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RELAYS SELECTION AND APPLICATION



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DEPARTMENT OF DEFENSE
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Relays, Selection and Application

MIL-STD-1346B

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FOREWORD

This standard provides selected standard relays for use in the design of military equipment.

Simply defined, a relay is an electrically operated switching device. A relay may be used for any of the following purposes:

- a. To obtain isolation between the input circuit and the output circuit.
- b. To invert the signal sense (from open to closed and vice-versa).
- c. To increase the number of output circuits (so as to switch more than one load or to switch loads from different sources).
- d. To repeat signals.
- e. To switch loads of different voltage or current ratings.
- f. To retain an input signal.
- g. To interlock circuits.
- h. To provide remote control.

Since misapplication is one of the major causes of relay failures, users are cautioned against using a relay in an application for which it is not rated. The application information and performance characteristics contained in this standard are offered for guidance and are not to be considered as mandatory. Users are advised to consult the Military Parts Control Advisory Group (see 8.2) to verify the capability of a relay to perform satisfactorily in an application where its suitability is questionable.

CAUTION: The use of any coil voltage less than the rated coil voltage will compromise the operation of the relays.

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M83725/11-001 thru -004	701.I	701-11	M83726/13-1000	602.I	602-1
M83725/12-001 thru -004	701.I	701-12	M83726/13-5000	602.I	602-1
M83725/13-001 thru -004	701.I	701-13	M83726/13-7500	602.I	602-1
M83725/14	701.I	701-14	M83726/13-1001	602.I	602-1
M83725/15-001 thru -005	701.I	701-15	M83726/13-2001	602.I	602-1
M83725/16-001 thru -004	701.I	701-16	M83726/13-3001	602.I	602-1
M83725/17-001,-002	701.I	701-17	M83726/13-5001	602.I	602-1
M83726/7-0600	601.I	601-1	M83726/13-7001	602.I	602-1
M83725/18-001 thru -003	601.I	601-1	M83726/13-1002	602.I	602-1
M83726/7-1000	601.I	601-1	M83726/13-1202	602.I	602-1
M83726/7-5000	601.I	601-1	M83726/13-1502	602.I	602-1
M83726/7-7500	601.I	601-1	M83726/13-2002	602.I	602-1
M83726/7-1001	601.I	601-1	M83726/13-3002	602.I	602-1
M83726/7-2001	601.I	601-1	M83726/13-4502	602.I	602-1
M83726/7-3001	601.I	601-1	M83726/13-6002	602.I	602-1
M83726/7-5001	601.I	601-1	M83726/13-1203	602.I	602-1
M83726/7-7001	601.I	601-1	M83726/13-1803	602.I	602-1
M83726/7-1002	601.I	601-1	M83726/13-3003	602.I	602-1
M83726/7-1202	601.I	601-1	M83726/14-1000	601.I	601-4
M83726/7-2002	601.I	601-1	M83726/14-5000	601.I	601-4
M83726/7-3002	601.I	601-1	M83726/14-7500	601.I	601-4
M83726/7-4502	601.I	601-1	M83726/14-1001	601.I	601-4
M83726/7-6002	601.I	601-1	M83726/14-2001	601.I	601-4
M83726/7-1203	601.I	601-1	M83726/14-3001	601.I	601-4
M83726/7-1803	601.I	601-1	M83726/14-5001	601.I	601-4
M83726/7-3003	601.I	601-1	M83726/14-7001	601.I	601-4
M83726/8-1000	601.I	601-2	M83726/14-1002	601.I	601-4
M83726/8-2001	601.I	601-2	M83726/14-1202	601.I	601-4
M83726/8-3001	601.I	601-2	M83726/14-1502	601.I	601-4
M83726/8-4001	601.I	601-2	M83726/14-2002	601.I	601-4
M83726/8-8001	601.I	601-2	M83726/14-3002	601.I	601-4
M83726/8-1002	601.I	601-2	M83726/14-4502	601.I	601-4
			M83726/14-6002	601.I	601-4
			M83726/14-1203	601.I	601-4
			M83726/14-1803	601.I	601-4
			M83726/14-3003	601.I	601-4
			M83726/20-1000	601.I	602-2
			M83726/20-5000	601.I	602-2
			M83726/20-7500	601.I	602-2
			M83726/20-1001	601.I	602-2
			M83726/20-2001	601.I	602-2

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CROSS REFERENCE OF PART NUMBER TO TABLES AND FIGURES - Continued

<u>Part Number</u>	<u>Table Number</u>	<u>Figure Number</u>	<u>Part Number</u>	<u>Table Number</u>	<u>Figure Number</u>
M83726/20-3001	601.I	602-2	M83726/28-3003X	601.I	601-6
M83726/20-5001	602.I	602-2	M83726/29-1001X	601.I	601-7
M83726/20-7001	602.I	602-2	M83726/29-2001X	601.I	601-7
M83726/20-1002	602.I	602-2	M83726/29-3001X	601.I	601-7
M83726/20-1202	602.I	602-2	M83726/29-4001X	601.I	601-7
M83726/20-1502	602.I	602-2	M83726/29-8001X	601.I	601-7
M83726/20-2002	602.I	602-2	M83726/29-1002X	601.I	601-7
M83726/20-3002	602.I	602-2	M83726/29-1402X	601.I	601-7
M83726/20-4502	602.I	602-2	M83726/29-3002X	601.I	601-7
M83726/20-6002	602.I	602-2	M83726/29-4502X	601.I	601-7
M83726/20-1203	602.I	602-2	M83726/29-6002X	601.I	601-7
M83726/20-1803	602.I	602-2	M83726/29-1203X	601.I	601-7
M83726/20-3003	602.I	602-2	M83726/29-1803X	601.I	601-7
M83726/21-001 thru -008	602.I	602-3	M83726/29-3003X	601.I	601-7
M83726/22-XXXX (see table 602-1)	602.I	602-4	M83726/30-1000X	601.I	601-8
M83726/23-1001	601.I	601-5	M83726/30-5000X	601.I	601-8
M83726/23-2001	601.I	601-5	M83726/30-7500X	601.I	601-8
M83726/23-3001	601.I	601-5	M83726/30-5001X	601.I	601-8
M83726/23-4001	601.I	601-5	M83726/30-7001X	601.I	601-8
M83726/23-8001	601.I	601-5	M83726/30-1002X	601.I	601-8
M83726/23-1002	601.I	601-5	M83726/30-1202X	601.I	601-8
M83726/23-1402	601.I	601-5	M83726/30-1502X	601.I	601-8
M83726/23-3002	601.I	601-5	M83726/30-2002X	601.I	601-8
M83726/23-4502	601.I	601-5	M83726/30-3002X	601.I	601-8
M83726/23-6002	601.I	601-5	M83726/30-4502X	601.I	601-8
M83726/28-1000X	601.I	601-6	M83726/30-6002X	601.I	601-8
M83726/28-5000X	601.I	601-6	M83726/30-1203X	601.I	601-8
M83726/28-7500X	601.I	601-6	M83726/30-1803X	601.I	601-8
M83726/28-1001X	601.I	601-6	M83726/30-3003X	601.I	601-8
M83726/28-2001X	601.I	601-6	M83726/31-1001X	601.I	601-9
M83726/28-3001X	601.I	601-6	M83726/31-2001X	601.I	601-9
M83726/28-5001X	601.I	601-6	M83726/31-3001X	601.I	601-9
M83726/28-7001X	601.I	601-6	M83726/31-4001X	601.I	601-9
M83726/28-1002X	601.I	601-6	M83726/31-8001X	601.I	601-9
M83726/28-1202X	601.I	601-6	M83726/31-1002X	601.I	601-9
M83726/28-1502X	601.I	601-6	M83726/31-1402X	601.I	601-9
M83726/28-2002X	601.I	601-6	M83726/31-3002X	601.I	601-9
M83726/28-3002X	601.I	601-6	M83726/31-4502X	601.I	601-9
M83726/28-4502X	601.I	601-6	M83726/31-6002X	601.I	601-9
M83726/28-6002X	601.I	601-6	M83726/31-1203X	601.I	601-9
M83726/28-1203X	601.I	601-6	M83726/31-1803X	601.I	601-9
M83726/28-1803X	601.I	601-6	M83726/31-3003X	601.I	601-9

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1. SCOPE

1.1 Scope. This standard is a guide for the selection of relays for use in military equipment. Included are the following:

- a. Selected standard relay types reviewed and accepted jointly by the Departments of the Army, Navy, and Air Force for use in the design and manufacture of military equipment.
- b. Details of relay physical and electrical characteristics are included in sections 100 through 700 for the convenience of designers in selecting and applying standard types.

Requirements for relays in this standard are covered in the latest issue of the applicable military specification or MS sheets (see 2.1).

1.2 Purpose of standard. The purpose of this standard is to:

- a. Provide the equipment designer with a list of relays that are considered to be suitable for military applications.
- b. Control and minimize the variety of relays used in military equipment in order to facilitate logistic support of the field equipment.
- c. Establish criteria pertinent to the choice, application, and use of relays in order to reduce "misapplication" failures.

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2. REFERENCED DOCUMENTS

2.1 Government documents.

2.1.1 Specifications, standards, and handbooks. Unless otherwise specified, the following specifications, standards, and handbooks of the issue listed in that issue of the Department of Defense Index of Specifications and Standards (DoDISS) specified in the solicitation form a part of this specification to the extent specified herein.

SPECIFICATIONS

MILITARY

- MIL-R-5757 - Relays, Electromagnetic, General Specification For.
- MIL-R-6106 - Relays, Electromagnetic, (Including Established Reliability Types) General Specification For.
- MIL-R-28750 - Relays, Solid State, General Specification For.
- MIL-R-28776 - Relays, Hybrid, Established Reliability, General Specification For.
- MIL-R-39016 - Relays, Electromagnetic, Established Reliability, General Specification For.
- MIL-R-83725 - Relays, Vacuum, General Specification For.
- MIL-R-83726 - Relays, Time Delay, Hybrid and Solid State, General Specification For.

STANDARDS

MILITARY

- MIL-STD-202 - Test Methods for Electronic and Electrical Component Parts.
- MIL-STD-690 - Failure Rate Sampling Plans and Procedures.

(Copies of specifications, standards, handbooks, drawings, and publications required by manufacturers in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting officer.)

2.2 Other publications. The following documents form a part of this standard to the extent specified herein. The issues of the documents which are indicated as DoD adopted shall be the issues listed in the current DoDISS and the supplement thereto, if applicable.

NATIONAL ASSOCIATION OF RELAY MANUFACTURERS

Engineer's Relay Handbook

(Application for copies should be addressed to the National Association of Relay Manufacturers, P. O. Box 1505, Elkhart, IN 46515.)

AMERICAN NATIONAL STANDARDS INSTITUTE

- ANSI C83.16 - Definitions and Terminology for Relays for Electronic Equipment.
- ANSI Y32.3 - Graphic Symbols For Electrical and Electronics Diagrams.

(Application for copies should be addressed to the American National Standards Institute, 1430 Broadway, New York, NY 10018.)

(Industry association specifications and standards are generally available for reference from libraries. They are also distributed among technical groups and using federal agencies.)

2.3 Order of precedence. In the event of a conflict between the text of this standard and the references cited herein, the text of this standard shall take precedence.

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3. DEFINITIONS

3.1 Terms. For a list of common terms used in the rating and design application of relays, refer to the Engineer's Relay Handbook. For relay definitions and terminology refer to ANSI C83.16 and the following:

Relay solid state. A self-contained device that performs the function of opening or closing an electrical circuit in response to electrical changes in an external circuit. In lieu of separable contacts and their actuator(s), the switching function is accomplished by means of an arrangement of semiconductors and passive circuit devices. The device is designed to have electrical isolation between control circuit and output circuit. Excludes RELAY, HYBRID.

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4. GENERAL REQUIREMENTS

4.1 Choice of relay types. The variety of relay types used in any particular equipment shall be the minimum necessary to obtain satisfactory performance with good design practices. Where more than one type of relay may be used in a given application, consideration should be given to cost and availability. The relays identified in this standard meet the criteria for standard types (see 4.2).

4.2 Conflict of requirements. In the event of conflict between technical requirements of relays described in this standard and the applicable specification, the latter shall govern.

4.3 Criteria for inclusion in this standard. The criteria for the inclusion of relays in this standard are as follows:

- a. The relay shall be considered by representatives of the military departments, the best available type for current application.
- b. The relay shall be in production and continued availability shall be reasonably certain.
- c. The relay shall have an approved military specification and be listed on a qualified products list.
- d. All contact ratings are with relay case grounded.

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5. DETAILED REQUIREMENTS

5.1 Requirements for standard relay types. The detailed requirements for standard relay types are contained in the applicable military specification.

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6. APPLICATION INFORMATION

6.1 General. This section contains general guideline information to assist the application engineers or circuit designers in choosing the appropriate relay. For application information pertaining to specific relay types, refer to the numbered sections for relays.

- a. This standard includes a listing of relay types selected by the Military Departments and provides sufficient information for the application or circuit design engineer to determine the suitability of one of the standard relay types for a specific application. This standard also includes a section index of the general relay families. Example: Section 100 - Relays, Electromagnetic (EM), Established Reliability (ER); Section 600 - Relays, Time Delay. The section index also lists the various relay types within each family listing.
- b. Each section includes a subsection index of all the relay types within the family, outlining general characteristics. A relay type that appears to be suitable can be chosen from this index. By looking up this suitable type, additional characteristics such as outline drawings, physical dimensions, schematic diagrams, electrical performance characteristics, environmental characteristics, and the applicable military specification are listed. By referring to the applicable specification, all performance requirements and the complete testing program, including test order, sampling plans, and test methods, may be determined. This should complete the information necessary to determine the suitability of a relay type for a specific application.

6.2 Relay selection and application. CAUTION: The use of any coil voltage less than the rated coil voltage will compromise the operation of the relay. Choosing the proper relay depends primarily on matching the relay to the load, power supply, and environment. Selection should be limited to items that meet the following requirements:

- a. Contacts must be rated for the load. Current rating, type of load (resistive, lamp, motor, inductive, and so forth), impedance range, voltage rating, dc or ac, frequency, single phase or polyphase, polyphase load balance, and type of switching or transfer should all be considered. Each of the following switching and transfer functions places a different requirement on the relay contacts and must be considered when selecting a relay with the proper contact rating:
 - (1) On-off switching - dc, single phase or polyphase.
 - (2) Motor reversing (ac or dc).
 - (3) Transferring load between phases of same source.
 - (4) Transferring load between unsynchronized ac sources.
- b. Power supply characteristics must be taken into account. Voltage regulation, variations in frequency, ripples and spikes, as well as steady state conditions should be included. If more than one power supply is involved, not only must each be suitable but any interaction between them also should be investigated.
- c. Coil (or coils) should be rated to insure proper operation under all conditions anticipated.
- d. Consideration of the environmental conditions anticipated throughout service life, as well as those expected during storage and transportation before installing the relays in the equipment is mandatory. Electrical parameters, environmental factors, mechanical stresses, and compatibility are among the categories the relay must be investigated for.
- e. The circuit the relay is used in, the interlocking employed, the wiring harness, and associated items should all be investigated to assure mutual suitability.

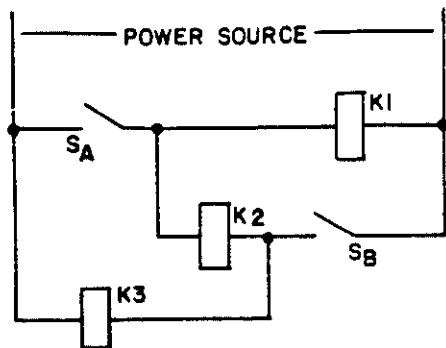


FIGURE 1A. Improper circuit design.

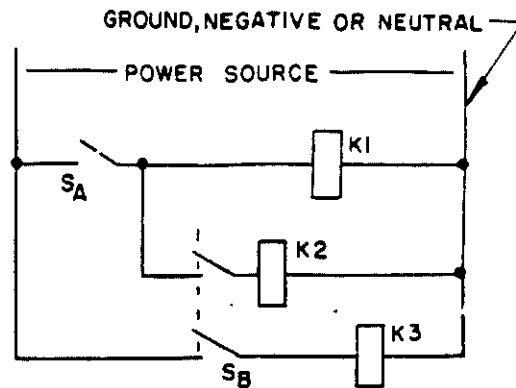


FIGURE 1B. Properly designed circuit.

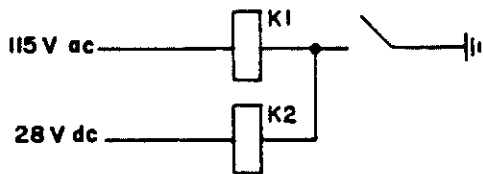


FIGURE 1C. Improper circuit design.

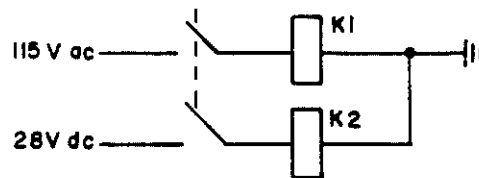


FIGURE 1D. Properly designed circuit.

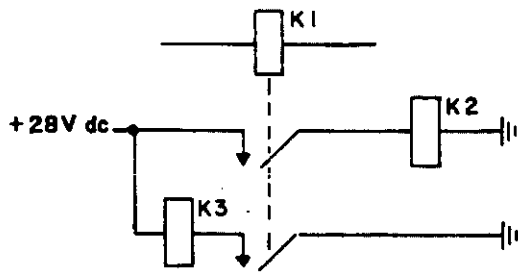


FIGURE 1E. Not recommended relay open ground.

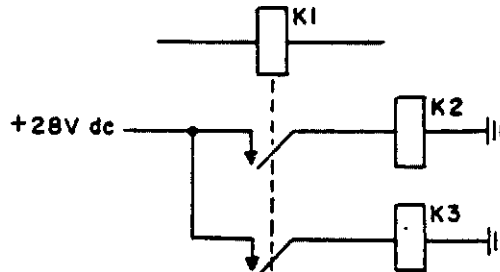


FIGURE 1F. Preferred design, two relays controlled with no adverse interaction on dropout.

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- f. Relays should be hard wired, whenever possible, to avoid the additional contact points associated with the relay plug-in socket arrangement.
- g. Care should be exercised in handling and lead cutting of T0-5 type relays since extremely close cover to frame spacing as well as fragile glass seals make these type relays susceptible to physical damage if not handled properly.
- h. Any switching device controlling the relay coil circuit must be capable of withstanding, without damage, the sum of the maximum coil circuit voltage and the peak value of transient voltage that results when the coil circuit is opened; for example, a switch controlling a relay coil that is (1) fed by a 28-volt dc line and (2) transient suppressed to 42 volts must be capable of withstanding $28 + 42 = 70$ volts surges without damage.
- i. In selecting solid state electronic switching devices to control relay coil circuits, be careful to select a solid state device that has a leakage current (in the "off" state) that is sufficiently low to permit the relay to drop out.
- j. Control of the relay coil circuit by other than step-function switching may invalidate published relay performance properties such as pull-in and dropout voltages, and pull-in, dropout, and bounce times.

6.2.1 On-off load control. On-off control of loads is a typical relay function. Where practical, connect one side of every load, including relay coils, to a common line (the grounded conductor of their power supply), if applicable. All contacts will be on the hot side with respect to the loads. No contact shall be connected to ground. The switching should be done in the hot side of circuit to prevent electrical shock, decrease the possibility of circuit malfunction, and reduce the number of contacts. Figures 1A, 1B, 1C, 1D, 1E, 1F, and 1G show the problems that can be avoided by proper circuit design.

- a. Figure 1A is an example of control problems resulting from not connecting all loads to the same common terminal. With three relays in series across the line, each has approximately one-third voltage continuously. In addition to the power drain, the relay will be sensitive to temperature, vibration, and mechanical shock causing spurious operation. Relay K1 is energized when switch A is closed. Relay K3 is energized when switch B is closed. Relay K2 is energized when switch A and switch B are both closed. If switch A is closed and then reopened, relay K1 may remain in the energized mode due to the back circuit through coils K1, K2, and K3. Relay K3 may stay energized similarly when switch B is opened. Any, or all relays may stay energized if both switches are closed then opened.
- b. Figure 1C. The opening ground lead does not open both relays; it places both in series.
- c. Figure 1F. Two relays in parallel will interact on dropout; if one relay is much larger the smaller relay may false cycle. Transient protection on either relay coil will suppress both, whether or not desired. With two relay coils in parallel, if one has an internal series diode and the other is not suppressed, the diode may break down from the other coil transients on dropout.
- d. Figure 1G. A very common example of poor practice is motor dynamic braking with form C contacts. Contacts may handle run current but often fail to interrupt inrush and cause a line to ground fault through the switch. It is improper circuit design to have line and ground on the stationary contacts.

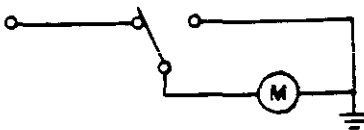


FIGURE 1G. Improper motor braking.

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6.2.2 Transfer operation. Relays used in transfer operations are subject to greater electrical stresses than relays used for on-off load control. Typical transfer applications are those in which relays reverse motors, reverse load polarity, or connect alternate power supplies to a load. Form C contact configurations are particularly susceptible to failure in transfer modes. Fast operation of a transfer contact can short circuit a power supply by making at one voltage before ionization from a previous voltage has decayed.

- a. Operate time, release time, contact air gap, spacing between contact poles, the type of load, and the power supply characteristics are all factors that must be considered. Some manufacturers offer relays with form C contacts, properly derated, for transfer applications. Because of the vagaries which arise even with the best designed circuits, users should be aware of the possibility of failures. The reason may be no more sophisticated than overvoltage applied to the coil, resulting in abnormally fast pickup. Mechanical interlocking will not protect form C contacts used for transfer operations.

Figure 2 illustrates polarity reversal of a load by form C contacts. If a contact arc persists for the operate or release time of the relay, the power supply is short circuited.

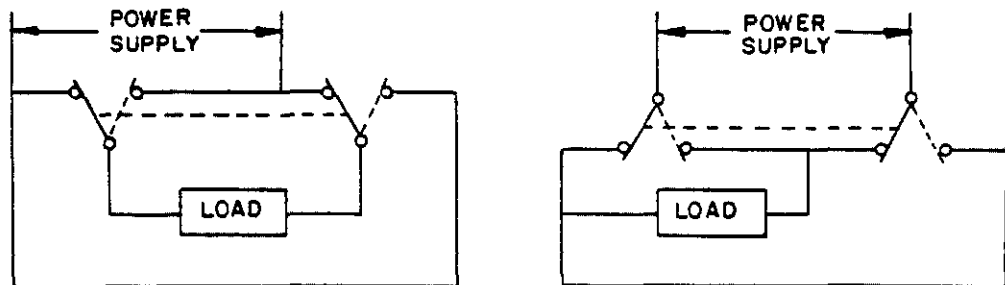


FIGURE 2. Polarity reversal, form C contacts.

- b. Failures can be reduced by using either three-position relays with form K contacts or separate relays mechanically interlocked. Electrical interlocking of each coil is an accepted circuit design practice with either option.

Figure 3 illustrates polarity reversal of a load by form K contacts. Interlocking can be used effectively to protect the form K contacts. Time required to complete transfer of contacts can be increased to assure that contact arcing has been extinguished.

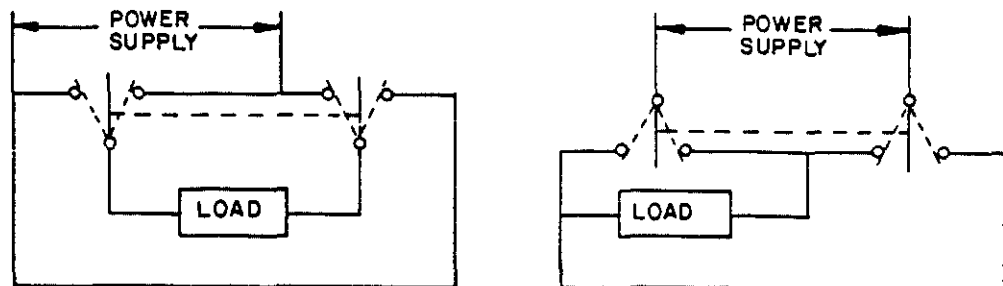


FIGURE 3. Polarity reversal, form K contacts.

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- c. Particularly during the transfer of a load from one source to another there are additional potential pitfalls to be considered. These do not necessarily damage the relays used for the transfer:
- (1) High currents circulating between sources if the two sources are interconnected during the transfer operation.
 - (2) High currents circulating between the load and a source.
 - (3) High mechanical stress of rotating equipment (Lenz's law).
 - (4) Secondary effects of the first three, for example: High field voltage, voltage regulation, hunting by regulators and governors.
- d. With ac sources feeding rotating machines, the following recommendations are made:
- (1) If the load is a synchronous motor, it will accelerate to lock in with the source frequency. Likewise, the synchronous machines used as sources will tend to synchronize if they are interconnected. The transient voltages, currents, and torques are usually high, depending on the designs and mechanical and electrical couplings involved, especially if the transfer between sources takes place when the source voltages are out of synchronization so that motors will suddenly accelerate (or decelerate) into step.
 - (2) If the load is an induction motor, care should be exercised to assure that the frequency to which the motor is transferred is no less than the frequency minus slip; otherwise the motor would be severely braked as it performs as an asynchronous generator, with resultant mechanical and electrical transients.
 - (3) When ac circuits are switched, consideration should be given to detrimental effects on the loads and/or the generators. The proper functioning of the relay is important, but no more important than the damage to associated equipment.
- e. When switching ac circuits, relay contacts should be adequately rated for twice normal voltage to accommodate out-of-phase switching; also, inrush current considerations should be up to four times those expected when energizing the load.

6.2.3 Multiple relay operation. When more contacts are required than are practical on a single relay, multiple relays must be used. When this is necessary, cascading (see figure 4) rather than paralleling (see figure 5) should be considered. A contact on the first relay is used to energize the second; a contact on the second is used to energize the third. Each relay is energized in turn by a contact on the preceding relay in the string. A contact on the last relay is used as the interlock or holding contact of the entire array.

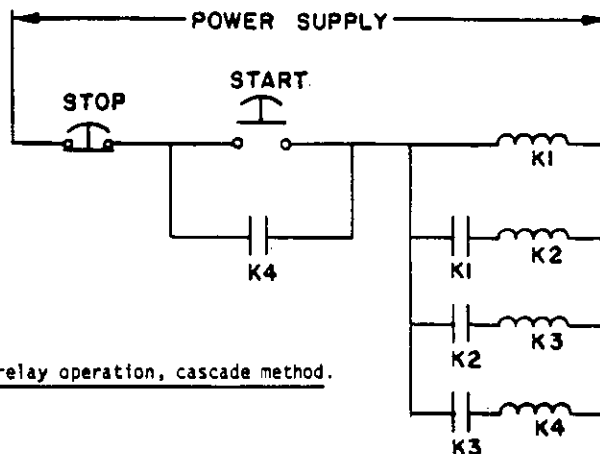


FIGURE 4. Concurrent relay operation, cascade method.

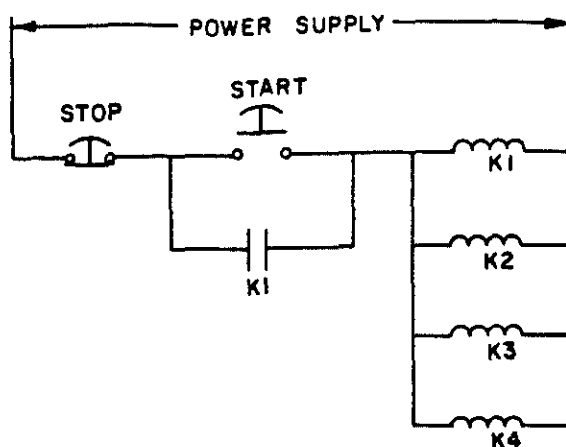


FIGURE 5. Concurrent relay operation, parallel method.

6.2.4 Coil transient suppression. Voltage induced in relay coils can cause arcing at the contacts that control the relay. Spikes in the transient induced voltage may result in electromagnetic interference. Several methods are available to cope with these problems. Nearly all of them slow the armature dropout and result in increased release time. Furthermore, the hammer blow necessary to break tack welds will be lacking. A way to suppress the coil and retain the fast break away and the hammer blow is by using back to back zener diodes or a zener diode and a blocking diode. The latter is less desirable because the relay coil is now polarity sensitive.

