GE Power Management

Static Breaker Back-up Relay
Type SBC Relay
SBC231B

INSTRUCTIONS

These instructions, GEK-106210 together with GEK-100637, constitute the complete instructions for the SBC231B Relay. Sections included in this document (GEK-106210) should overwrite corresponding sections in GEK-100637.

GENERAL

See Instruction book GEK-100637.

APPLICATION

The SBC231B is intended for applications that require an instantaneous overcurrent detector with fast pickup, fast reset, and minimum transient overreach. The SBC231B is designed for continuous operation in the picked up position, and output contact 'chattering' is prevented when the applied current is at the pickup setting. To eliminate contact chattering at pickup, hysteresis is added to the detection circuitry that reduces the dropout to pickup ratio by 5% compared to the SBC231A relay. The three current coils of the SBC231B can be connected to either the three phase currents (IA, IB, and IC) or to two-phase currents and the residual current (IN or 310).

Typical applications for the SBC231B relay's overcurrent function include:

- local breaker failure backup schemes
- blocking circuit breaker or circuit switcher operation for fault currents above the interrupting rating
- overcurrent supervision of distance relays to prevent miss-operation on loss of voltage (blown fuse)

The external connections for the SBC23IB are shown in Figure 1 and Figure 2 of the Instruction Book GEK - 100637.

The SBC231B internal current transactors connected to studs 1-2, 3-4, and 5-6 (see Figure 7) have a small air gap in the magnetic core. The transactors constitute a 'replica impedance' such that the dc offset contained in the secondary voltage is substantially reduced, if not eliminated, compared to the dc offset that may be present in the current applied to the primary. Reducing the dc offset produces the desirable result of a low transient overreach. The SBC231B incorporates low-pass filters that reduce the magnitude of the harmonics by compensating for the amplification of harmonics caused by the transactor. For the third harmonic and higher, the pickup of the overcurrent function is greater than the pickup at the fundamental frequency. The frequency response of the SBC231B is shown in Figure 1.

CONFIGURATIONS

Output Studs

The relay is delivered with a normally open contact at studs 15 and 16; it can be changed to a normally closed contact by connecting the 'fast-on' terminal from H15A on the backplane to terminal block stud 15 (see Figure 7 of Instruction Book GEK - 100637).

The SBC23IB is delivered with a power supply alarm contact at studs 7 and 8 (see Figure 7 of Instruction Book GEK - 100637). This contact will close if the battery voltage drops below 19 volts DC. To configure the SBC231B to have an output contact at studs 7 and 8, move relay K4 from position K4B to position K4A on the backplane.

> Note: If stud 17 is not connected directly to battery positive (see BFI connection option in Figures 1 and IA), then the power supply alarm contact will stay closed until the external BFI contact closes. For this connection, it may be preferable to place relay K4 in position K4A.

Input Currents

See Instruction Book GEK - 100637.

CALIBRATION

Level Detector

GE Power Management calibrates all SBC relays. There is no need for any calibration when the relay is received. However, if the analog board is replaced, the user does have the ability to calibrate the level-detector pickup.

This is done by first configuring the relay to monitor both the phase and ground inputs (see CONFIGURATION). Power the relay, and input an rms value of current equal to that of the pickup setting of the phase or ground unit.

If the TB ENERGIZED LED is not ON, adjust potentiometer R25 (Phase unit) or R24 (Ground unit), located on the front of the analog board, by turning the screw in the counter-clockwise direction until the TB ENERGIZED LED is ON continuously.

If the TB ENERGIZED LED comes ON as soon as the current is applied, turn the screw in the clockwise direction until the TB ENERGIZED LED goes out, then turn the screw in the counter-clockwise direction until the LED is ON continuously.

Reset Timer

The reset timer for the SBC is a fixed value built into the hardware of the relay. If there is a need to change the reset time, consult the factory for details.

RANGES

See Instruction Book GEK - 100637.

HARDWARE DESCRIPTION

See Instruction Book GEK - 100637.

ACCEPTANCE TESTS

T1 - POWER UP

See Instruction Book GEK - 100637.

T2 - BFT TEST

1. Connect the relay as shown in Figure 15 of Instruction Book GEK-100637.
2. Set the phase and ground pickup to its minimum setting.
3. Conduct the test according to the steps in Table 1.1, while increasing the current from 95% to 105% and then decreasing the current from 105% to 95% while observing the contact and TB Energized conditions.
4. Note: contacts should not chatter during this test.

