

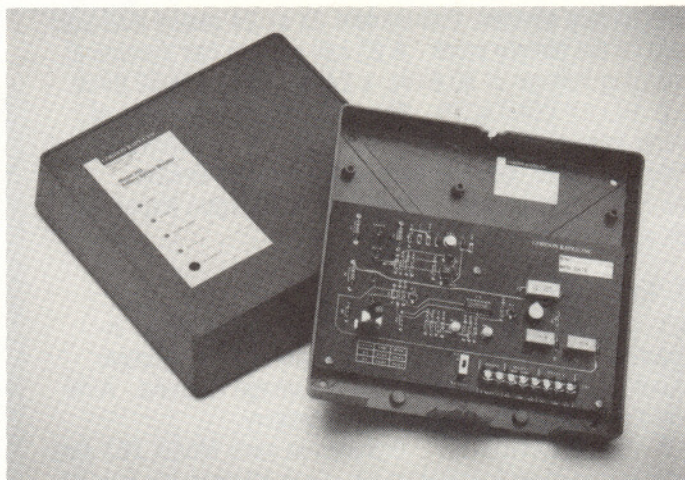
Technical Practice

Issue 1, September, 1990

MODEL 263 BATTERY MONITOR SYSTEM

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1. General Description

1.1 PRACTICE In the event that this practice is reissued, the reason for the reissue will be given in this paragraph.

1.2 PRODUCT OVERVIEW The Model 263 Battery System Monitor measures the charging voltage of a battery system associated with a PBX, Central Office (CO), or other telecommunications system. These battery systems provide power for equipment that requires nominal -48Vdc for operation. The 263 was designed with the primary goal of monitoring 23 or 24 cell sealed lead-acid battery systems. As of 1990, sealed lead-acid seems to be the battery of choice for many reasons. LED indicators provide charging voltage status: normal, high, or low. A high or low state is considered to be an alarm condition. To alert service personnel during an alarm condition, two relay contacts change state and an audible signal is activated. Once in the alarm state, a reset push button can be used to silence the audio signal and reset one of the relay contacts. The other alarm contact remains activated for the duration of the alarm.

1.3 WHY YOU SHOULD USE THE MODEL 263 Battery systems, also known as battery plants, are installed with communications systems to provide power during conditions of commercial power failure. Maintaining the batteries in their fully charged state is crucial to their ability to provide energy

when required. Using the 263 will help to ensure that the batteries are being charged at the correct voltage. Charging batteries at a lower than required voltage will keep them from fully charging. Charging at too high a voltage will shorten the life of, and possibly damage the batteries. The Model 263 provides a low cost "reality check" to assist in maintaining system integrity.

1.4 CELL SELECTION A switch option on the 263 configures the unit for operation with 23 or 24 cell battery systems. Once selected, the 263's circuitry is automatically selected for the correct minimum and maximum acceptable charging voltage levels.

1.5 LED STATUS INDICATORS Four LED status indicators are located on the 263's circuit board and are visible with the cover on or off. One LED shows that power has been applied. The other three show the state of the battery charging voltage.

1.6 AUDIO ALARM An audible alarm is activated upon the 263 detecting an alarm condition. A switch allows the audio alarm to be reset.

1.7 ALARM RELAYS Two form-C relay contacts are provided to control a variety of external devices. Both relay contacts change state when an alarm condition is detected. Relay Contact 1 can be reset; Relay 2 maintains its state until the unit no longer detects an alarm condition.

1.8 CONNECTIONS All interconnections are made via an 8-pin screw terminal strip.

1.9 POWERING The 263 derives its operating power from the battery system that is being monitored. No external power supply is required.

1.10 PHYSICAL DESCRIPTION The Model 263 consists of a precision fabricated printed circuit board and an injection molded base and cover. The thermoplastic material used for the housing conforms to industry recognized flame retardant standards. The 263 measures 8.75 inches (22.23cm) square, 3.25 inches (8.26cm) deep, and weighs 1.5 pounds (0.68kg). The unit wall mounts with four #8 screws.

2. Applications

2.1 23 AND 24 CELL SYSTEMS The 263 is compatible with battery systems that contain 23 or 24 sealed lead-acid cells in the battery stack. A 23 cell system has a nominal charging voltage of 50.6Vdc; a 24 cell system is 52.8Vdc.

2.2 RELAY CONTACTS The 263 provides two sets of alarm relay contacts. These contacts can be connected to indicator lights, external bells and horns, or remote monitoring equipment. Please contact Gordon Kapes, Inc. for applications assistance.

3. Installation

3.1 CHECKING FOR DAMAGE The 263 should be inspected for damage immediately upon receipt. A claim should be filed with the shipper if damage is found. A replacement should be ordered if necessary.

3.2 INSTALLATION KIT Included in each Model 263 shipping carton is an installation kit. Each kit contains four #8 pan head screws and two nylon cable ties.

