



## INSTRUCTIONS

GEK-28013

### STATIC AUXILIARY TIMING RELAY AND POWER SUPPLY

#### TYPE SAM

#### MODEL 0178A7343

#### DESCRIPTION

This relay consists of a static timer with its associated output unit and a three phase A.C. power supply. One normally open contact of the timer is brought out to terminals 4 and 5. The components are mounted in a non drawout case of dimensions shown in Figure 2.

#### APPLICATION

The 0178A7343 SAM relay was specifically designed for use with an NBV11A relay in a scheme to protect three phase motors from the damage which may be caused by single phase operation. Refer to GEI-50261 for a description of the NBV11A.

Figure H shows a typical load-center unit substation with fused primary, main secondary breaker, device 52, and a number of motor circuits in which power circuit breakers are used as starters or as motor feeders. The NBV11A relay shown in the dashed rectangle is a high-speed, sensitive, three-phase voltage unbalance relay. Since the NBV11A relay is instantaneous in action, it is necessary to interpose a time delay between the closing of the TR contacts and the tripping of breaker 52 to prevent unnecessary tripping during system disturbances. It is also necessary to have available sufficient power to operate the time delay relay and to trip the breaker under severely unbalanced voltage conditions, with perhaps only single-phase available.

The 0178A7343 SAM relay meets both these requirements. Even with only one phase voltage present, the output is sufficient to operate the timer and trip the breaker. The output of the 0178A7343 SAM relay is capable of tripping one magneblast breaker or two AK breakers.

#### RATINGS

The A.C. input will withstand rated volts continuously. The timing unit output relay contacts will make and carry 30 amperes for tripping duty at voltages less than 250. The contacts will carry three amperes continuously and have an interrupting rating as given in Table A.

TABLE A

#### 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 tripping coil.

CHARACTERISTICS

With rated voltage applied to terminals 1, 2, and 3 the timer output relay will pick-up at a fixed time interval after terminals 6 and 7 are connected together (terminal 7 must be connected to terminal 10). The internal connections are shown in Figure 1.

The time delay is fixed at either 4 or 30 seconds depending on the model number. This time may vary plus or minus ten percent.

The power supply in 178A7343 is also suitable for tripping certain circuit breakers under the proper conditions (see Application). The power supply is capable of operating the timer and tripping a circuit breaker even with only one phase of the A.C. input applied.

Resistor R2 is supplied for operation of an ET-16 indicating light of specified voltage.

RECEIVING, HANDLING AND STORAGE

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 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 Apparatus Sales Office.

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. 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.

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 wave forms.

Similarly, relays requiring dc control power should be tested using dc and not full wave rectified power. Unless the rectified supply is well filtered, many relays will not operate properly due to the 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.

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.

*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.*

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.

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.

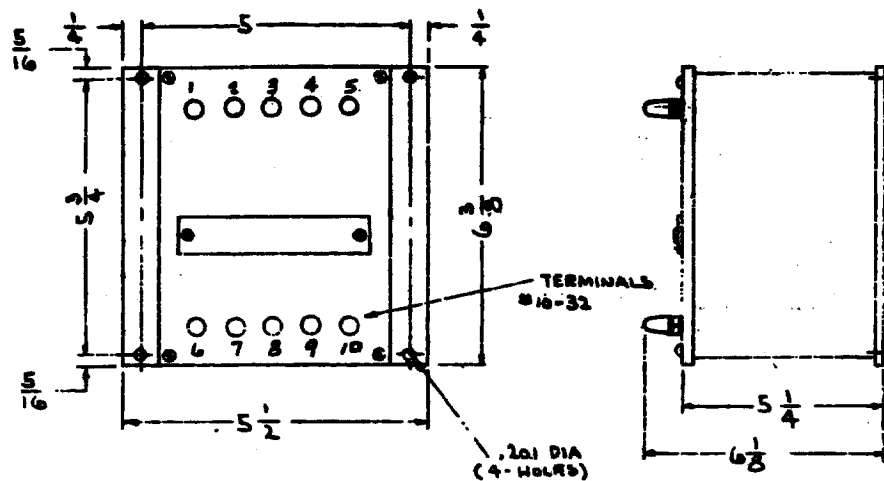
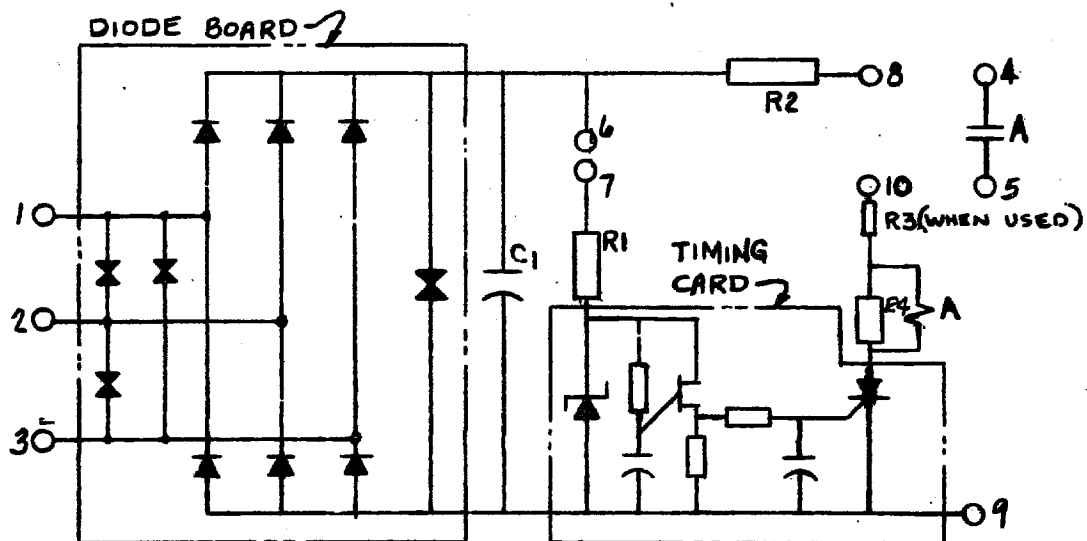
OUTLINEINTERNAL CONNECTIONS

