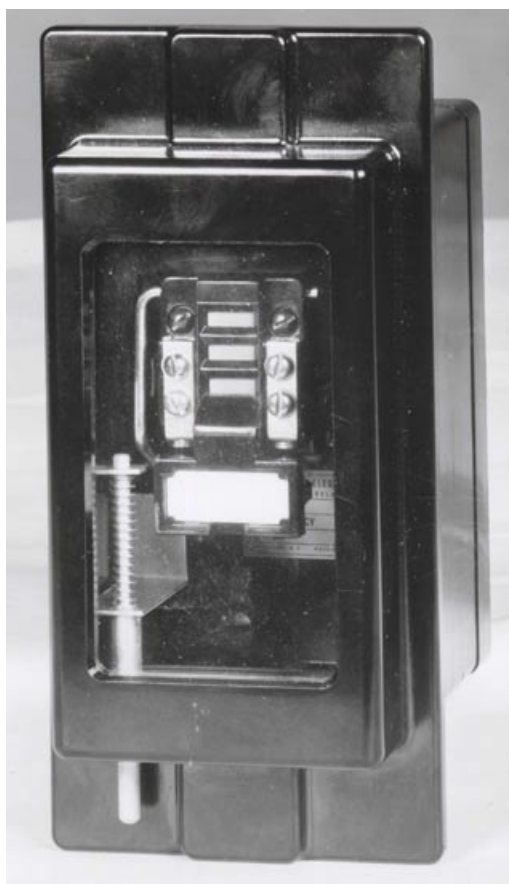




# INSTRUCTIONS

## HAA 15A / 15B / 15C / 15D / 15E / 15F / 15G / 15H AUXILIARY CURRENT RELAYS

Manual Part Number: GEI-83964H  
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Manufactured under an  
ISO9002 Registered System



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*These instructions do not purport to cover all details or variations in equipment nor 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 (USA).*

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

## DESCRIPTION

The HAA relays covered by this instruction book consist of one target unit mounted in a molded plastic case with a glass window. These relays have two normally open contacts electrically separate from the coil circuits. The two normally open contacts of relay HAA15H are also electrically separate. The available current and voltage ratings are given in Table 1. The internal connections are provided in Figures 3 through 7. The outline and panel drilling dimensions are given in Figures 7 through 10.

## APPLICATION

These HAA relays may be used wherever a single external target function is required. The HAA15A, HAA15C, or HAA15E may be used as an external target and seal-in.

## CHARACTERISTICS

The contacts will make and carry 30 A momentarily and will carry 6 A continuously.

The available current and voltage ratings, resistance values, pickup values (see ELECTRICAL TESTS for pickup limits) and continuous rating of the operating coils are given in Table 1 below.

**Table 1: HAA RATINGS**

MODEL	COIL RATING	TAP RATING	DC RESISTANCE	PICKUP	CARRY 30 A FOR	CARRY 10 A FOR	MAXIMUM CONTINUOUS
HAA 15A HAA 15E	0.2 / 2.0 A DC	0.2 A	7.0 $\Omega$	0.2 A	----	0.2 sec.	0.30 A
	0.2 / 2.0 A DC	0.2 A	0.13 $\Omega$	2.0 A	4 sec.	30 sec.	3.0 A
HAA 15A	0.6 / 2.0 A DC	0.6 A	0.6 $\Omega$	0.6 A	0.5 sec.	4.5 sec.	0.90 A
	0.6 / 2.0 A DC	2.0 A	0.13 $\Omega$	2.0 A	4 sec.	30 sec.	3.0 A
HAA 15C	2.0 A AC	----	0.15 $\Omega$	2.0 A	4 sec.	30 sec.	3.0 A
HAA 15B HAA 15F HAA 15H	250 V DC	----	11200 $\Omega$ **	200 V	----	----	250 V
	125 V DC	----	5600 $\Omega$	100 V	----	----	125 V
	48 V DC	----	840 $\Omega$	38.4 V	----	----	48 V
HAA 15B	24 V DC	----	200 $\Omega$	19.2 V	----	----	24 V
HAA 15D HAA 15G	230 V AC	----	6600 $\Omega$	185 V	----	----	230 V
	120 V AC	----	1650 $\Omega$	96 V	----	----	120 V

\*\* Includes series resistor of 5600  $\Omega$

## CONSTRUCTION

The HAA relays covered by this instruction book consist of one target unit mounted in a small molded plastic case with a glass window (see Figures 1 and 2). The target unit is a small hinged armature type relay with a “U” shaped magnet frame, a fixed pole piece, an armature, which operates the normally open contacts and the target, and an operation coil.

