



# MODULAR REDUNDANT SYSTEMS - Linear Regulated

ALL ACOPIAN  
POWER SUPPLIES  
MADE IN U.S.A.

**Output Redundancy:** Each Modular Redundant System contains two identical power supplies with their outputs interconnected through a diode switching arrangement that will detect any fault condition, isolate the output of the defective supply from the Redundant System output, and pass only the output of the other supply, with no interruption of the Redundant System output power during the transition. (A defective power supply can be rapidly and safely changed while the Modular Redundant System continues to furnish uninterrupted power to the load.)

**Input Redundancy:** Two isolated sets of AC input connections permit using two independent sources of input power, to obtain the advantage of input redundancy. By connecting a battery-backup power source (UPS) and/or a second line from the power utility to AC Input 2, output power will be maintained without interruption even when the power to AC Input 1 fails. If a second source of AC power is not available, connect the available source to both sets of input connections.

**Polarity:** Output is floating; either positive or negative output terminal may be grounded or floated up to 300 volts above ground.

## INSTALLATION AND OPERATION

Even a relatively small amount of air flowing around and through a power supply will significantly reduce the rise in its temperature resulting from operation, and therefore the temperature of the critical components within it, improving both reliability and stability. If possible, keep the Modular Redundant System spaced away from other heat dissipating or air blocking assemblies.

Make all connections before applying AC input power.

Do not use in series or parallel.

If the AC input power contains large voltage spikes ('noise') induced by the switching of high currents, inductive loads, electro-mechanical components, etc., the input power leads to the Integration Module should include some means of transient suppression. Otherwise, a portion of the noise may be coupled through it to the load, and both could be damaged. The means of suppression that is easiest to install is a 1 mfd capacitor or a metal oxide surge suppressor (MOV) across each set of AC input terminals. In extremely severe cases, the use of RF chokes in series with each side of the line may also be required.

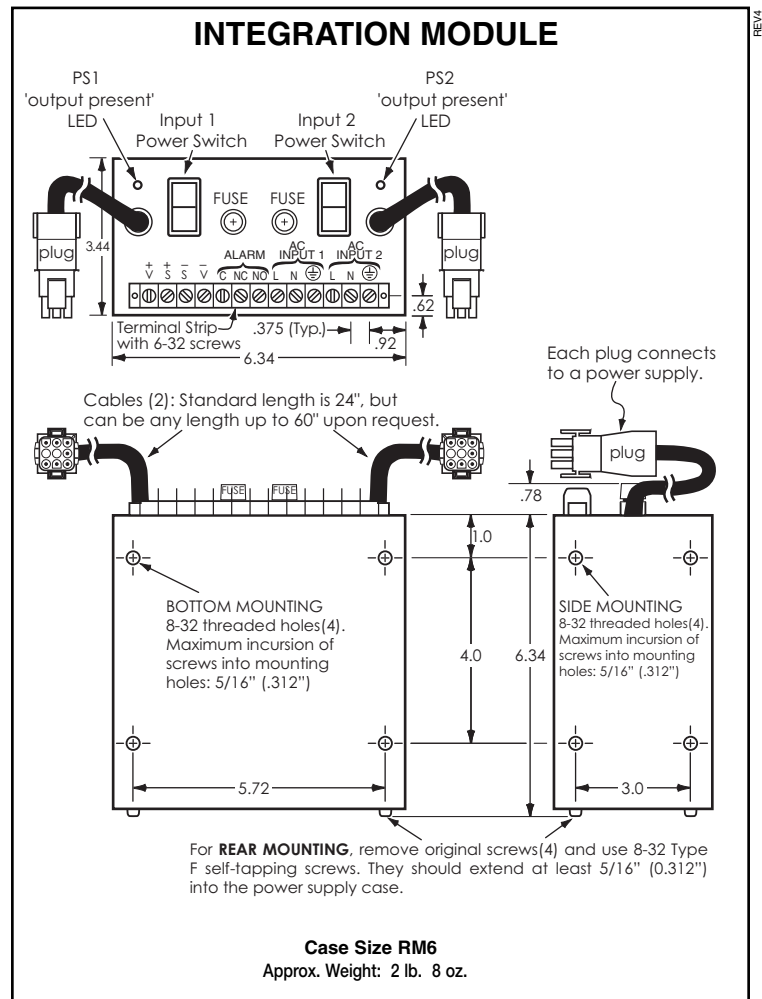
THE SENSING TERMINALS MUST BE CONNECTED to the output terminals, either on the front panel of the Integration Module or at the load. Failure to have the sense terminals connected will affect the output voltage (usually causing it to be higher than the rating of the supply, and unadjustable), and may result in permanent damage to both the Modular Redundant System and its load. If voltage drops in the output voltage leads (which degrade regulation) are not objectionable, local sensing can be used; leave in place the jumpers provided on the Integration Module (connecting the +S to the +V terminal and the -S to the -V terminal). However, if the best possible regulation at the load is required, then remove the jumpers and use two additional leads to connect the sense terminals to the output leads at the load, as shown in the schematic. This configuration permits the Modular Redundant System to sense and compensate the voltage actually across the load. Note that remote sensing is capable of compensating only limited wiring drops. The voltage across the load, plus the voltage drops through the wiring, must be within the specified output voltage range for the voltage at the load to remain within the load regulation specification.

