RPC-42

RPC-42 PRINTER / CHARGER.

Redpost Electronic Products Ltd.

**** See important amendment ****
inside front cover.

(October 1991)

ESSENTIAL READING!

To avoid invalidating the guarantee by incorrect use of this equipment please read at least Section 3 of this manual.

Page 5-1 also contains suggestions that, if followed, should ensure reliable operation.

REDPOST

Redpost RPC-42 Safety & Specification

INTENDED USE.

The Redpost RPC-42 is suitable for use as a playback unit in conjunction with P.U. Monitors also supplied by Redpost Electronic Products Ltd. It must not be used for any other purpose. Read the safety rules before using the equipment.

MAINS SUPPLY.

Before you use the equipment you must check the mains supply voltage at your location. Set the mains voltage selector to the correct position before connecting the equipment. The operating manual explains how to do this.

SAFETY

- Connect only to a mains supply that provides a safety earth (ground) connection. Use a mains lead with a 6 amp minimum rating. If possible use the mains lead supplied with the equipment.

> **DANGER**
> **Using this equipment without an earth (ground) connection could expose you to danger.**

- Always use replacement fuses of the same current rating, voltage and type as that fitted originally. See mains fuse specification below.
- The equipment is for use indoors in a laboratory or other reasonably clean and dry environment. It is not waterproof.
- Do not use where there is the possibility of the presence of explosive gases.
- If liquid is spilled onto the equipment disconnect it from the mains supply at once. Do not use it again until it has been checked by a competent service person.
- There are no operator controls inside the equipment. The main part of the equipment case should not be opened except by a competent service person. The small hinged paper-roll cover can be opened by the operator to allow the paper-roll to be replaced.
- When you use the RPC-42 with any of the Redpost P.U. monitors always do so in a well ventilated room. Do not allow smoking or naked flames nearby. These are normal precautions for charging a lead/acid battery.

EMC COMPLIANCE

To ensure continued conformity with European EMC directives you must use the connecting leads that were supplied with the equipment.

SPECIFICATION : RPC-42

Mains supply	110/220/240V; 1A; 45 - 65Hz
Mains Fuse	T 1A L 250V (two off)
Dimensions	length x breadth x height 335 x 285 x 105 mm
Weight	6.5 Kg
Ambient temperature	5 to 45 °C
Ambient humidity	80 %RH maximum

OPERATING AND SERVICING MANUAL.

RPC-42 PRINTER / CHARGER.

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CONTENTS.

NOTES

Due to improvements in design and the availability of new materials it is possible that the equipment may vary in minor details from that described in this manual.

DESCRIPTION AND SPECIFICATIONS.

GENERAL DESCRIPTION.

The RPC-42 printer/charger unit is designed to produce a printed copy of the results obtained by the RPU-120 P.U. Monitor, RPT-122 Pressure/Temperature Monitor and other instruments in the Redpost range. It also includes a high-speed charger for the battery of the Monitor. The unit is mains powered and housed in a strong metal case but is not designed for use in harsh environments.

A panel control selects either a print-out of just the calculated results and a graph of the temperatures against time or, in addition, a full list of all the recorded temperatures. A factory fitted option allows the graph to be omitted from the shorter list and included in the full list only.

A custom heading is normally included in the print-out from each Monitor together with the serial number of the instrument and this can be used to identify the particular pasteurising line that the results come from.

The Printer.

The 40 column dot-matrix printer uses an ink ribbon for impact printing onto a plain paper roll 114 mm wide. A simple self test feature is included so that the printer can be tested independently from the Monitor.

The Charger.

The charger is a constant voltage type that allows peak charging rates of up to 5 Amps in order to recharge the battery very quickly. The charging voltage is temperature compensated so that the charge rate is always kept within safe limits. The charging current level is shown by two panel indicator lamps.

Options.

An optional output interface, the RPC-8, is available to feed the results into a computer or other external device.

SPECIFICATIONS.

Operating conditions	5 - 45 °C and 30 - 80 %RH.
Power supply	A.C. mains 220 - 250 volts 50/60 Hz. (110 - 125 volts 50/60 Hz to order.)
Power consumption	Approximately 100 Watts. See also Section 5 for fuse ratings.
Size	335 x 285 x 105 mm.
Weight	6.5 Kg.

PAPER FOR PRINTER.

Width	114 mm (+/- 0.5 mm).
Roll Diameter	80 mm maximum. (12 mm inside core diameter).
Thickness	0.1 mm maximum.
Weight	50 - 80 grams/sq metre.
Redpost part number	PRS - 40

RIBBON FOR PRINTER.

Fabric	Nylon #40.
Width	13 mm.
Length	6 m.
Spool size	36 mm diameter (group 24 type).
Redpost part number	RSP - 40

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GENERAL OPERATING INSTRUCTIONS.

PRINT-OUT OPTIONS.

The printed copy can take the form of either a "short" list of the results calculated from the recorded data together with the recorded data shown in graphical form or a "full" list which also includes a list of all the recorded data in numerical form. (As a factory fitted option in the RPC-42 the graph can be excluded from the "short" list.)

TO PRODUCE A PRINT OUT.

With the rear mains-power switch of the printer/charger switched off, connect the P.U. Monitor to the printer/charger with the lead supplied. The P.U. Monitor should be in the idle mode after stopping recording. Do not switch the P.U. Monitor off until all printing has been completed.

Switch on the rear mains-power switch of the printer/charger. The POWER lamp will light and an internal self-test program will run for about 3 seconds to test the control electronics. If all is well, the six front panel lamps will all light together and then the POWER lamp will remain lit as normal operation begins.

Select the longer listing if required by pressing the FULL LIST switch. The FULL LIST lamp will light. Press the switch again to revert to the shorter listing. Whenever the mains power is switched on the initial setting is for the shorter list.

One or both of the CHARGE lamps should now be lit. Details of the charger are given on page 3-6. If one or both of the CHARGE lamps flash or if neither of the CHARGE lamps light then the battery in the P.U. Monitor is not charging. See section 5 for possible reasons.

If the PAPER lamp lights a new paper roll must be loaded into the printer. See page 3-3.