These relays have two normally open contacts, electrically separate from the coil circuit. The contacts of relay HAA15H are also electrically separate. When the coil is energized with rated current or voltage, the contacts will close and the target flag will be latched into position where it is visible from the front of the relay. An external manual reset button is provided on the relay case cover.

Relays with dual rated current coils are connected for the higher ampere rating when shipped as indicated in Figure 3. Interchange the green and black leads for the lower ampere rating connection.

The HAA15A, HAA15B, HAA15C, HAA15D, and HAA15H relays are back connected and can be either projection mounted (Figure 8) or semi-flush mounted (Figure 9).

The HAA15E, HAA15F, and HAA15G relays are front connected (surface mounted as shown in Figure 10).

The table below shows the type of operation, current or voltage, AC and DC, and references the internal connection diagrams for the HAA relays covered by this instruction book

**Table 2: HAA RELAY OPERATION**

MODEL	CURRENT / VOLTAGE	AC / DC	INTERNAL CONNECTIONS
HAA 15A	CURRENT	DC	Figure 3
HAA 15B	VOLTAGE	DC	Figure 4
HAA 15C	CURRENT **	AC	Figure 5
HAA 15D	VOLTAGE	AC	Figure 6
HAA 15E	CURRENT	DC	Figure 3
HAA 15F	VOLTAGE	DC	Figure 4
HAA 15G	VOLTAGE	AC	Figure 6
HAA 15H	VOLTAGE	DC	Figure 7

\*\* Single rated current coil

### 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 Power Management Office.

Reasonable care should be exercised in unpacking the relay in order that none of the parts are injured or the adjustments disturbed. Also check the nameplate stamping to ensure that the model number and rating of the relay received agree with the requisition.

Manually check the operation of each unit and that the contact gap is at least 3/32 inch and the wipe is 1/32 inch. Both contacts should close at approximately the same time.

### ACCEPTANCE TESTS

#### PRELIMINARY CHECK

1. Check wiring using applicable internal connections diagram. Check continuity of contact circuits with the armature picked up.
2. Manually check the operation of each unit and that the contact gaps are at least 3/32 inch. Both contacts should close at approximately the same time.
3. With the armature against the pole piece, the upper and lower contact buttons should be reasonably parallel.
4. In the de-energized position, the "T" spring (moving contacts of HAA15H) should rest on the turned-in prongs of the front molded block. The cross member of the "T" spring (moving contacts of HAA15H) should overlap the prongs by at least 1/32 inch so that the armature can never drop down.
5. With the armature against the pole piece, the cross member of the "T" spring (moving contact of HAA15H) should lie in a horizontal plane and there should be at least 0.017 inch wipe on the contacts. To check this wipe, raise the armature by hand until the contacts just make. There should be approximately 1/64-inch air gap between the armature and freeze pin of the pole piece; also, hold armature flush against the pole piece by hand and raise the orange target with a sharp tool such as a knife. It should be possible to raise this target at least 1/64 inch.
6. Check reset of the target.

## ELECTRICAL TESTS

### *General Power Requirements*

All alternating current operated devices are affected by frequency. Since non-sinusoidal waveforms can be analyzed as a fundamental frequency plus harmonics of the fundamental frequency, it follows that alternating current devices (relays) will be affected by the applied waveform.

Therefore, to properly test alternating current relays it is essential to use a sinewave of current and/or voltage. The purity of the sinewave (i.e. its freedom from harmonics) cannot be expressed as a finite number for any particular relay, however, any relay using tuned circuits (R-L or R-C networks) or saturating electromagnets (such as time overcurrent relays) would be essentially affected by non-sinusoidal waveforms.

