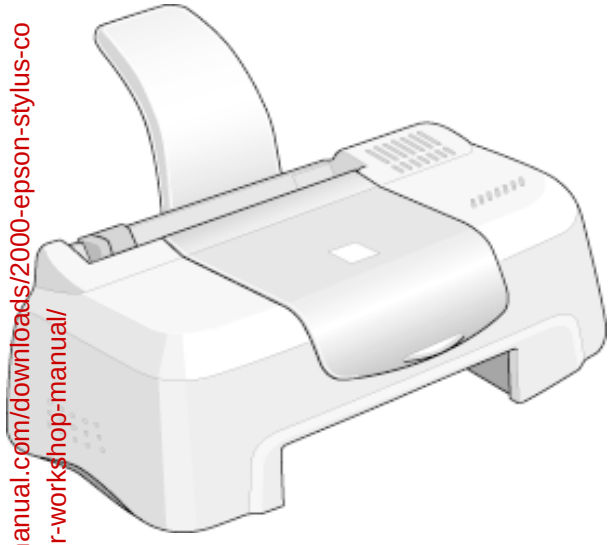
SERVICE MANUAL



Color Inkjet Printer

EPSON STYLUS COLOR 480

EPSON

SEIJ00002

Notice

☐ All effort have been made to ensure the accuracy of the contents of this manual. However, should any errors be detected, SEIKO EPSON would greatly appreciate being informed of them.

☐ The contents of this manual are subject to change without notice.

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PRECAUTIONS

Precautionary notations throughout the text are categorized relative to 1)Personal injury and 2) damage to equipment.

DANGER Signals a precaution which, if ignored, could result in serious or fatal personal injury. Great caution should be exercised in performing procedures preceded by DANGER Headings.

WARNING Signals a precaution which, if ignored, could result in damage to equipment.

The precautionary measures itemized below should always be observed when performing repair/maintenance procedures.

DANGER

1. ALWAYS DISCONNECT THE PRODUCT FROM THE POWER SOURCE AND PERIPHERAL DEVICES PERFORMING ANY MAINTENANCE OR REPAIR PROCEDURES.
2. NO WORK SHOULD BE PERFORMED ON THE UNIT BY PERSONS UNFAMILIAR WITH BASIC SAFETY MEASURES AS DICTATED FOR ALL ELECTRONICS TECHNICIANS IN THEIR LINE OF WORK.
3. WHEN PERFORMING TESTING AS DICTATED WITHIN THIS MANUAL, DO NOT CONNECT THE UNIT TO A POWER SOURCE UNTIL INSTRUCTED TO DO SO. WHEN THE POWER SUPPLY CABLE MUST BE CONNECTED, USE EXTREME CAUTION IN WORKING ON POWER SUPPLY AND OTHER ELECTRONIC COMPONENTS.

WARNING

1. REPAIRS ON EPSON PRODUCT SHOULD BE PERFORMED ONLY BY AN EPSON CERTIFIED REPAIR TECHNICIAN.
2. MAKE CERTAIN THAT THE SOURCE VOLTAGES IS THE SAME AS THE RATED VOLTAGE, LISTED ON THE SERIAL NUMBER/ RATING PLATE. IF THE EPSON PRODUCT HAS A PRIMARY AC RATING DIFFERENT FROM AVAILABLE POWER SOURCE, DO NOT CONNECT IT TO THE POWER SOURCE.
3. ALWAYS VERIFY THAT THE EPSON PRODUCT HAS BEEN DISCONNECTED FROM THE POWER SOURCE BEFORE REMOVING OR REPLACING PRINTED CIRCUIT BOARDS AND/OR INDIVIDUAL CHIPS.
4. IN ORDER TO PROTECT SENSITIVE MICROPROCESSORS AND CIRCUITRY, USE STATIC DISCHARGE EQUIPMENT, SUCH AS ANTI-STATIC WRIST STRAPS, WHEN ACCESSING INTERNAL COMPONENTS.

About This Manual

This manual describes basic functions, theory of electrical and mechanical operations, maintenance and repair procedures of EPSON Stylus Photo 720 / Stylus Photo EX3. The instructions and procedures included herein are intended for the experienced repair technicians, and attention should be given to the precautions on the preceding page.

Contents

This manual consists of six chapters and Appendix.

CHAPTER 1.PRODUCT DESCRIPTIONS

Provides a general overview and specifications of the product.

CHAPTER 2.OPERATING PRINCIPLES

Describes the theory of electrical and mechanical operations of the product.

CHAPTER 3.TROUBLESHOOTING

Provides the step-by-step procedures for the troubleshooting.

CHAPTER 4.DISASSEMBLY AND ASSEMBLY

Describes the step-by-step procedures for dissaembling and assembling the product.

CHAPTER 5.ADJUSTMENTS

Provides Epson-approved methods for adjustment.

CHAPTER 6.MAINTENANCE

Provides preventive maintenance procedures and the lists of Epson-approved lubricants and adhesives required for servicing the product.

APPENDIXProvides the following additional information for reference:

- Connector pin assignments
- Electric circuit boards components layout
- Exploded diagram
- Electrical circuit boards schematics

Symbols Used in This Manual

Various symbols are used throughout this manual either to provide additional information on a specific topic or to warn of possible danger present during a procedure or an action. Be aware of all symbols when they are used, and always read WARNING, CAUTION or NOTE messages.

Indicates an operating or maintenance procedure, practice or condition that, if not strictly observed, could result in injury or loss of life.

Indicates an operating or maintenance procedure, practice, or condition that, if not strictly observed, could result in damage to, or destruction of, equipment.

May indicate an operating or maintenance procedure, practice or condition that is necessary to accomplish a task efficiently. It may also provide additional information that is related to a specific subject, or comment on the results achieved through a previous action.

Revision Status

Revision	Issued Date	Description
Rev. A	May, 11 2000	First Release
Rev. B	18, July 2000	* Page 72: Fig 4-2, Fig 4-3 was revised due the change of the top housing securing screw number. * Page 76: Fig 4-11, Fig 4-12 was revised due to the addition of the Front Housing (Stacker Guide.) * Page 139: The Exploded diagram was changed with new figure. The Front Housing (Stacker Guide) was added in the Exploded diagram. * Page 141: Ref. Number 108 Front Housing (Stacker Guide) was added in the parts list.

