Spectra-Physics

SP4200
Operators Manual

Part Number A0099-091 (insert only)
Part Number A0099-092 (W/BASIC and Binder)

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SP4200

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FEDERAL COMMUNCATIONS COMMISSION
RADIO FREQUENCY INTERFERENCE
STATEMENT

Warning: This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. As temporarily permitted by regulation it has not been tested for compliance with the limits for Class A computing devices pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

INDEX OF FILE DIALOG AND TIME FUNCTION PARAMETERS

SECTION 1
INSTALLATION

Figure 1.1 SP4200 Showing Power Switch and Channel Selector Switches

1.1 UNPACKING

1. Upon receipt of the instrument inspect the packaging for evidence of damage. If the packaging appears to be damaged, have the damage noted by the carrier on both the delivery receipt and the freight bill. The carrier is responsible for damage incurred during shipping.

2. Unpack the instrument and inspect it for damage. If damage is found notify the carrier and your Spectra-Physics representative.

   A list of accessories and their part numbers is included on the next page.

NOTE

It is the buyer's responsibility to note any damage at the time of delivery, and report any damage to the carrier and your Spectra-Physics representative immediately. Do not return goods to Spectra-Physics without authorization from a Spectra-Physics representative.

Table 1.1 Accessory Parts List.

P/N	QUANTITIES		DESCRIPTION
	Ver. 030/070 (120V)	Ver. 040/080 (240V)	
A0099-092	1	1	Instruction Manual SP4200
A0022-010	1	1	Z-Fold Paper
A0099-093	1	1	Instruction Card
A1366-010	1	0	Power Cord, UL tested
6003-0330	0	1	Power Cord, CEE Coded
5401-0620	1	1	Alignment tool
5101-0060	2	0	Fuse, SloBlo, 2.0 amp.
5101-0550	2	4	Fuse, SloBlo, 1.0 amp.
5101-0660	6	6	Fuse, SloBlo, 5.0 amp.
5101-0740	1	1	Fuse, SloBlo, 6.25 amp.
A1249-010	1	1	Hood, Connector, Mod.
2114-0380	1	1	Hood, Connector
2105-2110	1	1	Connector, 18/36 pin
2105-0910	1	1	Connector, 6/12 pin
A2116-010	1	1	Cover, Connector, External
A2156-010	1	1	Installation Option Cables Connection

1.2 CHECKOUT PROCEDURE

Locate the SP4200 near the detector. Make sure the placement provides access to the rear of the instrument.

1.2.1 Electrical Connections

The SP4200 operates on AC line frequencies of either 50 or 60 Hz, and is preset at the factory for either 120 VAC or 240 VAC as described on the Serial Tag (Figure 1.2). If the AC line voltages in your area do not come within the range of +10 to -20% of these ratings, change the line voltage input selector to accommodate your line voltage (see Appendix 1 for instructions on changing the line voltage selection). Line voltage inputs of 100, 120, 220, or 240 can be selected.

