

# CIRCUIT-TEST

## Switching Mode Power Supply with Remote Sensing

### **PSC-9800**

0-16V 5A / 0-27V 3A / 0-36V 2.2A  
(80W)

# OPERATION MANUAL



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Keep this manual in a safe place for quick reference at all times.

This manual contains important safety and operation instructions for correct use of the power supply. Read through the manual and pay special attention to the markings and labels of this unit and equipment to be connected.

Pay special attention to these two types of notices used in this manual

**WARNING: Failure to observe this warning may cause injury to persons and damage to power supply or connected equipment.**

**CAUTION: Failure to observe this warning may result in damage to equipment and improper functioning of the power supply.**

## **Warning**

1. Do not use this power supply near water.
2. Do not operate or touch this power supply with wet hands.
3. Do not open the casing of the power supply when it is connected to AC mains.
4. Refer all servicing to qualified service personnel only.
5. Before replacing the AC fuse find out and clear up the cause first.
6. Replace the AC fuse with the same type and rating as the original fuse.

## **Caution**

1. Use a grounded 3 pin AC source.
2. This unit is for indoor use only. Do not block any ventilation of the unit.
3. Do not operate or place this unit in a humid, dusty, direct sunlight or near any heat source.
4. Before plugging into AC mains, check the rating label at the back of the unit.
5. This unit must be used within the specified rating; excessive continuous loading will damage the power supply.
6. The gauge size of input power cable must be at least 0.75mm<sup>2</sup> and the total length of power cable must not exceed 3m.
7. Input Fuse Recommended: T 2A/250V (2A Time Delay)

**NOTE:** To be serviced by qualified personnel only.

## **Operation Environmental Condition**

- 10-80% R.H. Altitude up to 2000m
- Installation Category: CAT 2 Pollution degree: 2
- Mains supply voltage fluctuation up to  $\pm 10\%$  of specified operating voltage.

# **Introduction**

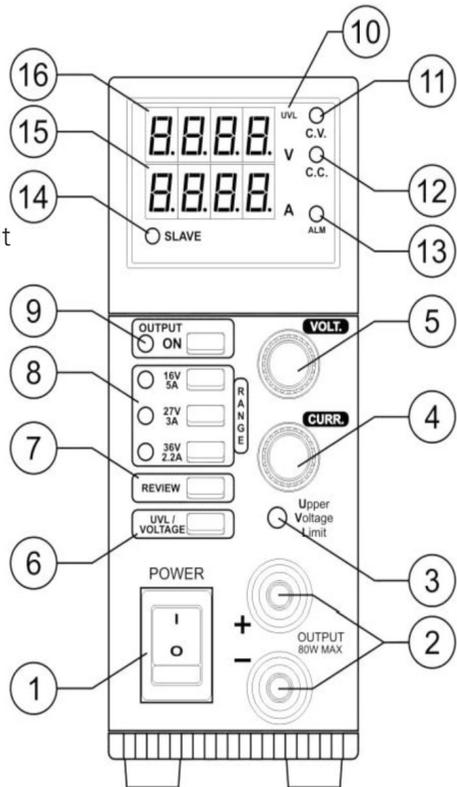
PSC-9800 is a constant power Switch Mode Power Supply with three different sets of voltage and current range giving the versatility of having three power supplies in one.

The modular design with additional output terminals at the rear panel and Master/Slave control allows easy connection of up to 5 units in parallel. The user pre-set upper voltage limit ensures protection to voltage sensitive load. Remote sensing and digital display gives precise voltage reading at the load.

# Controls and Indicators

## Front Panel Controls and Indicators

- 1 ON/OFF Power Switch
- 2 Front Panel Output Terminals
- 3 Upper Voltage Limit Adjustment
- 4 Current Tuning Knob
- 5 Voltage Tuning Knob
- 6 UVL/VOLTAGE
- 7 REVIEW
- 8 V I Push Buttons
- 9 Output ON/OFF button

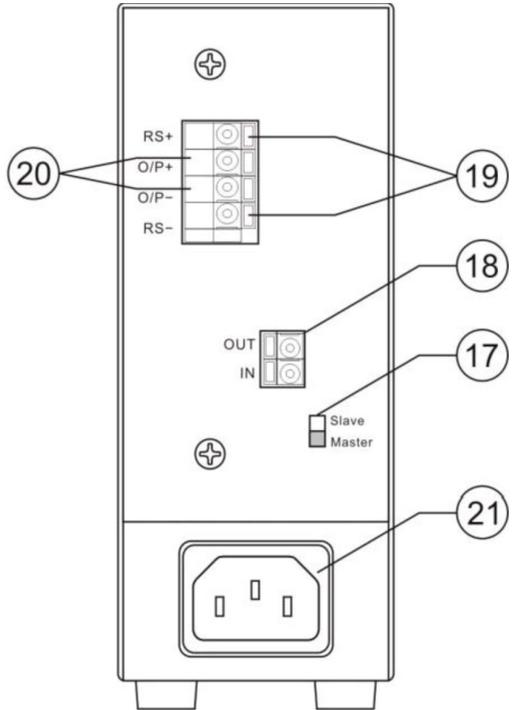


## Front LED Panel

- 10 UVL  
Upper Voltage Limit Indicator
- 11 C.V.  
Constant Voltage Indicator
- 12 C.C.  
Constant Current Indicator
- 13 ALM  
Alarm indicates the output voltage is either over the set Upper Voltage Limit or the power supply is in over temperature protection
- 14 SLAVE  
Indicates power supply is in Slave Mode
- 15 4 Digit Ammeter
- 16 4 Digit Voltmeter

