

# STANDARD POWER Inc

A Subsidiary of  
Acme Electric Corporation

## INSTRUCTION SHEET SPS/CPS SERIES MULTIPLE OUTPUT

### FEATURES

- Voltage adjustment potentiometer
- Foldback current limiting
- 115/230 Vac, 47-440 Hz input
- .1% line/load regulation
- Temperature compensated circuitry
- 0.1% ripple
- Optional overvoltage protection
- Optional square current limiting

### DESCRIPTION

The SPS and CPS Series are series regulated, solid state power supplies designed to provide closely regulated DC voltages in all popular voltage and current levels. The outputs are floating, so any voltage may be plus or minus or referenced to another voltage.

### OPERATING PROCEDURE

For 115 Vac, 47-440Hz connect input leads to terminals 1 and 4 of transformer or input terminal block, terminals 1 & 3 and 2 & 4 will be jumpered. (Factory connection)

For 230 Vac input, remove jumpers between 1 & 3 and 2 & 4. Then jumper terminals 2 and 3 together and connect 230 Vac to terminals 1 and 4. Suggest twisted AC input wires if electrical noise reduction is prime concern.

Output terminals identified in figure 3 on back of this sheet are marked + and -. Load should be connected to these terminals with due care to proper wire size and solid electrical connection for best results. Output voltages may be adjusted with the potentiometers identified in the tabulation block on the back of this sheet (Figure 2).

### SUGGESTED TEST PROCEDURE

Connect AC input power as outlined in operating procedure. Place a variac between Vac source and input to transformer. Place an AC voltmeter across transformer input terminals 1 and 4. Set input voltage for nominal 115 Vac with variac.

Place resistive loads across outputs, check Vdc output specifications. DC voltmeter should be connected directly across output terminals. Greatest test errors are made at this point.

### LINE REGULATION

With outputs adjusted to rated voltages, reduce input Vac to 104 volts and record or note output voltage. Then increase input Vac. to 126 Vac and note output voltage. Total output voltage change should not exceed .2% or  $\pm$  .1%.

### LOAD REGULATION

Set AC input voltage to 115 Vac. Place DC voltmeter across output terminals and record or note output voltage. A load resistor, equal to the rated load of each output, at selected DC voltage setting, is then applied to output terminals. The voltage change should be noted. This differential change should not exceed .2% or  $\pm$  .1% of DC output voltage.

### RIPPLE

With voltage set at 115 volts and full load across DC output terminals, the measurable AC voltage on output should not exceed 0.1% RMS.

### OVERVOLTAGE PROTECTION

Optional overvoltage protection (OVP) is available on most models. Consult the catalog selection guide or the listing on next page for appropriate models or contact the factory for application note. When installing OVP across two series connected outputs, observe cautionary note on reverse side of this sheet.

### SUGGESTED PRACTICES

Moving air is desirable when mounting in a confined area. Chassis may be attached to other heat dissipating surfaces to improve cooling characteristic at maximum ratings. Loads generating high back EMF voltages should be checked with zener, parallel diode, or series diode to reduce detrimental effects on pass elements. It is recommended that the AC input circuit be fused. A suggested fuse rating is listed on the reverse side of this sheet.

# SPS/CPS 30D (A) SERIES

## NOTES:

1. Recommended input fuse 1A, 3AG.
2. One OVP-1 may be used with 5V through 28V models.
3. If one OVP is used to protect two series connected outputs, it is necessary to install 3 amp diodes across each output as shown in figure 1.

The sum of the series connected outputs must be less than 32 volts.

4. OVP-0 or OVP-11 may be used on 5V outputs only.
5. If problems are encountered in series operation of two outputs powering a common load, contact the factory for application note AN 101.

