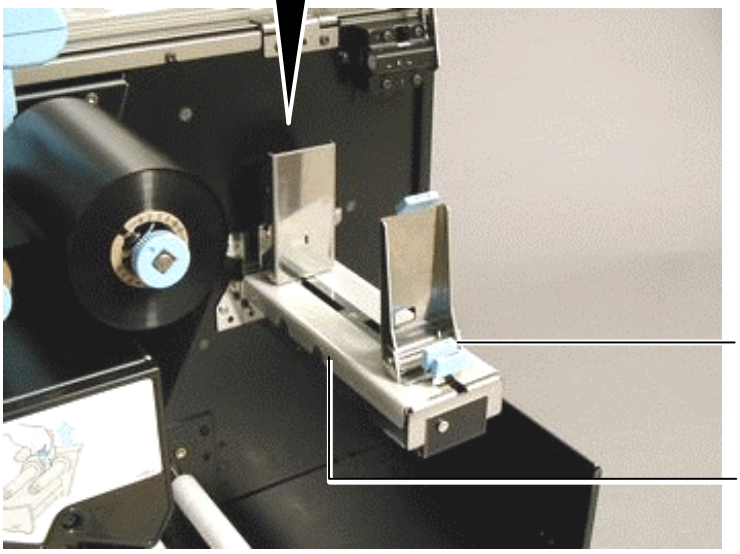


1.10.4 Media Roll Holder

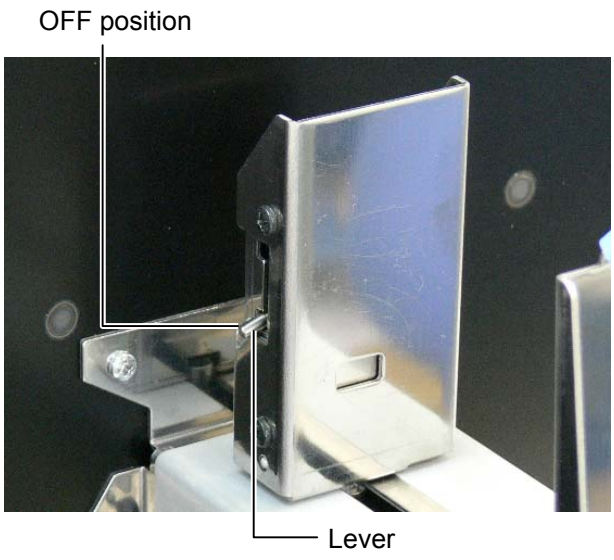
The main parts of the Media Holder Block are as follows.

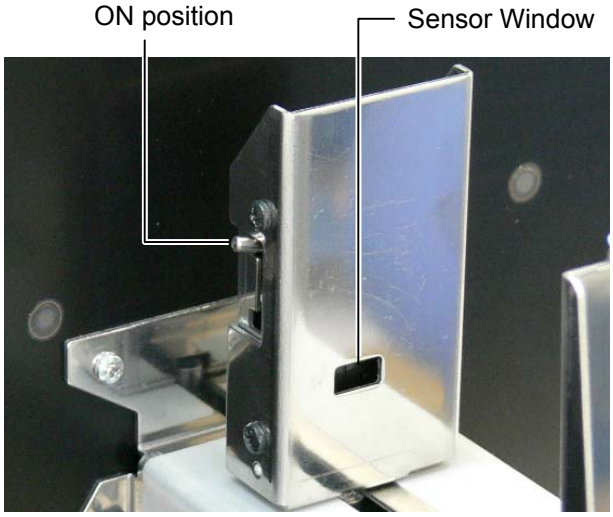


Media Near End Sensor
By adopting a reflective sensor, this sensor detects a media near end state when the media is reduced under the sensor window.



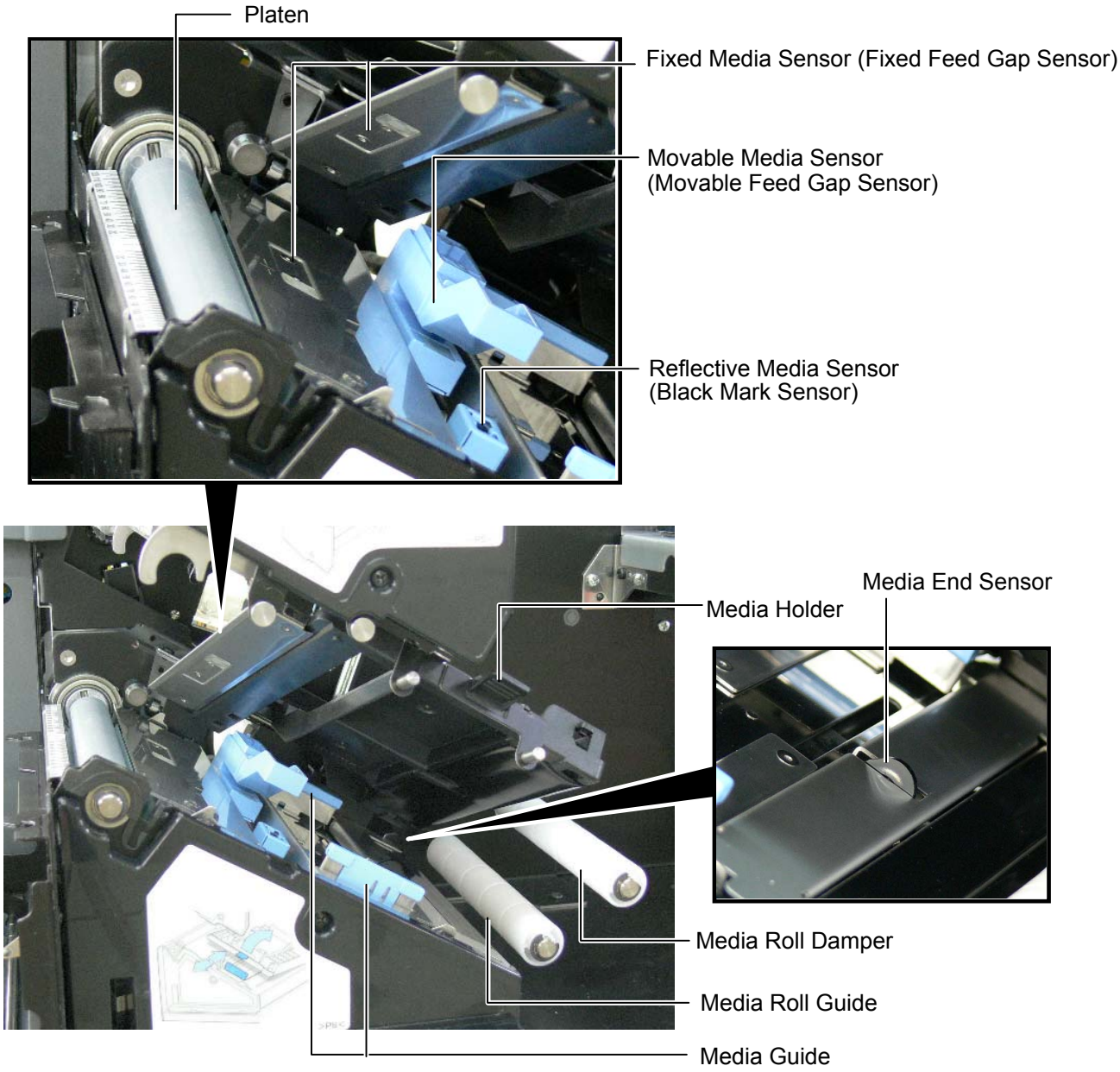
Note: *The on or off status of the media near end sensor can be switched with the Lever. Move the lever into OFF position for using the fanfold paper. If it remains in ON position, a media near end error is detected, causing that no print operation is performed.*





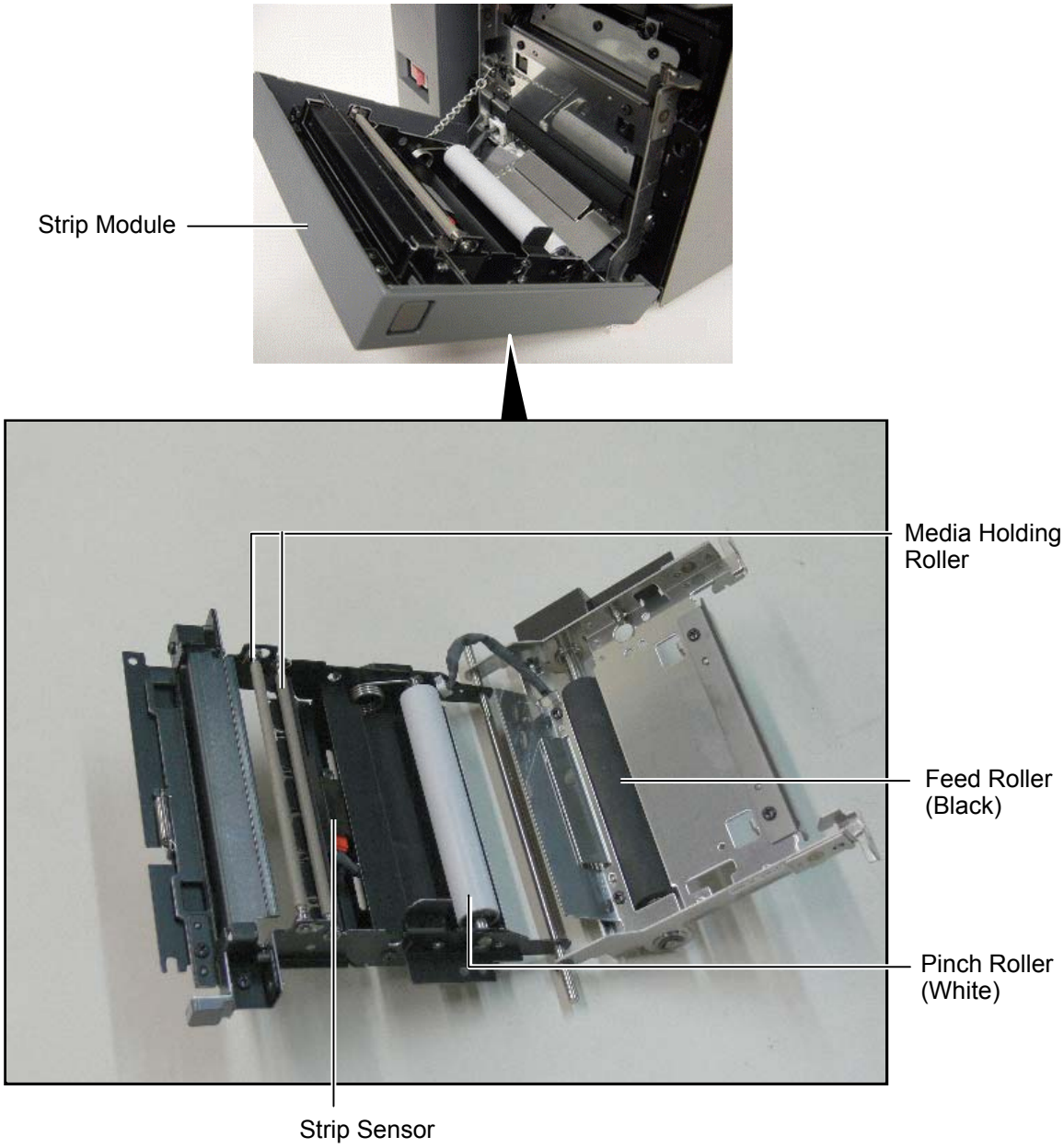
1.10.5 Lower Unit

The main parts of the Lower Unit are as follows.