The START switch can now be pressed to start the print-out. The START lamp will light for about 3 seconds and then the printer will start. At the end of the print-out the printer stops automatically and the P.U. Monitor returns to idle mode. If required the START switch can be pressed again to produce another copy of the print-out, possibly after changing the setting of the FULL LIST switch.

If the START switch is pressed while printing is in progress (or if an error occurs in transmission of the data) the print-out will start again from the beginning.

After all the required print-outs have been produced the P.U. Monitor can be switched off ready for a new recording run. Leave the P.U. Monitor connected to the printer charger until the required charging time is over or at least until the HIGH CHARGE lamp has gone out. (See page 3-6.)

PRINTER SELF TEST.

It is possible to test the operation of the printer by using its self-test function. The P.U. Monitor need not be connected to perform the test.

Press the START button and, when the START lamp lights, press and hold the PAPER button until printing starts. The printer will produce two lines of characters showing that the control electronics, paper feed, ink ribbon and print head are all operating correctly.

If the P.U. Monitor is connected, a print-out of the results will not follow the self test.

CHARGE LAMPS FLASHING.

In order to protect the battery of the Monitor from over-discharge, a print-out will not be produced when both CHARGE lamps are flashing indicating that the charger cut-out has operated. (See page 5-7). A message is printed to inform the operator.

PAPER LOADING.

The printer section of the RPC-42 has a friction type of paper feed and uses a standard plain paper roll 114 mm (4.5") wide. When the paper runs out the PAPER lamp will light and printing will stop. The P.U. Monitor will return to idle mode after about 10 seconds.

A new paper roll should be prepared for loading by tearing the end of the roll free from the retaining adhesive and then tearing off the first turn of the roll to remove the double layer.

Open the paper-cover of the RPC-42 by hinging it to the left. Remove the roll support spindle from the uprights and take off the centre core of the empty roll (if any). Use the PAPER switch (with mains power on) to feed out any remains of the old roll and remove it completely from the printer. Check that the tear-off bar is in its normal position; pulled towards the front of the equipment.

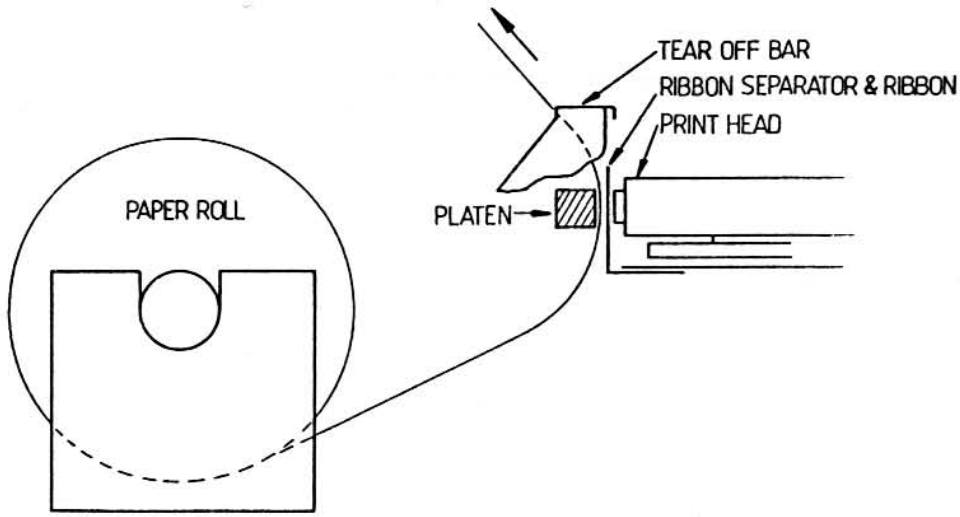
The free end of the roll should be torn cleanly and at a slight angle to the horizontal in order to aid loading. (The exposed vertical edge of the case, when the paper-cover is open, forms a convenient straight edge to tear against.)

Unwind about 50 cm of paper and hold the full roll in one hand above the printer while feeding the free end of the paper from the under side of the roll into the paper entry slot with the other hand. Feed the paper in as far as possible by hand and then operate the PAPER switch (with mains power on) while still holding the full roll above the printer. The paper feed roller in the printer will take hold of the paper and draw it into the printer mechanism, up between the ink ribbon and the metal platen and out under the tear-off bar. See diagram (over).

If the paper catches on the ribbon, the print head or the tear-off bar it may be necessary to stop feeding and guide the paper into the correct path with the point of a pencil but if the paper is cleanly torn or folded as described above it should feed correctly every time.

If necessary, the paper can be pulled through the printer both forwards and backwards without damaging the paper feed mechanism.

PAPER FEED PATH.



Pass the roll support spindle through the core of the roll, lower it onto the uprights and turn the roll to take up the slack paper. Close the paper-cover so that the paper emerges through the slot. Use the PAPER switch to feed a short length of paper to check that all is well and then tear the paper off against the cutting edge of the tear bar.

Always tear the paper towards the front of the instrument and use the PAPER switch to check that the paper is still feeding correctly through the slot after tearing. Printing can now be restarted by using the START switch.

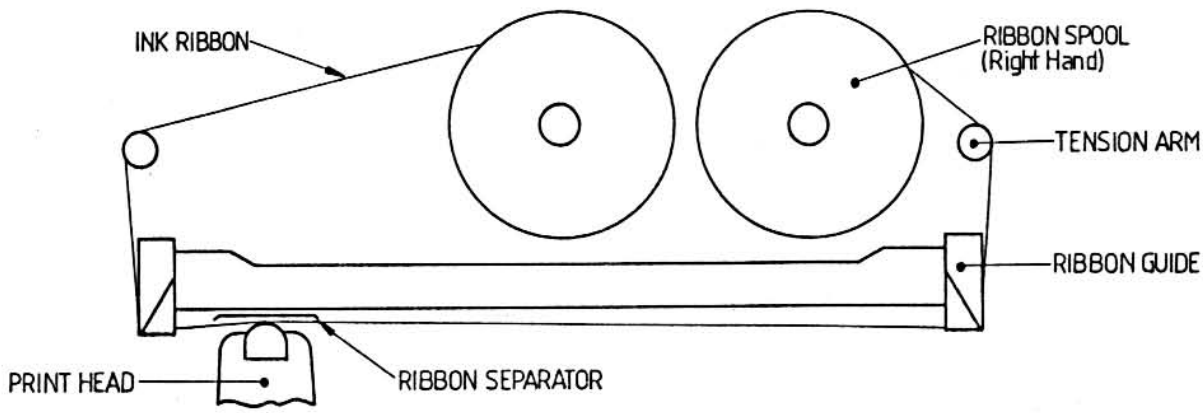
CHANGING THE INK RIBBON.