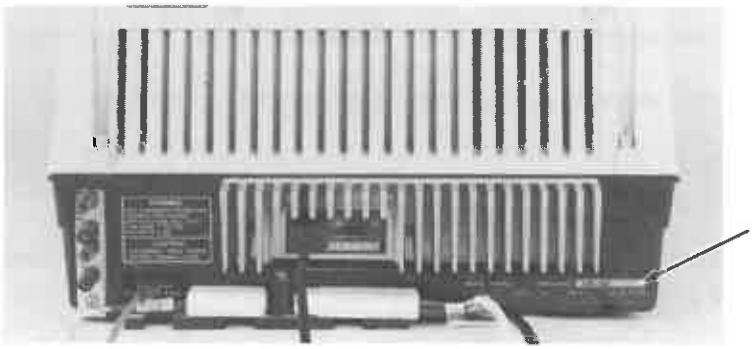


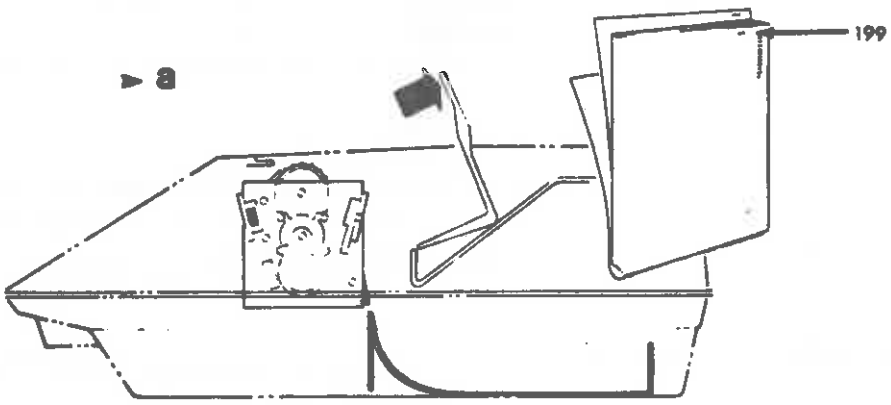
Figure 1.2 Location of the SP4200 Serial Tag

1.2.2 Printer/Plotter Paper Installation

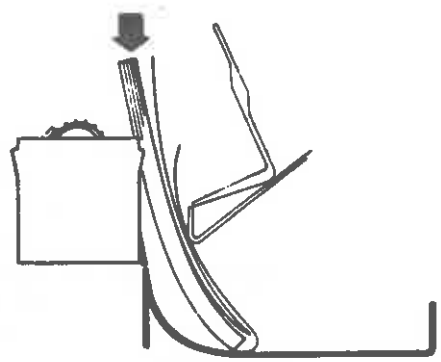
A pack of thermographic paper is included in the accessory kit. If this pack is the only one you have, you should order more immediately (P/N A0022-010).

To Install Paper

1. If there is a sheet still in the instrument, hold the ENTER key down to let it run out.
2. Remove the paper you are installing from its plastic jacket.
3. Lift the top page; make sure the number **"001"** is on the top right corner. Fold page 200 back over page 001 so page 199 is on the bottom.
4. Push back the clear plastic writing tray to expose the paper bay entrance.



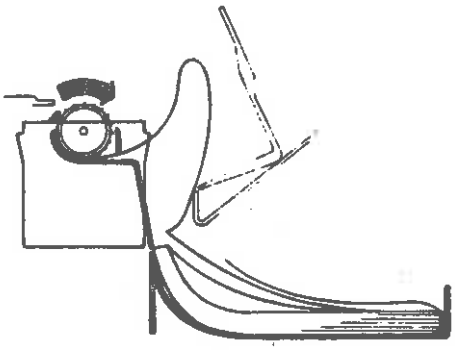
5. Place the paper pack in the paper bay, and slide the paper down and back. A slight up and down movement may be necessary to make the paper slide.



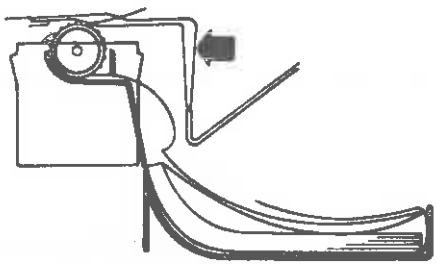
6. Place the top of the first page in the paper receiver slot. Press the ENTER key to start the paper roller.

7. Hold the ENTER key down and guide the paper into the slot until the sprocket keyholes in the paper are engaged by the platen sprockets and the top of the page is driven up to about 7 cm above the top of the print head.

►c



►d



8. Close the plastic writing tray and feed the page into the slot in the tray. If the top of the page is not parallel with the slot, pull the upper edge of the lower corner while feeding paper with the ENTER key until it is parallel.

1.2.3 Battery Backup of the SP4200

The SP4200 is equipped with a battery backup feature to prevent loss of data stored in read/write memory (RAM) in the event of a power failure. Appendix A describes a test of the battery backup system.

1.2.4 Internal Adjustments

It is assumed that internal controls and switches are properly set at the factory and no modification of these settings is necessary for initial operation of the SP4200. If changes become necessary, refer to Appendix A for directions on adjusting the analog board voltage range selector switch and the data system analog board adjust control.

NOTE: The Analog board voltage range selector switch is factory preset at 1.0 V, which is suitable for most applications.