6.2.4.1 Diode shunts. The transient voltage spike developed by one relay coil may be reduced by using a diode shunt but the contacts of that relay may suffer decreased life. When two or more relay coils are in parallel, a diode across one affects the operation of the others; also, the inductive voltage spikes from other paralleled relay coils will discharge through and may destroy any shunt diodes.

6.3 Relay contact configurations. An important consideration for relay application is the contact arrangement required. The contact arrangement is the various combinations of different basic contact forms that make up the entire relay switching structure. Relay contact notations are given in the following order:

- a. Poles - Each movable contact and its associated normally open and normally closed contacts of a relay constitutes a pole of the relay.
- b. Throws:
 - (1) Single throw (ST) - Normally open and normally closed contacts.
 - (2) Double throw (DT) - Transfer (form C or Z) contacts are a combination of two stationary contacts and a movable contact that engages one of the stationary contacts when the coil is energized and engages the other when the coil is unenergized.
- c. Normal position - A combination of a stationary contact and a movable contact that are engaged when the coil is unenergized is referred to as back, break, form B, or normally closed contacts (NC). A combination of a stationary contact and a movable contact that are engaged when the coil is energized is referred to as front, make, form A or normally open contacts (NO).

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- d. Double break (DB) - A combination in which a movable contact simultaneously makes and simultaneously breaks connection between two stationary contacts. All contacts are single break except when noted as double break. Example: DPST NCDB designates double pole, single throw, normally closed, double-break contacts.
- e. Multiple combinations: Relays having several sets of differently functioning contacts will have the contact forms listed in alphabetical order of their letter symbols as shown on figure 6; for example; 1B3C refers to SPST NC contacts and 3PDT contacts. For a relay on which the moving contact engages more than two stationary contacts during its cycle of operation, the contact arrangement is described as MPNT, when M is the number of poles and N is the number of throws, for example 8P2DT.

6.4 Relay misapplication. Relays, typically electromechanical devices, are subject to both electrical and mechanical failure. Some causes of failure are poor contact alignment; open, contaminated, or pitted contacts; loss of resiliency in springs; open coils. Contact failure can result from high inrush or sustained high currents, or from arcing when an inductive circuit is opened. High inrush currents occur in loads composed of motors, lamps, heaters, capacitive input filters, transformers, magnetization current, or other devices that have low starting impedance compared to operating impedance. However, the greatest cause of relay failure is due to misapplication. Circuit design resulting in relay failures is not advocated as sound engineering practice. However, that condition would be preferred to having equipment fail due to relay misapplication, with the actual circuit culprit possibly remaining unscathed. Such failure may well be past the time of facile correction when, and if, the actual cause is determined. Detection of the actual cause of the trouble may be elusive in such instances. Early failures due to a relay misapplication in which the relay itself is damaged are more easily analyzed. The following are typical relay misapplications which may lead to relay failures.

- a. CAUTION: The use of any coil voltage less than the rated coil voltage will compromise the operation of the relays.
- b. Improperly using existing military specifications by erroneous interpretation or even using the incorrect specification altogether. A given set or sets of conditions are given in the specifications. Variations from these conditions will affect performance of the relay accordingly.
- c. Paralleling contacts to increase capacity. Contacts will not make or break simultaneously and one contact carries all the load under the worst conditions. Contacts can be paralleled for reliability in the low level or intermediate current (minimum current) areas.
- d. Circuit transient surges. Circuit designers must not expect relays to handle circuit transient surges in excess of their ratings.
- e. Using relays under load conditions for which ratings have not been established. Contact ratings should be established for each type of load. Many relays will work from low level to rated load; however, the relay should not be expected to do both. Many relays possess high level and low level load capabilities; however, relays previously tested or used at high level loads shall not be used for low level load applications. High capacitive inrush currents and inductive break currents require oversized contacts. A cold filament lamp draws very high currents until warmed up. Contacts that switch lamps must be able to take the inrush current.
- f. Using relays on higher voltages than those for which they were designed, for example, switching 300-volt power supplies with relays only rated 115 volts maximum.

CONTACT ARRANGEMENTS, SYMBOLS AND TERMINAL MARKING (SEE NOTES 2 & 3)					
	SINGLE THROW		DOUBLE THROW		
	FORM "A"	FORM "B"	FORM "C" (TWO POSITION)	FORM "K" SPDT 3 POS CENTER OFF	FORM "M" 3 POS CENTER ON
SINGLE BREAK	NORMALLY OPEN	NORMALLY CLOSED			
DOUBLE BREAK	FORM "X"	FORM "Y"	FORM "Z"	FORM "KK"	FORM "MM"

Symbols and marking for terminals

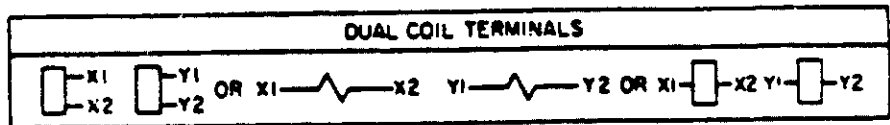
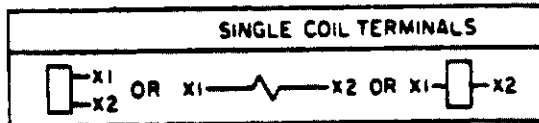


FIGURE 6. Symbols and markings for contacts and coils.

OTHER CONTACT ARRANGEMENTS AND SYMBOLS ^(SEE NOTES 1&4)					
FORM	DESCRIPTION	SYMBOL	FORM	DESCRIPTION	SYMBOL
D	Make, Break or Make-Before-Break, or SPST (D-4), or "Continuity transfer"		J	Make, Make, Break, or SPST (J-4-B)	
E	Break, Make, Break, or Break-Make-Before-Break, or SPST (E-4-B)		L	Break, Make, Make, or SPST (L-4-B)	
F	Make, Make SPST (F-4)		U	Double make, Contact on Arm SP ST NO DN	
G	Break, Break or SPST (G-4)		V	Double break, Contact on Arm SP ST NC DN	
H	Break, Break, Make, or SPST (H-4-B)		W	Double break, Double make, Contact on Arm ST DT NC-NO (DB-DN)	
I	Make, Break, Make, or SPST (I-4-B)				

NOTES:

1. Symbols are in accordance with ANSI Y32.2.
2. As a result of coil energization, the open and closed positions are as follows:

Coil energized	FORM	
	A, B, C, K and M	X, Y, Z, KK and MM
X1 and X2	1 & 2 Closed	1 & 2 Closed
	2 & 3 Open	3 & 4 Open
Y1 and Y2 (if applicable)	1 & 2 Open	1 & 2 Open
	2 & 3 Closed	3 & 4 Closed

3. Contacts are shown with the coil(s) de-energized; however, contacts of latching relays remain in the position attained as the result of the last coil energization.
4. Forms A, B, C, K, M, X, Y, Z, KK and MM are as previously shown.
5. The arrow in the symbol indicates the direction of motion of the moving contact in response to energization of the relay winding.

FIGURE 6. Symbols and markings for contacts and coils - Continued.

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- g. Contact ratings with grounded case. Some relays, with small internal spacing or lack of arc barriers, when switching in excess of 40 volts (ac or dc) with grounded case, must have the contact ratings significantly lower than in the ungrounded case mode of operation. Typically, the maximum ac rating of such a nominally rated 28 V dc, 2 amperes resistive relay, is of the order of 0.150 ampere. Relays with sufficient spacing or arc barriers may be used at full rating at voltages over 40 volts (ac or dc) or 115/200 V, 3-phase ac 400 Hz with case grounded when so rated in the detail specification or MS standard. Switching high voltage with the relay case ungrounded results in a potential hazard to personnel.
- h. Transferring load between unsynchronized power supplies with inadequately rated contacts. When the load is switched, the voltages can range from being in-phase to 180° out-of-phase; therefore, the relay contact voltage may vary from zero volts to two times peak voltage and maximum current.
- i. Switching polyphase circuits with relays tested and rated for single phase only. A typical misapplication is the use of small multipole relays (whose individual contacts are rated for 115 volts single phase ac) in 115/200 volts three phase ac applications. Phase-to-phase shorting at rated loads is a strong possibility in these instances with potentially catastrophic results.
- j. Using relays with no established motor ratings to switch motor loads. In addition, caution should be used in applying relays to reverse motors, particularly where the motor can be reversed while running, commonly called "plugging". This results in a condition where both voltage and current greatly exceed normal. Many power relays are rated for "plugging" and reversing service but a relay should not be utilized in potential "plugging" situations unless so rated by the manufacturer.
- k. Using relays with no established intermediate current (minimum current) capabilities. It must not be assumed that because a relay is used in an application considerably below its rated contact load that the consideration of intermediate current capability can be ignored; this is especially true if there is no established level of intermediate current for the relay.
- l. Using relays rated for 115 V ac only on 28 V dc or higher voltage dc applications. If contacts in these devices are of the single break form A type, it may be necessary to derate severely for use on dc applications, at 28 volts or higher.
- m. Effects of ambient temperature and coil temperature rise (I^2R heating) on coil overdrive. Many users do not consider that more power is required to operate a relay at elevated temperatures and are surprised to find that they have marginal operation at elevated temperatures. A relay, a current operated device (ampere-turns), increases its coil resistance at the rate of 0.004 ohm/ohm/°C due to the temperature coefficient of copper. Therefore, with a given voltage applied to a relay coil, overdrive decreases at elevated temperatures; if this is not taken into account, misapplication occurs. When rated voltage is specified instead of current, an ambient temperature is usually specified and the user must consider the maximum ambient temperature condition and the effect upon the voltage that must be supplied.
- n. Relay race involves conditions where, for proper operation, one relay must operate prior to another in separate drive circuits. Relay race circuits should be avoided; but where they must be used, ambient temperature drive power, operate and release times, coil suppression circuitry, and wear consideration must be made carefully.

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- o. Another less common problem is encountered when a relay coil is operated from a slowly rising current. When conditions are right, the relay operates at some point during the increasing drive current. Back electromotive forces (EMF's) are produced when the armature closes to the pole face. This voltage being opposite in polarity to the driving voltage causes the relay to release and then reoperate. This condition prevails until a sufficient amount of drive current is available to overcome the back EMF's.
- p. Relays rated for 400 Hz and not rated for 50/60 Hz should not be used at 50/60 Hz.
- q. Using relays to switch inductive loads. While ac inductive circuit requirements and relay capabilities can be properly matched in terms of current, voltage, frequency, and power factor, no such positive comparison method exists for dc inductive circuits. Thus, special care must be exercised in selecting relays to switch dc inductive loads.
- r. Using coil transient suppression relays where suppression is not required. Suppressing coil transients can affect load switching capability and relay life. Using maximum possible suppression will increase relay dropout time. Increased dropout time can reduce the amount of current that can be switched and the relay life. Increased dropout time can also adversely offset relay logic circuits.
- s. Coil voltage is the voltage across the relay coil terminals. Voltage drops that occur in control circuits, series diodes, control transistors, long wires, etc. must be taken into account by the user.
- t. Contact load affect on coil voltage. In applications where energizing a high current load or a load with high inrush current that affects coil voltage, the user must consider the possibility of relay chatter, rapid make and break cycling, with attendant damage and loss of contact life.

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7. SYMBOLS

7.1 Temperature class. The temperature class is identified by a single letter in accordance with table I.

TABLE I. Temperature class.

Symbol	Operating ambient temperature range (°C)
A	-55 to +85
B	-65 to +125
C	-65 to +200
D	-55 to +71
E	-65 to +85
F	0 to +70
G	-70 to +125
H	-70 to +200
J	-55 to +125

7.2 Shock. The shock is identified by a single digit in accordance with table II.

TABLE II. Shock.

Symbol	MIL-STD-202 method 213 test condition	Applicable test method of MIL-STD-202
1	A (50G)	213
2	B (75G)	213
3	C (100G)	213
5	---	207 (high impact)
6	(200G)	(6 ±1 ms pulse duration)
7	D (500G)	213
8	E (150G)	213 (11 ±1 ms half-sine wave)
9	F (1100G)	213

NOTE: Symbols 1, 2, and 3 replace 15, 30, and 50 G of methods 202 and 205 of MIL-STD-202.

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7.3 Vibration characteristic. The vibration characteristic is identified by a single digit in accordance with table III.

TABLE III. Vibration characteristic.

Symbol	Acceleration value	Vibration condition (hertz)
1	2 (G)	10 - 500
2	".060 dbl amptd"	10 - 55
3	10 (G)	10 - 500
4	10 (G)	10 - 1,500
5	15 (G)	10 - 2,000
6	20 (G)	10 - 2,000
7	20 (G)	10 - 3,000
8	30 (G)	10 - 2,000
9	30 (G)	10 - 3,000
10	50 (G)	10 - 3,000
11	5 (G)	10 - 2,000
12	10 (G)	10 - 2,000
13	10 (G)	55 - 2,000
14	".060 dbl amptd"	10 - 80

NOTE: Use .060 double amplitude whenever it is less than the curve "G" level.

7.4 Terminal. The style of terminal is identified by a single or double letter in accordance with table IV.

TABLE IV. Terminal.

Symbol	Style of terminal
L	Lug (solder hooks)
SKP	Socket pin/plug in
STUD	Stud
SP	Wirelead, Solder Pin
WL	Wire Lead
.500	Lead (T0-5)
.187	Lead (T0-5)

7.5 Failure rate level. The specified failure rate level is identified by a single letter in accordance with table V.

TABLE V. Failure rate level (established at a 90-percent confidence level for qualification and a 60 percent confidence level for maintenance of qualification).

MIL-R-39016, MIL-R-28776		MIL-R-6106	
Symbol	Failure rate level (% 10,000 operations)	Symbol	Failure rate level (% 10,000 operations)
L	3.0	M	1.0
M	1.0	U	0.5
P	0.1	X	0.3
R	0.01	P	0.1
S	0.001		

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8. SUPPLEMENTAL INFORMATION

8.1 Drawing notes.

8.1.1 Dimensions are in inches.

8.1.2 Metric equivalents. Metric equivalents provided on each drawing are for general information only.

8.1.3 Tolerance. Unless otherwise specified, tolerance is ± 0.010 (0.25 mm).

8.2 Technical information. Questions on the suitability of a particular application (when the suitability or capability of a relay is in question) should be referred to the Military Parts Control Advisory Group at the following address:

Commander
Defense Electronics Supply Center
ATTN: DESC-EMD
Dayton, Ohio 45444

Telephone: 513-296-6180
Autovon: 986-6180

Custodians:

Army - ER
Navy - EC
Air Force - 11

Preparing activity:
Navy - EC

(Project 5945-0590)

Review activities:

Army - MI, AR, AT, AV
Air Force - 17, 85
DLA - ES

User activities:

Army - ME
Navy - AS, MC, YD, OS, SH

Agent:

DLA - ES

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SECTION 100

RELAYS, ELECTROMAGNETIC (EM), ESTABLISHED RELIABILITY (ER)

Subsection

- 101 Relays, EM, ER, dc operated..
- 102 Relays, EM, ER, ac operated.
- 103 Relays, EM, ER, sensitive, dc operated.
- 104 Relays, EM, ER, latching, dc operated.
- 105 Relays, EM, ER, latching, sensitive, dc operated.
- 106 Relays, EM, ER, radio frequency (coaxial) dc operated.

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SUBSECTION 101

RELAYS, ELECTROMAGNETIC (EM), ESTABLISHED
RELIABILITY (ER), DC OPERATED

(Applicable specifications: MIL-R-6106 and MIL-R-39016)

SCOPE: This subsection covers relays with coils dc voltage rated.

TABLE 101.1. Relays, EM, ER, dc operated, part numbers and characteristics - Continued.

Rated coil voltage	Part number	Figure Shock (see number table ii)	Vibration (see table iii)	System voltage and frequency - contact current in amperes												Terminal style (see table iv)		
				28 V dc						50/60 HZ								
				115 V 1-phase		115/200 V 3-phase		115 V 1 phase		115/200 V 3-phase		115 V 1 phase		115/200 V 3-phase				
Resistive	Inductive	Lamp	Motor	Resistive	Inductive	Lamp	Motor	Resistive	Inductive	Lamp	Motor	Resistive	Inductive	Lamp	Motor			
SPDT CONTACTS - 1 FORM C - WITH COIL SUPPRESSION																		
28.0	M6106/19 Conf A	101-3	9	25	12	10	5	25	15	10	5	5	25	15	10	5	5	SP L SRP
"	-020 3/ -021 3/ -022 3/	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
"	Conf B	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	SP L
"	-023 3/ -024 3/	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
SPDT CONTACTS - 1 FORM C - WITH DIODE COIL TRANSIENT SUPPRESSION																		
5.0	M39016/23Z/	101-4	2	1.0	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	.187 .500
5.0	-019Z -025Z	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
6.0	-020Z -026Z	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	.187 .500
9.0	-021Z -027Z	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	.187 .500
12.0	-022Z -028Z	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	.187 .500
18.0	-023Z -029Z	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	.187 .500
26.5	-024Z -030Z	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	.187 .500

See footnotes at end of table.

TABLE 101.1. Relays, EN, ER, dc operated, part numbers and characteristics - Continued.

Rated coil voltage	Part number	Figure Shock (see number table II)	Vibration (see table III)	System voltage and frequency - contact current in amperes												Terminal style (see table IV)									
				28 V dc			400 Hz			50/60 Hz			115/200 V 3-phase				115 V 1 phase			115/200 V 3-phase					
				Resis- tive	Induc- tive	Motor	Resis- tive	Lamp	Motor	Resis- tive	Lamp	Motor	Resis- tive	Lamp	Motor		Resis- tive	Lamp	Motor	Resis- tive	Lamp	Motor	Resis- tive	Lamp	Motor
6.0	M39016/92/ -020Z -058Z -044Z -065Z	2 " " "	9 " " "	1.0 " " "	0.2 " " "	---	0.1 " " "	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	.187 .500 .187 .500
"	M39016/132/ No mount -055Z -074Z -089Z	3 " "	" " "	2.0 " "	0.3 " "	"	0.125 " "	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	SP WL L
"	Flange A -058Z -061Z -099Z	" " "	" " "	" " "	" " "	"	" " "	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	L WL SP
"	Flange B -064Z -067Z -070Z	" " "	" " "	" " "	" " "	"	" " "	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	L WL SP
"	M39016/172/ -026Z -032Z	2 "	"	1.0 "	0.2 "	"	0.1 "	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	.187 .500
"	M39016/342/ Bracket -001Z No mount -002Z -010Z 4/	3 " " "	6 " " "	"	"	"	---	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	WL SP SKP
"	Tab mount -003Z Flange mount -013Z 4/	" " "	" " "	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	SP SKP

DDPT CONTACTS - 2 FORM C - Continued

See footnotes at end of table.

TABLE 101.1. Relays, EM, ER, dc operated, part numbers and characteristics - Continued.

Rated coil voltage	Part number 1/	Figure Shock (see table I)	Vibration (see table III)	System voltage and frequency - contact current in amperes																				Terminal style (see table IV)					
				28 V dc					400 Hz				50/60 Hz				115 V 1 phase						115/200 V 3-phase						
				Resistive	Inductive	Motor	Lamp	Resistive	Resistive	Inductive	Motor	Lamp	Resistive	Resistive	Inductive	Motor	Lamp	Resistive	Resistive	Inductive	Motor	Lamp	Resistive		Resistive	Inductive	Motor	Lamp	
26.5	M39016/92/ -024Z -048Z -062Z -069Z	2	9	1.0	0.2	---	0.1	0.1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	.187 .187 .500 .500			
"	M39016/132/ Flange A -115Z -060Z -063Z Flange B -066Z -069Z -072Z No mount -057Z -078Z -091Z	3	"	2.0	0.3	"	0.125	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	SP L ML L ML SP SP ML L			
"	M39016/172/ -030Z -036Z	2	"	1.0	0.2	"	0.1 0.1	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	.187 .500			
"	M39016/342/ Bracket -007Z No mount -008Z -012Z 4/ Tab mount -009Z Flange mount -015Z 4/	"	6	"	"	"	---	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	ML SP SKP SP SKP			

DPDT CONTACTS - 2 FORM C - Continued

See footnotes at end of table.

TABLE 101.1. Relays, EM, ER, dc operated, part numbers and characteristics - Continued.

Rated coil voltage	Part number	Figure number	Shock (see table II)	Vibration (see table III)	System voltage and frequency - contact current in amperes																					Terminal style (see table V)
					28 V dc			400 Hz			50/60 Hz			115 V 1-phase			115/200 V 3-phase			115 V 1 phase			115/200 V 3-phase			
					Resistive	Inductive	Motor	Resistive	Inductive	Motor	Resistive	Inductive	Motor	Resistive	Inductive	Motor	Resistive	Inductive	Motor	Resistive	Inductive	Motor	Resistive	Inductive	Motor	
5.0	M39016/152/ -040Z -052Z -082Z -088Z -094Z -100Z	101-15	2	9	1.0	0.2	0.1	0.1	0.1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	.187 .187 .500 .500 .500 .500		
"	M39016/182/ -025Z -031Z	101-16 101-16	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	.187 .500		
"	M39016/372/ No mount -001Z -002Z	101-33 101-33	3	"	2.0 2.0	0.3 0.3	" "	0.125 0.125	" "	" "	" "	" "	" "	" "	" "	" "	" "	" "	" "	" "	" "	" "	" "	SP WL		
6.0	M39016/152/ -035Z -047Z -077Z -083Z -089Z -095Z	101-15	2	"	1.0	0.2	"	0.1	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	.187 .187 .500 .500 .500		
"	M39016/182/ -026Z -032Z	101-16 101-16	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	.187 .500		
"	M39016/372/ No mount -003Z -004Z	101-33 101-33	3	"	2.0 2.0	0.3 0.3	" "	0.125 0.125	" "	" "	" "	" "	" "	" "	" "	" "	" "	" "	" "	" "	" "	" "	" "	SP WL		

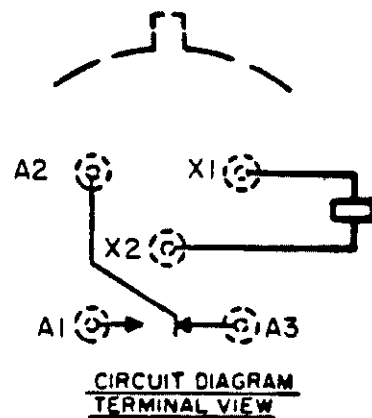
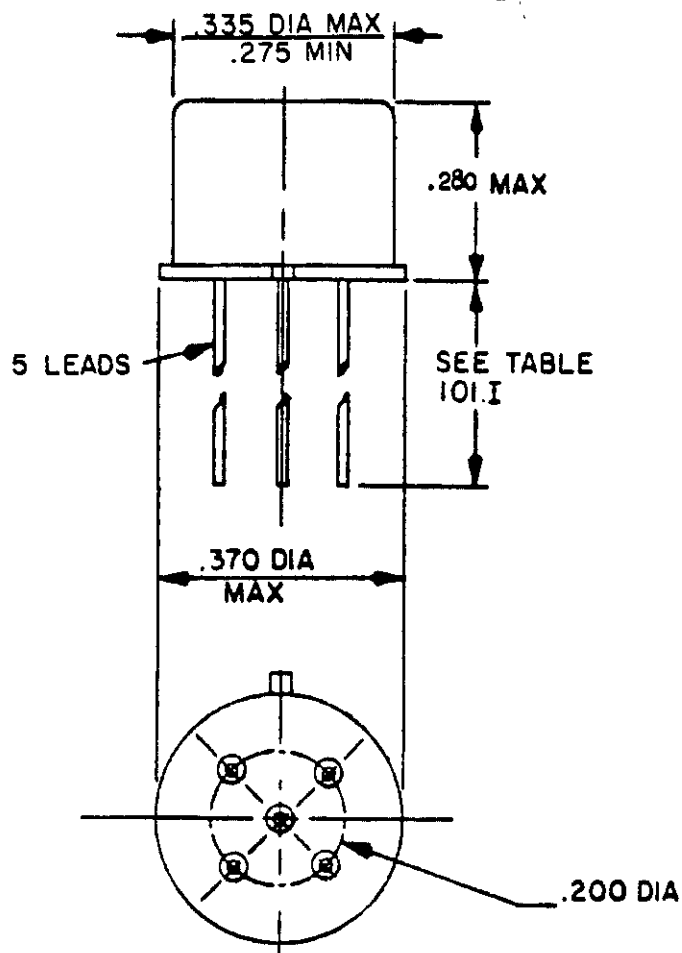
DPDT CONTACTS - 2 FORM C - WITH DIODE COIL TRANSIENT SUPPRESSION

See footnotes at end of table.

TABLE 101.1. Relays, EM, ER, dc operated, part numbers and characteristics - Continued.

Rated coil voltage	Part number	Figure Shock (see table II)	Vibration (see table III)	System voltage and frequency - contact current in amperes												Terminal style (see table IV)	
				28 V dc				400 Hz				50/60 Hz					
				Resistive	Inductive	Motor Lamp	Resistive	Inductive	Motor Lamp	Resistive	Inductive	Motor Lamp	Resistive	Inductive	Motor Lamp		Resistive
DPDT CONTACTS - 2 FORM C - WITH DIODE COIL TRANSIENT SUPPRESSION - Continued																	
26.5	M39016/182/ -039Z -051Z -081Z -087Z -093Z -099Z	2	9	1.0	0.2	0.1	0.1	0.1	---	---	---	---	---	---	---	---	.187 .187 .500 .500 .500
"	M39016/182/ -030Z -036Z	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	.187 .900
"	M39016/372/ No mount -021Z -022Z Flange A -023Z -024Z Flange B -025Z -026Z -027Z	3	"	2.0	0.3	"	"	0.125	"	"	"	"	"	"	"	"	SP ML L ML SP L ML
DPDT CONTACTS - 2 FORM C - WITH COIL TRANSIENT SUPPRESSION																	
6.0	M39016/222/ Flange B -018Z -019Z Flange C -021Z No mount -023Z	3	9	2.0	0.50	---	0.100	---	---	---	---	---	---	---	---	---	L SP L SP

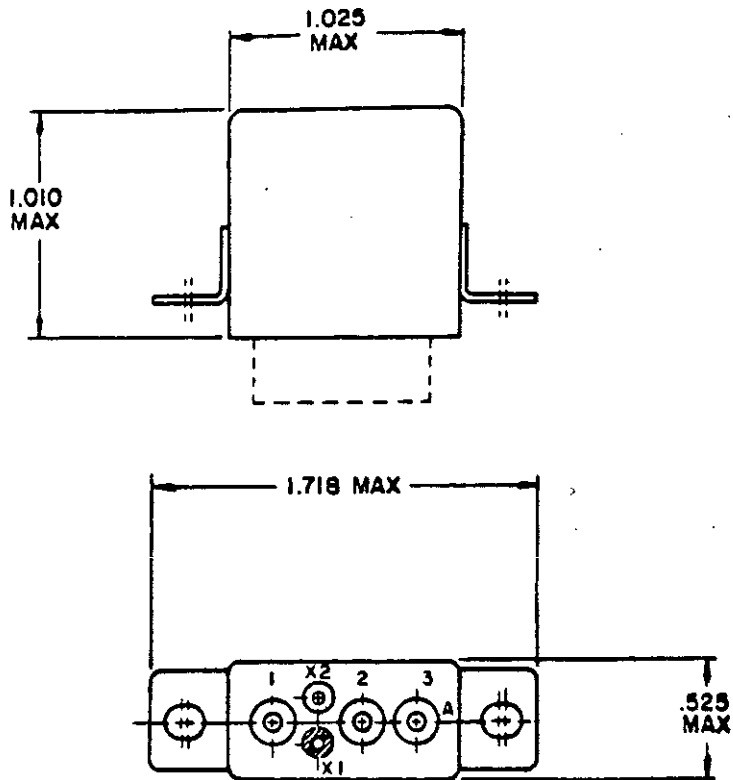
See footnotes at end of table.



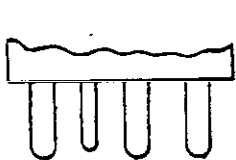
INCHES	MM
.200	5.08
.275	6.99
.280	7.11
.335	8.51
.370	9.40

FIGURE 101-1. Relay, EM, ER, SPDT, low level to 1 ampere (MIL-R-39016/7).

