# Instructions

GEK-45486A
Supersedes GEK-45486

## MULTI-CONTACT

## AUXILIARY RELAYS

## TYPE HFA154

*These instructions do not purport to cover all details or variations in equipment nor to provide for every possible contingency to be met in connection with installation, operation or maintenance. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to the General Electric Company.*

*To the extent required the products described herein meet applicable ANSI, IEEE and NEMA standards; but no such assurance is given with respect to local codes and ordinances because they vary greatly.*

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# MULTI-CONTACT AUXILIARY RELAY

# TYPE HFA154

## DESCRIPTION

The HFA154 relays are instantaneous, hinged-armature, multi-contact, electric-reset, auxiliary relays. Model HFA154B has a hand-reset feature in addition to the electric-reset feature. The HFA154 relays have five electrically-separate contact circuits, adaptable for either circuit-opening or circuit-closing applications. A sixth contact is used to open the reset-coil circuit.

The HFA154 relays are available as back-connected, semi-flush mounted relays, HFA154B(-)F or HFA154E(-)F, or as front-connected, surface-mounted relays, HFA154B(-)H or HFA154E(-)H. Internal connections for the relays are shown in Figure 4. Outline and panel-drilling dimensions are shown in Figures 5 and 6.

These relays have special long-life operating coils.

## APPLICATION

The Type HFA154 relays are intended for application where it is desired to control up to five circuits by the operation of a single auxiliary relay, and to maintain those circuits until the auxiliary relay is electrically reset (HFA154E) or, with the HFA154B, either manually or electrically reset.

## CHARACTERISTICS

The HFA154 relays are multi-contact auxiliary relays. The HFA154B has the additional feature of hand reset. The hand-reset feature is accomplished with a plunger assembly installed through the transparent cover. The general characteristics of HFA154 relays are summarized in Table I.

TABLE I

| Model Number | No. of Separate Contact Circuits | Additional Characteristics | Contact Arrangement Table |
|---|---|---|---|
| HFA154B | 5 | Hand Reset | II |
| HFA154E | 5 | - - - - - - | II |

Unless the relays are ordered with a specific contact arrangement, they will be shipped with all circuit-closing contacts (code 60); see Table II.

TABLE II

| Code No. | 60 | 51 | 42 | 33 | 24 | 15 |
|---|---|---|---|---|---|---|
| Position No. | Contact Arrangement | | | | | |
| 1 | a | a | a | a | a | b |
| 2 | a | a | a | a | b | b |
| 3 | a | a | b | b | b | b |
| 4 | a | b | b | b | b | b |
| 5 | a | a | a | b | b | b |
| 6 + | a | a | a | a | a | a |

a = Normally open b = Normally closed + = Used to open reset-coil circuit

## RATINGS

* The Type HFA154 relays are available with coil ratings for standard voltages up to 250 VDC and for 120 and 240 volts at 50 and 60 cycles. The operating coils are specifically designed for long life, even when operated continuously near maximum ambient temperature (55°C).

The operating coil is continuously rated, but the reset coil has a five (5)-second intermittent rating.

The current-closing rating of each contact is 30 amperes. The current-carrying rating is 12 amperes continuous, or 30 amperes for one minute. Table III lists the non-inductive interrupting capacity of each contact.

TABLE III

| 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 operating-coil burdens listed in Table IV are measured with the relay in the picked-up position, at rated voltage, and are for continuous usage.

TABLE IV

| DC Coils | | AC Coils | | |
|---|---|---|---|---|
| Watts | | | | |
| Cold | Hot | Frequency (Cycles) | Volt-Amperes | Watts |
| 7.3 | 6.0 | - | - | - |
| --- | --- | 50 | 23 | 9 |
| --- | --- | 60 | 32 | 12 |

* Revised since last issue

The burdens of the reset coil are listed in Table V and are for an intermittent rating of 5 seconds.

TABLE V

| DC Coils | | AC Coils | |
|---|---|---|---|
| Rating | Resistance ± 10% | Frequency | Volt-Amps |
| 250 | 740 | | |
| 220 | 740 | 50 | 220 |
| 125 | 185 | 60 | 180 |
| 110 | 185 | | |

## 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 Sales Office.

Reasonable care should be exercised in unpacking the relay in order that none of the parts are injured nor 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. 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.