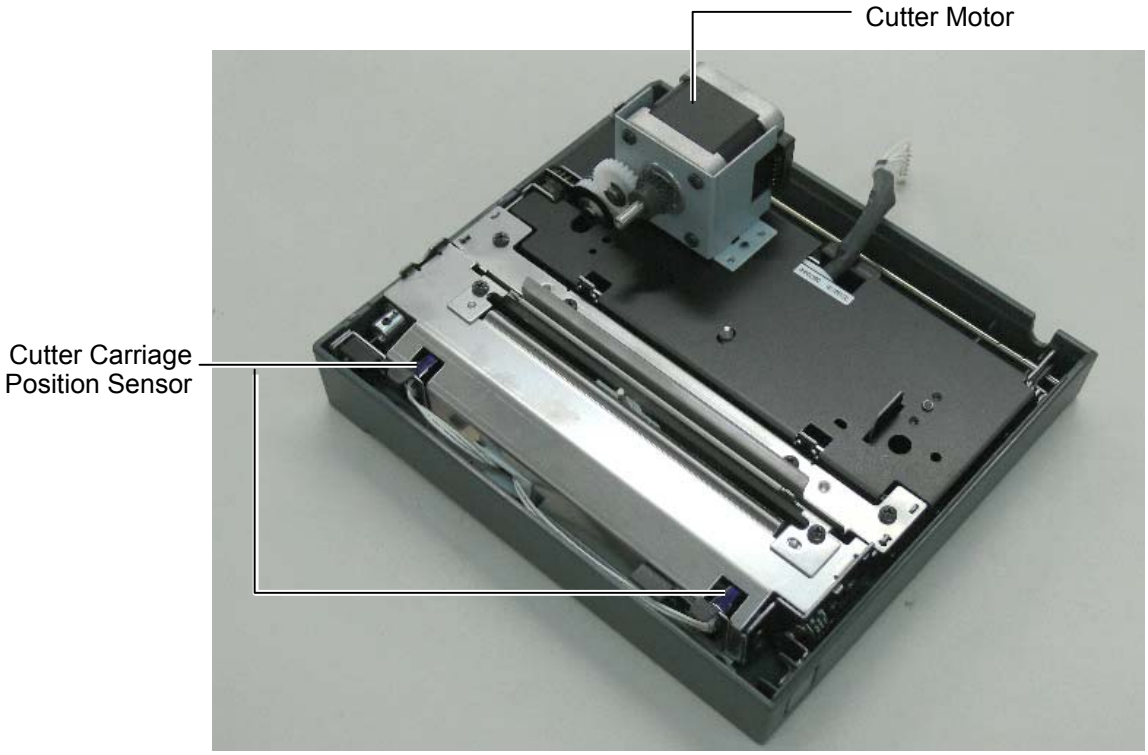
1.10.6 Strip Unit

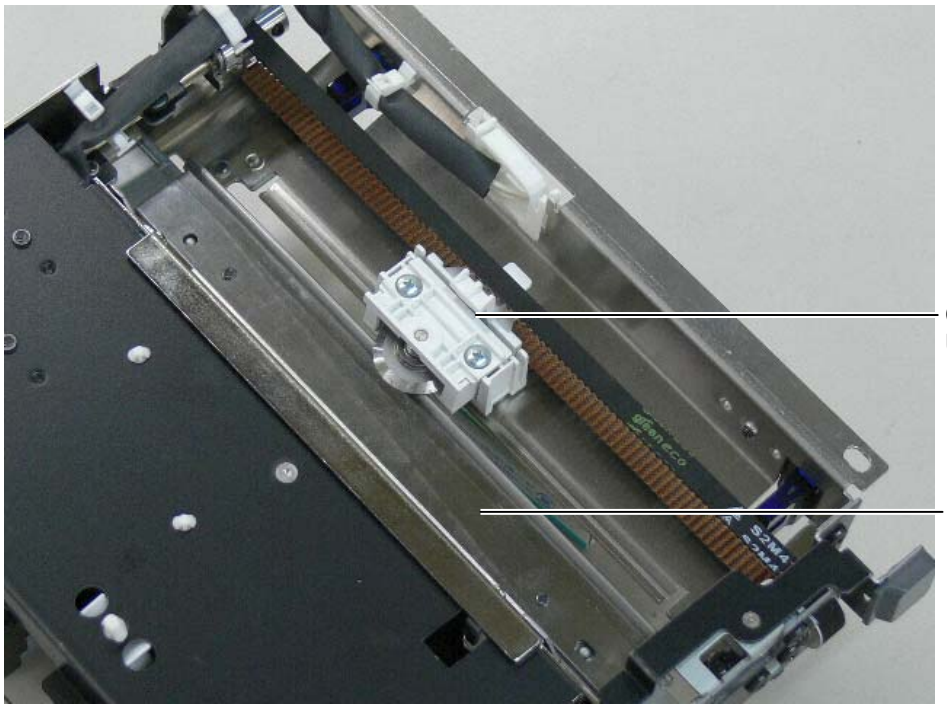
The main parts of the Strip Module are as follows.



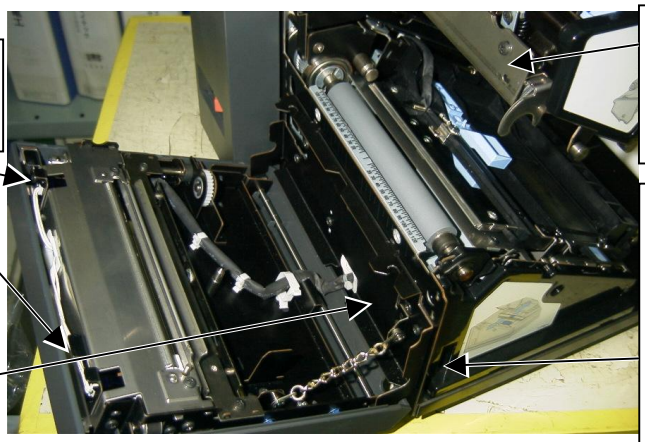
1.10.7 Cutter Unit

The main parts of the Cutter Unit are as follows.





1.10.8 Position of various sensors



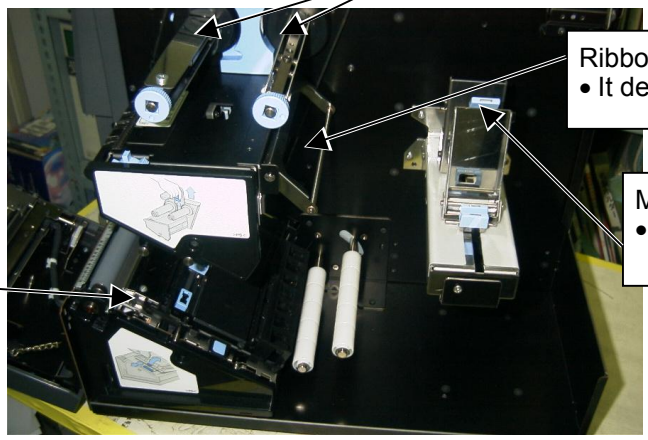
Cutter Carriage Position Sensor
- It detects the position of the cutter.

Print Head Thermistor
- It measures the temperature of the print head.

Side Cover Open Sensor
(1) Cover open
It detects the open or close status of the side cover.
(2) Interlock function
It performs as a safety interlock switch.

Front Cover Open Sensor
(1) Cover open
It detects the open or close status of the front cover.
(2) Interlock function
It performs as a safety interlock switch.

Ribbon Encoder Sensor
- It monitors the rotation of the ribbon shaft.
- It detects the tear of the ribbon.

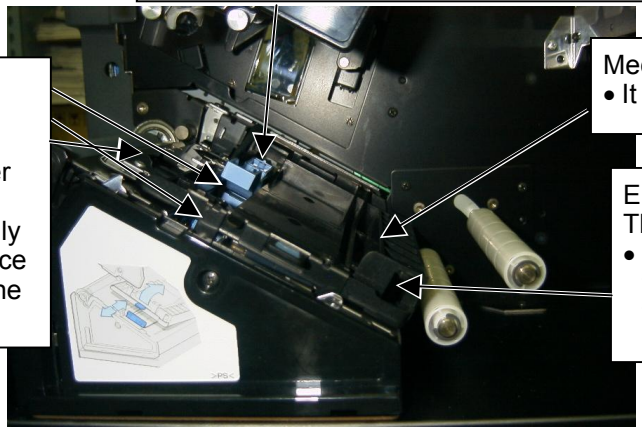


Ribbon End Sensor
- It detects a ribbon end.

Media Near End Sensor
- It detects the remaining number of media.

Print Head Open Sensor
- It detects the open or close status of the print head by working with the home position sensor.

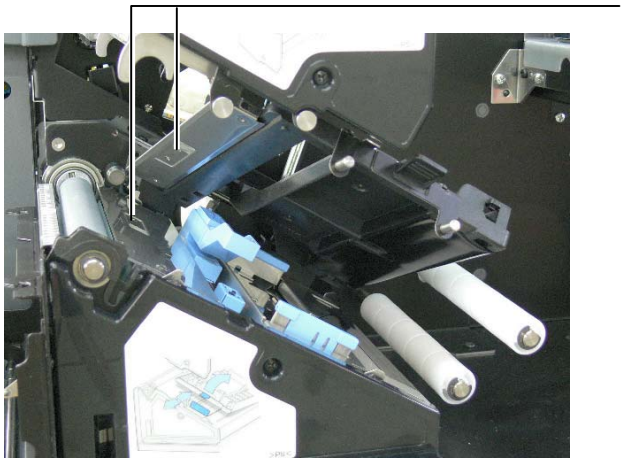
Home Position Sensor (Print Head Open Sensor)
- It detects the open or close status of the print head by working with the print head open sensor.



