INSTRUCTIONS

GEH-2024C

SUPERSEDES GEH-2024B

MULTICONTACT AUXILIARY

RELAY

TYPE HFA51

POWER SYSTEMS MANAGEMENT DEPARTMENT

GENERAL ELECTRIC

PHILADELPHIA, PA.

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MULTICONTACT AUXILIARY RELAY TYPE HFA51

DESCRIPTION

The HFA51 relays 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 internal connection diagram for HFA51 relays is shown in Fig. 4. The HFA51 relays are available for front or back connection. The front connected relays are suitable for surface mounting only.

The back connected relays are suitable for either surface mounting or semi-flush mounting; a steel flange is necessary for the latter to provide mounting with normal covers. The outline and panel drilling diagrams for HFA51 relays are shown in Figs. 5, 6 and 7.

APPLICATION

The Type HFA relays are auxiliary devices that are suitable for application where the operating characteristics and ratings as described in this book are required.

CHARACTERISTICS

The HFA51A relay is self reset and has an instantaneous dropout.

The HFA51B relay is hand reset by means of a plunger assembly installed through the transparent cover.

The HFA51P is similar to the HFA51A except that it has palladium contacts.

The HFA51S is similar to the HFA51A except that the (b) contact in the No. 3 position is used with an external resistor to obtain a pickup time of 8 milliseconds for high speed operation. The resistor is shorted by the (b) contact until the relay picks up. When the relay picks up the (b) contact opens and places the resistor in series with the relay coil. Unless relays are ordered with specific contact arrangements, they are shipped with six circuit closing contacts (Code 60), with the exception of HFA51S, which is shipped with Code 01 contacts. Code 01 is available in the HFA51S only. The HFA51S is not available in Codes 51 and 60.

Subject to the limitations noted in the preceding paragraph, the contact arrangement can be changed to provide any of the combinations shown in Table I.

RATINGS

The HFA51A, HFA51B and HFA51P relays are available with coil ratings for standard voltages up to 575 volts at 25, 50, or 60 cycles and up to 250 volts d-c inclusive. The HFA51S relay is available in d-c voltage rating up to 250 volts d-c inclusive.

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 II lists the non-inductive interruping capacity of each contact.

TABLE I

Code No.	60	51	42	33	24	15	06	01
Position No.	Contact Arrangement							
1	a	a	a	a	a	a	b	a
2	a	a	a	a	b	b	b	a
3	a	a	b	b	b	b	b	b
4	a	b	b	b	b	b	b	a
5	a	a	a	b	b	b	b	a
6	a	a	a	a	a	b	b	a

Note: a = Normally Open b = Normally Closed
HFA51S not available in Codes 51 and 60.
Code 01 is available in HFA51S only.

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 does not apply to the HFA53S because of the external resistor.

TABLE III

DC COILS		AC COILS		
Watts		Freq.	Volt	
Cold	Hot	Cycles	Amperes	Watts
7.8	6.0	25	10	4
		50	23	9
		60	32	12

INSTALLATION

MOUNTING AND CONNECTIONS

The Type HFA relays should be mounted on a vertical surface. The outline and panel drilling diagrams are shown in Figs. 5, 6 and 7. Surface mounting on steel panels requires an insulating bushing for each terminal. The internal connection diagram for Type HFA relays is shown in Fig. 4.

ADJUSTMENTS

PICKUP

The relays are adjusted at the factory to pick up at 80 percent of rating for a-c coils and 60 percent of rating for d-c coils. Normally these adjustments should not change; if it is necessary to readjust the relay, the armature 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 the relay has been mounted it should be operated a few times to be certain that the mechanism operates freely, that the contact surfaces align properly and that self reset models drop out quickly when the coil is de-energized.

PICKUP TIME

The HFA51S relays should pick up in eight milliseconds or less when rated voltage is applied across the resistor and relay coil combination. This time may be altered by adjustment of the armature stop screw.

