

Order Number

Serial Number

## PRODUCT / TEST MANUAL

**4P81K1**

**POWER SUPPLY**

<b>Issue Level</b>	<b>Date</b>	<b>Summary of changes</b>
A	17/12/99	Initial issue.

Due to RMS continuous product improvement policy this information is subject to change without notice.

<b>Document updated</b>	<b>Checked</b>	<b>Registered</b>	<b>.pdf file created</b>	<b>.pdf uploaded to web site</b>

**1. DESCRIPTION OF RELAY**

The 4P81K1 is a 24 volt linear regulated power supply. The supply has a heavy-duty transformer to allow it to be used on 25 Hz as well as 50Hz. Transistor circuitry protects the unit against overload or short circuit at the output and a SCR/fuse crowbar circuit operates if the output voltage rises to an excessive level.

**2. SPECIFICATION**

Input Voltage	110 VAC 25/50 Hz
Output Voltage	24 VDC
Maximum Output Current (Limiting Current)	3A maximum
Ambient Temperature Range	-5 to 55 Deg C
Crowbar Threshold Voltage	28 – 30 V approx.

**3. TEST EQUIPMENT REQUIRED**

- DC Variable Power Supply
- Digital Volt Meter
- Dummy Load
- Oscilloscope

**4. ASSOCIATED DRAWINGS**

678-020-201	Circuit Diagram PCB
678-020-301	Loading Diagram PCB

**5. HIGH VOLTAGE TESTING**

- a) Apply 2KV RMS 50Hz between terminal inputs and chassis for 1 minute.
- b) Apply 500 VDC megger between DC terminal outputs & frame.

**6. CALIBRATION & TEST PROCEDURE**

- a) Connect the power supply as shown in fig 1.
- b) Connect a dummy load of 16 ohms (1.5 A @ 24 VDC) to the output terminals.
- c) Apply 110 VAC to the input terminals.
- d) Measure the voltage at the output terminals (not across the dummy load)
- e) Select padding resistor (R6) to achieve an output voltage of between 24.0 and 24.1 volts

MINIMUM	MAXIMUM	NOMINAL	ACTUAL	UNITS
24	24.1	24	<input style="width: 100px; height: 15px;" type="text"/>	V

**6. CALIBRATION & TEST PROCEDURE (Cont)**

**6.1 Current Limit**

- (a) Decrease the load resistance to achieve 3 Amps output at 24 VDC
- (b) Allow the supply to run for 5 minutes at 3 Amps.
- (c) Select padding resistor (R11) so that the output voltage starts to fall at a load current of between 3.3 to 3.4 Amps
- (d) Short-circuit the output terminals and check that the short circuit current is between 0.5 and 1 Amp. (Increasing R8 will increase the short circuit current)

MINIMUM	MAXIMUM	NOMINAL	ACTUAL	UNITS
3.3	3.4	3.3		Amps

- (e) Set the AC input voltage to 99 volts
- (f) Set the output current to 3 Amps and monitor the output with the Oscilloscope.
- (g) Check that the output voltage is greater than 23.76 volts and that the DC ripple is less than 0.2 Volts peak to peak.
- (h) Increase the input voltage to 121 VAC
- (i) Check that the output voltage is greater than 24.24 and the DC ripple is less than 0.2 Volts peak to peak.

RIPPLE	INPUT	MINIMUM	CHECK
	99	23.76	
	121	24.24	
< 0.2 Volts	99		
< 0.2 Volts	121		

**6.2 Overload Protection**

- (a) Connect an external current limited power supply and voltmeter as per Fig 2
- (b) Set the external voltage to 25.5 V +/- 0.1
- (c) Adjust R13 until the relay picks up.
- (d) Check that the relay drops out at between 24.8 and 25.2 volts.
- (e) Repeat this test a number of times to ensure trip voltage accuracy.

MINIMUM	MAXIMUM	NOMINAL	ACTUAL	UNITS
24.8	25.2	25		V

**6.3 Crowbar Protection**

- (a) Using the same test setup as in 6.2 above ensure that the external supply is current limited to less than 0.5 Amp.
- (b) Increase the voltage slowly until the SCR overvoltage crowbar operates.
- (c) Check the voltage at which this occurs it should be between 28 – 30 volts.
- (d) Repeat p) above several times to ensure accurate trip point.

