

POWER UNIT (PWR:X0319)
FUNCTIONAL DESCRIPTION

1. GENERAL

- 1.01 This section is a cover sheet for the NEC America, Inc., Power Unit (PWR:X0319) Functional Description. This section is reproduced with permission of NEC America, Inc., and is equivalent to NEC practice NECA 365-407-407, 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:X0319A) for DC-48 V 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:X0319) may be ordered via the Southwestern Inventory Management System (SWIMS).
- 2.02 To order additional copies of this practice, use NECA 365-407-818SW 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:X0319)
Functional Description

PROPRIETARY

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Telephone Company except under written agreement.

**POWER UNIT (PWR : X0319)
FUNCTIONAL DESCRIPTION**

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◆ POWER UNIT (PWR:X0319)◆
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1. GENERAL

1.01 This practice provides a general description of power unit (PWR: X0319A) for DC-48 V supply and contains the following information:

- (1) Description
- (2) Function operation
- (3) Controls 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), a sub board (P1) and the associated circuit components. Printed circuit wiring is etched on both side surfaces of the PWB. On the left side surface (viewed from front), the components are mounted.

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

2.03 This unit is mounted in the FD-2240A E8980A shelf with back board connectors J1 (PWR 2) and J2 (PWR 1). The power input and output are terminated at the connector at the rear of the main PWB.

2.04 As power source is prepared in redundant configuration, two units are normally installed in the equipment.

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 PWB is burnished with ejector to facilitate insertion and removal of the unit from the shelf. A CLEI and bar code label is placed on the surface of the ejector. See Figure 4-1.

3. FUNCTIONAL OPERATION

3.01 This power (PWR) unit converts -48 Vdc input power into +5 Vdc and -9 Vdc output power. It contains a DC/DC converter and overcurrent/overvoltage protection circuitry. Refer to Figure 3-1, block diagram of this unit.

Input Circuit

3.02 The input voltage to the input terminal passes via a non-fuse circuit breaker (NFB) switch and goes to the input filter circuit and rush current prevention circuit. The rush current prevention circuit places a surge-current limiting resistor R1 in the circuitry to suppress surge-current into the filter circuit when the NFB is switched to ON. When the voltage in the filter circuit reaches the certain level, the RL1 is ON to short the R1 and prevents decreasing the PWR unit's efficiency by the R1.

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.

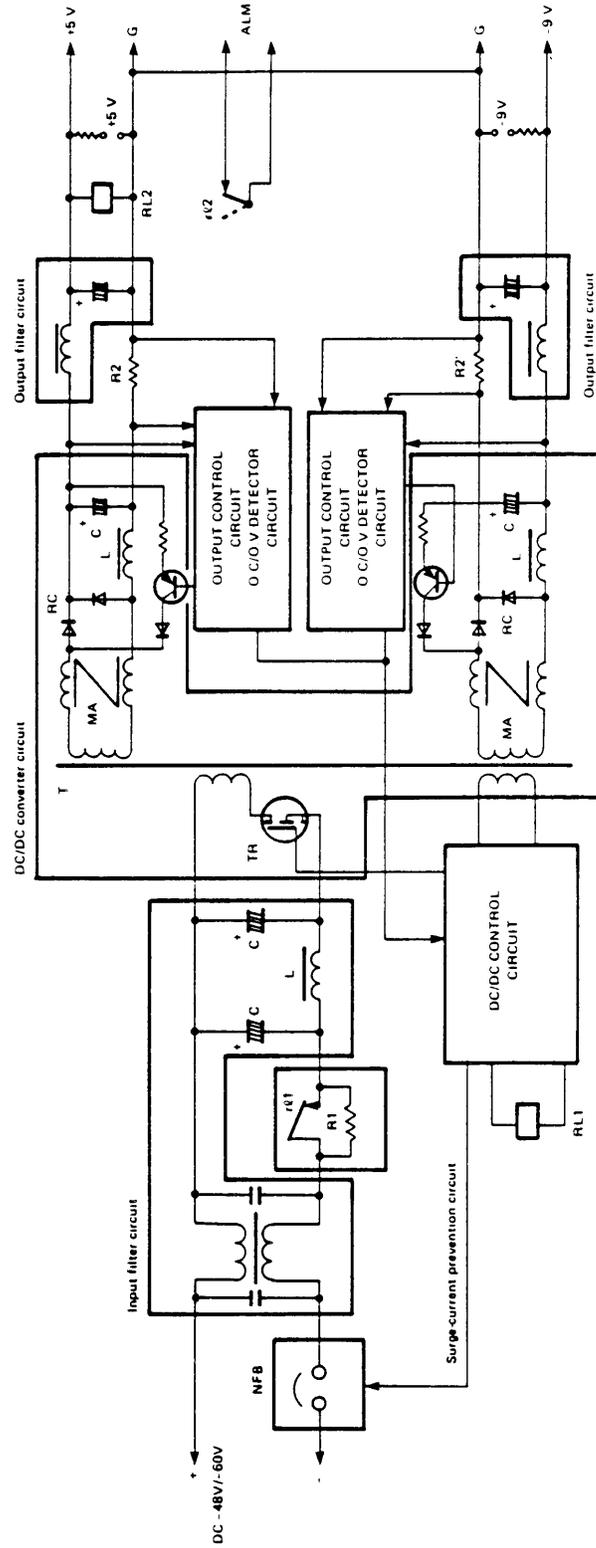
+5 V, -9 V Circuit

3.03 DC voltage sent to the DC/DC converter through input filter is converted to rectangular wave by TR. This rectangular wave outputs the voltage with turn ratio of transformer winding to the secondary side.

