



INSTRUCTIONS

GEK-7399B
Supersedes GEK-7399A

DC OPERATED TIMING RELAY
TYPE SAM15A, FORMS 21 AND UP

GENERAL  ELECTRIC

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DC OPERATED TIMING RELAY

TYPE SAM15A

INTRODUCTION

The SAM15A is a DC-operated timing relay that employs solid-state components to provide an extremely stable time delay function. The relay employs a low energy resistance-capacitance timing circuit that is regulated to make the timing independent of variations in supply voltage. The output of this timing circuit is amplified by solid-state circuitry to provide sufficient energy to operate a small telephone type relay with two electrically separate transfer contacts. The SAM15A has an adjustable time delay in the range of 0.05 to 1.0 second, and it is packaged in a small molded case, without targets or built-in test facilities. See Fig. 2 for internal connections.

APPLICATION

The SAM15A relay is applied wherever a short DC-operated timing function is required. Its negligible overtravel and reset times, plus its repeatability characteristics, regardless of supply voltage variations, make it particularly well suited for applications where consistent operating times are essential under all conditions. Fig. 1 illustrates typical external connections for the SAM15A relay.

RATINGS

The SAM15A relays are available with ratings of 48, 125 or 250 volts DC. The relay contacts will close and carry 30 amperes DC momentarily at control voltages of 250 volts or less. These contacts will carry three amperes continuously, and have an interrupting rating as given in Table A.

TABLE A

VOLTS	CURRENT-INDUCTIVE*	CURRENT NON-INDUCTIVE
48 volts DC	1.0	3.0
125 volts DC	0.5	1.5
250 volts DC	0.25	0.75
115 volts, 60 cycles	0.75	2.0
230 volts, 60 cycles	0.5	1.0

*Induction of average trip coil

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.

CHARACTERISTICS

The SAM15A relay measures the time it takes to charge a capacitor through an adjustable resistor after the initiating contact closes. Zener regulators keep the voltage across the resistor-capacitor combination constant to produce a charging time that varies directly with the resistance in the charging circuit. When the capacitor charge reaches a certain voltage level, it triggers a control rectifier, by means of a unijunction, and this picks up a telephone type unit to terminate the timing period.

Fig. 3 shows the time variation when the control voltage changes from 64 to 120 percent of normal.

Fig. 4 shows the changes in relay time produced by changing the ambient temperature from minus 40°C to plus 60°C.

The relay contains a discharge rectifier which provides a low resistance discharge path for the capacitor charge the instant that the initiating contact opens the timing circuit. This permits the SAM15A relay to be completely reset as soon as the telephone type unit drops out. The maximum reset time is 16 milliseconds.

Under identical conditions, the relay will repeat its operation as accurately as the relay can be set, or within one percent of its original setting. An electronic timer must be used in making the SAM15A relay settings.

The SAM15A relay has practically no overtravel.

BURDENS

The relay watts at rated voltage are given in Table B.

TABLE B

VOLTS	MAXIMUM RELAY WATTS
48	2.5
125	7.5
250	14.0

CONSTRUCTION

The relay case is suitable for either semi-flush or surface mounting on all panels up to two inches thick, and appropriate hardware is available. However, panel thickness must be indicated on the relay order to insure that proper hardware will be included. For outline and drilling dimensions, see Fig. 5 and 6.

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 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.

ADJUSTMENTS AND INSPECTION

MECHANICAL CHECK

Before installation, the relay should be checked mechanically to see that it operates smoothly and that the contacts are correctly adjusted.

With the relay de-energized, each normally open contact should have a gap of 0.010-inch to 0.015-inch. Observe the wipe on each normally closed contact by deflecting the stationary contact member towards the frame. Wipe should be approximately 0.005-inch.

The wipe on each normally open contact should be approximately 0.005-inch. This can be checked by inserting a 0.005-inch shim between the residual screw and the pole piece and operating the armature by hand. The normally open contacts should make before the residual screw strikes the shim.