Ensure that the print head is in its "home" position by briefly using the PAPER switch (with mains power on). Open the paper-cover. Tear off the paper and turn the paper roll backwards to withdraw the paper into the printer. Swing the tear-off bar towards the back of the equipment to give better access to the ribbon path. To remove the old ribbon, first turn the free spool backwards to release the tension on the ribbon and then pull up on both spools to free them from their spindles. Holding the two spools to guide the ribbon, unthread it from the ribbon path taking special care when lifting it passed the print head. Dispose of the old ribbon and its two spools.

Unpack the new ribbon and fit the right hand ribbon spool onto the right hand spindle with its locating pins downwards. Push down until it clicks into place, turning slightly if necessary to allow the locating pins to fit.

Use the other spool to guide the ribbon round the right hand tension arm and ribbon guide and then down between the print head and the ribbon separator. When the ribbon is correctly threaded passed the print head push the left hand spool down onto its spindle until it clicks. Turn the free spool to take up any slack, ensuring that the ribbon is correctly located round the left hand tension arm and ribbon guide. See diagram.

RIBBON PATH.



Return the tear-off bar to its normal position towards the front of the equipment and check that the paper is feeding underneath it correctly by using the PAPER switch.

To check that the ribbon is correctly loaded use the printer self-test facility by pressing the START switch and then holding the PAPER switch until the printer starts. (See page 3-2.) Watch the ribbon to check that it stays tight and correctly threaded. If all is well close the paper-cover so that the paper emerges through the slot.

| Some ribbons are wound onto spools which have locating pins on both sides. These ribbons can be reversed after one half is worn out and refitted upside down to allow the other half of the ribbon to be used.

BATTERY CHARGER OPERATION.

GENERAL.

Whenever the P.U. Monitor is connected to the printer/charger the battery will receive charge. The charging current is measured and the charging level is shown by the CHARGE and HIGH CHARGE lamps on the front panel. The charging voltage is temperature compensated so that charging can take place up to a battery temperature of 60 °C. This allows fast charging to take place.

The CHARGE lamp will light when the charging current is at or above the trickle charge level and so should light whenever the P.U. Monitor is connected. The HIGH CHARGE lamp will light when the battery is more than about 60% discharged and a high charging current is flowing.

In order to protect the battery the RPC-42 will not allow charging to take place when the temperature of the battery is below -10 °C or above 60 °C. When charging is prevented by over or under temperature both the CHARGE and the HIGH CHARGE lamps will flash.

If the temperature of the battery is normal but both charge lamps still flash, the connections to the P.U. Monitor may be faulty. See Section 5.

If, when the P.U. Monitor is connected, neither charge lamp lights (or they light only very briefly) there may be a problem with the connection or the battery may not be accepting charge. See Section 5.

CHARGING TIME.

The charger is able to return to the battery all the charge used in a recording run in less than the time taken to produce a full listing of that run. If the display has been used then charging may take slightly longer.

To ensure sufficient charge for a full two hour recording run and to help maintain the balance of charge in the individual cells of the battery the P.U. Monitor should, if possible, remain connected to the printer/charger for at least 15 minutes or until the HIGH CHARGE lamp has gone out, whichever is the longer.

MONTHLY CHARGING.

Once every month the P.U. Monitor should be switched off and left on charge for approximately 8 hours in order to fully charge the battery and to balance the charge in the individual cells. This longer charge will help to prolong the life of the battery. No harm will be done if the battery is left on charge for up to 24 hours but longer charge periods should be avoided.

During this longer charge the temperature of the battery may rise after some hours and the charging level may return to the "HIGH" rate. It is unlikely that the temperature will rise above 60 °C but in this event charging will stop (and both CHARGE lamps will flash) until the temperature falls to normal levels. The control system of the charger will always keep the charging current within safe limits.

Towards the end of an extended charge period the charging current may fall to such a low level that both the CHARGE lamps may go out. This is acceptable but even when this stage is reached the P.U. Monitor should not be disconnected from the charger until the recommended charge period is over.

VENTING OF GASES.

During charging, small quantities of the gases hydrogen, oxygen and carbon dioxide may be given off by the battery depending on its state of charge. These gases are vented to the atmosphere.

IMPORTANT NOTE.

NO SMOKING DURING CHARGING

Although the quantity of gas evolved is very small, NO NAKED FLAMES and NO SMOKING should be allowed near to the P.U. Monitor during charging. Charging should take place in a well ventilated room. This is standard practice when any lead/acid battery is being charged.

LONG TERM STORAGE.

If the P.U. Monitor is to be stored, unused, for long periods it should be recharged for about one hour every 2 months.

For more details of the P.U. Monitor battery and its care see Section 6 of the RPU-120 operating manual.

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PRINTED RESULTS FROM RPU-120 P.U. MONITOR.

The following details refer to RPU-120 instruments after serial number 3920. Earlier instruments give similar results but have a temperature range of 0 to 100°C only.

The RPC-42 printer/charger unit can print out all the results calculated by the P.U. Monitor together with a graphical representation of the recorded data. Several sample sections of printed results are shown below. These samples are reproduced approximately 20% larger than normal size. The complete example of the graphical review printed after page 7 is not enlarged.

The General Operating Instructions in section 3 of this manual explain how to connect and control the P.U. Monitor and the RPC-42 printer/charger to produce a print out.