## INSTALLATION

### MOUNTING AND CONNECTIONS

The Type HFA154 relays should be mounted on a vertical surface. The outline, panel-drilling diagrams and internal connections are shown in Figures 4, 5, and 6.

### ADJUSTMENTS

These relays have been calibrated at the factory and under normal conditions will require no further adjustments. If further adjustments are required, refer to the **SERVICING** section of this book.

## 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 points listed under **SERVICE AND ADJUSTMENT** be checked on the same schedule as the associated protective relays.

* Revised since last issue

CONTACT CLEANING

For cleaning fine silver relay contacts, a flexible burnishing tool should be used (available from the factory). This consists of a flexible strip of metal with an etched-roughened surface, resembling in effect a superfine file. The polishing action is so delicate that no scratches are left, yet it will clean off any corrosion thoroughly and rapidly. The flexibility of the tool ensures the cleaning of the actual points of contact. Do not use knives, files, abrasive paper or cloth of any kind to clean relay contacts.

## SERVICING AND ADJUSTMENT

* CONTACT ADJUSTMENT

The contacts are adjusted at the factory, and normally should not require readjustment since they are self-aligning.

HFA154 contact circuits can be changed from circuit-opening to circuit-closing, or vice versa, by removing the fixed contact, turning it over and restoring it to its place.

If for any reason it becomes necessary to readjust the contacts, for instance if a contact is changed from circuit opening to circuit closing, the following checks and adjustments should be made;

1. Make sure that all contact and coil studs are tight.

2. Make sure that the armature is free of binding when operated by hand. The braided "pigtail" lead on all contacts must be adjusted to exert minimum force on the contacts.

3. Adjust the contact arms so that the normally-open contacts make approximately simultaneously when the relay is operated by hand. It is permissible to have as much as, but no more than, 1/32 inch gap in any one contact when the first one to close is just making contact. Also, the normally-closed contacts must open at approximately the same time. These adjustments can be made by bending the moving contact arms.

4. All normally-open "a" contacts must 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.

5. The adjustment of the stop screw depends on whether there are normally-closed contacts present. If there are no normally-closed contacts, adjust the stop screw to give approximately 7/32-inch contact gap between moving and stationary contact. If there are normally-closed contacts, use the 7/32-inch adjustment as a reference point for starting the wipe adjustment.

6. All normally-closed "b" contacts must have a wipe of 0.067 $\pm$ .007 inches. This can be accurately accomplished by using the stop screw for the fine adjustment.

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

* Revised since last issue

8. Loosen the stop-screw locknut and turn the stop screw clockwise until the first of the normally-closed contacts opens.

9. Turn the stop screw an additional 1 turn 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.

10. Turn the stop screw back again so that there is approximately 1/8 inch between the end of the stop screw and the armature and then tighten the locknut.

11. Recheck pickup after the above changes or adjustments.

PICKUP

* The main coil should be adjusted to pick up at 73% to 81% of rated voltage for AC relays, and 55% to 61% of rated voltage for DC relays. This adjustment may be obtained by unseating the adjusting nut at the lower end of the armature and turning this nut in a clockwise direction to raise the pickup. The pickup is decreased by turning the nut in the counterclockwise direction.

* The reset coil sould pick up at 50% to 80% of rated AC voltage, and 50% to 75% of rated DC voltage. There is no adjustment available to alter this pickup. Since the reset coil is rated intermittently, care should be exercised when applying this voltage. If the pickup value is lower than 50% of rated voltage, check whether the reset coil resistance is within tolerance.

After all adjustments are completed, the mounted relay should be operated a few times to be certain that the mechanism operates freely and that the contact surfaces align properly. Check to see that the armature latches in when operated by hand, and opens readily when reset.

## RENEWAL PARTS

When ordering renewal parts, address the nearest Sales Office of the General Electric Company. Specify the name of the part wanted, quantity required, and complete nameplate data, including the serial number, of the relay. The renewal parts publication is GEF-2757.