Product Description

Operating Principles

Troubleshooting

Disassembly and Assembly

Adjustment

Maintenance

Appendix

CHAPTER

1

PRODUCT DESCRIPTION

1.1 Overview

Stylus Color 480 is developed newly for the low end product and realize a high quality graphic printing with the low price.

1.1.1 Features

Major features of this printer are as follows;

- ☐ High quality color printing
  - ■ 720dpi (H) x 720 dpi(V) dpi printing.
  - ■ MACH technology (4 color printing. YMCK)
  - ■ Micro wave, Super micro wave printing
  - ■ Multi-Shot & Variable dot printing
- ☐ Control panel less
  Host computer controls the printer.
- ☐ Built in I/F
  - ■ IEEE-1284 parallel
    Windows exclusive printer.
- ☐ Small, space-saving
- ☐ Built-in auto sheet feeder
  - ■ Holds 100 cut-sheets (65g/m2)
  - ■ Holds 10 envelopes
  - ■ Holds 10 transparency films
  - ■ Holds 30 special paper

Figure 1-1. External View

1.2 Basic Specification

1.2.1 Printing Specification

PRINTING METHOD

- On demand ink jet

NOZZLE CONFIGURATION

- Black: 48 nozzles x 1 row
- Color: 45 nozzles x 1 row
  15 nozzle is assigned for each 3 colors in the one row.
  (Cyan, Magenta, Yellow)

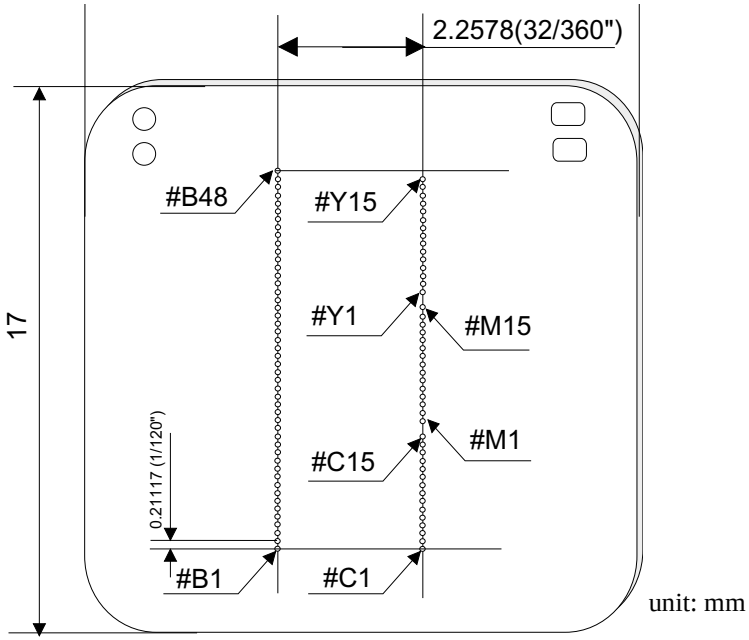

Figure 1-2. Nozzle Configuration (Seen from the Back of the Head)

PRINTING DIRECTION

- Bi-direction with logic seeking

PRINTING SPEED

- Character mode: Refer to the table below

Table 1-1. Character mode: black only

Character pitch	Character Quality	Printable Columns	CR Speed
10CPI	LQ	80column	20IPS

- Raster graphics mode: Refer to the table below.

Table 1-2. Printing Speed (Raster Graphics Mode)

Horizontal Resolution	Printable Area	Available Dot	CR Speed	Notes
480 dpi	8.26 inch	3968	14.1 IPS	Black mode
360 dpi	8.26 inch	2976	20 IPS	--
720 dpi	8.26 inch	5952	20 IPS	--

CHARACTER SPECIFICATION

- Character code: None. International character sets is not available. Only following characters are available.
  - ASCII 37 characters + Space code + One Symbol
    Alphabet A-Z (Code 41H-5AH)
    Number 0-9 (Code 30H-39H)
    SPACE (Code 20H)
    Symbol # (Code 23H)
  - Typeface
    Bit map LQ font: EPSON Courier 10CPI

CONTROL CODE

- ESC/P for Stylus Color 480
- EPSON Remote command

PAPER FEED SPECIFICATION

- Feeding Method: Friction feed with ASF
- Paper Path: Cut sheet ASF (Top entry - Front out)
- Line Interval: Programmable by 1/6 inch or 1/360 inch
- Paper Feed Speed:
  271.9ms 10 ms (10.16 mm (2/5 inch) at paper feed)
  1.67inch/sec (at continuous paper feed)

1.2.2 Paper Specification

CUT SHEET

- Size:

  A4 (210 x 297 mm)
  Letter (216 x 279 mm)
  B5 (182 x 257 mm)
  Legal (216 x 356 mm)
  Statement (139.7mm x 215.9mm)
  Executive (190.5 x 254 mm)

- Thickness (plain paper):
  0.08mm to 0.11mm(0.003 to 0.004”)
- Weight:
  64g/m^2 to 90g/m^2 (17lb to 24lb / 55 to 78 kg)
- Paper quality:
  Exclusive paper, Bond paper, Plain paper, recycled paper
- ASF hopper available capacity
  100 sheets

- **No wrinkled, scuffing, torn or folded paper be used.**
- **No curled paper more than 5mm be used.**

TRANSPARENCY, GLOSSY PAPER

- Size
  A4 (210mm x 297mm)
  Letter (216mm x 279mm)
- Thickness
  0.075mm to 0.085mm
- Quality
  Exclusive paper
- ASF hopper available capacity
  1sheet

NOTE: *Transparency printing is available only in the normal temperature*

ENVELOPE

- Size:
  No.10 (241.3 mm x 104.8 mm)
  DL (220 mm x 110 mm)
  C6 (162 mm x 114 mm)
  4”x 6”(220mm x 132mm)
- Thickness
  0.16mm to 0.52mm
- Weight
  45g/m2 to 75g/m2
- Quality
  Bond paper, Plain paper, Air mail
- ASF hopper available capacity
  10sheets

NOTE: ** Envelope printing is available only in the normal temperature.*
** Keep the longer side of the envelope horizontally at setting.*

