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S600

SERVICE MANUAL

REVISION 0

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S600

SERVICE MANUAL

Canon

Application

This manual has been issued by Canon Inc. for qualified persons to learn technical theory, installation, maintenance, and repair of products. This manual covers all localities where the products are sold. For this reason, there may be information in this manual that does not apply to your locality.

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CANON INC.
BJ Printer Technical Support Dept. 11
16-1, Shimonoge 3-chome, Takatsu-ku, Kawasaki, Kanagawa 213-8512, Japan

This manual has been produced on an Apple Power Macintosh 7300/180 personal computer and OKI MICROLINE 803 PSIIV laser beam printer; printing films were printed on Agfa SelectSet Avantra 25. All page layouts, logos, and parts-list data were saved with Canon Optical Disc Subsystem mo-5001S™ and Optical Disc Cartridge mo-502M™, and Interface Kit mo-IF2™ for Macintosh. All graphics were produced with MACROMEDIA FREEHAND™ 7.0J. All documents and all page layouts were created with QuarkXpress™ 3.3 Japanese version.

I. ABOUT THIS MANUAL

This manual consists of four parts containing information for servicing the product.

Part 1: Product Specifications
Product overview and specifications.

Part 2: Troubleshooting
A guide to troubleshooting the product and identifying parts needing replacement. Troubleshooting solutions are listed according to the error indications displayed by the status indicator and by problem descriptions.

Part 3: Technical Reference
Block diagrams and information on the hardware's new technologies.

Part 4: Appendix
Pin configurations.

Disassembly and reassembly procedures are not fully covered in this manual. Refer to the illustrations in the separate Parts Catalog as well.

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I. PRODUCT OVERVIEW

1.1 Product Overview

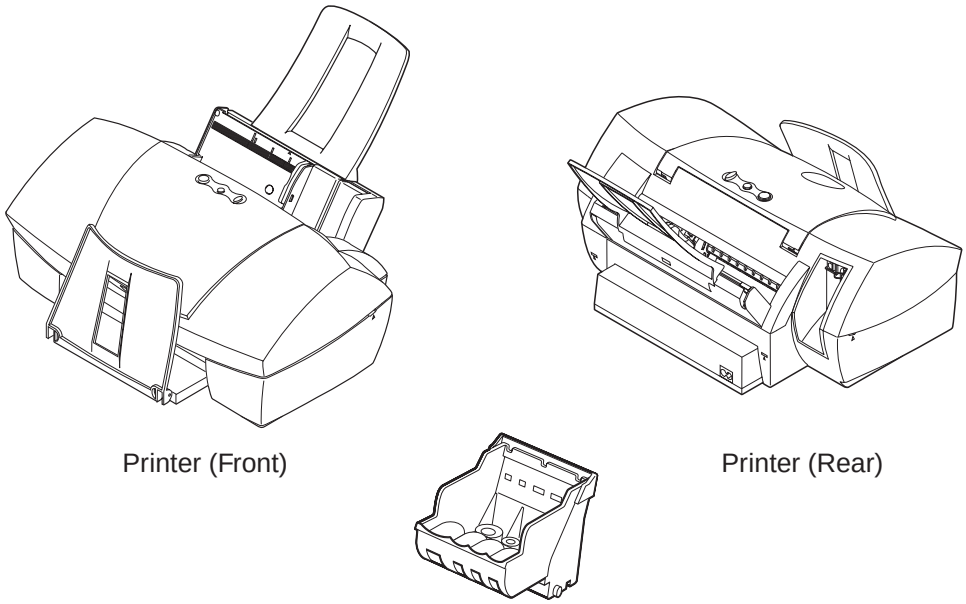
"Standard Color Printer for Personal Use"

With an emphasis on "out of the box performance," the printer is ready for high-speed, high-quality printing on plain paper at the default settings.

This printer targets business users who need high-quality text printing or DTP printouts and personal users who want high-speed printing or a good printer to print information from the Internet.

1) High-speed, high-quality printing with a bi-directional, color, 1200 dpi, nozzle-pitch printing head.
   - Full-page color printing on plain paper is faster and of higher quality than rival printers.
     B/W text: 15 ppm (Fast Gear Pattern*1)
     Color DTP: 10 ppm (Fast Gear Pattern*1)
     Compared to: Color full address*2: 2.5 ppm (A4 full pattern*1)
   - Color ink drop size is 5 pl.
2) High-quality printing with new inks
   Pigment black: A black with better density (OD*3 value of 1.4 or higher) makes high-density text printing possible.
   Color: Improved brilliance and better color density.
3) Base model for future printers
   - The printer's engine (BJ cartridge and BJ cartridge drive system) will be standard equipment on future BJ printers.
   - The printer's other systems (carriage system, paper transport system, ASF, purge system) have a modular design so they can easily be used in successor or sister models.
   - The ASF uses a new system (Duopro*4) marking a major improvement in paper feed power. Paper transport strength.
4) The DC motor (carriage and paper feed) makes printing quiet.
5) Compact design.
6) Compatible with Windows 95/98/NT 4.0/2000 and Mac OS 8.1 or higher.

*1: Standard pattern introduced in 2000 for printing speed measurements.
*2: On A4-size paper, each dot is printed at 1200 × 1200 dpi intervals.
*3: Optical Density.
*4: Separation system based on the friction between paper sheets, paper and pad, and paper and the paper transport roller of the separation pad.



