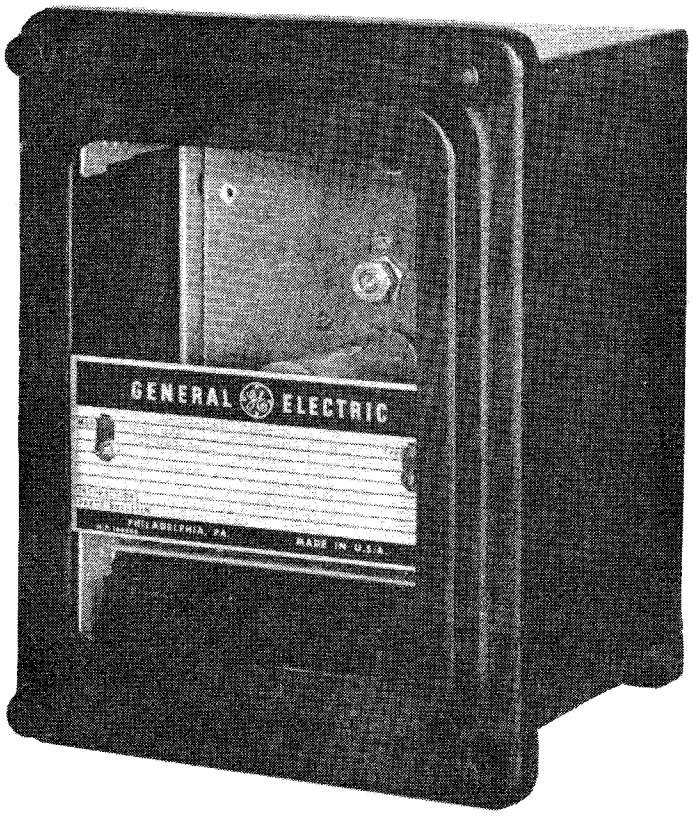
INSTRUCTIONS

GEI-98305C

D-C UNDERVOLTAGE RELAY

Type NGV18A



GENERAL ELECTRIC

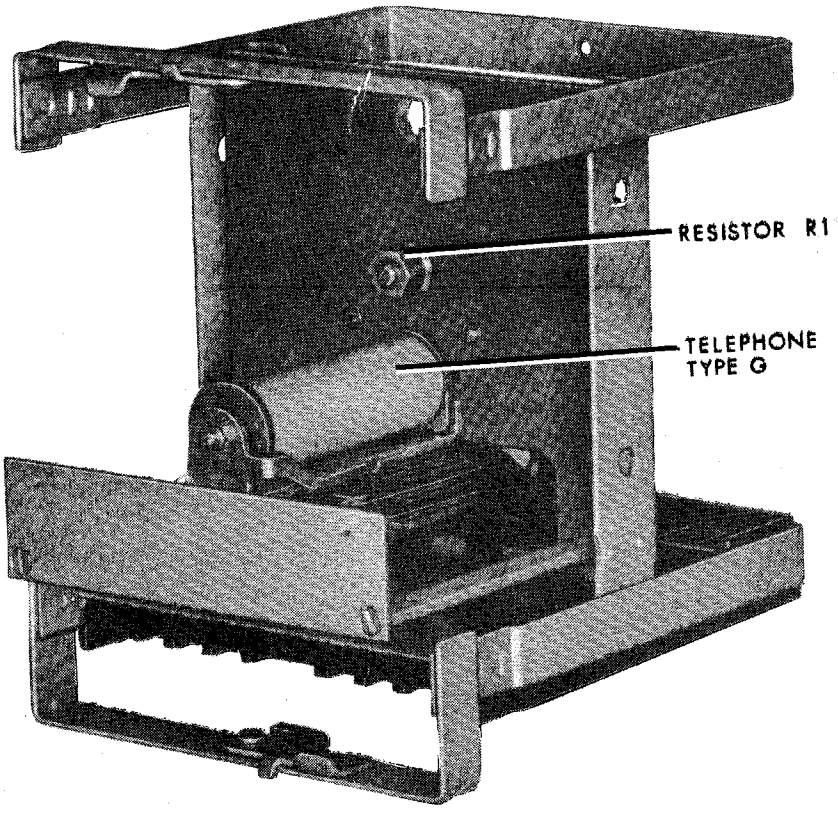


Fig. 1 (8035274) NGV18A Relay Removed From Case (Front View)