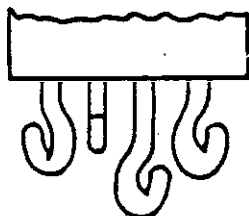
MIL-STD-1346B



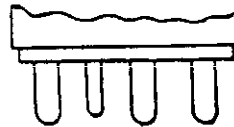
CONFIGURATION A



SOLDER PIN TERMINAL (SP)



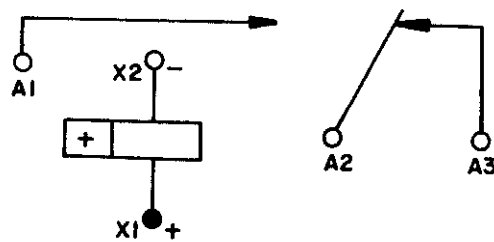
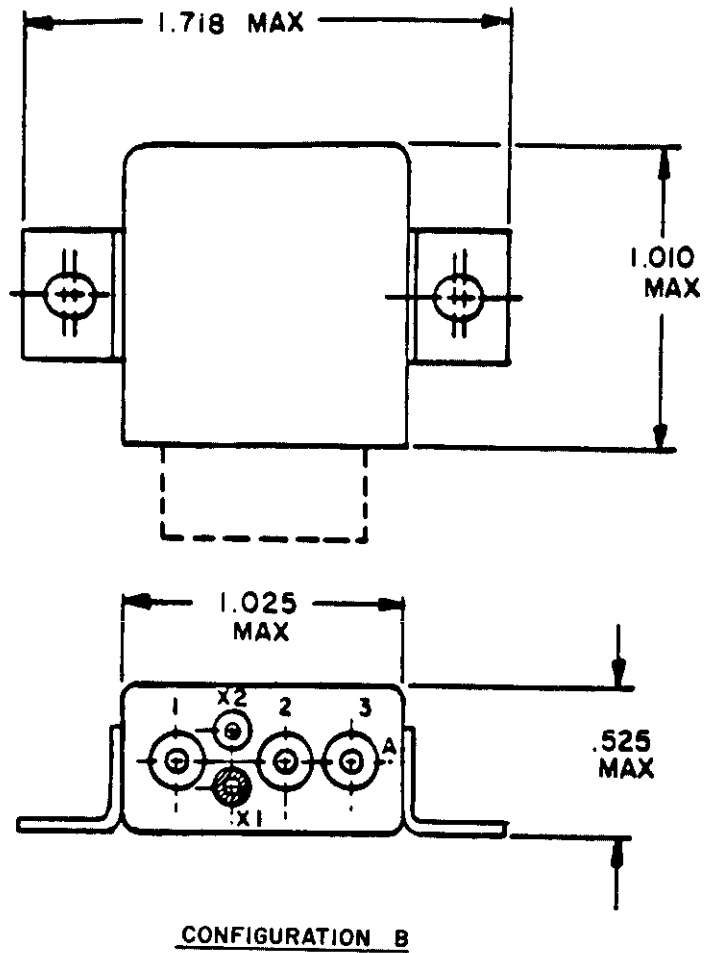
SOLDER HOOK TERMINAL (L)



SOCKET PIN TERMINAL (SKP)

FIGURE 101-2. Relay, EM, ER, SPDT, 25 amperes (MIL-R-6106/19).

MIL-STD-1346B

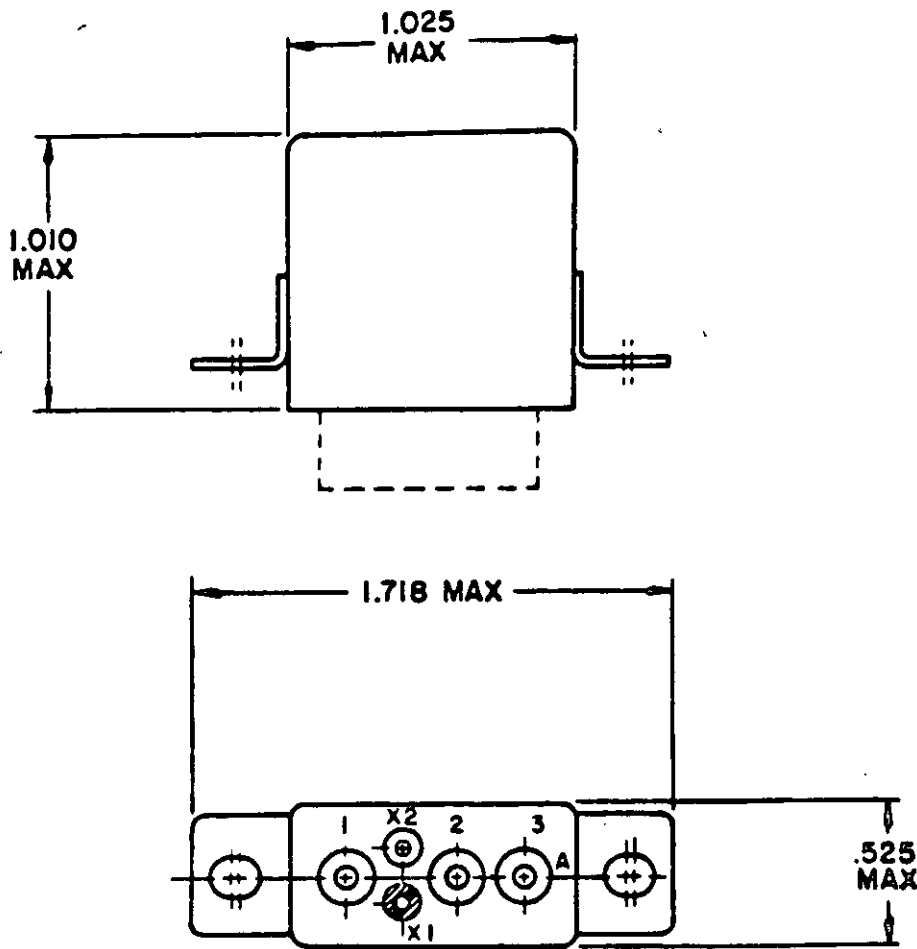


INCHES	MM
.525	13.34
1.010	25.65
1.025	26.04
1.718	43.64

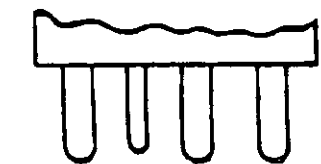
CIRCUIT DIAGRAM

FIGURE 101-2. Relay, EM, ER, SPDT, 25 amperes (MIL-R-6106/19) - Continued.

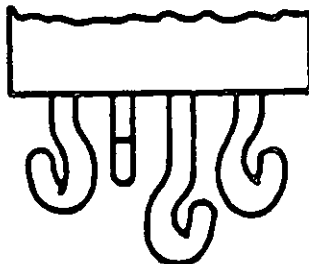
MIL-STD-1346B



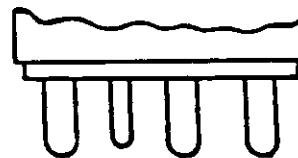
CONFIGURATION A



SOLDER PIN TERMINAL (SP)



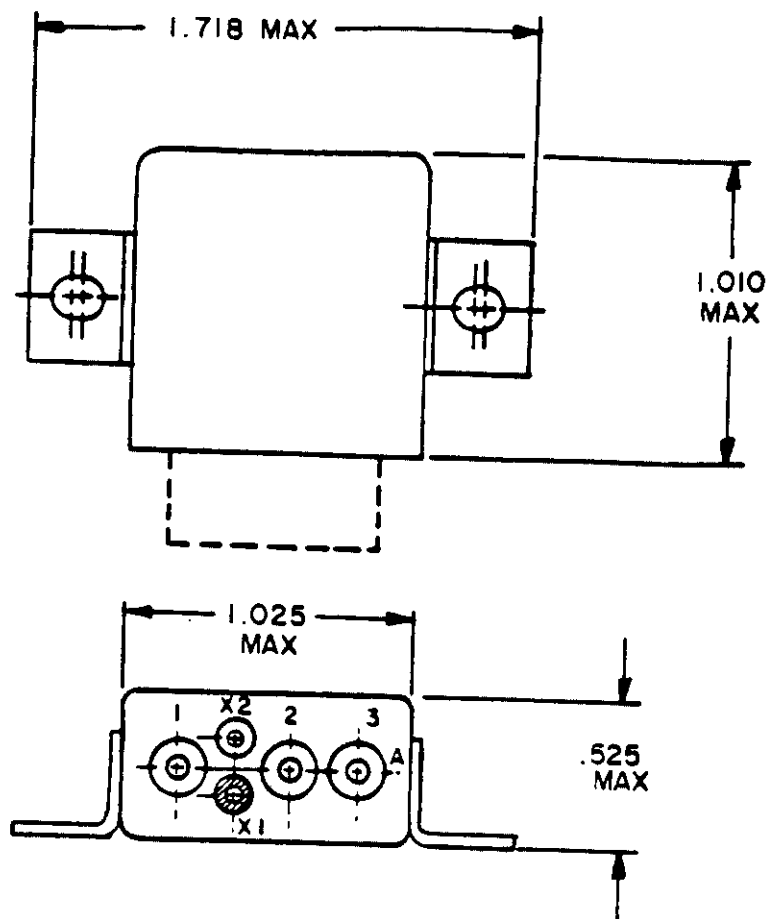
SOLDER HOOK (L)



SOCKET PIN TERMINAL (SKP)

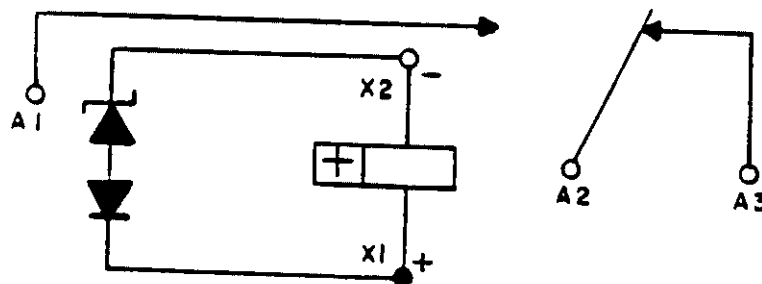
FIGURE 101-3. Relay, EM, ER, SPDT, 25 amperes with coil suppression (MIL-R-6106/19).

MIL-STD-1346B



CONFIGURATION B

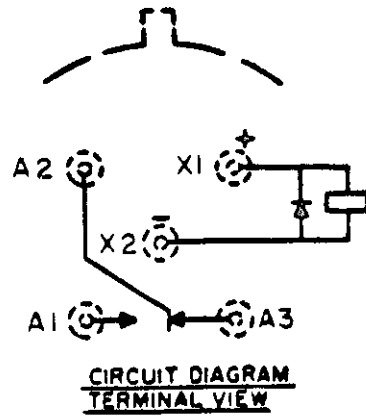
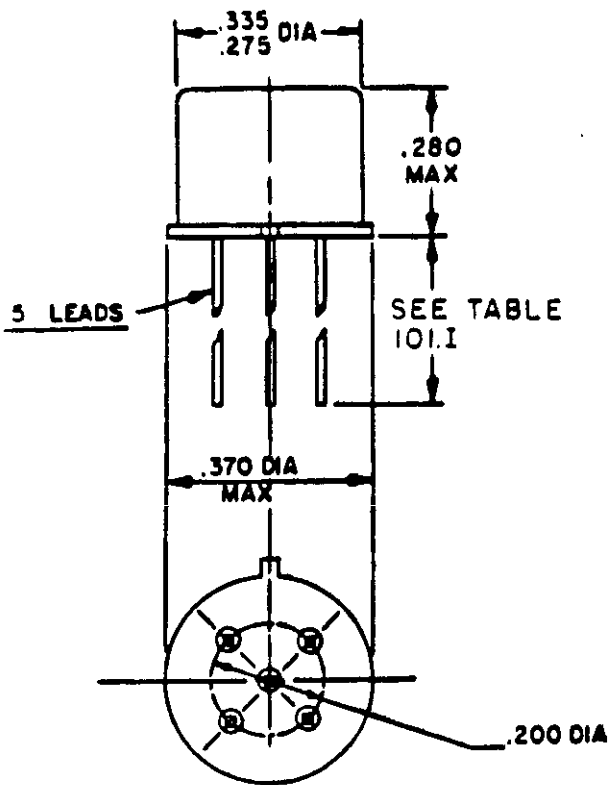
INCHES	MM
.525	13.34
1.010	25.65
1.025	26.04
1.718	43.64



CIRCUIT DIAGRAM

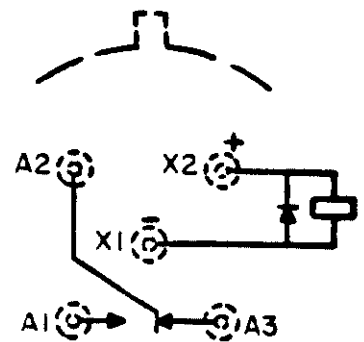
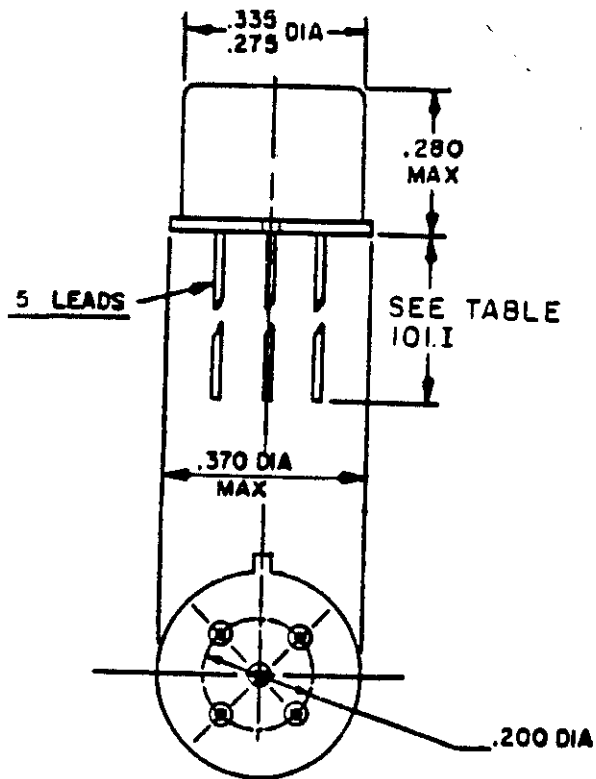
FIGURE 101-3. Relay, EM, ER, SPDT, 25 amperes with coil suppression (MIL-R-6106/19) - Continued.

MIL-STD-1346B



INCHES	MM
.200	5.08
.275	6.99
.280	7.11
.335	8.51
.370	9.40

FIGURE 101-4. Relay, EM, ER, SPDT, low level to 1 ampere, with internal diode for coil transient suppression (MIL-R-39016/23).

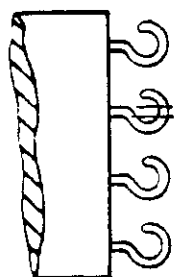
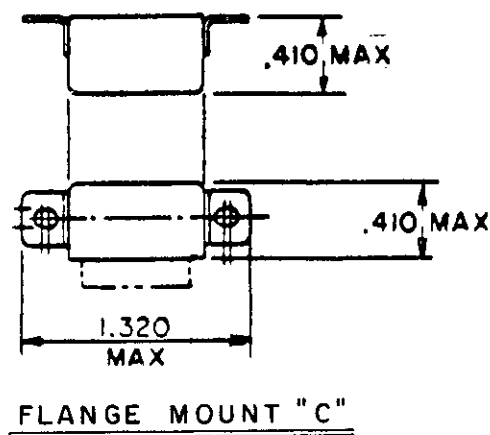
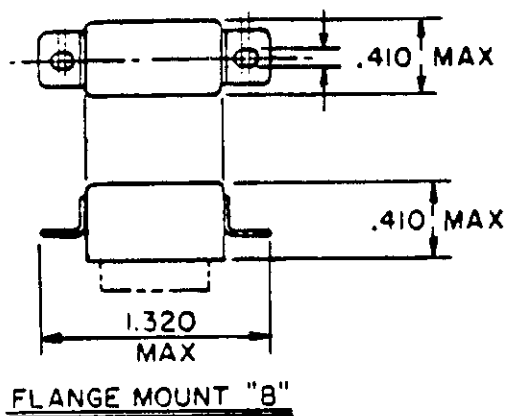
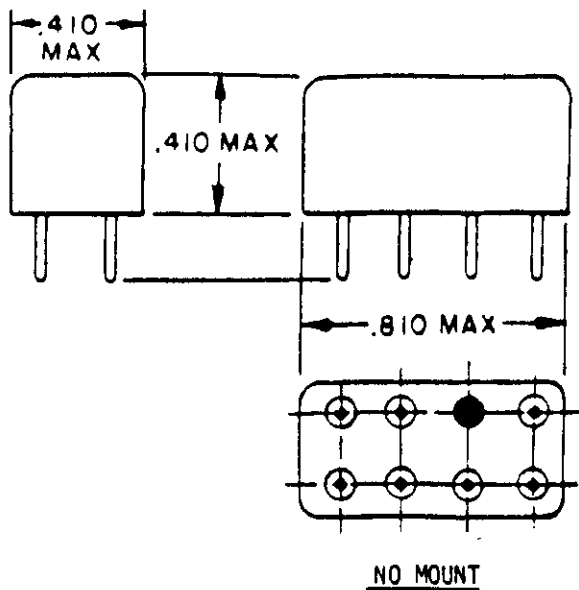
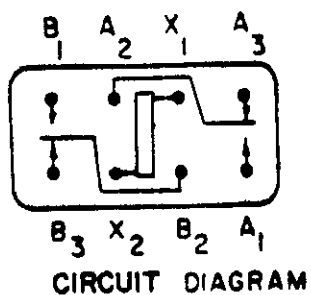


CIRCUIT DIAGRAM
TERMINAL VIEW

INCHES	MM
.200	5.08
.275	6.99
.280	7.11
.335	8.51
.370	9.40

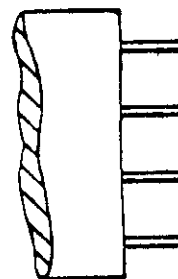
FIGURE 101-5. Relay, EM, ER, SPDT, low level to 1 ampere, with internal diodes for coil transient suppression and polarity reversal protection (MIL-R-39016/24).

MIL-STD-1346B



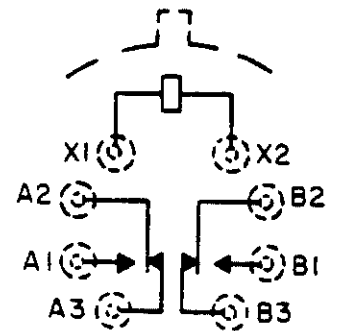
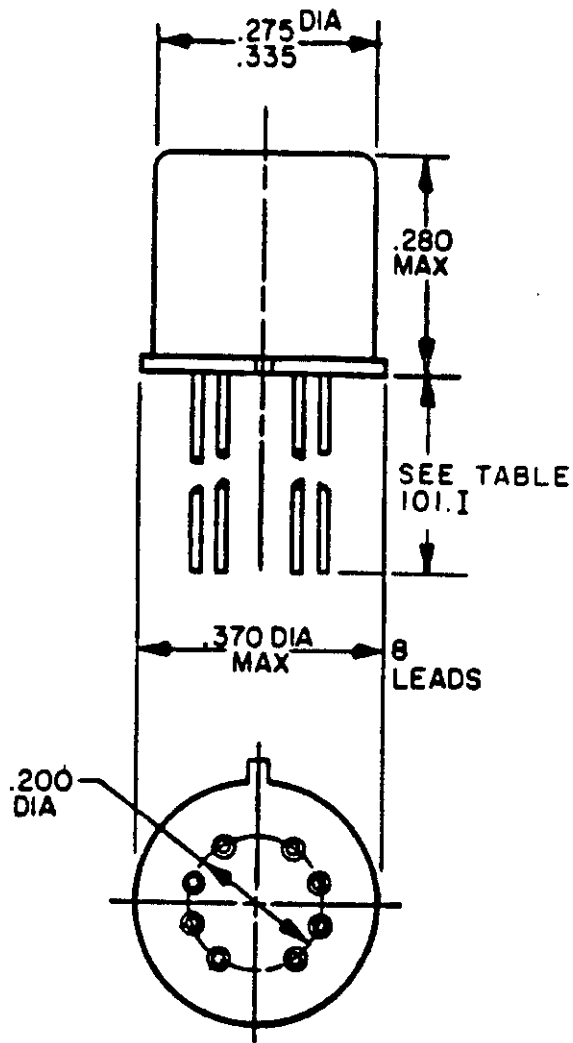
SOLDER LUG

INCHES	MM
.410	10.41
.810	20.57
1.320	33.53



PIN
(PRINTED CIRCUIT)

FIGURE 101-6. Relay, EM, ER, DPDT, low level to 2 amperes (MIL-R-39016/6).

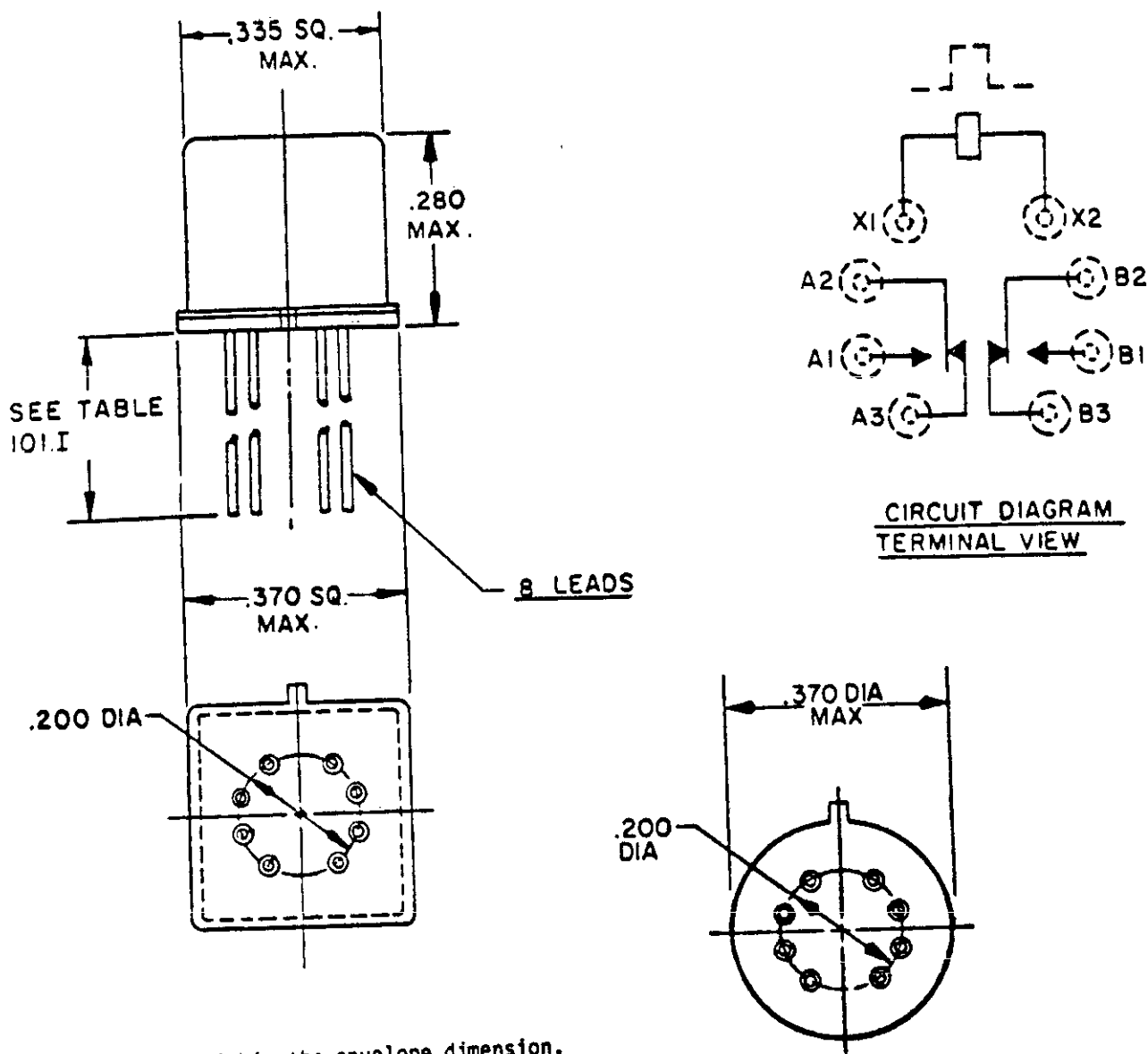


CIRCUIT DIAGRAM
TERMINAL VIEW

INCHES	MM
.200	5.08
.275	6.99
.280	7.11
.335	8.51
.370	9.40

FIGURE 101-7. Relay, EM, ER, DPDT, low level to 1 ampere (MIL-R-39016/9).

MIL-STD-1346B



Shape optional within the envelope dimension.

INCHES	MM
.200	5.08
.280	7.11
.335	8.51
.370	9.40

FIGURE 101-7. Relay, EM, ER, DPDT, low level to 1 ampere (MIL-R-39016/9) - Continued.

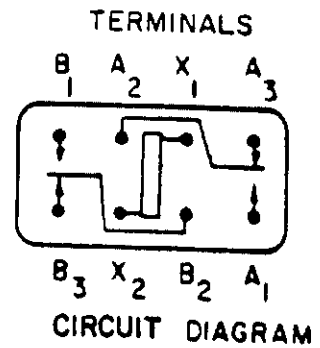
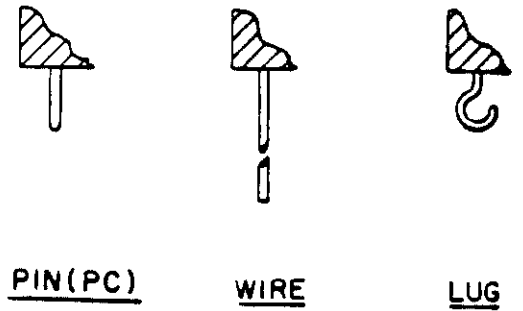
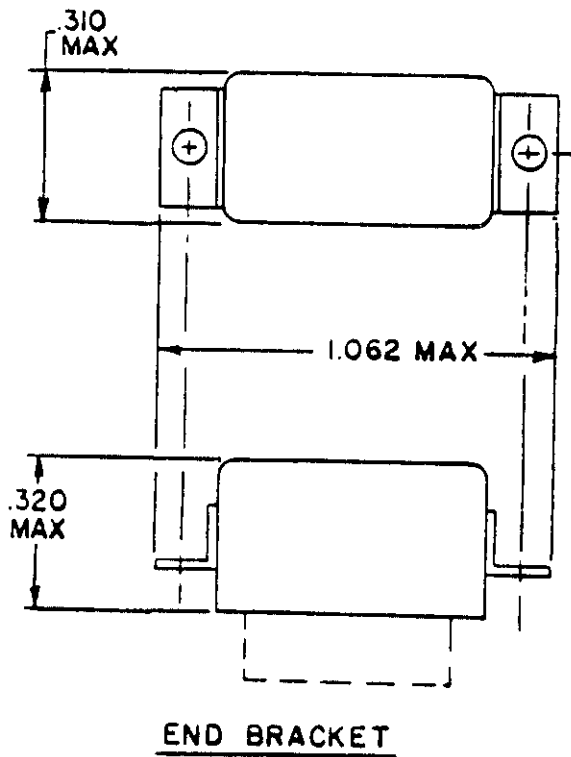
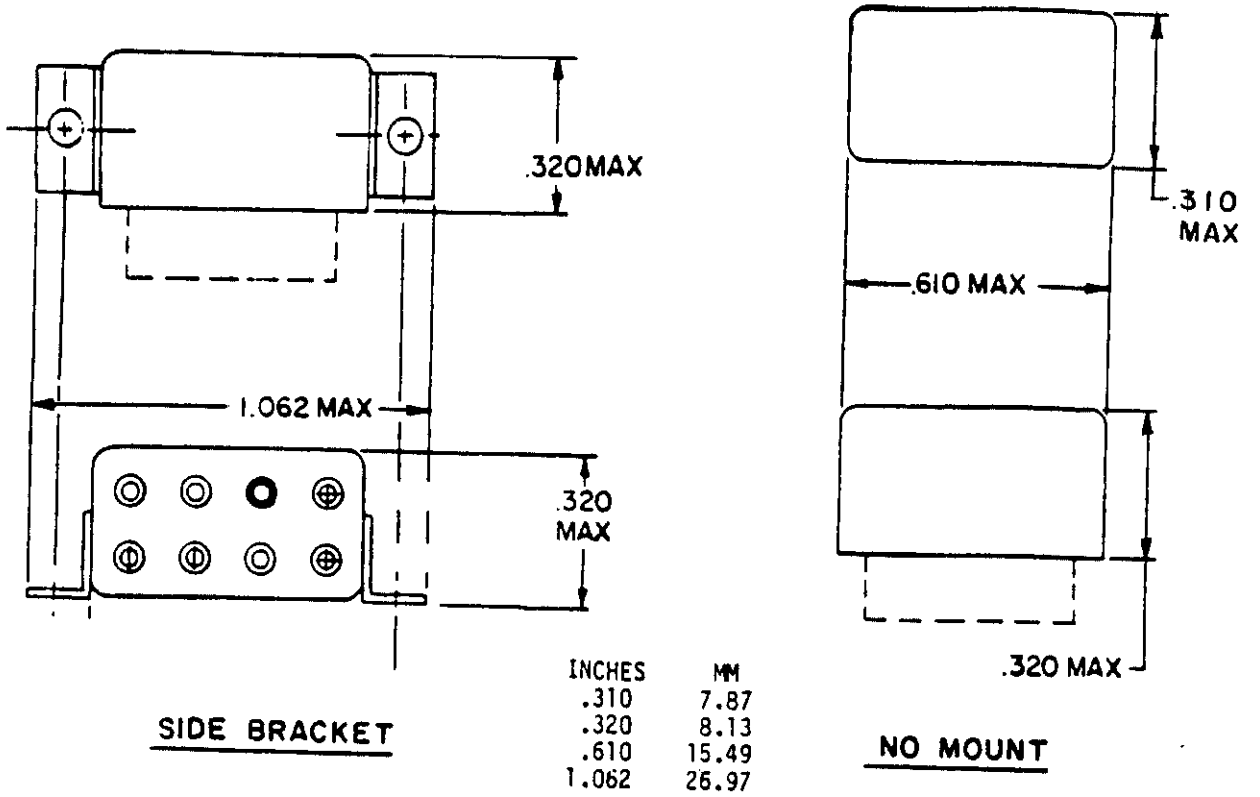
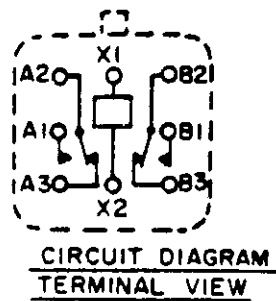
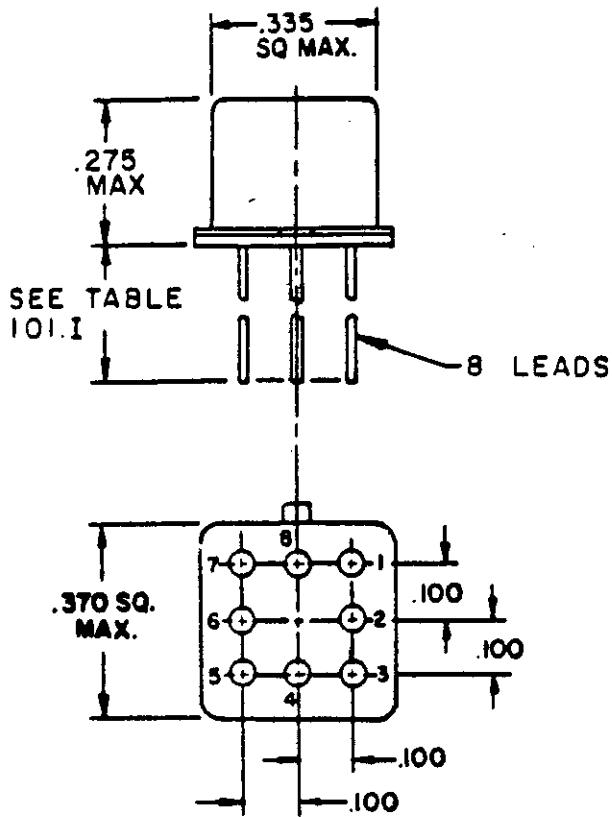


FIGURE 101-8. Relay, EM, ER, DPDT, low level to 2 amperes (MIL-R-39016/13).