Printer (Front)

Printer (Rear)

BJ Cartridge (Print Head)

Figure 1-1 Printer Exterior

2. SPECIFICATIONS

2.1 Printer Specifications

2.1.1 Printer specifications

Type	Desktop serial printer
Paper Feed System	Automatic feed only (No manual feed)
Resolution	2400 × 1200 dpi (Max. resolution)
Throughput	Bk: 15 ppm Color: 10 ppm
Printing Direction (Plain/Special paper)	HS mode (600 dpi × 600 dpi...): Single-pass bi-directional HQ mode (600 dpi × 600 dpi/1200 dpi × 1200 dpi): Single-pass unidirectional/double- or triple-pass bi-directional Fine1 mode (1200 dpi × 1200 dpi/As above): 1.2-pass unidirectional/4- or 6-pass bi-directional Fine2 mode (As above/As above): 4-pass bidirectional/4-pass unidirectional or bi-directional Fine3 mode (.../2400 dpi × 1200 dpi): 4-pass unidirectional or 6-pass bi-directional
Max. Printing Width	203 mm (8 in.) wide
Interface	IEEE 1284-standard, 8-bit parallel, USB (No HUB function)
ASF Capacity	Plain paper: Max. 10 mm (Approx. 100 sheets with 75 g/m² or approx. 110 sheets with 64 g/m²)
Sensors	Front cover-open sensor, BJ cartridge-loaded sensor, No-ink sensor, Printing position sensor, Paper sensor (paper out detector), Waste-ink capacity sensor, Internal temperature sensor, Pick-up roller sensor, Paper-feed roller position sensor, Carriage position sensor, Paper interval sensor
Operating Noise (at HQ)	39 dB (A) Sound pressure level conforms to ISO 9296.
Ambient Conditions	During operation: Temperature 5°C-35°C (41°F-95°F) Humidity 10%-90% RH (No condensation) During non-operation: Temperature 0°C-35°C (32°F-95°F) Humidity 5%-90% RH (No condensation)
Power Source	Power voltage/frequency — Power consumption — During standby — When Off 100-127 VAC 50/60 Hz — Max. approx. 40 W — Approx. 3 W — Approx. 1 W 220-240 VAC 50/60 Hz — Max. approx. 40 W — Approx. 3 W — Approx. 1 W
External Dimensions	Approx. 430 mm (W) × 294 mm (D) × 177 mm (H)
Weight	Approx. 5 kg (excluding BJ cartridge)
Certification (Printer & adapter)	Radio wave interference: VCCI, FCC, IC, C-Tick, Taiwan/Korea EMC, CCIB (EMC)/CCEE Electrical safety: Electrical appliance regulation, UL, Cul, CE Mark, TUV, FIMKO, SASO, AS, PSB, Korean Electric Commerce, CB/CCIB/CCEE Environmental: Energy Star, Blue Angel
Serial No. Location	Carriage ribbon cable holder (visible when the access cover is open)

2.1.2 Printer service life

Whichever comes first:

(1) A total of 30,000 sheets printed with 1,500 standard characters in black ink.

(2) A total of 10,000 sheets printed with 7.5% duty per color.

(3) Five years of use.

2.1.3 BJ cartridge service life

(1) Service life

For monochrome printing (1500-character standard text pattern printing): 30,000 pages

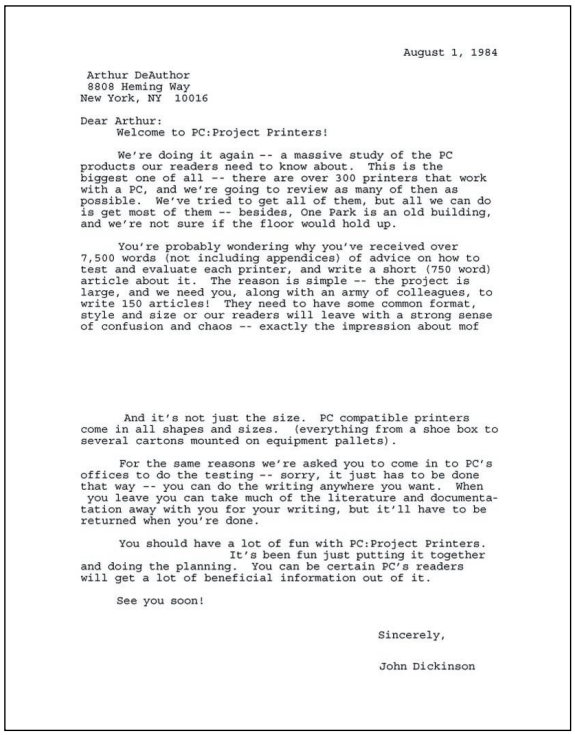
For color printing (7.5% duty pattern printing per color): 10,000 pages

(2) Ink tank service life (printable pages per tank)

Monochrome (black):		695 pages (1500 characters pattern*1/Printing quality: Standard)
Color	(Cyan):	460 pages (JIS SCID No. 5*2/Printing quality: Standard)
	(Magenta):	395 pages (As above)
	(Yellow):	300 pages (As above)

*1 Printing duty: Equivalent to 2.22% pattern

*2 Printing duty: Equivalent to 3.68% (cyan) pattern
Equivalent to 5.12% (magenta) pattern
Equivalent to 6.10% (yellow) pattern



August 1, 1984

Arthur DeAuthor
8808 Heming Way
New York, NY 10016

Dear Arthur:
Welcome to PC:Project Printers!

We're doing it again -- a massive study of the PC products our readers need to know about. This is the biggest one of all -- there are over 300 printers that work with a PC, and we're going to review as many of then as possible. We've tried to get all of them, but all we can do is get most of them -- besides, One Park is an old building, and we're not sure if the floor would hold up.

You're probably wondering why you've received over 7,500 words (not including appendices) of advice on how to test and evaluate each printer, and write a short (750 word) article about it. The reason is simple -- the project is large, and we need you, along with an army of colleagues, to write 150 articles! They need to have some common format, style and size or our readers will leave with a strong sense of confusion and chaos -- exactly the impression about mof

And it's not just the size. PC compatible printers come in all shapes and sizes. (everything from a shoe box to several cartons mounted on equipment pallets).