The Integration Module contains two voltage monitoring circuits with relays which may be used to control external failure alarms or other circuitry. The contact wiring of the two relays is connected in cascade, to simulate a single set of Form C contacts which switches if the output voltage of either power supply decreases by more than 2.0 volts (3.0 volts for outputs over 48 volts) from the nominal rating.

Each power supply contains an overvoltage protection circuit with automatic reset, to assure that neither power supply output will significantly exceed the nominal output voltage rating under any condition, including incorrect application and misadjustment.

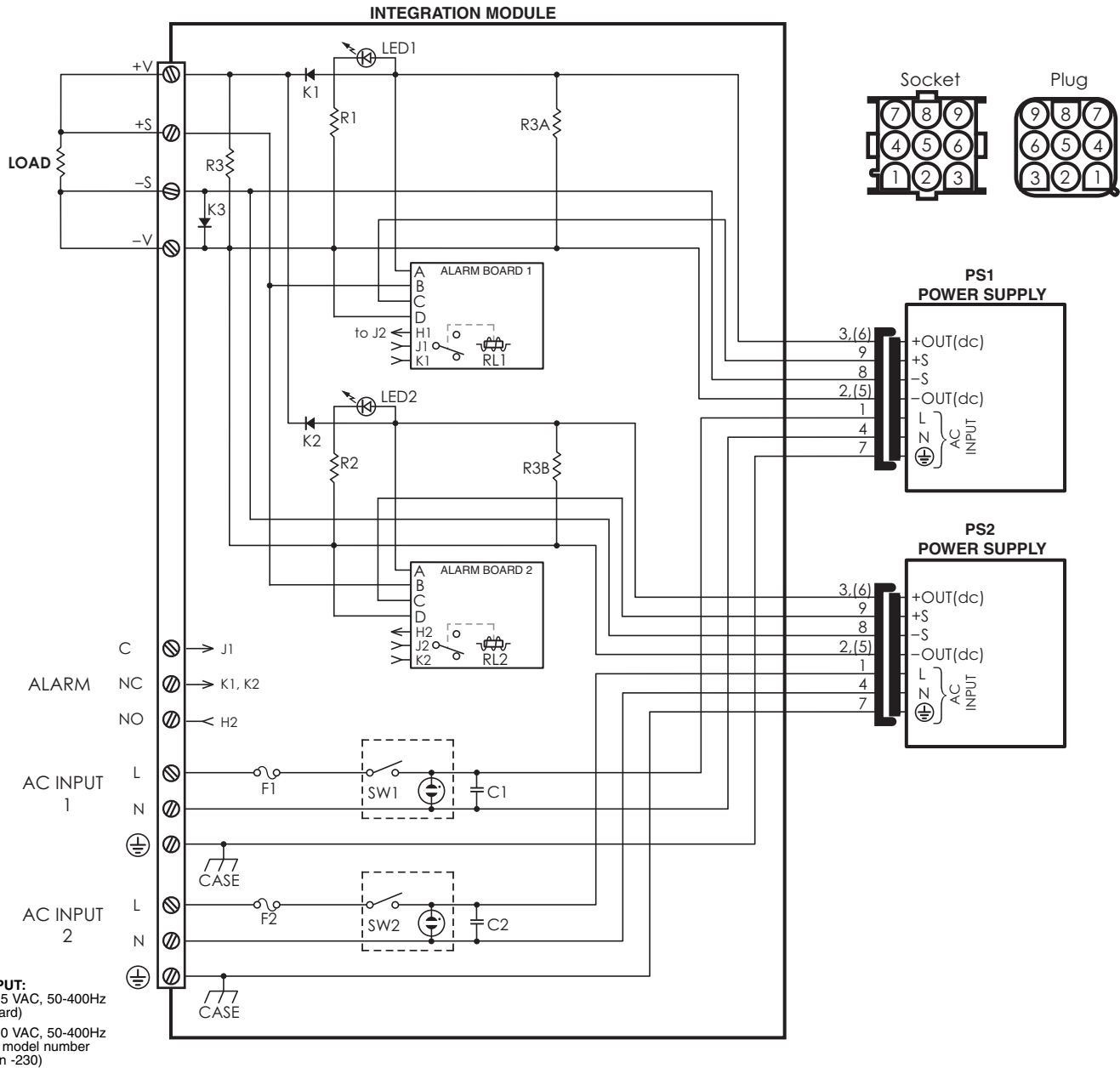
The power supplies have overload and short circuit protection. They operate as constant voltage sources when used at load currents equal to or less than their ratings. However if the power supply is overloaded, the current limit circuit will automatically reduce the output voltage, and it will then attempt to recover to its normal operating point. **EVEN A TRANSITORY OVERLOAD RESULTS IN A MOMENTARY DROP IN OUTPUT VOLTAGE.** If the overload is still present when the voltage attempts to recover, the voltage will continue to alternately drop and recover, which will appear as a sawtooth oscillation of the output. Do not operate the power supply in this mode; reduce the load so that an output current equal to or less than the rating of the supply will be drawn.