MIL-STD-1346B



INCHES	MM
.100	2.54
.275	6.99
.335	8.51
.370	9.40

FIGURE 101-9. Relay, EM, ER, DPDT, low level to 1 ampere, terminals 0.100 inch grid pattern (MIL-R-39016/17).

MIL-STD-1346B

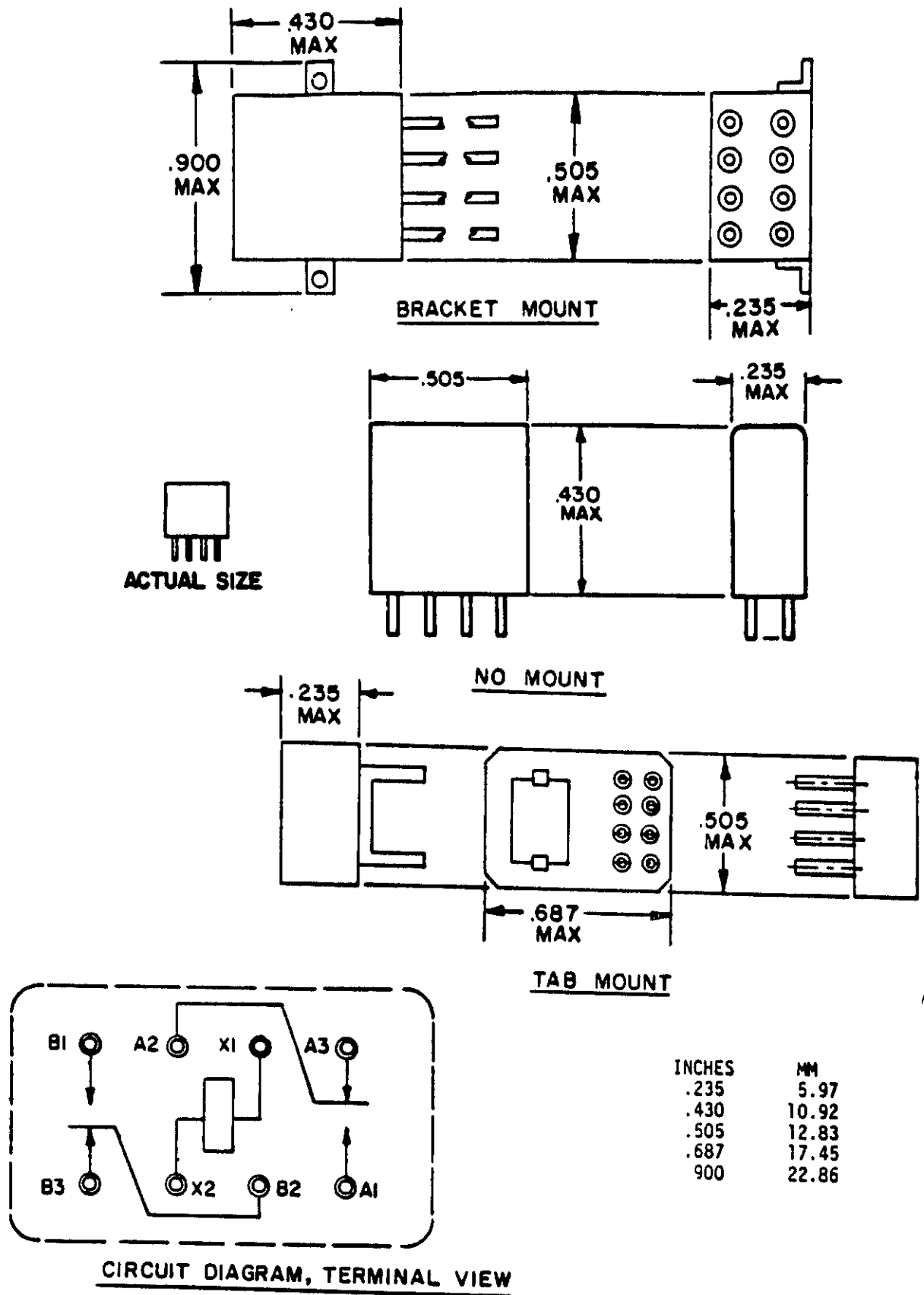
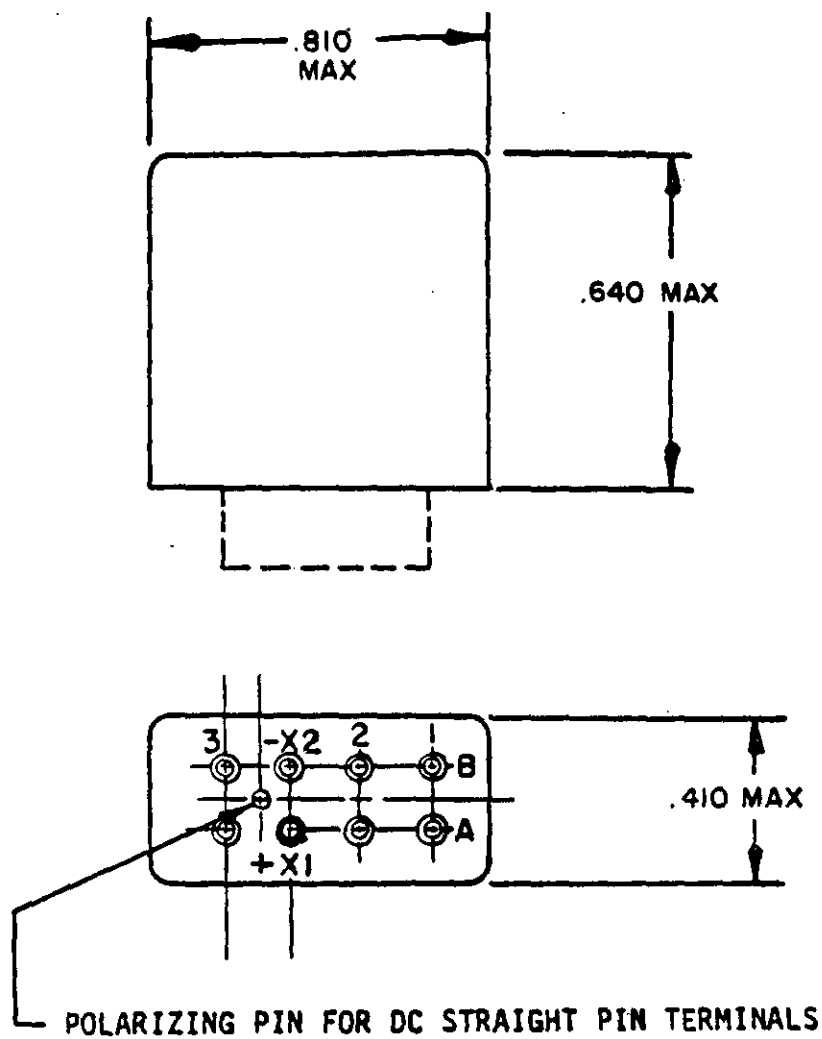


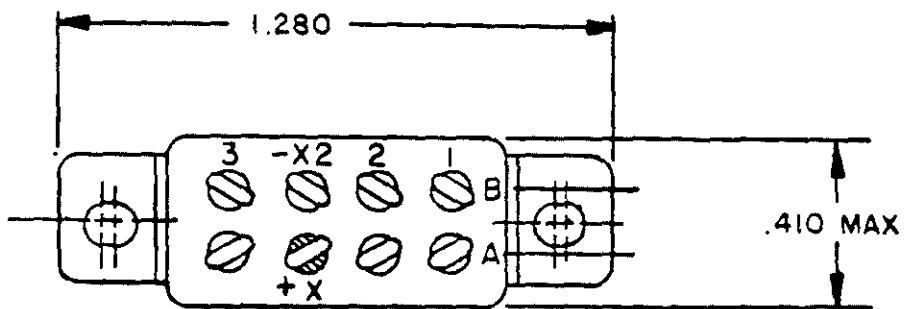
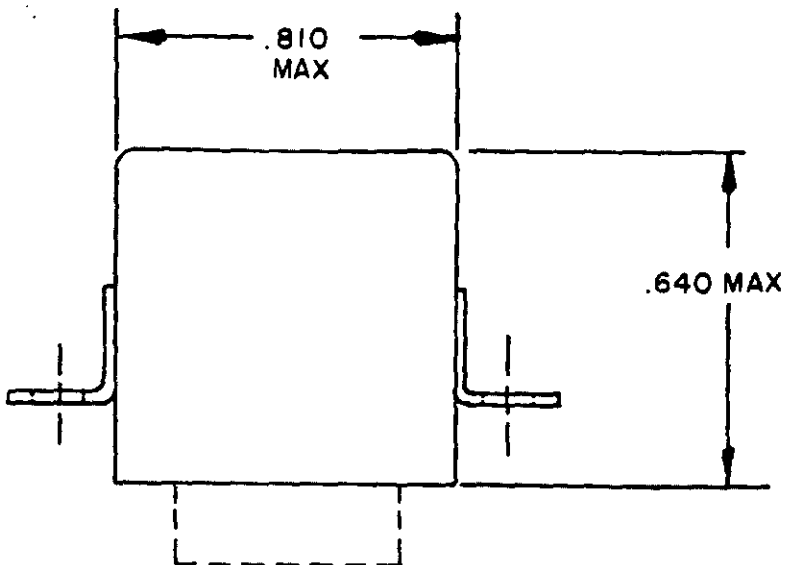
FIGURE 101-10. Relay, EM, ER, DPDT, low level to 1 ampere (MIL-R-39016/34).

MIL-STD-1346B



CONFIGURATION A

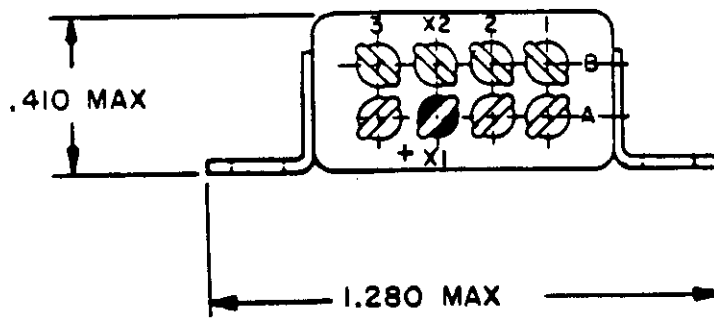
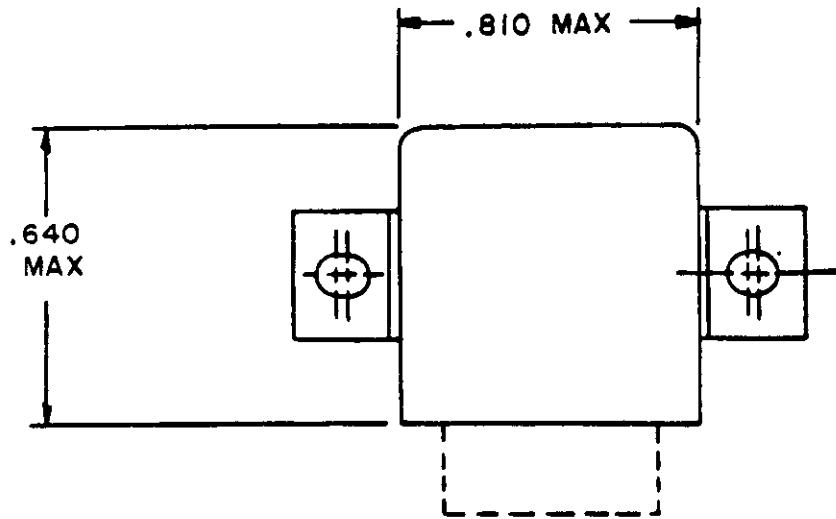
FIGURE 101-11. Relay, EM, ER, DPDT, low level to 5 amperes (MIL-R-6106/27).



CONFIGURATION B

FIGURE 101-11. Relay, EM, ER, DPDT, low level to 5 amperes (MIL-R-6106/27) - Continued.

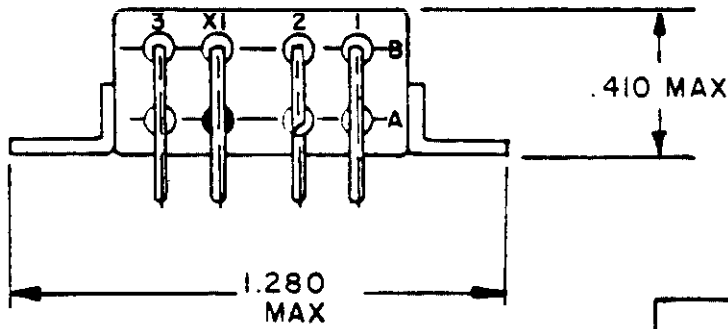
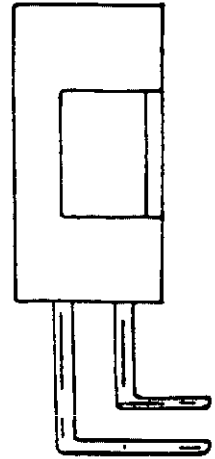
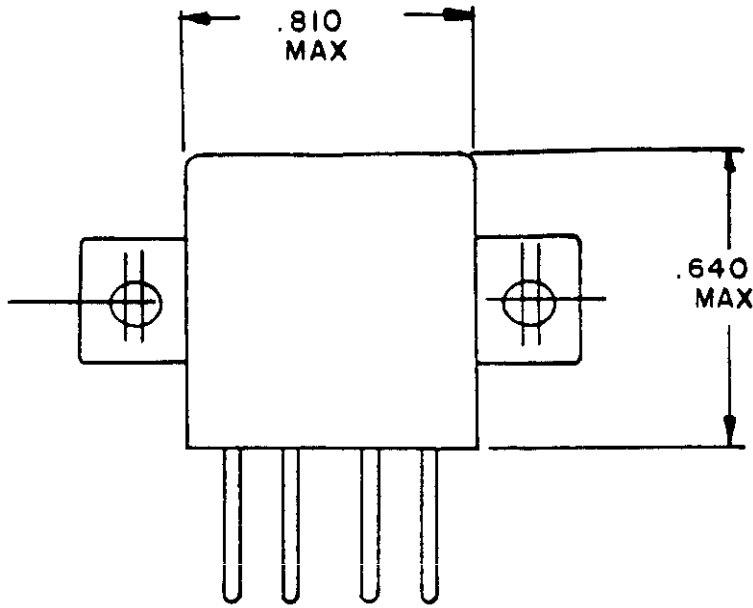
MIL-STD-1346B



CONFIGURATION C

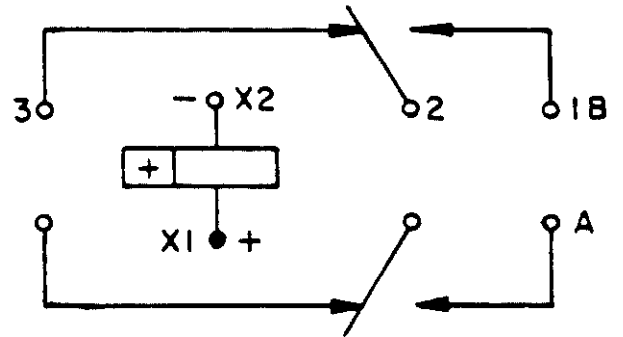
FIGURE 101-11. Relay, EM, ER, DPDT, low level to 5 amperes (MIL-R-6106/27) - Continued.

MIL-STD-1346B

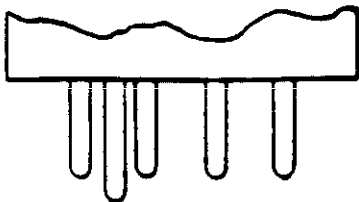


INCHES	MM
.410	10.41
.640	16.26
.810	20.57
1.280	32.51

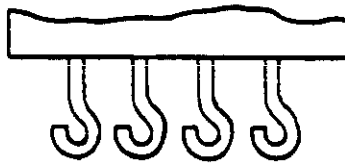
CONFIGURATION C (Continued)



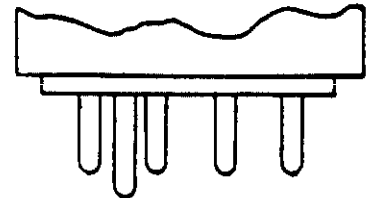
CIRCUIT DIAGRAM



SOLDER PIN



SOLDER HOOK



SOCKET PIN

FIGURE 101-11. Relay, EM, ER, DPDT, low level to 5 amperes (MIL-R-6106/27) - Continued.

MIL-STD-1346B

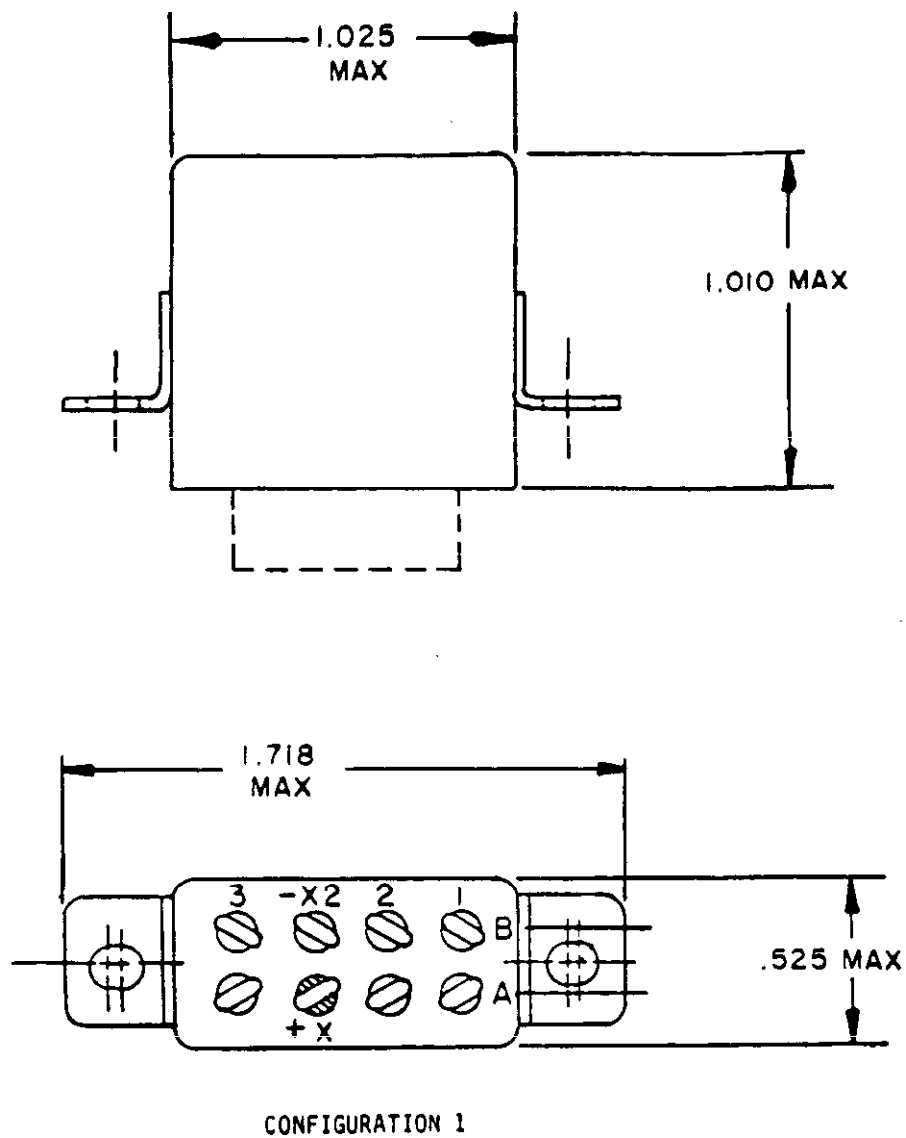
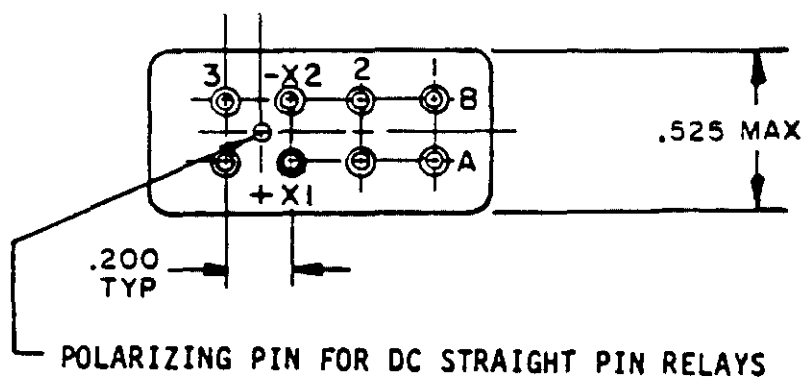
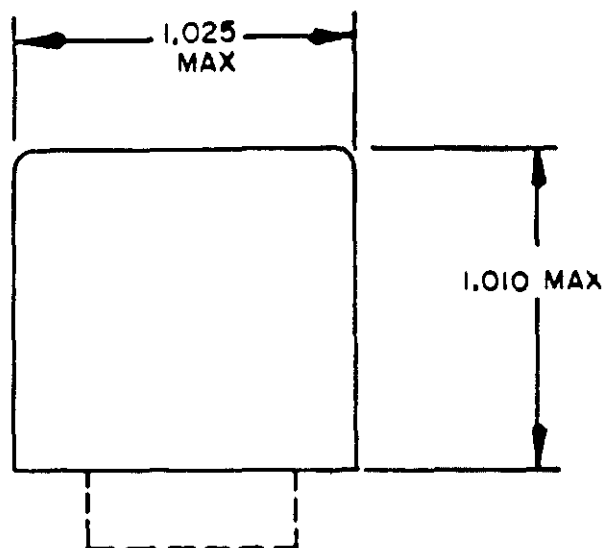


FIGURE 101-12. Relay, EM, ER, DPDT, 10 amperes (MS27401).

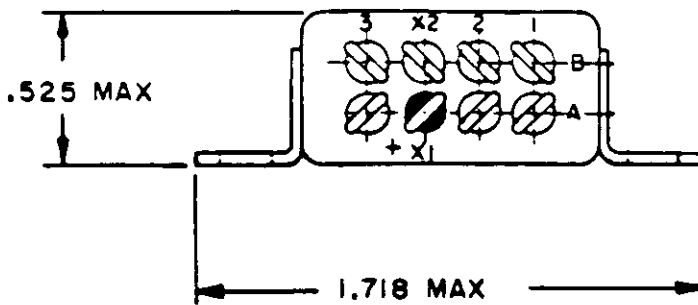
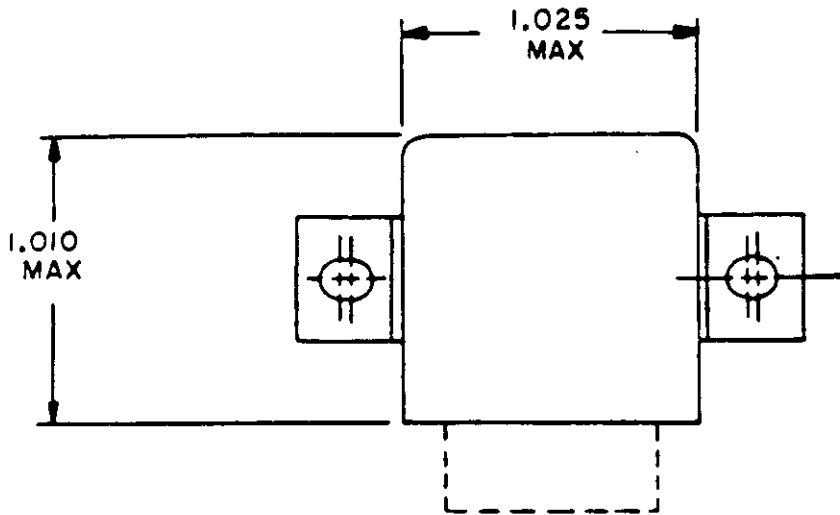
MIL-STD-1346B



CONFIGURATION 3

FIGURE 101-12. Relay, EM, ER, DPDT, 10 amperes (MS27401) - Continued.

MIL-STD-1346B



CONFIGURATION 2

FIGURE 101-12. Relay, EM, ER, DPDT, 10 amperes (MS27401) - Continued.