For the same reasons we're asked you to come in to PC's offices to do the testing -- sorry, it just has to be done that way -- you can do the writing anywhere you want. When you leave you can take much of the literature and documentation away with you for your writing, but it'll have to be returned when you're done.

You should have a lot of fun with PC:Project Printers. It's been fun just putting it together and doing the planning. You can be certain PC's readers will get a lot of beneficial information out of it.

See you soon!

Sincerely,

John Dickinson

Figure 1-2 1500 Characters Pattern

Figure 1-3 JIS SCID No. 5

2.2 Paper Specifications

2.2.1 Paper sizes and weights

(1) Paper sizes

See the table below.

(2) Weight

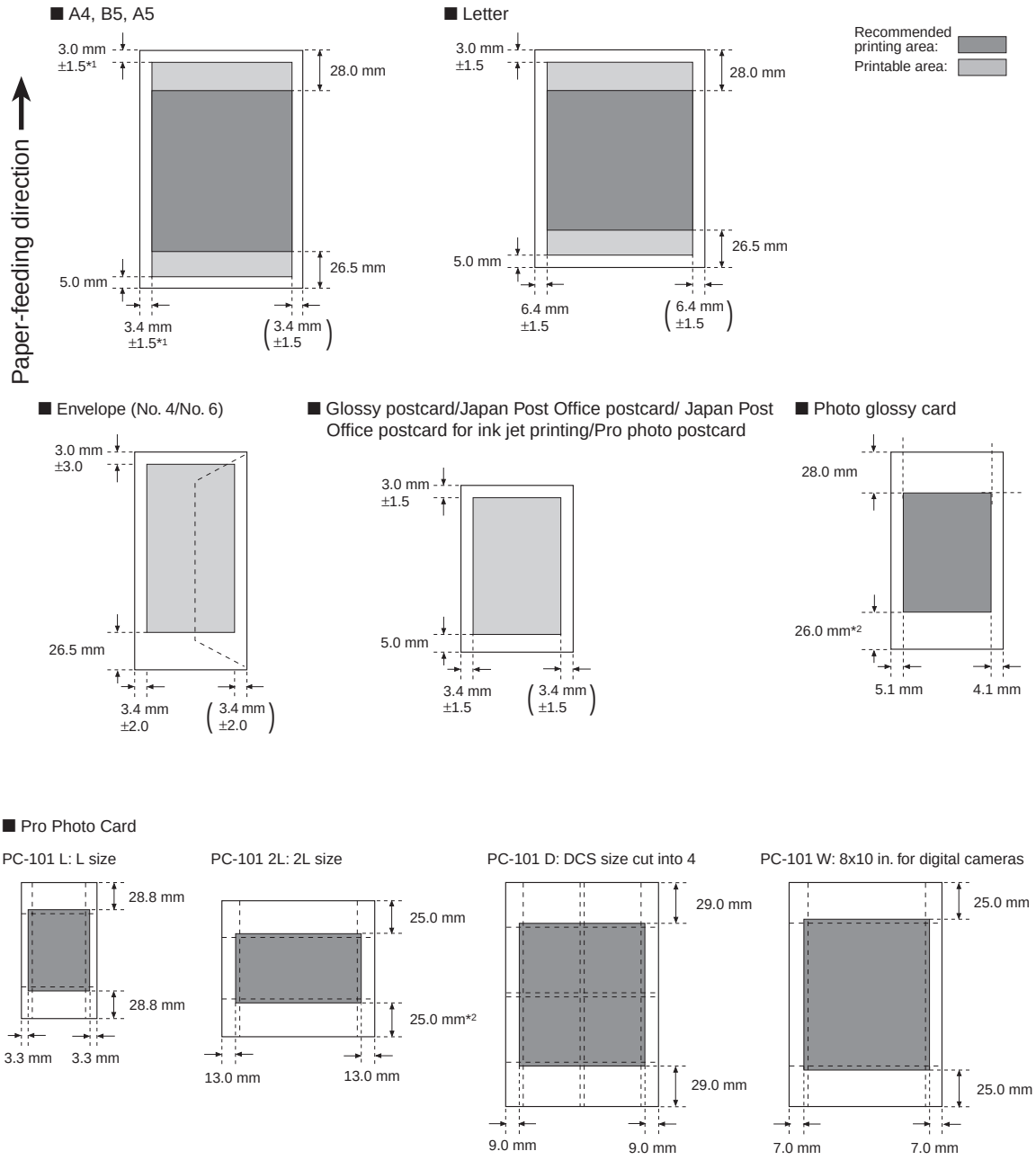
For automatic feeding, the paper's weight should be 64-90 g/m².

2.2.2 Paper types and settings

Type		Size	Sheet Feeder Capacity	Paper Spacing Lever Position
Plain paper	64-90 g/m²	A4/B5/A5/LTR/LGL	Less than 10 mm	Left (Narrow)
High-quality paper	HR-101	A4/LTR	Less than 80 sheets	Left (Narrow)
Photo glossy paper	GP-301	A4/LTR	10 sheets	Left (Narrow)
Photo paper	PR-101	A4/LTR	1 sheet	Left (Narrow)
Glossy film	HG-201	A4/LTR	1 sheet	Left (Narrow)
Transparency film	CF-102	A4/LTR	Less than 30 sheets	Left (Narrow)
Banner	BP-101	A4/LTR	1 sheet	Right (Wide)
T-shirt transfer	TR-201	A4/LTR	1 sheet	Right (Wide)
Mouse pad	MK-101	---	1 sheet	Left (Narrow)
Glossy postcard	KH-201	148 mm × 100 mm	Less than 20	Left (Narrow)
Photo glossy card	FM-101	118.6 mm × 213.9 mm	Less than 20	Left (Narrow)
Japan Post Office postcard	---	148 mm × 100 mm	Less than 40	Left (Narrow)
Japan Post Office postcard for ink jet printing	---	148 mm × 100 mm	Less than 40	Left (Narrow)
Pro photo postcard	PH-101	148 mm × 100 mm	Less than 20	Left (Narrow)
Envelope	COM#10	241 mm × 106 mm	Less than 10	Right (Wide)
	DL-size	220 mm × 110 mm	Less than 10	Right (Wide)
	No. 4	235 mm × 105 mm	Less than 10	Right (Wide)
	No. 6	190 mm × 98 mm	Less than 10	Right (Wide)
Pro photo card	PC101 L	101.6 mm × 190.5 mm	Less than 20	Left (Narrow)
	PC101 2L	210 mm × 183 mm	Less than 10	Left (Narrow)
	PC101 D	210 mm × 310 mm	Less than 10	Left (Narrow)
	PC101 W	210 mm × 310 mm	Less than 10	Left (Narrow)

If the paper spacing lever is not properly set, problems with paper feeding or printing may occur.

2.2.3 Printing area



*1 For recycled paper, it will be 3.0mm ±3 or 3.4mm ±2.

*2 If the bottom margin goes beyond the plain paper's printable area, the software application's specifications will apply.
The region inside the dotted lines is the printable area where print quality can be guaranteed.

Note: The right margins in parentheses indicate that the dimension depends on the paper size.

Figure 1-4 Printable Area

2.3 BJ Cartridge Specifications

	BJ Cartridge (Print Head)
Configuration	Detachable ink tanks for each color and BK/Cl (C, M, Y) integrated head
Print Head	BK: 320 nozzles, 2-column vertical array Cl: 256 nozzles/color, 2-column vertical array/color
Ink Colors*	Pigment BK, dyes C, M, Y
Ink Tank	BCI-3eBK, BCI-3eC, BCI-3eM, BCI-3eY
Weight (Net value)	BK: 32 g Cl (C, M, Y): 11 g

2.4 Printer and Scanner Drivers

The user interface of the drivers has been greatly improved. See page 3-22 for details.

1 Windows drivers
Win95/98/ME BJ raster driver (V. 7.00)
Win9NT4.0 BJ raster driver (V. 4.30)
Win2000 BJ raster driver (V. 1.30)

2 Macintosh driver
Mac BJ printer driver (V. 3.71)

3 Scanner driver
None.

3. PACKING CONFIGURATION

After opening the box, make sure all the items below are included.

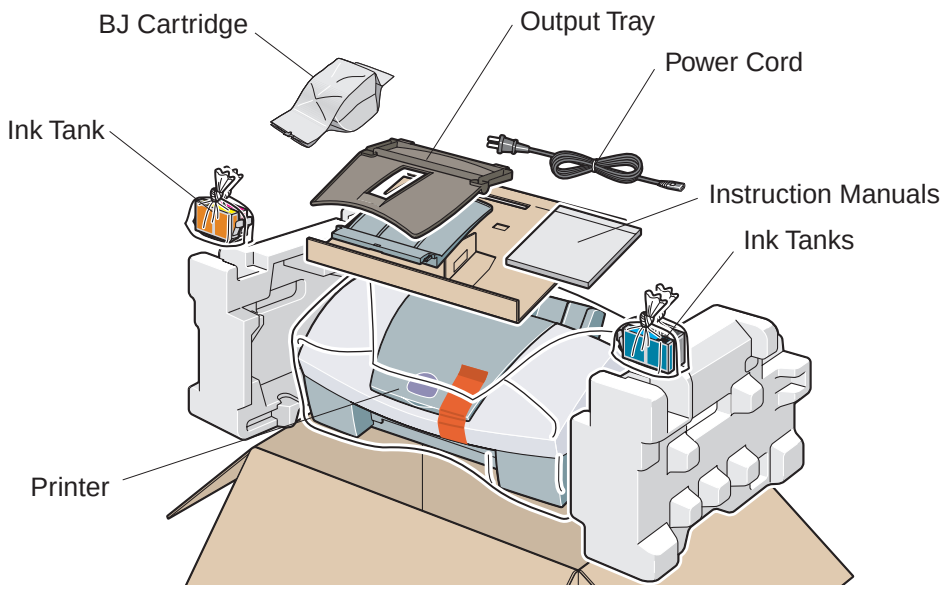


Figure 1-5 Packing Configuration

NOTE There is no storage box for storing the BJ cartridge.

4. PARTS CODE LIST

A list of printer parts, consumables, and optional equipment are listed below.
The printer's BJ cartridge (print head) will be supplied only as a spare part for servicing.

Table 1-1 PARTS CODE

Item		Designation	Parts Code
Printer	---	S600	Q30-3380 (CCSEK)
			Q30-3382 (HK/TW)
		BJ S600	Q30-3381
BJ cartridge*1	---	---	QY6-0034
Ink tank	Black	BCI-3eBK	F47-3131
	Cyan	BCI-3eC	F47-3141
	Magenta	BCI-3eM	F47-3151
	Yellow	BCI-3eY	F47-3161

*1 Supplied only as a spare part for servicing. It will not be supplied as a consumable or optional part.

Part 2
TROUBLESHOOTING

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1. PRINTER OPERATION

The printer's operation procedures are explained below. You can operate the printer either by itself or with a computer. Both methods are explained below.

1.1 Printer Operation Procedure

The printer's operation panel has a *POWER* button and a *RESUME* button to cancel printing operation or to cancel an error. With a computer, you can use the printer driver to adjust the print head's position and to change various settings. For details on using the printer driver with the computer, see page 3-22.

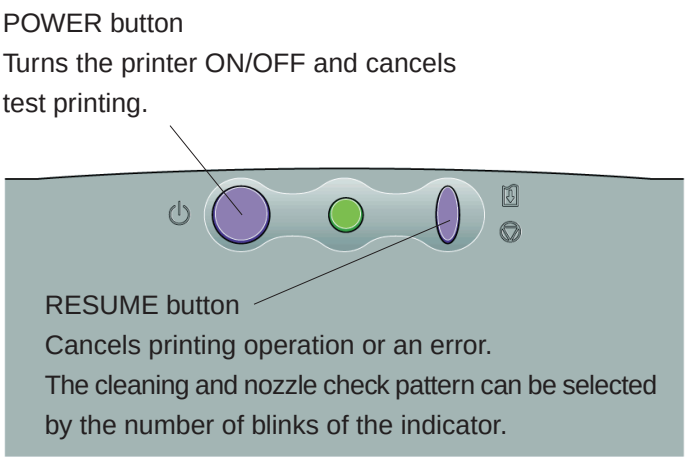


Figure 2-1 Operation Panel

1.2 Status Indicator

When you operate the printer by itself, you can find out the printer's operation status with the indicator. When an error occurs, the nature of the error can be determined by the number of times the indicator blinks.

Normal Operation

Indicator Display	Operation Status
Green light	Power ON
Blinks green (Long/short)	Power ON in progress, power OFF in progress, resume operation in progress, cleaning in progress, test printing in progress, front cover open, printing in progress
Light off	Power OFF

Error

Indicator Display	Operation Status
Blinks orange (Long/short)	The number of blinks differs depending on the error. See page 2-10 for details.
Green/orange (Toggle blinking)	The blinking method differs depending on the error. See page 2-11 for details.

1.3 Operating the Printer

The printer has an offline operation mode that works when the printer is not connected to a computer and the power is on.

To conduct the operations below, with the power turned on, hold down the *RESUME* button until the green indicator blinks for the specified number of times.

Operation	Indicator Blink Count	Remarks
Cleaning operation	Once	---
Nozzle check pattern printing	Twice	Load a sheet of B5 or larger paper.
Roller cleaning operation	3 times	Load no paper or load A4 paper.
---	4 times	Execute no operations.

1.3.1 Cleaning operation

To start the cleaning operation, turn on the printer and hold down the *RESUME* button until the green indicator blinks once. Then let go of the button. Cleaning will then start. The black and color ink nozzles will be cleaned simultaneously by suction. This is the same as using the printer driver to clean all of the ink nozzles.

1.3.2 Printing the nozzle check pattern

With the printer turned on, hold down the *RESUME* button until the green indicator blinks twice. The printer will then start printing the nozzle check pattern. If any printing flaws show up in this test printout, clean the BJ cartridge.

Printing the nozzle check pattern requires B5 or larger paper. If the paper's width is narrower than the nozzle check pattern, the printer will print on the bare platen, dirtying the platen with ink.

To stop printing of the test pattern midway, press the *POWER* button. Printing will stop and the paper will be ejected. The printer will remain on.

If the problem persists even after cleaning the BJ cartridge three times, Perform Deep Cleaning of from the driver. If that still does not resolve the problem, replace the BJ cartridge.

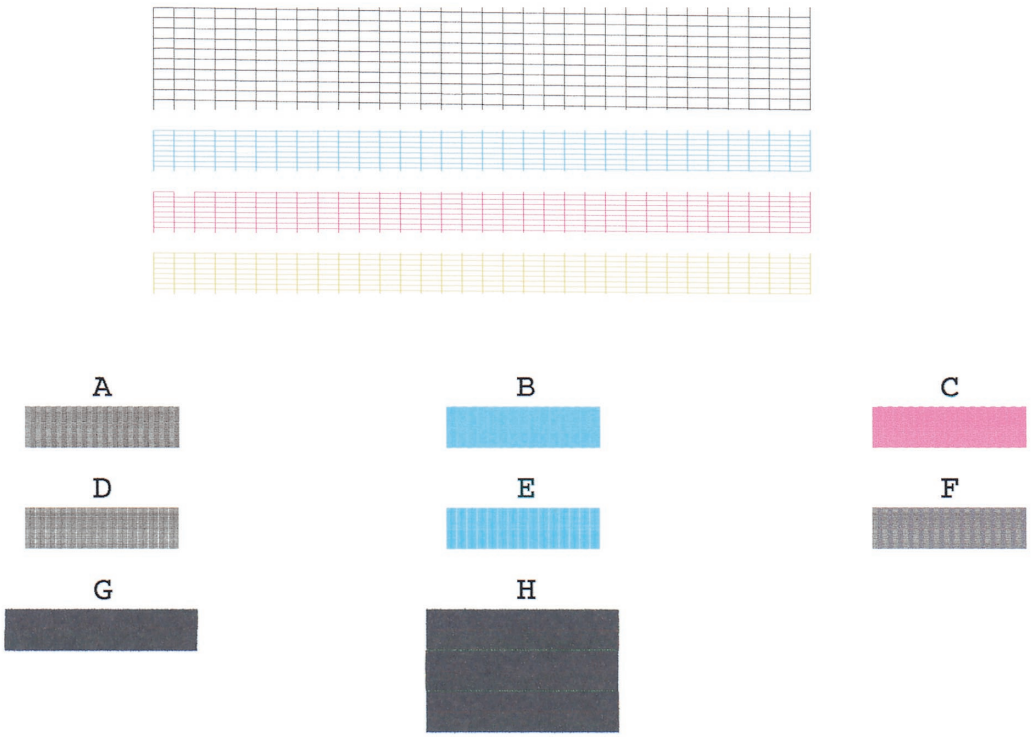


Figure 2-2 Nozzle Check Pattern Printout

1.3.3 Roller cleaning operation

This is to remove the paper dust adhering to the auto sheet feeder's rollers. With the printer turned on, hold down the *RESUME* button until the green indicator blinks once. The cleaning of the rollers will then start.

