

# **3000 Power Supply Unit Reference Manual**

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## STATUTORY NOTICES

### WARNINGS

The mains powered shelf must be connected to earth via the power lead. Protective covers on this unit should only be removed by authorised personnel and with the mains disconnected. The socket outlet supplying mains powered equipment shall be installed near to the equipment and be easily accessible.

The DC powered power shelves must be connected to earth via the marked earth terminal.

### APPROVALS

The approval number for the Case Technology 3000 PSU is NS/3660/12/H/452538.

- 1) Interconnection directly, or by way of other apparatus, of ports marked:-

"WARNING. CONNECT ONLY APPARATUS COMPLYING WITH BS6301 TO THIS PORT."

or

"WARNING. CONNECT ONLY APPARATUS COMPLYING WITH BS6301 TO THESE PORTS."

with ports not so marked may produce hazardous conditions on the network. Advice should be obtained from a competent engineer before such a connection is made.

- 2) All ports are marked as shown in para 1 and may only have equipment complying with BS6301 connected to them.
- 3) Connection of power supply. This equipment is intended for use when fitted with the following power supply units:-

DT106 99 to 132VAC, 50/60Hz, at up to 2.5 amps.

DT106 187 to 264VAC, 50/60Hz at up to 1.5 amps.

DT108  $\pm 18$  to  $\pm 32$ VDC, at up to 14 amps.

DT107 -38 to -60VDC at up to 6.5 amps.

Other usage will invalidate any approval given to this apparatus if as a result it ceases to comply with BS6301:1982.

- 4) The primary dc power source for the equipment must be from a power supply complying with BS6301.



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# 3000 Power Supply Unit

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## 1. 3000 Power Supply Unit

### 1.1 General Description

The 3000 power supply unit may be used to power 2 independent co-located equipments e.g. 3200 multiplexers.

The shelf may be equipped with up to 4 plug-in Power Supply Units (PSU) depending on the chassis options in use. Available combinations include:-

Single Power Supply (1 PSU), Dual Power Supply (2 independent PSUs), Single Redundant Power Supply (2 PSUs in parallel) or Dual Redundant Power Supply (2 independent sets of paralleled PSUs).

Single versions occupy half the chassis. Two paralleled PSUs provide redundant operation with active current sharing and 'hot-swap' capability.

AC 240V/115V switch selectable, and 24VDC or 48VDC PSUs are available.

Each PSU has a power input switch, fuse and a 'power good' indication by LED and signal output.

PSU connectors are coded to prevent accidentally plugging the wrong voltage power unit into the chassis.

## 2. Mechanical Layout

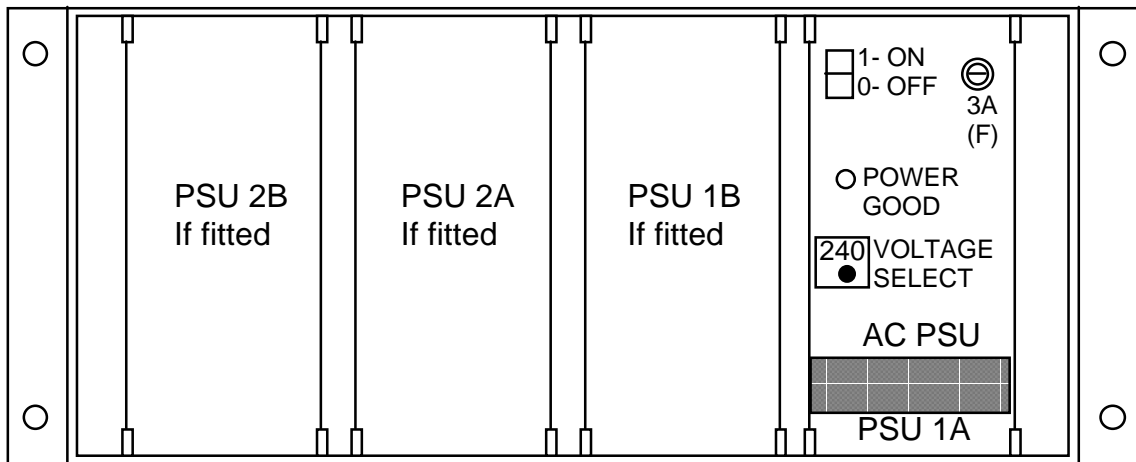
The Power Unit Shelf is housed in a 19 inch 3RU chassis assembly. Figure 1 shows the front layout of the unit and positions of the PSUs in a fully equipped chassis.

