



INSTRUCTIONS

GEK- 41962

TRANSFERRED TRIP AUXILIARY RELAY

TYPE NAA

MODEL 12NAA27AD(-)A

POWER SYSTEMS MANAGEMENT DEPARTMENT

GENERAL  ELECTRIC

PHILADELPHIA, PA.

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TRANSFERRED TRIP AUXILIARY RELAYTYPE NAAMODEL 12NAA27AD(-)ADESCRIPTION

The type NAA27AD relay is a special purpose auxiliary relay designed for use in conjunction with line relays and other auxiliary devices in permissive underreaching transferred trip schemes. Included in the relay are two telephone type auxiliary relays designated BX and RI plus a target unit T.

The NAA27AD relay is mounted in an M2 size case, the outline and panel drilling dimensions for which are given in Figure 2. Internal connections for the relay are shown in Figure 1.

APPLICATION

The type NAA27AD relay is designed specifically for application in permissive underreaching transferred trip schemes utilizing tone type equipments.

The auxiliary units included in the NAA27AD are used to perform the following functions.

RI UNIT

The RI unit is energized by all high-speed trip circuits, including the received transferred trip signal, and initiates high-speed reclosing. It has a pickup time of approximately one cycle and a dropout time of 7 - 10 cycles.

BX UNIT

The BX unit is operated by a "b" switch on the associated circuit breaker. Its purpose is to key the transmitter to send a continuous trip signal to the remote terminal when the local breaker is open. This permits high-speed tripping of the remote breaker should it be closed onto an internal fault beyond the reach of the first-zone protection. The BX unit has a time delay pickup of approximately 70 milliseconds. This is to allow time for the overreaching relays at the remote terminal to reset before BX sends a trip signal in the event that the local breaker is tripped by bus differential relaying.

RATINGS

The Type NAA relays covered by these instructions are suitable for continuous operation at the rated DC voltage shown on the nameplate and are available for 48, 125, and 250 volt applications. The resistance values of the telephone type relays and associated resistors are listed on the internal connection diagram (Figure 1).

The target unit in the NAA27AC relay is rated as shown in Table I.

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.

TABLE I
RATINGS OF TARGET UNIT

FUNCTION	2 AMP TAP	0.6 AMP TAP
Operating Range	2-30	0.6-2
Carry for Tripping Duty	30	6
Carry Continuously	4	0.8
Resistance	0.3	0.6

If the tripping current should exceed thirty (30) amperes, it is recommended that an auxiliary tripping relay be used.

Tripping diodes D1, D2, D3, D6 will withstand a maximum of 600 volts in the reverse direction. They will carry 30 amperes for tripping duty or 10 amperes continuously. Diodes D5 and D7 are also rated 600 volts in the reverse direction and will carry 1 ampere in the forward direction.

The contacts of RI and BX will make and carry 30 amperes for tripping duty at voltages less than 250. They will carry 3 amperes continuously. The interrupting rating of these contacts is given in Table II below:

TABLE II
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 inductance of an average trip coil.

RECEIVING

These relays, when not included as a 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 damage resulting from rough handling is evident, a claim should be filed at once with the transportation company and the nearest Sales Office of the General Electric Company notified promptly.

Reasonable care should be exercised in unpacking the relay in order that none of the parts are 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.

INSPECTION

The relay should be inspected at the time of installation and the following points checked:

1. Contacts should not be tarnished.
2. The normally open contacts of both telephone relays should have a gap of 0.015 inch.
3. The normally closed contacts should have a 0.005 inch wipe.
4. When the telephone relays are operated by hand, the open contacts should have a 0.015 inch gap and the closed contacts should have a 0.005 inch wipe.

ACCEPTANCE TESTSRI UNIT

The RI unit should pick up at 70% or less of rated voltage. Pick up time should be less than 16 milliseconds and drop out time from 115 to 167 milliseconds.

BX UNIT

The BX unit should pick up at 80% or less of rated voltage. Pick up time at rated voltage should be 70 to 80 milliseconds.