ELECTRICAL TEST

The relay should be tested before installation and periodically thereafter by connecting a variable source of DC voltage to the coil studs and checking the pickup voltage. The relay should be adjusted by means of the variable resistors to the time delay required at its final location. An electronic timer should be used in making this setting.

SERVICING

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 which removes corroded material quickly without scratching the surface. The flexibility of the tool insures cleaning the actual points of contact. Never use knives, files, or abrasive paper or cloth to clean relay contacts.

The burnishing tool described above can be obtained from the factory.

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 give complete nameplate data, including the serial number. If possible give the General Electric Company requisition number on which the relay was furnished.

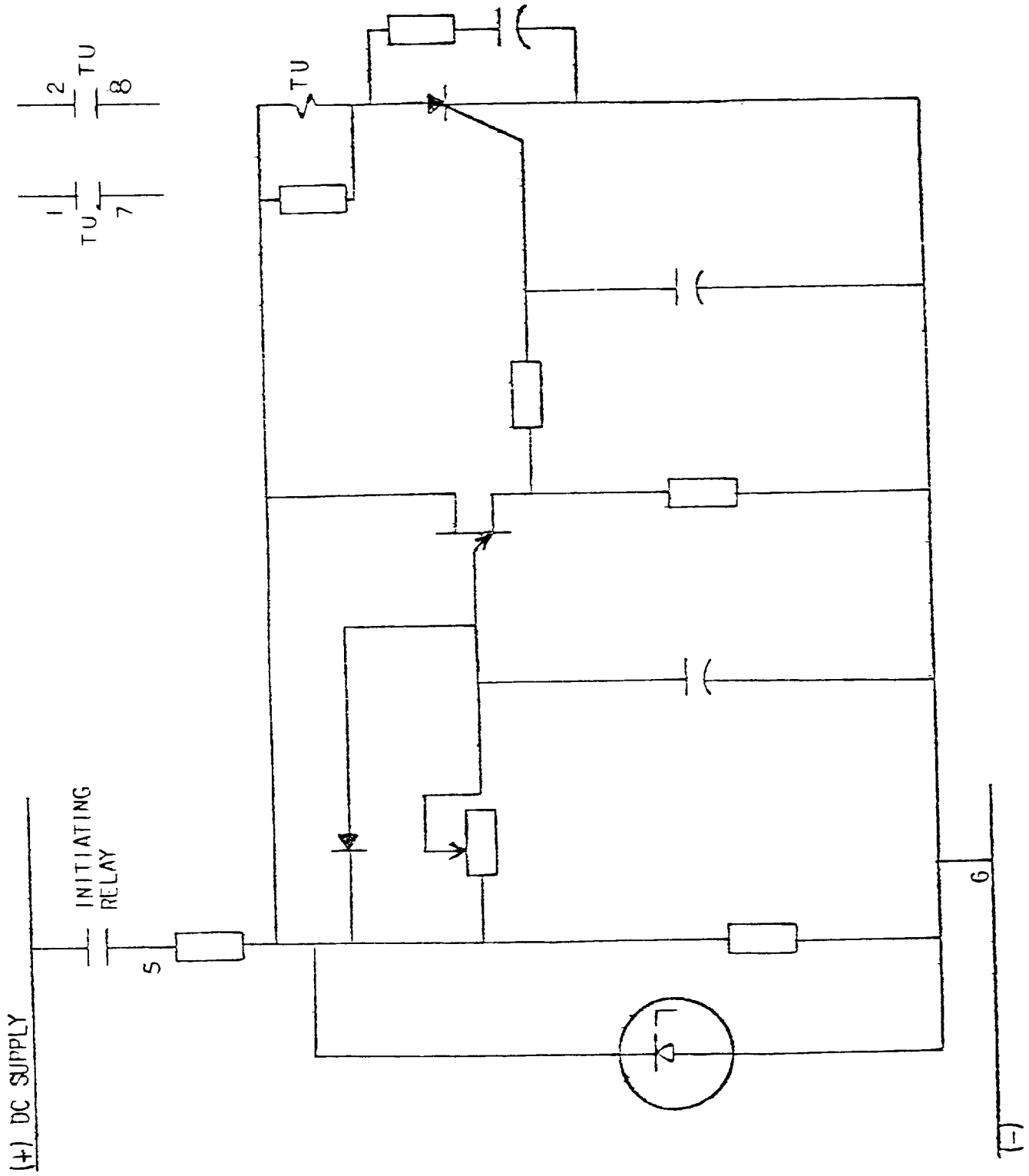


Fig. 1 (0285A6268-0) External Connections for Type SAM15A Relay, Forms 21 and up

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*Indicates Revision

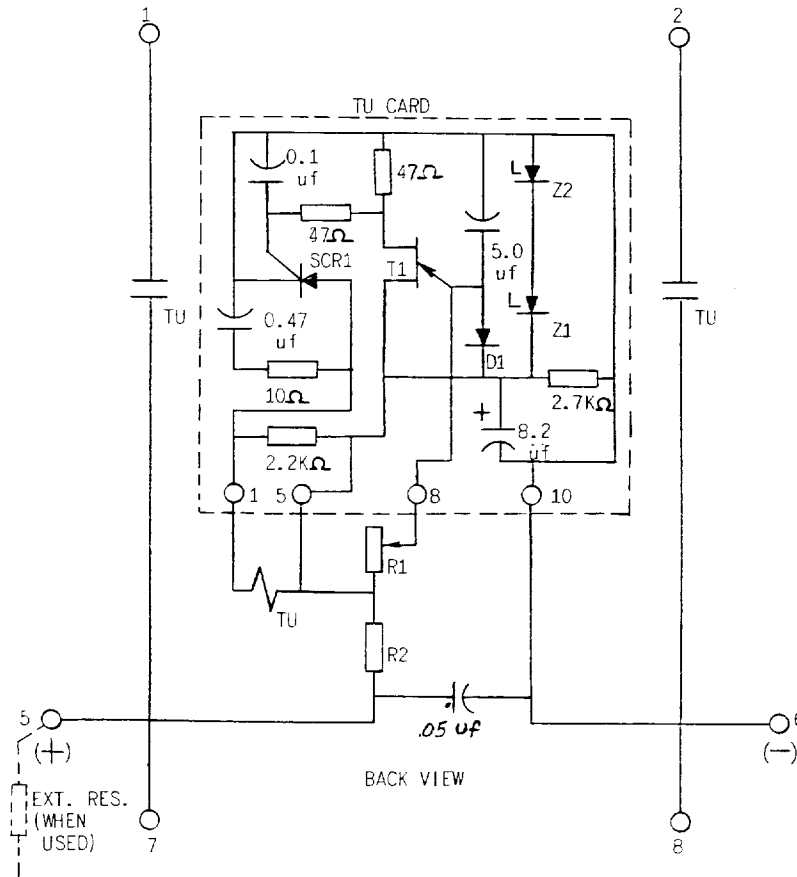


Fig. 2A (0208A2428-0) Internal Connections for Type SAM15A Relay, Forms 21 and up

MODEL	FORM					
12SAM15A(-)A	21	22	23	24	25	26
VOLTS D.C.	125	125	250	250	48	48
RESISTANCE IN OHMS						
TU COIL	650	650	650	650	650	650
R1	1.5 MEG	0.75 MEG	1.5 MEG	0.75 MEG	1.5 MEG	0.75 MEG
R2	500	500	500	500	500	500
EXT. RES.	1200	1200	4000	4000	NONE	NONE