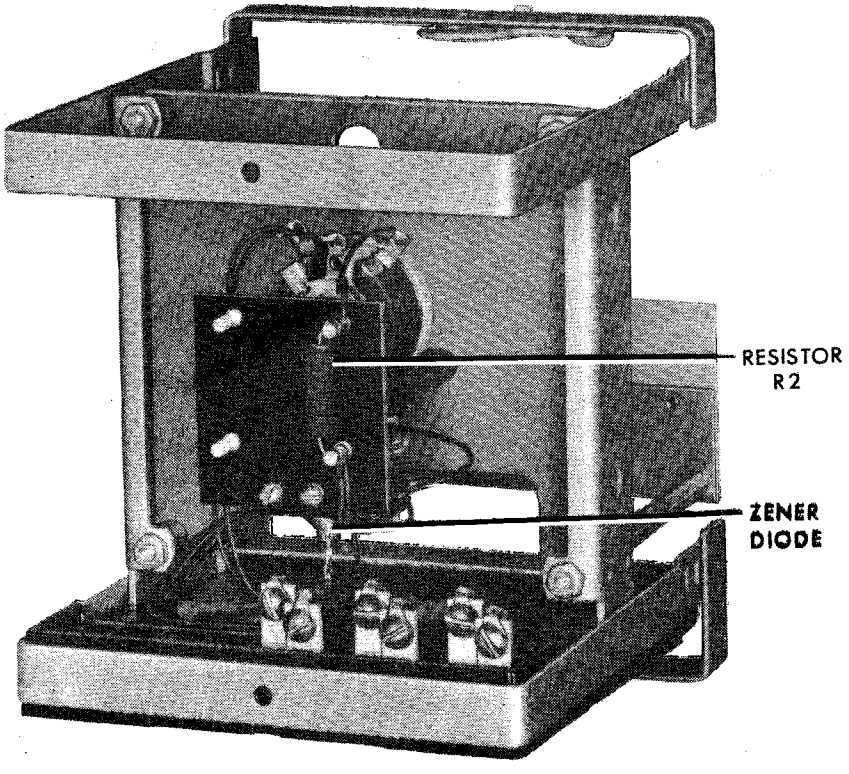


Fig. 2 (8035275) NGV18A Relay Removed From Case (Rear View)

D-C UNDERVOLTAGE RELAY

TYPE NGV18A

DESCRIPTION

The NGV18A relay is an instantaneous d-c undervoltage relay with extra high dropout designed specifically to be used to monitor the d-c charging supply for a station battery to sound an alarm if this supply fails.

The relay undervoltage element consists of a telephone-type voltage unit with a zener regulator in series with the operating coil and the fixed and adjustable resistors. Also the relay has one normally open and one normally closed contact but no target. It is packaged in a S-1 drawout case, for either flush or surface mounting. It is normally used in conjunction with one time delay dropout auxiliary relay.

APPLICATION

Because the NGV18A picks up at 105% of dropout voltage or less, it finds application wherever a high-speed, extra high dropout, d-c relay is required.

Usually the NGV18A relay is used to detect station battery undervoltage and to provide an alarm. Since some operating conditions may temporarily lower the d-c voltage, it is suggested that the NGV18A be used in conjunction with a time delay auxiliary relay to prevent false alarms.

Figure 5 shows the NGV18A used with a time delay dropout HFA65D relay which provides a time delay of about two seconds and at the same time monitors the a-c supply to the battery charger. This arrangement will sound an alarm not only when a prolonged d-c undervoltage occurs but also when the a-c power is lost without waiting for the battery voltage to decay.