MIL-STD-1346B

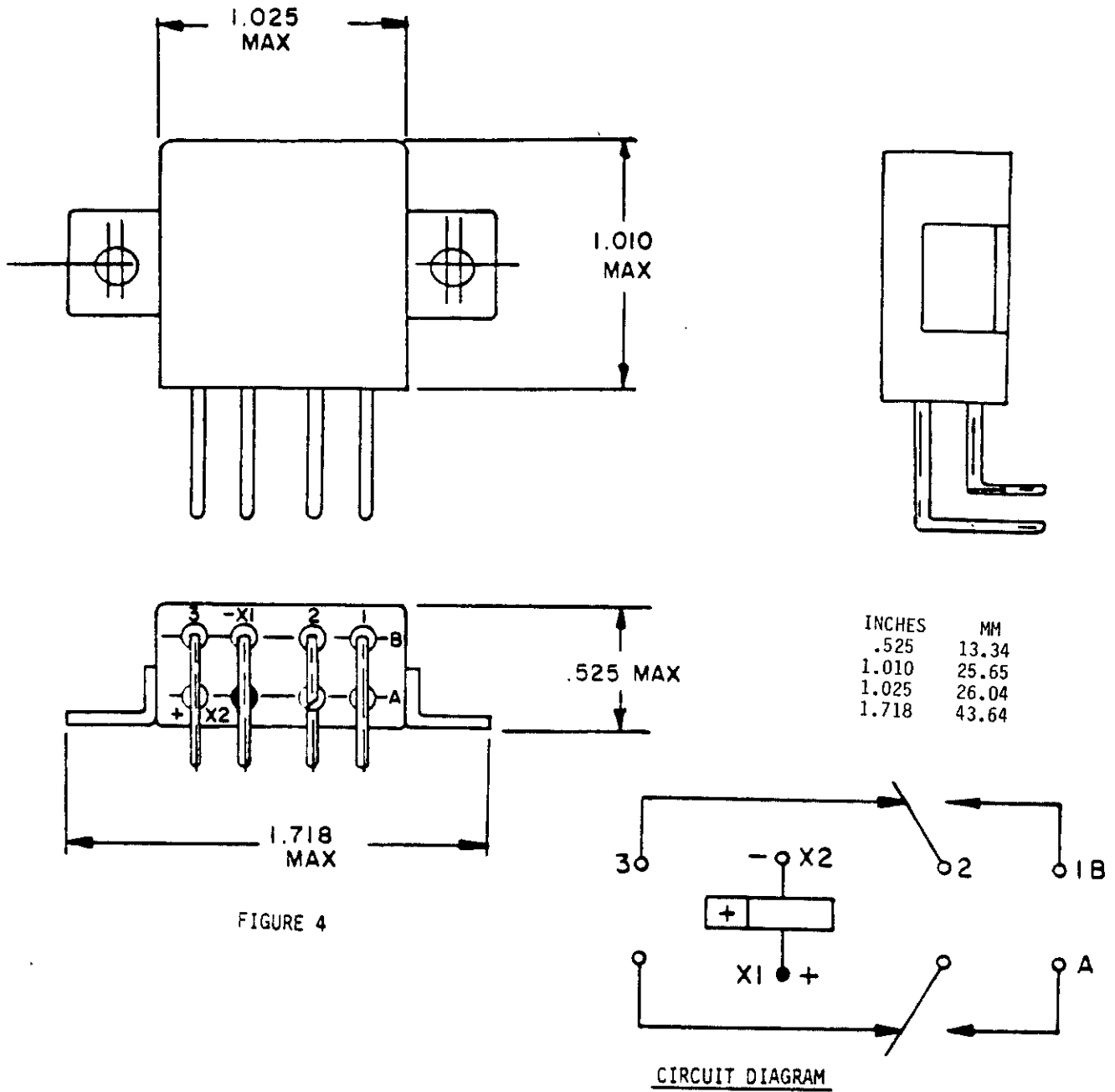
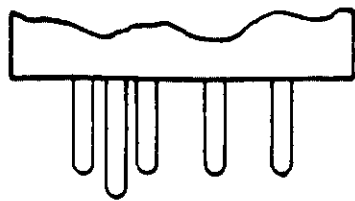
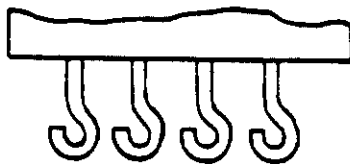


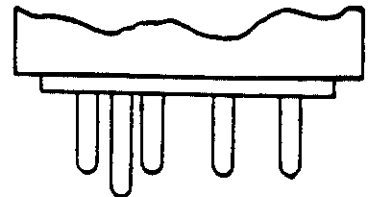
FIGURE 4



SOLDER PIN



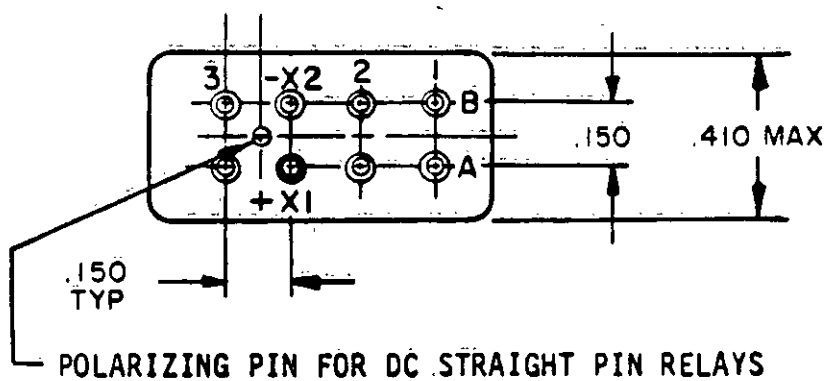
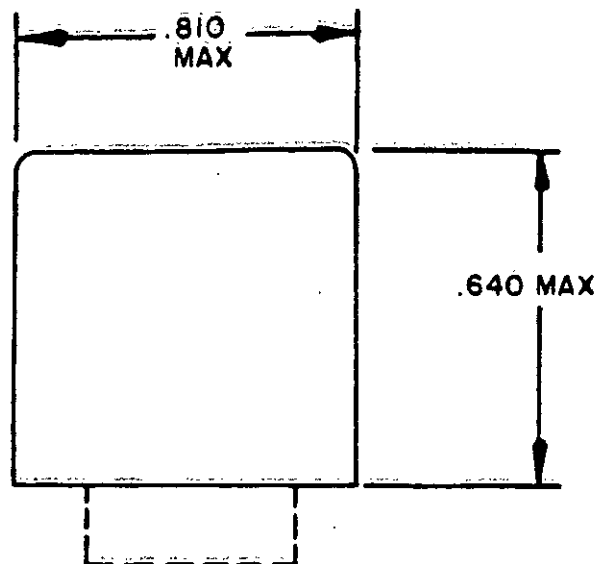
SOLDER HOOK



SOCKET PIN

FIGURE 101-12. Relay, EM, ER, DPDT, 10 amperes (MS27401) - Continued.

MIL-STD-1346B



CONFIGURATION A

FIGURE 101-13. Relay, EM, ER, DPDT, low level to 5 amperes, coil suppressed (MIL-R-6106/27).

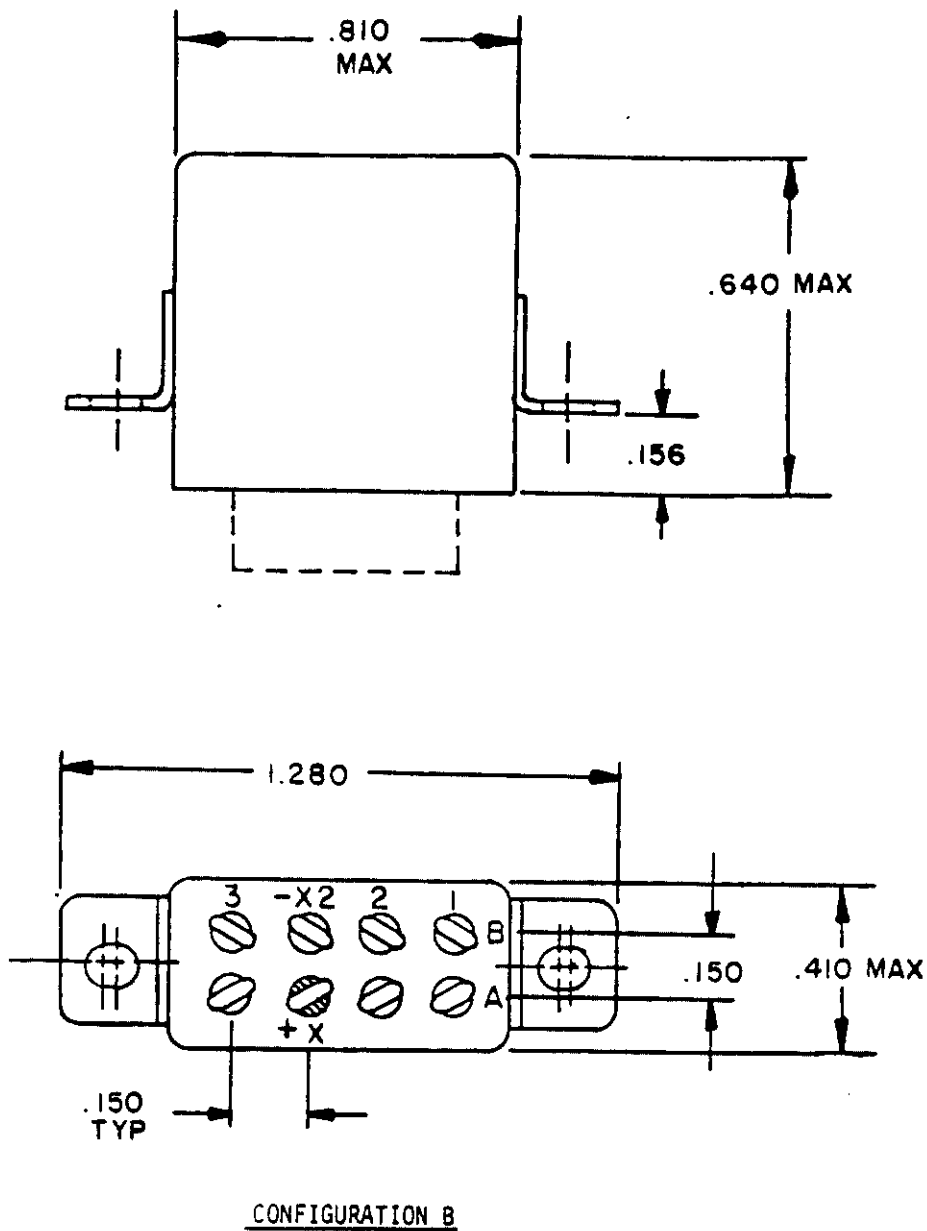
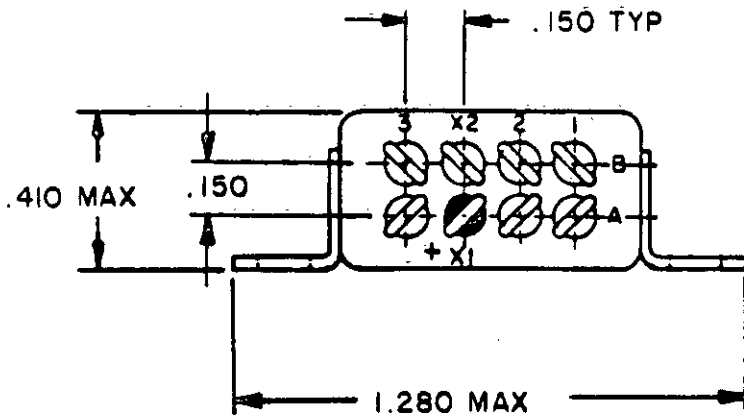
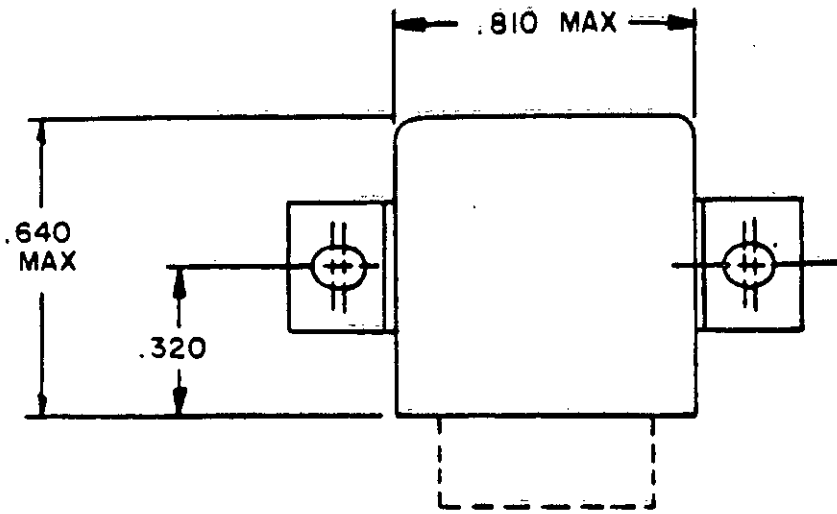


FIGURE 101-13. Relay, EM, ER, DPDT, low level to 5 amperes, coil suppressed (MIL-R-6106/27) - Continued.

MIL-STD-1346B



CONFIGURATION C

FIGURE 101-13. Relay, EM, ER, DPDT, low level to 5 amperes, coil suppressed (MIL-R-6106/27) - Continued.

MIL-STD-1346B

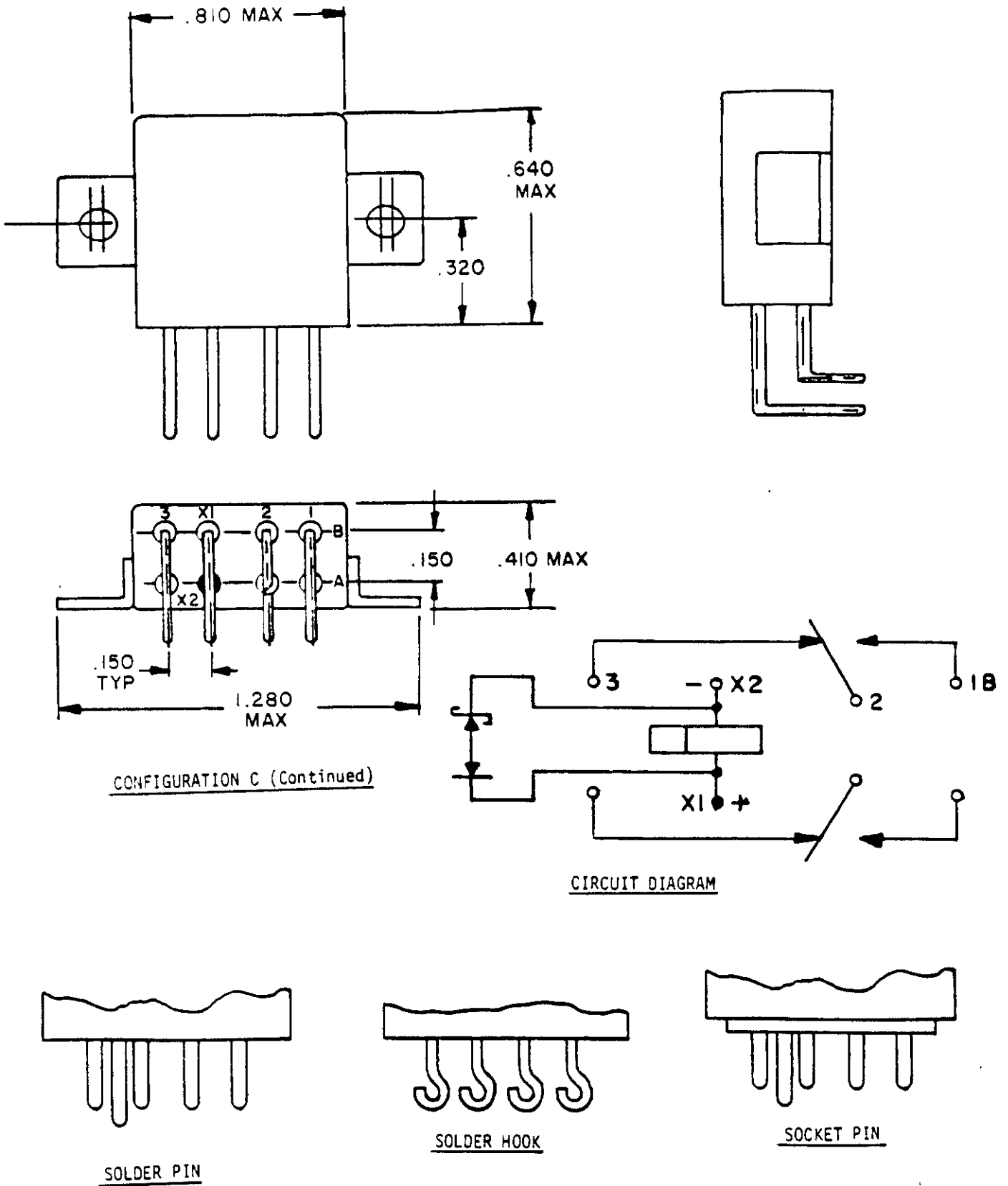
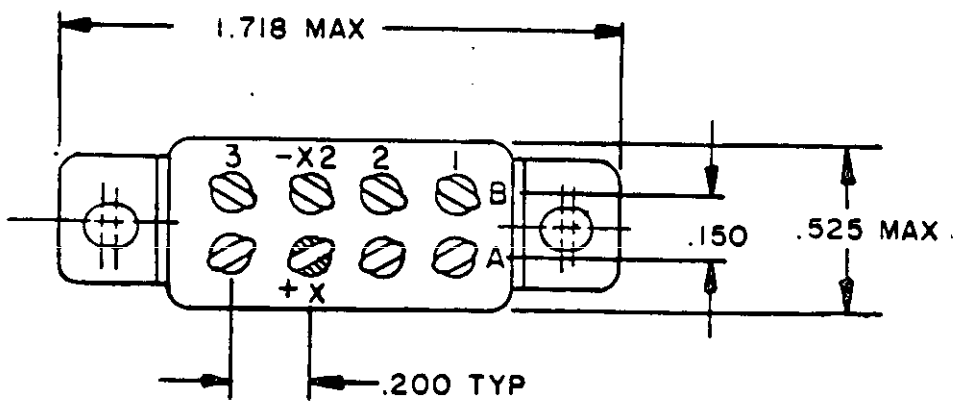
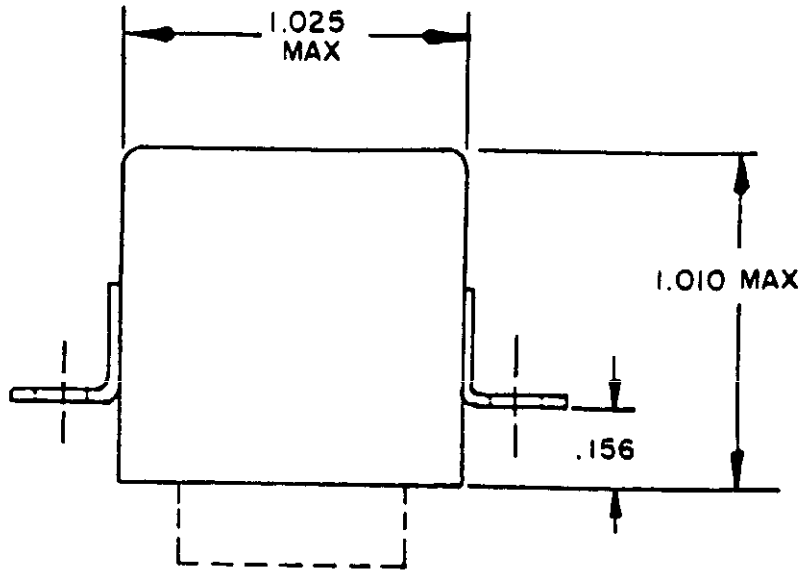


FIGURE 101-13. Relay, EM, ER, DPDT, low level to 5 amperes, coil suppressed (MIL-R-6106/27) - Continued.

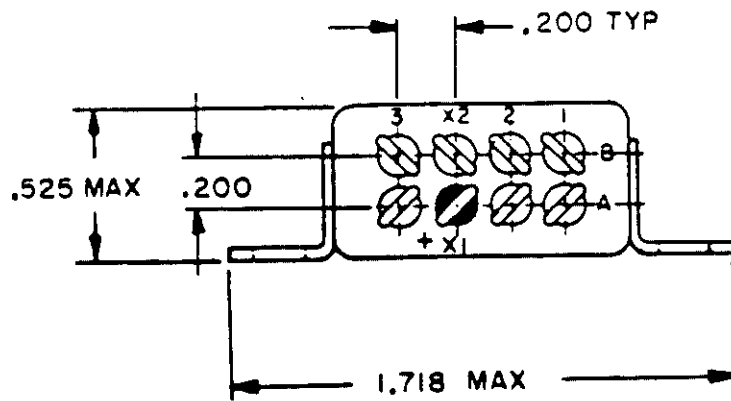
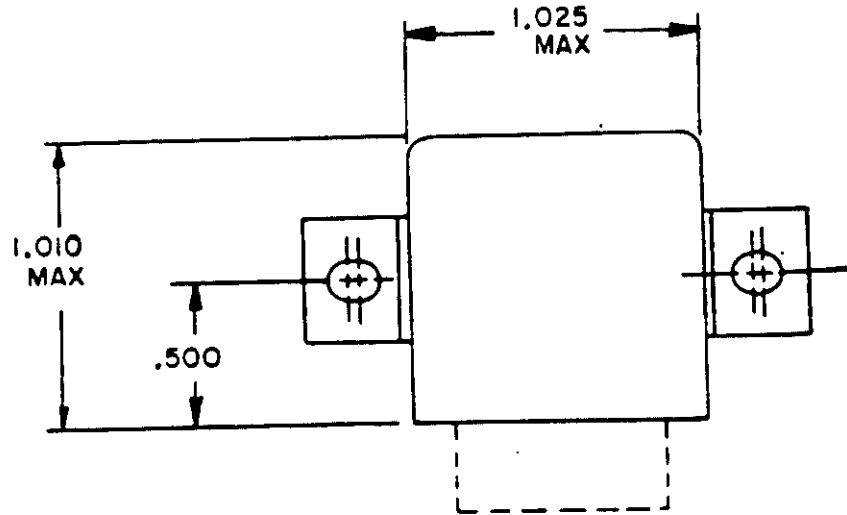
MIL-STD-1346B



CONFIGURATION I

FIGURE 101-14. Relay, EM, ER, DPDT, 10 amperes, coil suppressed (MS27401).

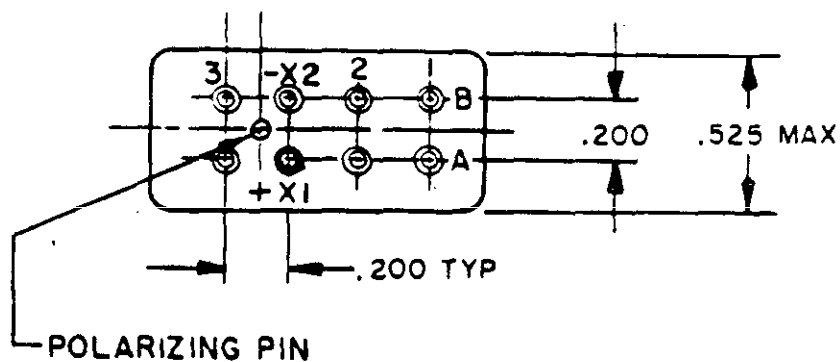
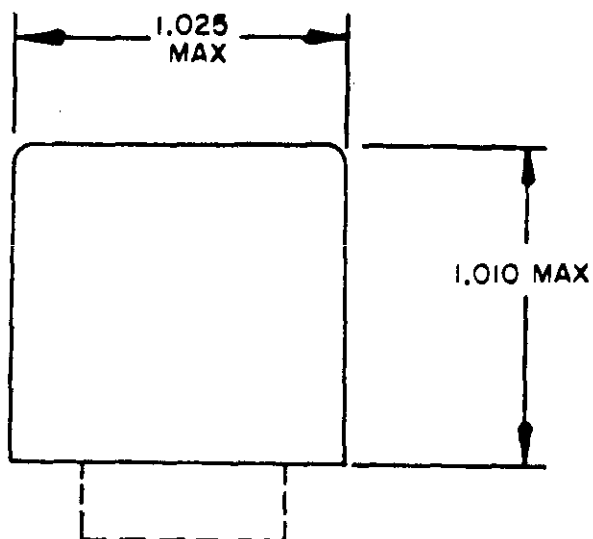
MIL-STD-1346B



CONFIGURATION 2

FIGURE 101-14. Relay, EM, ER, DPDT, 10 amperes, coil suppressed (MS27401) - Continued.

MIL-STD-1346B



CONFIGURATION 3
for dc straight pin terminals

FIGURE 101-14. Relay, EM, ER, DPDT, 10 amperes, coil suppressed (MS27401) - Continued.

MIL-STD-1346B

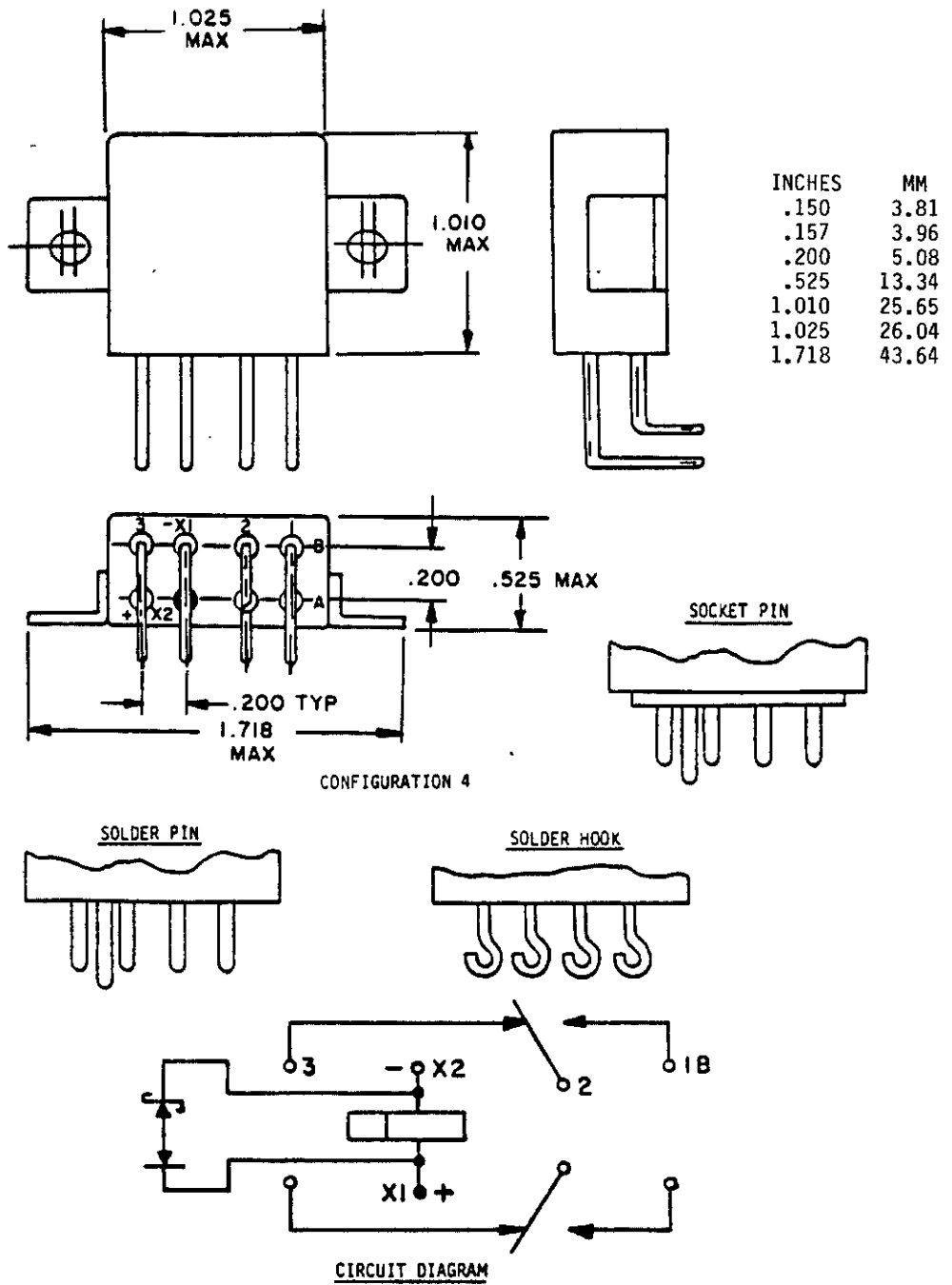
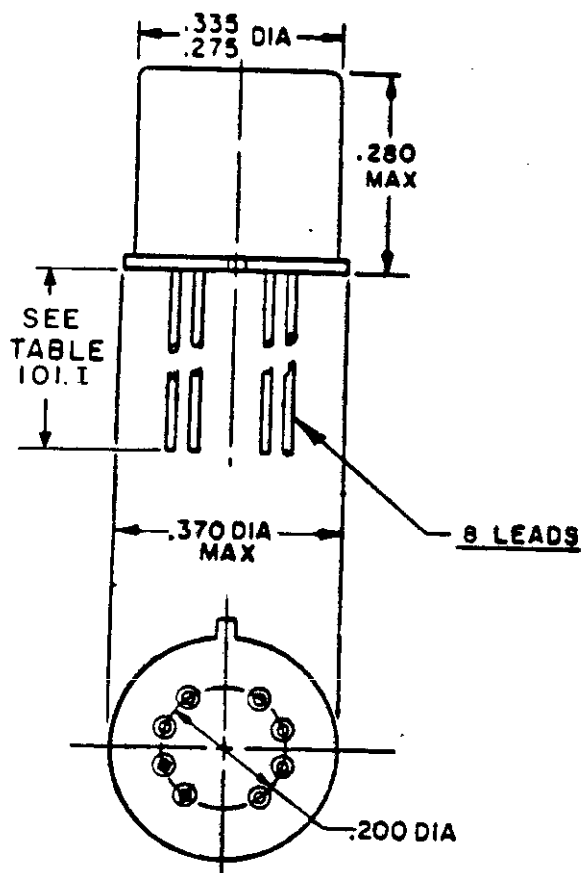


FIGURE 101-14. Relay, EM, ER, DPDT, 10 amperes, coil suppressed (MS27401) - Continued.