PSU positions for the various versions of the Power Unit Shelf are as follows:-

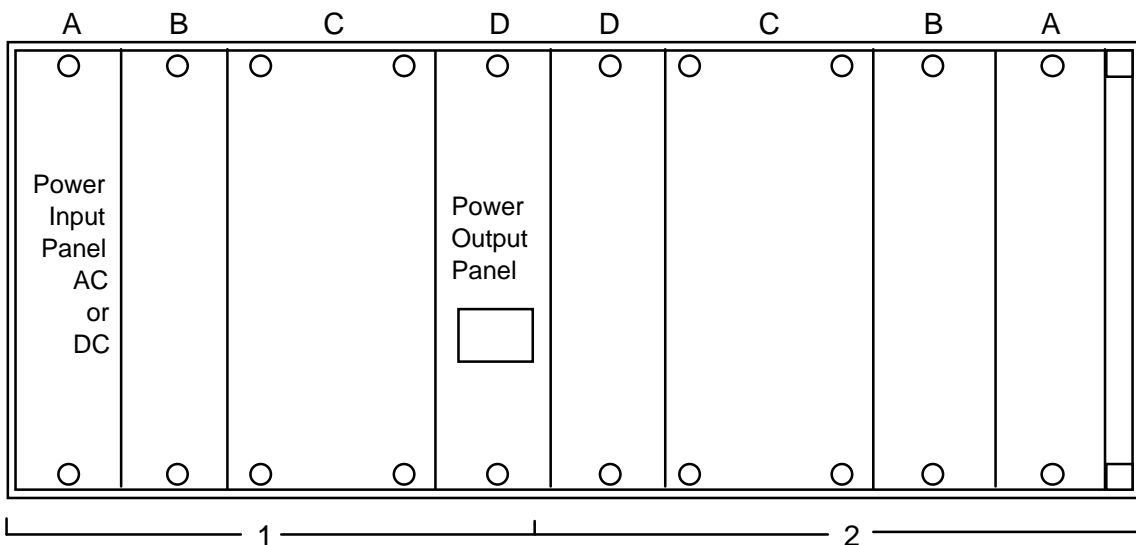
<b>TYPE</b>	<b>PSU POSITIONS</b>
Single	1A
Dual	1A, 2A
Single Redundant	1A, 1B
Dual Redundant	1A, 1B, 2A, 2B

The front of the unit is covered by a single front panel.

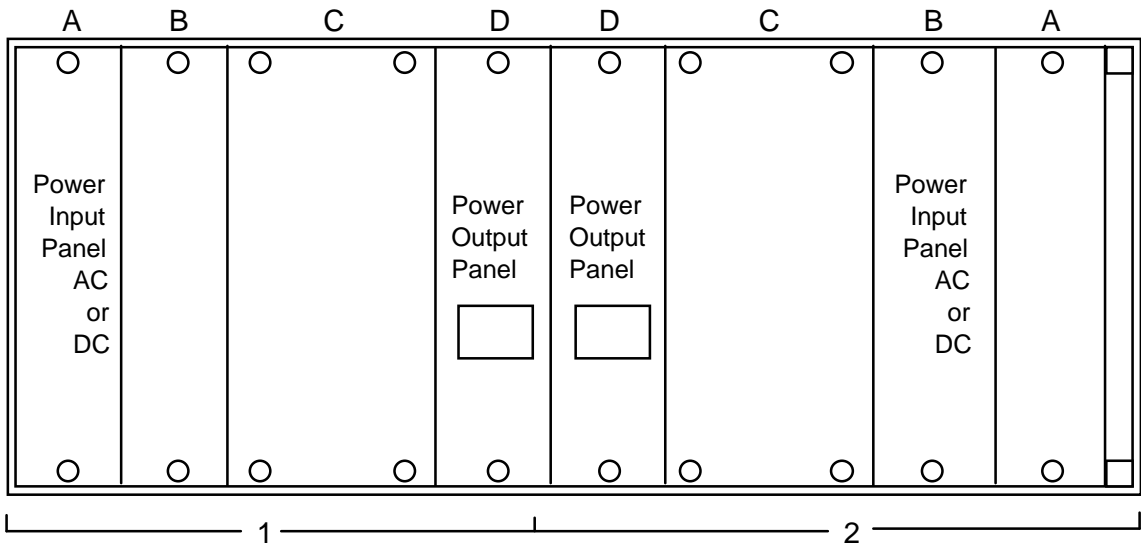
All connections are made to the rear of the chassis for power input/output and PSU alarms. These are described in detail in Section 2.