Similarly, relays requiring DC control power should be tested using DC and not full-wave rectified power. Unless the rectified power supply is well filtered, many relays will not operate properly due to dips in the rectified power. Zener diodes, for example, can turn off during these dips. As a general rule the DC source should not contain more than 5% ripple.

### *Target Units*

1. Check pickup using a variable power source. Check pickup of both taps of dual rated current units. The higher tap rating is the green lead and the lower tap is the black lead. The unused taps should be terminated on the dummy terminal. The armature should pick up with a snap action and seal against the pole piece.

The pickup limits for DC current operated relays are:

RATING	PICKUP AMPS
0.2	0.16 to 0.20 A
0.6	0.48 to 0.60 A
2.0	1.6 to 2.0 A

The pickup limits for AC operated relays are 70 to 80% of the rated value. The pickup limits for DC voltage operated relays are 60% of rated voltage or less.

2. Check that the dropout of DC current operated seal-in units is 25% of tap value or higher. This is to ensure the relay will not remain picked up due to low-level DC current through a sneak circuit.
3. To check latching-in of targets, energize the seal-in units of DC current operated relays at approximately 95% of rating; apply approximately 85% of rated value to voltage and AC current operated relays.
4. De-energize the seal-in unit and tap the top of the unit several times to ensure that the target will not drop on vibration.

## INSTALLATION

### LOCATION AND MOUNTING

The location should be clean and dry, free from dust and excessive vibration, and well lighted to facilitate inspection and testing. The outline and panel drilling diagrams are shown in Figures 8, 9, and 10.

### INSPECTION

At the time of installation, the relay should be inspected for tarnished contacts, loose screws, or other imperfections.

### CONNECTIONS

The internal connection diagram for the various relay types are shown in Figures 3 to 7.

### DUAL RATED CURRENT UNITS

For the 0.2 to 2.0 A and 0.6 to 2.0 A dual rated current units, make sure that the tap screw is in the desired tap. The relay is shipped from the factory with the tap screw in the higher ampere position. The tap screw is the screw holding the right-hand stationary contact. To change the tap setting, first remove one screw from the *left-hand* stationary contact and place it in the desired tap. Next, remove the screw from the undesired tap and place it on the left-hand stationary contact where the first screw was removed (see Figures 1 and 2). This procedure is necessary to prevent the right-hand stationary contact from getting out of adjustment. Screws should never be in both taps at the same time.

### SERVICING

For cleaning relay contacts, a flexible burnishing tool should be used. This consists of a flexible strip of metal with an etch-roughened surface resembling a superfine file that 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 of any kind to clean fine silver contacts. A burnishing tool as described above can be obtained from GE Power Management.

### RENEWAL PARTS

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

When ordering renewal parts, address the nearest GE Power Management sales office. Specify the name of the part, quantity required, and complete nameplate data, including the serial number, of the relay. If possible, provide the GE requisition number on which the relay was furnished.