CONTACTS

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

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 with the first one to close 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. Set the wipe on moving contacts between 3/64 and 3/32 inch. The wipe is controlled by the armature adjusting nut, see PICKUP ADJUSTMENT, and the setting of the armature stop screw. If there are no normally closed contacts, adjust the stop screw to give approximately 7/32 inch contact gap. If there are normally closed contacts, use the 7/32 inch gap as a starting point for wipe adjustment.

5. Recheck pickup. HFA51 contact circuits 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, relay pickup and contact adjustment should be rechecked.

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 etched 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.

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. The renewal parts publication is GEF-2757.

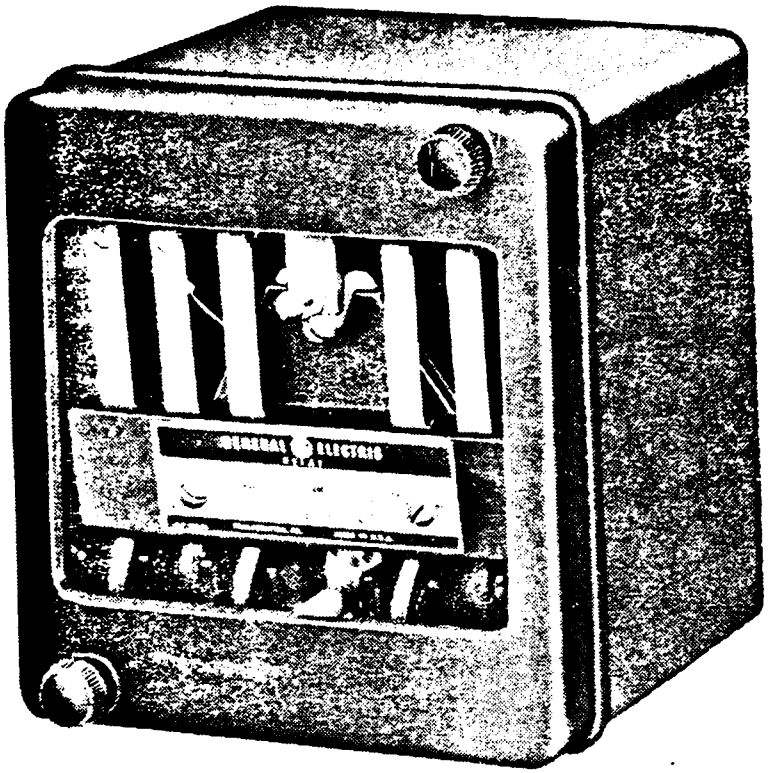


FIG. 1 (8025536) HFA51 BACK CONNECTED RELAY IN STANDARD CASE

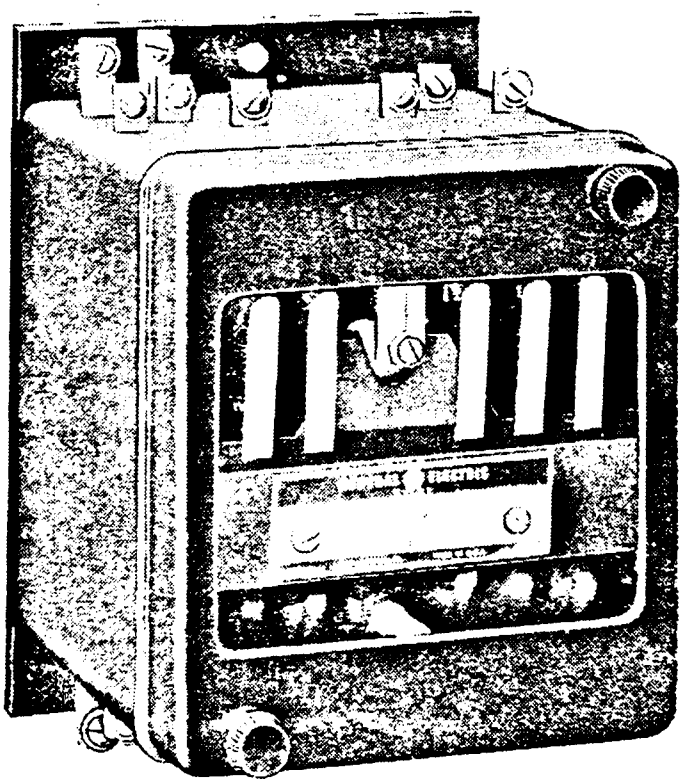


FIG. 2 (8025264) HFA51 FRONT CONNECTED RELAY IN STANDARD CASE

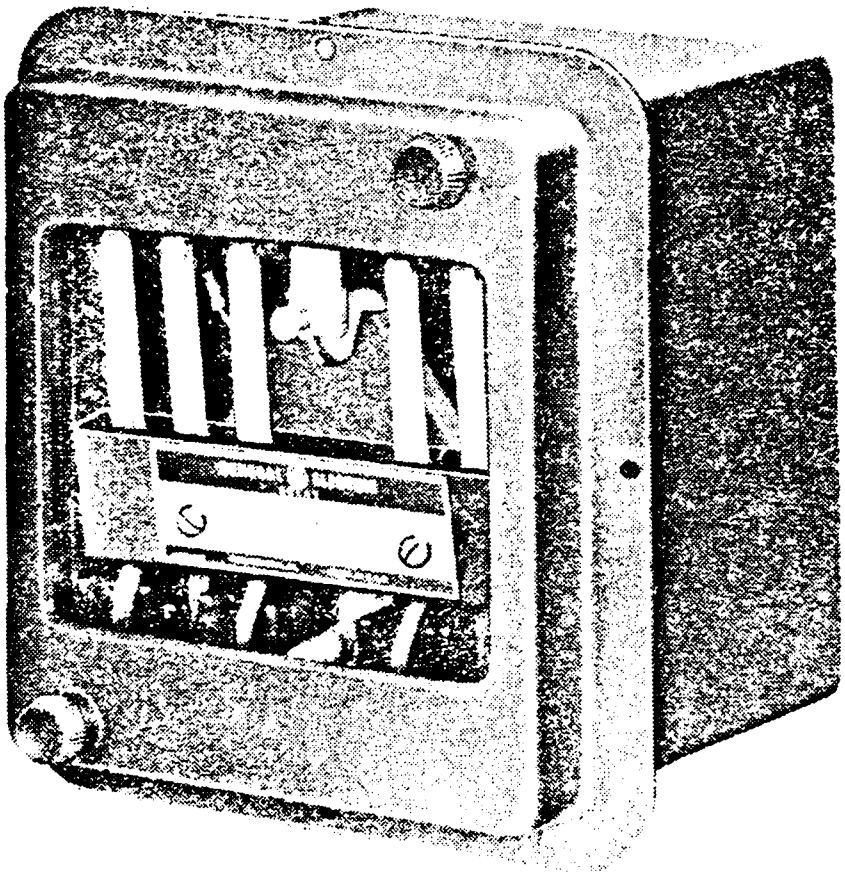
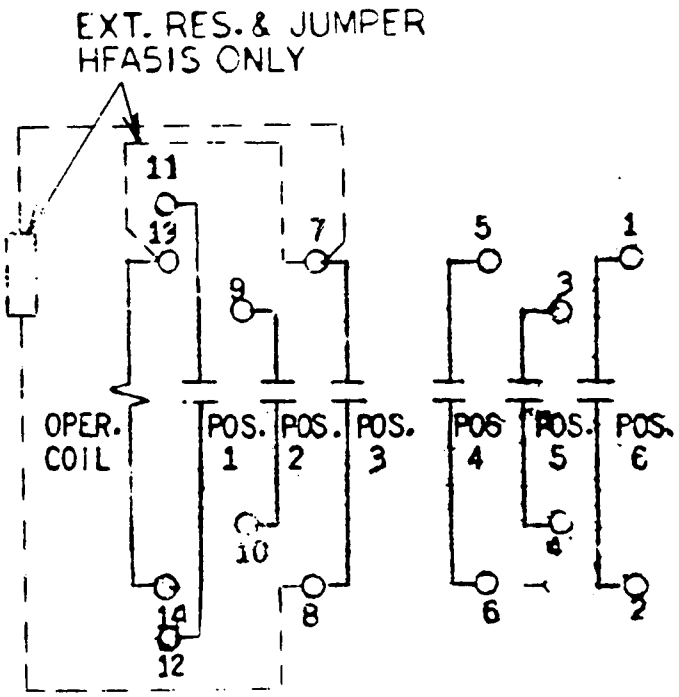