(1) Transmissive Media Edge Sensor Sensor
(2) Reflective Media Sensor
(3) Transmissive Media Center Sensor
- The above sensors optically measure potential difference of the media to measure the media length.

Media End Sensor
- It detects a media end.

Environmental Temperature Thermistor
- It measures the operating temperature of the printer to adjust print energy.



Fixed Media Sensor (Fixed Feed Gap Sensor)
This sensor detects the tag paper in which center a round hole (3 mm in diameter) is provided.

Note:

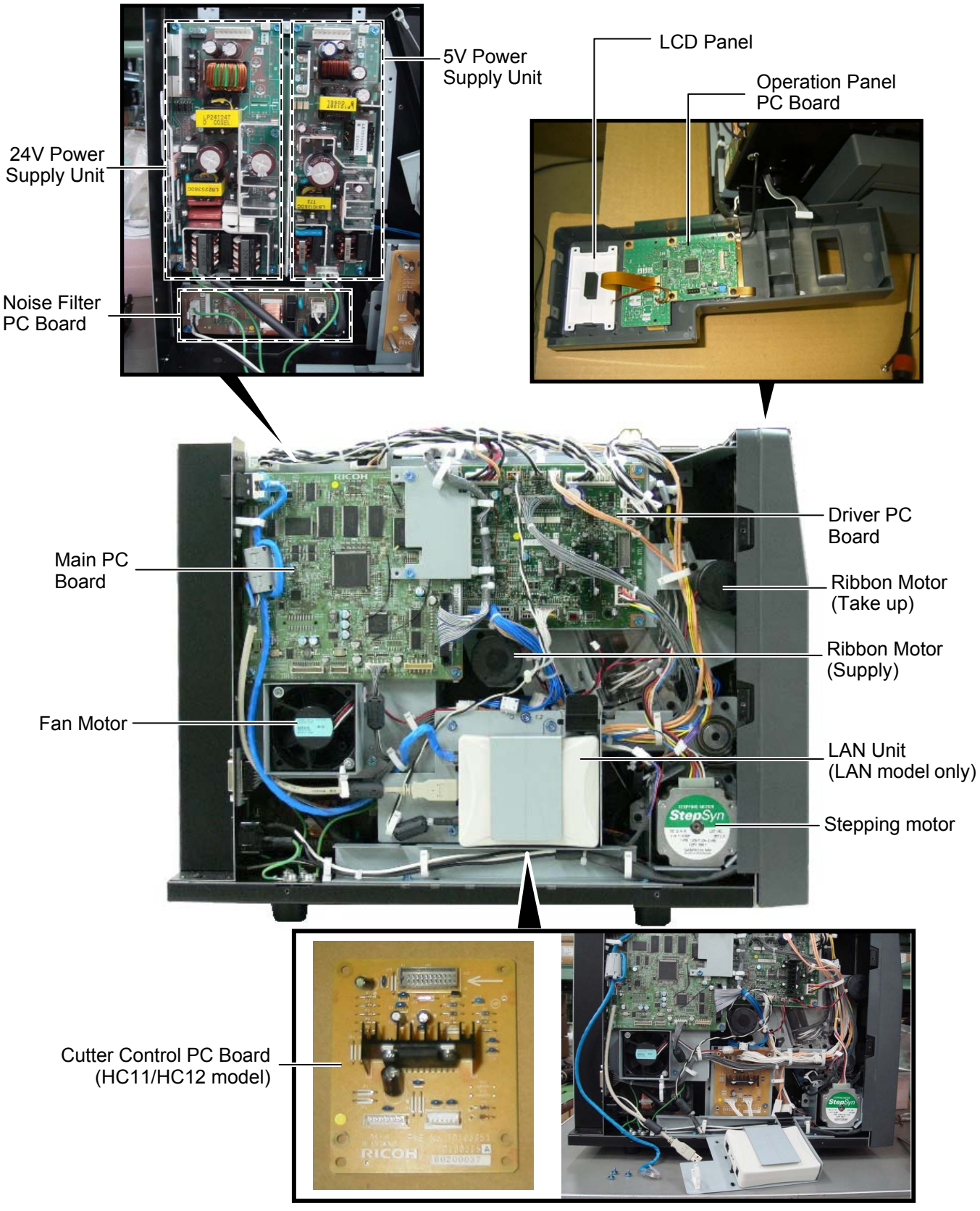
The sensor is selectable from Movable Media Sensor, Reflective Media Sensor, and Fixed Media Sensor by the printer driver.

Refer to Owner's Manual or Printer Driver Users Manual.

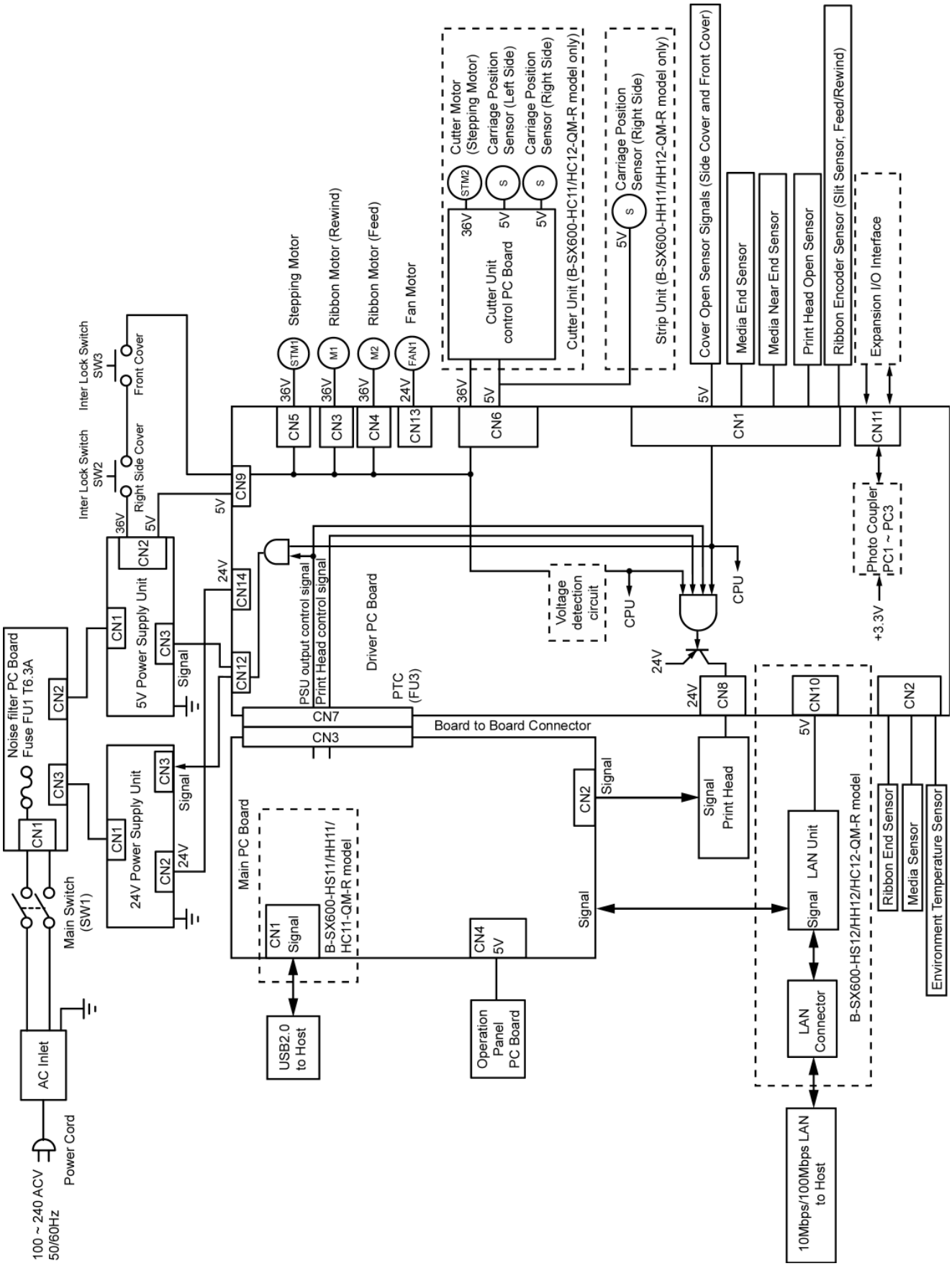
2. ELECTRONIC SPECIFICATION

2.1 ELECTRONIC BLOCK

The main parts of the Electronic Block are as follows.