CAUTION

- **Use above mentioned paper at normal temperature. (temperature = 15 to 25%, humidity = 40 to 60% RH)**
- **No wrinkled, scuffing, torn or folded paper be used.**
- **No curled paper more than 5mm be used.**
- **No paper with glue on flap be used.**
- **No double envelops nor with window envelops be used.**
- **Do not print on the back.**

INDEX CARD

- Size
  A6 Index card (105mm x 148mm)
  A5 Index card (148mm x 219mm)
  5 x 8” Index Card (127mm x 203mm)
  10 x 8” Index card (127mm x 203mm)
- Thickness
  Less than 0.23mm
- ASF hopper available capacity
  30sheets

SPECIAL PAPER

Paper type: EPSON exclusive paper

- Photo Quality Ink Jet Paper
  A4 (210 x 297 mm)
  A6 (105 x 148 mm)*
  B5 (182 x 257mm)
  Letter (216 x 279 mm)
  Legal (216 x 356 mm)
  5 x 8” (127 x 203 mm)*1
  8 x10” (100 x 148 mm)*1
- 360 dpi Ink Jet Paper
  A4 (210 x 297 mm)
  Letter (216 x 279 mm)
- Transparencies *2)
  A4 (210 x 297 mm)
  Letter (216 x 279 mm)
- Photo Quality Glossy Film*2)
  A4 (210 x 297 mm)
  A6 (105 x 148 mm)*1
  Letter (216 x 279 mm)
- Photo Paper (PP2)
  A4 (210 x 297 mm)
  Letter (216 x 279 mm)
  Photo quality card 2 (100 x 148 mm)*1
  Panorama (210 x 594 mm)
  4” x 6”(113.6 x 175.4)
  100mm x 150mm
  200mm x 300mm
- Photo Sticker
  A4 (210 x 297 mm)
  A6 (105 x 148 mm)
  8 “x 10” (100 x 148 mm)*1
- Iron-ON Transfer Paper
  A4 (210 x 297 mm)
  Letter (216 x 279 mm)
- Matte Paper
  A4 (210 x 297 mm)
  Letter (216 x 279 mm)
- High Quality Normal Paper
  A4 (210 x 297 mm)

NOTE: **1): Set the enclosed loading support sheet as the last sheet in the ASF.*
**2): Set the plain paper as the last sheet in the ASF.*

Use above mentioned paper at normal temperature.
(temperature = 15 to 25%, humidity = 40 to 60% RH)

1.2.3 Printable Area

CUT SHEET

Refer to the following table. As for the each margin area, refer to the Figure 1-3

Table 1-3. Printable Area for Cut Sheet

Paper Size	Paper Width	Paper Length	LM/RM/ TM	BK Bottom Margin(*1)	Color Bottom Margin (*1,*2)
A4	210mm	297mm	3mm	14 mm or more than 3 mm	21mm or more than 3mm
Letter	216mm	279mm	3mm	14 mm or more than 3 mm	21mm or more than 3mm
B5	182mm	257mm	3mm	14 mm or more than 3 mm	21mm or more than 3mm
Legal	216mm	356mm	3mm	14 mm or more than 3 mm	21mm or more than 3mm
Statement	139.7mm	215.9mm	3mm	14 mm or more than 3 mm	21mm or more than 3mm
Executive	190.5mm	254mm	3mm	14 mm or more than 3 mm	21mm or more than 3mm

NOTE: **1): Bottom margin can be set up to 3mm at minimum when the paper length is designated with "ESC(S" command.) However, the printing quality is not guaranteed in the area ranging from 3mm to 14mm, from the form lower end. When the paper length is not designated, the bottom margin must be wider than 14 mm.*

**2): Bottom margin for color printing can be set up 3mm at minimum when the paper length is designated with "ESC(S" command.). However, guaranteed print area of color printing is narrow than BK (monochrome)printing. This is due to the each color nozzles is assigned in the one row nozzles.*

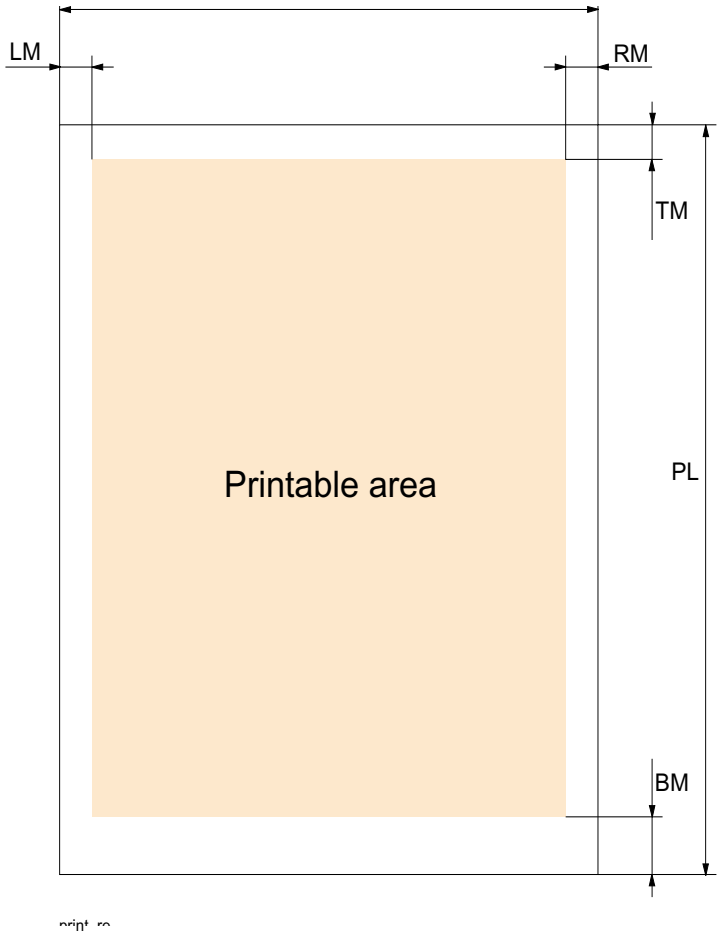

Figure 1-3. Printable Area

ENVELOP (PRINTABLE AREA)

Refer to the following table.