IDENTIFYING HEADINGS.

```
REDPOST P.U. MONITOR.    RPU-120 : 3800

          THE MODERN BREWERY COMPANY

LINE -

PRODUCT -

DATE     ____:____:____

TIME     ____.____   AM □   PM □
```

The first line of the print-out shows the type number and serial number of the P.U. Monitor used to make the recording. Then follows a custom heading which is specified for each instrument by the customer at the time of ordering. It may consist of several lines and usually shows the customers name or the location of the pasteuriser and may have spaces for variable information such as product type to be entered by hand.

The next two lines allow time of day and date information to be entered by hand. The results calculated from the recorded data are then printed out. A description of each of these results is given overleaf.

RESULTS.

```
RESULTS.

 18·5   P.U. ACHIEVED.
 58·5   RUN TIME. (MINUTES)

 61·1   MAXIMUM TEMPERATURE. (°C)
 12·5   TIME WITHIN 2°C OF MAX. (MINS.)

 57·1   P.U. LOWER CUT-OFF TEMP. (°C)
 16·5   TIME ABOVE CUT-OFF. (MINS.)
```

P.U. ACHIEVED.

The P.U. value is calculated according to the definition that one minute at 60 degrees Centigrade produces one pasteurisation unit. For every increase or decrease of seven degrees Centigrade the P.U. value changes by a factor of ten. The P.U. Monitor is able to calculate the P.U. value over the range of temperatures from 38 to 85 degrees Centigrade. Normally this wide range is not needed and a cut-off temperature is specified. If the temperature is less than or equal to this cut-off, the P.U. value will be calculated as zero.

The P.U. value is calculated for each half minute of the recording run and summed to give the P.U. achieved.

RUN TIME.

Timing starts after the P.U. Monitor has passed the pre-record self test and the PASS messages have been displayed. The first recording is taken at this time which is designated time zero (0.0) minutes. (Note that timing does not start immediately the RECORD switch is operated.)

The run time is the time interval from time zero until recording was stopped. It is rounded down to the nearest half-minute and so, for instance, a run of 20 minutes and 29 seconds would show a run time of 20 minutes.

MAXIMUM TEMPERATURE.

This is simply the highest temperature (in degrees Centigrade) reached at any time during the recording run. The first recording made at time zero is included in the calculation.

TIME WITHIN 2 DEGREES OF MAXIMUM.

Each record is checked to find how close it is to the maximum temperature. The total time during which the records are within two degrees Centigrade of the maximum gives the required result. If the recording has several peaks, all reaching to within two degrees of the maximum, then the total time of all these periods is given. The result is intended to show the duration of the plateau or holding region of the time / temperature curve.

The time near maximum is rounded down to the nearest half-minute. Times near maximum of less than half a minute (one record only) will give a zero result. Only a very sudden isolated peak can give this unusual result.

The two degrees Centigrade figure for the selection limit is accurate when the maximum falls within the normal working range of 40 to 80 degrees Centigrade. For maxima outside this range the selection limit will be broader.

P.U. LOWER CUT-OFF TEMPERATURE.

This is a reminder of the cut-off temperature (in degrees Centigrade) that has been specified by the customer and programmed into the P.U. Monitor used to make the recording. Temperatures less than or equal to this value will not contribute to the P.U. calculation.

TIME ABOVE CUT-OFF.

The total time during which recordings contributed to the P.U. calculation gives this result. The time is rounded down to the nearest half-minute so that total times of less than half a minute will give a zero result.

REASON FOR STOPPING.

One of the following messages will be printed to show why the recording run ended. [On Monitors before number 3921 the messages are only printed for full memory or low battery:- see over.]

RECORDING ENDED WHEN SWITCH WAS OPERATED

RECORDING ENDED WHEN PROBE WAS REMOVED.

FULL MEMORY OR LOW BATTERY.

If the recording run ended when the recording memory became full (after 2 hours) or because the battery voltage fell too low for accurate operation then one of the following messages will be printed to warn the operator.

RECORDING ENDED BECAUSE OF FULL MEMORY.

RECORDING ENDED BECAUSE OF LOW BATTERY.

OFF SCALE RECORDS.

If the recorded data includes any records that are off-scale (below -5 or above 100°C) the majority of the results would be meaningless and so the results section is not printed. The following message is printed to inform the operator.

RESULTS SUPPRESSED - OFF-SCALE READINGS.

If the short list has been selected a second message suggests that a full listing will show at what time the off scale recordings were made. This may help to give an explanation of the problem. Section 8 of the P.U. Monitor manual may help to trace any faults.

RESULTS SUPPRESSED - OFF-SCALE READINGS.

FULL LISTING WILL GIVE ALL READINGS.

GRAPHICAL REVIEW

Following the results section the graphical review is printed. A complete example of the graph is printed on the reverse side of page 7 of this section.

The recorded data is printed out in graphical form as a means of visually checking the overall shape of the time/temperature curve. This can be helpful in tracing unusual or fault conditions caused by malfunctions in the pasteuriser.

For standard instruments the graph is produced for recordings in the range 40 to 79 degrees Centigrade using each of the printer's 40 character positions to indicate one degree. The graph heading shows the temperature axis with the temperature rising from left to right. Each graph point is represented by an asterisk "*" at the correct position across the axis. Temperature values are rounded to the nearest degree so that 54.4 is shown as 54, while 54.5 is shown as 55.

Temperatures that are outside the normal working range are shown as a left pointing arrow in the left margin for temperatures below 40 degrees Centigrade and a right pointing arrow in the right margin for temperatures above 79.4 degrees Centigrade.

As an aid to reading the graph, a "grid" mark is made at 5 degree intervals across the temperature axis to the left of the graph points.

The time axis runs down the paper and a time marker is printed every 5 minutes. The first graph point is at time zero (0.0) which refers to the recording made immediately after the P.U. Monitor passed the pre-record self test. Graph points are plotted for every one minute of the recording run.

Extended range instruments (9999 P.U. range) usually produce a graph covering the range 45 C to 84°C. The graph heading shows the range in each case.

OFF SCALE RECORDS.

If the recordings contain any off scale records (below -5 or above 100°C) the graph is not printed. The following message is printed to inform the operator.

```
GRAPH SUPPRESSED - OFF-SCALE READINGS.
```

FULL REVIEW LISTING.