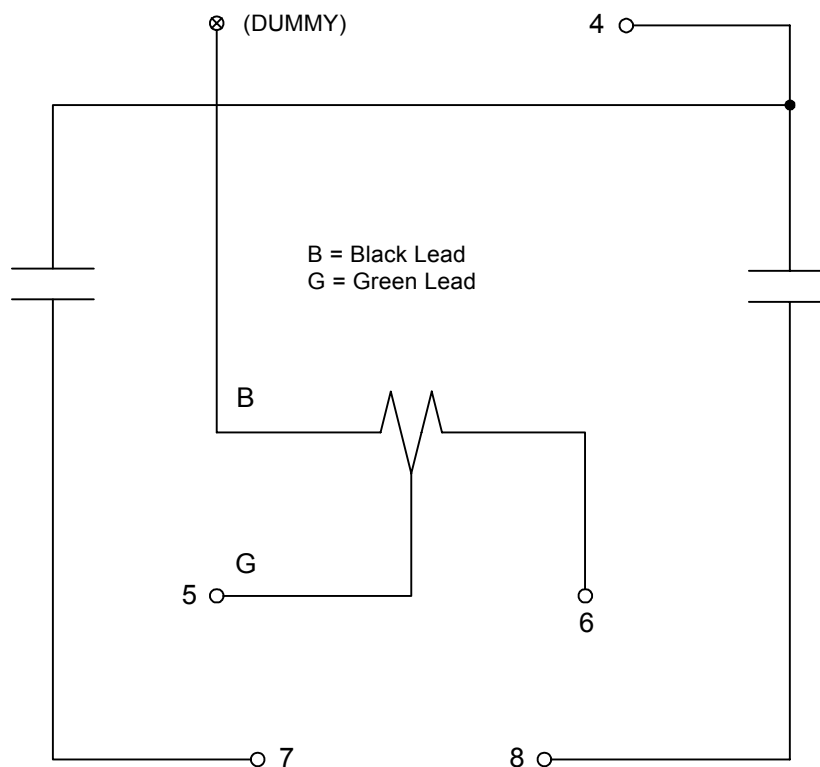


**Figure 1 (8030184): HAA15 RELAY REMOVED FROM CASE**



**Figure 2 (8912917): HAA15 RELAY IN FLUSH MOUNTED CASE**

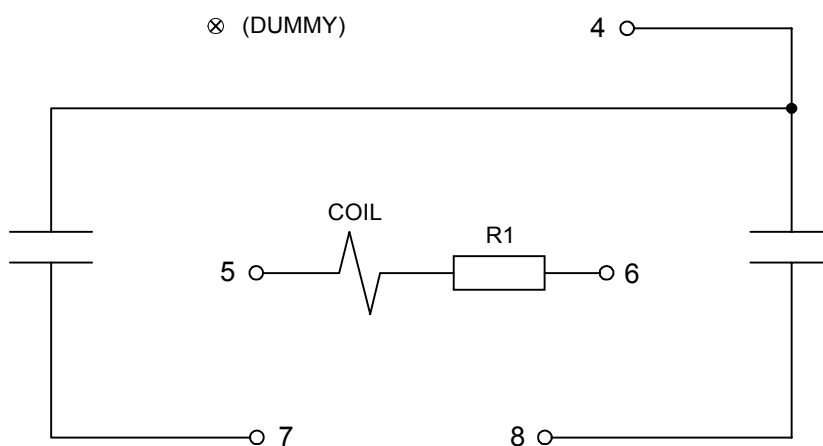




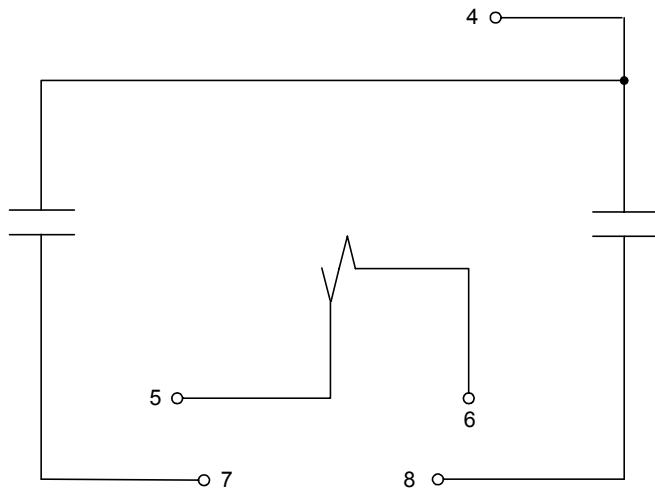
Connection shown for higher ampere rating. Interchange Green and Black leads for lower ampere rating.