Frequent fuse failure is symptomatic of overload, a short circuited output, a tripped overvoltage protector, or power supply failure. Do not overfuse; this can result in damage to the power supplies.





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The size of the barrier strip screws is 6-32.

## SET-UP

1. Be certain AC input switches are off.
2. Connect the Modular Redundant System as shown, but temporarily without the load. (Each sensing line must remain connected to its respective output terminal. Failure to do so may result in permanent damage.)
3. Turn on Primary power supply (PS1) and set its output to the nominal output voltage. (For greatest accuracy, using a digital voltmeter connected to the output terminals is recommended.) Then switch off this supply.
4. Turn on Backup power supply (PS2) and set its output to 0.2 volts below the nominal output voltage. Then switch off this supply.
5. Connect the load, then switch on both power supplies. The Modular Redundant System is now operational.

Rev2

Rev2



## SERIES A POWER SUPPLIES - for Modular Redundant Systems

### INSTALLATION AND OPERATION

Threaded holes on the bottom (and one side surface on M6, M9, & M13 case sizes) may be used for mounting, or the supply may be rear mounted using the same holes that attach the rear cover plate. An accessory Mounting Kit (model GB8) is available to enable mounting the power supply when the opposite side of the mounting surface is inaccessible.

Even a relatively small amount of air flowing around and through a power supply will significantly reduce the rise in its temperature resulting from operation, and therefore the temperature of the critical components within it, improving both reliability and stability. Avoid blocking air flow through vented surfaces. If the perforated bottom of a supply is mounted to a solid surface, use spacers at least 3/16" thick between it and the surface to which it is fastened, to permit convection air flow, or punch ventilation holes in the mounting surface. Allow free air to circulate around heat sinks. Space at least one inch away from surrounding objects.

Make all connections before applying AC input power.

THE SENSING TERMINALS MUST BE CONNECTED to the output terminals, either at the barrier strip on the power supply or at the load. Failure to have the sense terminals connected will affect the output voltage (usually causing it to be higher than the rating of the supply, and unadjustable), and may result in permanent damage to both the power supply and its load. If voltage drops in the output voltage leads (which degrade regulation) are not objectionable, local sensing can be used; leave in place the jumpers provided with the power supply on the barrier strip (connecting the +SENS to the +OUT terminal and the -SENS to the -OUT terminal). However, if the best possible regulation at the load is required, then remove the jumpers and use two additional leads to connect the sense terminals to the output leads at the load, as shown in the schematic. This configuration permits the power supply to sense and compensate the voltage actually across the load. Note that remote sensing is capable of compensating only limited wiring drops. The voltage across the load, plus the voltage drops through the wiring, must be within the output voltage range of the supply for the voltage at the load to remain within the load regulation specification.