FIG. 3 (8025537) HFA51 BACK CONNECTED RELAY WITH FLANGE FOR SEMI-FLUSH MOUNTING (FRONT VIEW)

NOTE - CODE 01 HFA51S ONLY;
HFA51S, ONLY, NO CODE 51 OR 60.

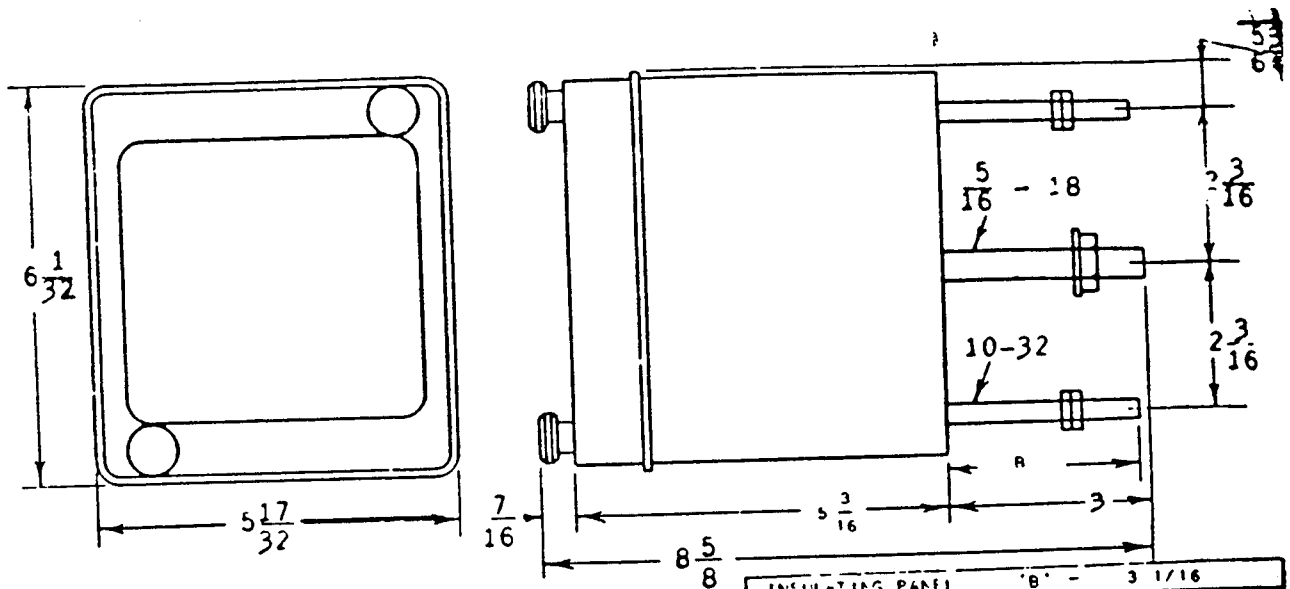
	CODE	CONTACT ARRANGEMENT					
		1	2	3	4	5	6
HFA51A**H	60	a	a	a	a	a	a
51B**H	51	a	a	a	b	a	a
51P**H	42	a	a	b	b	a	a
51S**H	33	a	a	b	b	b	a
65D**H	24	a	b	b	b	b	a
65E**H	15	a	b	b	b	b	b
	06	b	b	b	b	b	b
	01	a	a	b	a	a	a



INTERNAL CONNS
FRONT VIEW

EACH CONTACT CONVERTIBLE ONLY ACCORDING TO CONTACT ARRANGEMENT CODE.