When the NGV18A relay is used to monitor either a lead-acid or a nickel-cadmium battery, it is suggested that the dropout be set about 98% of the fully charged open circuit voltage of the battery. For example, the fully charged open circuit voltage of a 60 cell lead-acid battery will be 123 volts and the suggested NGV18A setting about 121 volts. Also the relay must pickup at the lowest acceptable battery charger output.

RATINGS

Table A gives detailed information on the NGV18A relay coil ratings and the resistors are listed on Fig. 3. The resistors are supplied as a part of the relay and each relay is calibrated with its resistors.

TABLE A

RELAY MODEL	COIL D.C. RESISTANCE OHMS	VOLTAGE D.C.
NGV18A1	2500	250
NGV18A2	2500	125
NGV18A3	200	48

Table B gives the relay contact interrupting ratings. These contacts will make and carry three amperes continuously or 30 amperes for two seconds.

TABLE B

INTERRUPTING RATINGS

A-C VOLTS	AMPS	
	INDUCTIVE*	NON-INDUCTIVE
115	0.75	2.0
230	0.5	1.5
D-C VOLTS		
48	1.0	3.0
125	0.5	1.5
250	0.25	1.0

* The inductive rating is based on the indictive of an average tripping coil.

CHARACTERISTICS

OPERATING PRINCIPLES

The NGV18A is a hinged armature type relay which operates by electromagnetic attraction. The contacts are opened and closed by the movement of an armature which is restrained by an opening spring and operated by the D.C. solenoid. The high droput feature results from the characteristic of the zener diode regulator.

The NGV18A relay pick up can be adjusted by means of the variable resistor R1. The relay will pick up at 105% or less of dropout voltage.

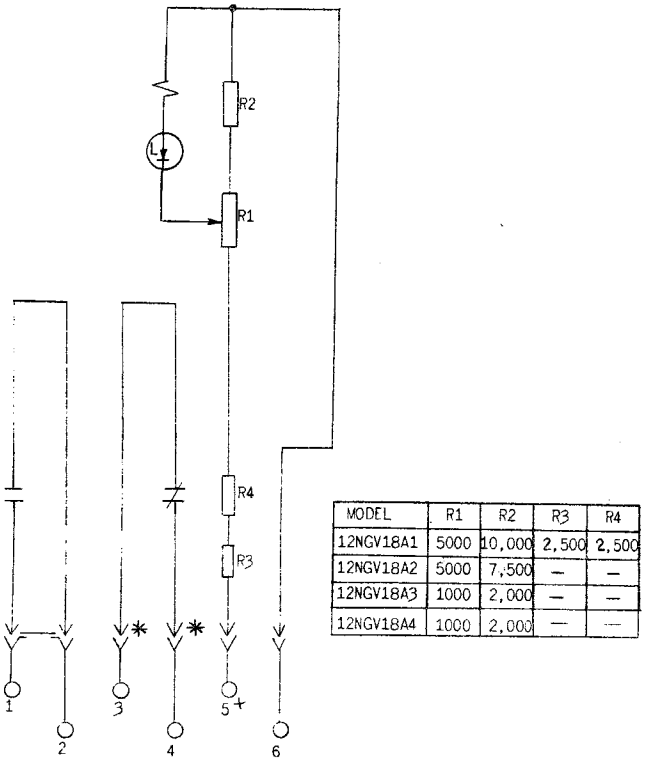
BURDEN

The resistances of the d-c windings are given in Table A.

CONSTRUCTION

The relay components are mounted in a cradle assembly which is latched into a drawout case when the relay is in operation but it can be easily removed when desired. To do this, the relay is first disconnected by removing the connection plug which completes the electrical connections between the case block and the cradle block. To test the relay in its case this connection block can be replaced by a test plug. The cover, which is attached to the front of the relay case, contains an interlock arm which prevents the cover from being replaced until the connection plugs have been inserted.