MIL-STD-1346B



INCHES	MM
.200	5.08
.275	6.99
.280	7.11
.335	8.51
.370	9.40

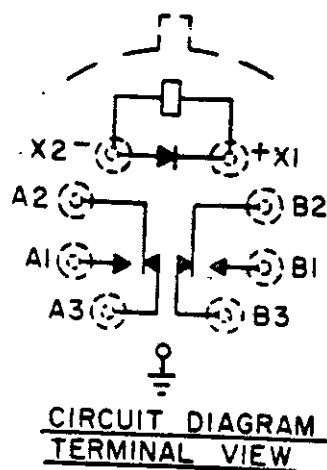
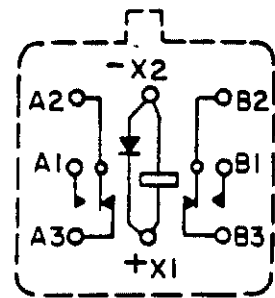
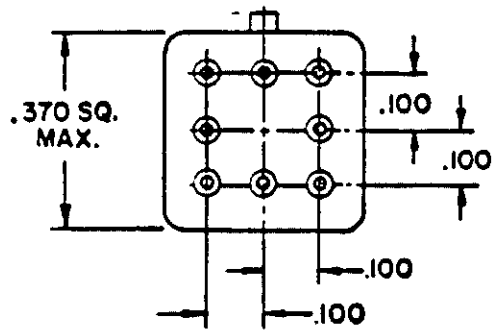
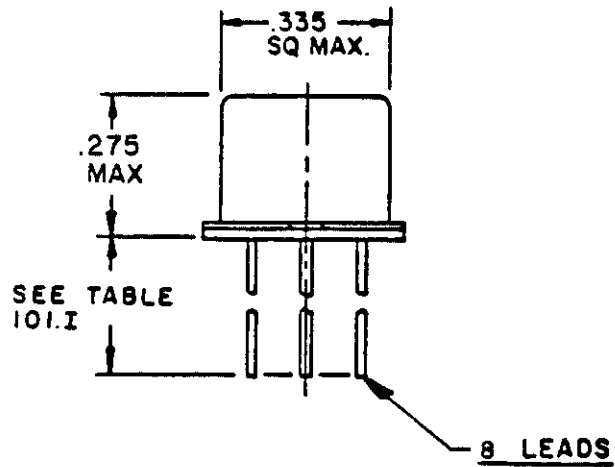


FIGURE 101-15. Relay, EM, ER, DPDT, low level to 1 ampere, with internal diode for coil transient suppression (MIL-R-39016/15).

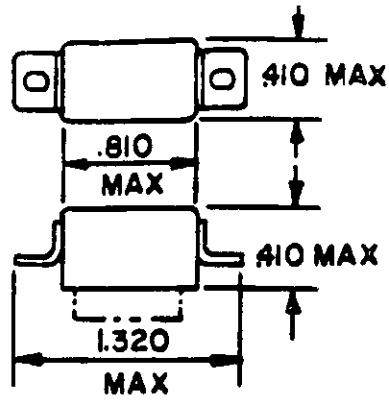


CIRCUIT DIAGRAM
TERMINAL VIEW

INCHES	MM
.100	2.54
.275	6.99
.335	8.51
.370	9.40

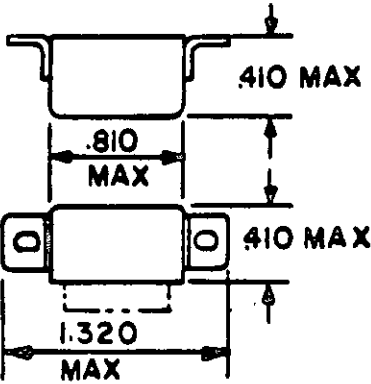
FIGURE 101-16. Relay, EM, ER, DPDT, low level to 1 ampere, with internal diode for coil transient suppression, terminals 0.100 inch grid pattern (MIL-R-39016/18).

MIL-STD-1346B



FLANGE MOUNT B

INCHES	MM
.410	10.41
.810	20.57
1.320	33.53



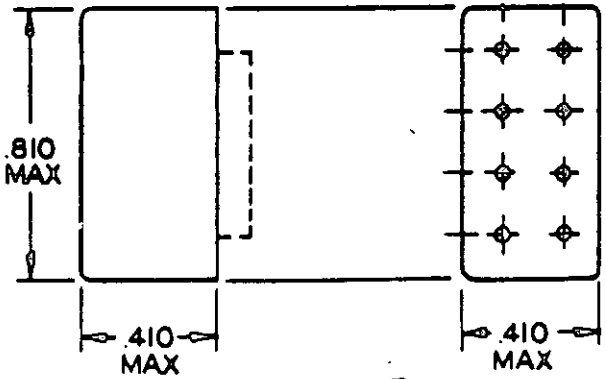
FLANGE MOUNT C



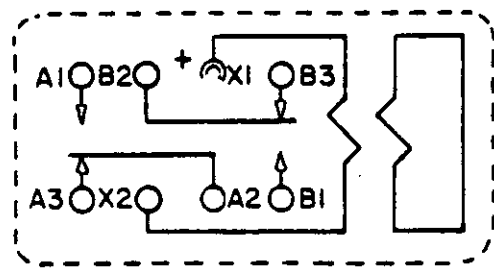
WIRE LEAD
(SOLDER PIN-SP)



SOLDER LUG



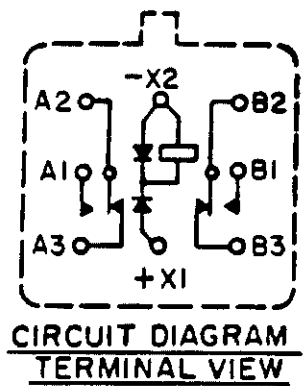
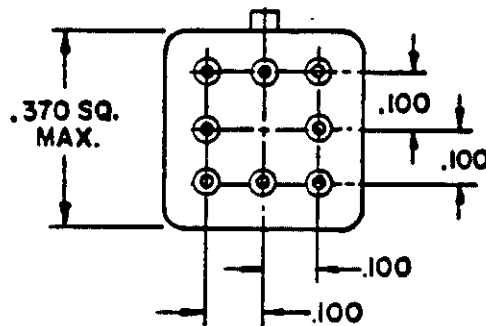
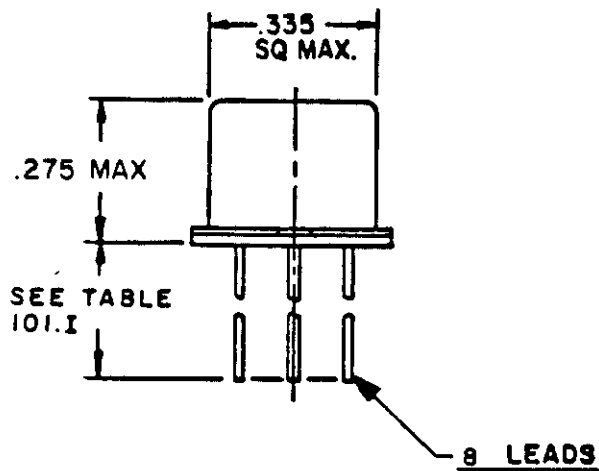
NO MOUNT



CIRCUIT DIAGRAM
TERMINAL VIEW

FIGURE 101-17. Relay, EM, ER, DPDT, low level to 2 amperes (0.200 inch terminal spacing) coil transient suppressed (MIL-R-39016/22).

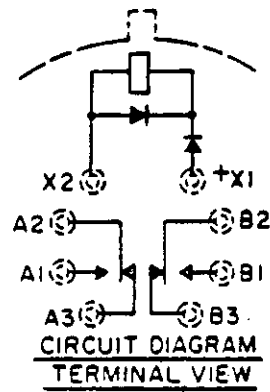
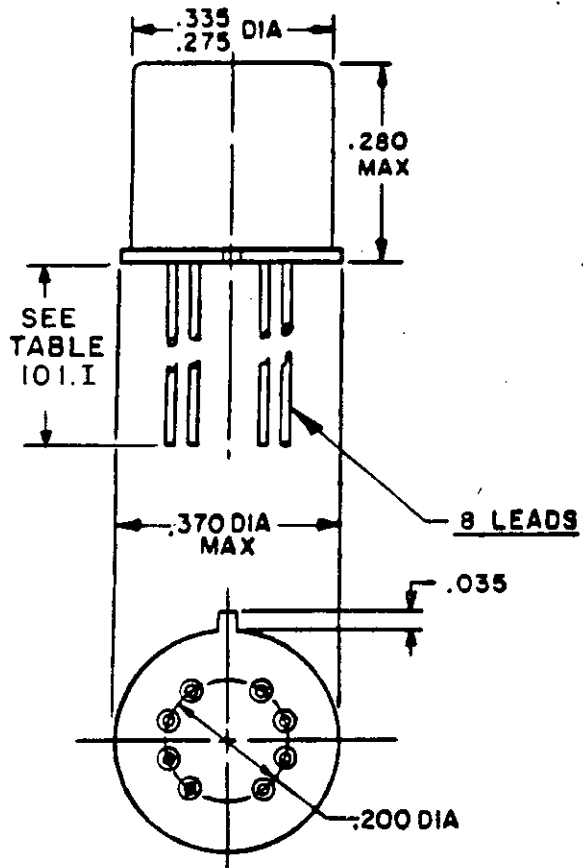
MIL-STD-1346B



INCHES	MM
.100	2.54
.275	6.99
.335	8.51
.370	9.40

FIGURE 101-18. Relay, EM, ER, DPDT, low level to 1 ampere, with internal diodes for coil transient suppression and polarity reversal protection, terminals 0.100 inch grid pattern (MIL-R-39016/19).

MIL-STD-1346B



INCHES	MM
.035	0.89
.200	5.08
.275	6.99
.280	7.11
.335	8.51
.370	9.40

FIGURE 101-19. Relay, EM, ER, DPDT, low level to 1 ampere, with internal diode for coil transient suppression and polarity reversal protection (MIL-R-39016/20).

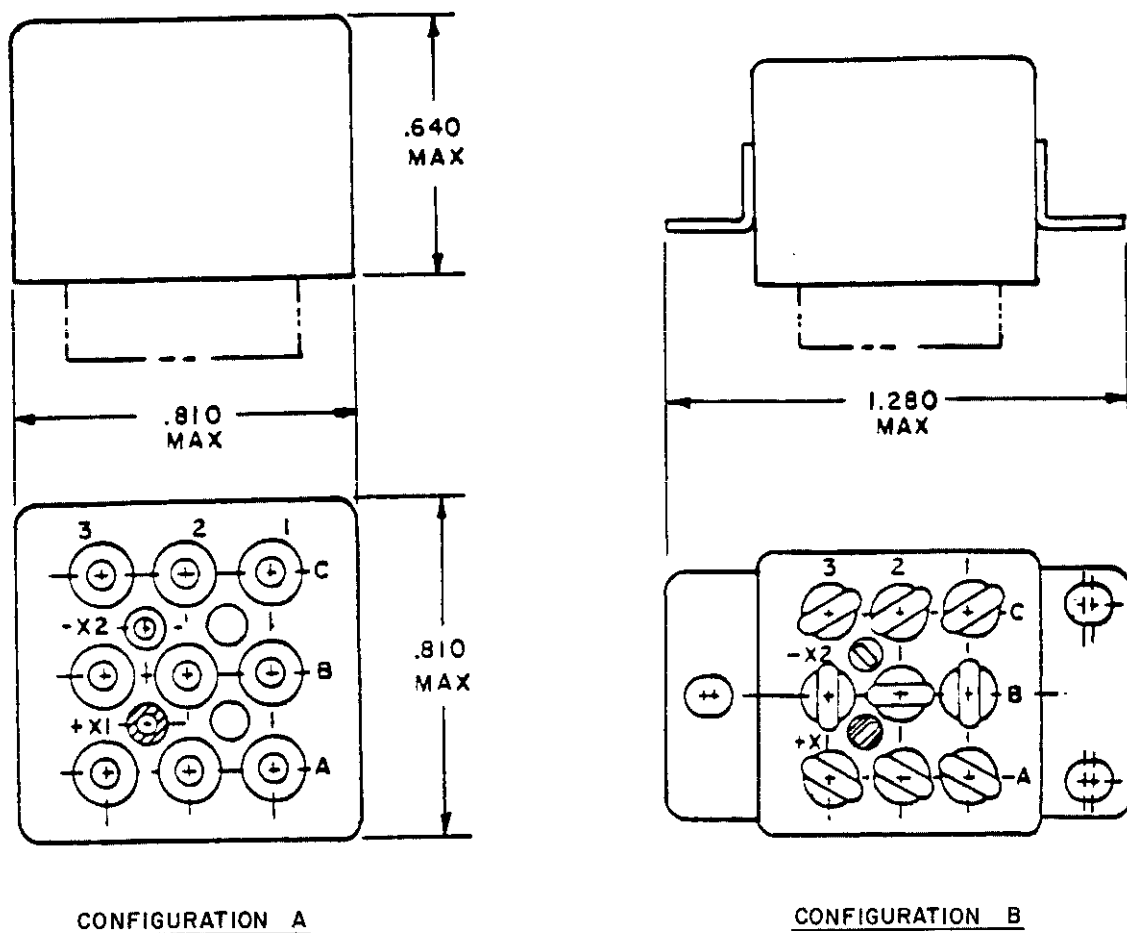
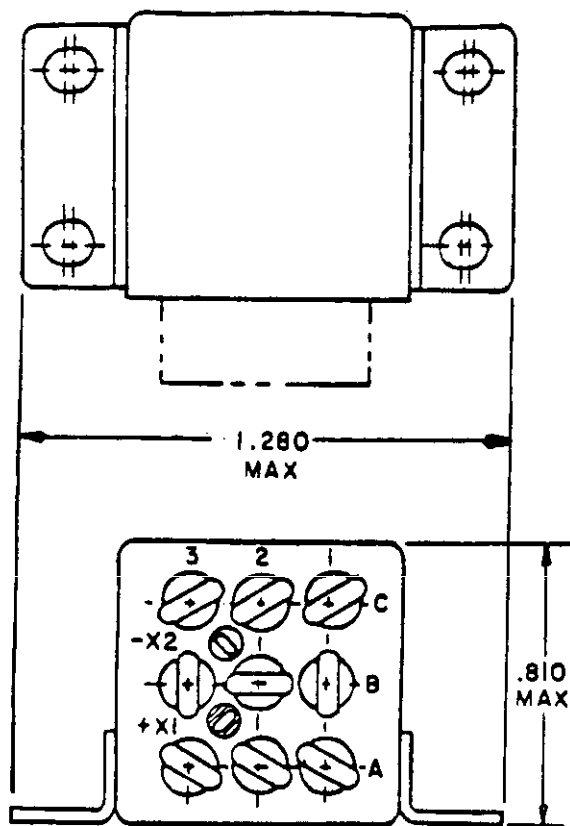


FIGURE 101-20. Relay, EM, ER, 3PDT, low level to 10 amperes (MIL-R-6106/29).

MIL-STD-1346B



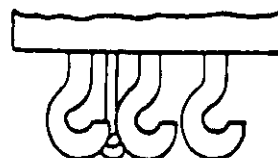
CONFIGURATION C



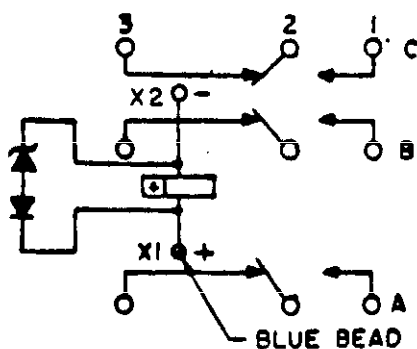
SOLDER PIN



SOCKET PIN

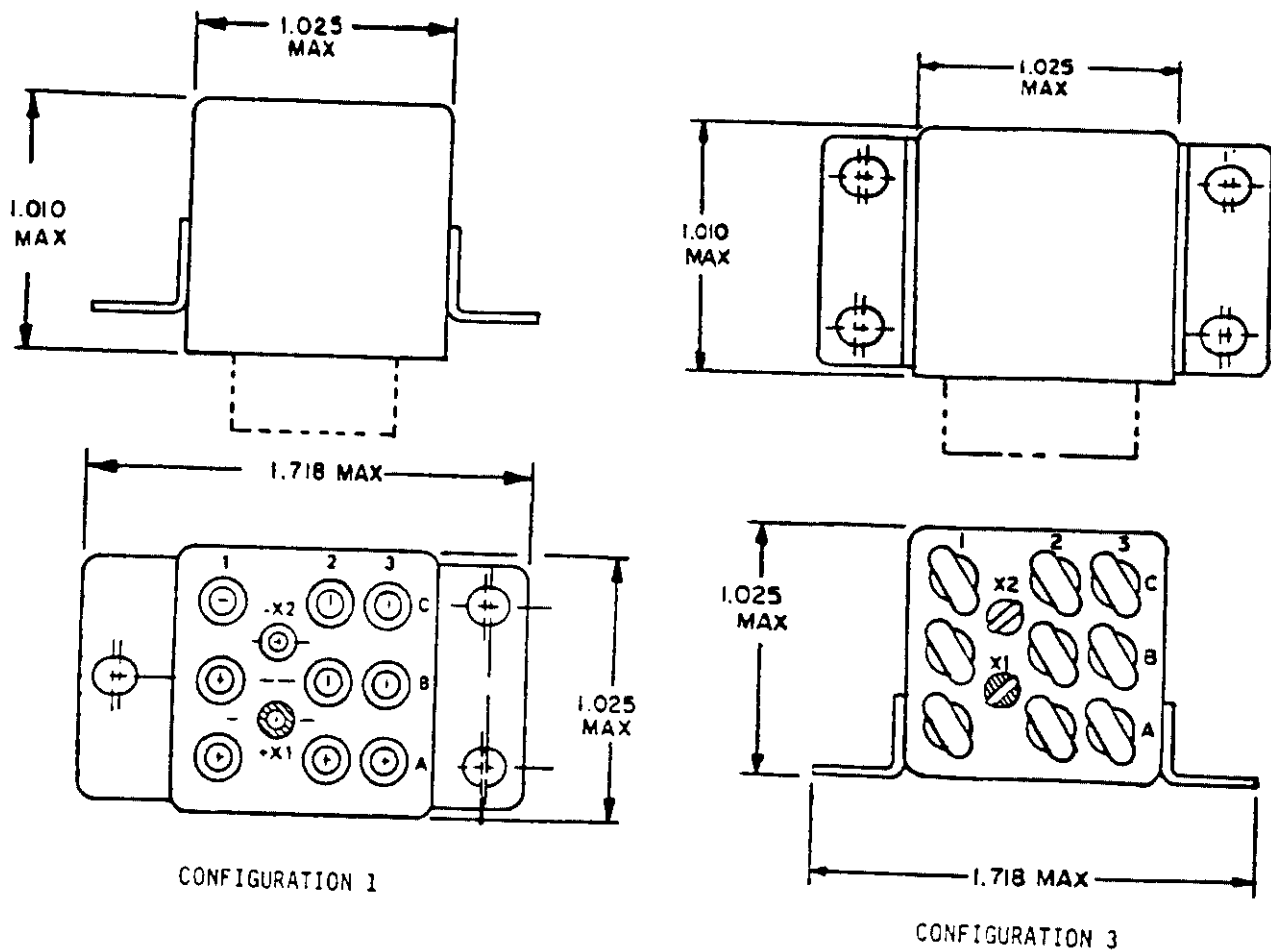


SOLDER HOOK



CIRCUIT DIAGRAM

FIGURE 101-20. Relay, EM, ER, 3PDT, low level to 10 amperes (MIL-R-6106/29)
- Continued.

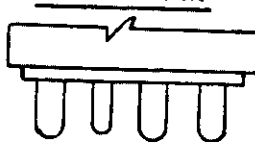
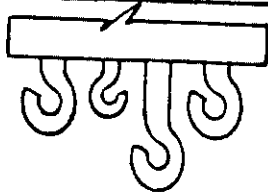


CONFIGURATION 1

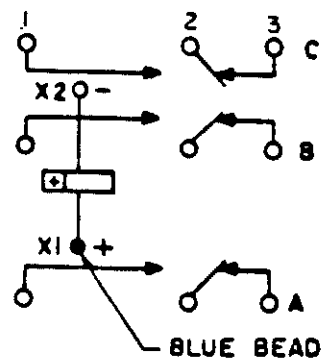
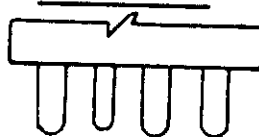
CONFIGURATION 3

SOLDER-HOOK TERMINAL

SOCKET PIN



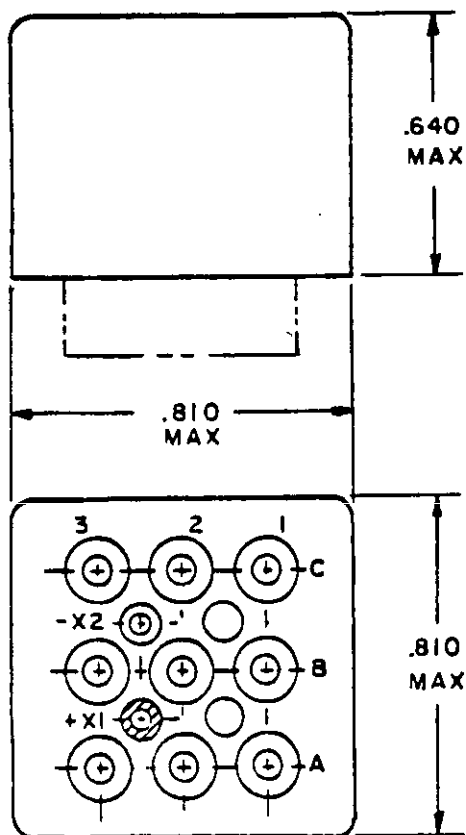
SOLDER PIN



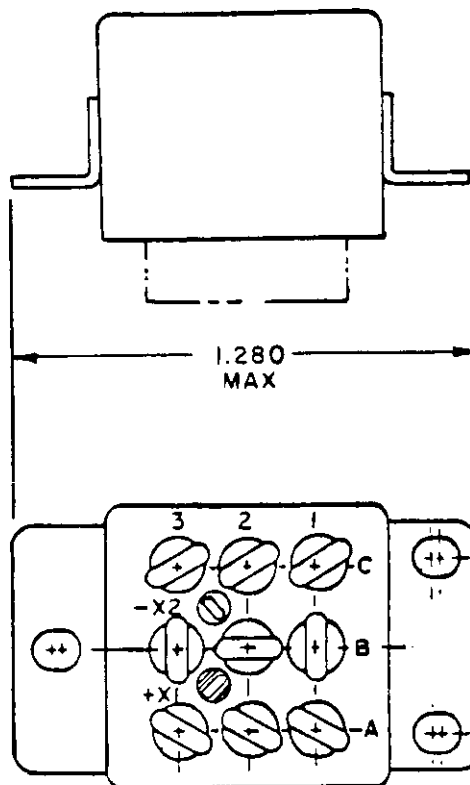
INCHES	MM
1.010	25.65
1.025	26.04
1.718	43.64

FIGURE 101-21. Relay, EM, ER, 3PDT, 25 amperes (MS27743).

MIL-STC-1346B



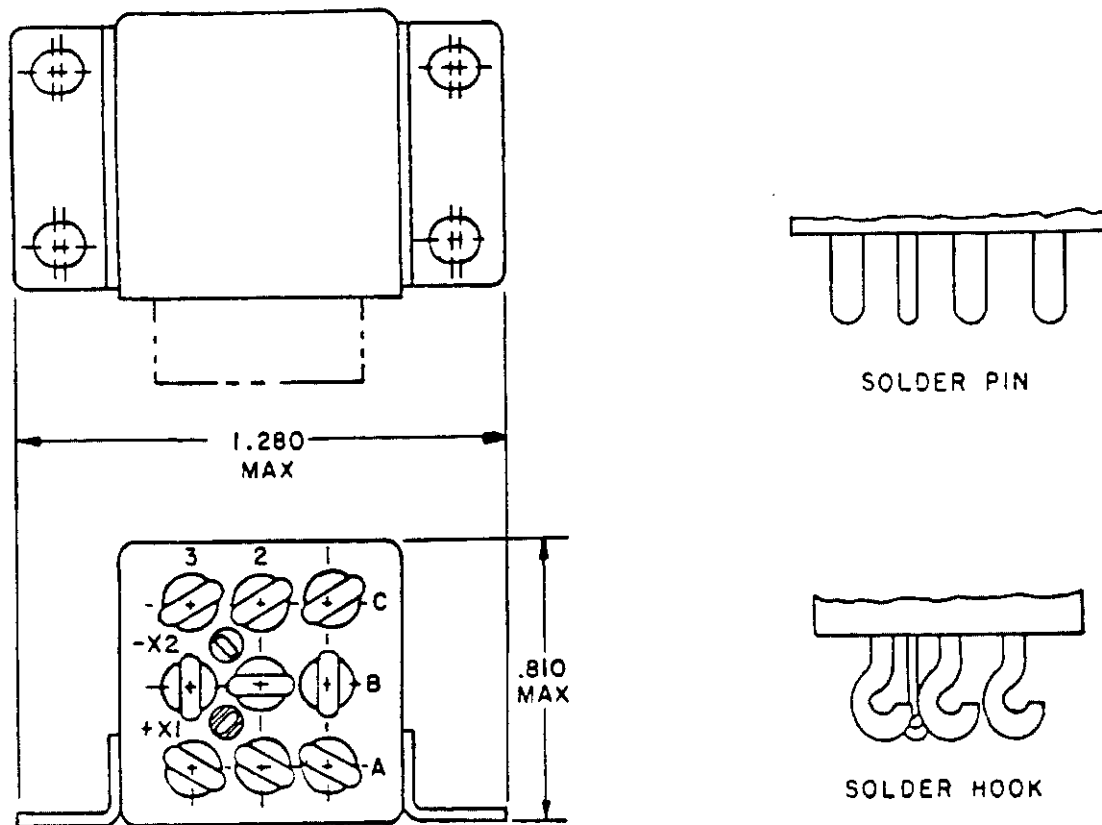
CONFIGURATION A



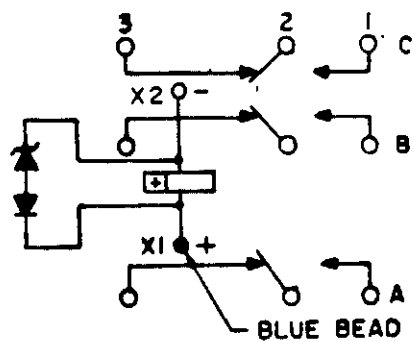
CONFIGURATION B

INCHES	MM
.640	16.26
.810	20.57
1.280	32.51

FIGURE 101-22. Relay, EM, ER, 3PDT, low level to 10 amperes, with coil suppression (MIL-R-6106/29).