Note that in many instances polarity marks are shown in the internal connection diagram. These polarities should be observed when making tests.

ELECTRICAL TESTSDRAWOUT RELAYS GENERAL

Since all drawout relays in service operate in their case, it is recommended that they be tested in their case or an equivalent steel case. In this way any magnetic effects of the enclosure will be accurately duplicated during testing. A relay may be tested without removing it from the panel by using a 12XLA13A test plug. This plug makes connections only with the relay and does not disturb any shorting bars in the case. Of course, the 12XLA12A test plug may also be used. Although this test plug allows greater testing flexibility, it also requires C.T. shorting jumpers and the exercise of greater care since connections are made to both the relay and the external circuitry.

POWER REQUIREMENTS GENERAL

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, in order to properly test alternating current relays it is essential to use a sine wave of current and/or voltage. The purity of the sine wave (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 RC 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 a well filtered supply or batteries. Unless the rectified supply is well filtered, many relays will not operate properly due to ripple. As a general rule the dc source should not contain more than 5% ripple.

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 INSTALLATION PROCEDURE be checked at an interval of from one to two years.

CONTACT CLEANING

For cleaning relay 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 it will clean off any corrosion thoroughly and rapidly. Its flexibility insures the cleaning of the actual points of contact. Do not use knives, files, abrasive paper or cloth of any kind to clean relay contacts.

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 relays should be mounted on a vertical surface. The outline and panel drilling diagrams are shown in Figure 2.

Unless mounted on a steel panel which adequately grounds the relay case, it is recommended that the case be grounded through a mounting stud or screw with a conductor not less than #12 B & S gauge copper wire or its equivalent.

SERVICINGPICKUP

If it is found that the pickup of any of the telephone type units is too high it may be restored by changing the spacing between the armature and pole face by bending the contact operating arm. After this adjustment all contacts must be readjusted to have a 0.005 inch wipe and a gap of 0.015 inch. Refer to Figure 3 for identification of telephone type unit parts.

PICK-UP TIME

In order to decrease the pick up time of any of the telephone type units reduce the pressure of the normally closed contacts by bending the flexible movable contact arm slightly. Pick up time may be increased by reversing this procedure.

DROP OUT TIME

The drop out time of any of the telephone type units may be adjusted by means of the residual screw in the armature. The more the residual screw is turned in the shorter the drop out time. Be sure to tighten the locknut after adjusting the residual screw.

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 the complete model number of the relay for which the part is required.

