# INSTRUCTIONS

## MULTI-CONTACT AUXILIARY RELAYS

TYPE
HFA 171

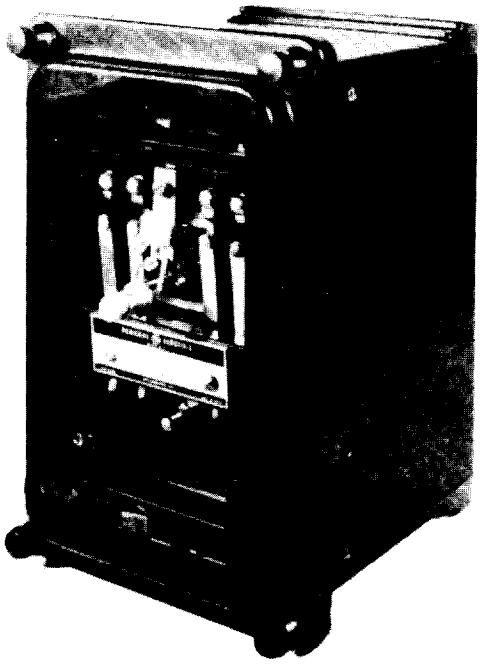

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FIGURE 1 (8042040) COVER

# MULTI-CONTACT AUXILIARY RELAYS

## TYPE HFA171

## DESCRIPTION

The HFA171A and HFA171B are instantaneous, hinged-armature, multi-contact, auxiliary relays. They have six electrically separate contact circuits adaptable for either circuit-opening or circuit-closing application. This arrangement permits a number of operations to be performed simultaneously.

The relays are mounted in single-unit double-end drawout-type cases. The case has studs for external connections at both ends. The electrical connections between the relay and the case are made through stationary molded inner and outer blocks between which rests a removable connecting plug that completes the circuits. The molded outer blocks carry the studs for the external connections, while the inner blocks carry the terminals for the internal connections. The operating coil is connected in parallel with both the upper and the lower inner molded blocks, while the contact circuits are connected in series with these blocks. In this way, insertion of either the upper or lower connecting plug will energize the operating coil, but the contact circuits will not be completed until the second connecting plug is inserted.

The operating coil is designed for long life even when operated continuously near maximum ambient temperature.

The internal connection diagram for these relays is shown by Figure 2 of this instruction book. Outline and panel drilling are shown by Figure 3.

## APPLICATION

The Type HFA171A relay is intended for application where it is necessary to perform up to six auxiliary functions simultaneously by the operation of a single drawout-case-mounted auxiliary relay. The Type HFA171B relay is designed for use where it is desired to maintain the circuits controlled by the auxiliary relay until it is manually reset. If more than six circuits are to be controlled the coils of two HFA relays may be connected in series (DC only) or in parallel.

## CHARACTERISTICS

The HFA171A relay is self reset and has an instantaneous dropout.

The HFA171B is hand reset by means of a plunger assembly installed through the transparent cover.

Unless the relays are ordered with a specific contact arrangement, they will be shipped with six circuit-closing contacts (Code 60). The contact arrangement can be easily changed to provide any of the combinations shown in Table I.

The operating coil should pick up at 80% of rated voltage for AC relays and 60% of rated voltage for DC relays. (See ADJUSTMENTS section of this book.) The dropout voltage is 45% to 60% of rated voltage for AC relays and 5% to 10% of rated voltage for DC relays.

DC Relay

The operating time at rated voltage is 40 to 70 milliseconds and at 65% of rated voltage is 130 to 170 milliseconds.

AC Relay

The average operating time with rated voltage suddenly applied should be 8 to 32 milliseconds.

TABLE I

| CODE NO. | 60 | 51 | 42 | 33 | 24 | 15 | 06 |
|---|---|---|---|---|---|---|---|
| POSITION NO | CONTACT ARRANGEMENT | | | | | | |
| 1 | a | a | a | a | a | a | b |
| 2 | a | a | a | a | b | b | b |
| 3 | a | a | b | b | b | b | b |
| 4 | a | b | b | b | b | b | b |
| 5 | a | a | a | b | b | b | b |
| 6 | a | a | a | a | a | b | b |

Note: a = Normally Open
b = Normally Closed

## RATINGS

The Type HFA relays are available with coil ratings for 120 or 240 volts AC at 50 or 60 cycles and up to 250 volts DC. The operating coil is continuously rated.

The current-closing rating of each contact is 30 amperes. The current-carrying rating is 12 amperes continuous, 30 amperes for one minute or 125 amperes for one second.