If there is any possibility of voltage from another source (another power supply, a battery, transients, etc) being applied to the power supply's output terminals, protect the power supply by using a diode in series with one of the output leads.

Frequent fuse failure is symptomatic of power supply overload, a short circuited output, a tripped overvoltage protector, or power supply failure. Do not overfuse; this can result in damage to the power supply.

If the AC input power contains large voltage spikes ('noise') induced by the switching of high currents, inductive loads, electro-mechanical components, etc., the input power leads to the supply should include some means of transient suppression. Otherwise, a portion of the noise may be coupled through the supply to the load. Also, the supply could be damaged. The means of suppression that is easiest to install is a 1 mfd capacitor or a metal oxide surge suppressor (MOV) across the AC input terminals of the supply. In extremely severe cases, the use of RF chokes in series with each side of the line may also be required.

These power supplies operate as constant voltage sources when used at load current equal to or less than their ratings. If the power supply is overloaded, the current limit circuit will automatically reduce the output voltage, and it will then attempt to recover to its normal operating point. Therefore, A TRANSITORY OVERLOAD RESULTS IN A MOMENTARY DROP IN OUTPUT VOLTAGE. However, if the overload is still present when the voltage attempts to recover, the voltage will continue to alternately drop and recover, which will appear as a sawtooth oscillation of the output. Do not operate the power supply in this mode; reduce the load so that an output current equal to or less than the rating of the supply will be drawn.

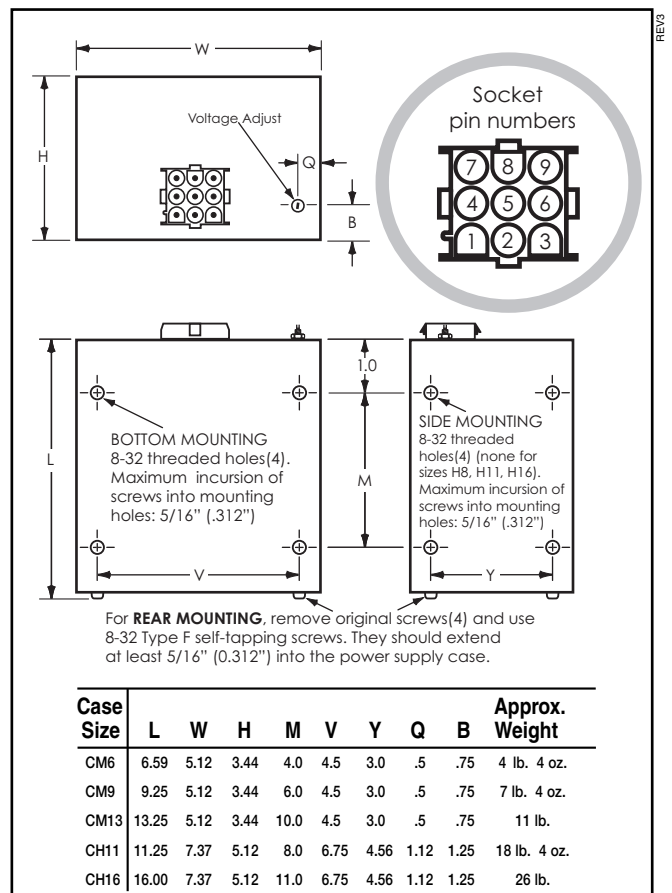
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**WARRANTY:** Acopian power supplies are warranted to be free from defects in material and workmanship for a period of five years (encapsulated devices and fans, for one year) from date of original shipment. Acopian's obligation under this warranty is limited to repairing any power supply returned to the factory Service Department in Easton, PA and replacing any defective parts. Authorization must be obtained from Acopian before a power supply may be returned for repair. Transportation charges are to be paid by the purchaser. A reinspection and handling charge will be applied to returned units found to have no defects. If a failure has been caused by misuse, operation in excess of specifications, or modification by the customer, repairs will be billed at cost; in such cases, a cost estimate will be submitted before work is started.

Acopian reserves the right to make changes or improvements in its products without incurring any obligation to install the same on products previously manufactured.