3.3 THE COVER The cover is secured via two clamp screws located on the top and bottom of the cover. Remove the cover at this time.

3.4 MOUNTING The 263 wall mounts using four #8 screws appropriate for the wall material. Four #8 pan head screws are contained in the installation kit; use these if suitable.

3.5 263 CONNECTIONS All interconnections are made via 8-position terminal strip TS1. A complete, but cryptic, description of their functions is located adjacent to the terminal strip positions. Table 1, 263 Connection Chart, provides detailed connection information.

3.4 ALARM RELAY CONNECTIONS Two separate relays allow connection to various types of audio and visual alarm devices. Both relays provide normally open (NO), normally closed (NC), and common (COM) leads. Normally open refers to the state when the 263 is in the normal, non-alarm state. Relay 1 changes state in an alarm condition. It can be reset using the reset switch. Relay 2 changes state in an alarm condition and cannot be manually reset. It will return to the normal state when the battery charging voltage returns to the correct range.

3.5 CONNECTION TO BATTERY SYSTEM The Model 263 is connected to the battery system for two purposes. The first is to provide power for its own operation. The second is to monitor the batteries for the correct charging voltage. The 263 needs to monitor the voltage directly

across the 23 or 24 cells of the battery stack. Connect TS1 terminal 1 to "+" lead of the battery stack; TS1 terminal 2 to "-" lead of the battery stack. The power LED will light as soon as the battery supply has been connected.

SAFETY WARNING: It is not possible for Gordon Kapes, Inc. to recommend an exact connection point. Use extreme caution when making connections as very high current can be drawn from a battery system. The connection to the "-" lead of the battery stack should have an in-line fuse as close to the battery terminal as possible.

Description	Legend	Terminal
Ground/Common, (Positive Reference Lead)	GND	1
Battery Source, Supply to Monitor	BATT	2
Alarm RELAY 1		
Normally Closed Contact,	NC	3
Common	COM	4
Normally Open Contact	NO	5
Alarm RELAY 2		
Normally Closed Contact,	NC	6
Common	COM	7
Normally Open Contact	NO	8

Table 1. Model 263 Connection Chart.

4. Configuration and Operation

4.1 LED STATUS INDICATORS Four LED status indicators are located on the 263's circuit board and are visible with the cover on or off. The power LED will light when the battery system is connected to the 263. The voltage normal LED will illuminate if the charging voltage is within correct range. Section 6 - Specifications shows minimum and maximum voltage levels for 23 and 24 cell sealed lead-acid batteries. The voltage low LED will illuminate if the charging voltage falls below the correct range. The voltage high LED will illuminate if the charging voltage exceeds the correct range.

4.2 SWITCH SETTING Set the switch to match your battery system. Some systems use 23 cells, others 24. The 263 will work correctly ONLY if the switch is set to the appropriate position.

4.3 ALARM CONDITION The 263 goes into the alarm state if it detects the charging voltage being lower or higher than the normal range. The 263 provides an audio alarm, as well as two alarm contacts. The audible alarm and alarm relay 1 can be reset via a push button. Once reset, they remain off until the next violation occurs. Alarm relay 2 stays in the alarm state until the charging voltage returns to the normal range.

5. Circuit Description

5.1 GENERAL DESCRIPTION The circuit description is intended to familiarize you with the 263 for engineering, applications, and curiosity purposes.

5.2 POWER SUPPLY The battery system under observation provides power for the Model 263. The low current

draw required will not effect measurement of the charging voltage. A -15V reference is created using a zener diode. This -15Vdc is used by an integrated circuit comparator and a CMOS logic IC. The -15Vdc is also fed to a precision reference device which produces -10Vdc.

5.3 VOLTAGE SENSING Two comparators provide low and high voltage detect signals to drive the alarm logic and status LEDs. The trip points are factory calibrated for a 24 cell system. The 23/24 cell select switch provides a voltage offset to correct sense 23 cell systems.

5.4 ALARM RESET Upon detecting an alarm condition (charging voltage out of range) several actions take place. The voltage normal LED goes out and either the voltage high or voltage low LED lights. Relay 2 de-energizes and, obviously, its contacts change state. Relay 1 energizes, its contacts change state, and the audio transducer sounds. A reset switch allows relay 1 and the audio transducer to return to their normal state. Relay 2 remains in the de-energized state until the charging voltage returns to the normal range. Pushing the reset button during a normal condition has no effect.

6. Specifications

COMPATIBILITY

Designed to work in conjunction with battery systems with 23 or 24 sealed lead-acid cells. These batteries require 2.23 to 2.30V for correct charging.

VOLTAGE FOR NORMAL STATE

23 cell systems: 51.29 to 52.0V, $\pm 0.1V$

24 cell system: 53.52 to 55.20V, $\pm 0.1V$

INPUT CURRENT

45mA nominal, 60mA maximum @ -56Vdc

RELAY CONTACTS

Relays 1 and 2 change state upon detection of charging voltage out of range. Relay 1 is resettable, Relay 2 is not.