Table II lists the non-inductive interrupting capacity of each contact.

TABLE II

| DC | | AC | |
|---|---|---|---|
| VOLTS | AMPERES | VOLTS | AMPERES |
| 12 | 30 | 115 | 30 |
| 24 | 15 | 230 | 20 |
| 32 | 10 | 460 | 15 |
| 48 | 8 | 575 | 10 |
| 125 | 3 | | |
| 250 | 1 | | |

BURDENS

The burdens are measured with the relay in the picked-up position, and at rated voltage are listed in Table III.

TABLE III

OPERATING COILS (CONTINUOUS RATING)

| DC COILS WATTS | | AC COILS | | |
|---|---|---|---|---|
| COLD | HOT | FREQ. CYCLES | VOLT-AMPERES | WATTS |
| 7.8 | 6.0 | 50 | 23 | 9 |
| | | 60 | 32 | 12 |

RECEIVING, HANDLING AND STORAGE

These relays, when not shipped as part of a control panel, will be shipped in cartons designed to protect them against damage. Immediately upon receipt of the relay, an examination should be made for any damage sustained during shipment. If injury or rough handling is evident, a damage claim should be filed at once with the transportation company and the nearest General Electric Sales Office should be notified promptly.

Reasonable care should be exercised in unpacking the relay in order that none of the parts get injured or the adjustments disturbed.

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.

INSTALLATION

The Type HFA171 relays should be mounted on a vertical surface. The outline and panel drilling diagram is shown in Figure 3. The internal connections are shown in Figure 2.

After the relay has been mounted it should be operated a few times to be certain that the mechanism operates freely, and that the contact surfaces align properly and open quickly when the coil is de-energized. Check latching and reset operation of hand reset relay HFA171B.

## MAINTENANCE

CONTACT CLEANING

In cleaning fine silver contacts a flexible burnishing tool should be used. This consists of a flexible strip of metal with an etch-roughened surface, resembling in effect, a superfine file. The polishing action is so delicate that no scratches are left, yet corroded material will be removed rapidly and thoroughly

Fine silver contacts should not be cleaned with knives, files or abrasive paper or cloth.

The burnishing tool described is included in the standard XRT11A relay tool kit obtainable from the factory.

## ADJUSTMENTS

CONTACTS

The contacts should not require readjustment since they are self-aligning.

Any contact circuit can be changed from circuit opening to circuit closing, or vice versa, by removing the fixed contact, turning it over and replacing it. After the change, the contacts should be checked to see that all circuit-closing contacts make simultaneously when the relay is operated by hand, and that all circuit-opening contacts reclose simultaneously when the relay is allowed to drop out. All moving contacts should have at least 3/64 inch wipe. It may be necessary to bend the moving contact arms to realize these requirements.

It may be necessary to increase the armature travel by means of the armature adjusting screw to get sufficient wipe on the normally closed contacts. All pigtails should be checked to ensure that they exert no force on the contacts. If the above changes are required, the pickup should be rechecked.

1. All normally open "a" contacts shall have a wipe of 3/64 to 3/32 of an inch. This can be adjusted by forming the moving contacts with the tools provided along with the go/no go gauges.

2. All normally closed "b" contacts shall have a wipe of 0.067 inches ±.007 inches. This can be accurately accomplished by using the stop screw as a more accurate wipe adjustment.

3. Connect a continuity light to each of the normally closed contacts.

4. Loosen the stop screw locknut and turn the stop screw clockwise until the first of the normally closed contacts open.

i. Turn the stop screw an additional 1-1/4 turns and all the normally closed contact lights should go out, indicating that the normally closed contacts are adjusted within 1/32 of an inch overall from the first open to the last open.

6. Return the stop screw adjustment to the position mentioned in paragraph 4.

7. Nate the position of the slot of the stop screw. With that as a reference, turn the stop screw 2-1/2 turns ± 1/4 turn counterclockwise and lock into position.

PICKUP

The relays are adjusted at the factory to pick up at 80% (minimum 73%, maximum 81%) of rating for AC coils and 60% (minimum 55%, maximum 61%) of rating for DC coils. Normally these adjustments should not change; if it is necessary to readjust the relay, the adjusting nut should be lifted 1/16 inch, turned clockwise to raise pickup or counterclockwise to lower pickup, and then reseated in the hexagonal groove in the armature tailpiece.