6. CPS 30D 5/10-12 is normally wired V1 + 12, V2 + 5, and common at output terminal block.

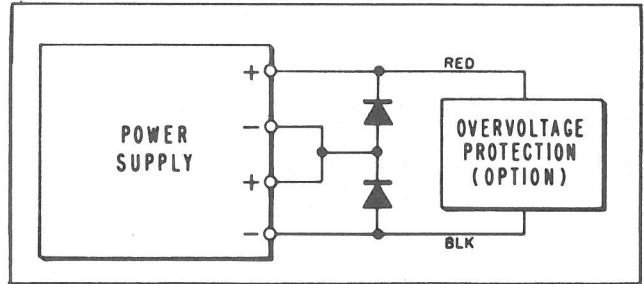
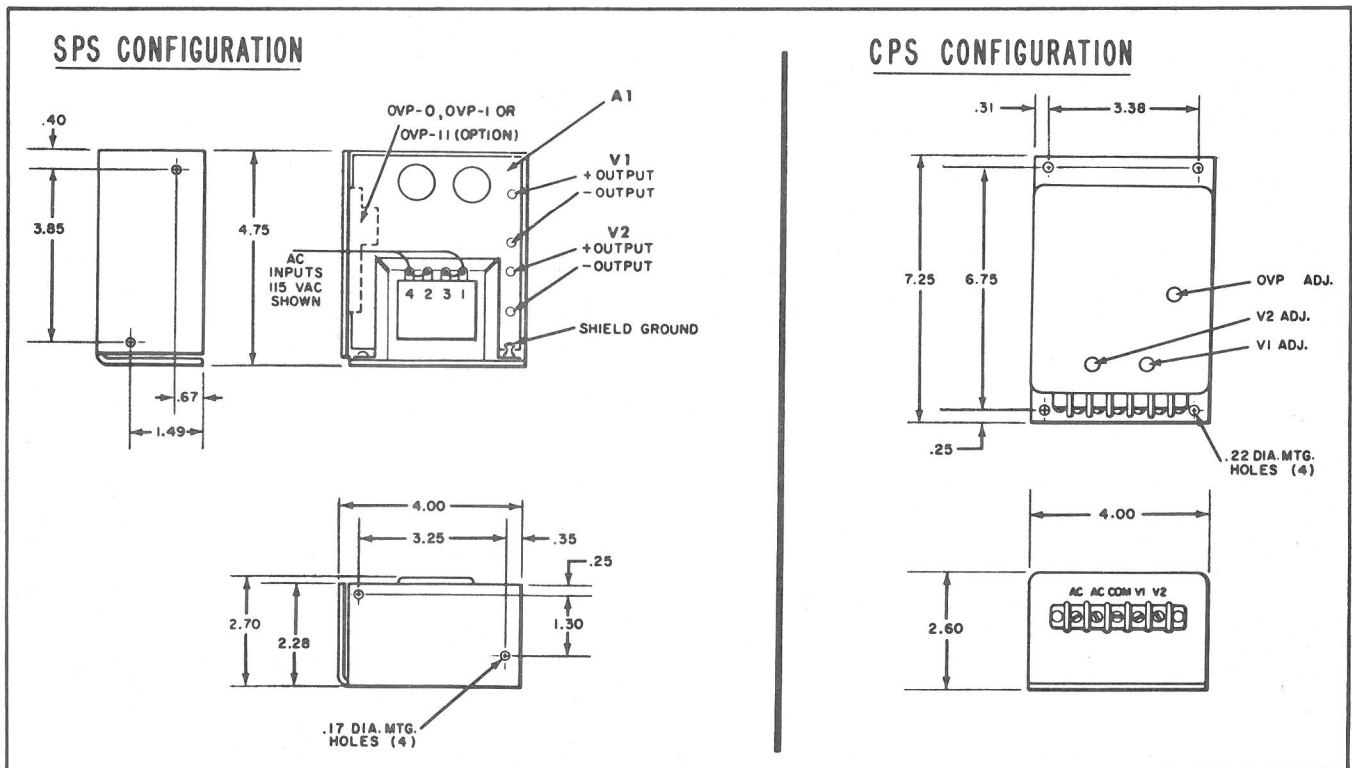


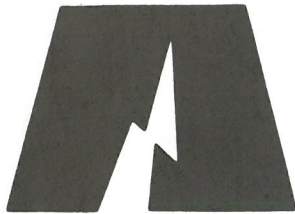
Figure 1

Figure 2

LOCATION	A1-V1	A1-V2
OUTPUT VOLTAGE ADJ CURRENT LIMIT ADJ	10/12V, .5/.6A R9	5V, 2A R19
OUTPUT VOLTAGE ADJ CURRENT LIMIT ADJ	12/15V, .7A R9	12/15V, .7A R19
OUTPUT VOLTAGE ADJ CURRENT LIMIT ADJ		

Figure 3





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## OVERVOLTAGE PROTECTION

### CROWBAR DESCRIPTION

The overvoltage protection (OVP) is a device designed to protect against undesirable overvoltage conditions, which may occur due to power supply regulation, or power distribution malfunction.

