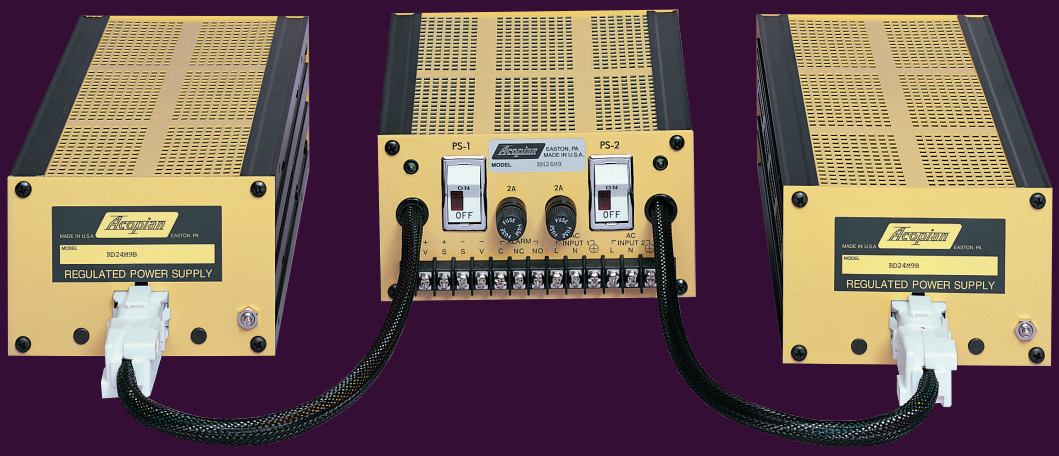
Acopian

Redundant Power Supplies

Keep Machines Up When Power Goes Down



When your operation is critical, you need power you can count on.

Redundant Power Systems are ideal for any equipment where the highest attainable reliability is essential, and an unexpected loss of power would be disastrous. Such applications include communications systems, computer systems, process controls, utility and municipal systems, and security/safety alarm systems.

Acopian offers a diverse line of redundant power supplies that will keep your DC power going no matter what, provide for multiple AC or DC input sources, and deliver ultimate power protection. We've been making rugged, reliable power supplies for over half a century—shipped within 3 days!

Redundant Power Supplies Keep Machines Up When Power Goes Down

One way to make fail-safe production lines and manufacturing processes is to use a redundant power supply system. A well-planned system includes not only multiple power supplies, but also several redundant AC input power lines as well.

In a redundant arrangement, more than one power supply feeds a single voltage rail. If one power supply fails, the other continues to provide the entire power needs of that rail. Furthermore, a separate feed to each power supply input helps stem failure on the primary side.

Redundant power systems come with various features. Some are complete turnkey assemblies that include over/under voltage, surge protection,

isolation diodes, alarms and remote voltage sensing. Others are more basic, consisting of just power supplies and mounting frames. However, most power supplies cannot simply be connected in parallel, so for these systems, users must add isolation diodes and perhaps special features required by the particular installation.

In a **primary/backup configuration**, you are connecting the outputs of two identical power supplies to a common point through isolation diodes. This is the prevalent way of providing redundant dc voltage. The output of a primary supply is set higher than that of the backup supply, insuring the backup power supply's isolation diode is back-biased. Only the primary supply delivers current to the load. However, if the primary supply voltage drops below the backup voltage, the situation reverses and only the backup delivers load current. In either case, the load voltage is not interrupted during switchover.

In this configuration, both power supplies can be set to the same voltage. But, as a practical matter, they cannot remain precisely balanced over long periods. Even a difference of only a few millivolts in output voltages (due to changes in operating temperature, load current, aging of components, and so forth) can switch the load from one power supply to the other and back again.

A single wire current share configuration allows like units to be wired in parallel and each unit shares the load within +/- 5%. The term "100% redundancy" refers to systems where a backup supply provides all the required operating load current, which is not the case with a single wire current share configuration. However, **another approach is (n+1) redundancy**, where n is the number of current-sharing power supplies connected in parallel to obtain the required output current, plus an additional supply having the same current rating as the others to ensure full output current in the event one power supply fails.

In either configuration, isolation diodes are incorporated. Isolation diodes typically have a voltage drop of 0.7 Vdc, accompanied by additional drops

An advantage of the (n+1) approach is that one fractional backup unit costs less than a supply that provides full output current. Further, in this function, the units run cooler because both power supplies are sharing the load current, therefore increasing life expectancy and reliability.

in wiring, connectors, ammeter shunts, and so on. Consequently, the power supplies must deliver at least a volt more than the specified output voltage of the system. Remote voltage-sensing leads should also contain isolation diodes to prevent a fault in the sense circuitry of one power supply from affecting the other supply.

All power supplies should have overvoltage protection. Shunt circuits, called crowbars in linear units, short circuit the output terminals if the voltage goes too high. Although diodes isolate a supply with decreasing output voltage, they do not block voltages that are high enough to damage loads.

If the utility power fails, a battery backup source (commonly referred to as an uninterruptible power system, or UPS) can pick up the load for a limited time. It supports the load only while its battery pack remains charged. However, the UPS may keep a system running until a downed power line is repaired or the system is shutdown in an orderly way.

If two utility power sources are available, use one for each of the redundant power supplies. Two totally independent power sources provide the highest input redundancy, but even two inputs from the same power source are better than one if they come through different transmission lines and transformers.

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A UPS can be connected to one power supply source. With this arrangement, the failure of an input power source, the UPS, or a power supply will not disturb the dc power to the load. Such redundancy requires that each input power source supply the entire load current.

For servicing a live redundant power system, a number of special features should be included. For safety, each power supply should have a separate input power switch, and all connections should be made with insulated connectors. Each power supply should also be easy to remove from its mounting, preferably without using tools.

There's no time for down time in your mission critical operations.

When you need durable, reliable, redundant power systems, ***think Acopian.***

Talk to an engineer about your critical application needs today. **We will find you the best "dam" power supply for the job.** Why? We design, build and sell millions of standard and custom power supplies in a wide range of voltages, amperages, and configurations. All are made in the USA, and most ship within three days after receipt of order. Certain products and custom power supply orders ship within nine days after receipt of order.

Acopian: An ISO 9001:2008 Certified Company

Acopian has been designing and manufacturing power supplies since 1957. Our products include AC-DC power supplies, DC-DC converters; redundant & multiple-output power systems. Capabilities include shipping most models within 3 days and redundant and multiple output systems in 9 days. Standard power supplies are available in all voltages from 0v to 30 kV and up to 1200W. Standard models include single, dual, triple and wide adjust output power supplies; switching, linear, regulated & unregulated power supplies; programmable, high voltage, universal input & mini power supplies; & NEMA 4X Enclosed & UL508 listed configurations. Redundant and multiple-output power systems are available for rack, wall or DIN rail mounting and in modular configurations. Customized solutions are also available to meet special customer requirements. Our products are made in the USA.

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Easton, PA & Melbourne, FL