## Back Panel Terminals & Switch

- 17 Master/Slave Switch  
Used in Master/Slave control parallel mode
- 18 In/Out Terminal  
Control terminals for use in the Master/Slave control parallel mode
- 19 RS+ and RS-  
Remote Sensing Terminal
- 20 O/P+ and O/P- Alternative Output Terminals
- 21 INPUT Power Socket



**NOTE - In normal operation, Master/Slave switch should be set to Master (default)**

# Operations

## 1. Stand Alone Operation

Check the power supply is set as Stand Alone operation mode with the Master & Slave switch (17) set to Master position.

Switch ON the power supply without any load by pushing (1) and the LED display should light up. There should not be any reading on the Voltmeter and the Ammeter.

Press the Output On-Off button (9) and its green LED will light up, the voltmeter should show the set output voltage.

Take note of the pre-set range and its LED, turn the voltage knob and check the voltmeter reading at the same time.

## 2. Selection of Voltage and Current Range

When using the Voltage and Current range setting (8), take note of the Voltmeter reading changing to zero voltage and LED of Output On-Off button (9) turning off.

The output terminal is off automatically when the VI range is changed, this is to safeguard the connected load.

## 3. PREVIEW Button

Press (7) to check the values of VI when output terminal is off.

Press and holding this button will show the output voltage and current limiting values previously set at the selected range with the output terminal off.

## 4. Setting the Current Limiting Value

You can set the current limiting value without connecting to the load or shorting the output terminals. Press and hold the PREVIEW button (7) and turn the current knob (5) to desired value.

## 5. UVL/VOLTAGE Button (6) and UVL LED (10)

Press UVL/VOLTAGE button to see the default value of Upper Voltage Limit. The LED (10) also lights up during this operation.

## 6. Setting the Upper Voltage Limit UVL value

Press button (6) and insert a small screw driver (less than 3mm diameter) into (3), slowly turn clockwise to increase and anti-clockwise to decrease the UVL value.

The UVL is an added protection for voltage sensitive load, only one UVL value can be set for all three ranges. When the output voltage exceeds the set UVL, the output terminal will be off automatically and the ALM (13) LED will light up.

## 7. Master & Slave Operation

### 7.1 Introduction

Two or more units of PSC-9800 can be connected in parallel to increase output current to the sum of connected power supplies. In this mode of operation, the designated Master power supply will control all the voltage and current setting of the Slave power supplies.

### 7.2 Preparing and connecting the Control Terminals (19)

Make sure all the power supplies are set to the same UVL by (6) and the same VI Range by (8). Set the voltage and current limit of all the Slave units to maximum values. Switch off all power supplies before any connections. Set the switch (17) to Slave position of all the Slave power supplies. Connect the Master & Slave control circuit as shown in Fig 7.1 and Fig 7.2

### 7.3 Output terminal Connection and Operation

You can either use the Output Terminals at the front (2) or at the back (20) to connect to the load as shown in Fig 7.3 depending on your application and requirement.

**NOTE:** All power cables should be of the same thickness and length.

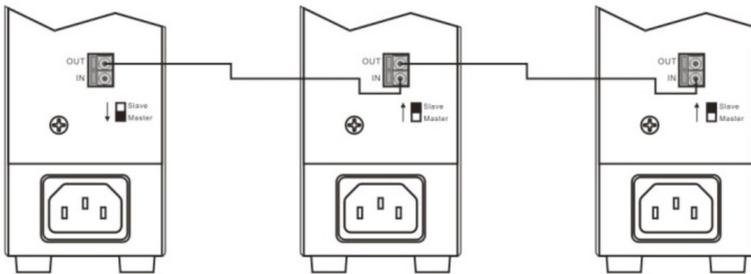
#### Caution:

- Double check the maximum voltage and current setting of the Slave units.
- Switch on the Master unit first and set to desired voltage, then switch on the Slave units.

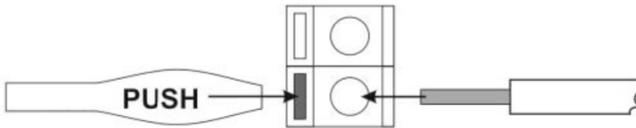
The Slave indicator LED (14) should light up in the Slave units as a confirmation of correct connections. All the output voltages and currents of the Slave units are now controlled by the Master Unit.