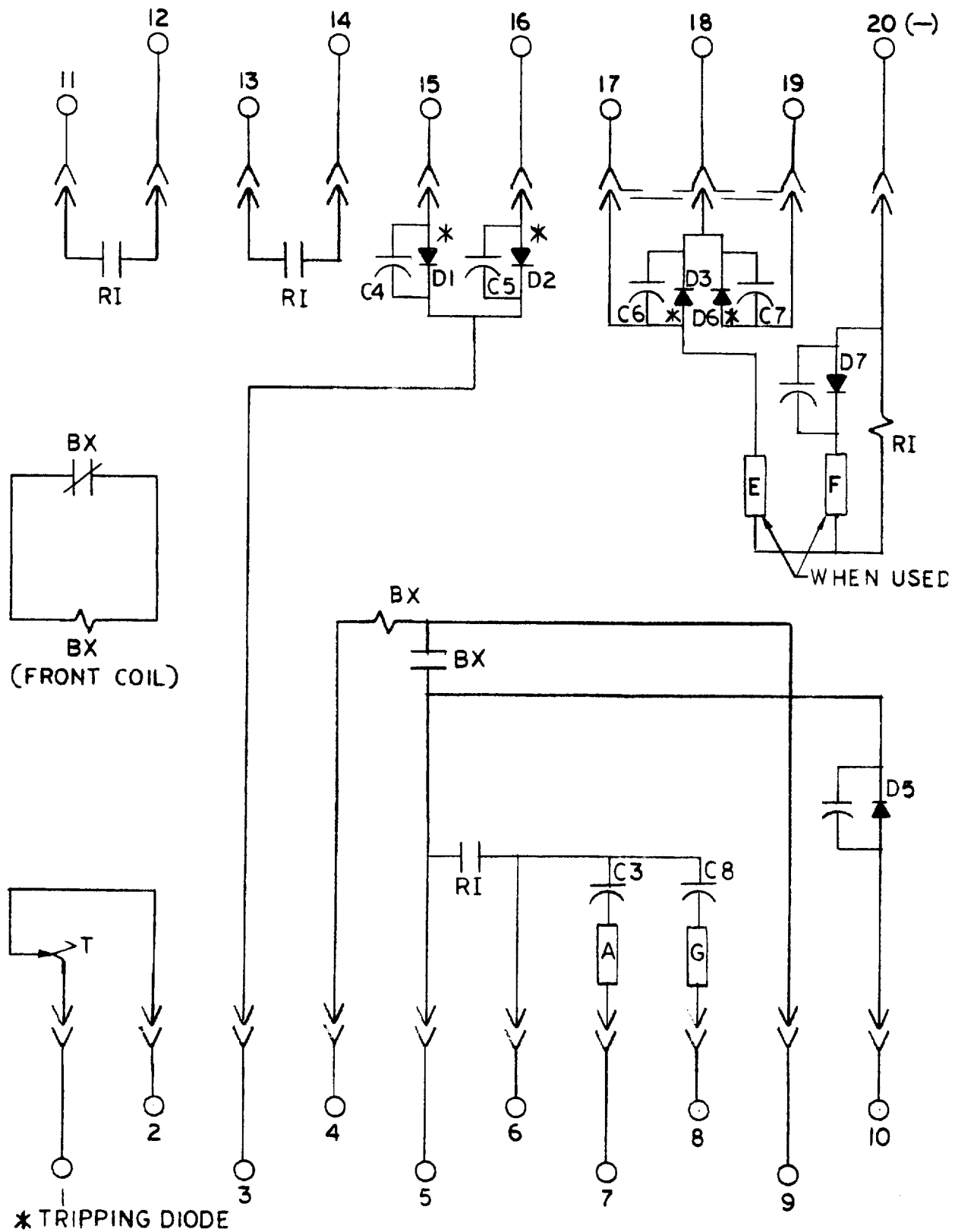


FIG. 1 (0246A6992-1 SH. 1) Internal Connections For The NAA27AD1A

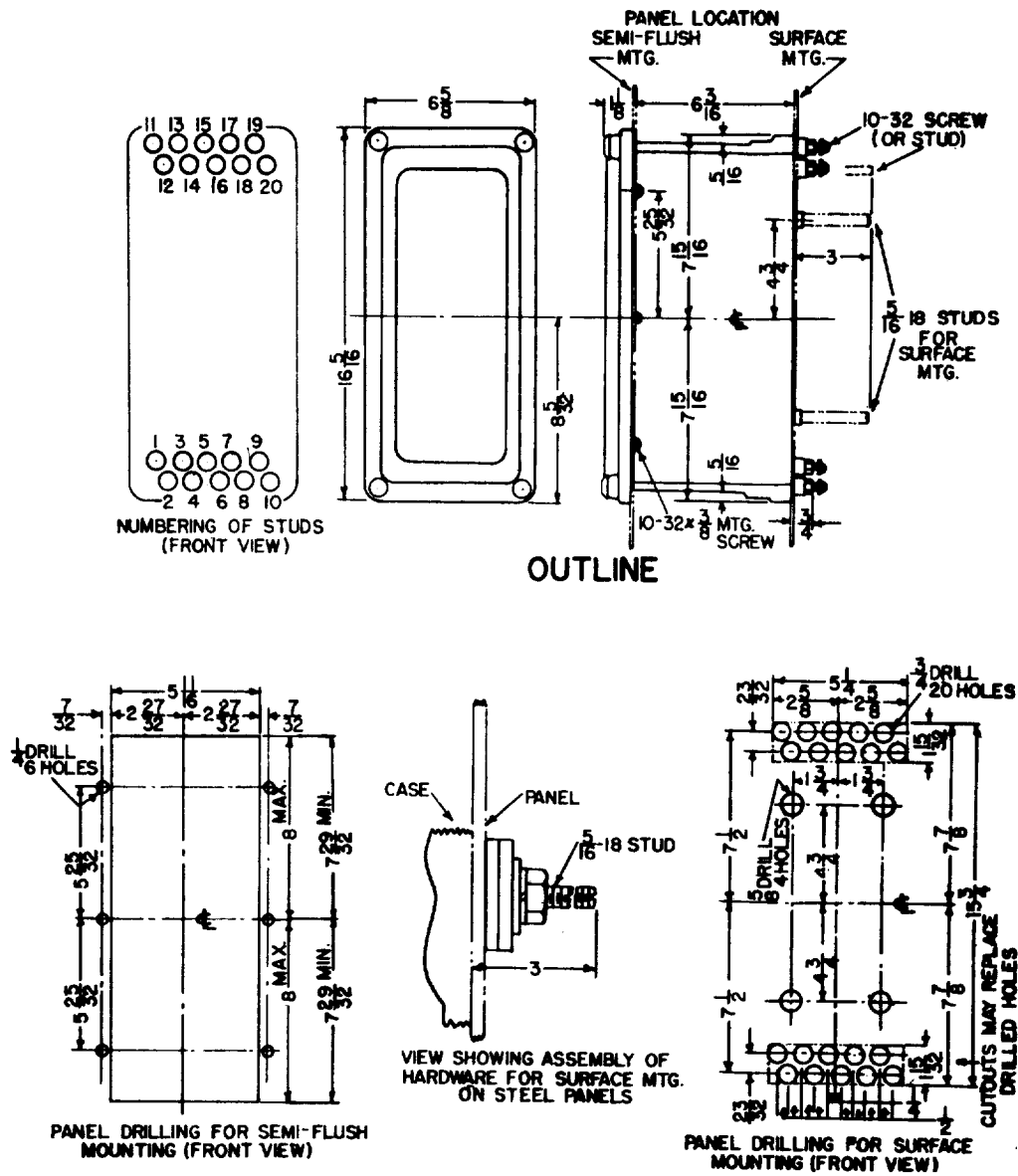


