

2.0 MECHANICAL/ELECTRICAL DESCRIPTION

The following is a description of the mechanical and electrical components, as well as the characteristics of the input connections, for the Power Supply module and Racks.

2.1 Power Supply Module Mechanical Description

The Power Supply module is a printed circuit board assembly that plugs into the leftmost position of either the 10- or 16-Slot Rack. The module is enclosed in a protective steel housing with integral heatsink. Through its connection to the Multibus backplane of the Rack, the Power Supply module provides the D-C voltages necessary to power the logic circuitry of modules in the Rack. On the faceplate of the module are four LED indicators, a terminal block connector, a keyswitch, and a battery back-up connector. See figure 2.1.

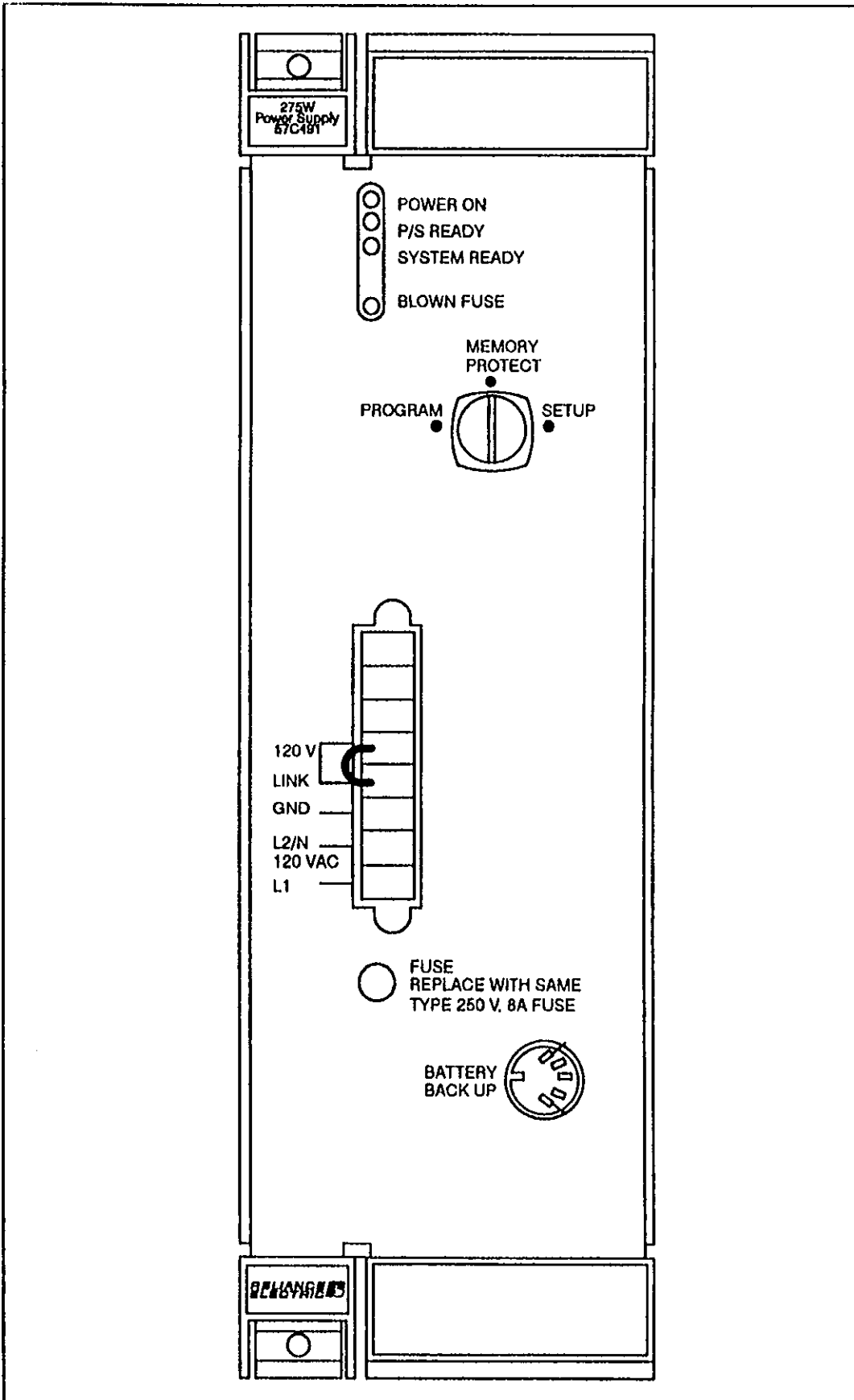


Figure 2.1 - Power Supply Module

2.1.1 Power Supply Module LED Indicators

The Power Supply module faceplate LED labeled "POWER ON" is lit to indicate when incoming A-C power is within the specified ranges. "P/S READY" is lit when the Power Supply is producing all required D-C voltages within the specified ranges. The "SYSTEM READY" LED indicates whether the system watchdog is being properly reset. If any of the Processors in the Rack stop functioning properly, this LED will be turned off. If the "BLOWN FUSE" LED is lit, the fuse has blown and must be replaced. See section 4.4 for more information.

2.1.2 Power Supply Module Terminal Block

The terminal block on the Power Supply faceplate provides the means to connect the 115 VAC power and a ground wire from the rack to the module. Note that terminals 1-3 (reading top to bottom) are not functional. Terminals 4 and 5 come from the factory with a jumper attached. This jumper must be in place at all times for the Power Supply module to operate correctly.

The green ground wire from the Rack connects to the "GND" terminal on the faceplate of the Power Supply. Terminal "L2/N" is the connection for the A-C neutral input line from the Rack. Terminal "L1" is the connection for the A-C hot input line from the Rack. See section 3.2 for more information.

2.1.3 Power Supply Module Battery Connection

The faceplate connection labeled "BATTERY BACK UP" provides the means to connect the Battery Back-Up (M/N 57C492) to the Power Supply module. Note that the Battery Back-Up unit is required only when there is a DCS 5000 Processor module (M/N 57C407) or a Common Memory module (M/N 57C413) in the Rack. The Battery Back-Up unit can save the contents of the Common Memory and DCS 5000 Processor RAM in the event of a power failure.