The relay case is suitable for either semi-flush or surface mounting on all panels up to 2 inches thick and appropriate hardware is available. However, panel thickness must be indicated on the relay order to insure that proper hardware will be included. For outline and drilling dimensions, see Fig. 6. Every circuit in the drawout case has an auxiliary brush, as shown in Fig. 4, to provide adequate overlap when the connecting plug is withdrawn or inserted. Some circuits are equipped with shorting bars (see Fig. 3). On these circuits, it is especially important that the auxiliary brush makes contact as indicated in Fig. 4 with adequate pressure to prevent the opening of important interlock circuits.



MODEL	R1	R2	R3	R4
12NGV18A1	5000	10,000	2,500	2,500
12NGV18A2	5000	7,500	—	—
12NGV18A3	1000	2,000	—	—
12NGV18A4	1000	2,000	—	—

Fig. 3 (0165A7720-3) Internal Connections, Relay Type NGV18A (Front View)

RECEIVING, HANDLING AND STORAGE

These relays, when not included as part of a control panel, will be shipped in cartons designed to protect them against damage. Immediately upon receipt of a relay, examine it for any damage sustained in transit. If injury or damage resulting from rough handling is evident, file a damage claim at once with the transportation company and promptly notify the nearest General Electric Apparatus Sales Office.

Reasonable care should be exercised in unpacking the relay. If the relays are not to be installed immediately, they should be stored in their original cartons in a place that is free from moisture, dust and metallic chips. Foreign matter collected on the outside of the case may find its way inside when the cover is removed and cause trouble in the operation of the relay.

ACCEPTANCE TESTS

Immediately upon receipt of the relay an inspection and acceptance test should be made to insure that no damage has been sustained in shipment.

VISUAL INSPECTION

Check the nameplate stamping to insure that the model number, rating and calibration range of the relay received agree with the requisition.

Remove the relay from its case and check by visual inspection that there are no broken or cracked molded parts or other signs of physical damage, and that all screws are tight.

* MECHANICAL INSPECTION

It is recommended that the following mechanical adjustments be checked:

1. Operate the armature of the voltage unit by hand and allow it to reset to insure that all parts are free from friction or binds.

2. With the relay de-energized each normally open contact should have a gap of .015" or more. Observe the wipe on each normally closed contact by deflecting the station contact member towards the frame. Wipe should be approximately .005".

The wipe on each normally open contact should be approximately .005". This can be checked by inserting a .0025"shim between the residual screw and the pole piece and operating the armature by hand. The normally open contacts should make before the residual screw strikes the shim. With the armature picked up, the gap on the normally closed contacts should be .010"to .020".

INSTALLATION PROCEDURE

If after the performance of the ACCEPTANCE TESTS, the relay is held in storage before shipment to the job site, it is recommended that the visual

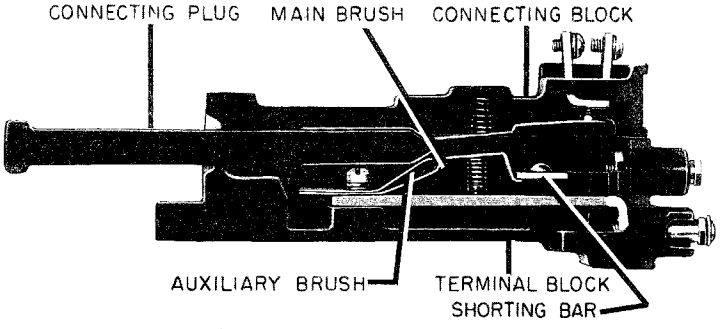
* Indicates revision

and mechanical inspection described in the section on ACCEPTANCE TESTS be repeated before installation.

Also the relay should be set at the dropout value to be used and it should be checked. When making this check, the relay should be installed in its permanent location and preheated. After the droput is set, check that the relay will pick up at the lowest acceptable battery charger output voltage.