FULL REVIEW LISTING.

TIME	°C	TIME	°C
0·0	16·3	0·5	16·3
1·0	16·3	1·5	16·3
2·0	16·3	2·5	17·0
3·0	17·7	3·5	19·1

If the FULL LIST has been selected (See page 3-1), the final part of the print-out will be a listing of all the recorded data in numerical form. The time of each record and the temperature recorded (in degrees Centigrade) are listed in order with two time/temperature pairs per line. As an aid to reading the list it is divided up into ten line sections with the column headings repeated every two sections.

OFF SCALE RECORDS.

If any of the records are off scale (below -5 or above 100°C) the review list is printed but the temperature value of each off scale record is replaced by the message "LOW" or "HIGH" as appropriate. The timings of the off scale records may help to suggest an explanation of the problem. The fault finding suggestions on probe damage in section 8 of the RPU-120 manual may help to trace any faults.

TIME	°C	TIME	°C
40·0	* HIGH *	40·5	* LOW *

NO RECORDS FOUND.

If a print out is made from a P.U. Monitor that has made no recordings since it was switched on, the following message is printed to show the serial number of the instrument and inform the operator that no data can be found in the memory.

```
REDPOST P.U. MONITOR.   RPU-120 : 3800

        ** NO DATA FOUND **
```

END OF PRINT OUT.

After the print-out is finished about 50 mm of blank paper is fed out. The paper should be torn off towards the front of the instrument using the sharp edge of the tear-off bar.

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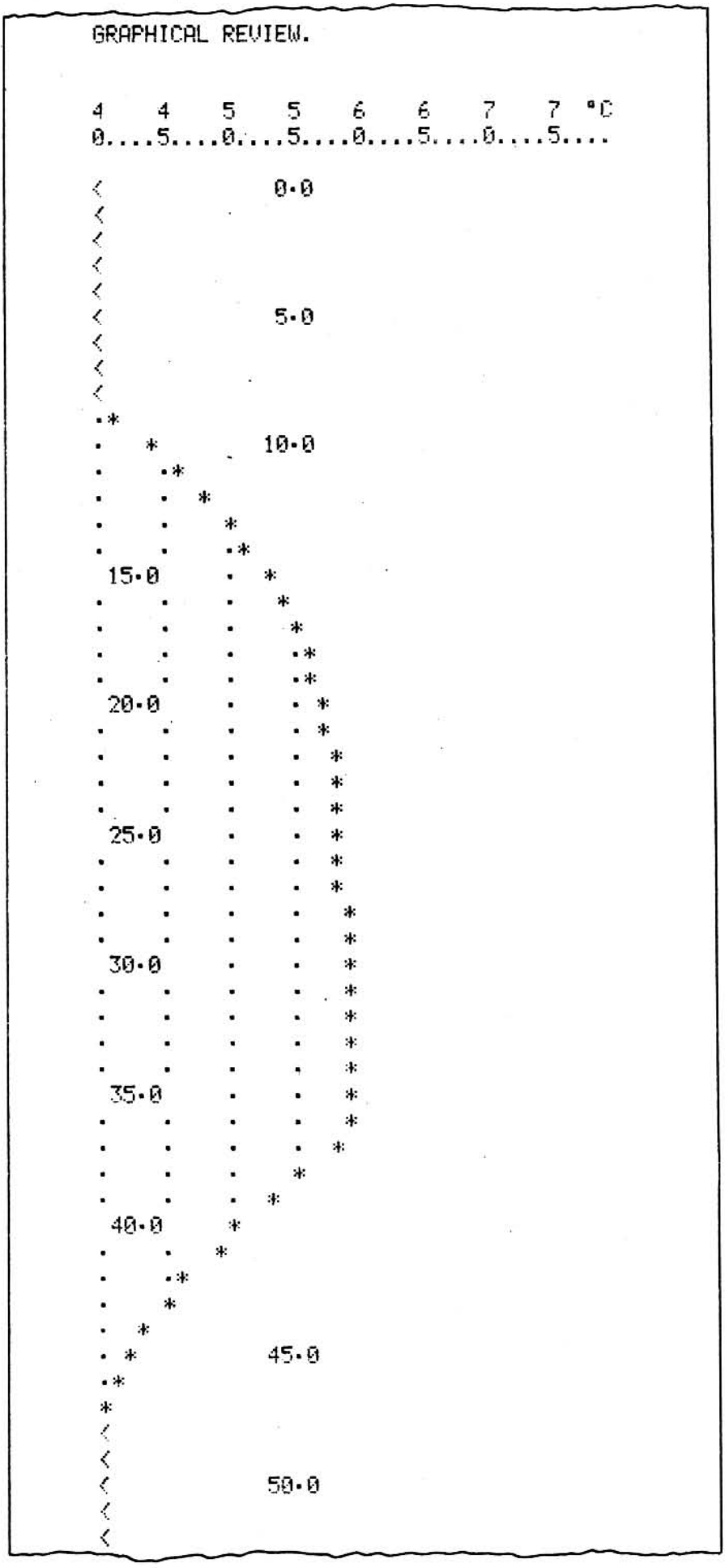

GRAPHICAL REVIEW.
4 4 5 5 6 6 7 7 °C
0....5....0....5....0....5....0....5....
0·0
5·0
10·0
15·0
20·0
25·0
30·0
35·0
40·0
45·0
50·0

MAINTENANCE AND PROBLEM SOLVING.

MAINTENANCE.

No regular preventive maintenance is required for the RPC-42. All the moving parts of the printer mechanism are lubricated for life. However, the reliability of the equipment will be improved if the suggestions below are followed for the proper care of the unit.

CARE OF THE INSTRUMENT.

GENERAL.

Try not to use or store the printer/charger unit in direct sunlight or in dusty, damp or humid conditions. Keep away from metal filings, swarf or other metal particles that might enter the printing mechanism.

Never attempt to operate the printer without paper or without the ink ribbon.

Always tear the paper carefully and towards the front of the unit. Pull slightly to one side so that the teeth of the tear-off bar cut into the paper at one edge first and the paper is cut cleanly.