The keyswitch is used to reset the "OK" signal on the Battery Back-Up. It is necessary to reset this signal if the battery fails or if the cable is removed. See 2.1.4 and 2.2 for more information.

2.1.4 Power Supply Module Keyswitch

The keyswitch on the faceplate routes TTL signals through the Multibus backplane to the Processor module(s) to allow lockout of programming functions for system security. The three positions of the keyswitch are PROGRAM, MEMORY PROTECT, and SET UP. The position of the keyswitch indicates the security level of the rack, i.e., the kind of ON-LINE Menu operations that can be performed through a personal computer communicating with the processors in the rack. The MEMORY PROTECT position allows only monitoring of variables and saving of tasks from the rack. SETUP allows the operator to monitor all variables, modify tunable variables, and save tasks from the rack. The PROGRAM position allows the operator to perform all ON-LINE Menu functions, providing the password for the rack is also entered. See J-3630 or J-3684 for more information.

2.2 Power Supply Module Electrical Description

When the Power Supply module powers-up, it executes a "soft start," gradually increasing its output until it reaches the voltage necessary for logic operations. At this time, the module generates an initialize signal and the "P/S READY" indicator is illuminated.

Should the A-C input fall below the lower line voltage limit, the module will generate a power fail interrupt signal at least three milliseconds before loss of the regulated D-C power to allow for orderly system shutdown. The holdover time on loss of A-C input is 20 milliseconds.

In the event of a power fail interrupt signal, 5 Volt output power is supplied by the Battery Back-Up (if installed) for maintaining the volatile memory of DCS 5000 Processor modules and the Common Memory module. When the regulated output power of the Power Supply module is restored to 4.85 Volts or greater, power will be supplied by the Power Supply module. Note that AutoMax processors have on-board battery back-up and do not require Battery Back-Up unless there is a Common Memory module in the rack.

If Battery Back-Up Voltage ever drops below 3.0 Volts, or the cable between the Battery Back-Up and Power Supply module is disconnected with the power off, memory will be lost and the Processor modules will not function until the Power Supply is manually reset by turning the keyswitch on the front panel from MEMORY PROTECT to the PROGRAM position.