FIG. 4 (0104A8526-7) INTERNAL CONNECTION DIAGRAM FOR TYPE HFA51 RELAYS (FRONT VIEW)

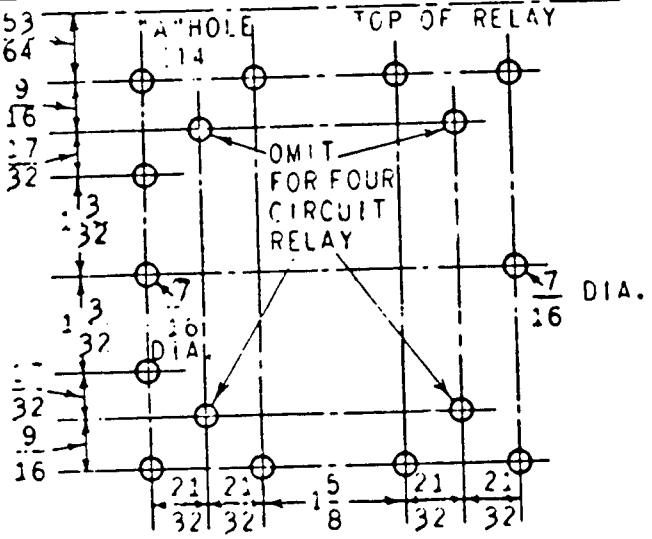


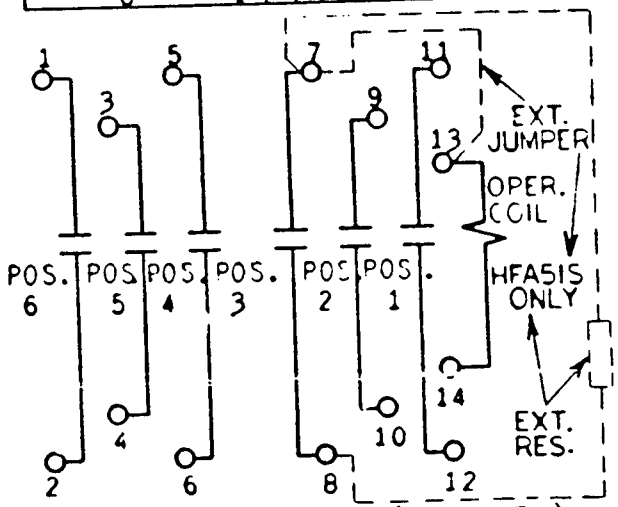
NOTE-CODE CI HFA51S ONLY; HFA51S,ONLY,NO CODE 51 CR 6C.

OUTLINE

CODE NO.	60	51	42	33	24	15	06	01
POSITION NO.	CONTACT ARRANGEMENT							
1								
2								
3								
4								
5								
6								