FIG. 2 (K-6209274-2) Outline And Panel Drilling Dimensions For An M2 Size Case

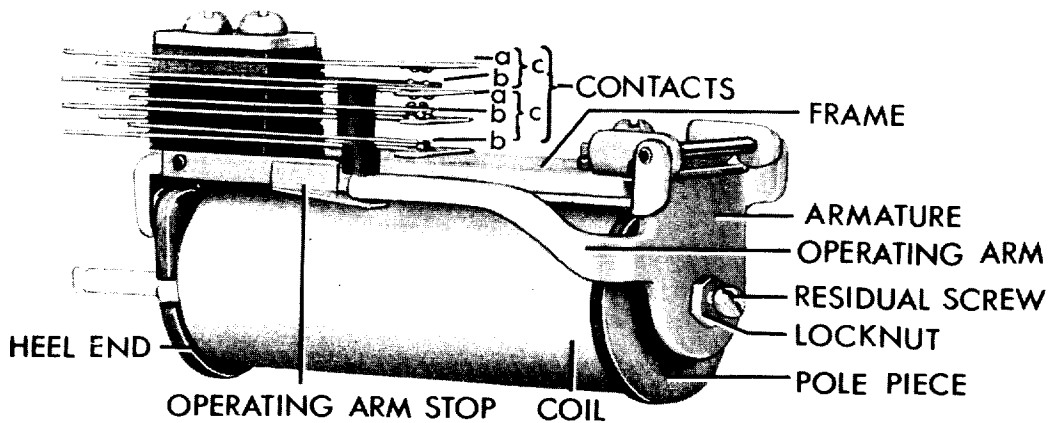


FIG. 3 (8012106-) Typical Telephone Relay Unit Used In NAA Relays