2.3 Rack Mechanical Description

The 10- and 16-Slot Racks provide the mechanical means for mounting the indicated number of DCS 5000 and AutoMax modules, as well as the Power Supply module. Both Racks are designed for panel mounting and include two built-in high capacity cooling fans, an A-C line filter, and a cable management tray. See figures 2.2 and 2.3.

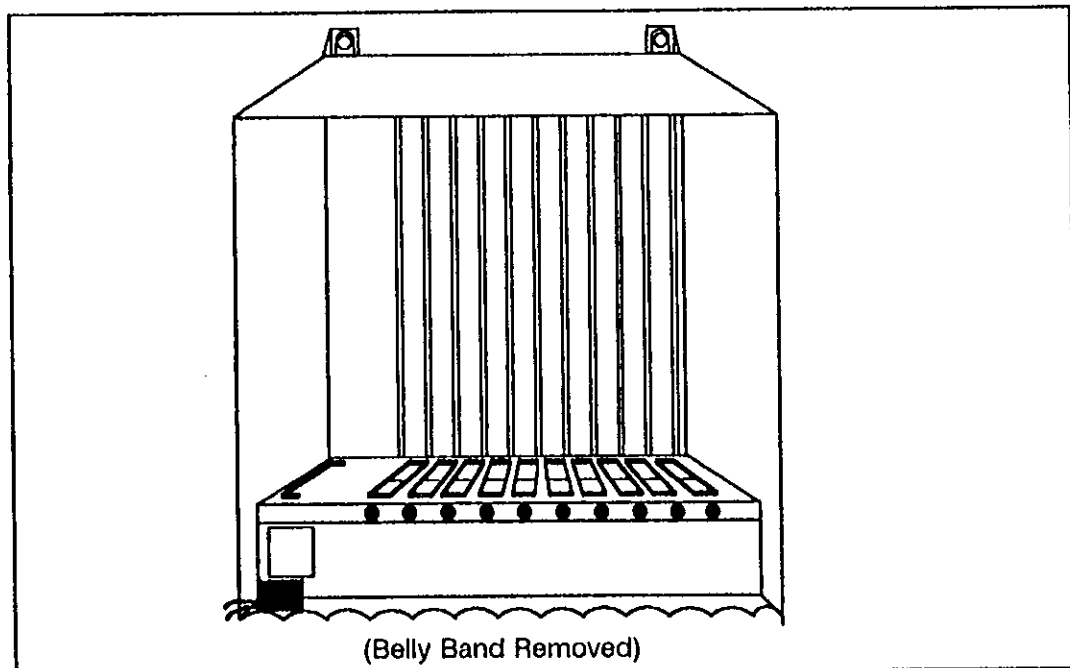


Figure 2.2 - 10-Slot Rack

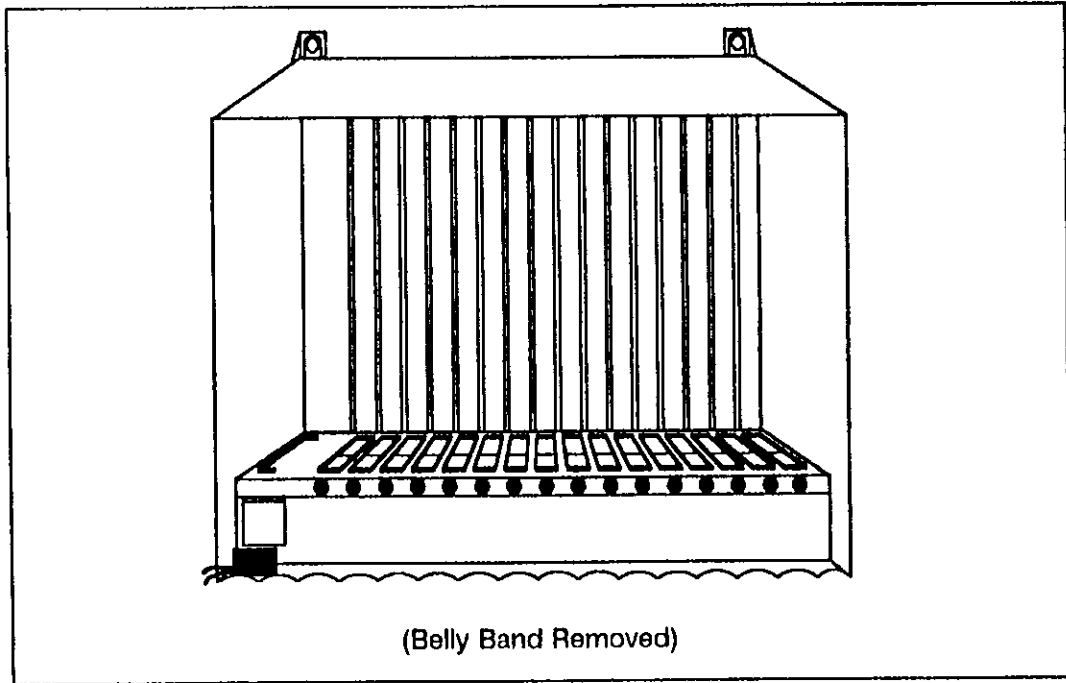


Figure 2.3 - 16-Slot Rack

Dedicated signal lines on the Multibus backplane require limitations on slot placement for some types of DCS 5000/AutoMax modules. See figure 2.4.

Module	Module Slot Position															
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
10-Slot Rack: Common Memory	•															
Processor	•	•	•	•	•											
D-C Drive ¹						•	•	•	•							
All Other	•	•	•	•	•	•	•	•	•	•						
16-Slot Rack: Common Memory	•															
Processor	•	•	•	•	•											
D-C Drive ¹						•	•	•	•			•	•	•	•	
All Other	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

¹ Must be grouped together.

Figure 2.4 - Rack Slot Limitations