Fig. 2B (0208A2428-0) Internal Connections for Type SAM Relay

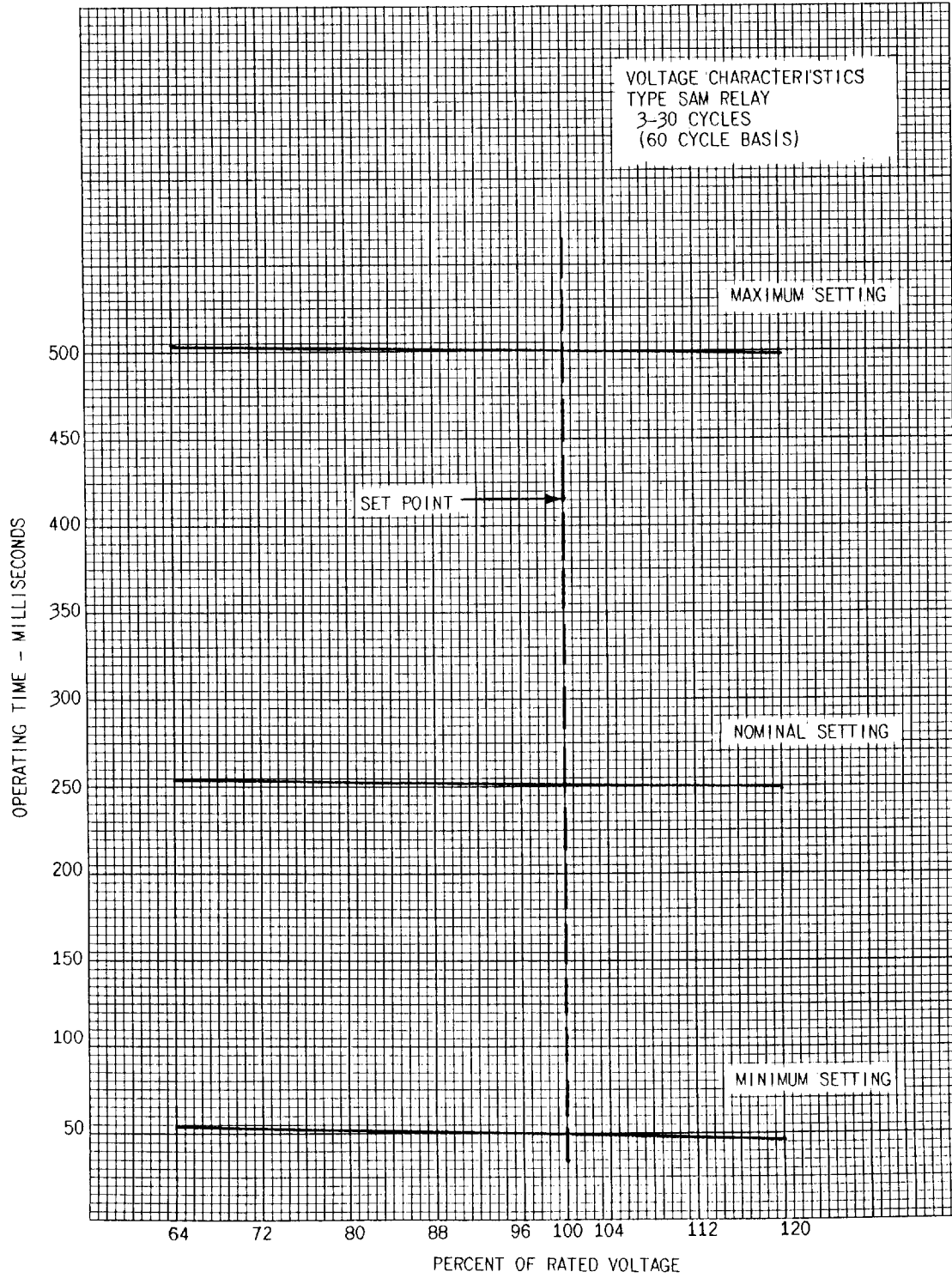
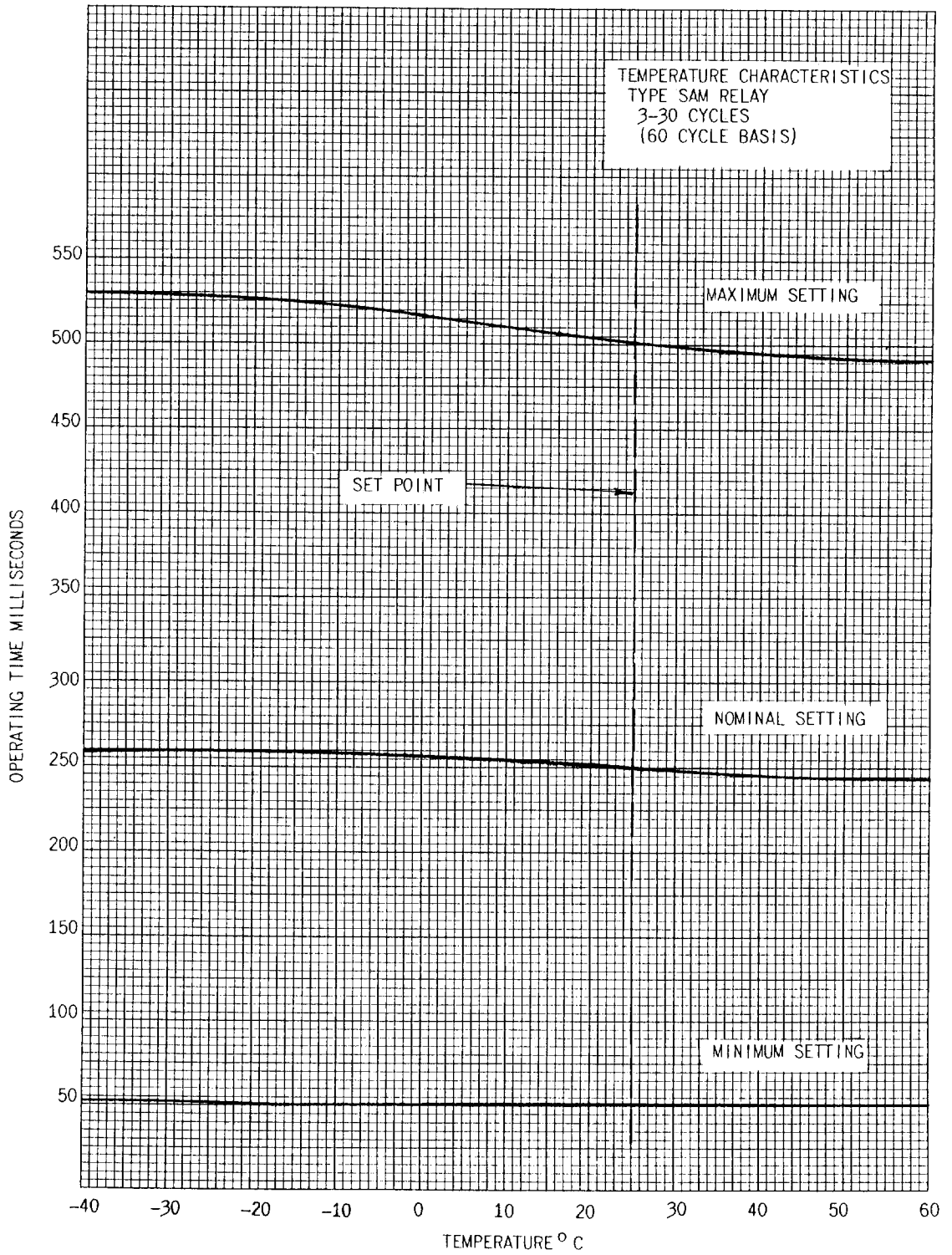