This transformed voltage is sent to magnetic amplifier (Mag Amp) and its width is controlled and rectified by the RC and is output from the DC/DC converter by L and C.

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

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



◆ Figure 3-1 PWRT Unit (X0319A/B) Block Diagram ◆

Protection Function

3.06 When overcurrent is input to the load side, R2s (or R2's) both end voltages are sent to overcurrent detection circuit and overcurrent signal is output to the protection circuit.

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

3.08 If the protection circuit receives an overcurrent/overvoltage signal from detector 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

3.09 When the protection circuit operates, an alarm signal is sent out. ALM signal is outputted in closed loop status. ALM signal is sent if any of the following conditions occur:

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

Output Voltage Monitor

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

Monitor jack output voltage	Allowable range
+5 Vdc	+5.4 \pm 0.27 Vdc
-9 Vdc	-9.4 \pm 0.47 Vdc

4. CONTROL AND INDICATOR

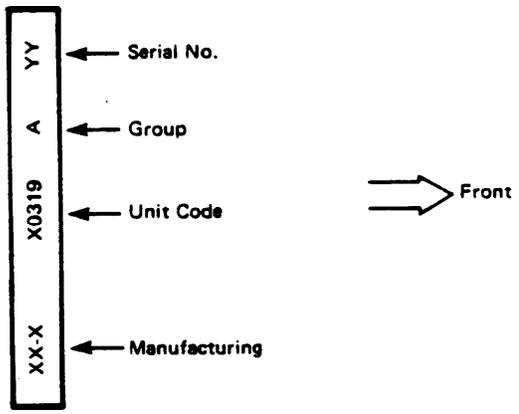
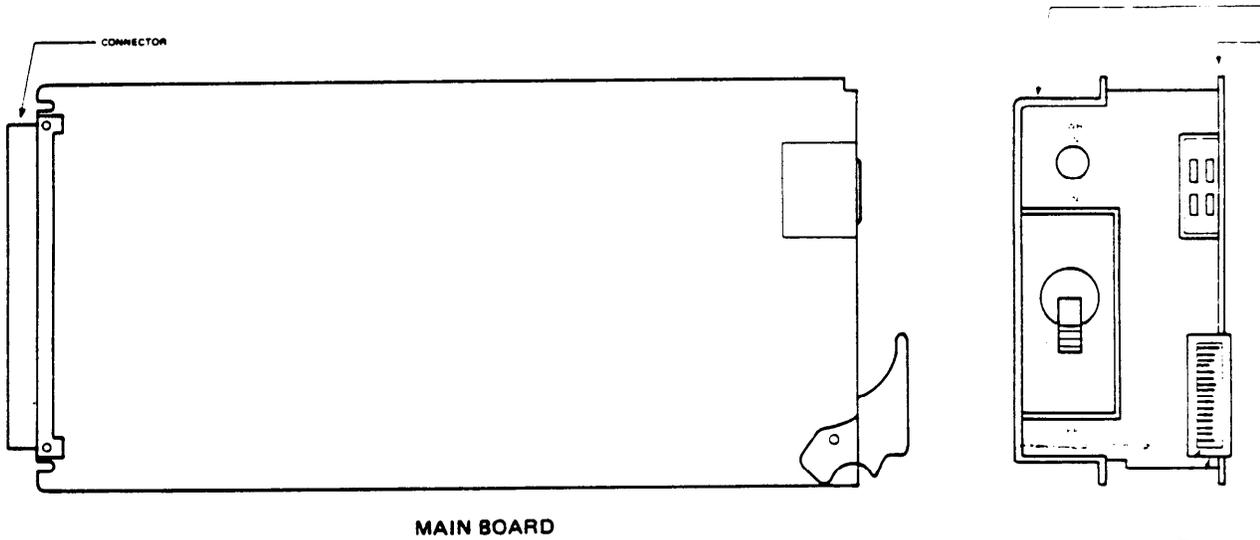
4.01 Table 4-1 and Figure 4-1 show the switch and LED indicator on the PWR unit (X0319A/B). Physical location of switch and indicator is shown in Figure 4-1.

Table 4-1
PWR Unit (X0319A) Control and Indicator

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 the power to this unit, this switch is turned to ON.

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 (X0319A/B) Control and Indicator ◆