Always use the PAPER switch to check that the paper is feeding freely from the tear-off bar before starting a print-out run.

MAINS SUPPLY.

The mains supply to the instrument is electrically filtered internally but it is still wise to choose a supply point for the unit that is free from interference spikes. If possible do not run the printer/charger from any circuit that supplies thermostatically controlled equipment (such as refrigerators or heaters), welding equipment or large motors.

PRINT HEAD.

The print head should not require cleaning during its life which is more than 15 million characters. Should the print head ever fail it can be easily replaced; full fitting instructions are included with the replacement print head.

If paper of non-standard thickness or two-ply carbonless copy paper is used then it may be necessary to readjust the clearance between the face of the print head and the platen to obtain best quality printing. Full details of the adjustment can be supplied on request.

REPLACEMENT OF FUSES.

There are two fuses in the printer/charger unit; one for the mains supply and one for the charger output. It is most important in order to maintain safe operation of the unit that the fuses are replaced only with similar fuses of the correct value and type.

Always disconnect mains supply before removing fuses.

The mains fuse is housed in the body of the mains input connector on the back panel of the unit. A broad bladed screwdriver should be used to open the fuse carrier "drawer" after the mains input lead has been taken out. A spare fuse is supplied in the front section of the "drawer".

The charger fuse holder is mounted on the internal barrier that divides the paper-roll holder section from the rest of the instrument and is accessible when the paper cover is open. It may be necessary to remove the paper roll itself. Use a broad bladed screwdriver to remove the fuse-holder cover.

The fuse ratings are as follows :-

Mains fuse (220 - 250 volt supply)

Type	20 mm x 5 mm Slow Blow
Rating	500 milliamp
Suppliers	Littelfuse type 213 - 500 mA
	R.S.Components 412-374

Charger fuse

Type	20 mm x 5 mm Quick Blow
Rating	5 Amp
Suppliers	Littelfuse type EA or ECX - 5A
	R.S.Components 412-188

Spare fuses are supplied as part of a Printer Fuse Kit:-
Redpost part number FSK - 42

(Option) Mains fuse (110 - 125 volt supply option)

Type	20 mm x 5 mm Slow Blow
Rating	1.0 Amp
Suppliers	Littelfuse type 213 - 1A
	R.S.Components 412-396

MAINS SUPPLY LEAD FUSE.

The mains supply lead is normally fitted with a UK type square pin plug and this plug is fitted with a 5 Amp fuse. It is recommended that if the mains plug has to be changed a fuse of between 3 and 5 Amps rating is fitted at some point in the supply circuit. Always use a plug with an earth connection.

INDICATOR LAMPS.

The indicators on the front panel of the printer/charger are all of the solid state, light emitting diode type and should not need replacement.

FAULTY OPERATION & PROBLEM SOLVING.

GENERAL.

This section attempts to suggest the most likely causes of faulty operation of the printer/charger. Sometimes faults may exist which cannot be traced without dismantling the unit and testing individual printed circuit boards. Circuit diagrams for the unit can be supplied on request but only qualified persons should attempt to repair electronic equipment and we advise that if faults occur the unit should be returned to us for repair. When equipment is under guarantee it must in all cases be returned for repair or replacement if faults occur.

INDICATORS AND SWITCHES.

No POWER lamp.

If the POWER lamp does not light when the unit is switched on and the rest of the unit appears dead, first check the mains lead and mains plug. Disconnect the mains power lead and check the 500 mA slow blow fuse inside the mains input connector. (For 120 volt option this is a 1 Amp fuse.) Visual inspection will show whether the fuse has blown. If the fuse has blown, replace it with one of exactly the same type and rating. See page 5-2. If the fuse blows again within a short time then a fault must exist in the charger or possibly in the connecting lead to the P.U. Monitor.

It is possible that the mains switch itself is faulty or that a fault exists in the power supply section of the unit. It is advised in such cases to return the unit for repair.

If the temperature of the printer/charger seems to be unusually high the over-temperature cutout may have operated. This is a protection device included in the mains transformer to prevent the danger of fire if a fault causes a large temperature rise. The cutout does not reset and the unit should be returned for repair so that a replacement can be fitted and the cause of the overheating can be investigated.

No START lamp.

Check the paper supply: the START switch does not operate when the printer has run out of paper. The PAPER lamp should be lit in this case. Load a new roll of paper and restart.

If there is a good supply of paper then the fault may lie in the circuitry or the START switch itself may be faulty.

No PAPER lamp.

If the paper has run out and the PAPER lamp does not light and if printing continues turn the unit off at once to avoid damage to the printing mechanism. Check that the paper chute is not blocked with a scrap of torn paper. There is a small micro-switch to detect paper in the paper chute: this switch may be faulty. The switch should be heard to operate when paper is pushed into the paper chute: check by pushing a short length of paper in and out of the chute. The lever of the micro-switch may have become bent out of shape or it may have been forced behind the horizontal bar that normally acts as its back stop.

No FULL LIST lamp.

A circuit fault must exist or the FULL LIST switch must be faulty. Pressing the switch should first turn the full list feature on and pressing the switch again should turn it off. The full list feature is always off when the instrument is first turned on.

POWER-ON SELF TEST.

If when the unit is first turned on only the POWER lamp lights and any other single lamp flashes regularly, a fault has been found during the initial self-test and it is advised that the unit be returned for repair.

CHARGER SECTION.

NO LAMPS.

Assuming that the POWER lamp is lit and that the P.U. Monitor is connected to the printer/charger then at least the CHARGE lamp should be lit. If neither lamp lights then the following possibilities should be investigated:-

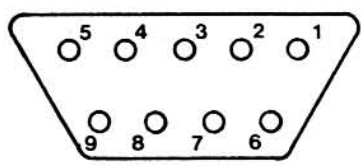
a) The 5 Amp quick blow fuse on the internal panel near the paper-roll holder has blown.
b) The connecting lead to the P.U. Monitor is faulty.
c) The P.U.Monitor is faulty.
d) The charger circuit is faulty.