* Revised since last issue

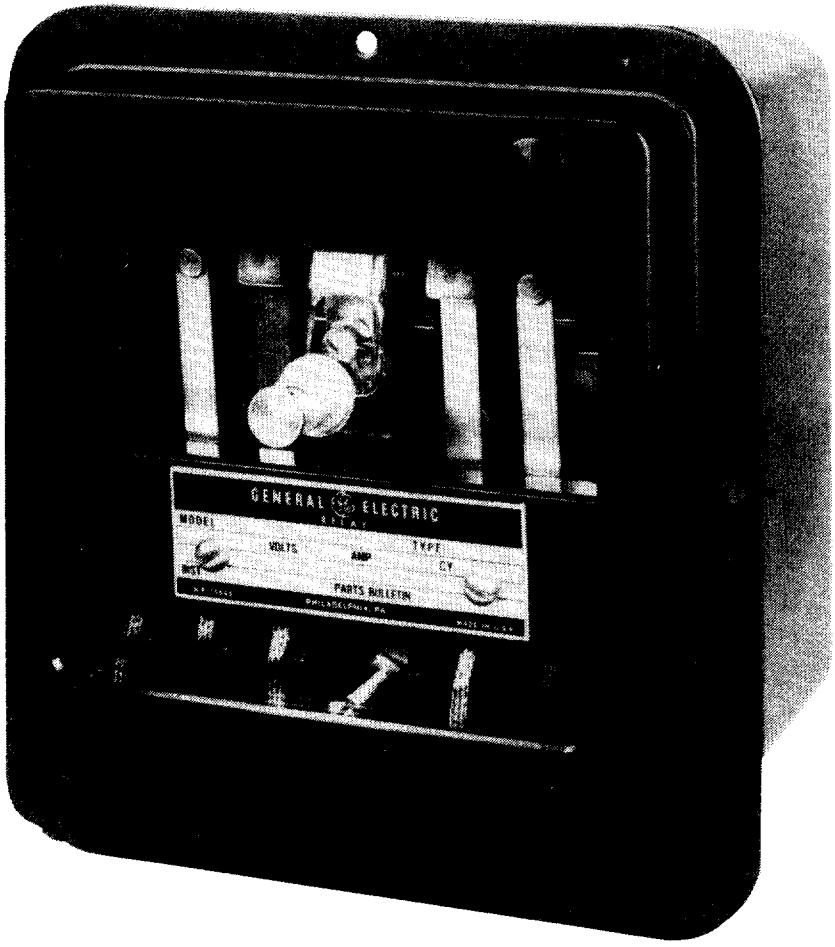



Figure 1 (8043000) HFA154 Relay, Back-Connected, Semi-Flush mounted (Front View)

