6. POWER SUPPLY UNIT

6.1. INTRODUCTION

There are currently two types of Power Supply Unit (PSU) used in the P3202/P3204 computers.The P3202 uses a 192/200 W switching PSU and the P3204 uses a 130 W switching PSU. Section 6.2 details the technical data for the PSU used in the P3202 and section 6.3 details the technical data for the PSU used in the P3204.

6.2. P3202

6.2.1. Specifications

The P3202 PSU furnishes operating power for the motherboard, the expansion boards, the disk drives, the keyboard, and the VDU. The module is enclosed in a cage at the rear of the system unit, and contains the dc power supply circuitry and the ac line filter and input circuitry. The cooling fan is contained in the PSU and is always on when the system is switched on.

SPECIFICATION		VALUE
ac input 120 V	Vrms	90-132
ac input 240 V	Vrms	180-264
ac input frequency	Hz	47-63
Efficiency	%	≥ 70
Output power	W	192/200

PSU Specifications

6.2.2. Inputs

The computer is shipped from the factory wired for a nominal mains voltage of either 120 Vac or 240 Vac and can operate from mains frequencies from 47 Hz to 63 Hz. The maximum inrush current is 32 A for a maximum of 10 ms. The ac power is input from an IEC type power inlet on the rear of the PSU, the input is filtered and fused by the PSU.

6.2.3. Outputs

The PSU provides 4 regulated dc outputs to the system. The specifications of the outputs are shown in the table below.

OUTPUT V	LOAD CURRENT A		TOLERANCE %		RIPPLE %	NOISE %
	MIN.	MAX.	+	-		
+5	7	19.8	5	4	1	3
+12	1.5	7.3	5	4	1	3
-12	0	0.3	10	8	3	5
-5	0	0.3	10	8	3	5

dc Output Voltages

There is a power good signal output from the PSU. This signal is a TTL level signal that is active high 100-500 ms after all dc outputs reach their nominal voltages, and inactive low a minimum of 1 ms before any dc output drops below its nominal level.

The ac line input is connected to the keyswitch on the front of the system, the power to the system is controlled by this switch. There is a switched ac mains voltage output (IEC outlet) on the rear of the PSU that the VDU may be connected to. This outlet is intended only for the VDU, nothing else should be connected to this output.

6.2.4. Output Protection

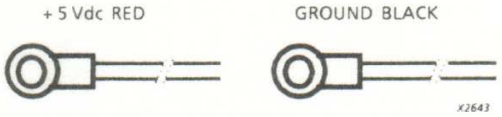
The PSU is current-limited so that an overcurrent does not damage it. If one of the outputs of the PSU is overloaded, the output voltage automatically decreases. The PSU can withstand short circuits between any of the output signals.

6.2.5. No-load Operation

The PSU requires a minimum load for proper operation. When primary power is applied with no load on the PSU, voltage regulation does not remain within tolerance and the correct operation of the computer is uncertain.

6.2.6. Connections

The power connection to the motherboard is via three connectors, there are separate +5 Vdc and ground wires and a +/- 12 Vdc connector.



PIN	SIGNAL NAME
1	GROUND
2	-12 Vdc
3	GROUND
4	+12 Vdc

Motherboard Power Connectors

There are four disk drive power connectors, three have straight 4-way keyed connectors and one has a right angle connector (this is reserved for the hard disk). All the disk connectors have the same connections as detailed below.

PIN	SIGNAL NAME
1	+12 Vdc
2	GROUND
3	GROUND
4	+5 Vdc

Disk Drive Power Connectors

6.3. P3204

6.3.1. Specifications

The P3204 PSU furnishes operating power for the motherboard, the expansion boards, the disk drives, the keyboard, and the VDU. The module is enclosed in a cage at the rear of the system unit, and contains the dc power supply circuitry and the ac line filter and input circuitry. The cooling fan is contained in the PSU and is always on when the system is switched on.

SPECIFICATION		VALUE
ac input 120 V	Vrms	90-132
ac input 240 V	Vrms	180-264
ac input frequency	Hz	47-63
Efficiency	%	≥65
Output power	W	130

PSU Specifications

6.3.2. Inputs

The computer is shipped from the factory wired for a nominal mains voltage of either 120 Vac or 240 Vac and can operate from mains frequencies from 47 Hz to 63 Hz. The maximum inrush current is 32 A for a maximum of 10 ms. The ac power is input from an IEC type power inlet on the rear of the PSU, the input is filtered and fused by the PSU.

6.3.3. Outputs

The PSU provides 4 regulated dc outputs to the system. The specifications of the outputs are shown in the table below.

OUTPUT V	LOAD CURRENT A		TOLERANCE %		RIPPLE %	NOISE %
	MIN.	MAX.	+	-		
+5	3	15	5	5	1	3
+12	0.8	4 *	5	5	1	3
-12	0	0.3	10	10	3	5
-5	0	0.3	10	8	3	5

dc Output Voltages

** Excluding current rating for dc fan*

There is a power good signal output from the PSU. This signal is a TTL level signal that is active high 100-500 ms after all dc outputs reach their nominal voltages, and inactive low a minimum of 1 ms before any dc output drops below its nominal level.

The ac line input is connected to a power switch in the PSU. This power switch is linked by a plastic rod to the push button on the front panel. This push button controls the mains input to the system. There is a switched ac mains voltage output (IEC outlet) on the rear of the PSU that the VDU may be connected to. This outlet is intended only for the VDU, nothing else should be connected to this output.

6.3.4. Output Protection

The PSU is current-limited so that an overcurrent does not damage it. If one of the outputs of the PSU is overloaded, the output voltage automatically decreases. The PSU can withstand short circuits between any of the output signals.

6.3.5. No-load Operation

The PSU requires a minimum load for proper operation. When primary power is applied with no load on the PSU, voltage regulation does not remain within tolerance and the correct operation of the computer is uncertain.

6.3.6. Connections

The power connection to the motherboard is made via a 12-pin molex connector. The pin assignments for this connector are given below.

PIN	SIGNAL NAME
1	POWER GOOD
2	+5 Vdc
3	+12 Vdc
4	-12 Vdc
5	GROUND
6	GROUND
7	GROUND
8	GROUND
9	-5 Vdc
10	+5 Vdc
11	+5 Vdc
12	+5 Vdc

Power Supply Connector

There are five disk drive power connectors, two have straight 4-way keyed connectors (these are reserved for 5-1/4 inch floppy disk drives) and one has a right angle connector (this is reserved for the hard disk). The pin assignments for these connectors are given below.

PIN	SIGNAL NAME
1	+12 Vdc
2	GROUND
3	GROUND
4	+5 Vdc

Hard Disk and 5-1/4 inch Floppy Disk Drive Power Connectors

There are two, 4-way power connectors provided for 3-1/2 inch disk drives. The pin assignments for these connectors are given below.

PIN	SIGNAL NAME
1	+5 Vdc
2	+5 Vdc RETURN
3	+12 Vdc RETURN
4	+12 Vdc

3-1/2 inch Disk Drive Power Connectors