

# OPERATION

## GEN CONTROL RELAYS



**CAUTION:** All circuits connecting the auto generator control system **MUST** be protected with fuses rated at 5 amps or less. The warranty does not cover damage to these relays. Fuses should be located as close as possible to the point of connection to the larger conductors providing power from the battery. A fuse must be used, even if the circuit is providing only a "dry contact" or "ground" connection - it will prevent damage if the connection is miswired or if the cable connecting the inverter to the generator is damaged.

The generator control relays are not intended to directly control the starter motor or operate the ignition system - rather they are used to send a signal to operate the coil of another higher amperage device which does the actual switching of power. For location and wiring information on the GEN CONTROL RELAYS, see **AUXILIARY AND GENERATOR CONTROL RELAY** on page 14.

The SW Series Inverter/Charger provides two relays, labeled **RY7** and **RY8**, to allow starting of many types of generators. Two LED indicators provide status indications whether **RY7** or **RY8** have been energized.

The relay labeled **RY7** is used to provide either a **STOP** signal or a **RUN** signal. It can also be used to provide a **GLOW** signal on diesel generators with glow-plugs. The relay labeled **RY8** is used to provide a crank signal for the starter of the generator engine. It is not used on two-wire type (auto cranking) generators. The **COM** (common) terminals of the relays are separated and both the **N.O.** (normally open) and **N.C.** (normally closed) contacts of the relays are provided.

It is much easier to make the connections to the generator if a remote control terminal or connector is available on the generator. This sometimes requires that the generator optional remote control be purchased. This also allows examination of how the generator remote control works - which is what the inverter's generator control system in the inverter must duplicate.

Connection of the **GEN CONTROL RELAYS** to the generator remote control also eliminates the need to modify the generator and violate the warranty of the generator.

You should also add a switch to allow disabling of the automatic generator control system at the generator to allow local control of the generator, preventing starting while servicing, etc. Many generators include this switch with the optional remote control.

## GENERATOR STARTING SCENARIOS

The generator can be set to start based on the four following scenarios:

### AUTOMATICALLY

- (1) **AC Current:** The generator starts whenever the current travelling through the inverter to the AC loads remains above the **LOAD START AMPS AC** setting for the selected **LOAD START DELAY MIN** period. The current can be monitored by the **LOAD AMPS AC** menu item under the **METERS** menu. The generator will start, unless the timer is in the "quiet time" period, at which time it will only start if the **READ LBCO 30 SEC START VDC** setting is reached. Whenever the generator starts automatically, based on load amps, it will shut off once the load current drops below the **LOAD START AMPS** value for the selected **LOAD STOP DELAY MIN** period.
- (2) **Battery Voltage:** The generator starts whenever the battery voltage reaches one of the four adjustable low battery voltage levels for the selected delay periods (24 hours, 2 hours, 15 minutes, or 30 seconds). The low battery voltage levels are set under the **GEN AUTO START SETUP**. Actual battery voltage can be monitored from the **BATTERY ACTUAL VOLTS DC** menu item under the **METERS** menu. The generator will start, unless the timer is in the "quiet time" period, at which time it will only start if the **SET LOW BATTERY CUTOUT VDC** or **READ LBCO 30 SEC START VDC** setting is reached. Whenever the generator starts automatically, based on low battery voltage it will shut off once the **BULK** and **ABSORPTION** stages of the battery charging have completed, thus fully recharging the batteries.