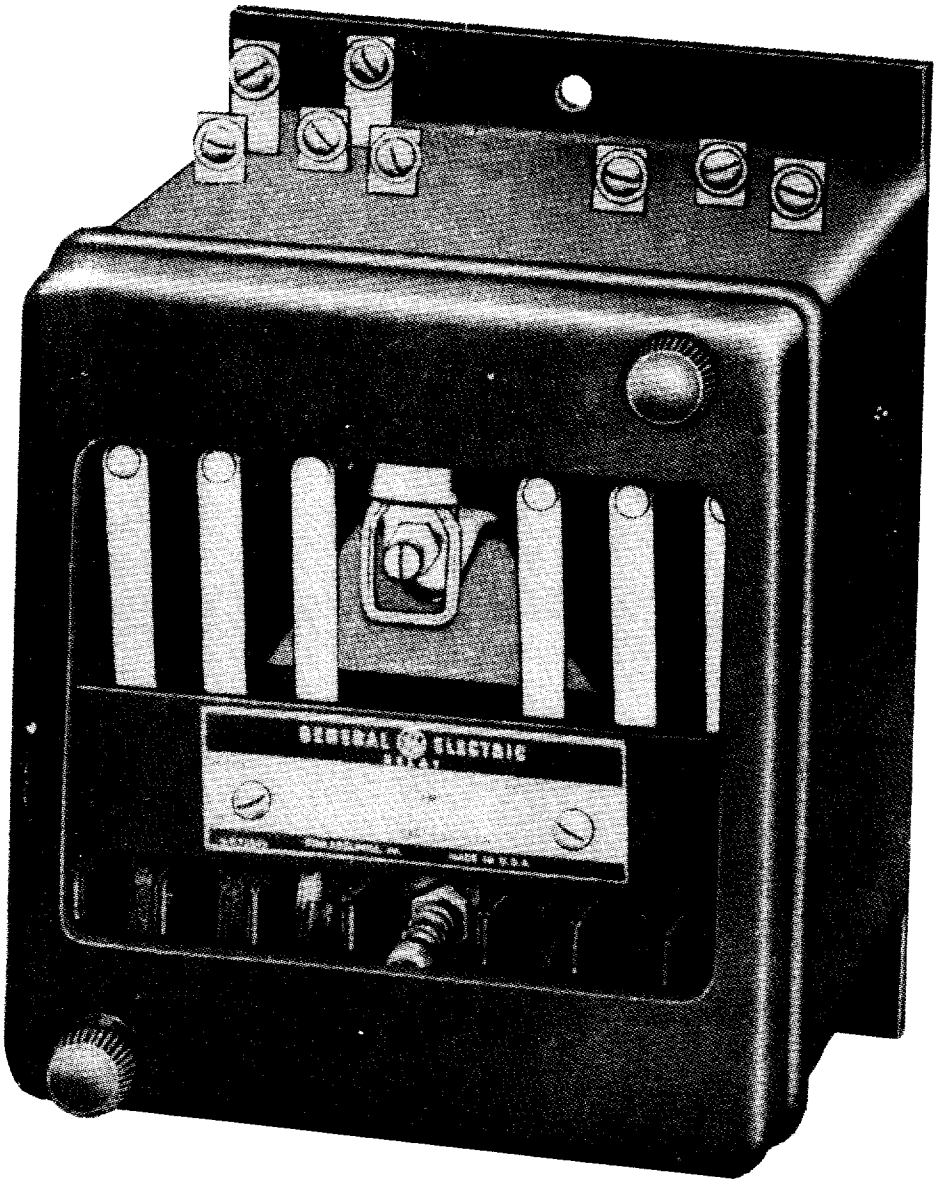



Figure 2 (8025781) HFA154 Relay, Front-Connected, Surface-Mounted (Front View)