MINIMUM	MAXIMUM	NOMINAL	ACTUAL	UNITS
28	30	29		V

**7. GENERAL & FUNCTIONAL**

- (a) Check that all wiring used in the construction of the power supply is rated at V150 (150° C).
- (b) Check that the terminations on the bridge rectifier, fuse holder and power transistors are either
- (c) twisted 360° around the lug or (b) are twisted through 180° through the hole in the lug.
- (d) Check that all screws, nuts and bolts are tight.
- (e) Check operation of the input and out LED's.
- (f) Check that the relay is electrically sound and mechanically robust as per Standard Inspection & Test Schedule 903-000-026

PASS

TESTED BY : \_\_\_\_\_ DATE : \_\_\_\_\_

8. CONNECTION DIAGRAM

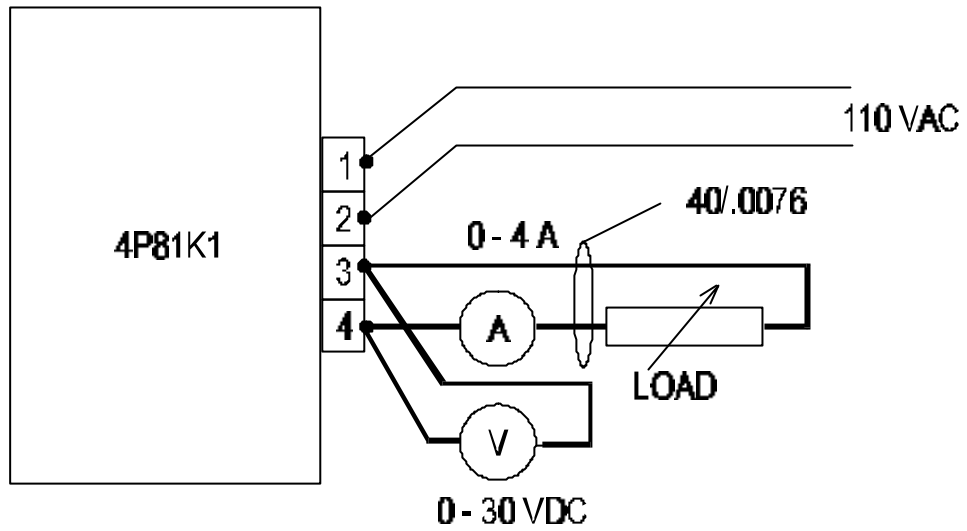


FIGURE 1

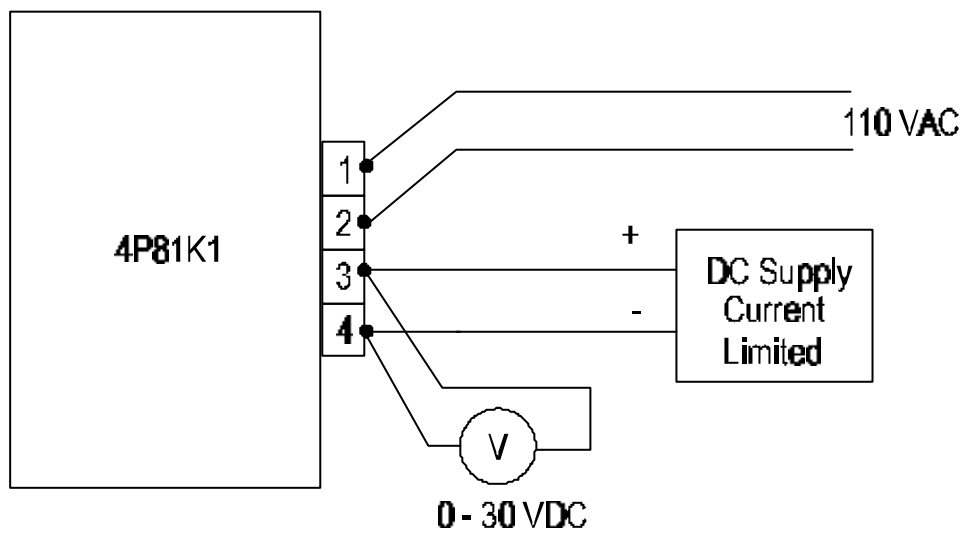


FIGURE 2