FIG. 1 (0178A9089-3) Outline And Internal Connections For 0178A734C SAM Relay

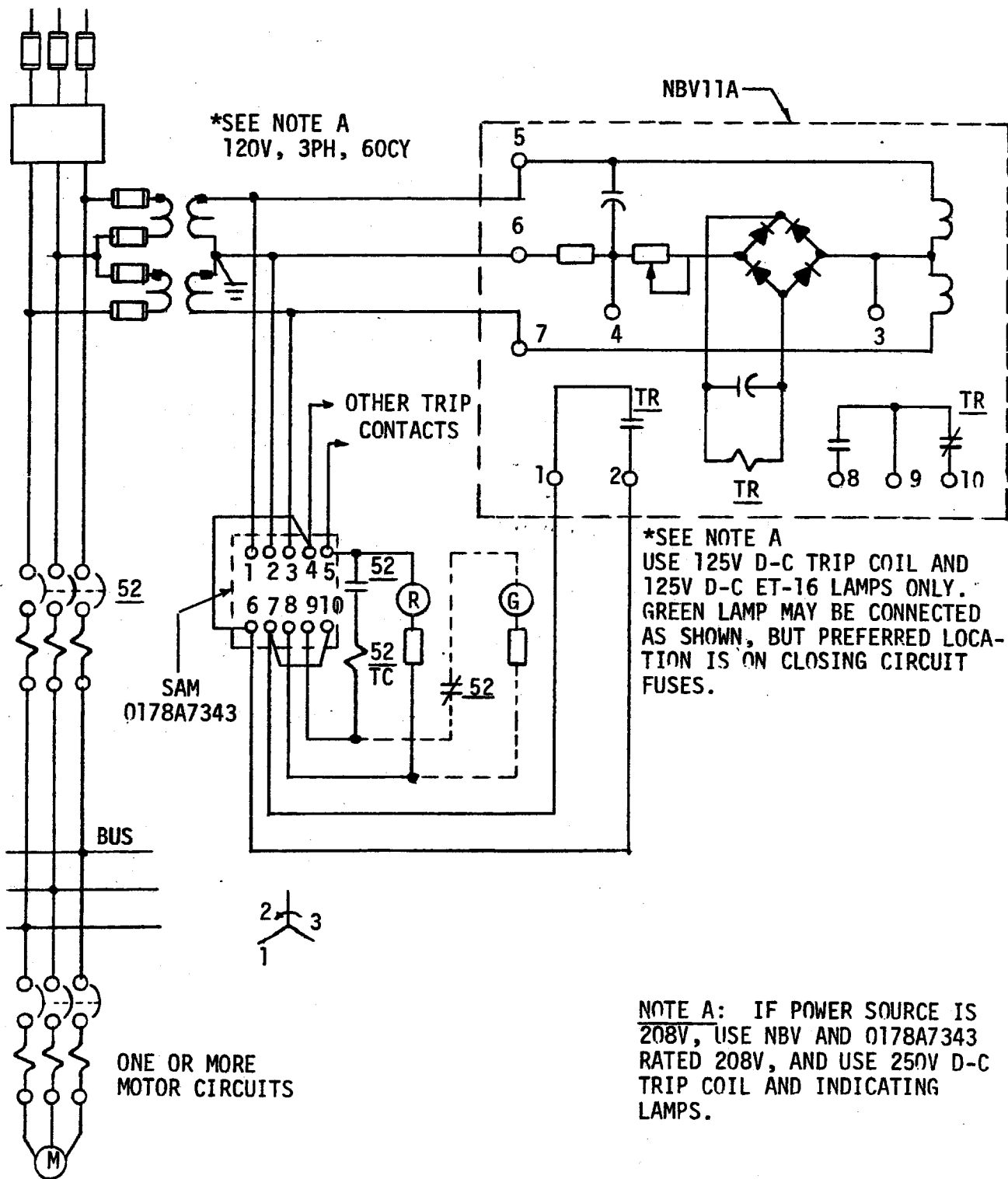


FIG. 2 (0246A6817-0) External Connection Diagram For 0178A7343 SAM Relay