**NOTE:**

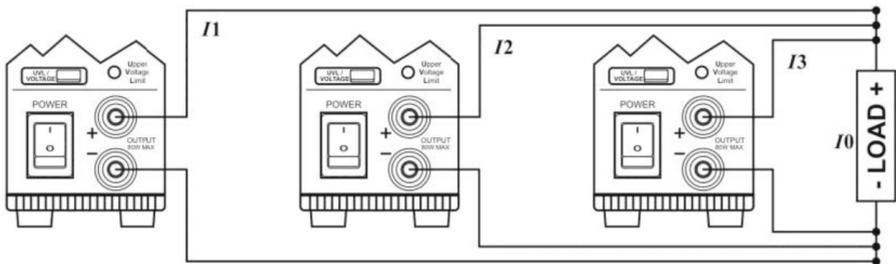
When the output current in the Master & Slave connection drops to zero, the output voltage will no longer be controlled by the Master unit. Make sure to keep a minimum current flowing that is at least several percent of the rated current at all times. This can be done by supplying a small removable load.



**Fig 7.1**



**Fig 7.2**



$$I_0 = I_1 + I_2 + I_3$$

**Fig 7.3**

## 8. Remote Sensing Operation

When the output current is high or there is a long connection to load, there is a voltage drop across the connecting cable and the voltage at load point will be less than at the output terminal of the power supply.

By making an extra connection from the remote sensing terminal (19) to the load point will make up for the load line voltage drop and make the voltage at the load point and output terminal the same.

**Caution: Do not reverse the polarity.**

**NOTE: Make sure to disconnect the wiring to remote sensing first before disconnecting the main output connection.**

## Trouble Shooting

<b>PROBLEM</b>	<b>INDICATIONS</b>	<b>POSSIBLE CAUSES</b>	<b>SUGGESTED SOLUTIONS</b>
Power supply not working	Panel display LED indicators not ON	AC input power is not connected. AC input fuse blown	Check AC power connection
No DC output power	Voltmeter zero indication  ALM (13) Alarm LED ON  ALM (13) Alarm LED ON  CC (12) LED ON	Output On/Off button not ON  UVL (10) protection triggered  OTP protection triggered  Output short circuit	1. Check output LED (9) is ON, push (9) to ON.  2. Check UVL set voltage by pushing (6), reset UVL to applicable limit, see section 5 & 6  3. Check vent holes are clear, if ambient temperature is too high.  4. Check and undo short circuit of output connection.
Voltage meter reading is inaccurate	Actual output voltage is different from the meter readouts	Voltmeter is not showing the output voltage.   Possible misalignment in voltmeter calibration	1. Check the UVL LED indicator on Voltmeter, if it lights up then the voltmeter only shows the set UVL value. Push (6) to return to output voltage.  2. Contact local agent, recalibration may be required.
Current meter reading is inaccurate	In CV mode, the actual current measured is different from the Ammeter reading	Possible misalignment in calibration	Contact local agent, recalibration may be required
The activated (auto-cross over) Current limiting value is different from the pre-set CC value	All indicators and display are normal, only CC mode has the problem	For stand-alone unit, Master & Slave Switch (17) in wrong position (Slave). Wrong setting or connection in Master & Slave or set-up procedure	Check if the Master & Slave switch (17) is in correct position. Use stand-alone mode to check power supply separately without any connection to slave units. Follow the procedure in section 8 carefully and make sure there is only one Master unit.

# Specifications

Input AC Voltage Range	120VAC
No Load Input Current at 120VAC	0.2A
Full Load Input Current at 120VAC	1.2A
AC Input Frequency	47 - 63Hz~
Full Load Input Power	144W
Efficiency	70%
Power Factor	0.9
Constant Voltage and Current Range Selection:	
0-16V / 5A selection I	0 - 16.4V 0 - 5.1A
0-27V / 3A selection II	0 - 27.6V 0 - 3.1A
0-36V / 2.2A selection III	0 - 36.8V 0 - 2.3A
Constant Voltage Characteristics:	
Load Regulation (0-100%)	20mV
Line Regulation ( $\pm 10\%$ )	4mV
Ripple & Noise (peak to peak)	30mV
Constant Current Characteristics:	
Load Regulation (0-100%)	10mA
Line Regulation ( $\pm 10\%$ )	10mA
Meter Accuracy:	
Voltmeter Accuracy	$\pm 1\%$ +2 counts
Ammeter Accuracy	$\pm 1\%$ +2 counts
Protection	Adjustable Upper Voltage Limit, Current Limiting Protection, Short Circuit, Overload, Over Temperature Protection
Output Terminals	Front and Back of housing
Additional Function	Remote Sensing
Cooling	Natural Convection
Dimensions (WxHxD)	53 x 127 x 330mm / 2 x 5 x 13 in
Weight	1.9 kg / 4.2 lb

## **Warranty**

Circuit-Test Electronics warrants to the original purchaser that this product be free of defect in material or workmanship for a period of 2 years from the date of purchase.

Any product which has been subjected to misuse or accidental damage is excluded from the warranty. Except as stated above, Circuit-Test Electronics makes no promises or warranties either expressed or implied including warranties of merchantability or the fitness for any particular purpose.

Notes:

**CIRCUIT-TEST**  
**ELECTRONICS**

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