2.4 Rack Electrical Description

The Multibus backplane of the Rack supports two sets of bus lines that serve as the electrical connection for all slots in the Rack. The P1 bus, the larger of the two electrical connectors, conforms to the IEEE Microcomputer System Bus Standard for the P796 bus, compliance level D16M20116. This bus is used for communication and control signals among the different modules in the Rack. The P2 bus, the smaller of the two backplane electrical connectors, follows a Reliance pin assignment as permitted by the IEEE P796 standard. The P2 bus is used for functions such as determining the type of module in the slot. See Appendix C for a description of the pins on the Rack backplane. See J-3649 for guidelines on using non-Reliance modules in the Rack.

The A-C line filter on the Rack filters the incoming power signal before it is transmitted to the Power Supply module. No other connections to the A-C line are permitted between the line filter and the Power Supply module. See figure 2.5 for a typical input power signal.

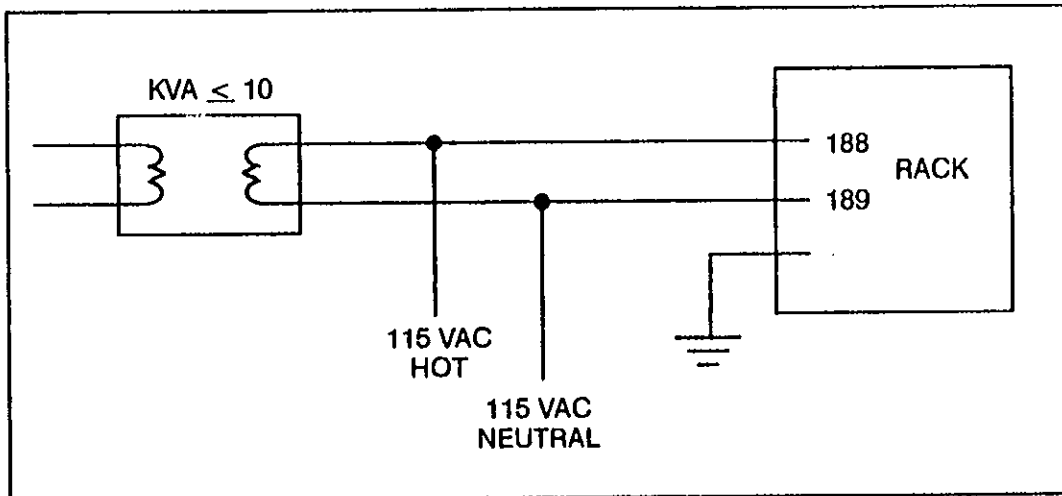


Figure 2.5 - Typical Input Power Connections