PERIODIC CHECKS AND ROUTINE MAINTENANCE

In view of the vital role of protective relays in the operation of a power system it is important that a periodic test program be followed. It is recognized that the interval between periodic checks will vary depending upon environment, type of relay and the user's experience with periodic testing. Until the user has accumulated enough experience to select the test interval best suited to his individual requirements, it is suggested that the following points be checked at an interval of from one to two years.



NOTE: AFTER ENGAGING AUXILIARY BRUSH, CONNECTING PLUG TRAVELS 1/4 INCH BEFORE ENGAGING THE MAIN BRUSH ON THE TERMINAL BLOCK

Fig. 4 (8025039) Cross Section of Drawout Case Showing Position of Auxiliary Brush and Shorting Bar

MECHANICAL CHECKS

Manually operate the armature and allow it to reset to make sure that there is no excessive friction or tendency to bind.

Check that the contact gap and wipe values agree with those given in the section under ACCEPTANCE TESTS.

Examine the contact surfaces for signs of tarnishing or corrosion.

Set the battery charger at its lowest charging rate and check the pickup and dropout. The pickup voltage should be 106% or less of the dropout voltage. A voltmeter with at least 1000 ohms per volt should be used for making the test. If it is necessary to make adjustments, refer to the section on SERVICING.

SERVICING

If any of the mechanical or electrical check points described in the previous sections are found to be out of limits, the following points should be observed in restoring them.

The pickup voltage is adjusted by changing the setting of the variable resistor R1, (see Fig. 3.) The ratio of pickup to dropout can be changed by turning the residual screw of the telephone-type voltage unit. The minimum gap must be 0.002 inch between armature and pole face.

For cleaning relay contacts, a flexible burnishing tool should be used. This consists of an etched roughened strip of flexible metal, resembling a superfine file which removes corroded material quickly without scratching the surface. The flexibility of the tool insures the cleaning of the actual points of contact. Never use knives, files, abrasive paper or cloth to clean relay contacts. A burnishing tool as described above can be obtained from the factory.

RENEWAL PARTS

It is recommended that sufficient quantities of renewal parts be carried in stock to enable the prompt replacement of any that are worn, broken or damaged.

When ordering renewal parts, address the nearest Sales Office of the General Electric Company, specify quantity required, name of the part wanted, and give complete nameplate data. If possible, give the General Electric requisition number on which the relay was furnished.