1.2.5 Test Signal

Turn on the SP4200 by pressing the power switch shown in Figure 1.1. Set both channel A and B (if present) input selector switches to the TEST position. Press INJECT/END A. A "peak" should be plotted at approximately 0.33 minute intervals at 60 Hz and at 0.4 minute intervals at 50 Hz line power. After five or six peaks, press INJECT/END again. A report of retention times and areas for the peaks should be given, with the time between peaks and their areas consistent. Figure 1.3 shows an example of the test signal and its report. Be sure to try both channels A and B (if present). Enter PLOT"B" AUTO to plot the channel B signal.

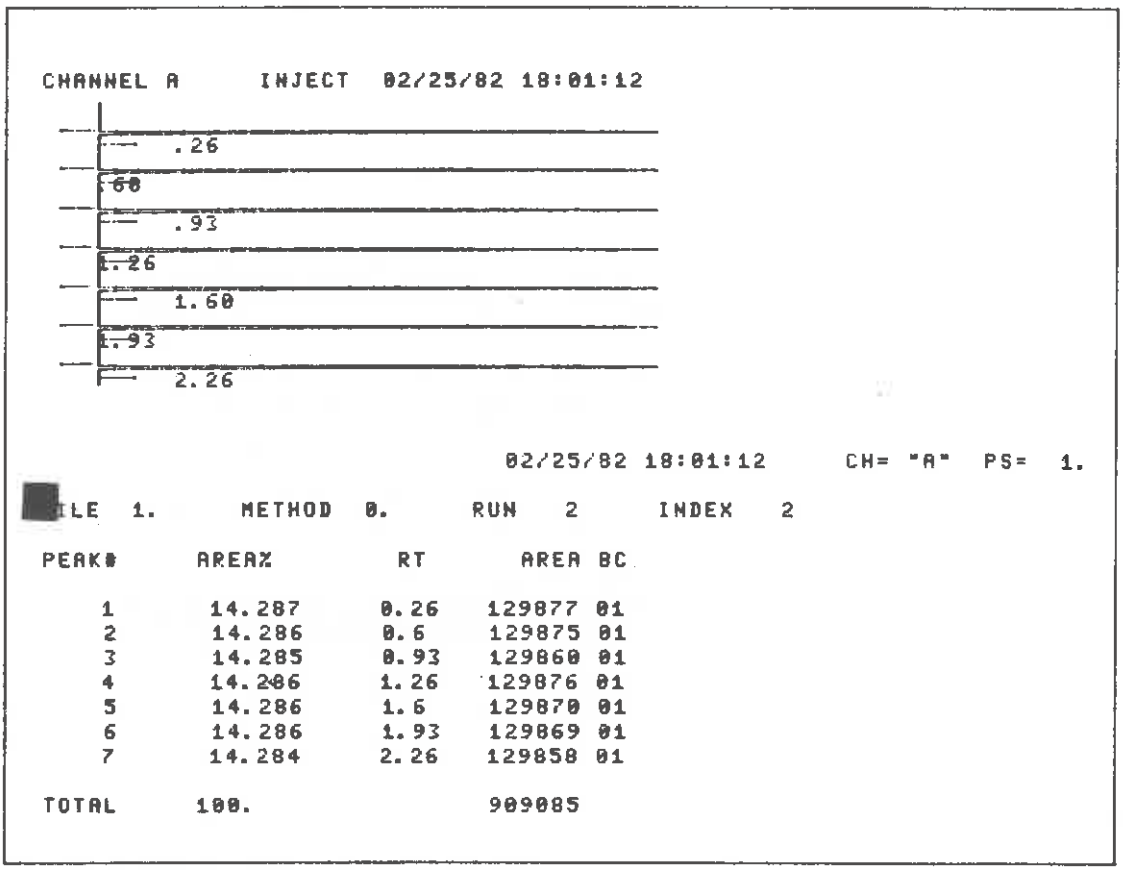


Figure 1.3 Example of Chromatogram and Report Using the Test Signal

2.2.6 Connection to a Detector

It is usually advisable to use the "recorder" outputs from the detector rather than the "computer" or "integrator" outputs. The latter provide an unattentuated signal to the SP4200 which may include unnecessary electronic noise or detection of small peaks that are not of interest.