Type: Form-C (Break Before Make), provides common, normally open, and normally closed connections

Rating: 1A maximum at 30Vdc or 100Vac (resistive)

AUDIO TRANSDUCER

2300Hz, active continuously in alarm state. Resettable.

FCC REGISTRATION

The 263 does not require FCC registration as it is not intended for connection to the public switched telephone network.

RELIABILITY

MTBF 48.0 years, per Method I of Bellcore

TS-TSY-000332, Issue 2, July 1988

INTERCONNECTIONS

One 8-position screw terminal strip.

ENVIRONMENT

0 to 50 degrees C, humidity to 95% (no condensation)

DIMENSIONS

8.75 inches high (22.23cm)

8.75 inches wide (22.23cm)

3.25 inches deep (8.26cm)

WEIGHT

1.5 pounds (0.7kG)

Shipping Weight 2.6 pounds (1.2kG)

MOUNTING

Four #8 pan head screws of the type appropriate for the wall material.

7. Incorrect Operation

7.1 REVIEW PRACTICE Should problems arise in the operation of the 263, please review Section 3 - Installation of this practice. Ensure that all connections have been made properly. If another 263 is available, substitute and retest.

7.2 LED INDICATORS The four LED indicators located on the 263 circuit board will assist in locating the source of trouble. The power LED should always be on. If the power LED is not illuminated, check the polarity of the connections at terminals 1 & 2. The power and a status LED should illuminate once a battery source is connected.

7.3 CELL SELECTION The 263 alarm trip points depend on the setting of the 23/24 cell switch. Therefore, setting a switch improperly may cause an incorrect alarm condition.

8. Repair and Replacement

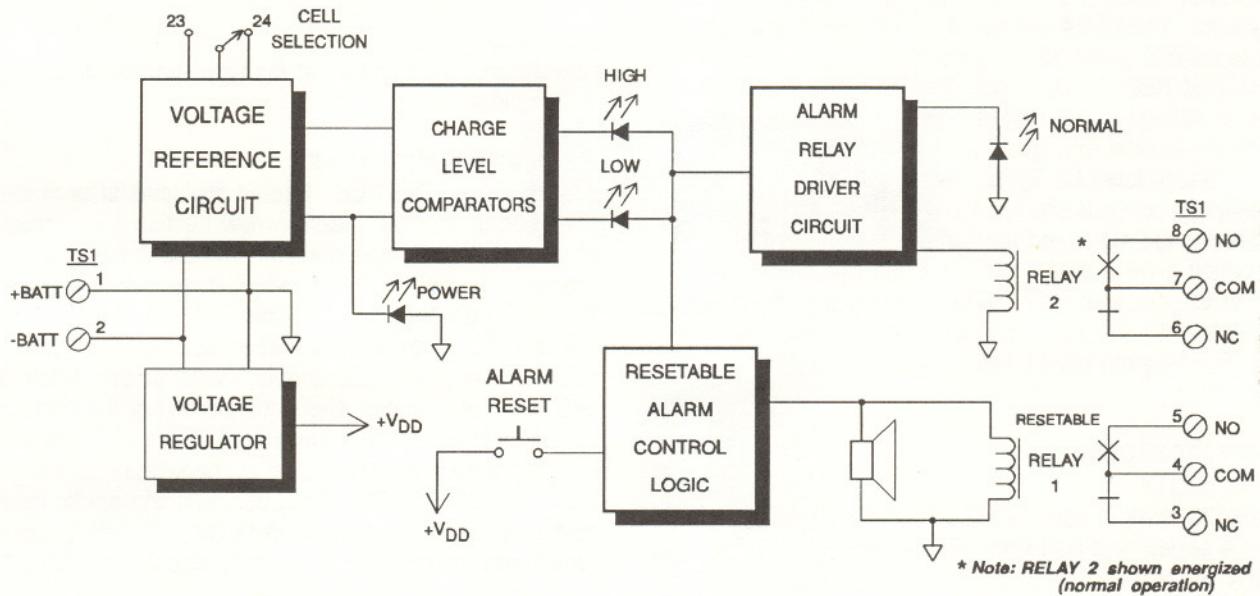
8.1 NOT SO FAST Statistically, most equipment returned to Gordon Kapes, Inc. for repair actually has nothing wrong with it. A telephone call to Gordon Kapes, Inc. technical support can often help to get the equipment operating correctly. We don't mind spending time with our customers getting a site up and running.

8.2 SEND IT BACK If you determine that the 263 is defective, return for repair or replacement according to the Gordon Kapes, Inc. Warranty/Repair and Return policy.

8.3 ONLY WE FIX IT In the event repairs are ever needed on your 263, they should be performed by Gordon Kapes, Inc. or our authorized representative. For further information, contact Gordon Kapes, Inc.

Specifications and information contained in this technical practice subject to change without notice.

Figure 1 Model 263 Battery Monitor System Block Diagram



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