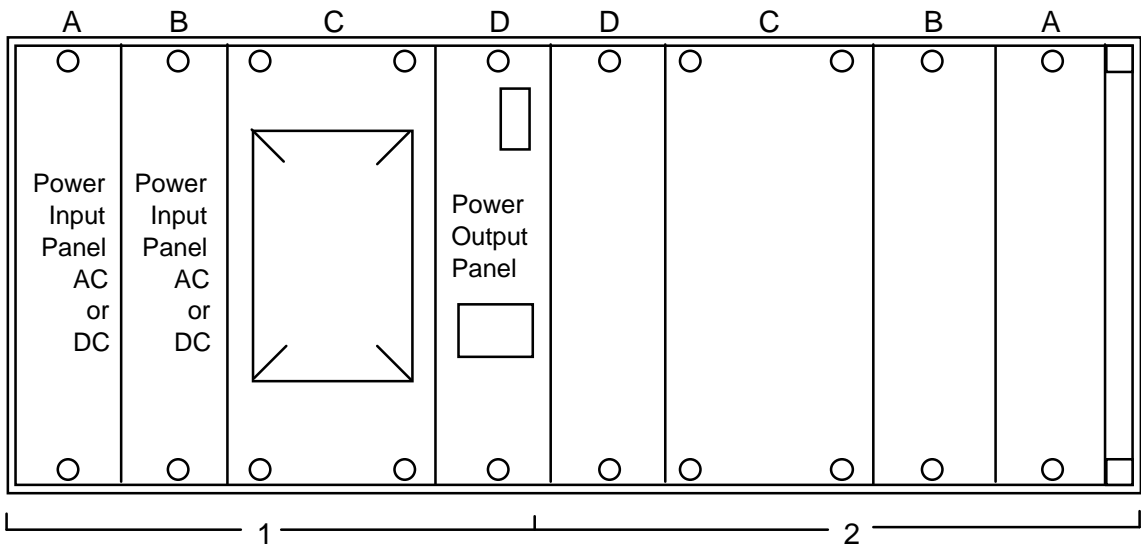
**Figure 1-1 Power Unit Shelf (Front view)**



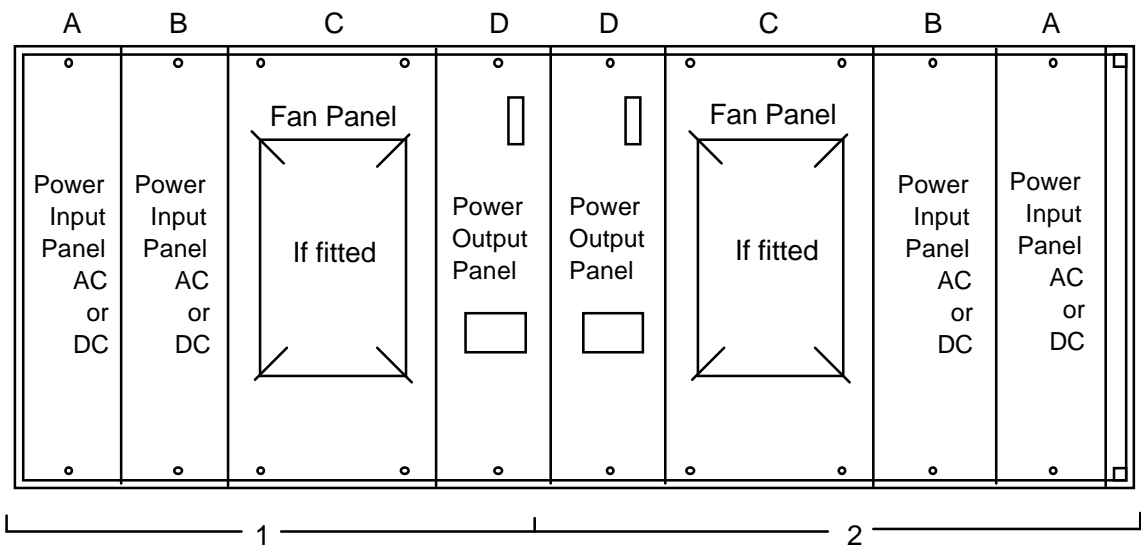
**Figure 1-2 Single Power Unit Shelf (Rear view)**