**Figure 3 (0165A6061-0): INTERNAL CONNECTION DIAGRAM FOR HAA15A AND HAA15E RELAYS SHOWING CONNECTIONS FOR HIGHER AMP RATING (BACK VIEW)**

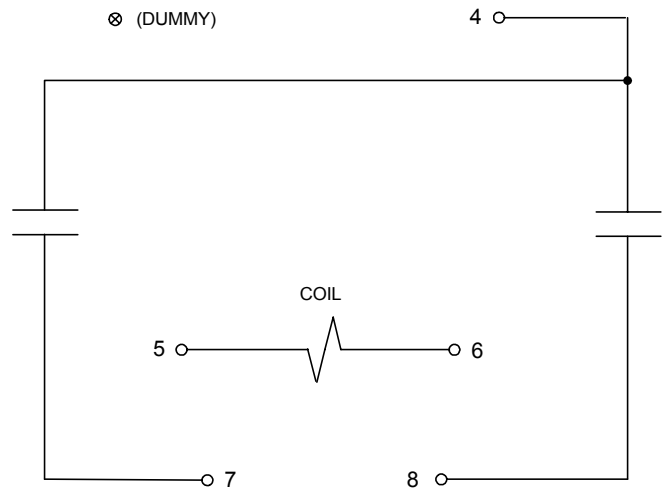
VOLTAGE	RESISTANCE	
	COIL	R1
24 V DC	200 $\Omega$	----
48 V DC	840 $\Omega$	----
110 V DC	5600 $\Omega$	----
125 V DC	5600 $\Omega$	----
250 V DC	5600 $\Omega$	5600 $\Omega$



**Figure 4 (0165A6062-2): HAA15B/15F INTERNAL CONNECTIONS AND TABLE OF RESISTANCE VALUES (BACK VIEW)**

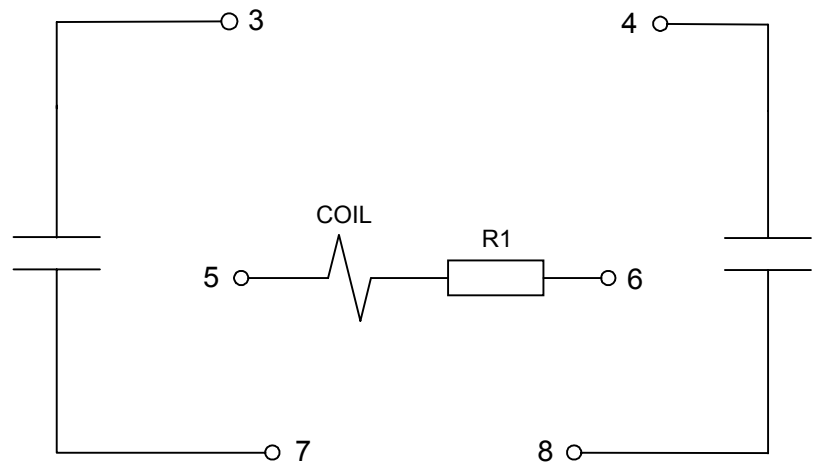


**Figure 5 (0195A9121-0): HAA15C INTERNAL CONNECTION DIAGRAM (BACK VIEW)**



**Figure 6 (0257A5083-0): HAA15D/15G INTERNAL CONNECTION DIAGRAM (BACK VIEW)**

VOLTAGE	RESISTANCE	
	COIL	R1
48 V DC	840 $\Omega$	----
125 V DC	5600 $\Omega$	----
250 V DC	5600 $\Omega$	5600 $\Omega$