*This warranty is in lieu of all other warranties, obligations, and liabilities, expressed or implied, and is the purchaser's exclusive remedy. Acopian makes no warranty, either express or implied, of merchantability, fitness for a particular purpose or otherwise. In no event shall Acopian be liable for incidental or consequential damages of any kind, including loss of business or profits, or any other losses incurred by the purchaser or any third party.*

The validity, performance and construction of all terms and conditions and any sale made by Acopian shall be determined by the law of Pennsylvania, not including its law of conflict of laws.

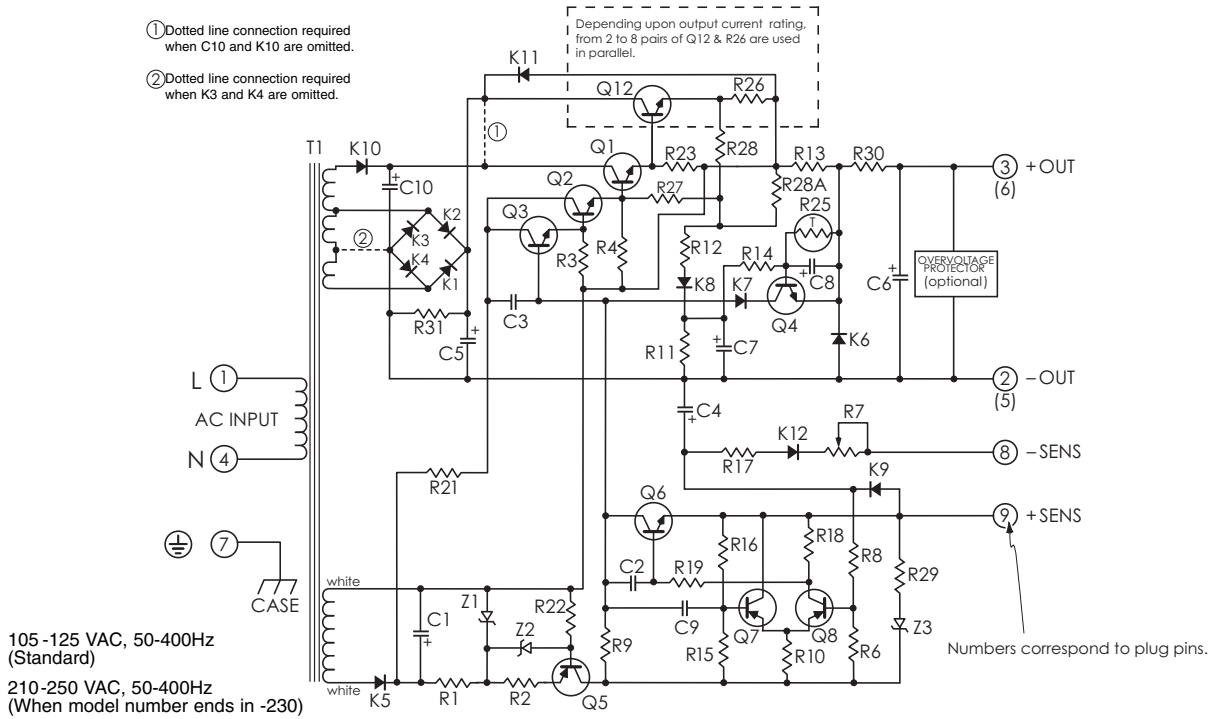


The complete Acopian catalog is available on the Internet at [www.acopian.com](http://www.acopian.com)  
P.O. Box 638, Easton, PA 18044 • Phone: (610) 258-5441 • FAX: (610) 258-2842



# SERIES A POWER SUPPLIES - for Modular Redundant Systems

Acopian modular power supplies are ideally suited to all applications where compact, high performance and high reliability power supplies are required. Modular construction and pluggable interconnections provide mounting and wiring convenience and flexibility. All models have floating outputs which may be used floating, with either the positive or negative side grounded, and/or in series with another supply(ies). All have built-in short circuit protection and provision for remote sensing of output voltage at the load for applications where voltage regulation is critical. They are conservatively rated for operation at ambient temperatures to +71°C.



CAUTION: To provide protection from risk of fire, use a

amp time-delay fuse (250V) in the AC input wiring.

MODEL: