MODULAR REDUNDANT SYSTEMS
Narrow Profile Switching 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.

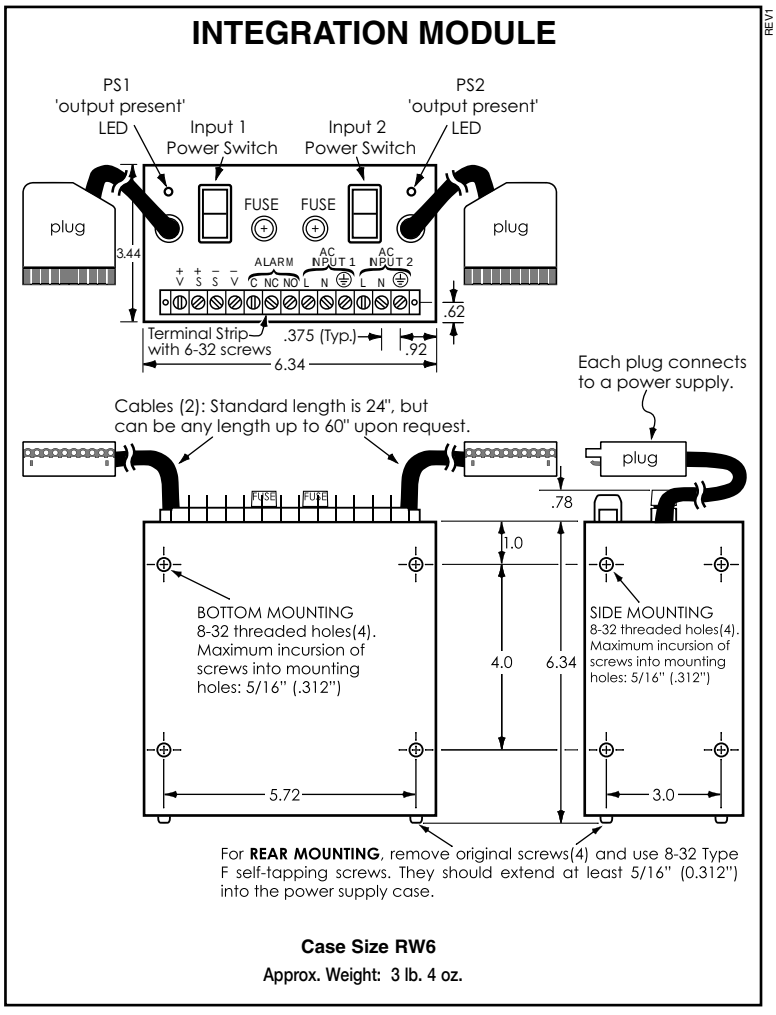
THE SENSING TERMINALS MUST BE CONNECTED to the output terminals, either on the front panel of the Integration Module or at the load. Failure to have the sense terminals connected will affect the output voltage (usually causing it to be higher than the rating of the supply, and unadjustable), and may 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 changes by more than 2.0 volts from the nominal rating.

Each power supply contains an overvoltage protection circuit to assure that neither power supply output will significantly exceed the nominal output voltage rating under any condition, including incorrect application and misadjustment. A higher than normal output voltage (even if momentary, as when caused by a transient induced into the output wiring) will result in the overvoltage protection circuit momentarily shutting the output OFF.

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.



Case Size RW6

Approx. Weight: 3 lb. 4 oz.

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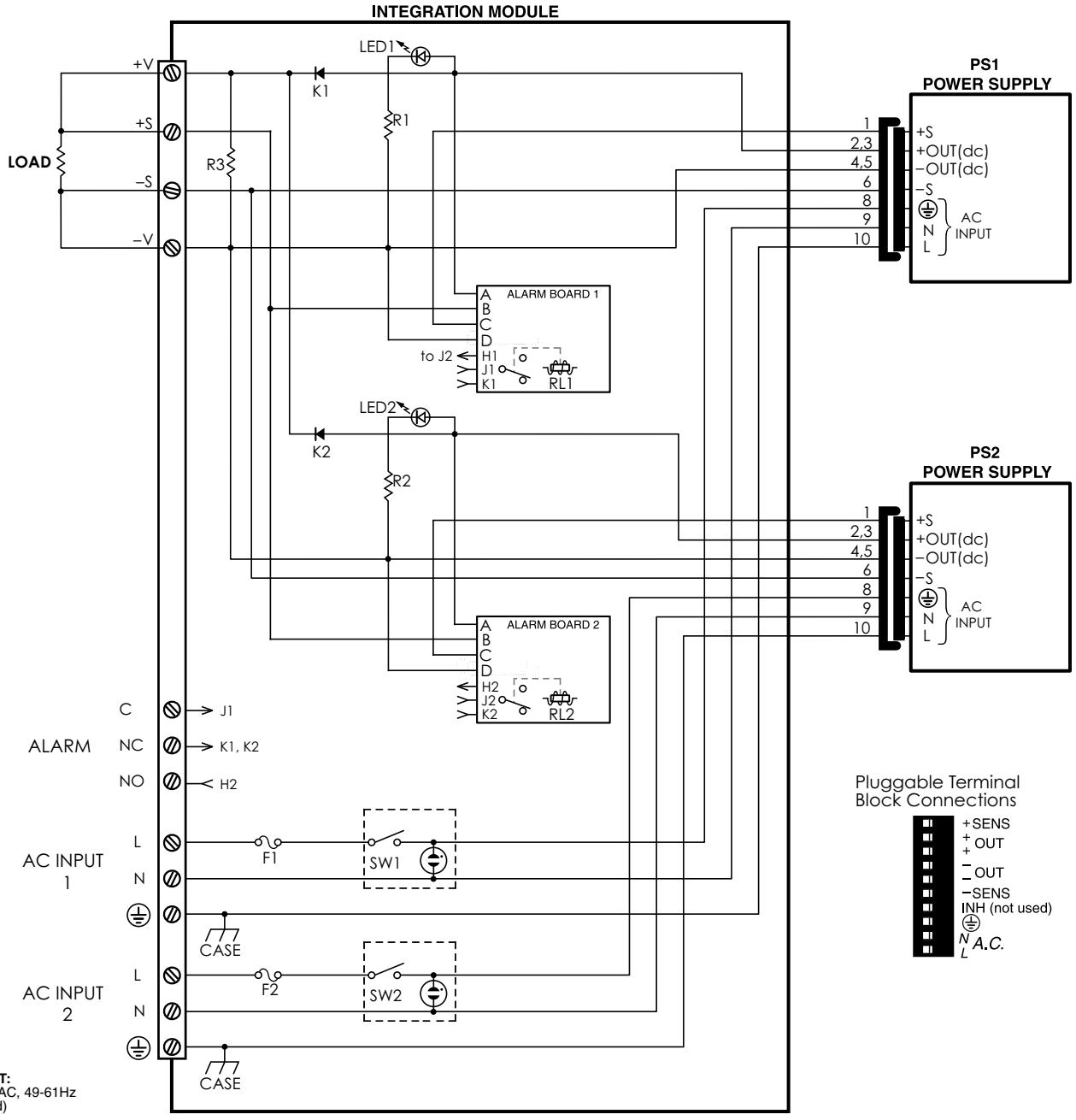


AC INPUT:
90-265 VAC, 49-61Hz
(Standard)

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

SET-UP

REV1

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.

SWITCHING POWER SUPPLIES - NARROW PROFILE (WN8) for Modular Redundant Systems

Acopian switching power supplies are high performance units that are unusually compact relative to their output ratings. Features include short circuit, overvoltage and thermal protection, 'soft start' operation, and a status light that shows operational status at a glance: the green 'DC on' indicator signals normal operation, and extinguishes when the current limit control is activated by a short circuit or latchup of the overvoltage protection circuit due to an overvoltage condition.

INSTALLATION

Threaded holes on the bottom and right side surface may be used for mounting. An accessory Mounting Kit (model NP6) is available to enable mounting the power supply when the opposite side of the mounting surface is inaccessible. DIN rail Mounting Kits are also available.

It is very important to allow for the free circulation of air around and THROUGH the power supply (do not block fan intake or exhaust). Failure to do so will result in thermal shutdown or possible damage to the power supply.