### CIRCUIT THEORY

A voltage reference is established by a zener in series with a divider network placed in shunt across DC output of power source. The zener reference voltage is amplified through a transistor stage connected to a SCR gate. The SCR is shunted across the output of the DC source.

### THEORY OF OPERATION

When the source voltage rises above the preset threshold level, the SCR is triggered on causing what appears to be a short across the DC source, thereby reducing the DC source voltage to near zero.

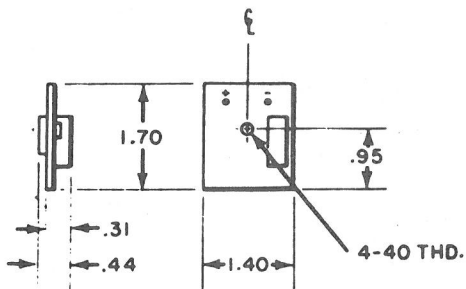
### APPLICATION

The OVP leads are placed red to + Vdc and black to - Vdc of power supply output. The voltage adjust pot on OVP printed circuit board is turned counterclockwise to its stop (facing component side of printed circuit board). The desired trip point of overvoltage is set on Vdc output of supply. Then the pot on the OVP is turned clockwise until the OVP fires or crowbars. Turn off the DC supply and re-adjust power supply to desired operating voltage. The OVP will recover or reset automatically when DC voltage is turned off and the capacitors have discharged. If difficulty is experienced in adjusting the power supply output to the desired OVP firing point, contact the factory for application note (AN 105). An auxiliary power supply should not be used to trigger the OVP unless the OVP is disconnected from the power supply under test. Failure to disconnect the OVP before the auxiliary supply is connected may damage the power supply. Fusing of primary or secondary of power supply is recommended to avoid damage to supply in the event that regulator is shorted when the OVP is actuated. Suggested primary fuse values are listed on the instruction sheet of each power supply model. Fuse type 3 AG or 3 AB are recommended.

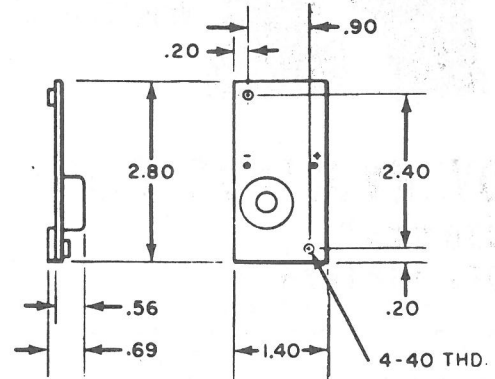
	<b>OVP - 0</b>		
TRIGGER VOLTAGE RANGE	6.5 Vdc $\pm$ 5%		
CONTINUOUS SHUNT CURRENT	8 Amps Max.		
INSTANTANEOUS SHUNT CURRENT	80 Amps Max.		
	<b>OVP - 1</b>	<b>OVP - 11</b>	<b>OVP - 21</b>
ADJUSTABLE VOLTAGE RANGE	5.35 - 32 Vdc	5 - 8 Vdc	25 - 75 Vdc
CONTINUOUS SHUNT CURRENT	8 Amps Max.	8 Amps Max.	8 Amps Max.
INSTANTANEOUS SHUNT CURRENT	80 Amps Max.	80 Amps Max.	80 Amps Max.
	<b>OVP - 2</b>	<b>OVP - 12</b>	<b>OVP - 22</b>
ADJUSTABLE VOLTAGE RANGE	5.35 - 32 Vdc	5 - 8 Vdc	25 - 75 Vdc
CONTINUOUS SHUNT CURRENT	16 Amps Max.	16 Amps Max.	16 Amps Max.
INSTANTANEOUS SHUNT CURRENT	240 Amps Max.	240 Amps Max.	240 Amps Max.
	<b>OVP - 3</b>	<b>OVP - 13</b>	<b>OVP - 23</b>
ADJUSTABLE VOLTAGE RANGE	5.35 - 32 Vdc	5 - 8 Vdc	25 - 75 Vdc
CONTINUOUS SHUNT CURRENT	35 Amps Max.	35 Amps Max.	35 Amps Max.
INSTANTANEOUS SHUNT CURRENT	450 Amps Max.	450 Amps Max.	450 Amps Max.
	<b>OVP - 4</b>	<b>OVP - 14</b>	<b>OVP - 24</b>
ADJUSTABLE VOLTAGE RANGE	5.35 - 32 Vdc	5 - 8 Vdc	25 - 75 Vdc
CONTINUOUS SHUNT CURRENT	60 Amps Max.	60 Amps Max.	60 Amps Max.
INSTANTANEOUS SHUNT CURRENT	1000 Amps Max.	1000 Amps Max.	1000 Amps Max.
	<b>OVP - 5</b>	<b>OVP - 15</b>	<b>OVP - 25</b>
ADJUSTABLE VOLTAGE RANGE	5.35 - 32 Vdc	5 - 8 Vdc	25 - 75 Vdc
CONTINUOUS SHUNT CURRENT	80 Amps Max.	80 Amps Max.	80 Amps Max.
INSTANTANEOUS SHUNT CURRENT	1000 Amps Max.	1000 Amps Max.	1000 Amps Max.