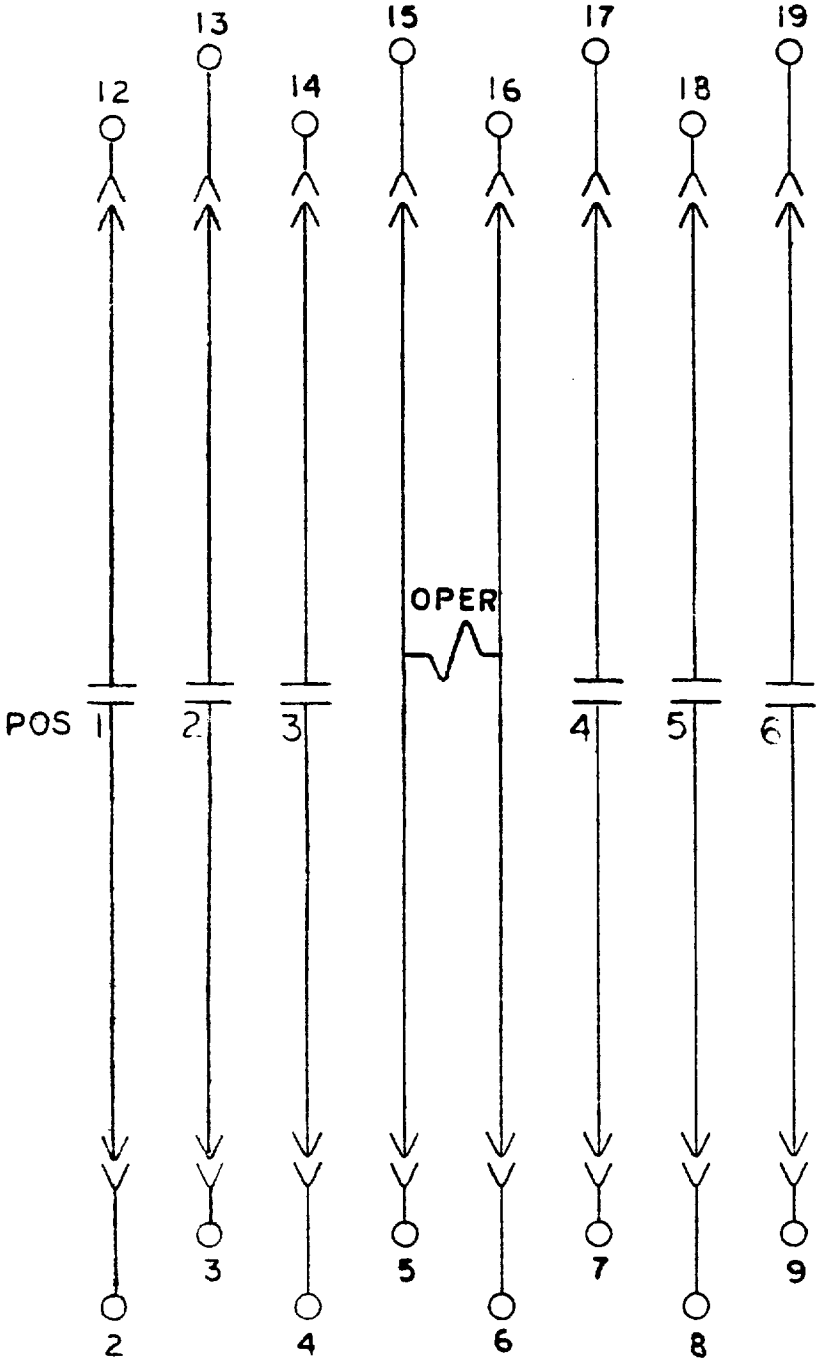
After all adjustments are completed, the relay should be operated a few times to be certain that the mechanism operates freely, and that the contact surfaces align properly and open quickly when the coil is de-energized.

## PERIODIC CHECKS AND ROUTINE MAINTENANCE

In view of the vital role of 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 points listed under ADJUSTMENTS be checked on the same schedule as the associated protective relays.