CODE NO.	40	31	22	13	04
POSITION NO.	CONTACT ARRANG.				
1					
3					
4					
6					



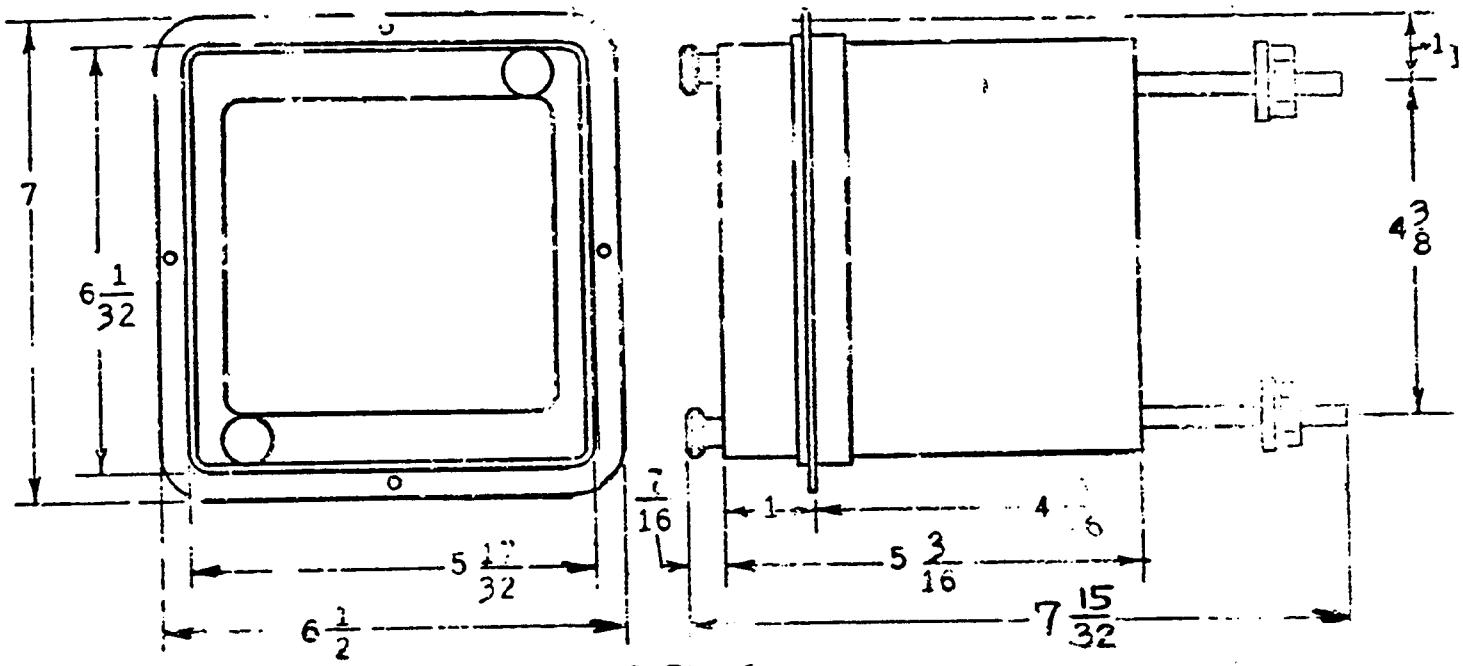


INTERNAL CONNECTIONS (REAR VIEW)

PANEL DRILLING FRONT VIEW
INSULATING PANEL "A" HOLE = 7/16 DIA
STEEL PANEL "A" HOLE = 9/16 DIA.

POSITIONS 5 AND 2 ARE OMITTED IN FOUR CIRCUIT RELAYS.
EACH CONTACT CONVERTIBLE ACCORDING TO CONTACT ARRANGEMENT CODE.