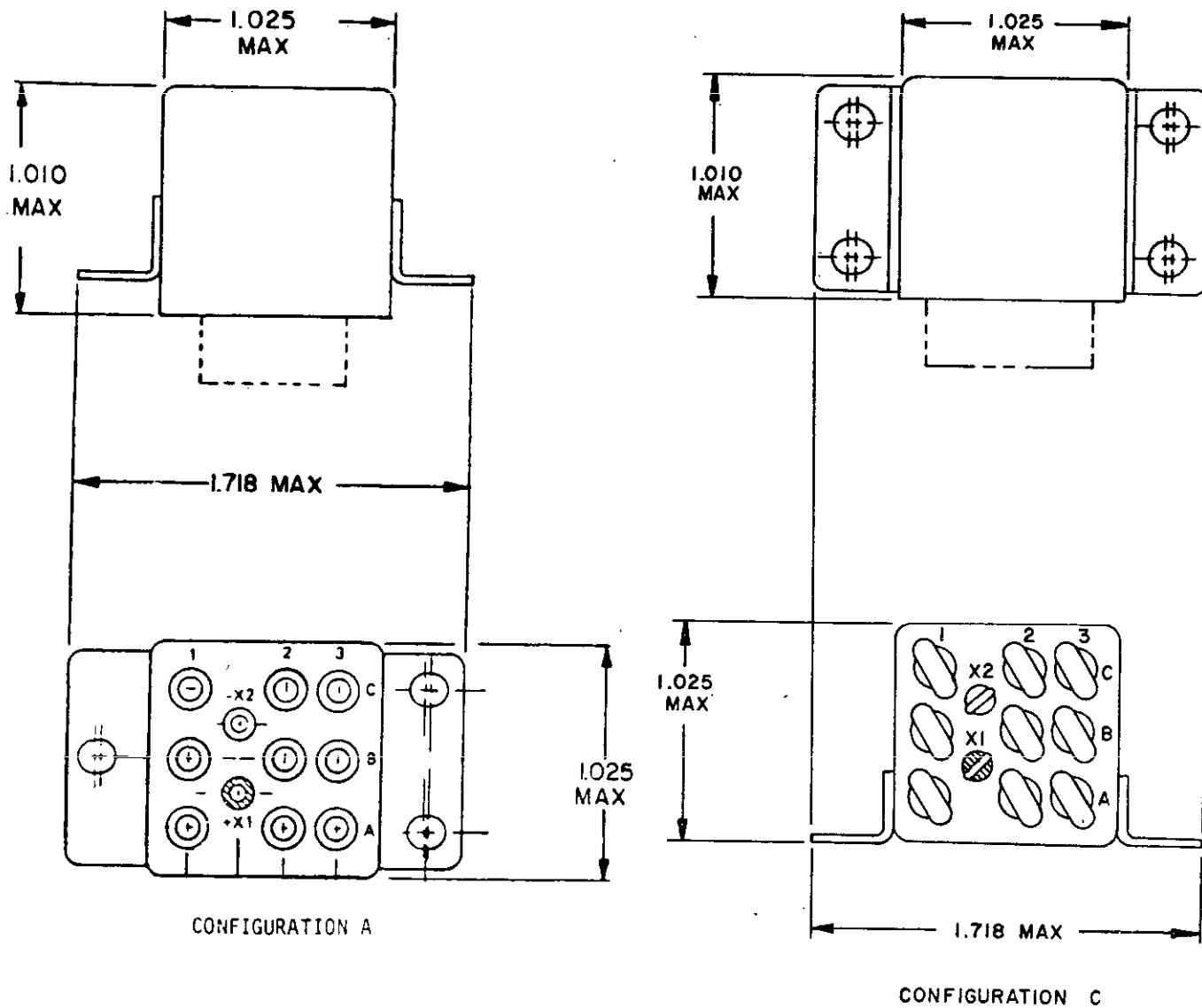
CONFIGURATION C



CIRCUIT DIAGRAM

FIGURE 101-22. Relay, EM, ER, 3PDT, low level to 10 amperes (MIL-R-6106/29) - Continued.

MIL-STD-1346B

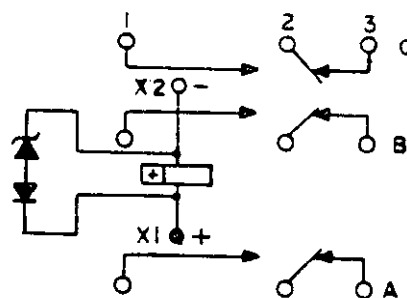


SOLDER-HOOK TERMINAL

SOCKET PIN

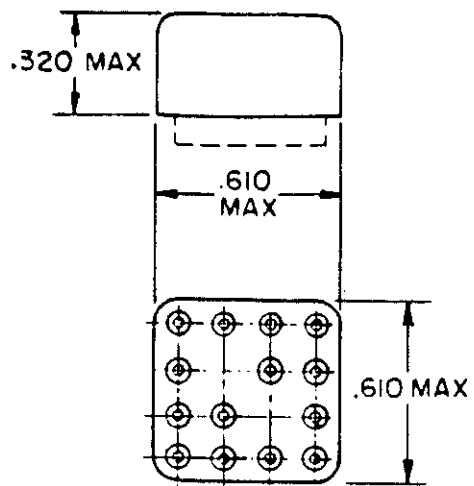
SOLDER PIN

INCHES	MM
1.010	25.65
1.025	26.04
1.718	43.64



CIRCUIT DIAGRAM

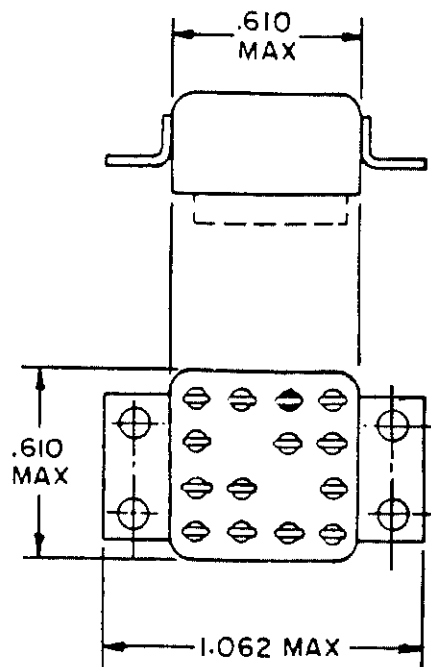
FIGURE 101-23. Relay, EM, ER, 3PDT, 25 amperes, with coil suppression (MS27743).



NO MOUNT



PRINTED WIRE
(PW) LEAD

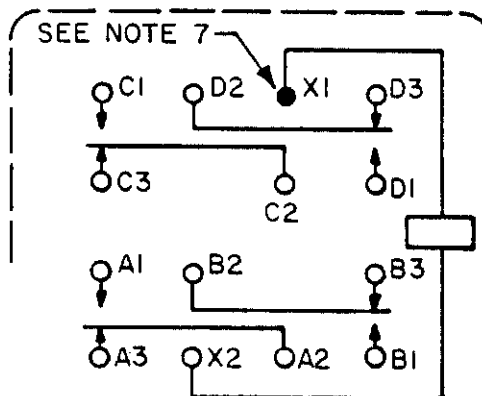


FLANGE MOUNT



SOLDER LUG

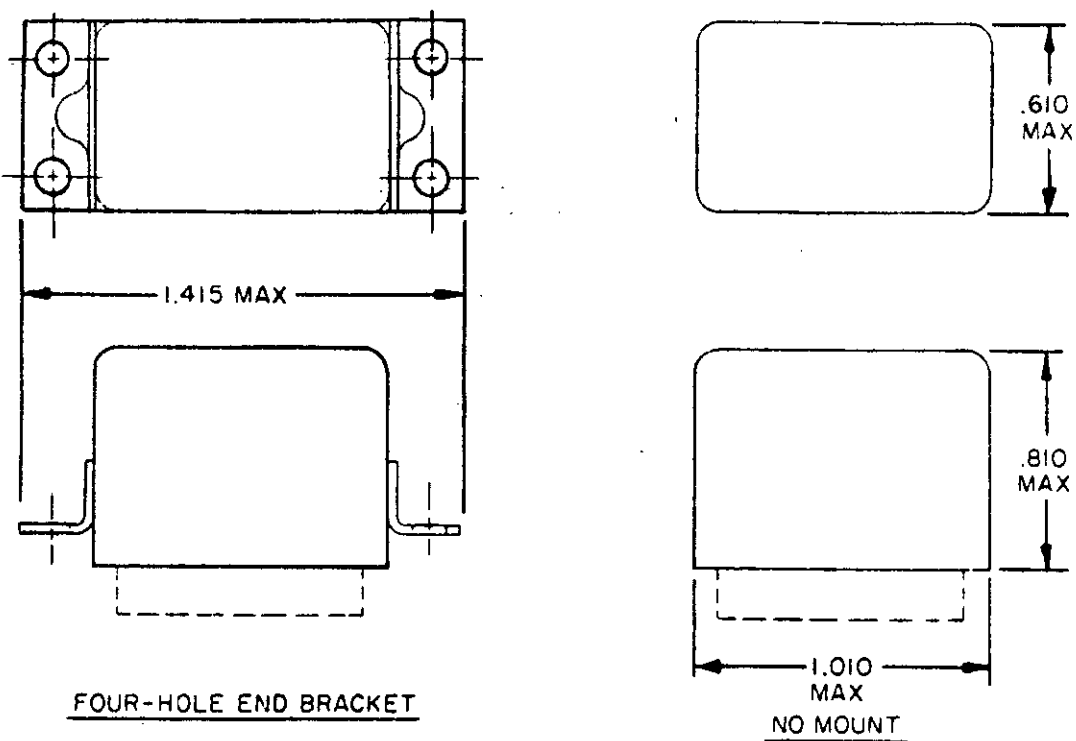
INCHES	MM
.320	8.13
.610	15.49
1.062	26.97



CIRCUIT DIAGRAM
TERMINAL VIEW

FIGURE 101-24. Relay, EM, ER, 4PDT, low level to 1 ampere (MIL-R-39016/14).

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INCHES	MM
.610	15.49
.660	16.76
.810	20.57
1.010	25.65
1.415	35.94

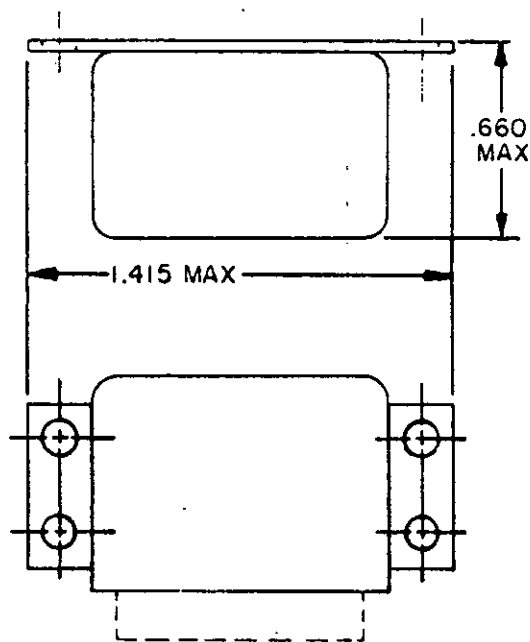
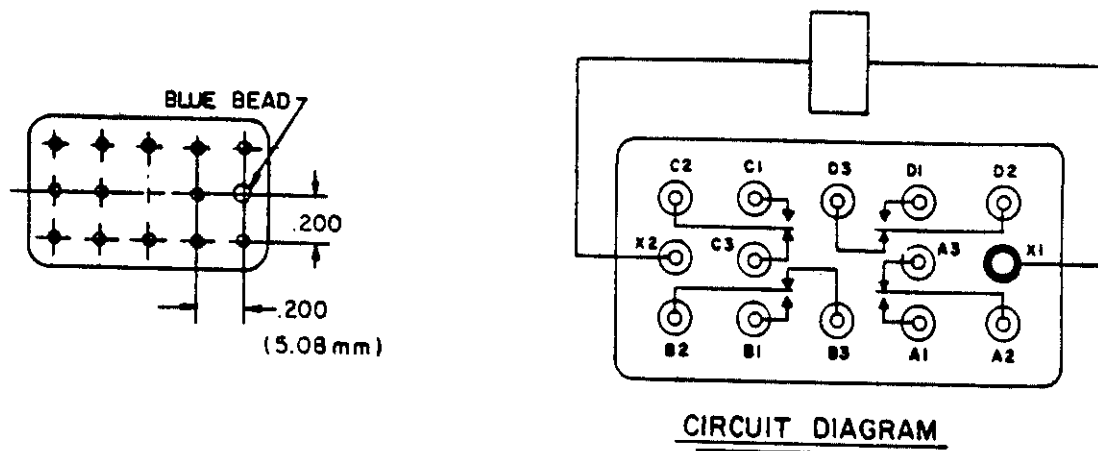


FIGURE 101-25. Relay, EM, ER, 4PDT, low level to 2 amperes (400 milliwatts) (MIL-R-39016/39).



PIN(PC)

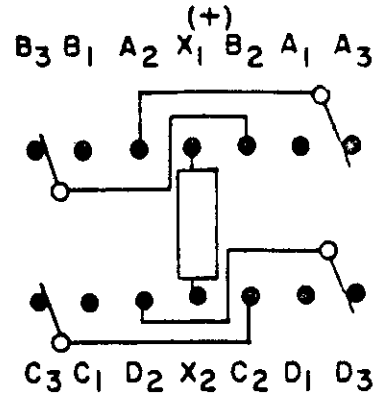
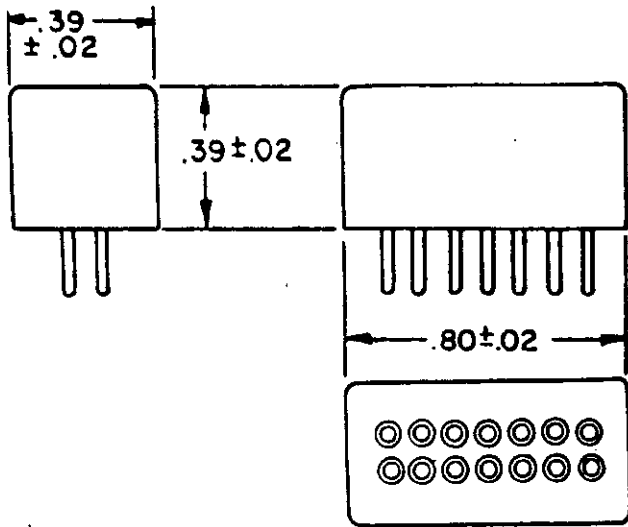


LUG

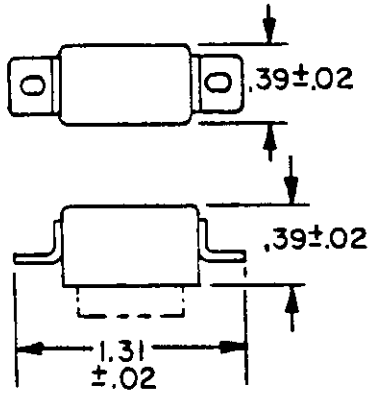
TERMINALS

FIGURE 101-25. Relay, EM, ER, 4PDT, low level to 2 amperes (400 milliwatts)
(MIL-R-39016/39) - Continued.

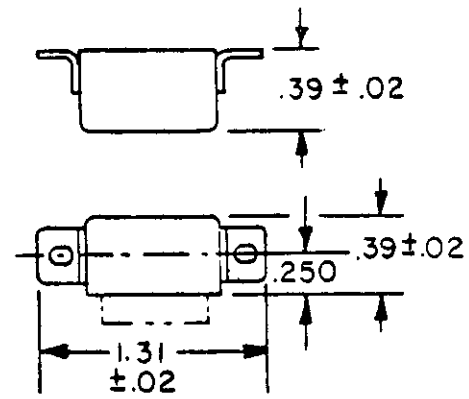
MIL-STD-1346B



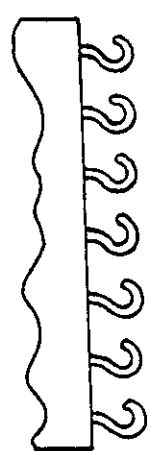
SCHEMATIC DIAGRAM
UNENERGIZED POSITION
BOTTOM VIEW



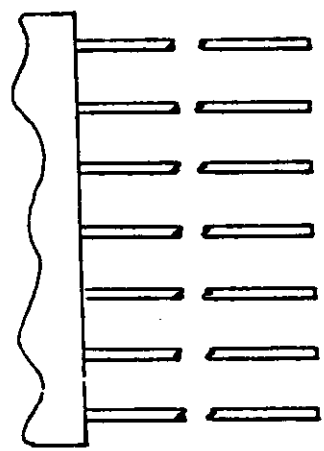
FLANGE MOUNT A



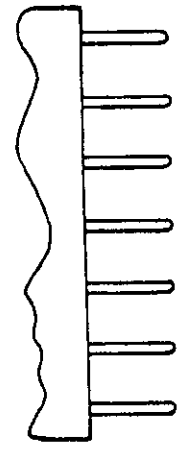
FLANGE MOUNT B



SOLDER LUG



WIRE LEAD



PIN (PRINTED CIRCUIT)
AND PIN SOCKET

INCHES	MM
.02	.51
.250	6.35
.39	9.91
.80	20.32
1.31	33.27

FIGURE 101-26. Relay, EM, ER, 4PDT, low level to 2 amperes (MIL-R-39016/40).

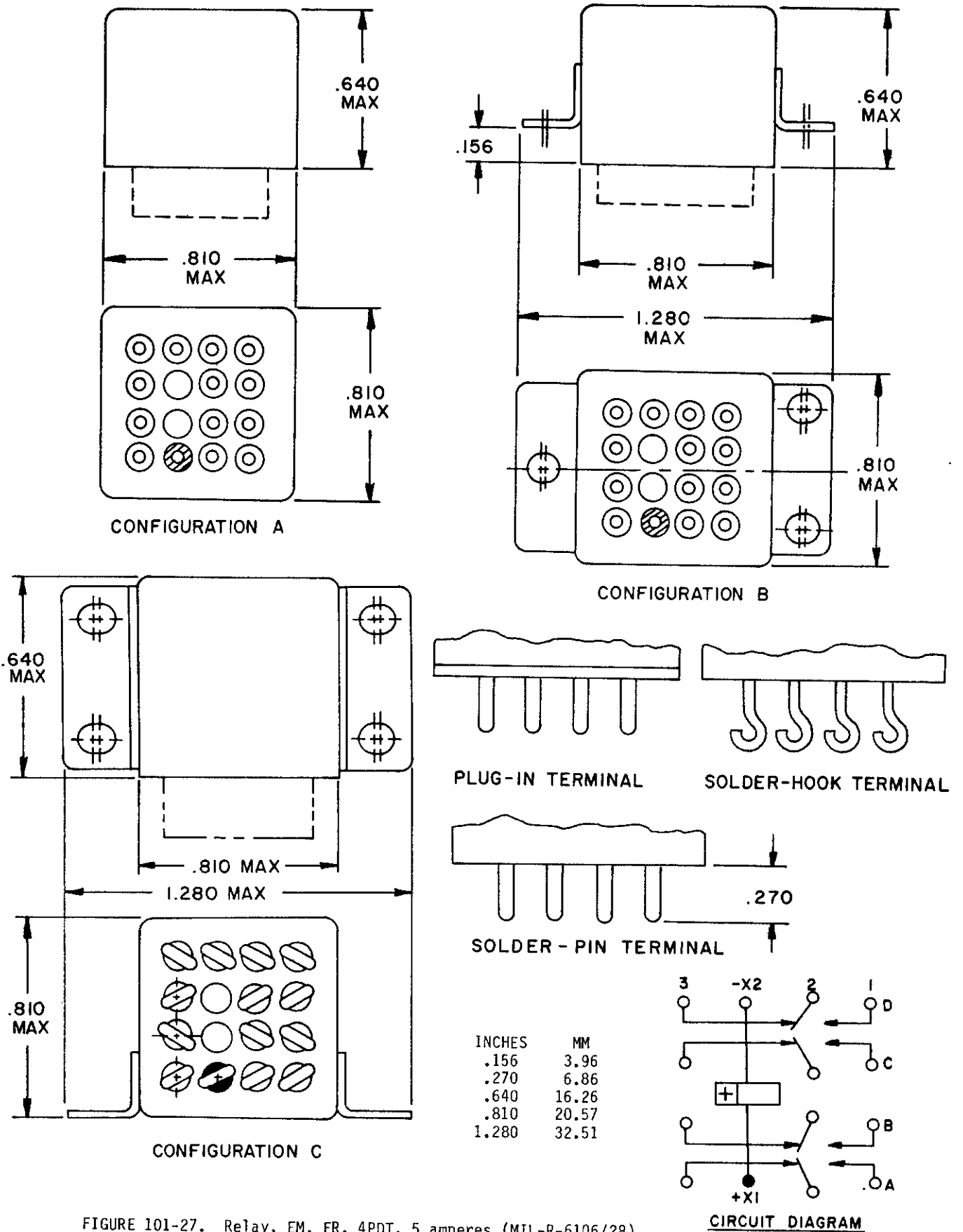


FIGURE 101-27. Relay, EM, ER, 4PDT, 5 amperes (MIL-R-6106/28).

MIL-STD-1346B

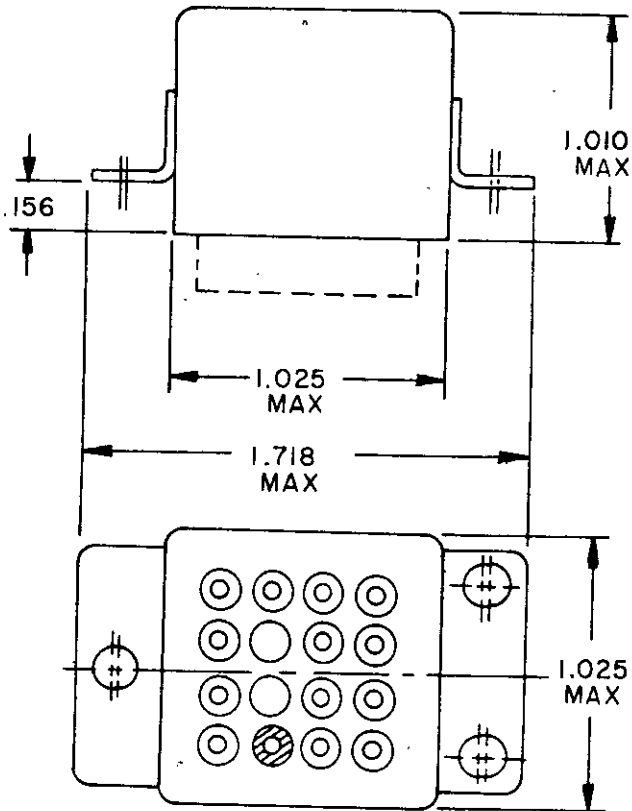


FIGURE 1

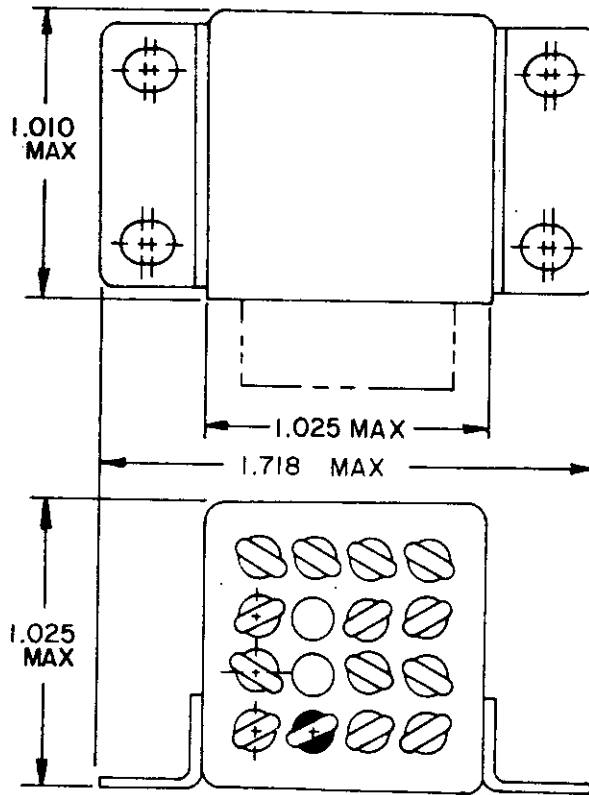


FIGURE 2

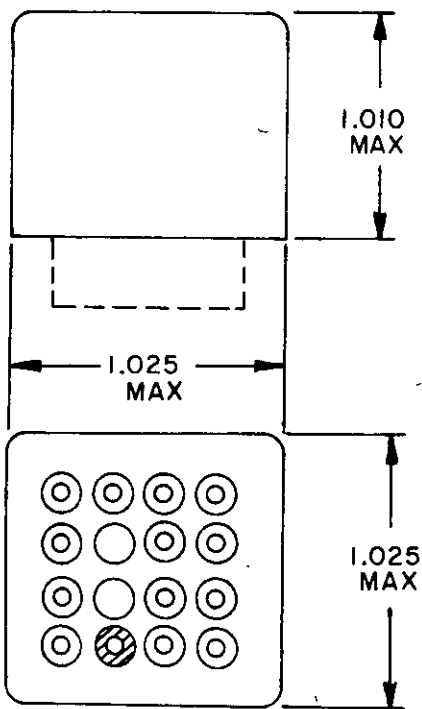
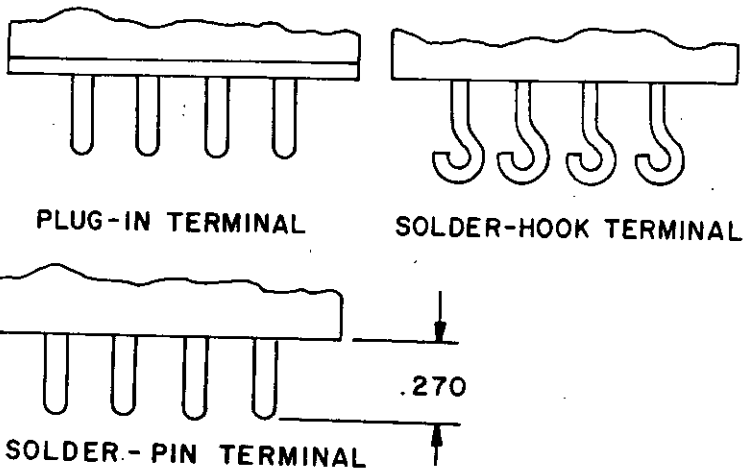
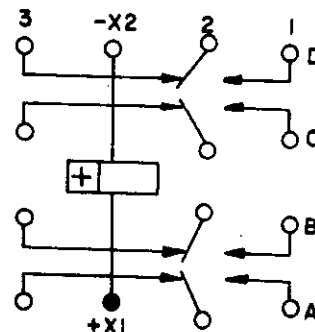


FIGURE 3



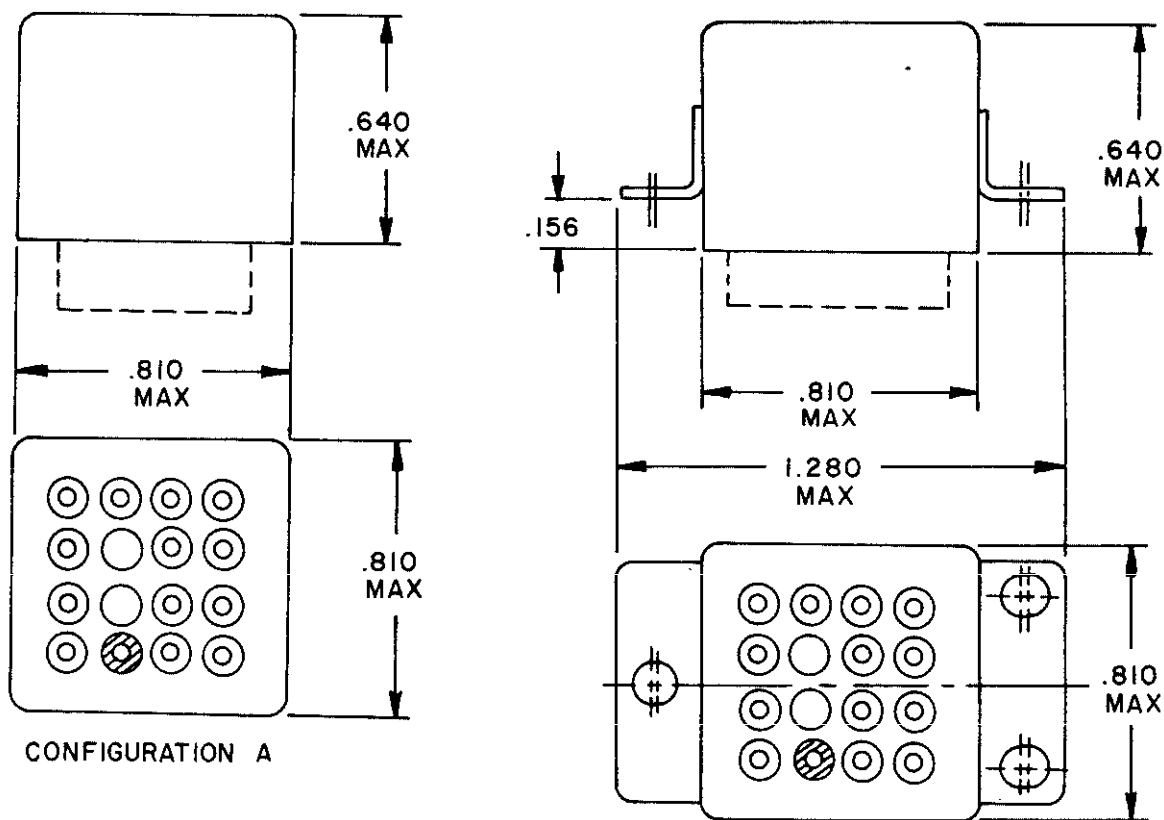
INCHES	MM
1.010	25.65
1.025	26.04
1.718	43.64



CIRCUIT DIAGRAM

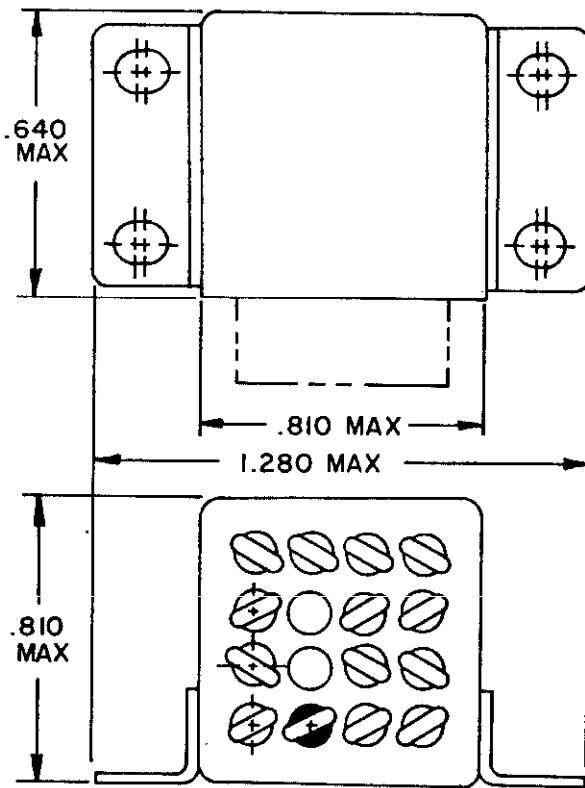
FIGURE 101-28. Relay, EM, ER, 4PDT; 10 amperes (MS27400).

