

POWER UNIT (PWR:X1914)  
FUNCTIONAL DESCRIPTION

1. GENERAL

- 1.01 This section is a cover sheet for the NEC America, Inc., Power Unit (PWR:X1914) Functional Description. This section is reproduced with permission of NEC America, Inc., and is equivalent to NEC practice NECA 365-407-408, Issue 1.
- 1.02 Whenever this section is reissued the reason(s) for reissue will be listed in this paragraph.
- 1.03 This section provides a general description of the Power Unit (PWR:X1914A) for AC supply.
- 1.04 If corrections are required in the attached document, use Form-3973 as described in Section 000-010-015.
- 1.05 If equipment design and/or manufacturing problems should occur, refer to Section SW 010-522-906 for procedures on filing an Engineering complaint.

2. ORDERING PROCEDURE

- 2.01 The Power Unit (PWR:X1914) may be ordered via the Southwestern Inventory Management System (SWIMS).
- 2.02 To order additional copies of this practice, use NECA 365-407-819SW as the section number.

3. REPAIR/RETURN

- 3.01 Malfunctioning units may be returned to NEC America, Inc., for repair.

Attachment: NEC America, Inc.  
Power Unit (PWR:X1914)  
Functional Description

PROPRIETARY

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Telephone Company except under written agreement.

**POWER UNIT (PWR : X1914)  
FUNCTIONAL DESCRIPTION**

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## 1. GENERAL

1.01 This practice provides a general description of the Power unit (PWR: X1914A) for AC supply and contains the following information:

- (1) Description
- (2) Functional operation
- (3) Control and indicators
- (4) Strapping selection

1.02 Whenever this practice is reissued, the reason for reissue will be listed in this paragraph.

## 2. DESCRIPTION

2.01 This unit consists of a main epoxy-glass printed wire board (PWB), two sub boards of P1 and P2, and associated circuit components. Printed circuit wiring is etched on both surfaces of the PWB.

2.02 A LED for indicating the operational status and a power ON switch are located on the front panel of the unit.

2.03 This unit is mounted in the FD-2240A E8980A shelf with back board connectors J1. The power unit input and output are terminated at the connector on the rear of the main PWB.

2.04 As only one unit can be mounted in the FD-2240A shelf, main AC power supply route is limited to one.

2.05 The unit designation, unit code, manufacturing date and serial number are printed on the right side surface of the main board connector.

2.06 The lower front edge of the main board is burnished with ejector to facilitate insertion and removal of the unit from the shelf. A CLEI and bar codes label is placed on the surface of the ejector. See Figure 4-1.

### 3. FUNCTIONAL OPERATION

3.01 This power (PWR) unit inverts 100 Vac or 200 Vac input power into +5 Vdc, -9 Vdc and -48 Vdc output powers. It contains an DC/DC converter and overcurrent/overvoltage protection circuitry. See Figure 3-1, block diagram of this unit.

#### Input Circuit

3.02 The input AC voltage to the input terminal passes via non-fuse circuit breaker (NFB) switch and goes to the input filter circuit, rush current prevention circuit and rectifier and smoothing circuit. The rush current prevention circuit places a surge-current limiting resistor R1 in the circuitry and R1 suppresses surge current flow into the rectifier and smoothing circuits when the NFB is ON.

When the voltage in the filter circuit reaches to a certain level, the RLL is ON to short the R1 and keeps from decreasing the PWR unit's efficiency by R1 resistor.

The input filter circuit prevents external noise and also prevents the switching noise generated by the converter from being fed back to the input power.



#### +5 V, -9 V Circuit

3.03 DC voltage sent to the DC/DC converter through the rectifier and smoothing circuit is converted into square wave by TR. This square wave outputs the voltage with turn ratio of winding of the transformer T1 to the secondary side. This transformed voltage is sent to magnetic amplifier (Mag Amp) and its pulse width is controlled and is rectified by RC and is outputed form the DC/DC converter by L and C.

3.04 DC voltage with a large ripple after rectification is smoothed by the output filter and becomes +5 Vdc and -9 Vdc output voltage.

3.05 This unit contains output voltage stabilizer circuit by the Mag Amp.

#### -48 V Circuit

3.06 DC voltage sent to the DC/DC converter through rectifier circuit is converted into square wave by TR. This TR controls TR's ON time width and the output voltage by the signals from IC which is width-controlled by the signals from detection circuit. The width-controlled square wave is output to the secondary side with turn ratio of the transformer T2. This voltage is then rectified by RC and is smoothed by L and C and is passed through the output filter circuit and is output.

3.08 When overcurrent flow is sent to the load side, R2's both end voltages are sent to overcurrent detection circuit and it is sent to the protection circuitry as an overcurrent signal.

3.09 The output voltage is always monitored by overcurrent detection circuit. If the output voltage is abnormally high, overcurrent detector circuit sends a signal to the protection circuit.

3.10 If the protection circuit receiveds a signal from overcurrent/overvoltage detection circuit, it trips the NFB switch, thereby the input is released and the PWR unit's operation is stopped. Thus, the PWR unit and the connected load are protected.