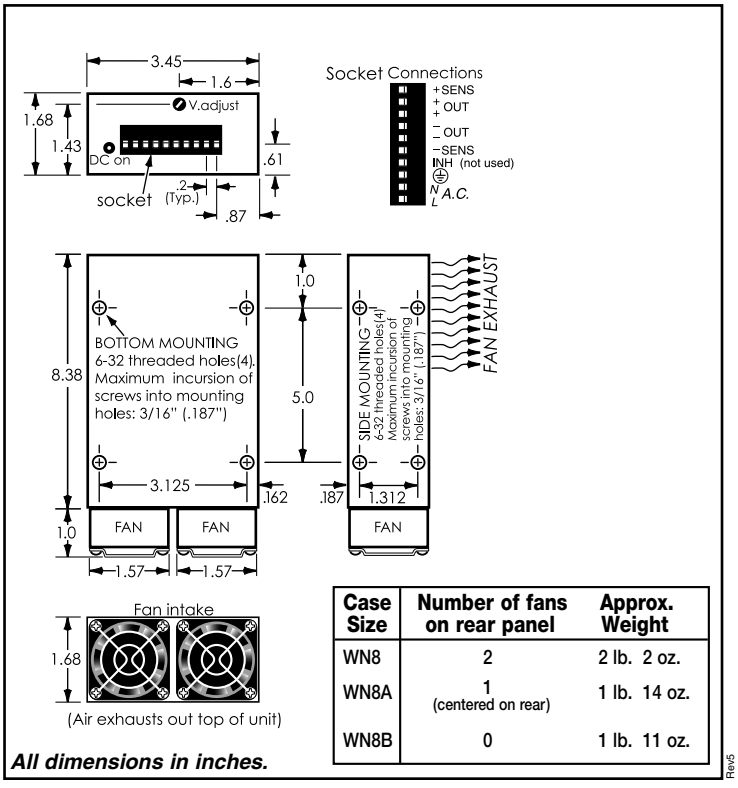
Space at least one-half inch away from surrounding objects.

CONNECTIONS

Make all connections before applying input power.

THE SENSING TERMINALS MUST BE CONNECTED to the output terminals, either at the output terminals of 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), or may result in the overvoltage protection circuit latching the output 'off'. 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 (connecting the +S (sense) to the +OUT and the -S (sense) to the -OUT). However, if the best possible regulation at the load is required, then remove the jumpers and use two lighter gauge 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. Therefore, the wire gauge used for the output lines MUST BE LARGE ENOUGH to assure that their combined voltage drops will not exceed the difference between the maximum output voltage of the supply and the voltage to be maintained across the load.

In electrically noisy environments it may be necessary to use shielded wire for remote sensing. Connect the shields to the ground terminal on the terminal strip. Usually, the lowest level of output noise results when the load ends of the shield are *not* connected. Noise can be reduced in some applications with the use of a capacitor connected across the sense lines at the power supply; and in other applications, when one is connected across the load. A 0.1 mfd (100 WVdc) capacitor with good high frequency characteristics (such as Mylar types) is appropriate. Do not use a capacitor unless necessary.



Case Size	Number of fans on rear panel	Approx. Weight
WN8	2	2 lb. 2 oz.
WN8A	1 (centered on rear)	1 lb. 14 oz.
WN8B	0	1 lb. 11 oz.

All dimensions in inches.

Rev5

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The complete Acopian catalog is available on the Internet at ***www.acopian.com***

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OPERATION

These power supplies operate as constant voltage sources when used at load currents equal to or less than their ratings. If a power supply is overloaded, the current limit circuit will automatically reduce the output voltage until the overload is removed, and will then recover. Under high overload or shorted conditions, the green Output Voltage Indicator is not on.

A higher than normal output voltage (even if momentary, as when caused by a transient induced into the output wiring) will result in the overvoltage protection circuit momentarily shutting the output OFF.

These power supplies are internally fused for protection in the event of power supply failure. When using a line to line input (two high lines as with typical 208 VAC and 230 VAC sources) for safety reasons it is recommended that an external fuse of 6.3 amps be used in series with the 'N' side of the AC input.

These power supplies have internal input line noise filtering and transient suppression. If the 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 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.

TROUBLE ANALYSIS

Whenever an operating problem is experienced, systematically check for external causes first, including all fuses, primary power lines, external circuit elements, and external wiring. Failures and malfunctions often can be traced to simple causes such as improper wiring or connections. Lack of output may result from no input voltage or voltage too low, tripped overvoltage protection, presence of an inhibit signal, a blown fuse, thermal shutdown (self-resetting) or a damaged power supply.