Table 1-4. Printable area for Envelop

Paper Size	Paper Width	Paper Length	LM	RM/TM	BK Bottom Margin(*1)	Color Bottom Margin (*1,*2)
#10	241mm	104.8 mm	28mm	3mm	14 mm or more than 3 mm	21mm or more than 3mm
DL	216mm	279mm	7mm	3mm	14 mm or more than 3 mm	21mm or more than 3mm
C6	182mm	257mm	3mm	3mm	14 mm or more than 3 mm	21mm or more than 3mm

NOTE: **1): Bottom margin can be set up to 3mm at minimum when the paper length is designated with "ESC(S" command.) However, the printing quality is not guaranteed in the area ranging from 3mm to 14mm, from the form lower end. When the paper length is not designated, the bottom margin must be wider than 14 mm.*

**2): Bottom margin for color printing can be set up 3mm at minimum when the paper length is designated with "ESC(S" command.). However, guaranteed print area of color printing is narrow than BK (monochrome)printing. This is due to the each color nozzles is assigned in the one row nozzles.*

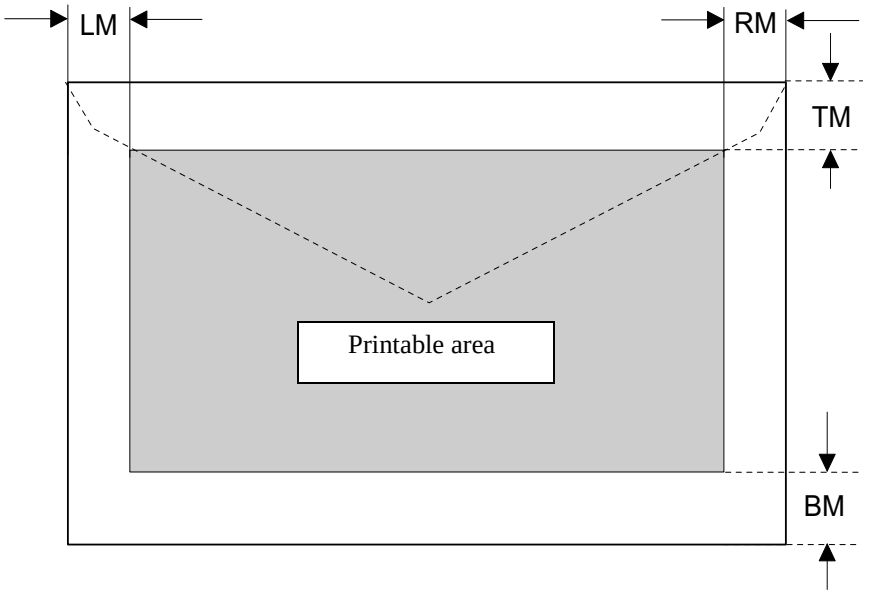

Figure 1-4. Printable area for Envelop

1.2.4 PG Adjust Lever

Unlike other products, this printer dose not have the PG (Platen Gap) adjust lever in the printer mechanism. So, the Platen Gap value can not be changed according to the paper thickness.

1.2.5 Ink Cartridge

INK CARTRIDGE (BLACK)

- Type: Exclusive cartridge
- Color: Black
- Print capacity: 270 pages/A4 (ISO/IEC 10561 Letter Pattern at 360dpi)
- Ink life: 2 years from production date
- Storage temperature:
  - -30°C to 60°C
    Being transported, within 120 hours at 60°C, within a month at 40°C
  - -30°C to 40°C
    Packing storage, within a month at 40°C
  - -20°C to 40°C
    Mounted on the printer, within a month at 40°C
- Dimension: 19.8mm (W) x 52.7 mm (D) x 38.5mm (H)

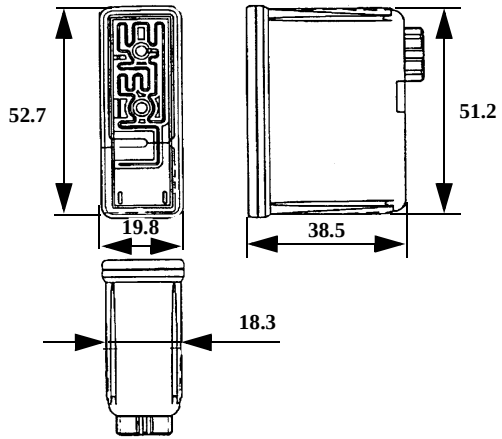

Figure 1-5. Black Ink Cartridge

COLOR INK CARTRIDGE

- Type: Exclusive cartridge
- Color: Magenta, Cyan, Yellow
- Print capacity: 150 pages/A4 (360dpi, 5% duty each color)
- Ink life: 2 years from production date
- Storage temperature:
  - -30°C to 60°C
    Being transported, within 120 hours at 60°C, within a month at 40°C
  - -30°C to 40°C
    Packing storage, within a month at 40°C
  - -20°C to 40°C
    Mounted on the printer, within a month at 40°C
- Dimension: 42.9mm (W) x 52.7 mm (D) x 38.5mm (H)

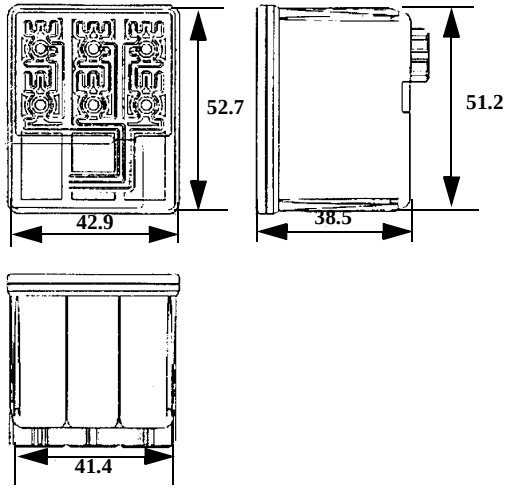

Figure 1-6. Color Ink Cartridge

1.2.6 Input Data Buffer

- Buffer: 16Kbytes

1.2.7 Electric Specification

120V VERSION

- Rated voltage: AC 120V
- Input voltage range: AC 99 -132V
- Rated frequency range: 50 - 60Hz
- Input frequency range: 49.5-60.5 Hz
- Rated current: 0.4A(Max 0.5A)
- Power consumption: Approx. 21W (ISO/IEI 10561 Letter pattern)
  Approx. 5W in Standby mode
  Energy star compliant
- Insulation Resistance: 10 M ohms min.
  (between AC line and chassis, DC 500V)
- Dielectric Strength: AC 1000 V rms. 1 minute or
  AC 1200 V rms 1 second
  (between AC line and chassis)
- Leak Current: less than 0.25mA(input:100V/50Hz)
  less than 0.75mA(input: 138V/60Hz)

220 - 240V VERSION

- Rated voltage: AC 220 - 240V
- Input voltage range: AC 198 -264V
- Rated frequency range: 50 - 60Hz
- Input frequency range: 49.5-60.5 Hz
- Rated current: 0.2A (Max. 0.3A)
- Power consumption: Approx. 21W (ISO/IEI 10561 Letter pattern)
  Approx. 5.5W in standby mode
  Energy star compliant
- Insulation Resistance: 10 M ohms min.
  (between AC line and chassis, DC 500V)
- Dielectric Strength: AC 1500 V rms. 1 minute
- Leak Current: less than 0.75mA (input: 276V/60Hz)

1.2.8 Reliability

- Total print volume: : 10000 pages (A4.Letter) (except ESP,EIO,EPC)
  : 20000 pages (A4, Letter) (ESP, EIO,EPC)
- Printhead Life: 4000 million dots/nozzle
  .

1.2.9 Safety Approvals

120V VERSION

- Safeties standards: UL1950 with D3
  CSA C22.2 No.950 with D3
- EMI: FCC part15 subpart B class B
  CSA C108.8 class B

220V -240V VERSION

- Safety standards: EN60950(VDE)
  EN55022 (CISPR Pub.22) Class B
- EMI: EN55022 (CISPR Pub.22) Class B

1.2.10 Acoustic Noise

- Level Approx. 45dB(A) (According to ISO 7779)

1.2.11 CE Marking (for 220V - 240V)

- ☐ Low Voltage Directive 73/23/eec : ENN60950
- ☐ EMC Directive 89/336/EEC : EN55022 Class B
  : EN61000-3-2
  : EN610000-3-3
  : EN50082-1
  IEC801-2
  IEC801-3
  IEC801 -4

1.2.12 Environmental Conditions

TEMPERATURE

- ☐ Operating: 10 to 35°C (Refer to Figure 1-7)
- ☐ Non-operating: -20 to 60°C (with shipment container)
  1 month at 40°C
  120hours at 60°C

HUMIDITY

- ☐ Operating: 20 to 80% RH
  without condensation, Refer to Figure 1-7
- ☐ Non-operating: 5 to 85% RH
  without condensation, with shipment container

The environmental condition should be within the range shown in the figure below.

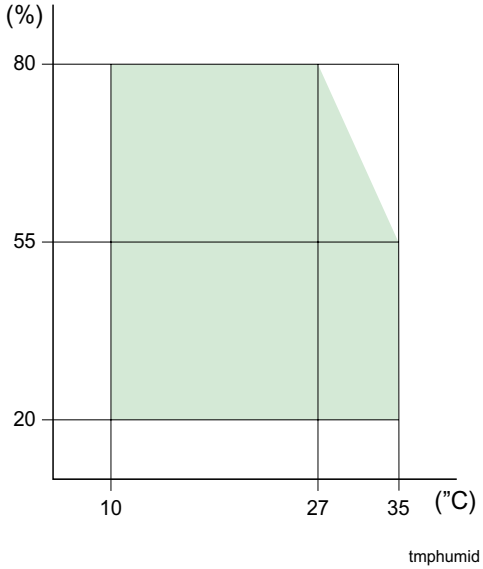

Figure 1-7. Environmental Condition

RESISTANCE TO SHOCK

- ☐ Operating: 1 G, within 1ms (operating)
- ☐ Non-operating: 2G, within 2ms (with shipment container)

RESISTANCE TO VIBRATION

- ☐ Operating: 0.15G
- ☐ Non-operating: 0.50G (with shipment container)

CAUTION

- **When non-operating, make sure the printhead is capped.**
- **When transporting, make sure the printhead is capped and keep the ink cartridge mounted on the printer.**
- **Under the power OFF condition, if the printhead is not capped, turn ON the printer after installing the ink cartridge, and turn off the printer after the capping has completed.**
- **If the printer kept under -40°C, the ink inside the printhead and inside the ink cartridge will be frozen.**
  It takes 3 hours at 25°C to recover once frozen ink to be ready for use.

1.3 Interface Specification

This printer has IEEE-1284 parallel interface and USB interface as standard.

1.3.1 IEEE-1284 Parallel I/F (Forward Channel)

Forward channel is the mode to transfer the ordinary printing command to the printer side from the PC side.

Table 1-5. Parallel I/F Specification (F-Channel)

Item	Specification
Transmission mode	8bit parallel
Synchronization	By STROBE pulse supplied from the external
Handshaking	By BUSY and ACKNLG signal
Signal Level	TTL level (IEEE-1284-Level 1 device)
Adaptable connector	36 pin 57-30360 (amphenol) or equivalent

NOTE: *I/F cable is recommended to be in minimum length.*

The connector pin assignment is described below. For these signals described in the table, use the twist pair wire and connect the return side to the signal GND.

Table 1-6. Connector Pin Assignment and Signals (F-Channel)

Pin No.	Return GND Pin	Signal Name	From	Function Description
1	19	-STROBE	PC	The strobe pulse for the printer to read data. Pulse width requires min. 0.5µs (500ns). High at normal condition. Receives data after shifting Low.
2-9	20-27	Data1-8	PC	The DATA 1 through DATA8 signals represent data bits 1-8, respectively.
10	28	-ACKNLG	Printer	A low signal indicates the printer can accept data. Pulse width is 0.5 (default) or can be set at 2µs.
11	29	BUSY	Printer	A high signal indicates that the printer cannot receive data. The signal becomes high under the condition below; -Receiving data. -Error. -Other I/F receiving data.
12	28	PE	Printer	A high signal indicates paper-out error.
13	28	SLCT	Printer	Always at high level. Pulled up to +5V via 1.0KΩ resistor.
14	30	-AFXT	PC	Not used.
31	30	-INIT	PC	The printer is initialized by the width of min. 50µs Low pulse input.
32	29	-ERROR	PC	A low signal indicates printer error condition.
18	-	Logic H	-Printer	Always at high level. Pulled up to +5V via 3.9KΩ resistor.
35	-	+5V	Printer	Always at high level. Pulled up to +5V via 1.0KΩ resistor.
17	-	Chassis GND	-	Printer chassis GND.
16, 33 19-30	-	GND	-	Signal GND.
15, 34	-	NC	-	Not used.
36	30	-SLIN	-	Not used.

1.3.2 IEEE-1284 Parallel I/F (Reverse Channel)

Reverse channel is used to transfer the information data from the printer side to the PC side.

Table 1-7. Parallel I/F Specification (R-Channel)

Item	Specification
Transmission mode	IEEE-1284 nibble mode
Synchronization	Comply with the IEEE-1284 specification
Handshaking	Comply with the IEEE-1284 specification
Logic Level	TTL level (IEEE-1284-Level 1 device)
Data trans. timing	Comply with the IEEE-1284 specification
Extensibility request data	The printer responds affirmatively when the extensibility request values are 00H or 04H; 00H: Request Nibble Mode Reverse Channel Transfer. 04H: Request Device ID; Return Data Using Nibble Mode Reverse Channel Transfer

- Device ID
  The printer sends following device ID string when it is requested.
  [00H] [5AH]
  MFG: EPSON;
  CMD: ESCPL2, BDC, D4;(*1)
  MDL: Stylus[SP]COLOR[SP]480;
  CLS: PRINTER;
  DES: EPSON[SP]Stylus[SP]COLOR[SP]480;

(*1): When the D4 mode (IEEE1284.4) is OFF, printer reply as follows.
CMD: ESCPL2,BDC

NOTE: *[00H] denotes a hexadecimal value of zero.*
MDL value depends on the EEPROM setting. Refer to Appendix.

The connector pin assignment is described in the table below. For these signals described in the table, use the twist pair wire and connect the return side to the signal GND.

Table 1-8. Connector Pin Assignment and Signals (F-Channel)

Pin No.	Return GND Pin	Signal Name	From	Function Description
1	19	HostClk	PC	Host clock signal.
2-9	20-27	Data1-8	PC	The DATA 1 through DATA8 signals represent data bits 1-8 respectively.
10	28	PtrClk	Printer	Printer clock signal.
11	29	PtrBusy/ DataBit-3,7	Printer	Printer busy signal and reverse channel transfer data bit 3 or 7.
12	28	AckDataReq/ DataBit-2,6	Printer	Acknowledge data request signal and reverse channel transfer data bit 2 or 6.
13	28	Xflag/DataBit-1,5	Printer	X-flag signal and reverse channel transfer data bit 1 or 5.
14	30	HostBusy	PC	Host busy signal.
31	30	-INIT	PC	Not used.
32	29	-DataAvail/ DataBit-0,4	Printer	Data available signal and reverse channel transfer data bit 0 or 4.
18	-	Logic H	Printer	Pulled up to +5V via 3.9K ohm resistor.
35	-	+5V	Printer	Pulled up to +5V via 3.3 K ohm resistor.
17	-	Chassis	-	Printer chassis GND.
16, 33 19-30	-	GND	-	Signal GND
15, 34	-	NC	-	Not used.
36	30	1284-Active	PC	1284 active signal.

Following lists “Notes” when using the parallel interface.

- “Return GND pin” in the table means twist pair return and is connected to the signal GND level.
  For each signal, use the twist pair wire and connect the return side.
  Also, these cables are shielded wires and it is effective means to connect to each chassis GND in the center machine and printer for electrostatic noise.
- Refer to the timing chart for transmission timing of each signals.
- Do not perform data transmission ignoring -ACK or BUSY signals. (Perform the data transmission after confirming that either -ACK or BUSY signal is Low)
- It is possible to perform the printing test including interface circuit without using external equipment when 8-bit data signal (2-9 pin) is set to appropriate character code (against GND, Open=”1”, Short=”0”) and connect then forcefully to -ACK and -STRB. However, to perform this, “I/F selection” of EEPROM must be set to “Auto”. Also, IEEE-1284.4 packet mode must be set Off.

The figure below shows the timing chart of the parallel interface.

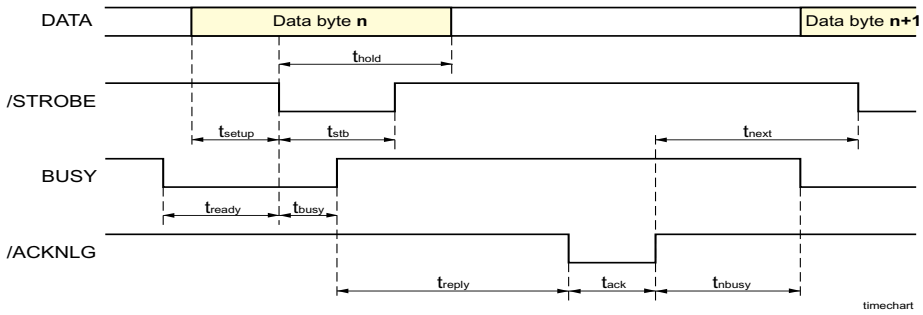

Figure 1-8. IEEE1284 Timing Chart

Table 1-9. IEEE1284 Timing Chart

Parameter	Minimum	Maximum
tsetup	500ns	--
thold	500ns	---
tstb	500ns	---
tready	0	---
tbusy	0	---
tt-out (*1)	---	120ns
tt-in (*2)	---	200ns
treply	0	---
tack	500ns	10us
tnbusy	0	---
tnext	0	---

(1*): Rise and fall time of every output signals.
(*2): Rise and fall time of every input signals.

On the above timing chart, T_{ack} rated period is varies depend on the Parallel I/F data transmission speed below.

Table 1-10. t_{act} Typical time of T_{ack}

Parallel I/F Mode	Typical Time
High speed	2 µs
Normal speed	4 µs

1.3.3 EEE1284.4 Protocol

The packet protocol described by IEEE1284. 4 standard allows a device to carry on multiple exchanges or conversations which contain data and /or control command with another device at the same time across a single point-to-point link. The protocol is not, however. a device control language. It dose provide basic transport-level flow control and multiplexing services. The multiplexed logical channels are independent of each other and blocking of one has no effect on the others. The protocol operates over IEEE1284.4.
Three function modes of IEEE1284.4 protocol, “On”, “Off” and “Auto” are available for Parallel I/F, and the setting is defined based on the data stored in the value in EEPROM address 25<H>.