**Figure 7 (0269A3026-0): HAA15H INTERNAL CONNECTION DIAGRAM AND TABLE OF RESISTANCE VALUES (BACK VIEW)**

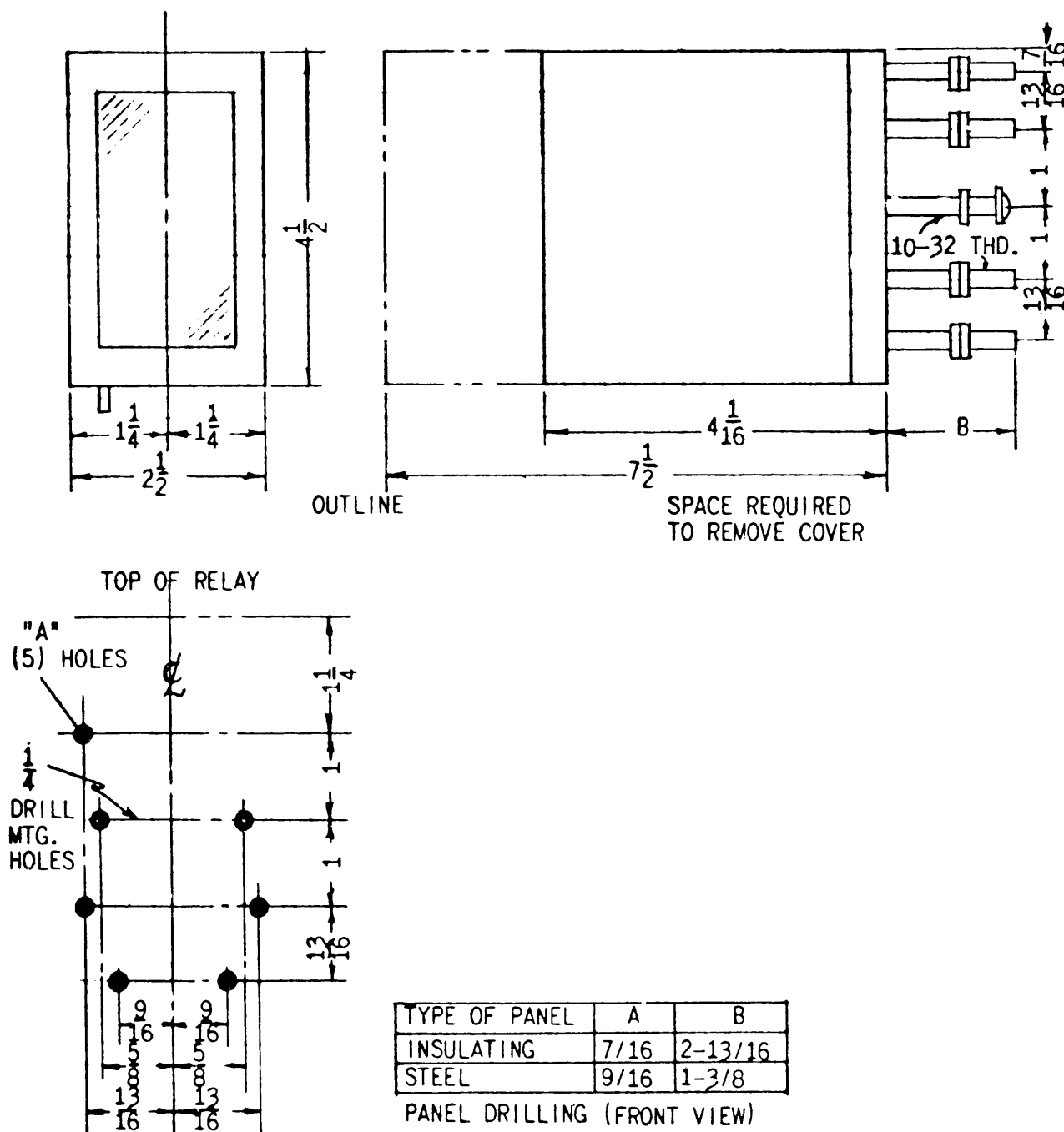


Figure 8 (0165A6003-3): HAA15A/15B/15C/15D/15H BACK CONNECTED PROJECTION MOUNTED OUTLINE AND PANEL DRILLING DIMENSIONS

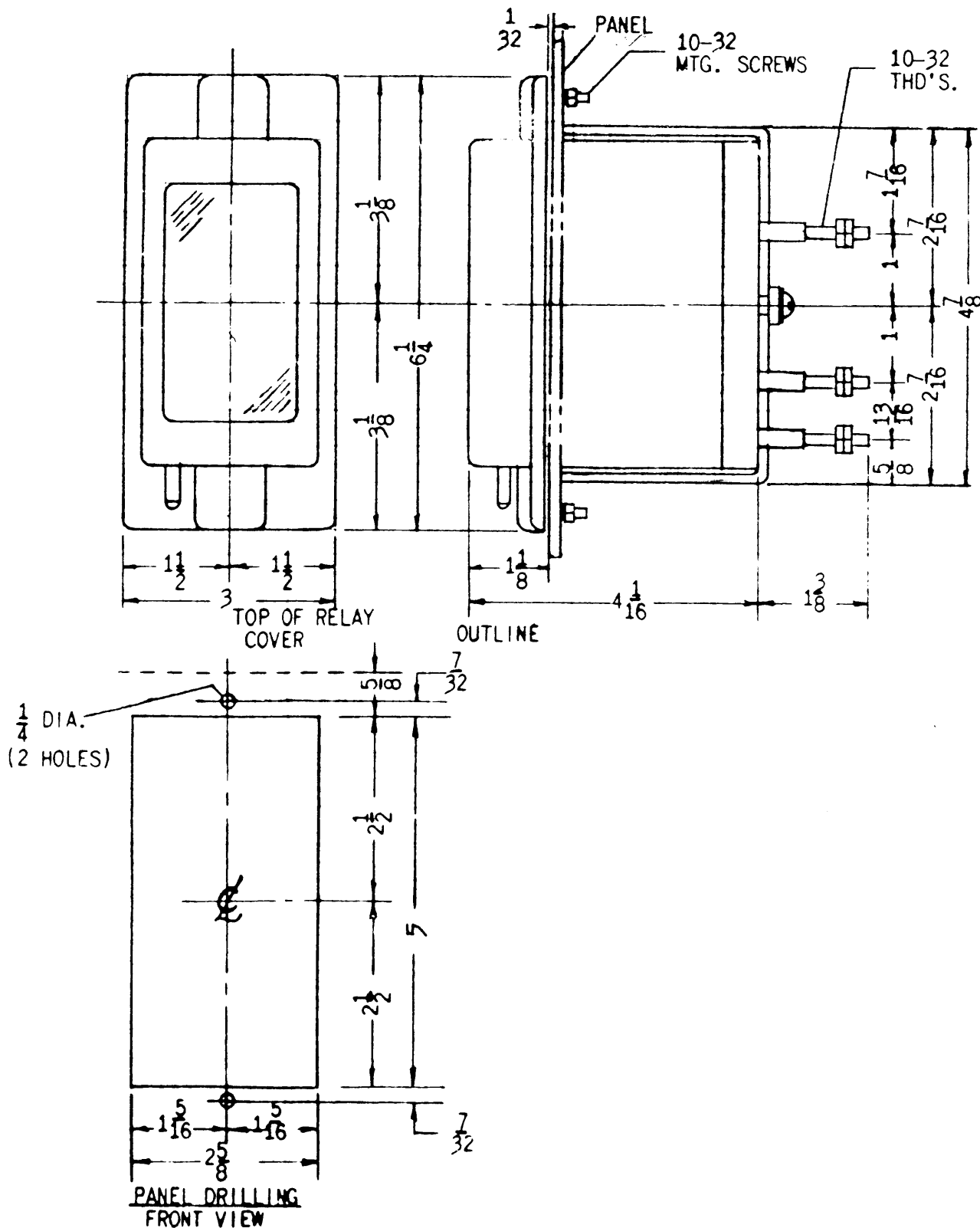
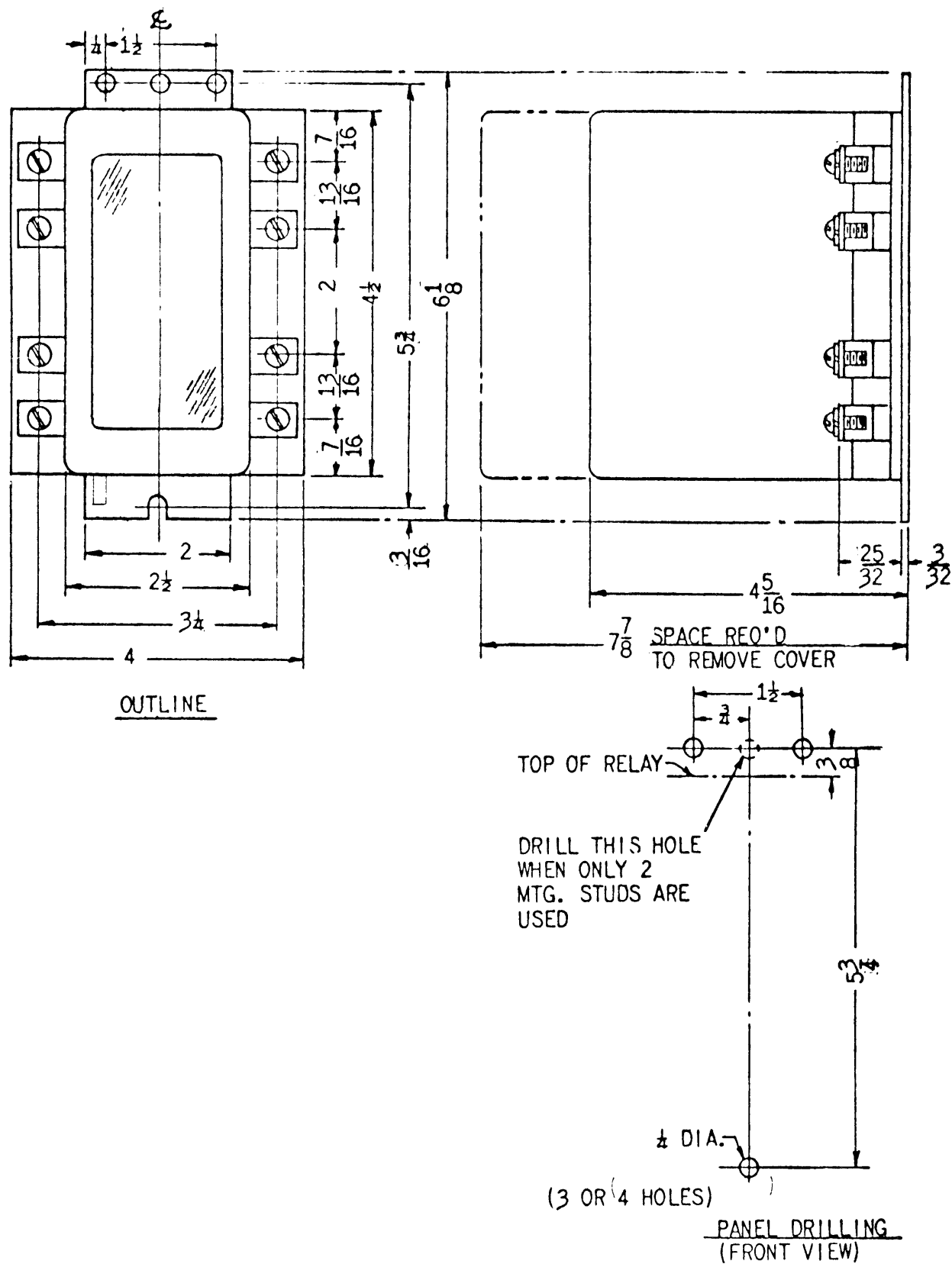


Figure 9 (0127A9555-3): HAA15A/15B/15C/15D/15H BACK CONNECTED SEMI-FLUSH MOUNTED OUTLINE AND PANEL DRILLING DIMENSIONS



**Figure 10 (0208A3773-0): HAA15E/15F/15G FRONT CONNECTED SURFACE MOUNTED OUTLINE AND PANEL DRILLING DIMENSIONS**



The latest product information for the HAA Auxiliary Relay series is available on the Internet via the GE Power Management website:

<http://www.GEindustrial.com/pm>



This site provides access to the following customer services:

- Complete Products Directory  
*Product descriptions may be viewed online*
- Product Catalog  
*Product brochures can be downloaded and printed*
- Product Selector Guide  
*A graphical tool for finding the product you require*
- Sales Offices  
*A complete listing of world-wide sales offices*
- Technical Support  
*Complete contact information is available*
- Instruction Manuals  
*Manuals for most products are available online*
- GE Product Software  
*The latest working versions of product software*
- Technical Drawings  
*Many technical drawings are available in either AutoCAD, CorelDRAW, or PDF formats.*
- Order Codes  
*Order codes for many products can be downloaded and printed*
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