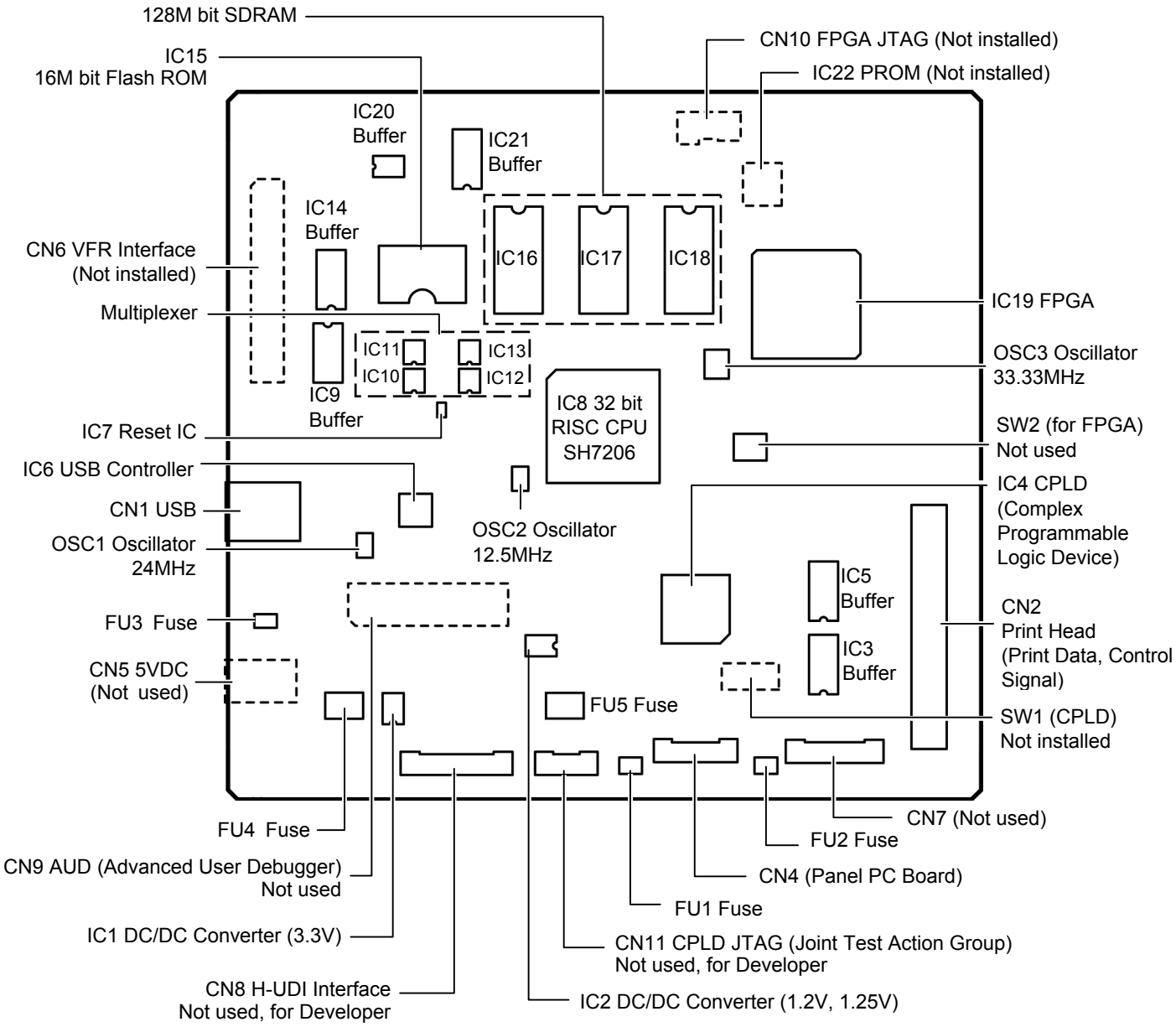


2.2 BLOCK DIAGRAM

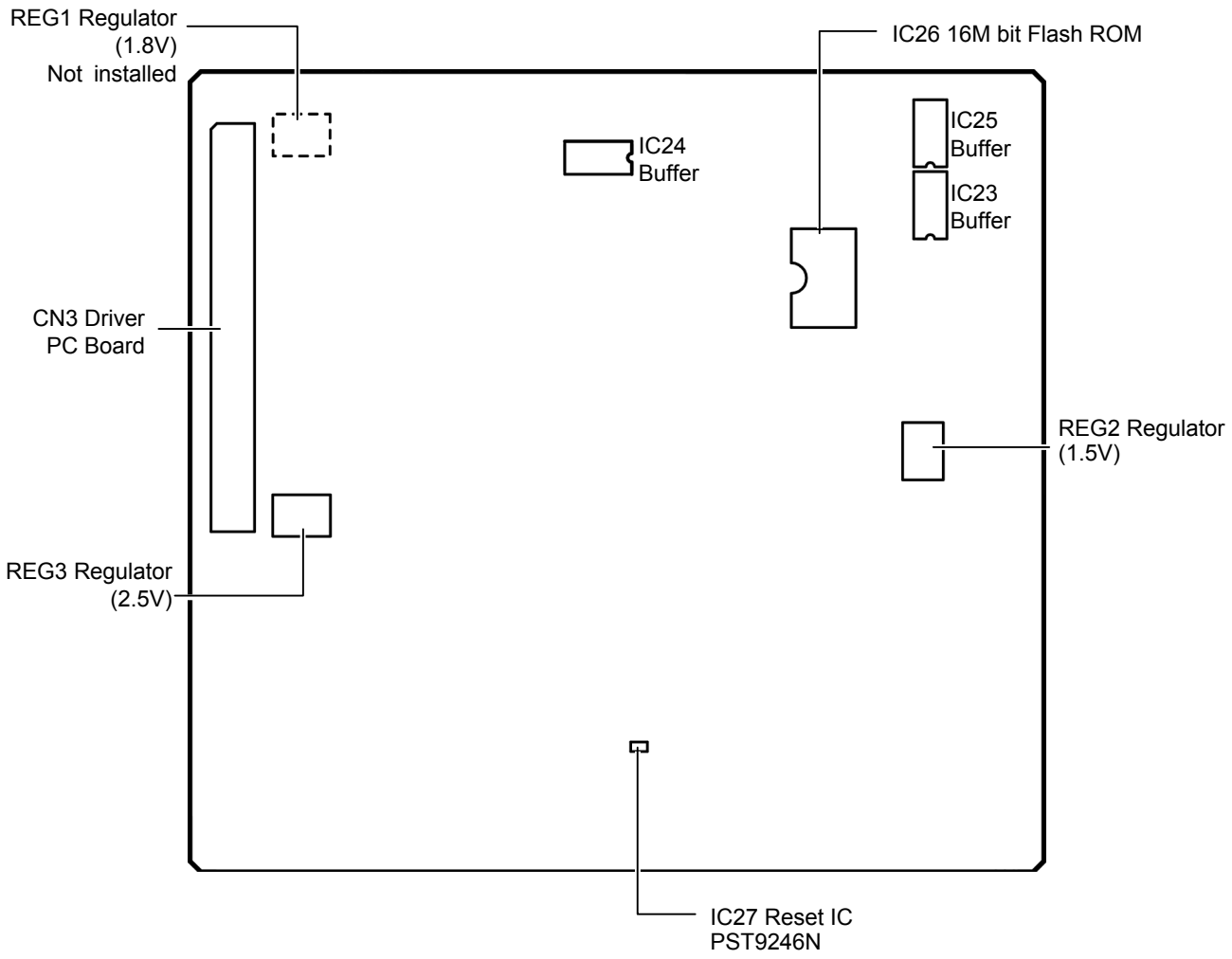


2.3 DESCRIPTION OF THE MAIN PC BOARD

2.3.1 Parts Side Layout



2.3.2 Solder Side Layout



2.3.3 Outline of the ICs and Connectors

The Main PC board functions as a central part of the printer and controls the operation of print head.
This PC board is comprised of the following major components:
Main Electronic parts

CPU (IC8):

32bit RISC CPU
Type: SH7206
Clock: Max. 200MHz
This IC is a central part of the electric system, which performs the following processing.
Controlling the data bus and address bus
Controlling the serial interface
Controlling the interruption
Performing as the A/D converter
Performing as the D/A converter

Flash ROM (IC15, 26):

32Mbit Flash ROM
Type: S29AL016D70
Various setting values of firmware program, sensor setting, etc. are written into this memory.

SDRAM (IC16, 17, 18):

128Mbit SDRAM
Type: EDS1216AATA-75-E
This memory is used for drawing the print data.
It is not possible to store writable characters, etc. into the printer which does not support TEC Printer Command Language.

FPGA (IC19):

Type: XC3S1500
This IC is a Field Programmable Gate Array (FPGA), which performs controlling the devices such as cutter, print head, ribbon motor, and sensors.

CPLD (IC4):

Type: EPM3128ATC100
This IC is a Complex Programmable Logic Device (CPLD).

USB Controller (IC6)

Type: M66592WG
This IC is used for controlling the USB interface.

DC/DC Converter (IC1, 2):

Type: TPS54380PWPG4
These ICs are DC/DC converters. From +5V, IC1 generates +3.3V and IC2 generates +1.25V and +1.2V, respectively.
+3.3V is used as the operating voltage for logic devices such as CPU.
+1.25V is used as the supply voltage for the CPU.
+1.2V is used as the operating voltage for the FPGA (IC19).

Regulator (REG2, 3):

Type: PQ070XH02ZPH
They are regulator ICs.
From +3.3V, REG2 generates +1.5V and REG3 generates +2.5V, respectively.
+1.5V is used for the USB controller (IC6).
+2.5V is used as the operating voltage for the FPGA (IC19).

Connectors

CN1

Signal	I/O	Pin No.
USB_GND	---	1
D+	I/O	2
D-	I/O	3
VBUS	---	4

This is a USB interface connector.
The model with a USB interface is connected to a PC via the connector.
The model with a LAN interface, not provided with the connector, is connected to the printer server via the cable directly installed into the PC board.

CN4

Signal	I/O	Pin No.
PANEL_VDD_O	O	1
PANEL_RESERVE2	I	2
PANEL_BUZZER	O	3
PANEL_RESERVE1	O	4
PANEL_SDI	I	5
PANEL_SDO	O	6
PANEL_LCD_CS_N	O	7
PANEL_LCD_A0	O	8
PANEL_SCLK	O	9
GND	---	10

This connector is connected to the panel PC board.
The signals output from the connector are used for controlling the LCD display, buzzer, and so on.

CN2

Signal	I/O	Pin No.
HEAD_TEMP	I	1
GND	---	2
HEAD_TRS5	I	3
HEAD_TRS6	I	4
HEAD_TRS3	I	5
HEAD_TRS4	I	6
HEAD_TRS1	I	7
HEAD_TRS2	I	8
HEAD_DATA13	O	9
GND	---	10
HEAD_DATA12	O	11
GND	---	12
HEAD_DATA11	O	13
GND	---	14
HEAD_DATA10	O	15
GND	---	16
HEAD_DATA9	O	17
GND	---	18
HEAD_DATA8	O	19
GND	---	20
HEAD_DATA7	O	21
GND	---	22
HEAD_DATA6	O	23
GND	---	24
HEAD_DATA5	O	25
GND	---	26
HEAD_DATA4	O	27
GND	---	28
HEAD_DATA3	O	29
GND	---	30
HEAD_DATA2	O	31
GND	---	32
HEAD_DATA1	O	33
GND	---	34
HEAD_STROBE2_N	O	35
GND	---	36
HEAD_STROBE1_N	O	37
GND	---	38
HEAD_CLOCK	O	39
GND	---	40
HEAD_LATCH_N	O	41
GND	---	42
HEAD_B_E_O	O	43
GND	---	44
+5V	O	45
GND	---	46
+5V	O	47
GND	---	48
+5V	O	49
GND	---	50

This connector is connected to the print head.
+5V, print data (HEAD DATA1 to HEAD DATA13), and the strobe, clock, and latch signals which control the print head are output from the connector.
Also, the thermistor signal (HEAD TEMP) which is used for detecting the internal temperature of the print head and the print head element resistance rank detect signal (HEAD TRS1 to HEAD TRS6) are input into the connector.