## RENEWAL PARTS

When ordering renewal parts, address the nearest sales office of the General Electric Company, specify quantity required, name of part wanted, and give complete nameplate data.




a = ⊣⊢ b = ⊣/⊢

| CODE NO. | | 60 | 51 | 42 | 33 | 24 | 15 | 06 |
|---|---|---|---|---|---|---|---|---|
| POS. NO... | 1 | a | a | a | a | a | a | b |
| | 2 | a | a | a | a | b | b | b |
| | 3 | a | a | b | b | b | b | b |
| | 4 | a | b | b | b | b | b | b |
| | 5 | a | a | a | b | b | b | b |
| | 6 | a | a | a | a | a | b | b |

Figure 2 (0246A6935) Internal Connection Diagram for Type HFA171 Relays (Front View)

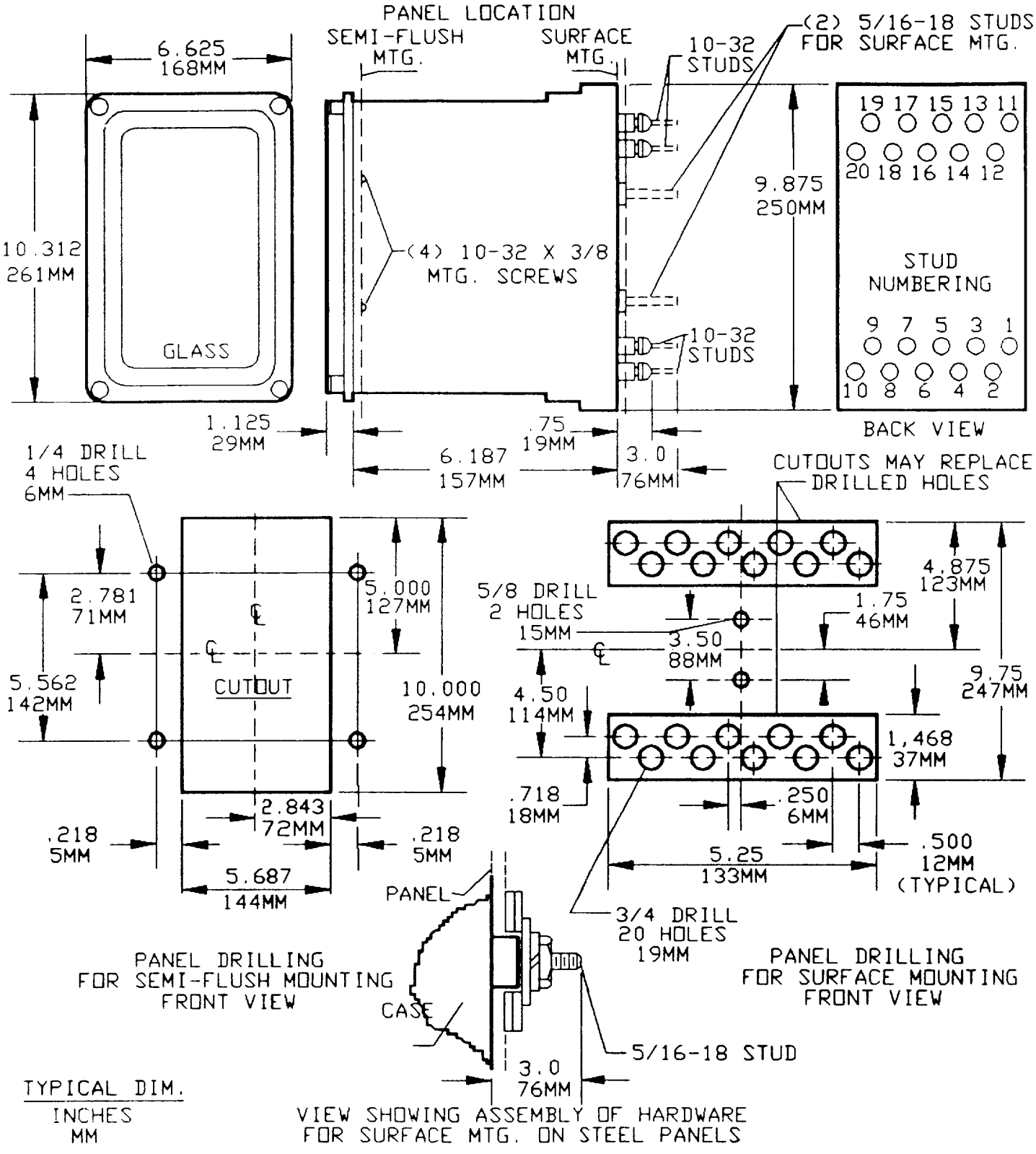



**Figure 3 (K-6209272 [7]) Outline and Panel-Drilling Diagram for HFA171 Relays**

Since the last revision, changes have been made in the following places:

p.4, Characteristics section, paragraphs entitled DC Relay and AC Relay
p.6, Adjustments section, numbered contact-adjustment paragraphs
Figure 3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