FIG. 5 (K-6178931-12) OUTLINE AND PANEL DRILLING FOR SURFACE MOUNTED TYPE HFA51- *RELAYS

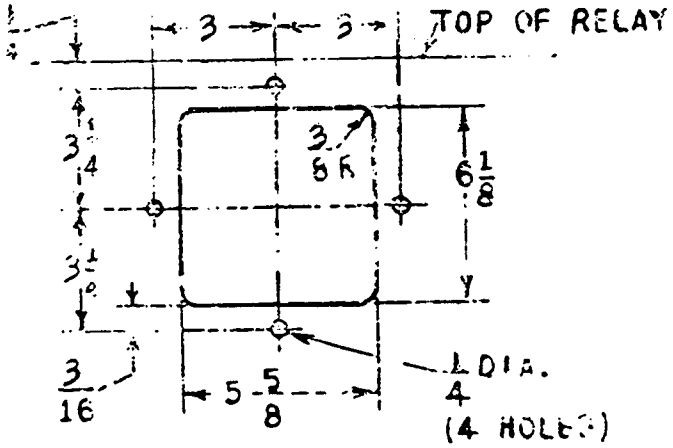


OUTLINE

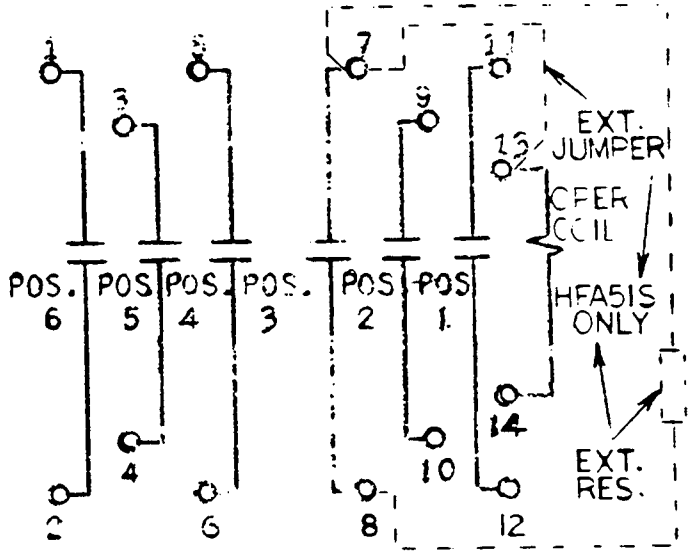
NOTE- CODE 01 HFA51S ONLY;
HFA51S, ONLY, NO CODE 51 OR 60.

CODE NO.	60	51	42	33	24	15	06	01
POSITION NO.	CONTACT ARRANGEMENT							
1								
2								
3								
4								
5								
6								

CODE NO.	40	31	22	13	04
POSITION NO.	CONTACT ARRANG				
1					
3					
4					
6					



PANEL DRILLING



INTERNAL CONNECTION (BACK VIEW)
POSITIONS 5 AND 2 ARE OMITTED IN FOUR CIRCUIT RELAYS. EACH CONTACT CONVERTIBLE ACCORDING TO CONTACT ARRANGEMENT CODE