Fig. 3 (0165A7626-3) Voltage Characteristics of Type SAM Relay



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Fig. 4 (0165A7625-2) Temperature Characteristics of Type SAM Relay

*Indicates Revision

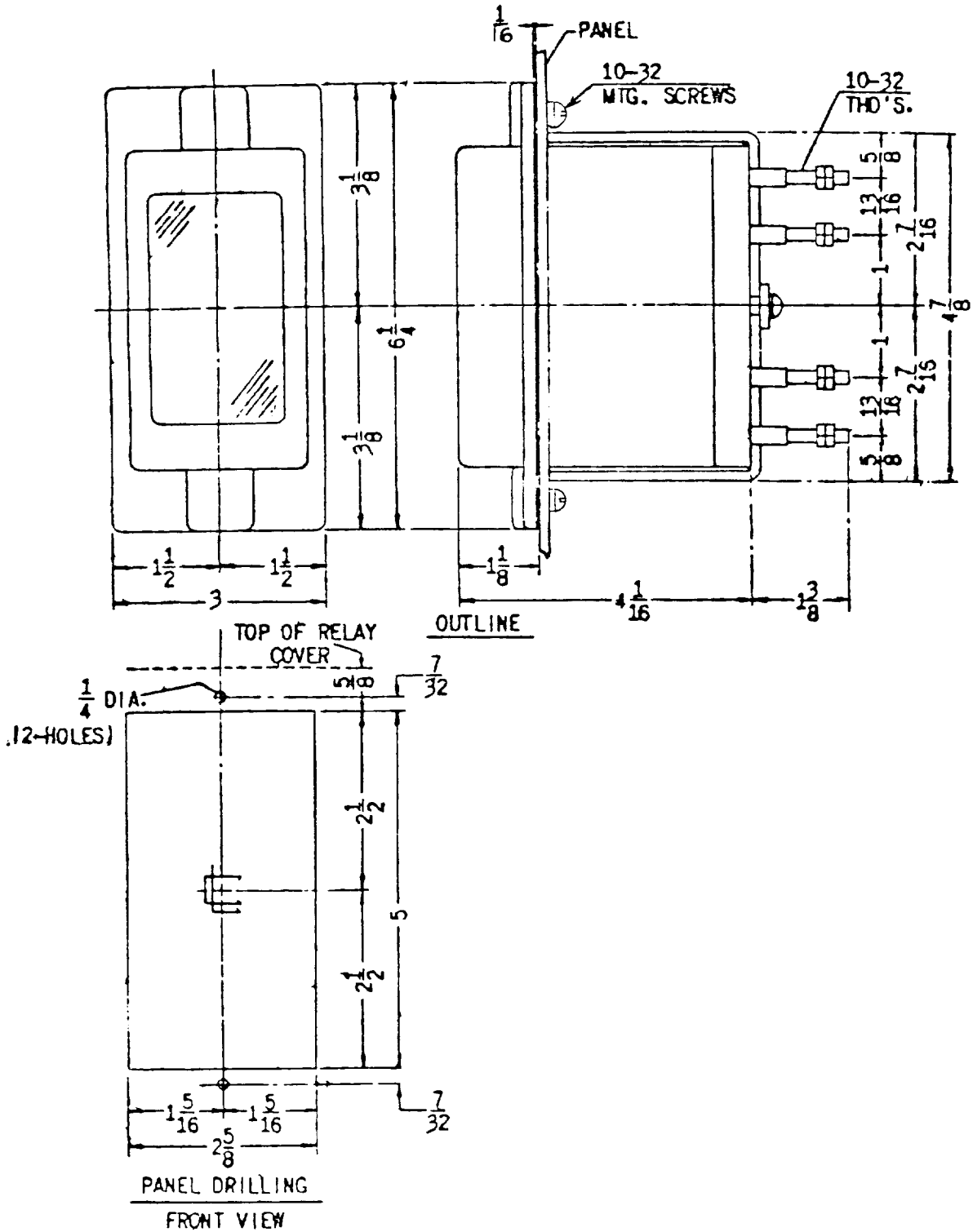
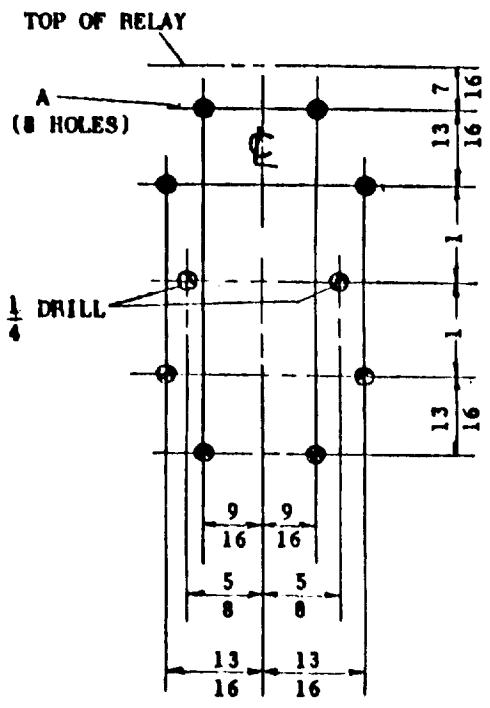
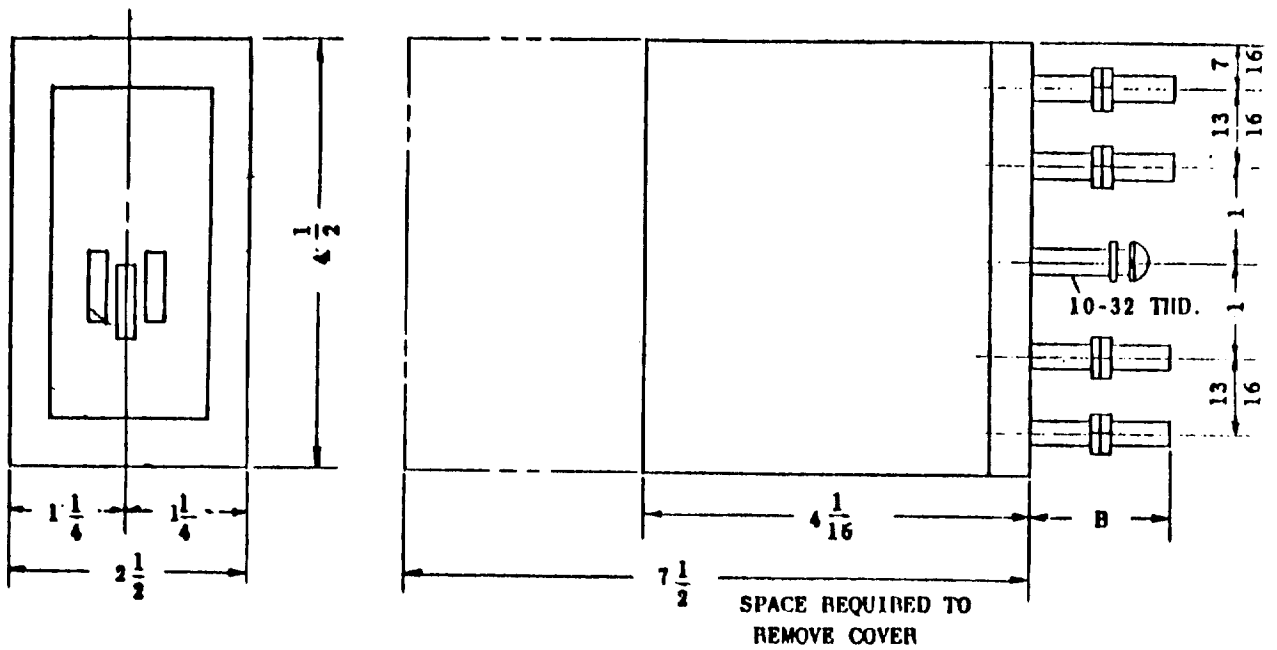


Fig. 5 (0148A3978-2) Outline and Panel Drilling Diagram for Flush Mounted Type SAM15A Relay, Forms 21 and up



OUTLINE

TYPE OF PANEL	A	B
INSULATING	7/16	2-13/16
STEEL	9/16	1-3/8

PANEL DRILLING (FRONT VIEW)

* Fig. 6 (0148A3979-5) Outline and Panel Drilling Diagram for Surface Mounted Type SAM15A Relay, Forms 21 and up

*Indicates Revision

11/82

4/69