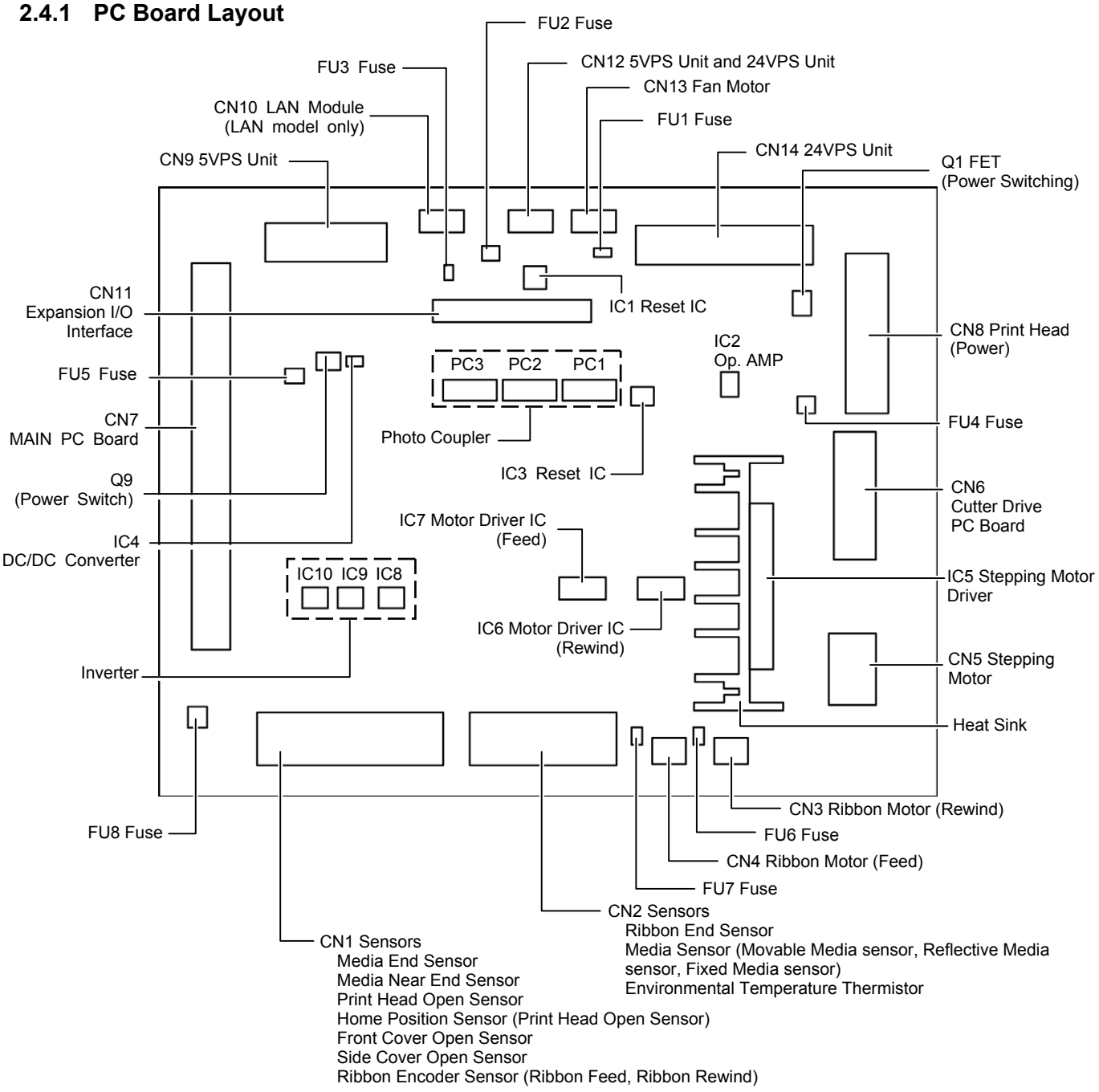
CN3

Signal	I/O	Pin No.	Signal	I/O	Pin No.
GND	---	1	GND	---	51
GND	---	2	GND	---	52
GND	---	3	GND	---	53
GND	---	4	GND	---	54
+5V	I	5	+5V	I	55
+5V	I	6	+5V	I	56
+5V	I	7	+5V	I	57
+5V	I	8	+5V	I	58
+5V	I	9	+5V	I	59
+5V	I	10	+5V	I	60
CO_VM_MONITOR	I	11	CO_FAN_REVOLUTION	I	61
CO_VTH_MONITOR	I	12	CO_N_DISCHARGE	O	62
CO_N_PSU_REMOTE	O	13	EX_IF_LABEL_END	O	63
EX_IF_ERROR	O	14	EX_IF_CMP_NRMLTY	O	64
EX_IF_CMP_ABNRMLTY	O	15	EX_IF_READY_N_PAUSE	O	65
EX_IF_PRINT_DATA	O	16	EX_IF_RIBBON_END	O	66
EX_IF_RESERVE_OUT	O	17	EX_IF_PAUSE	I	67
EX_IF_BACK_FEED	I	18	EX_IF_RESERVE_IN	I	68
EX_IF_PRINT_START	I	19	CO_N_HEAD_ENABLE	O	69
CO_N_HEAD_CHECK	O	20	CUTE_M_CW_CCW	O	70
CUTE_M_CLOCK	O	21	CUTE_M_MODE_1	O	71
CUTE_M_POWER	O	22	CUTE_M_MODE_3	O	72
CUTE_M_MODE_2	O	23	CO_OPT_SIG1	I	73
CUTE_M_RESET	O	24	CO_OPT_SIG2	I	74
LF_MO_CLOCK	O	25	LF_MO_CW_CCW	O	75
LF_MO_POWER_1	O	26	LF_MO_POWER_2	O	76
LF_MO_MODE_1	O	27	LF_MO_MODE_2	O	77
LF_MO_MODE_3	O	28	LF_MO_RESET	O	78
RB_M_WAND_UP_ENABLE	O	29	RB_M_DELIVER_ENABLE	O	79
RB_M_WAND_UP_MODE	O	30	RB_M_DELIVER MODE	O	80
RB_M_WAND_UP_PAHSE	O	31	RB_M_DELIVER_PAHSE	O	81
RB_M_WAND_UP_PFD_1	O	32	RB_M_DELIVER_PFD_1	O	82
RB_M_WAND_UP_PFD_2	O	33	RB_M_DELIVER_PFD_2	O	83
GND	---	34	GND	---	84
GND	---	35	GND	---	85
RB_M_WND_UP_REF	O	36	RB_M_DELIVER_REF	O	86
SEN_CENTER_HOLE	I	37	SEN_HEAD_RESISTOR	I	87
SEN_INTERRUPTER	I	38	SEN_REFLECTIVE	I	88
SEN_THERMISTOR	I	39	SEN_RBN_END	I	89
GND	---	40	GND	---	90
GND	---	41	GND	---	91
SEN_CUT_HP_LEFT_PEL	I	42	SEN_CUT_HP_RIGHT	I	92
SEN_PAPER_NEAR_END	I	43	SEN_SIDE_COVER_OPEN	I	93
SEN_HEAD_LATCH_OPEN	I	44	SEN_HEAD_OPEN	I	94
SEN_PAPER_END	I	45	SEN_FRONT_COVER_OPN	I	95
SEN_RBN_WAND_UP_ENC	I	46	SEN_RBN_DELIVER_ENC	I	96
SEN_RBN_PINCH	I	47	LEDS_PULSE_INT	O	97
LEDS_PULSE_CENTER	O	48	LEDS_PULSE_REF	O	98
RESERVE_IN_1	I	49	POWER_ON_IN	I	99
RESERVE_OUT_1	O	50	POWER_ON_OUT	O	100

This connector, which is connected to the driver PC board, performs the input/output of the control signals for the motor, sensors, and so on.
Also, +5V, the operating voltage for each logic device, is supplied from the connector.

2.4 DESCRIPTION OF THE DRIVER PC BOARD

2.4.1 PC Board Layout



In addition, the following PC boards are used in the printer.

24V Power Supply PC Board:	Generate +24VDC
5V Power Supply PC Board:	Generate +5VDC
Cutter Control PC Board:	Control of the cutter
Operation Panel PC Board:	Control of the operation panel.
Noise Filter PC Board:	Reduce a noise of the power supply.

2.4.2 Outline of the ICs and Connectors

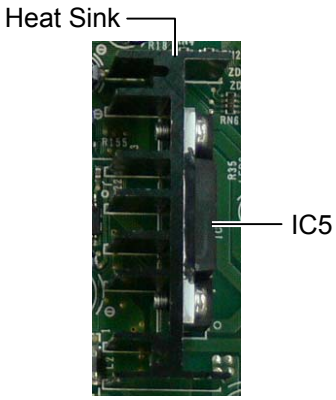
The Driver PC board controls devices such as stepping motor and DC motor, detects the sensor status, and generates a voltage to work devices such as print head and motors.

Motor Driver IC (IC6, 7):

Type: A3959SLP

These ICs generate the operating voltage for the ribbon motor.
IC6 generates the RIBBON_WAND_OUT_A and RIBBON_WAND_OUT_B signals from +36V and the RBN_M_WAND_UP_PFD_1 and RBN_M_WAND_UP_PFD_2 signals output from the CPU PC board, and then it outputs these signals to the ribbon motor (rewind).
IC7 generates the RIBBON_DELIVER_OUT_A and RIBBON_DELIVER_OUT_B signals from +36V and the RBN_M_DELIVER_UP_PFD_1 and RBN_M_DELIVER_UP_PFD_2 signals output from the CPU PC board, and then it outputs these signals to the ribbon motor (feed).

Stepping Motor Driver (IC5):



Type: SLA7078MR

This is a driver IC which controls the stepping motor.
It generates the A, B, N_A, and N_B signals from +36V and the LF_M_MODE and LF_M_CLOCK signals output from the CPU PC board, and then it outputs these signals to the stepping motor.

NOTE:

The IC is provided with the heat sink. Never touch the IC which may become hot immediately after the operation. Doing so may burn your fingers or hands.

Photo Coupler (PC1 to PC3):

Type: TLP281-4

These ICs are used as the input/output circuits of each signal for the external I/O interface.

DC/DC Converter (IC4):

Type: R1223N332G

This IC is a DC/DC converter which generates 3.3V from +5V.
3.3V is used as the operating voltage for each circuit, and so on.