- On
  Communication in IEEE1284.4 packet mode is started by receiving a magic string (1284.4 synchronous commands). Until a magic string is received, other commands are discarded. In this setting, the printer can not communicate with DOS or Windows 3.X environment.
- Off
  Communication is carried out in the conventional mode. A magnetic string (1284.4 synchronous commands) is discarded. And only IEEE1284 nibble protocol is available.
- Auto
  Communication is carried out in the conventional mode until a magic string (1284.4 synchronous commands) is received. By receiving a magic string, communication in IEEE1284.4 packet mode is started. If the printer dose not receive a magic string, the printer communicates the PC by IEEE1284 nibble mode.

The factory setting for IEEE1284.4 mode is “ON”. But, after complete the initial ink charge operation, the setting of the EEPROM is set to “AUTO”. The change in this setting will be effective when the power is back on after the initial ink charge operation.

1.3.4 Miscellanea

1.3.4.1 Receive Data Buffer Full Operation

Generally, hosts abandon data transfer to peripherals when a peripheral is in busy state for dozens of seconds continuously. In order to prevent the long busy status, printer start receive the data every 1 second when the reset of the input buffer become less than several hundreds of bytes. The printer will be in busy state continuously when the input buffer finally gets full. This operation is not IEEE 1284.4 protocol

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1.3.5 Panel-less control & Status Indication

On this product, the control panel is not assembled in. So, Printer driver utility (STM39 allows to control the printer operation instead of the Control panel and indicates the printer status include the several errors.

1.3.5.1 Error Indication on Status Monitor 3

Following printer status is displayed in the STM3 (Status monitor 3).

☐ **Ink End/Low Error**

When the printer is in the ink end or low condition, the STM3 displays the status. If the “How to” button is clicked, the Ink Cartridge Replacement Utility runs and it reads the ink cartridge replacement procedure step by step.

Figure 1-9. Ink low error indication

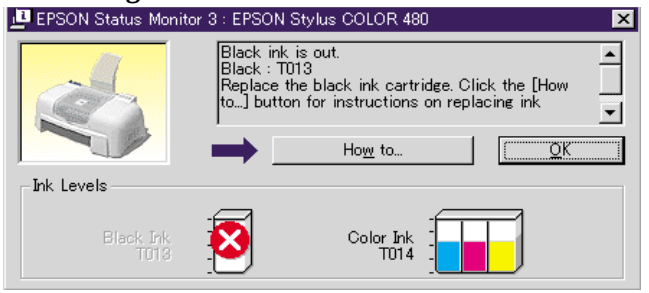

Figure 1-10. Ink out error indication

☐ **Paper out Error**

When the paper is not loaded correctly from the ASF to the PF roller, this error is displayed on the STM3.

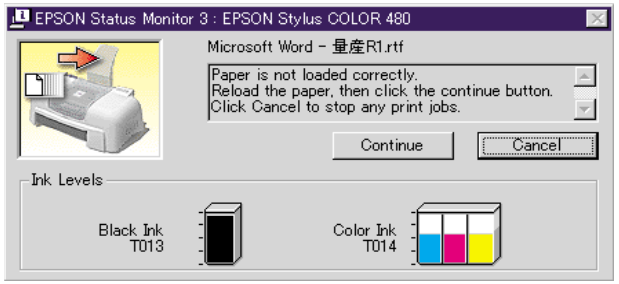

Figure 1-11. Paper out error indication

☐ **Paper jam error**

When the paper is jammed between the PE sensor and the Paper eject roller, this error indication is displayed on the STM3.

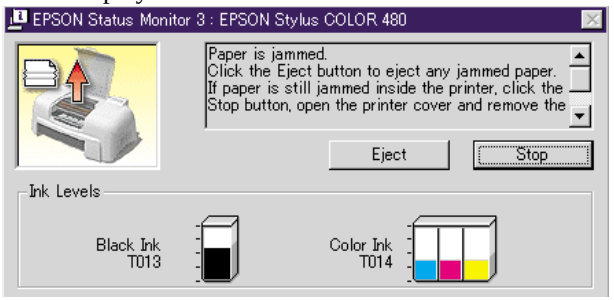

Figure 1-12. Paper jam error indication

☐ **Fatal Error**

When the general error has occurred, this error is displayed on the STM3. For example, circuit damage, motor damage...etc.

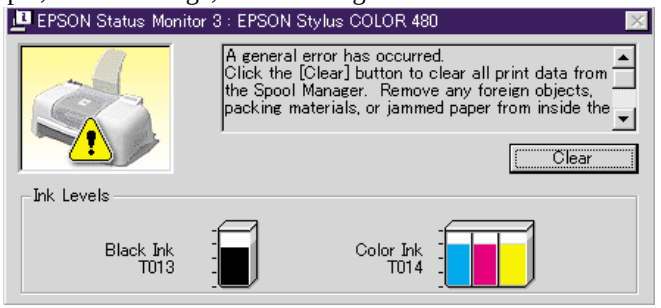

Figure 1-13. Fatal Error indication

☐ **Maintenance Error**

When the waste ink counter reaches to the specific counter value, this error is displayed on the STM3.

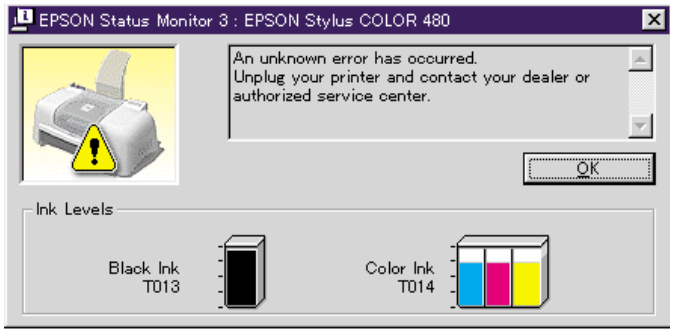

Figure 1-14. Maintenance Error indication

☐ **Communication Error**
When the printer can no t communicate with PC, this message is displayed on the STM3.