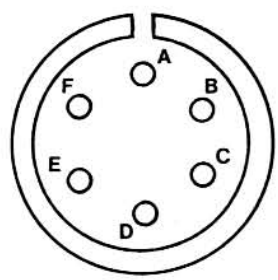
Possible action.

a) Always disconnect the mains supply before removing fuses. If the fuse has blown always replace it with one of exactly the same type and rating: see page 5-2. If the fuse blows again within a short time then there may be a fault in the charger circuit or in the cable to the P.U. Monitor.

b) With the cable unplugged at both ends check the continuity of connection from one connector to the other according to the table below. Also check that there are no short circuits between the connections.

CHARGER END. MONITOR END.





CONNECTIONS.

1,5,6 & 9	A & F
2	B
3	C
4	D
7	No Connection
8	E

c) If possible check the P.U. Monitor on a second printer/charger. If the battery of the Monitor is faulty or the fuse in the Monitor has blown, the instrument may appear to operate correctly when connected to the charger but will take no charge (no CHARGE lamps) when turned off and will not operate when disconnected from the charger.

d) If possible test the charger on a second P.U. Monitor. If the charger circuit is faulty it is advised that the unit be returned for repair.

CHARGE / HIGH CHARGE LAMPS FLASH.

If one or both of the CHARGE lamps flash then the charger cut-out has operated. This is caused by the temperature of the Monitor's battery, as sensed by the charger circuit, being outside the range -10 to 60 °C. If the actual temperature is unlikely to be outside this range then check the connecting lead for continuity as described on page 5-6 (section 'b'). The lead should be unplugged from both ends for this test. In particular check the continuity from 8 to E and check that there is no connection between 8 and 9.

If no fault can be found in the lead the problem may lie in the P.U. Monitor and this should be checked as described on page 8-3 of the RPU-120 manual under the heading "Instrument will not charge".

If the P.U. Monitor is not plugged into the charger the CHARGE and HIGH CHARGE lamps will both flash because the temperature sensor is disconnected. If a resistor of value 1000 ohms is now connected between pins 6 and 8 of the printer/charger output socket the flashing should stop and a relay in the unit will be heard to close. If this does not happen there is a fault in the charger circuit and it is advised that the unit be returned for repair.

A print out will not be made when the charger cut-out has operated. This prevents over discharge of the battery in the Monitor.

PRINTER UNIT PROBLEMS.

GENERAL.

The majority of printer problems are caused by the paper jamming in the mechanism and possibly causing damage to the ribbon and other parts of the printer. If the paper is torn cleanly from the tear-off bar it should feed correctly when the next print-out is begun. If the paper has a ragged tear it may catch on the tear-off bar or on the slot in the paper cover and as more paper is fed from the printer it will fold up inside the mechanism and a jam can be formed.

The backward and forward motion of the print head will normally tend to free the paper but in some cases this will not happen, the ribbon may be dislodged from its path and the movement of the print head may be halted. In some cases the ribbon will be caught up in the spiral drive of the print head and will cause it to jam.

If the mechanism becomes completely jammed the motor drive circuit will sense that the motor has stalled and will stop the motor. If this occurs during a print-out then the printer/charger and the Monitor will both revert to idle mode.

REMOVING THE COVER.

In most cases where the paper or ribbon has jammed it will be necessary to remove the cover of the printer/charger unit to gain access to the mechanism.

IMPORTANT SAFETY NOTE.

Before removing the cover make sure that the mains supply to the unit is completely disconnected.

The main cover is held in place by four M3 button-head socket screws which should be removed with a 2 mm AF hexagon key. This key is supplied as part of the printer/charger fuse kit; Redpost part number FSK - 42. (N.B. The two screws that hold the hinged paper cover should not be removed.) The main cover can then be lifted clear of the unit.

UNJAMMING THE PRINTER.

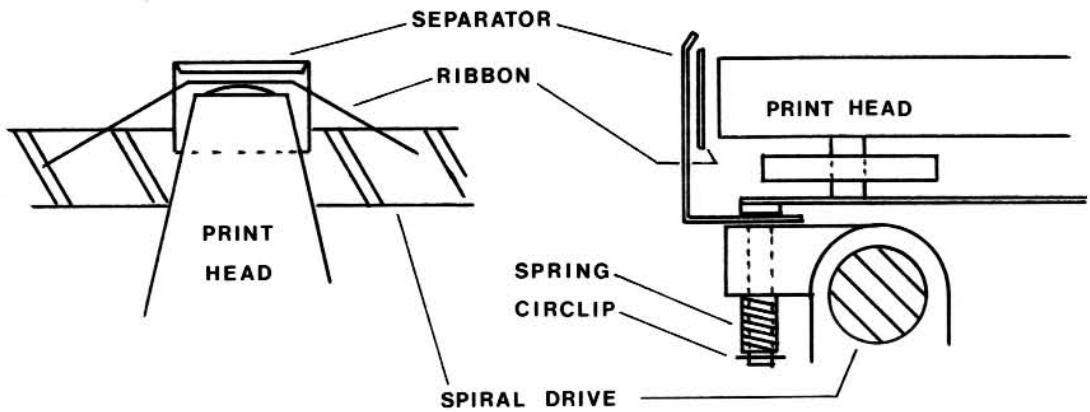
With the cover removed it will be possible to see more clearly what has caused the printer to jam. It is usually possible to turn the mechanism by hand in either direction using the large white nylon gear on the right. Do not force the gear if the mechanism is jammed.

Remove all paper from the mechanism taking care not to further damage any of the parts. If the ribbon is caught in the mechanism it must be freed and replaced if cut or torn.

RIBBON SEPARATOR.

Check the print head ribbon separator is not twisted or bent. It's correct position is shown in the diagram below. The ribbon separator is difficult to remove or replace but if necessary a spare can be supplied. It is possible to operate the printer without the ribbon separator but the print quality will be reduced.

RIBBON SEPARATOR.



TOP VIEW. SIDE VIEW.

After freeing the mechanism rethread the ribbon and reload the paper. Before testing the printer it is advisable to replace the cover, at least temporarily, to avoid any danger from the mains power unit.