CN1

Signal	I/O	Pin No.
GND	---	1
R_PINCH_VDD	O	2
SENS_RBN_OPN	I	3
GND	---	4
D_RENC_VDD	O	5
SENS_D_ENC	I	6
GND	---	7
W_RENC_VDD	O	8
SENS_W_ENC	I	9
GND	---	10
SCVR_OPN_VDD	O	11
SENS_NEAR_E	I	12
GND	---	13
HEAD_UP_VDD	O	14
SENS_HEAD_UP	I	15
GND	---	16
P_NEND_VDD	O	17
SENS_SCVR_OPN	I	18
GND	---	19
P_END_VDD	O	20
SENS_P_END	I	21
GND	---	22
TH_OPEN_VDD	O	23
SENS_TH_OPN	I	24
GND	---	25
FCVR_OPN_VDD	O	26
SENS_FCVR_OPN	I	27
GND	---	28
RSRV_VDD	O	29
SENS_RSRV	I	30

This connector is connected to the sensors as follows. The sensor control and sensor status signals are input into the connector.

- Media End Sensor
- Media Near End Sensor
- Print Head Open Sensor
- Home Position Sensor (Print Head Open Sensor)
- Front Cover Open Sensor
- Side Cover Open Sensor
- Ribbon Encoder Sensor (Ribbon Feed, Ribbon Rewind)

CN2

Signal	I/O	Pin No.
A-GND	---	1
LED_CENT	O	2
A-GND	---	3
CENT_SIG_VDD	O	4
SENS_CENT_SIG	I	5
A-GND	---	6
LED_REF	O	7
SENS_REF_SIG	I	8
A-GND	---	9
A-VDD1	O	10
SENS_THERMISTOR_SIG	I	11
A-GND	---	12
A-GND	---	13
A-VDD2	O	14
SENS_A_RSRV	I	15
A-GND	---	16
LED_INT	O	17
A-GND	---	18
A-GND	---	19
INT_GIG_VDD	O	20
SENS_INT_SIG	I	21
A-GND	---	22
A-VDD3	O	23
SENS_RIBN_END_SIG	I	24

This connector is connected to the sensors as follows. The sensor control and sensor status signals are input into the connector.

- Ribbon End Sensor
- Media Sensor (Transmissive Sensor, Reflective Sensor)
- Transmissive Media Center Sensor
- Environmental Temperature Thermistor

CN3

Signal	I/O	Pin No.
RIBBON_WAND_OUT_A	O	1
RIBBON_WAND_OUT_B	O	2

This connector is connected to the ribbon motor (rewind).
The RIBBON_WAND_OUT_A and RIBBON_WAND_OUT_B signals generated from the motor driver IC (IC6) are output from the connector.

CN4

Signal	I/O	Pin No.
RIBBON_DELIVER_OUT_A	O	1
RIBBON_DELIVER_OUT_B	O	2

This connector is connected to the ribbon motor (feed).
The RIBBON_DELIVER_OUT_A and RIBBON_DELIVER_OUT_B signals generated from the motor driver IC (IC7) are output from the connector.

CN5

Signal	I/O	Pin No.
COM_A	O	1
COM_B	O	2
A	O	3
N_A	O	4
B	O	5
N_B	O	6

This connector is connected to the stepping motor.
The COM_A and COM_B, operating voltage for the stepping motor, are output from the pins 1 and 2, respectively.
The control signals A, N_A, B, and N_B are output from the pins 3, 4, 5, and 6, respectively.

CN6

Signal	I/O	Pin No.
36V	O	A1
3.3V	O	A2
OPT_CUT_M_CLOCK	O	A3
OPT_CUT_M_RESET	O	A4
5V_P_3	O	A5
OPT_CON_SIG_1	I	A6
OPT_CON_SIG_2	I	A7
OPT_CUT_M_MODE_1	O	A8
OPT_CUT_M_MODE_2	O	A9
OPT_CUT_M_MODE_3	O	A10
CUT_M_HP_RIGHT	I	B1
CUT_M_HP_LEFT	I	B2
OPT_PEEL	I	B3
GND	---	B4
GND	---	B5
GND	---	B6
OPT_CUT_M_POWER	O	B7
OPT_CUT_M_CW_CCW	O	B8
GND	---	B9
GND	---	B10

This connector is connected to the cutter drive PC board.
(It is used only for the model with the cutter, but unused for the standard model and the model with the strip module.)

CN8

Signal	I/O	Pin No.
24V_TH	O	1
24V_TH	O	2
24V_TH	O	3
24V_TH	O	4
P_GND	---	5
P_GND	---	6
P_GND	---	7
P_GND	---	8

This connector is connected to the print head.
The 24V, operating voltage for the print head, is supplied from the connector.

CN9

Signal	I/O	Pin No.
GND	---	1
GND	---	2
5V	I	3
5V	I	4
P_GND	---	5
VM	I	6

This connector is connected to the 5V power supply unit.
The +5V and VM (36V), operating voltage for the ICs and devices such as stepping motor and ribbon motor, are input into the connector.
The VM and +5V are protected by the fuses FU3 and FU5, respectively.
For safety VM (36V) is supplied only when the interlock switches of the right side cover and the front cover are on (cover close).

CN10

Signal	I/O	Pin No.
P_GND	---	1
GND	---	2
36V	O	3
5V_P_1	O	4

This connector is connected to the print server.
The +5V and 36V, operating voltage for the print server is supplied from the connector.

CN11

Signal	I/O	Pin No.
24V_EXIT_IN	I	1
GND_EXT	---	2
EXT_BACK_FEED	I	3
EXT_PRINT_START	I	4
EXT_PAUSE	I	5
EXT_RESERVE_IN	I	6
EXT_ERROR	O	7
EXT_PRINT_DATA	O	8
GND_EXT	---	9
EXT_COMP_NORMALITY	O	10
EXT_COMP_ABNORMALITY	O	11
EXT_READY_PAUSE	O	12
EXT_RIBBON_END	O	13
EXT_LABEL_END	O	14
EXT_RESERVE_OUT	O	15

This connector is used for the external interface.
It is connected to the 15-pin D-sub connector on the back of the printer.
For each signal, refer to Section 4.1.7. PIN Description.

CN12

Signal	I/O	Pin No.
PSU2_VH_REMOTE_VCC	O	1
PSU2_VH_REMOTE	O	2
PSU1_VM_REMOTE_VCC	O	3
PSU1_VM_REMOTE_GND	O	4

This connector is connected to the 5V power supply unit and the 24V power supply unit.
The control signals are output from the connector.

CN13

Signal	I/O	Pin No.
FAN_VH	O	1
FAN_REV	I	2
P_GND	---	3

This connector is connected to the fan motor.
The FAN_VH functions as the operating voltage +24V.

CN14

Signal	I/O	Pin No.
P_GND	---	1
P_GND	---	2
P_GND	---	3
P_GND	---	4
P_GND	---	5
24V	I	6
24V	I	7
24V	I	8
24V	I	9

This connector is connected to the 24V power supply unit.
The 24V is input into the connector.

CN7

This connector is connected to the MAIN PC board. It performs the input/output of the control signals for the motors, sensors, and so on. Also, it outputs +5V, operating voltage for each circuit, to the CPU PC board.

Signal	I/O	Pin No.	Signal	I/O	Pin No.
GND	---	1	GND	---	51
GND	---	2	GND	---	52
GND	----	3	GND	---	53
GND	---	4	GND	---	54
+5V	O	5	+5V	O	55
+5V	O	6	+5V	O	56
+5V	O	7	+5V	O	57
+5V	O	8	+5V	O	58
+5V	O	9	+5V	O	59
+5V	O	10	+5V	O	60
VM_MONITOR	O	11	FAN_REVOLUTION	O	61
VTH_MONITOR	O	12	N_DISCHARGE	I	62
N_PSU_REMOTE	I	13	EXT_IF_LABEL_END	I	63
EXT_IF_ERROR	I	14	EXT_IF_CMP_NRMLTY	I	64
EXT_IF_CMP_ABNRMLTY	I	15	EXT_IF_READY_N_PAUSE	I	65
EXT_IF_PRINT_DATA	I	16	EXT_IF_RIBBON_END	I	66
EXT_IF_RESERVE_OUT	I	17	EXT_IF_PAUSE	O	67
EXT_IF_BACK_FEED	O	18	EXT_IF_RESERVE_IN	O	68
EXT_IF_PRINT_START	O	19	N_HEAD_ENABLE	I	69
N_HEAD_CHECK	I	20	CUT_M_CW_CCW	I	70
CUT_M_CLOCK	I	21	CUT_M_MODE_1	I	71
CUT_M_POWER	I	22	CUT_M_MODE_3	I	72
CUT_M_MODE_2	I	23	OPT_SIG_1	O	73
CUT_M_RESET	I	24	OPT_SIG_2	O	74
LF_M_CLOCK	I	25	LF_M_CW_CCW	I	75
LF_M_POWER_1	I	26	LF_M_POWER_2	I	76
LF_M_MODE_1	I	27	LF_M_MODE_2	I	77
LF_M_MODE_3	I	28	LF_M_RESET	I	78
RBN_M_WAND_UP_ENABLE	I	29	RBN_M_DELIVER_ENABLE	I	79
RBN_M_WAND_UP_MODE	I	30	RBN_M_DELIVER MODE	I	80
RBN_M_WAND_UP_PAHSE	I	31	RBN_M_DELIVER_PAHSE	I	81
RBN_M_WAND_UP_PFD_1	I	32	RBN_M_DELIVER_PFD_1	I	82
RBN_M_WAND_UP_PFD_2	I	33	RBN_M_DELIVER_PFD_2	I	83
GND	---	34	GND	---	84
GND	---	35	GND	---	85
RBN_M_WND_UP_REF	I	36	RBN_M_DELIVER_REF	I	86
SENS_CENTER_HOLE	O	37	SENS_HEAD_RESISTOR	O	87
SENS_INTERRUPTER	O	38	SENS_REFLECTIVE	O	88
SENS_THERMISTOR	O	39	SENS_RIBBON_END	O	89
GND	---	40	GND	---	90
GND	---	41	GND	---	91
SENS_CUT_HP_LEFT_PEL	O	42	SENS_CUT_HP_RIGHT	O	92
SENS_PAPER_NEAR_END	O	43	SENS_FRONT_COVER_OPN	O	93
SENS_HEAD_OPEN	O	44	SENS_HEAD_LATCH_OPN	O	94
SENS_PAPER_END	O	45	SENS_SIDE_COVER_OPN	O	95
SENS_RBN_WAND_UP_ENC	O	46	SENS_RBN_DELIVER_ENC	O	96
SENS_RBN_PINCH	O	47	LED_PULSE_INT	I	97
LED_PULSE_CENTER	I	48	LED_PULSE_REF	I	98
RESERVE_IN_1	O	49	RESERVE_IN_2	O	99
RESERVE_OUT_1	I	50	POWER_ON_MAIN	I	100