NOTE

Do not change the detector attenuator or range settings during integration or between integrations that are to be compared. Doing this changes the signal input to the SP4200. The SP4200 plot can be attenuated if it is necessary to keep peaks on scale. (Section 3.3 discusses printer/plotter attenuation.

The banana jacks are color coded for the interconnect cable P/N A1463-010.Red is the positive lead, black is the signal return, and the clear lead is the shield. Try connecting the detector both with the shield grounded through the A2156-010 assembly, and then NOT grounded at all. Use the connection that is the least noisy.

Figure 1.4 below shows the detector input banana jacks. There is an "Installation Option Cables Connection" assembly (P/N A2156-010) in the Accessory Kit. The assembly is for use in a high electronic noise environment. See **NOTES**, below. Push the assembly onto the grounding bracket that is just to the right of the input banana jacks. Connect the grounding shield of the cable to the ground of the Installation Option. This ground is a Philips head screw near the top outer edge.

Figure 1.4 Detector Input Connections (banana jacks) to the SP4200

To test the connections:

1. Set the input selector switch to the NORM position and press the INJECT/END key that corresponds to the channel of interest.
2. Rotate the detector "balance" or "zero" control to provide what would normally be a positive pen deflection. If the printer/plotter print head is deflected in a negative direction, reverse the input lines or change the detector polarity switch, if one is available.
3. Press the LEVEL key. When the signal input to the SP4200 is zeroed, the display of LEVEL reads 1000$\pm$ 2. One unit in the display is equivalent to 10 microvolts, thus the properly adjusted SP4200 has an offset of 10 millivolts. See Section 6 for a complete description of the necessity for this baseline offset.

NOTES

Use of P/N A2156-010 may be required in some installations to avoid EMI interference in other communications equipment.

A signal of less than -10 mV causes a condition where no integration can take place. When this occurs, there is no display of level and plotting stops. The display is blank.

1.2.7 Input Selector SHUNT Position

Place the input selector switches in the SHUNT position. Press the LEVEL key. The display should show 1000$\pm$2. If the display does not show 1000$\pm$2, refer to Appendix A.3.2 for adjustment instructions. Press the A <-> B key and repeat the above action for the other channel, if present.

1.2.8 External Connections

External connections and cables, including LABNET connections, current loop/ cassette player cable, and the external controls cable, are covered in Section 7 of this manual, "Peripheral Devices and Storage."

1.2.9 LABNET Unit Number Selector Switches (Range 0 to 15)

The LABNET unit number for either channel is selected on the LABNET thumbwheel selector switches located below the right side of the keyboard. The left hand switch is channel A . The right hand switch is channel B. If LABNET is NOT going to be used, set both switches to zero; or if only one channel is going to be used with LABNET, set the other channel to zero.

NOTE

Setting only one channel to zero disables that channel and the unit becomes, in effect, a single channel integrator. This results in about 800 bytes of additional memory for use by the active channel.

The actual unit numbers selected can be shown in the LED display. First, set the desired unit number or numbers on the thumbwheels. They are readout in the LED display **BUT** have not been executed. Now, execute a **"soft reset"** by pressing the CTRL and SHIFT keys simultaneously, holding them down and pressing RPRT. You also may execute this by typing RESET.

NOTE

A soft reset stops integration on BOTH channels, stops the execution of BASIC Programs on both channels, sets Time Base (TB) to zero, and much more. Appendix E-20 further describes the uses of soft reset.

Switch S1 (see Appendix A-4) on the LABNET interface board selects the range of the LABNET unit number selectors. This is preset at the factory for unit numbers less than 16. To set LABNET unit numbers in the range of 16 to 31, refer to Appendix C, "Nuances of LABNET" in this manual.

1.2.10 Calculating Memory Requirements

The SP4200 provides 16K bytes of RAM memory. Of this, several thousand bytes are required for overhead and reserve, depending on system configuration. If you are writing large or complex programs, you may wish to maximize the amount of memory available to you. This can be accomplished by configuring a single channel, not connected to LABNET. The procedure is covered in Appendix A.