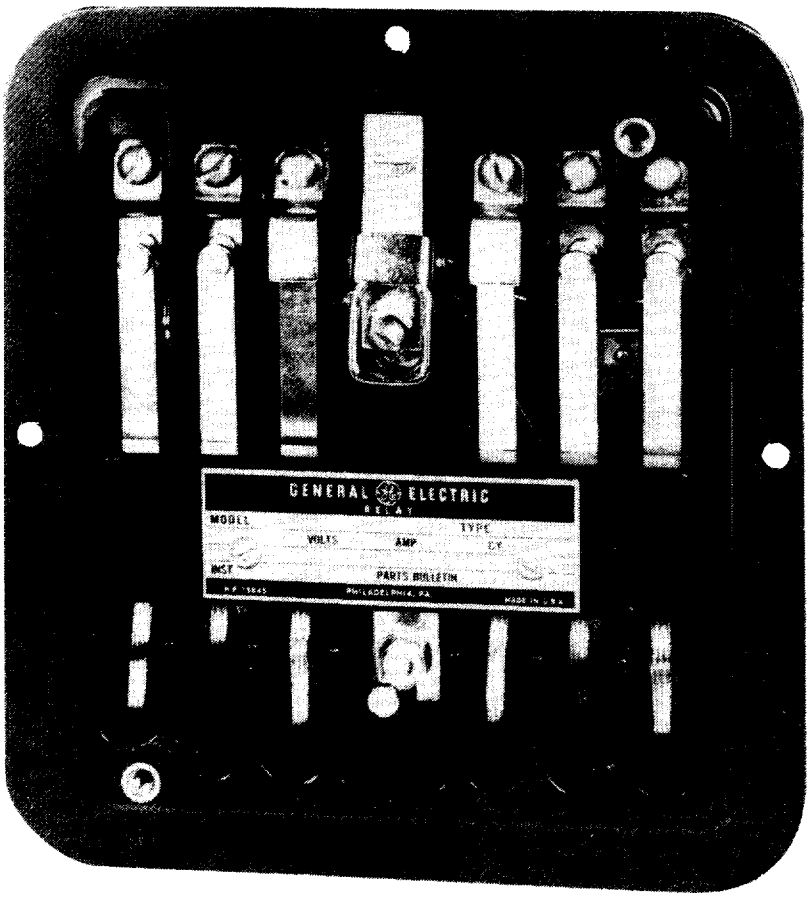
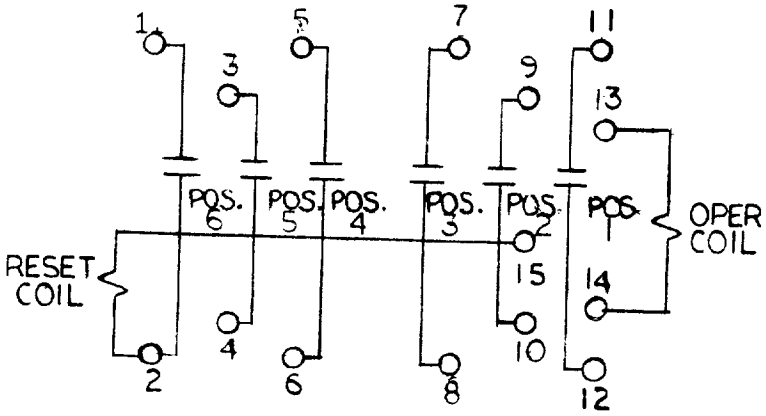



Figure 3 (8043001) HFA154 Relay with Cover Removed (Front View)




INTERNAL CONNECTIONS
BACK VIEW

EACH CONTACT CONVERTIBLE ONLY ACCORDING TO CONTACT ARRANGEMENT CODE.

Figure 4 (0104A8528-4) Internal Connections of HFA154 Relays (Front View)