TABLE 1.1

Current	Current Input Studs	Contacts	Phase or Ground TB Energized
95% ⇒ 105% of phase PU	1, 2	open ⇒ closed	off ⇒ on
105% ⇒ 95% of phase PU	1, 2	closed ⇒ open	on ⇒ off
95% ⇒ 105% of phase PU	3, 4	open ⇒ closed	off ⇒ on
105% ⇒ 95% of phase PU	3, 4	closed ⇒ open	on ⇒ off
95% ⇒ 105% of ground PU	5, 6	open ⇒ closed	off ⇒ on
105% ⇒ 95% of ground PU	5, 6	closed ⇒ open	on ⇒ off

T3 - SHUTDOWN TEST

1. Connect the relay as shown in Figure 15 of Instruction Book GEK-100637.
2. Conduct the test according to Table 1.2
3. While the input current is still being applied, decrease the input DC to 60% of the Rated DC voltage.
4. The only relay lights that should remain on are the DC Voltage Low light and the Energized light. All contacts should go to their unenergized state.

TABLE 1.2

Current	Current Input Studs	Contacts	Phase or Ground TB Energized
105% of phase PU	1, 2	closed	on
105% of phase PU	3, 4	closed	on
105% of ground PU	5, 6	closed	on

T4 - POWER SUPPLY ALARM TEST

1. Connect the relay as shown in Figure 16 of Instruction Book GEK-100637.
2. Lower the DC voltage to 19 VDC.
3. All output contacts should go to their unenergized state and the Power Supply Alarm contacts should close.

T5 - TARGET TEST

See Instruction Book GEK - 100637.

PERIODIC TESTS

See Instruction Book GEK - 100637.

HARMONIC SENSITIVITY

The harmonic sensitivity response of the SBC231A and SBC231B were tested using the pick-up setting of 1 A on the relay. Figure 1 plots the current that the relay contacts actually pick up.

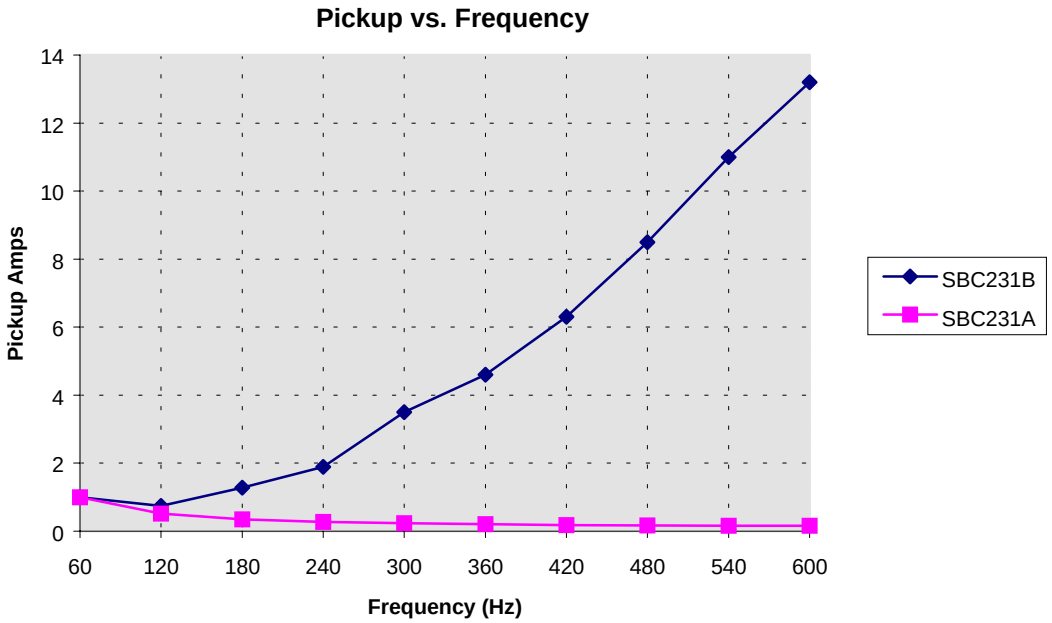

Figure 1 SBC231B Frequency Response

RENEWAL PARTS

MODEL NUMBER	FUNCTION	PART NUMBER
SBC231B01A	BACKPLANE BOARD	0215B8412G001
	ANALOG BOARD	0184B8921G007
	POWER SUPPLY	0184B6385G003
	LOGIC BOARD	0188B9752G006
SBC2XXXXXA	EXTENDER BOARD	0215B8031G001
	CARD PULLER	207A5404P001
	UPPER CRADLE BLOCK	0184B8624G014
	LOWER CRADLE BLOCK	0184B8624G013
	UPPER CASE BLOCK	006418058G045
	LOWER CASE BLOCK	006418058G129

SPECIFICATIONS

See Instruction Book GEK - 100637.

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