3. MEDIA AND RIBBON SPECIFICATIONS

3.1 SUPPLY SPECIFICATIONS

Item	Batch/Tear-off mode	Strip mode	Cut mode
Media width (Backing paper width)	15 mm to 120 mm		
Media thickness (total)	0.08 mm to 0.26 mm		
Media pitch	5 mm to 1,000 mm	12 mm to 1,000 mm	10 mm to 1,000 mm
Label length	-	10 mm to 998 mm (Note 1)	-
Label width	-	10 mm or more	-
Label thickness	-	0.05 mm or more	-
Backing paper thickness	-	0.1 mm or less	-
Material of backing paper	-	Glassine paper	-
Media type (Roll direction)	Roll (Inside/outside) Fanfold (Note 2)	Roll (Inside)	Roll (Inside/outside) Fanfold
Max. outside roll diameter	∅200 mm		
Inner core diameter	∅76.2 mm		
Ribbon width	30 to 120 mm (A ribbon must be at least 10 mm wider than the loaded media.)		
Ribbon roll direction	Ink side faces outside		
Ribbon inner core diameter	∅25.4 mm to ∅ 26.4 mm		
End of ribbon	Minimum of 200 mm long silver film is attached to the end of the ribbon.		
Outside roll diameter	∅70 mm or less (Ribbon length: Approx. 300 m or less)		

Notes:

1. *If the length of a label is long, place the printer on a surface where an ejected label does not stick to the printer or floor.*
2. *Feed fanfold paper from back of the printer. (Refer to section 5.3 of owner's manual)*
3. *Use a ribbon that is at least 10 mm wider than the media.*
4. *In the case of peel-off operation, use of perforated labels is not allowed.*
5. *Feed fanfold paper through the Fanfold Paper Slot on the printer back.*

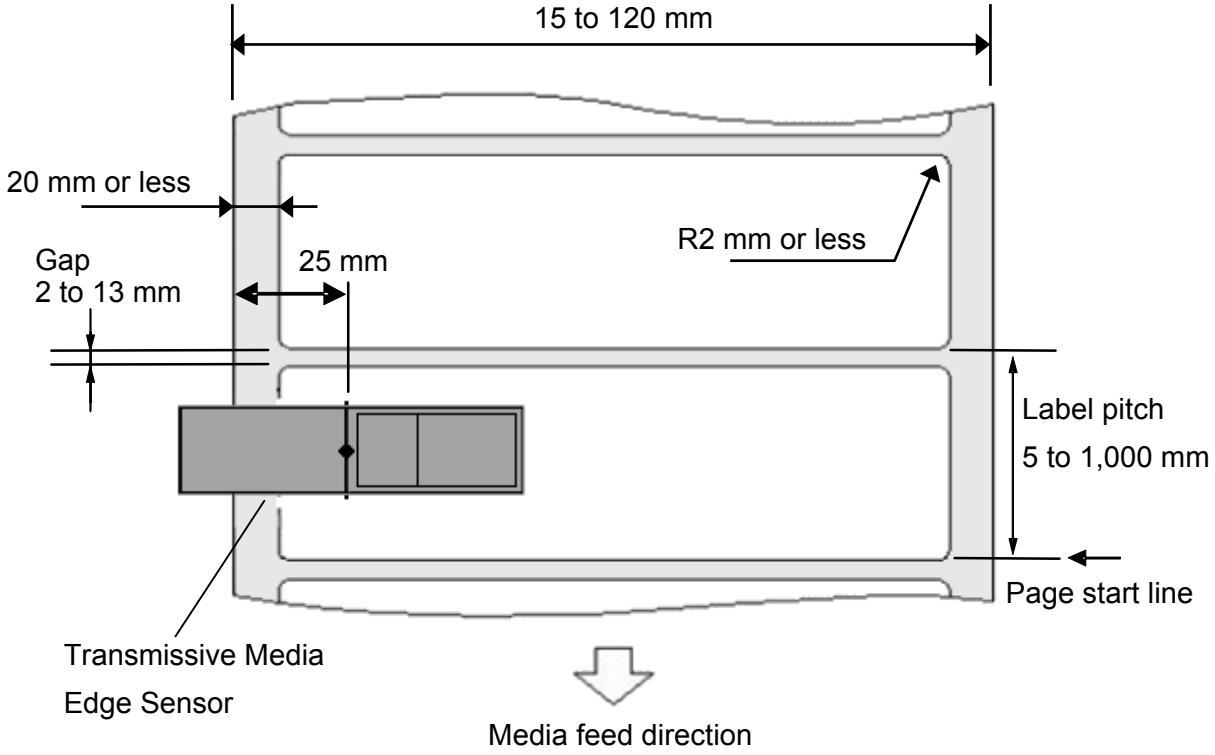
3.2 DIE-CUT LABEL

"Die-cut label" refers to a label stock of which labels are die cut one by one and surroundings are removed, as illustrated below.

When a die-cut label stock is loaded, either the Transmissive Media Edge Sensor or the Transmissive Media Center Sensor is used to detect a print position. The Transmissive Media Center Sensor is located at the centre of the label feed path. (Refer to section 1.3 of owner's Manual)

Precautions

· The Transmissive Media Edge Sensor must be placed so that it does not come into contact with the media.

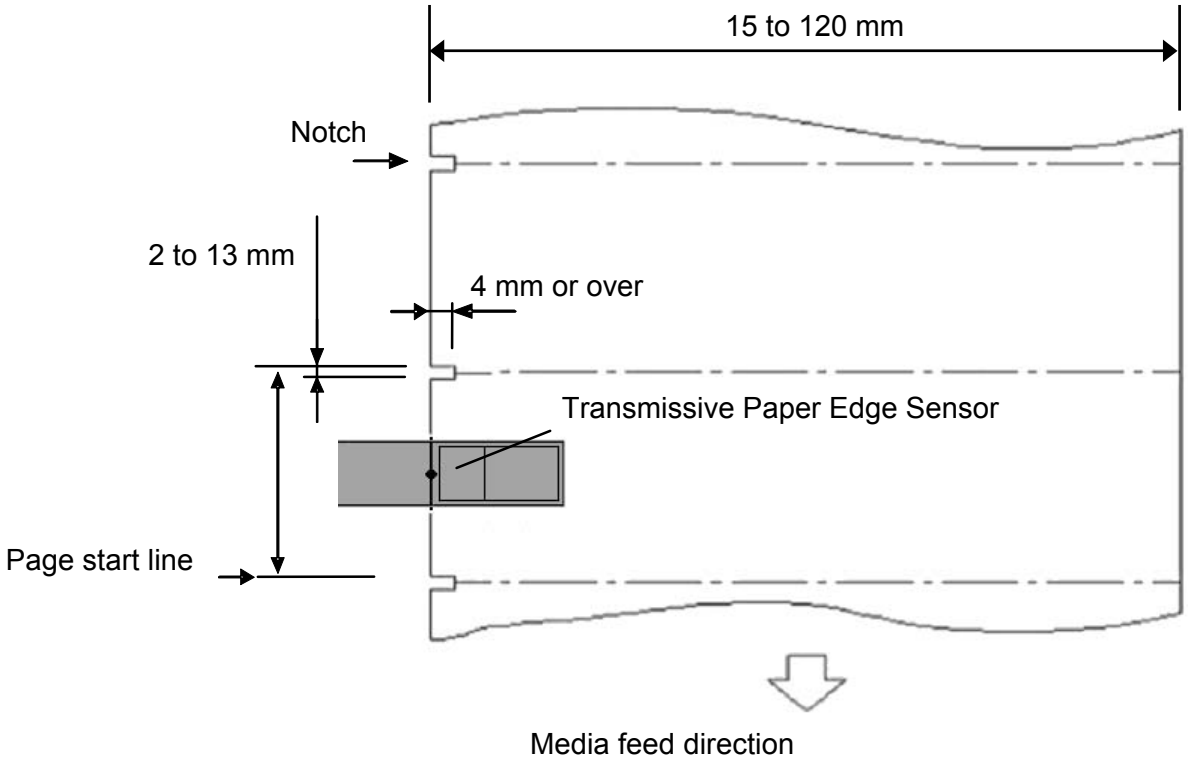


3.3 NOTCHED MEDIA

"Notched media" is notched on the left at a regular interval. When notched media is loaded, the Transmissive Paper Edge Sensor is used.

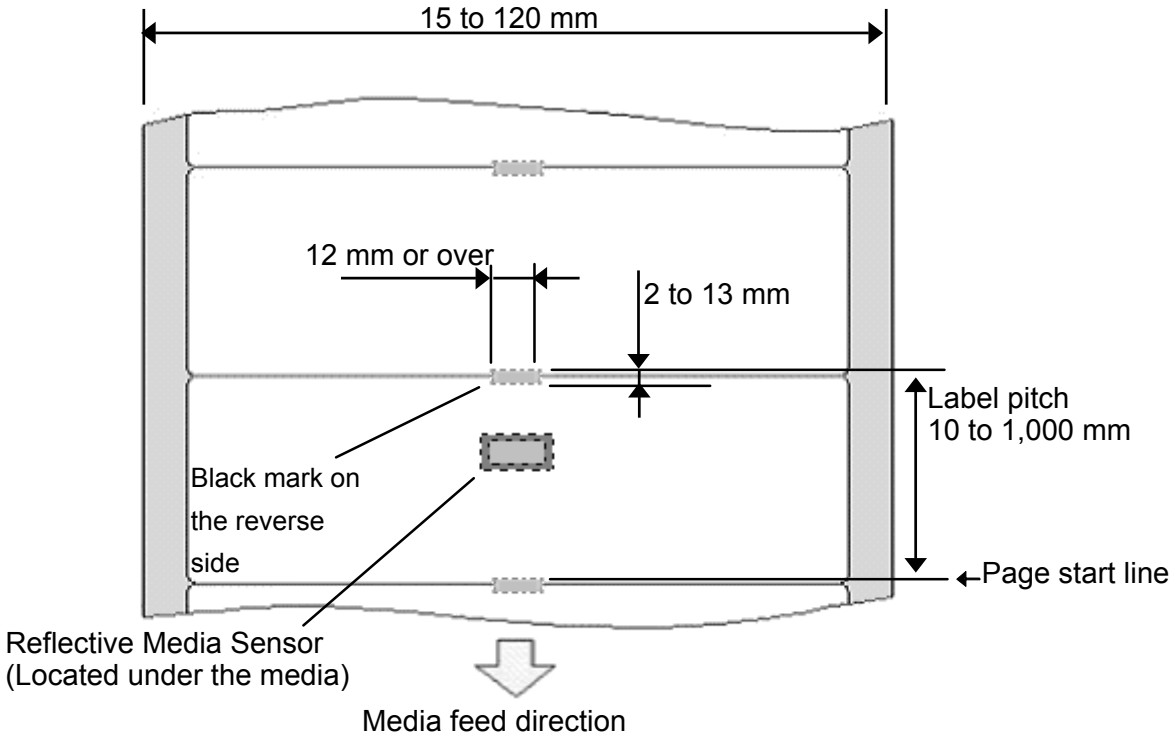
Precautions

- The Transmissive Paper Edge Sensor must be placed so that it does not come into contact with the media.



