

ARC-81: Small Power Supply

The small power supply converts input AC power that can range between 110 and 240 Volts and 50-60 Hz to the DC voltages required by the controller. It contains an input AC filtering circuit, eight small switcher modules, a filter circuit for reducing the ripple produced by the switcher modules and a circuit for operating solenoid-driven shutters. A push-button switch resets the DSP on the controller's timing board, dumping the application code and turning the analog power off at the power control board. The enclosure is made of heavy cast aluminum held together with four screws. It is normally connected to the controller housing via a shielded power cable 0.5 to 5 meters in length, with heavy metal circular connectors at each end.

The available voltages and corresponding pinouts for all the functions are as follows:

+5 V digital	5 Amps	pin A
+6.5 V analog	5 Amps	pin P
-6.5 V analog	5 Amps	pin 2
+16.5 V analog	1.3 Amps	pin J
-16.5 V analog	1.3 Amps	pin D
+12 V fan supply	1.6 Amps	pin s H, X
+36 Volt analog	0.5 Amps	pin M
DSP reset		pin f
Shutter Logic		pin R
Shutter pulse to solenoid		pin F
Thermostat		pin d
Power supply grounds		pins S, N, C, K, E, L

10 lbs. = 4.5 kg.

9 x 9 x 4.5 inches = 23 x 20 x 11 cm.

The thermostat is installed to signal to the power control board that the internal temperature of the power supply is too high. It is a normally open switch that will close when its temperature exceeds 122 +/- 9 degrees F or 50 +/- 5 degrees C. It has a bit of hysteresis, so will open again only after a temperature fall of 15 deg. C. The power control board will turn off the analog power to the backplane and prevent it from being turned on until the switch re-opens. This causes the only red LED on the power control board to turn ON. Unfortunately, the switch has a tendency to fail more often than the power supply gets overheated, in which case users are advised to simply disconnect the part until a replacement can be installed, available from Selco #802F-050.

There is a +12 volt fan inside the power supply, with inlet and outlet holes to allow good air circulation. The inlet hole has a filter and filter holder. The filter should be cleaned or replaced when it gets dirty so it doesn't inhibit good airflow.

The shutter logic input on pin R is wired to the timing board via the controller backplane pin A30 = SHUTTER. It is controlled in software by bit #4 of the latch U12, traceable to the memory mapped location Y:WRLATCH = Y:\$FFFF5, controlled by the software seen in the file "timCCDmisc.asm". Clearing this bit will open the shutter by sending a pulse of

about +33 volts from a large capacitor in the shutter driving circuit to pin F of the power supply connector, and then to the power control board . Wiring internal to the controller housing routes this signal to a small 6-pin connector mounted on the outside of the housing near the fiber optic connectors. Its pinout is given in the timing board User's manual. The pulse will decay exponentially as the charge on the capacitor is discharged by the solenoid coil, and then be held at +5 volts until the shutter is closed, when it drops to zero volts.