FIG. 6 (K-6178972-9) OUTLINE AND PANEL DRILLING FOR SEMI-FLUSH MOUNTED TYPE HFA51- *F RELAYS

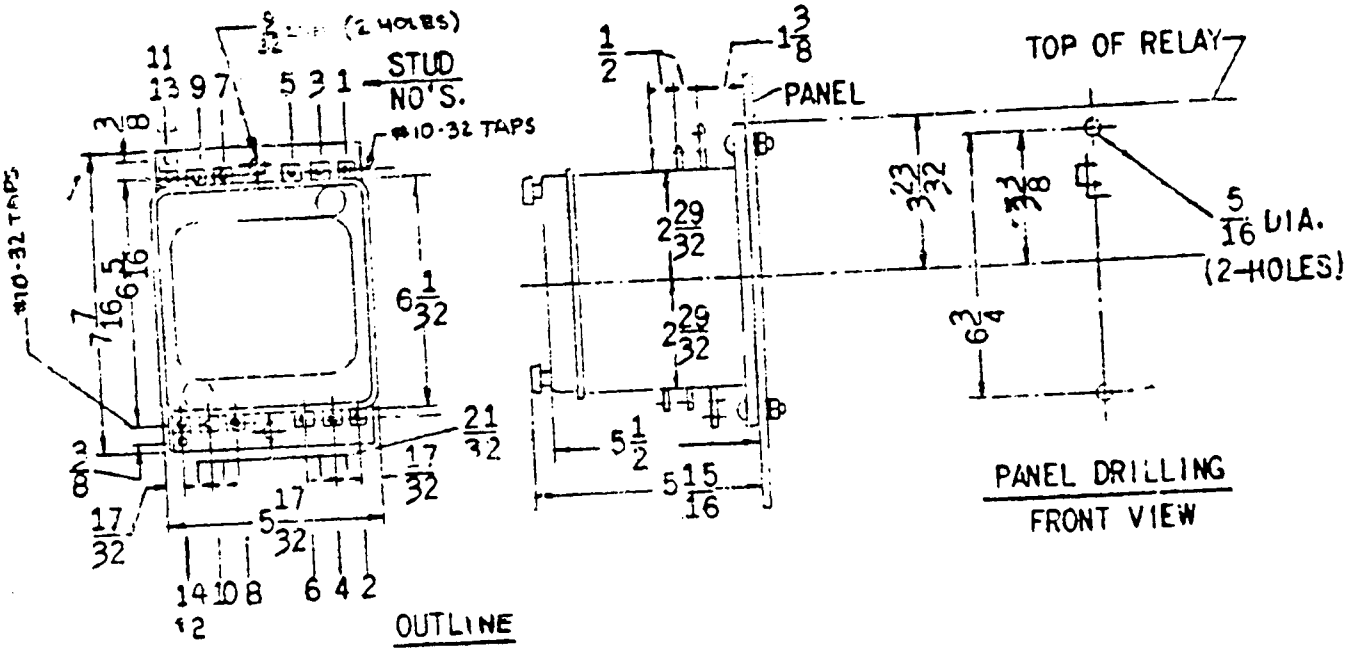


FIG. 7 (0104A8526-7) OUTLINE AND PANEL DRILLING FOR FRONT CONNECTED TYPE HFA51- *H RELAYS

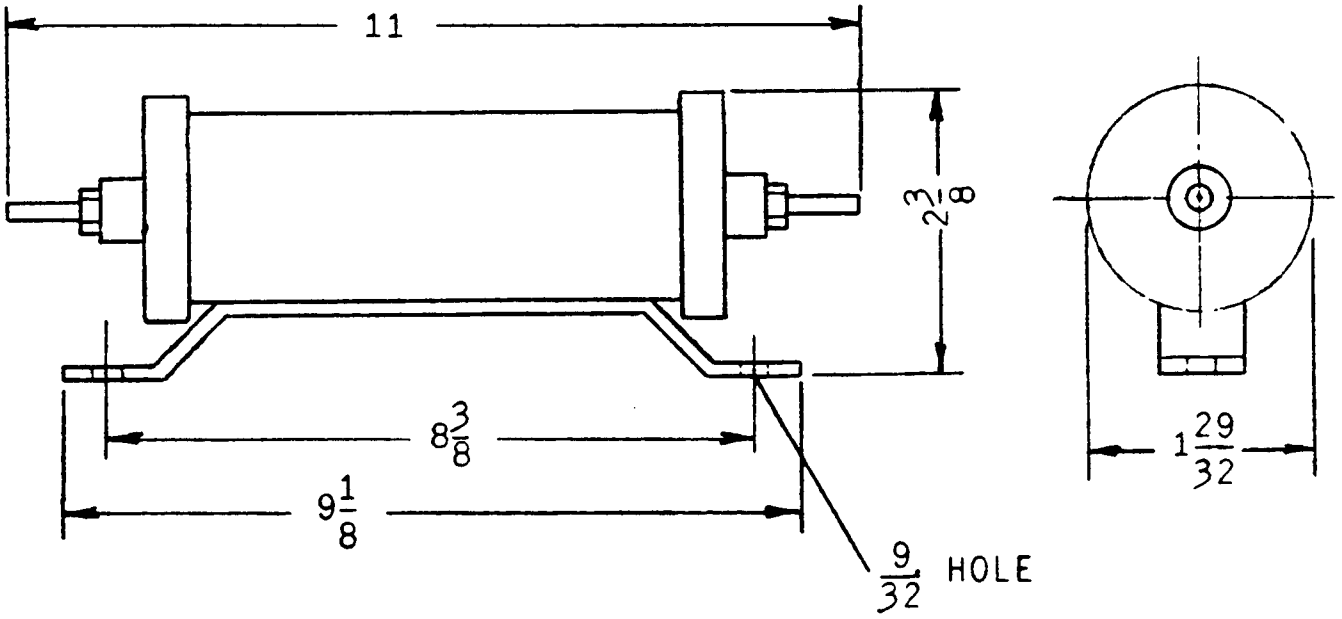


FIG. 8 (0389A0752-1) OUTLINE OF EXTERNAL RESISTOR USED WITH HFA51S RELAYS

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