There are two cleaning methods:

(1) Passing plain paper through
Place a sheet of plain paper on the auto sheet feeder and execute roller cleaning. Do this three times.

(2) Rotating the rollers without paper
Execute roller cleaning without placing any paper on the auto sheet feeder. (The rollers will rotate ten times.)
Do this three times.

Do not execute the cleaning operation more times than necessary. Excessive cleaning will generate rubber dust which can affect the printer's operation.

2. SERVICING

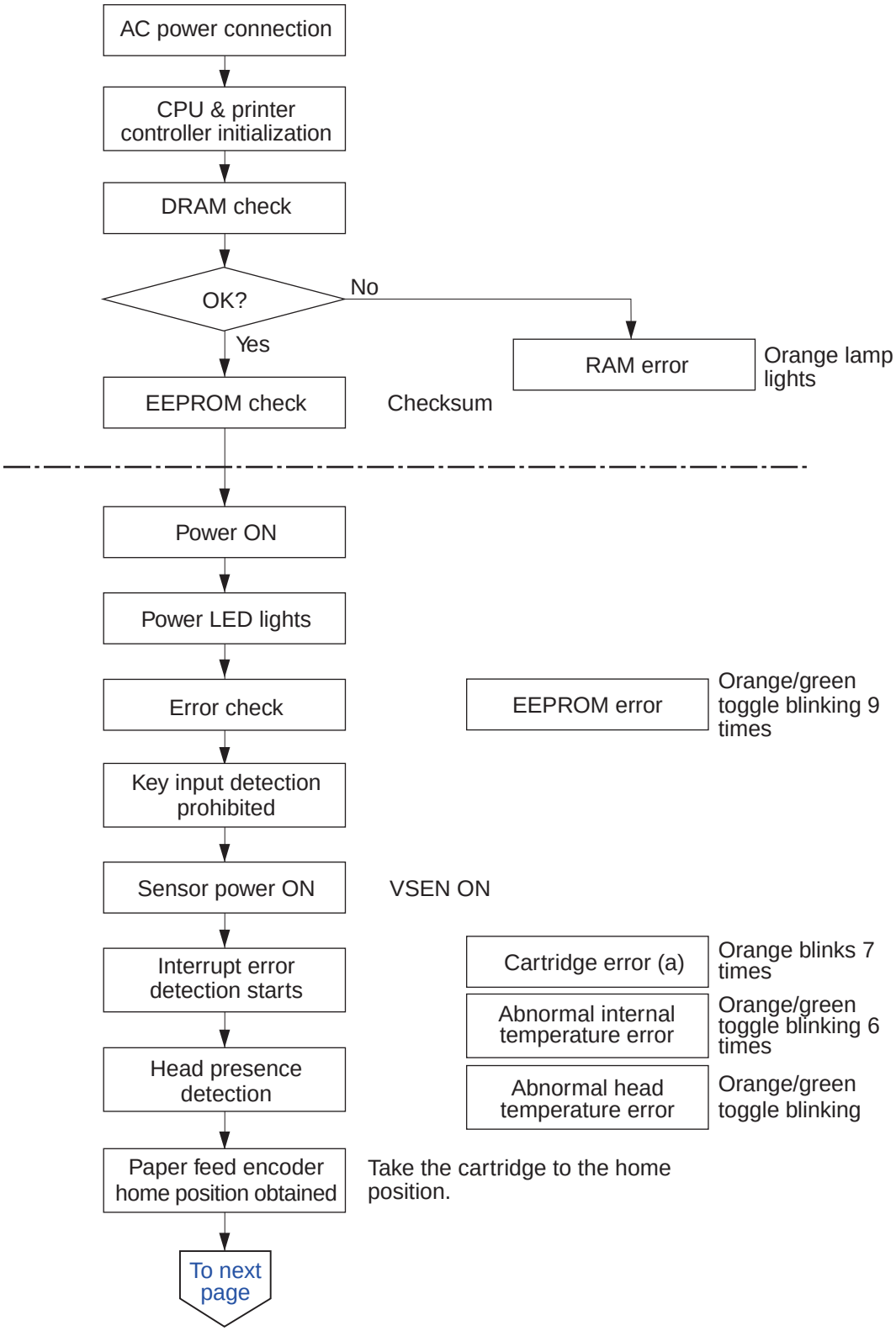
2.1 Before Troubleshooting

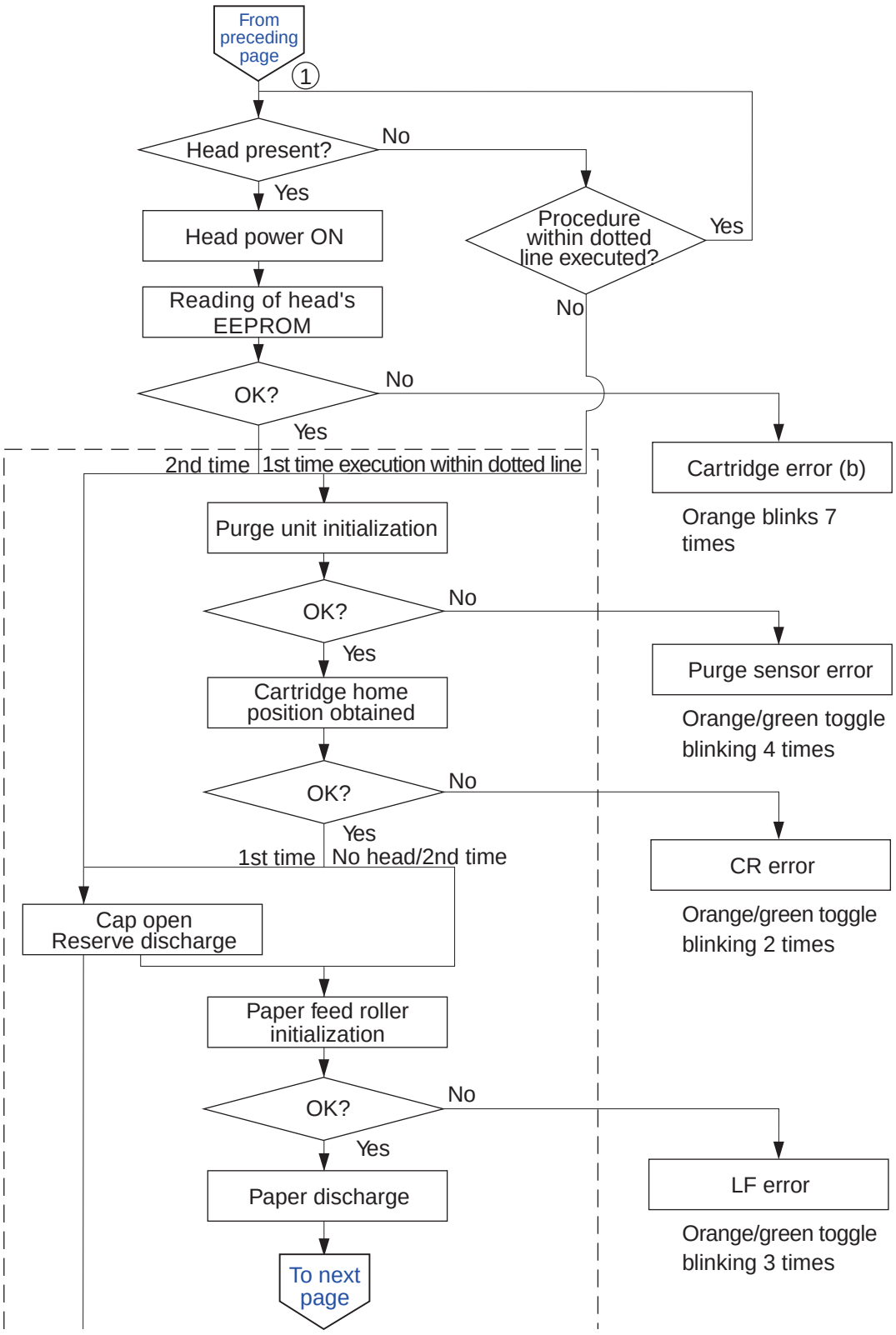
Before troubleshooting, check the following and see if any of the applicable problems can be fixed.

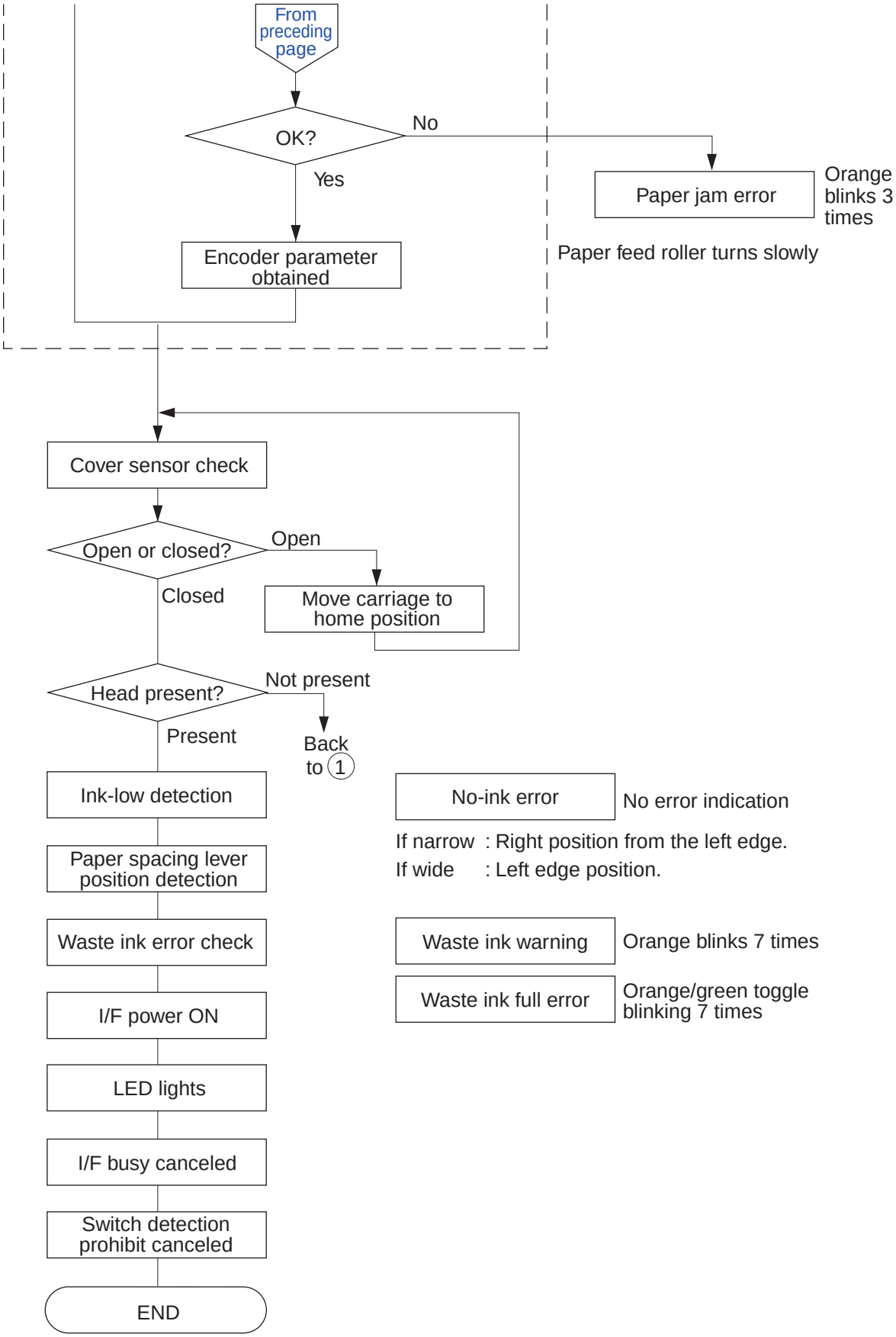
Problem	Probable Cause	Solution
The printer does not operate at all.	The power outlet is not supplying the required voltage.	Connect the AC cord to a power outlet which supplies the required voltage.
	The power cord is not properly connected to the printer or power outlet.	Check that the power cord is connected properly.
	An internal plug is disconnected.	Disconnect and reconnect the plug.
Paper feeding does not work.	The recommended paper is not being used.	Use the recommended paper.
	There is foreign matter in the paper feed section (sheet feeder, pinch roller, LF roller, platen, spur).	Remove the foreign matter.
No printing.	The BJ cartridge needs cleaning.	Clean the BJ cartridge.
	The ink cartridge is empty.	Replace the ink cartridge.
	The BJ cartridge has not been used for a prolonged period.	Clean the cartridge. If the problem still persists, replace the cartridge.
Stripes appear in the printout.	The print head position has not been adjusted.	Execute print head position adjustment.
		See page 2-23.