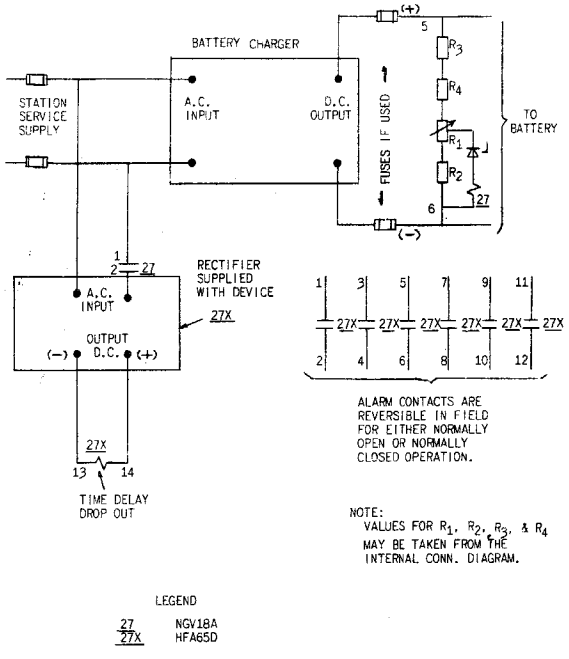
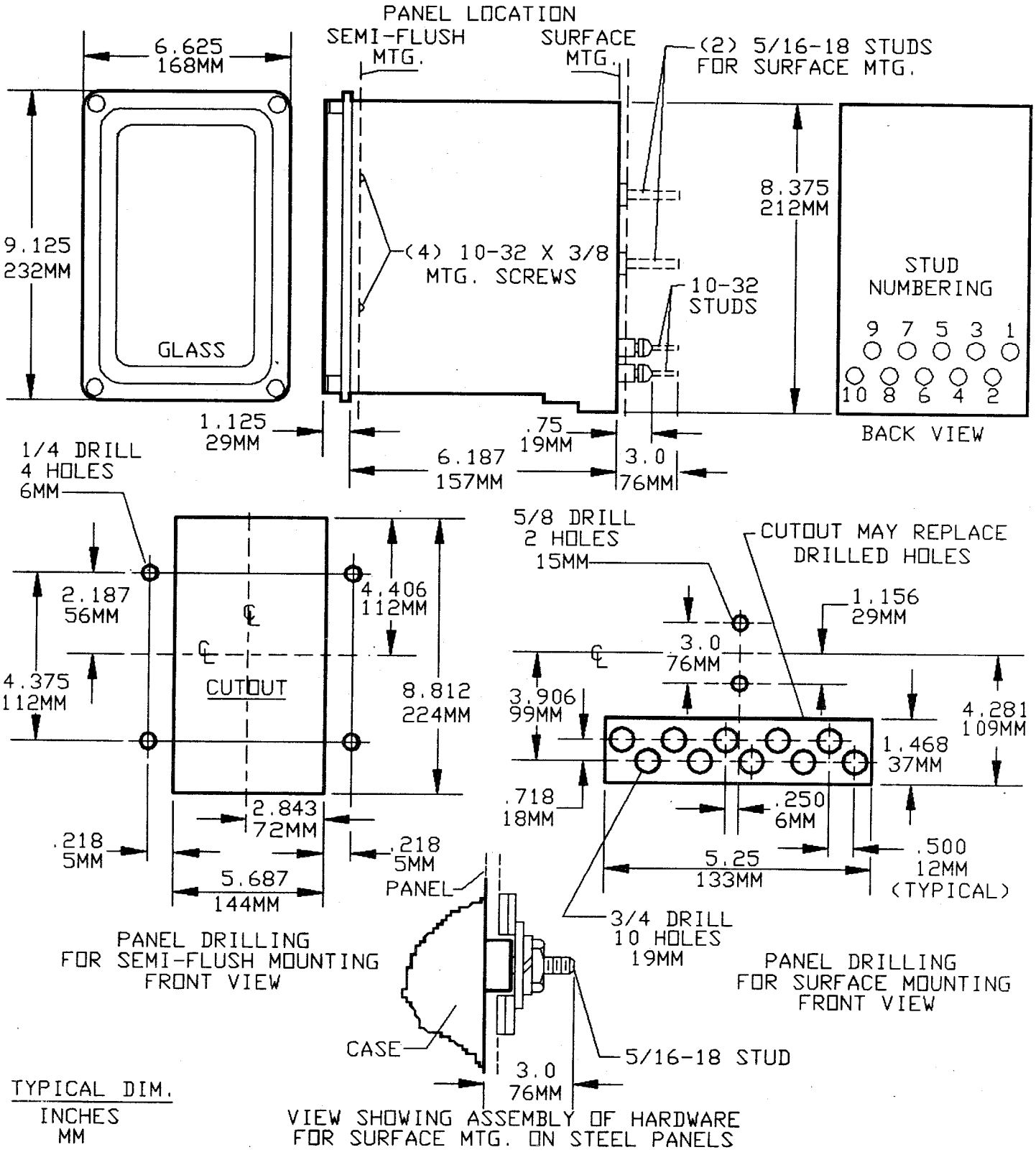


Fig. 5 (0178A9003 [2])External Connection Diagram for Type NGV18A Relay with Type HFA65D for Low Battery Indicator



* Fig. 6 (6209271 [8]) Outline and Panel Drilling Dimensions for Type NGV18A Relay

GE Power Management

215 Anderson Avenue
Markham, Ontario
Canada L6E 1B3
Tel: (905) 294-6222
Fax: (905) 201-2098
www.GEindustrial.com/pm