3.4 LABEL WITH BLACK MARKS

"Label with black marks" refers to a label stock with black marks printed at the back of the backing paper for the position detection purpose, as illustrated below. When a label stock with black marks is loaded, the Reflective Media Sensor is used.

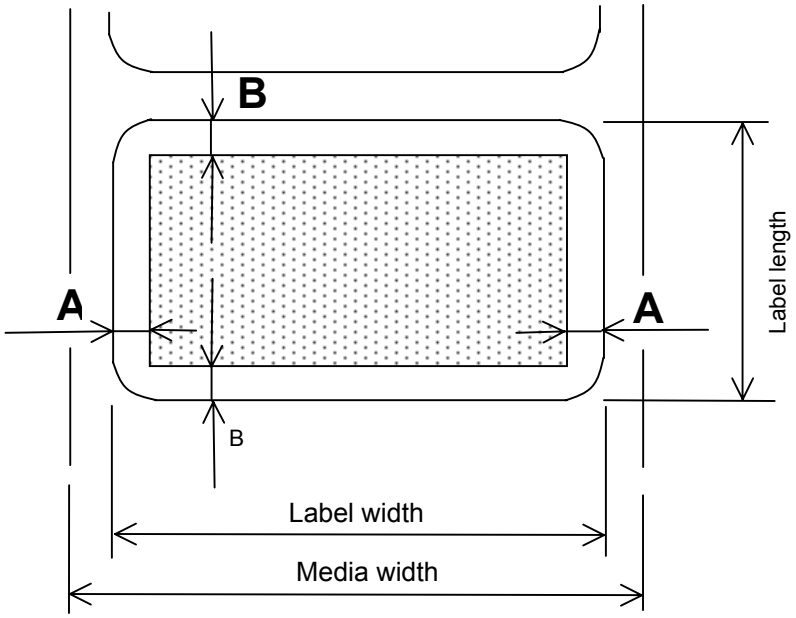


3.5 GUARANTEED PRINT AREA

Printing must be performed within the shaded area as illustrated below.

If a printed image is placed outside this area, the loaded ribbon may be torn or the print quality may be degraded.

1. Die-cut label

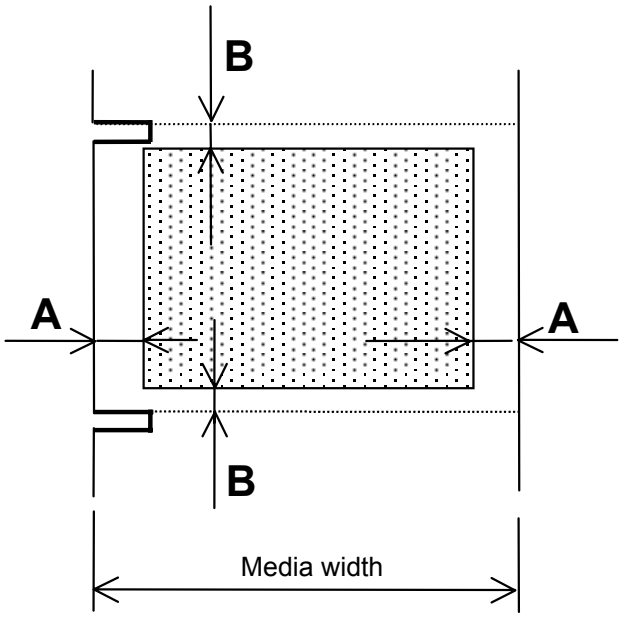


A = 2 mm or over

B = 1.5 mm (if a label length is 100 mm or less)

B = 2.5 mm (if a label length is more than 100 mm)

2. Notched media



A = 2 mm or over

B = 1.5 mm (if a notch pitch is 100 mm or less)

B = 2.5 mm (if a notch pitch is more than 100 mm)

3.6 STORAGE OF MEDIA AND RIBBONS

1. Store the media and ribbon in a cool, dry place. Avoid areas where they would be exposed to direct sunlight, high temperature, high humidity, dust or gas.
2. Store the media in a plastic bag so as not to collect dust or dirt particles.
3. Store media rolls on the flat end. Do not store them on the curved sides as this might flatten that side causing erratic media advance and poor print quality.

3.7 UNACCEPTABLE MEDIA AND RIBBONS

4. Wrinkled, folded, or ripped media
5. Media on which dust particles settle on
6. Media or ribbon whose edge is wavy
7. Curled media
8. Damp media or ribbon
9. Media or ribbon already used for printing
10. Media whose surface is treated (except for designated media)
11. Media whose thickness does not meet the specifications
12. Perforated or punched media (except for designated media)
13. Label from which adhesive squeezes out
14. Partially darkened media
15. Media or ribbons of which shelf life is expired

- **When you purchase media and ribbons**

There are a wide variety of media or ribbons depending on what they are made of and how the front and back surfaces are treated.
Please use only TOSHIBA TEC-approved or recommended media and ribbons in order to ensure the best print quality.
TOSHIBA TEC shall not be liable for any print failures or defects arising from the use of non-approved media or ribbons.

- **Preprinted Media**

When preprinted media (for instance, media with a box already printed on it) is used for printing, the Print Head may be damaged by the ink used for preprinting. Particularly, if pigment-based ink is used for preprinting, the life of the Print Head will be considerably reduced. Please contact your nearest authorised TOSHIBA TEC representative for further information before using preprinted media.
If you use media with preprints on the back and have the Reflective Media Sensor (designed to detect black marks) detect black marks, please consult your nearest authorised TOSHIBA TEC representative. The Reflective Media Sensor is only applicable to the media with preprints printed with special ink.

4. INTERFACE

4.1 Expansion I/O Interface

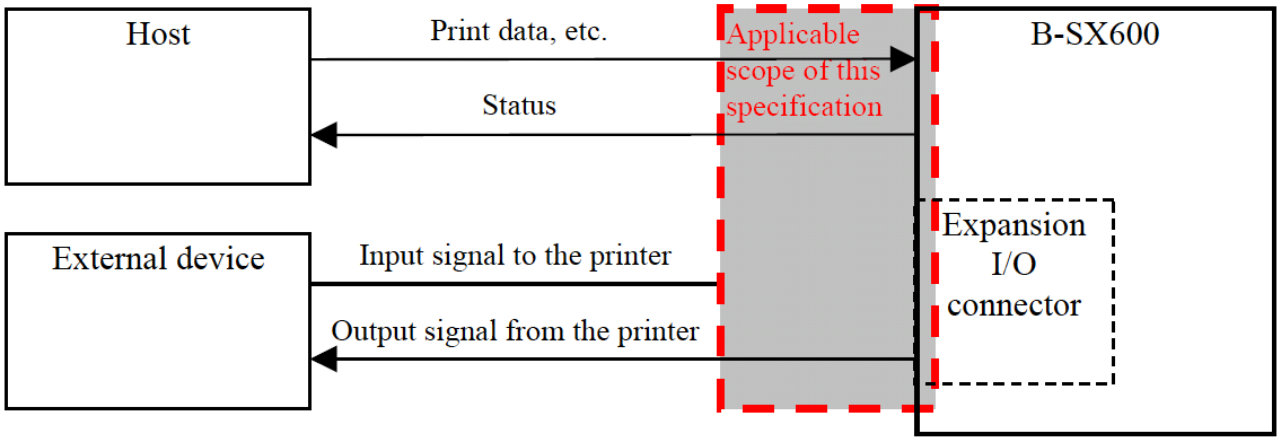
4.1.1 Scope

This specification describes the functions provided through the expansion input/output (I/O) interface of the B-SX600 series (hereinafter referred to as “this printer”) and the control of the signals between this printer and an external device.

For details, please refer to the Expansion I/O Specifications.

4.1.2 Basic System Configuration and Scope of Application

The following diagram shows the basic system configuration including this printer and peripherals and the applicable scope of this specification.



4.1.3 General Description of the Expansion I/O Interface of this Printer

To meet the requirements of various external devices of different controls, this printer has three expansion I/O interface modes.

Each of the expansion I/O interface modes and its function are descried in the following section.

4.1.4 Mode of the Expansion I/O Interface

This printer has three expansion I/O interface modes that are different in the available functions and operations.

● **Expansion I/O interface disabled**

The expansion I/O interface is disabled, and input signals from an external device are ignored.
This mode has been selected as the factory default.

● **Expansion I/O interface mode 1**

It is possible to obtain printer statuses, switch between “Printer ready” and “NOT ready” by an external device, and cancel data in the printer buffer.

● **Expansion I/O interface mode 2**

In addition to the functions of mode 1 above, it is also possible to control the start of printing or the start of a reverse feed by an external device.
This mode can be selected only on the printer with a peel-off module. Be sure to enable the peel-off issue whenever this mode is selected.

4.1.5 External Signal Connector

This printer is equipped with a D-Sub 15-pin connector for interfacing with the sequencer of an automated instrument. Since the signals of this connector are isolated from the printer’s internal circuit, it is possible to send/receive signals to/from an external device only by turning on the external device.

(1) Expansion I/O Interface Connector on the Printer

Manufacturer: DDK Ltd. Connector model: 17DE-13150-C (socket connector)

Connector body	17DE-13150-C D-Sub 15-pin Socket type
Connector contact	17D-303SCR Socket contact
Jack socket	17L-003A3 with M2.6 screw, Depth: 4 mm or less

(2) Recommended Mating Connector

The following connector is recommended as a mating connector.

Manufacturer	DDK Ltd.
Connector body	17DE23150-C D-Sub 15-pin Contact type
Connector contact	17D-703PCR Pin contact
Mounting screw	M2.6, Depth: 4 mm or less