**Figure 1-3 Dual Power Unit Shelf (Rear view)**



**Figure 1-4 Single Redundant Power Unit Shelf (Rear view)**



**Figure 1-5 Dual Redundant Power Unit Shelf (Rear view)**

## **3. Specifications**

### **3.1 EMC**

Complies with:

BS6527 1988 Class A EN55022, Emissions

IEC801 part 3 level 3, narrow band susceptibility

British Telecom RC5000M open issue 11.1.9, broad band susceptibility

IEC801 part 2 level 3, ESD

### **3.2 Power Input**

#### **Voltage:**

DT106 187 to 264VAC @ 1.5 amps, 47 to 63Hz.

DT106 99 to 132VAC @ 2.5 amps, 47 to 63Hz.

DT107 -38VDC to -60VDC. Nominal -48VDC @ 6.5 amps.

Max. - 57VDC if a DT579 is fitted in the multiplexer.

DT108  $\pm$ 18VDC to 32VDC. Nominal 24VDC @ 14 amps.

## **Connections:**

AC power: IEC320 chassis plug.

DC power: Screw terminal block.

### **3.3 Input Polarity Reversal**

Protection is provided on the DC input versions.

### **3.4 Inrush Current**

AC Input: <18A Peak

DC Input: meets British Telecom BTR2511 Issue 3, Section 4.2

### **3.5 Output Power**

All versions: 185 Watts maximum, excluding -48VDC output if used.

+5v	22 amps
-5v	1.0 amp
+12v	3.0 amps
-12v	3.0 amps

### **3.6 Efficiency**

Typically 70% @ 185 Watts output.

### **3.7 Alarms**

Power Good: '0V' or open circuit connection.

Presence of '0V' represents a power good condition.

'0V' signal will be within the range  $\pm 0.3V$  with respect to the local earth, and capable of sinking 10mA max.

Connection: 9-way 'D' type socket.

### **3.8 Mechanical**

19 inch, 3RU rack mounting chassis with a one piece front cover.

Width: 485mm

Height: 133mm

Depth: 382mm

## **Weight**

PSU: 2kg each

Chassis: 3.5kg maximum

### **3.9 Environmental**

Storage temperature: -20°C to +60°C

Operational temperature: 0°C to +50°C

Humidity: 5% to 95% non condensing

## **4. Forced Air Cooling**

Forced air cooling may be required to cool the power unit and its associated equipment under certain circumstances.

If required, fans may be fitted to the Cray 3000 power supply as a factory fitted option, or the equipment may be mounted in a cabinet with a fan tray fitted.

Factors to be considered when making decisions on forced air cooling are as follows:-

- a) If the power supply is loaded to more than 80% of it's rated output.
- b) High ambient temperature.
- c) Whether the equipment layout in the cabinet allows efficient cooling via natural air circulation, e.g. by leaving spaces between equipments, or fitting vent panels.
- d) The total power dissipation of all equipments in the cabinet.

Under typical conditions, e.g. ambient temperature less than 25°C, and powering a 3200 multiplexer half loaded with cards, fans will not be required.

Advice on any particular installation can be gained by contacting your supplier.

## 5. Installation

### 5.1 Unpacking

Check for any physical damage on receipt of the equipment. Advise the carrier and your supplier immediately if any damage is found.

### 5.2 Mounting

The equipment should be mounted in a standard 19 inch rack or in a suitable equipment case.

A support runner should be fitted to each side of the rack to prevent undue strain on the front end angle brackets of the Power Unit Shelf.