### ALM Function

3.11 When the protection circuit operates. ALM signal is output. ALM signal is output in the closed loop status. This signal is sent out if any of the following conditions occur:

- (1) The NFB switch is in OFF position.
- (2) The load current exceeds a predetermined amount, or the output side is shorted.
- (3) The output voltage exceeds a predetermined level.
- (4) The output voltage becomes 0 V.

### Output Voltage Monitor

3.12 On the front panel of the PWR unit, the monitor terminals for output voltage checking are located. The following are allowable ranges of the output voltage.

Monitor terminal output voltage	Allowable range
+5 V	+5.4 ±0.27 Vdc
-9 V	-9.4 ±0.47 Vdc
-48 V	-48.0 ±2.4 Vdc

## 4. CONTROL AND INDICATORS

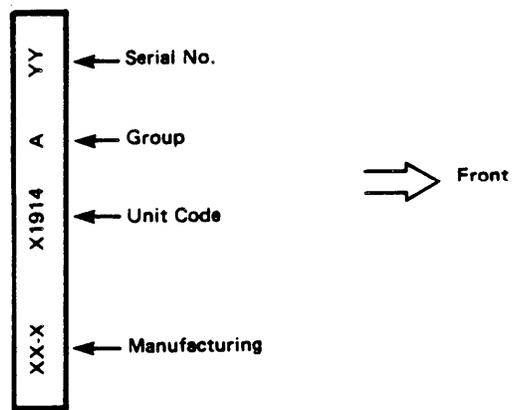
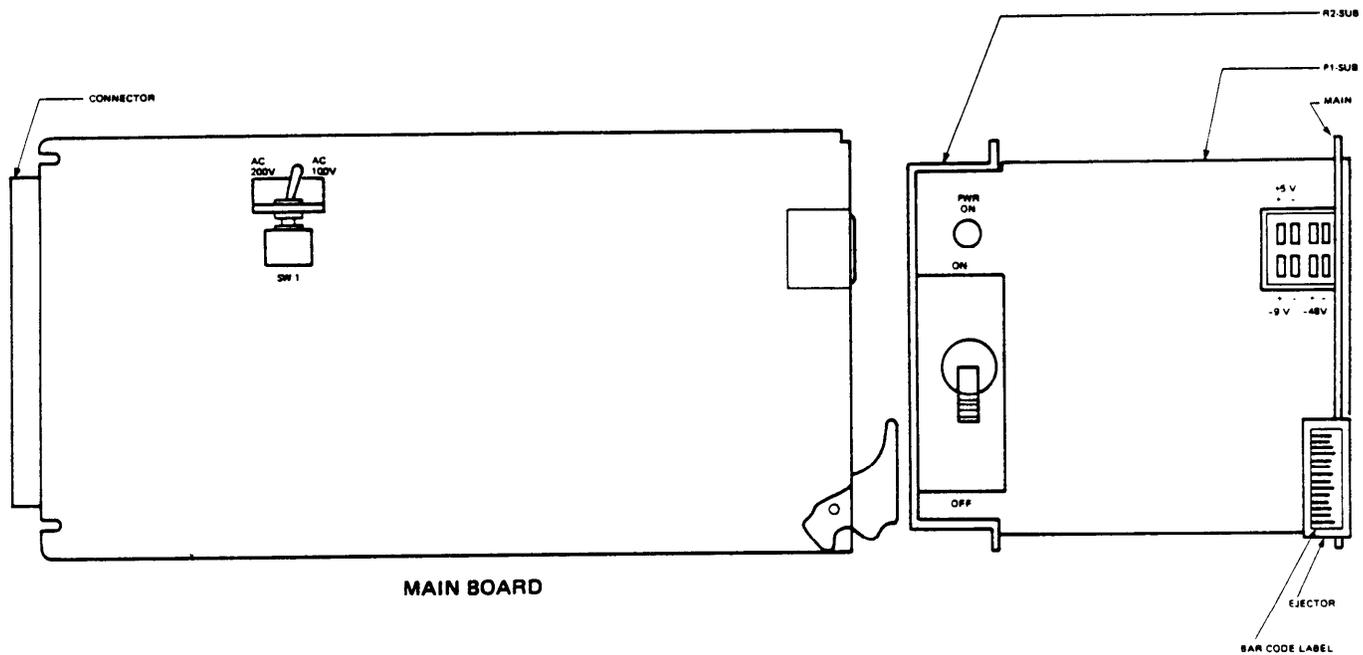
4.01 Table 4-1 and Figure 4-1 show the switch and LED indicator on the PWR unit (X1914A). Physical location of switch and indicator is shown in Figure 4-1.

Table 4-1  
PWR Unit (X1914A) Control and Indicators

Feature	Type	Control/ Indicator	Function
Status	Green LED	PWR ON	Lights when output voltage is normal while PWR ON/OFF switch is turned to ON.
Operation	Non fuse breaker	PWR ON/OFF	To supply power to this unit, turn this switch to ON.
Operation	Two position toggle switch	SW 1	Switches input voltage (117 Vac $\pm$ 10% or 200 Vac $\pm$ 10%). This switch is located on the main board.

## 5. STRAPPING SELECTION

5.01 On this unit, there is no strapping location.



NOTE: Printed on the right side surface of the main board connector.

Figure 4-1 PWR Unit (X1914A) Control and Indicator