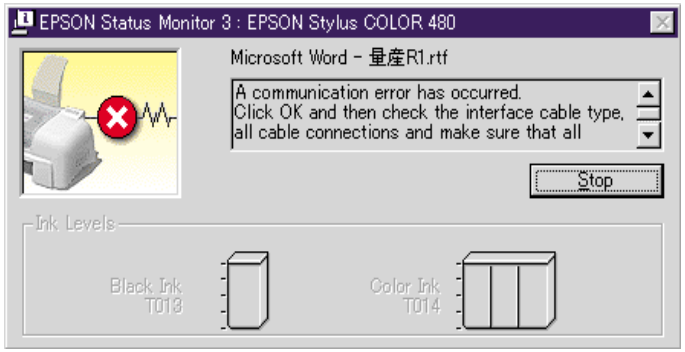

Figure 1-15. Communication error indication

1.3.5.2 Status Monitor 3 function

STM3 in the Printer driver utility allows to perform the following functions.

☐ **Nozzle Check Pattern printing**
The printer prints the nozzle check pattern and the 6 digits code of the firmware version & 6 digits code of the CPU Mask version.

☐ **Head cleaning**

☐ **Bi-d adjustment patter printing**

☐ **Print head alignment adjustment**

☐ **Cancel the Paper out error**
When the paper is not loaded correctly, STM3 (status monitor 3) display the following message and the Paper Error can be canceled by clicking the "Continue" button in the STM3.
"Paper is not loaded correctly. Reload the paper, then click the "Continue" button. Click "Cancel" to stop any print jobs."

☐ **Cancel the Paper jam error**
When the paper is jammed, STM3 display the following message and printer attempt to eject the Jammed paper by clicking the "EJECT" button.
"Paper is jammed". Click the "Eject" button to eject any jammed paper.
If paper is still jammed inside the printer, click the "Stop" button, open the printer cover and remove the paper. Then close the printer cover and click the "Reset" button.
Moreover, if the "Stop" button is clicked, the printing is stopped and the "Reset" button is displayed. If once the "Reset" button is clicked, the printer setting is reset.

☐ **Ink Cartridge Exchange utility**
According to the procedure displayed, I/C can be replaced. In this function, CR moves to the I/C replacement position automatically and turn back to the home position after setting the I/C in the CR unit. This function is always available, not only Ink end or low condition.

☐ **Printer Setup utility**
This utility instructs the printer set up procedure (I/C setting procedure) and print the nozzle check patter and head cleaning. Additionally, printhead alignment pattern is printed and allow the user to adjust the bi-d printing alignment.

1.3.6 Initialization

The printer have 3 types of initialization. The initialization operations executed by each initialization method are described below.

HARDWARE INITIALIZATION

This printer initializes itself when it is turned power on or printer recognized the Reset command (D4 command). On this initialization, following actions are performed.

- Initialize printer mechanism
- Clear the input data buffer
- Clear the print buffer
- Set default values

SOFTWARE INITIALIZATION

Initialization command, “ESC@” also initializes the printer.
On this initialization, following actions are performed.

- Clear the print buffer
- Set default values

POWER ON INITIALIZATION EXCEPT I/F

This printer initializes itself when the printer receive the IEEE1284.4 reset command or the Parallel I/F cable is disconnected /connected.
On this initialization, following actions are performed.

- Initialize printer mechanism
- Clears the input data buffer
- Clears the print buffer
- Sets default values except I/F setting.

1.4 Physical Specification

DIMENSIONS

- Stylus Color 480: 431 mm (W) x 311mm (D) x 271mm (H) (Printing)

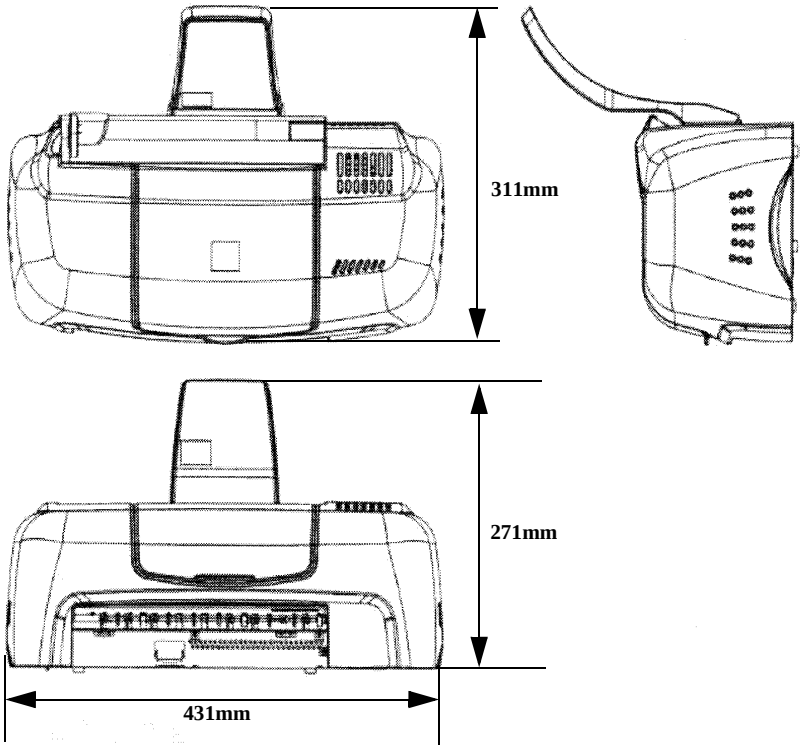

Figure 1-16. Stylus Color 480 Dimensions

WEIGHT

- Stylus Color 480: 3.0kg (without the ink cartridges)

1.5 Consumables and Options

CONSUMABLE

The consumable for this printer are following;

Table 1-11. Consumables

Classification	No.	Name
Consumables	S020187	Ink Cartridge (black)
	S020193	Ink Cartridge (color)

ENCLOSED PARTS

The following parts are enclosed in the Production.

Table 1-12. Enclosed parts

Enclosed Parts	Quantity
User's manual	1 (paper + CD-ROM)
Driver DISK	1(CD-ROM)\
Black ink cartridge	1
Color Ink cartridge	1
Power Code	1(220-240V version only) *1

NOTE: **1: On the 100-120V version product, the power cable is soldered on the PS board directly.*