PRINTER REMOVAL.

If it is ever necessary to remove the printer mechanism from the case, to change the ribbon separator for instance or to completely replace the printer, the four M4 screws passing through the mounting grommets should be removed and the printer lifted clear of the four pillars which should be left fixed to the case. All connections are removeable via plug and socket links.

The printed circuit board under the printer mechanism carries the micro-switch for paper sensing. When refitting the printer is is important to hold this micro-switch down when positioning the printer mechanism above it. This allows the lever arm to clear an obstruction inside the paper shute and to take up the correct position.

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SAFETY.

ELECTRICAL.

Although the RPC-42 is mains powered, all the parts accessible when the hinged paper-cover is open are operating at low voltage and do not present any electrical shock hazard. An earthed barrier divides the case internally and so prevents access to the mains power supply section.

Always use a correctly wired three pin plug with an earthed supply socket for the mains supply or else connect the earth wire of the mains supply lead to a suitable earth point.

The front panel indicators are illuminated by low voltage LEDS run from an isolated supply. All voltages present on the rear panel connector are too low to present any electrical shock hazard. All currents are limited to safe levels by fuses or overload cut-outs. The mains transformer is protected against overheating by an over-temperature cut-out.

FUSES.

Always completely disconnect the mains supply from the unit before removing or replacing the fuses. A warning notice to this effect is printed on the rear panel.

Always use the correct type and value of replacement fuse link. See Section 5-2. A spare mains fuse is supplied inside the fuse holder.

COVER REMOVAL.

Only qualified persons should attempt to repair electronic equipment and we advise that if faults occur the unit should be returned to us for repair. However, if necessary the cover can be removed as described in Section 5-8. Always completely disconnect the mains supply before removing the cover. Do not run the unit under test with the cover removed; replace the cover at least temporarily before testing.

All the mains voltage connections are sleeved or insulated and this insulation must be put back into place if disturbed during repairs.

BATTERY GASES.

When the battery in the P.U. Monitor is being charged hydrogen and oxygen are vented from the Monitor's case in small quantities. This is a potentially explosive mixture and so the normal precautions for charging a lead/acid battery should be taken. No naked flames and no smoking should be allowed near the equipment when the battery is being charged. Charging should take place in a well ventilated room.

ELECTRONIC COMPONENTS.

If the cover is removed or if the case is accidentally damaged so that internal components are exposed, several potential safety hazards are produced. These are in addition to the possible danger of electrical shock if the equipment is connected to the mains supply.

Electrolytic capacitors (bead shape and cylindrical) may contain liquid electrolyte. The chemical constituents vary from manufacturer to manufacturer but in general, if the components are damaged, skin contact should be avoided and any liquid washed away in cold water.

The large transistors and bridge rectifiers that are bolted to the internal heat sinks and to the bottom of the case may contain Beryllium Oxide, a toxic substance, that could be released if their cases are broken open. All skin contact should be avoided.

In general any damaged electronic component should not be handled if at all possible.

FIRE.

If the equipment is involved in a fire it should be remembered that PVC covered wire and other plastics may give off noxious fumes when burning. The amount of plastic material in the instrument is small and should not create a dangerous concentration of fumes in a normal room.

If it is possible, disconnect the equipment from the mains supply before using fire fighting equipment.

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GUARANTEE. (U.K. CUSTOMERS.)

TWO YEAR GUARANTEE. (Electronics.)

All parts manufactured by Redpost Electronic Products Ltd. in the RPC-42 Printer/Charger are guaranteed against defects arising in normal use for a period of two years from the date of purchase provided that the defect has not been caused by misuse or abnormal conditions of operation.

The Printing Head and Printing Mechanism are not manufactured by Redpost Electronic Products Ltd. and are guaranteed against defects arising in normal use for a period of 6 months from the date of purchase provided that the defect has not been caused by misuse or abnormal conditions of operation.

Redpost Electronic Products Ltd will repair or replace (at their discretion) the faulty equipment if it is returned to them, carriage paid, within the guarantee period.

Pack the equipment carefully and send it with a note describing the fault to the address shown in the front of this manual.

This guarantee is offered in addition to any statutory rights to the original purchaser only.

This guarantee is offered to U.K. customers only. Customers outside the U.K. should contact the distributor from whom the instrument was purchased to check the guarantee and service arrangements for that particular country.

This guarantee does not cover fuses, printer ribbons, printer paper or other consumable items.

REPAIRS & SERVICING.

RETURNING EQUIPMENT FOR REPAIR.

Should any fault develop, the equipment should be returned, carefully packed and carriage paid, to Redpost Electronic Products Ltd at the address shown in the front of this manual.

If the guarantee has expired or if the fault is the result of misuse then repairs will not be carried out until a price has been agreed and an official order received.

Normally repairs will be completed within one working week from receipt but failing this we will often be able to loan replacement equipment until the original items are fully repaired. (U.K. mainland only.)

Please include the model number and serial number of the instrument in any communication regarding service.

Customers outside the U.K. should contact the distributor from whom the instrument was purchased to check on the service arrangements for that particular country.

NOTE. WE WILL SUPPLY CIRCUIT DIAGRAMS OF THE RPC-42 ON REQUEST BUT WE WOULD ADVISE THAT FAULTY EQUIPMENT IS RETURNED TO US FOR REPAIR.

ONLY QUALIFIED PERSONS SHOULD ATTEMPT TO REPAIR ELECTRONIC EQUIPMENT.

SPARES FOR THE RPC-42.

DESCRIPTION	PART NUMBER	QUANTITY
Paper Roll	PRS - 40	Box of 10
Ribbon (Purple)	RSP - 40	One
Fuse Kit	FSK - 42	Contents:- 3 x 500 mA Slow Fuse 3 x 5 Amp Quick Fuse 1 x 2 mm AF Hexagon Key

The following items are not normally held in stock but are available to special order. There may be minimum order quantities on some items; please check when ordering.

Paper Roll (2 ply) (Carbonless Copy)	PRD - 40
Ribbon (Black)	RSB - 40
Fuse 1 Amp Slow (For 120 V Option)	FSS - 001

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