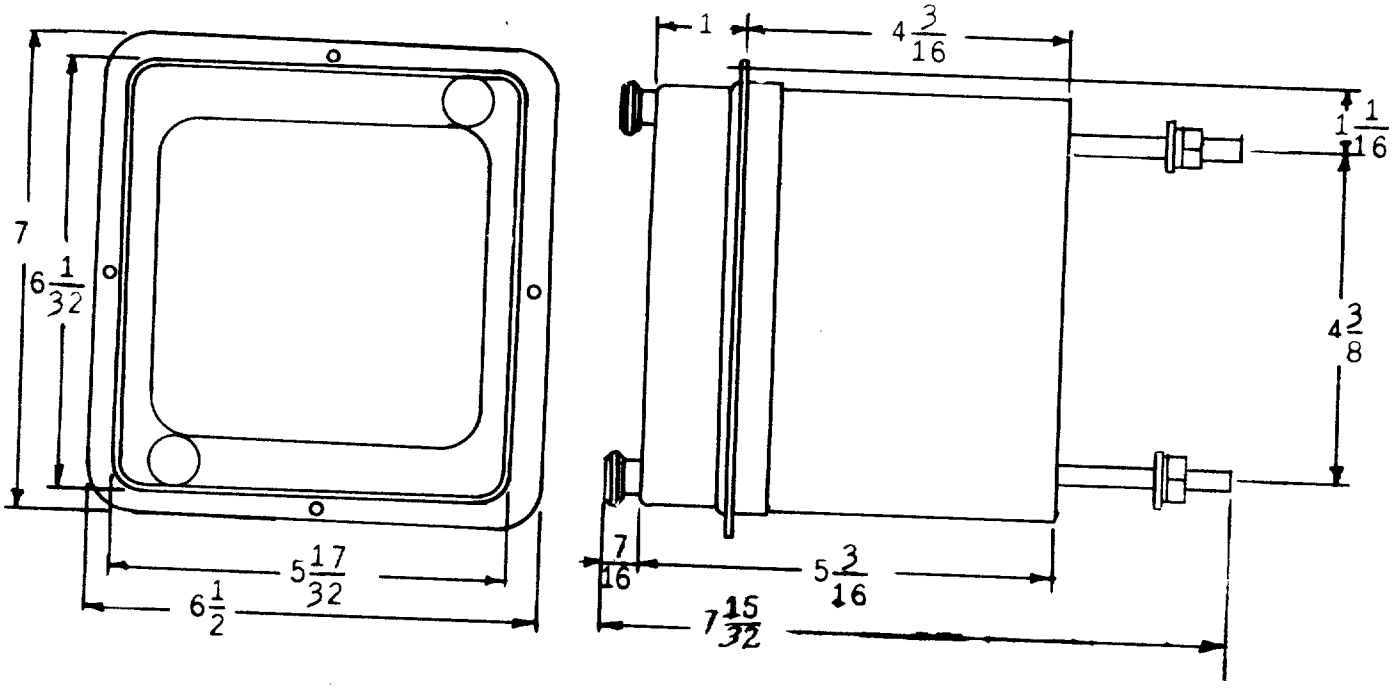
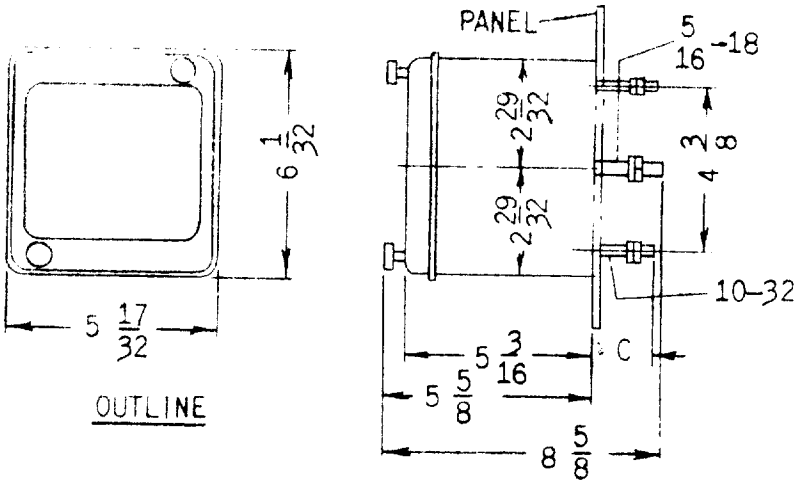
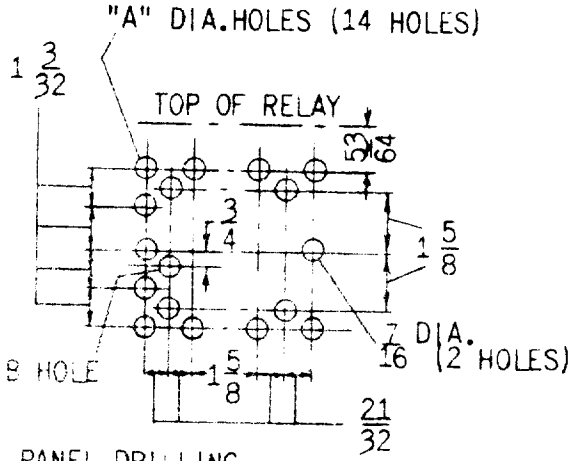



Figure 5 (637837-4) Outline and Panel-Drilling Diagram
for HFA154 Relays for Semi-Flush Mounting




OUTLINE

| TYPE OF PANEL | "C" |
|---|---|
| INSULATING | 3-1/16 |
| STEEL | 1-9/16 |




PANEL DRILLING (FRONT VIEW)

| TYPE OF PANEL | "A" | "B" |
|---|---|---|
| INSULATING | 7/16 | 7/16 |
| STEEL | 9/16 | 9/16 |

Figure 6 (0362A0576-6) Outline and Panel-Drilling Diagram for HFA154 Relays for Surface Mounting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