2.2 Detectable Problems from System Start to Exit

Errors unresolvable by the user can be checked before system startup is completed.




From preceding page
1
Head present?
No
Yes
Head power ON
Reading of head's EEPROM
OK?
No
Yes
Procedure within dotted line executed?
Yes
No
2nd time
1st time execution within dotted line
Cartridge error (b)
Orange blinks 7 times
Purge unit initialization
OK?
No
Yes
Purge sensor error
Orange/green toggle blinking 4 times
Cartridge home position obtained
OK?
No
Yes
1st time
No head/2nd time
CR error
Orange/green toggle blinking 2 times
Cap open
Reserve discharge
Paper feed roller initialization
OK?
No
Yes
LF error
Orange/green toggle blinking 3 times
Paper discharge
To next page


From preceding page
OK?
No
Yes
Paper jam error
Orange blinks 3 times
Encoder parameter obtained
Paper feed roller turns slowly
Cover sensor check
Open or closed?
Open
Closed
Move carriage to home position
Head present?
Not present
Present
Back to (1)
Ink-low detection
Paper spacing lever position detection
Waste ink error check
I/F power ON
LED lights
I/F busy canceled
Switch detection prohibit canceled
END
No-ink error
No error indication
If narrow : Right position from the left edge.
If wide : Left edge position.
Waste ink warning
Orange blinks 7 times
Waste ink full error
Orange/green toggle blinking 7 times

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2.3 Troubleshooting Problems

	Problem	Probable Cause / Check Items	Solution
Faulty Operation	Power does not turn on. After power ON, it immediately turns off.	1. AC adapter, 2. Logic board	1. Replace faulty parts.
	The print head is not recognized. It does not return to the home position.	1. BJ cartridge, 2. BJ cartridge contacts, 3. Carriage flex cable	1. Remove and reinstall the BJ cartridge. 2. Replace faulty parts.
	Abnormal noise.	1. Dislodged parts, 2. Dislodged pinch roller.	1. Remove foreign matter, 2. Reinstall dislodged parts.
	Printing stops midway.	1. Control board	1. Replace faulty parts.
Faulty Paper Feed	Multiple sheets are fed at a time.	1. ASF (Return tab, faulty pressure roller operation)	1. Replace faulty parts.
	Paper is not fed.	1. Foreign matter, 2. PE sensor arm	1. Remove foreign matter, 2. Replace faulty parts
	The paper is slanted.	1. Paper guide, 2. Foreign matter adhering to paper feed rollers	1. Readjust the paper guide to the correct position, 2. Remove foreign matter.
Faulty Printout	No printing. No color.	1. BJ cartridge, 2. Ink tank, 3. Purge unit	1. Replace faulty parts.
	Scrape marks or white stripes appear even after cleaning. Lines not in the printing data appear.	1. BJ cartridge, 2. Ink tank, 3. Purge unit, 4. BJ cartridge faulty contacts, 5. Carriage flex cable	1. Remove and reinstall BJ cartridge and check the contacts, 2. Replace faulty parts.
	The paper is dirtied.	1. Ink mist from the paper transport section in the printer.	1. Pass through several sheets of paper. 2. Use a cloth to clean the paper transport section.
	Spur marks appear.	1. Deformed spur tips.	1. Replace faulty parts.
	Broken vertical lines appear.	1. Paper spacing lever position not properly set. 2. Improper amount of grease applied on guide shaft.	1. Set the paper spacing lever to the proper position. 2. Adjust the printing position. 3. Apply the correct amount of grease on the guide shaft.
	Lines are missing.	1. Ink tank	1. Replace ink tank.
	Strange color tones.	1. BJ cartridge	1. Replace faulty parts.
	Overlapping printing	1. Platen unit (eject roller)	1. Replace faulty parts.

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