

**THEORY OF OPERATION FOR
 COMBINED ALARM STATUS MONITOR (CASM)**

<u>PRODUCT USES</u>	Installed into the SCR and SCRF battery charger line to monitor the operation and status of the battery charger and battery.
<u>DESCRIPTION</u>	<p>This option combines a dc bus monitor and an ac input voltage alarm system on one printed circuit board, EN0014-XX. This option provides a dry contact for each of the following relay conditions:</p> <ul style="list-style-type: none"> ◆ low voltage dc alarm ◆ high voltage dc alarm ◆ high and low ac voltage alarm ◆ dc ground detection alarm ◆ charger failure alarm <p>A second FORM C contact is optional. The relay contacts are accessible at an on board terminal block. Relay contact ratings are 0.5A at 120 Vac/dc resistive. Maximum wire size accepted by TB15 is 14 gauge.</p> <p>Seven red LED front panel lamps display:</p> <ul style="list-style-type: none"> ◆ low voltage dc ◆ high voltage dc ◆ high voltage ac ◆ low voltage ac ◆ dc ground detection (+) ◆ dc ground detection (-) ◆ charger failure <p>A lamp test switch is also provided to test the lamps.</p>
<u>OPERATION</u>	<p>The option is powered by the dc output of the battery charger or batteries and requires 0.17 Amperes to operate. Adjustments for alarm settings are made by potentiometers located on the CASM board. Each alarm lamp illuminates upon the set point, and the relays have a built in time delay of 15 seconds. Delay for the charger failure alarm lamp and relay depends on the type of charger failure that has been user selected 36 seconds or 70 minutes. All relays are energized in the non-alarm state, except the high voltage dc alarm relay.</p> <p>LOW VOLTAGE DC This detects when the dc bus voltage at the battery charger drops below the alarm set point. The option measures the voltage at the output terminals, where the batteries are connected to the battery charger.</p>

OPERATION
continued**HIGH VOLTAGE DC ALARM**

This detects when the dc voltage inside the battery charger rises above the high voltage set point. The high voltage alarm will not activate if the high voltage is being created by some other source, such as battery chargers that are connected in parallel.

HIGH VOLTAGE AC ALARM

This detects when the input voltage has risen to the HVAC set point. Factory setting is 115% of the nominal input voltage.

LOW VOLTAGE AC ALARM

This detects when the input voltage has fallen below the LVAC set point. Factory set point is 85% of nominal. In the case of 3 phase battery chargers it will also detect the complete loss of any phase as well as all three phases dropping to 85%.

DC GROUND DETECTION (+ or -)

Measuring the output of the battery charger and the chassis building ground point, this option determines if any additional resistance has been connected between the dc output and the chassis ground.

A disable jumper can be moved to prevent the GND and COMMON alarm relays from operating if the battery has been intentionally grounded. The lamps still light even if the ground detection relay has been disabled.

CHARGER FAILURE or ZERO CURRENT ALARM

(user chooses one or the other by an on board switch)

Charger failure, the factory default, checks every 70 minutes once the output current falls below 2% of the rated output. This test confirms if the battery charger will provide current upon load demand. An alarm is activated only if the battery charger is unable to deliver output current to the battery. This is preferred when there is little or no load connected to the battery.

Zero current provides an alarm relay closure 35 seconds after the output current has fallen below 2% of the rated output current.

A jumper on board can be moved to disconnect charger failure or zero current alarm from the common alarm.

COMMON ALARM

This relay changes state when any of the other relay is activated.

See ground detection and charger failure for common alarm options.