# PHYSICAL CHARACTERISTICS

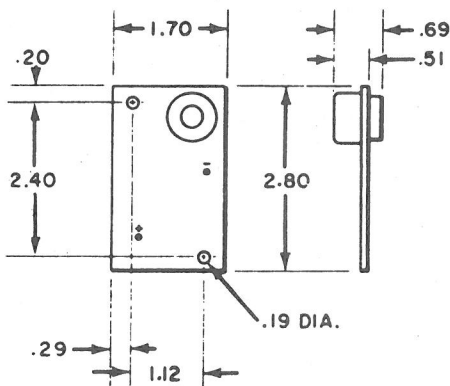
## OVP - 0



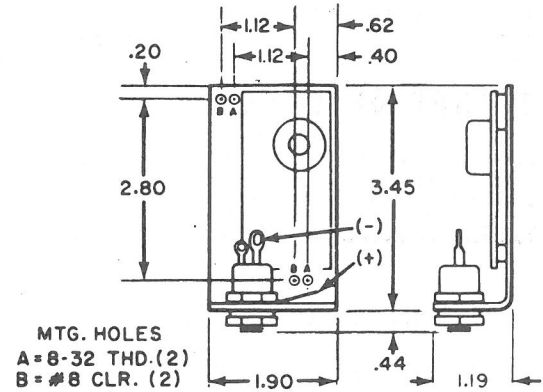
## OVP - 1 or 11 or 21



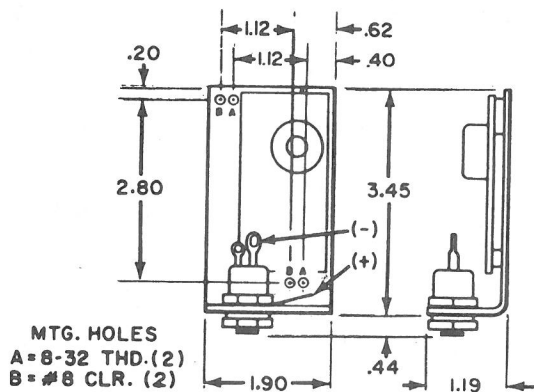
## OVP - 2 or 12 or 22



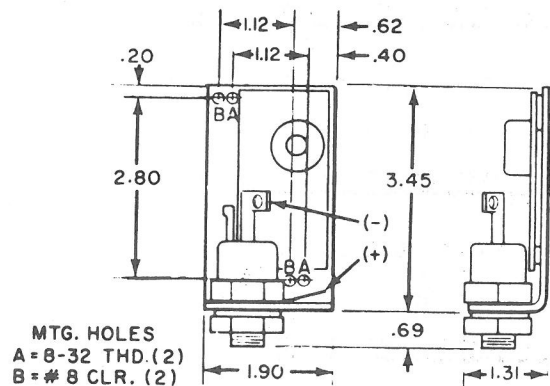
## OVP - 3 or 13 or 23



## OVP - 4 or 14 or 24



## OVP - 5 or 15 or 25



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## NOTES:

- All dimensions in inches
- Typical voltage adjustment (component side of PC board)  
 CW.....6.0 Volts  
 CCW.....30 Volts