It is recommended that a 1U (44.45mm) space is left above the power unit to aid ventilation.

The Power Unit Shelf may be mounted either above or below the powered equipment.

All connections are made to the rear of the unit. At least 70mm clearance is required for the fitting of connectors and cable routing.

### 5.3 Power Wiring

Before making any power connections, ensure the PSUs are removed from the shelf or isolated with the front panel switches 'off'.

All power connections are made to the rear power input panels. The connection method depends upon the type of PSU fitted.

#### 5.3.1 48VDC Power Input Panel

Connection is by means of a three way screw terminal block, using M3.5 (4BA) ring terminals.

Input Voltage: -38 to -64VDC

Current: 6.6 amps max.

Fuse Type: 8 amp quick blow (F), 20mm x 5mm

The fuse is mounted in the PSU front panel.

Note that the positive pole of the input supply must be connected to earth, usually at the supply source. **An earth connection must also be made to the earth terminal (E).**

### 5.3.2 AC Power Input Panel

**(a)** AC connection is by means of an IEC320 type connector. A connector with a 2 metre mains lead fitted is supplied. The AC PSUs may be operated at 115V or 240V (nominal) which can be selected by a switch mounted on the PSU front panel.

*Ensure the voltage select switch is set to the correct voltage before installation.*

Input Voltage: 99 to 132VAC or 187 to 264VAC

Frequency: 47 to 63Hz

Current: 2.5amps @ 115V or 1.3amps @ 240V maximum.

Fuse Type: 3 amps quick blow (F), 20mm x 5mm

The fuse is mounted in the PSU front panel.

**An earth connection must be made to the mains connector.**

**(b)** A two way terminal block on the AC Power Input Panel allows for connection of an auxiliary -48VDC supply. This is required in addition to the mains input if the powered equipment contains a card which requires a -48VDC supply to operate e.g.:-

Subscriber loop disconnect cards DTE64, DTE67 and DTE68.

Ringling generator card DT579

The 0V input terminal must be connected to earth, usually at the supply source.

### 5.3.3 Power Output Panel

All power output connections are made via a 12-way Trident socket mounted on the Power Output Panel.

The -48VDC output is switched and fused on the Power Output Panel.

Fuse type: 4 amps quick blow (F), 20mm x 5mm

In redundant Power Unit Shelves, the two -48VDC inputs are diode 'OR'ed to provide a single output.

## 5.4 Alarm Wiring

All alarm connections are made by means of a 9 way female 'D' type connector which is mounted on the Power Output Panel at the rear of the equipment.

Connections are as follows:-

PIN No.	OUTPUT
1	POWER GOOD A
2	POWER GOOD B
3-8	NOT USED
9	DIG. 0V

## 6. Commissioning

### 6.1 Switch 'On' procedure

Always ensure a PSU is switched off before plugging it into a live chassis.

Ensure that the correct PSU type is fitted to the chassis.

Check that AC PSUs are set to the correct input voltage.

After switching 'On', the 'POWER GOOD LED' on each PSU front panel should be illuminated.

### 6.2 Alarm Indications

An Alarm output is provided from each PSU. This will indicate a PSU failure when any of the outputs are faulty, as follows:-

PSU STATE	SIGNAL OUTPUT	PSU LED INDICATOR
NO POWER INPUT	OPEN CIRCUIT	OFF
PSU NOT FITTED	OPEN CIRCUIT	N/A
PSU ON + GOOD	SHORT TO 0V	ON
PSU ON + FAIL	OPEN CIRCUIT	OFF

## **7. Maintenance**

### **7.1 PSU Replacement**

A PSU is faulty if the 'Power Good' LED is not illuminated when switched on.

**WARNING:** A non illuminated LED does not necessarily mean that power is not available on the chassis.

A PSU must be switched off before it is plugged into or unplugged from a live system.

### **7.2 Fan Unit Replacement (When fitted)**

**NOTE:** AC versions of the equipment should be powered down and the mains lead disconnected before removing a Fan Unit Assembly.

A Fan Unit Assembly may be replaced by removing the rear panel fixings and disconnecting the in-line connector. Care must be taken when fitting the fan to ensure the airflow is from the outside of the unit to the inside.