MIL-STD-1346B



CONFIGURATION A

CONFIGURATION B



CONFIGURATION C

INCHES	MM
.156	3.96
.640	16.26
.810	20.57
1.280	32.51

FIGURE 101-29. Relay, EM, ER, 4PDT, low level to 5 amperes with coil suppression (MIL-R-6106/28).

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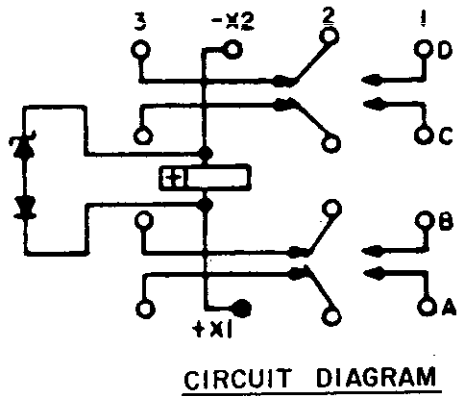
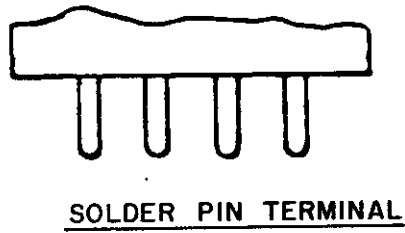
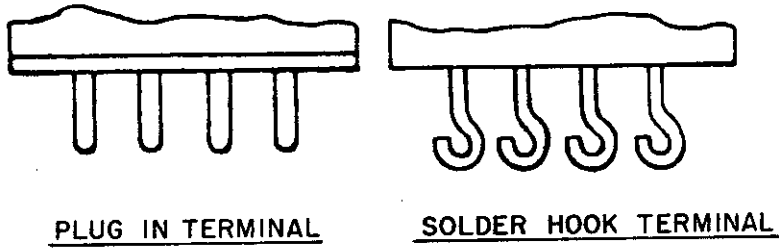
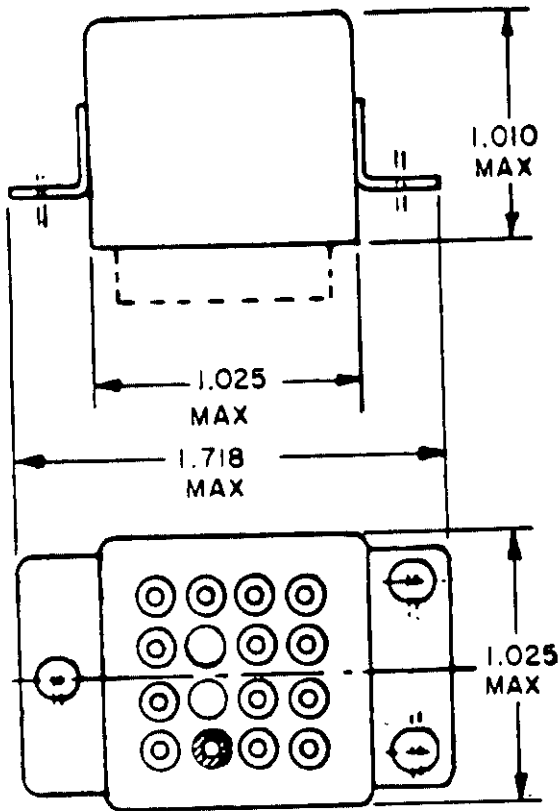
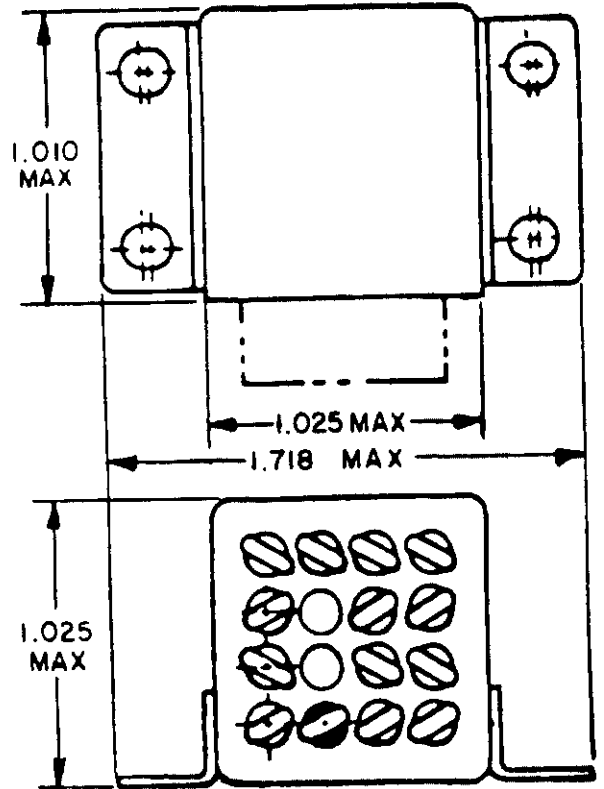


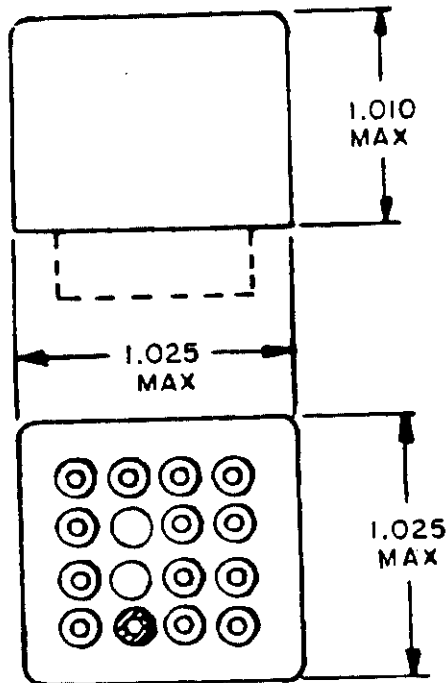
FIGURE 101-29. Relay, EM, ER, 4PDT, low level to 5 amperes with coil suppression (MIL-R-6106/28) - Continued.



CONFIGURATION 1



CONFIGURATION 2



CONFIGURATION 3

INCHES	MM
1.010	25.65
1.025	26.04
1.718	43.64

FIGURE 101-30. Relay, EM, ER, 4PDT, 10 amperes with coil suppression (MS27400).

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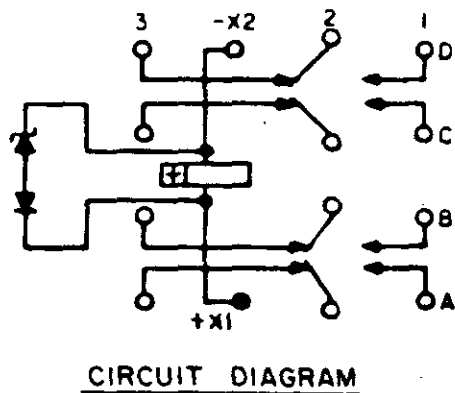
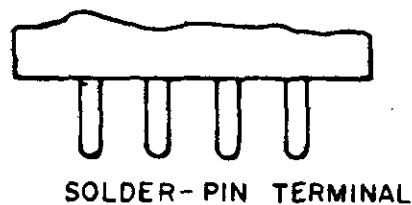
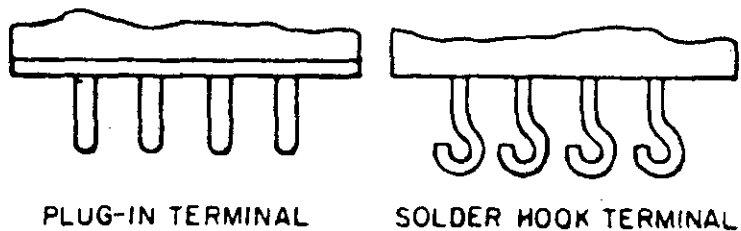


FIGURE 101-30. Relay, EM, ER, 4PDT, 10 amperes with coil suppression (MS27400) - Continued.

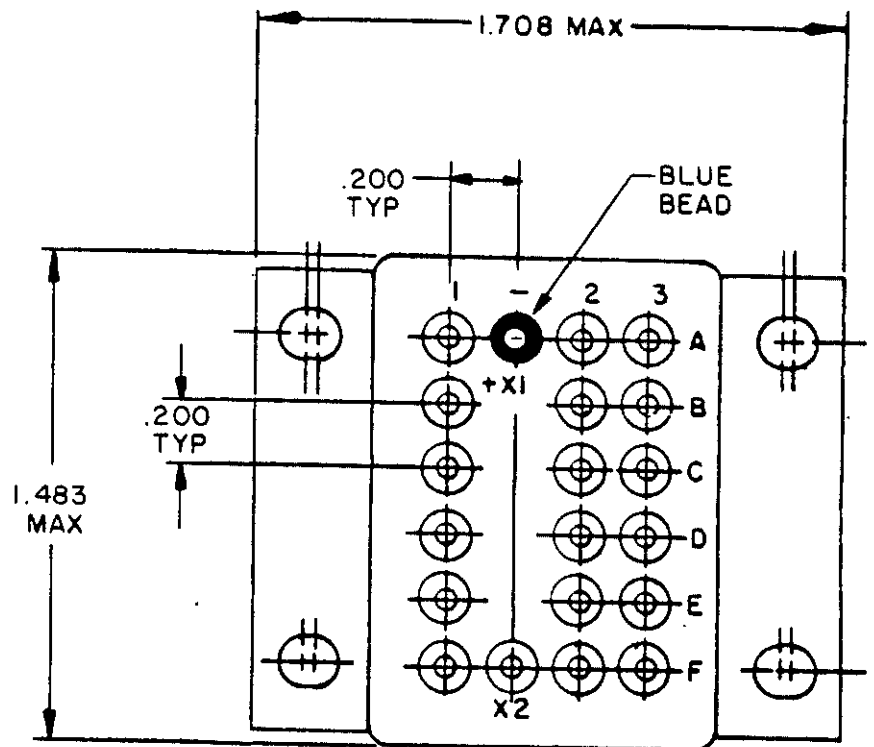
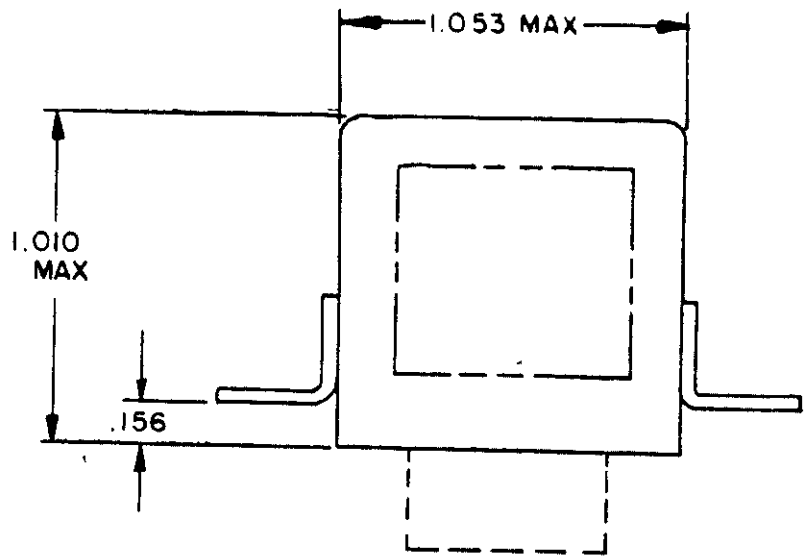
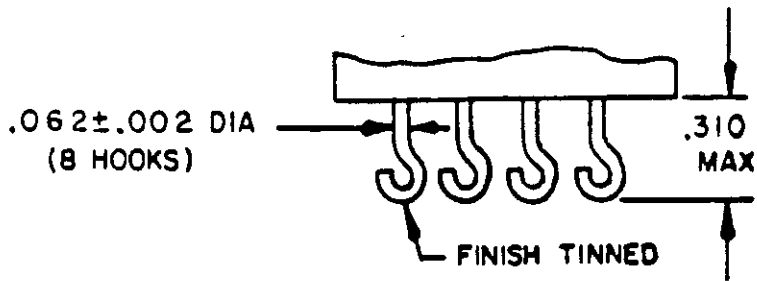
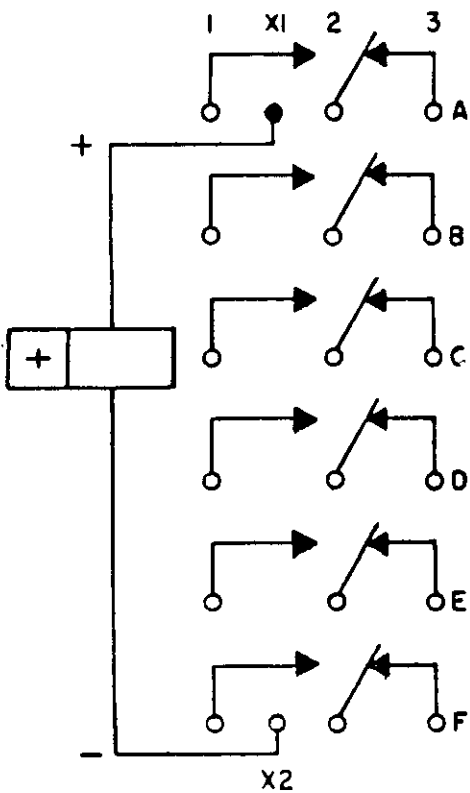


FIGURE 101-31. Relay, EM, ER, 6PDT, 10 amperes (MIL-R-6106/8).

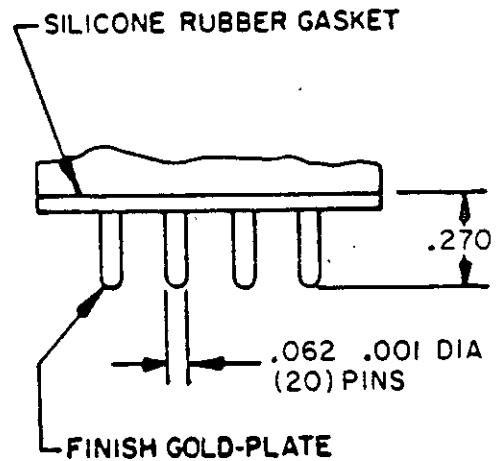
MIL-STD-1346B



SOLDER-HOOK TERMINAL



CIRCUIT DIAGRAM



PLUG-IN TERMINAL

INCHES	MM
.001	0.03
.002	0.05
.062	1.57
.156	3.96
.200	5.08
.270	6.86
.310	7.87
1.010	25.65
1.053	26.75
1.483	37.67
1.708	43.38

FIGURE 101-31. Relay, EM, ER, 6PDT, 10 amperes (MIL-R-6106/8) - Continued.

MIL-STD-1346B

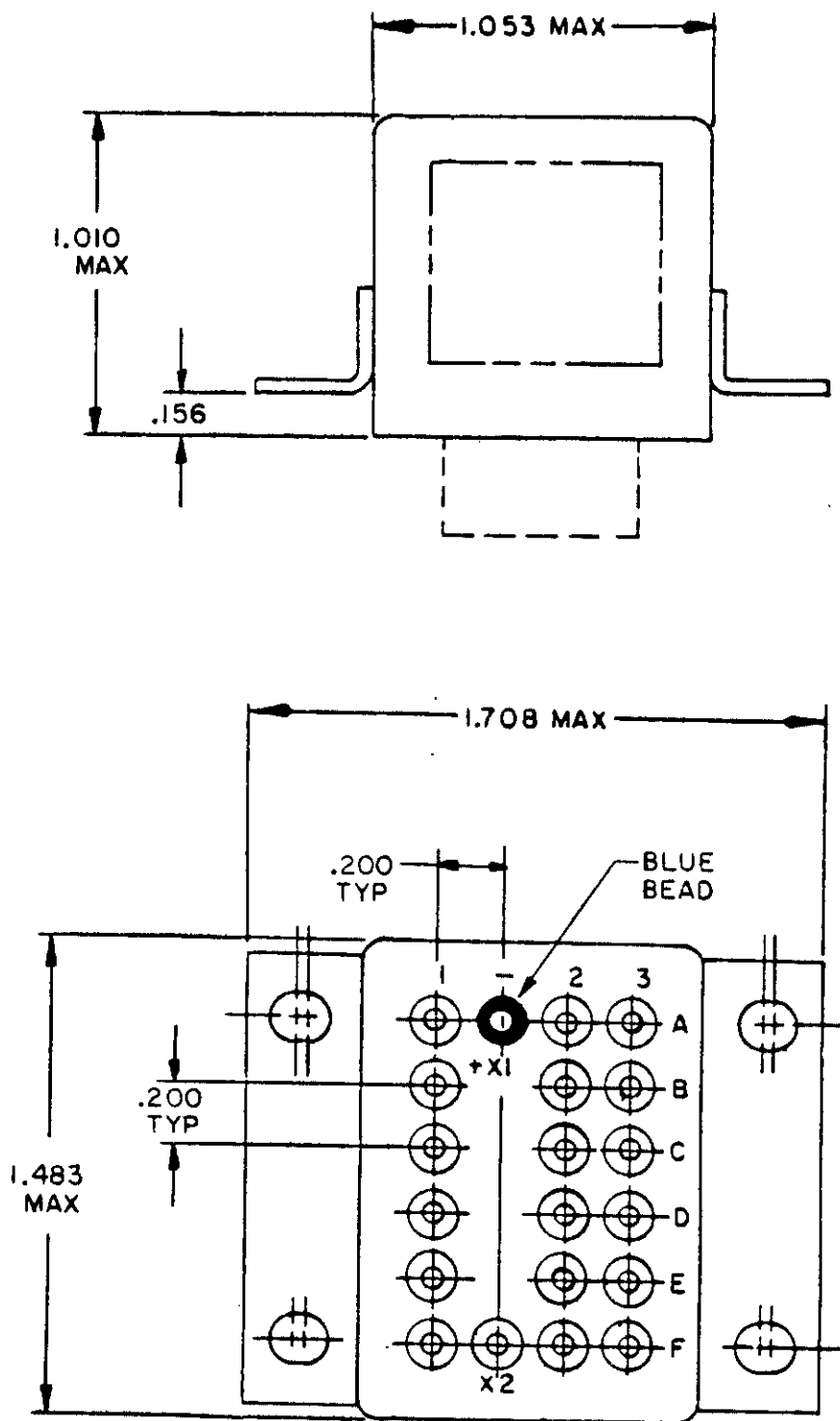
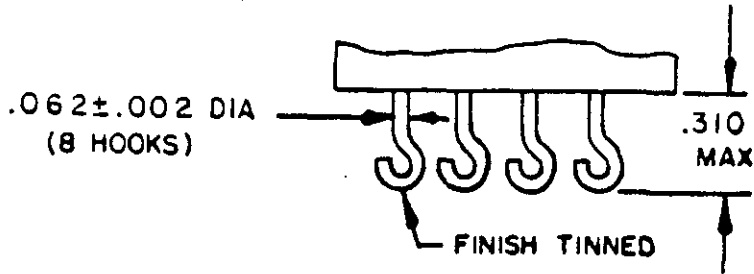
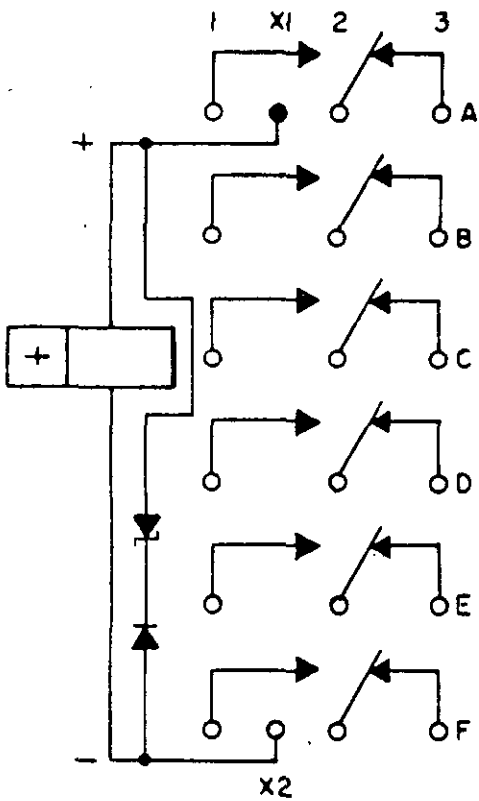


FIGURE 101-32. Relay, EM, ER, 6PDT, 10 amperes with coil suppression (MIL-R-6106/8).

MIL-STD-1346B

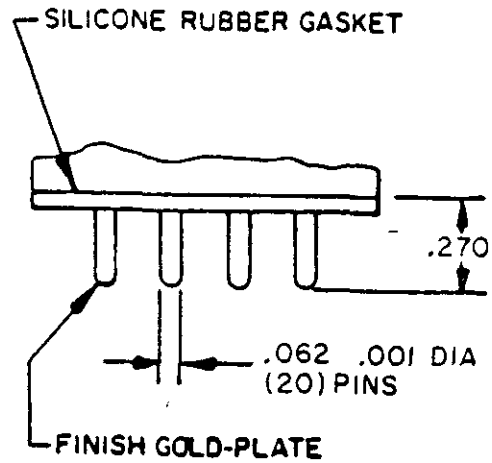


SOLDER-HOOK TERMINAL



CIRCUIT DIAGRAM

INCHES	MM
.001	0.03
.002	0.05
.062	1.57
.156	3.96
.200	5.08
.270	6.86
.310	7.87
1.010	25.65
1.053	26.75
1.483	37.67
1.708	43.38



PLUG-IN TERMINAL

FIGURE 101-32. Relay, EM, ER, 6PDT, 10 amperes with coil suppression (MIL-R-6106/8) - Continued.

MIL-STD-1346B

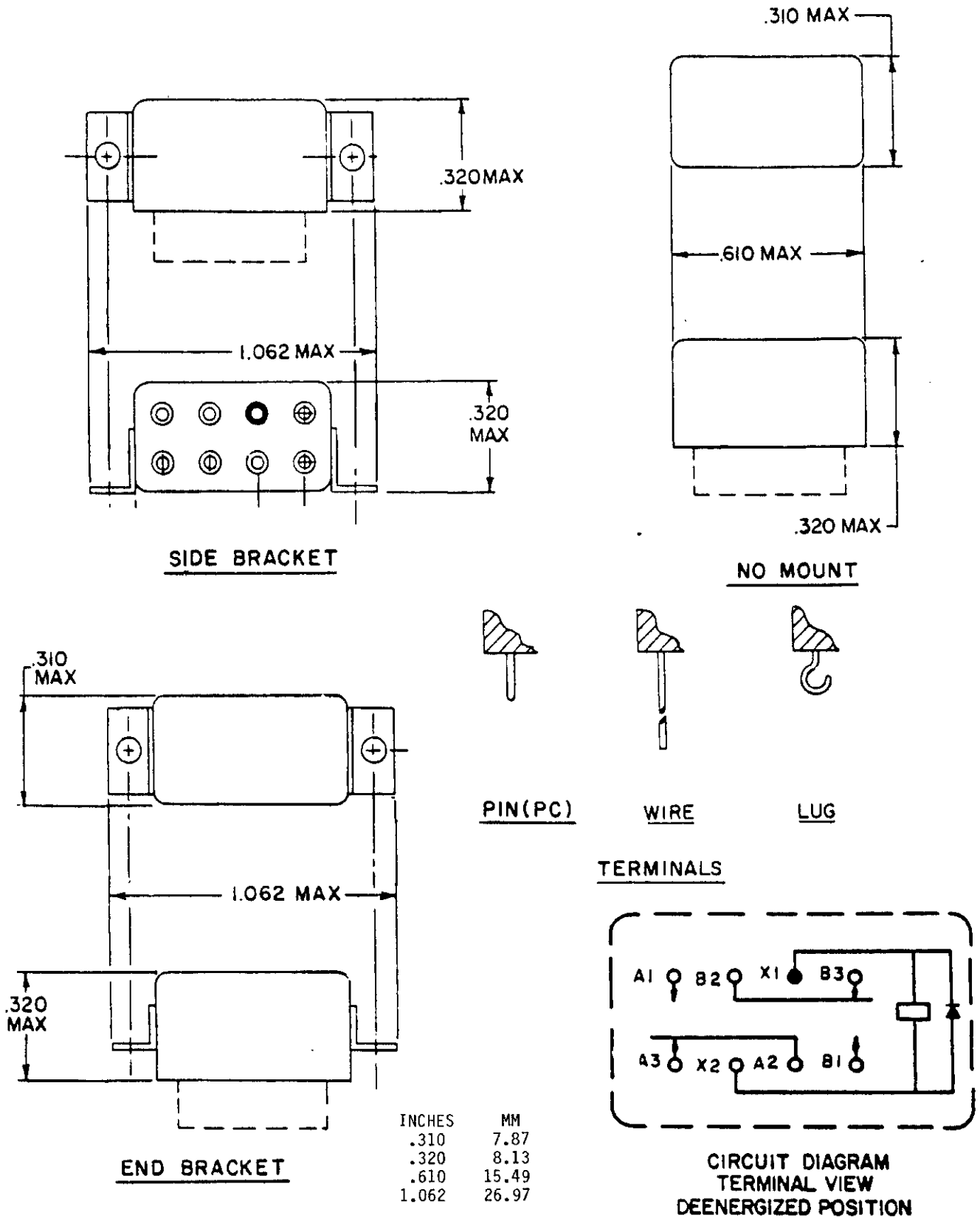


FIGURE 101-33. Relay, EM, ER, DPDT, low level to 2 amperes with internal diode for coil transient suppression (MIL-R-39016/37).

MIL-STD-1346B

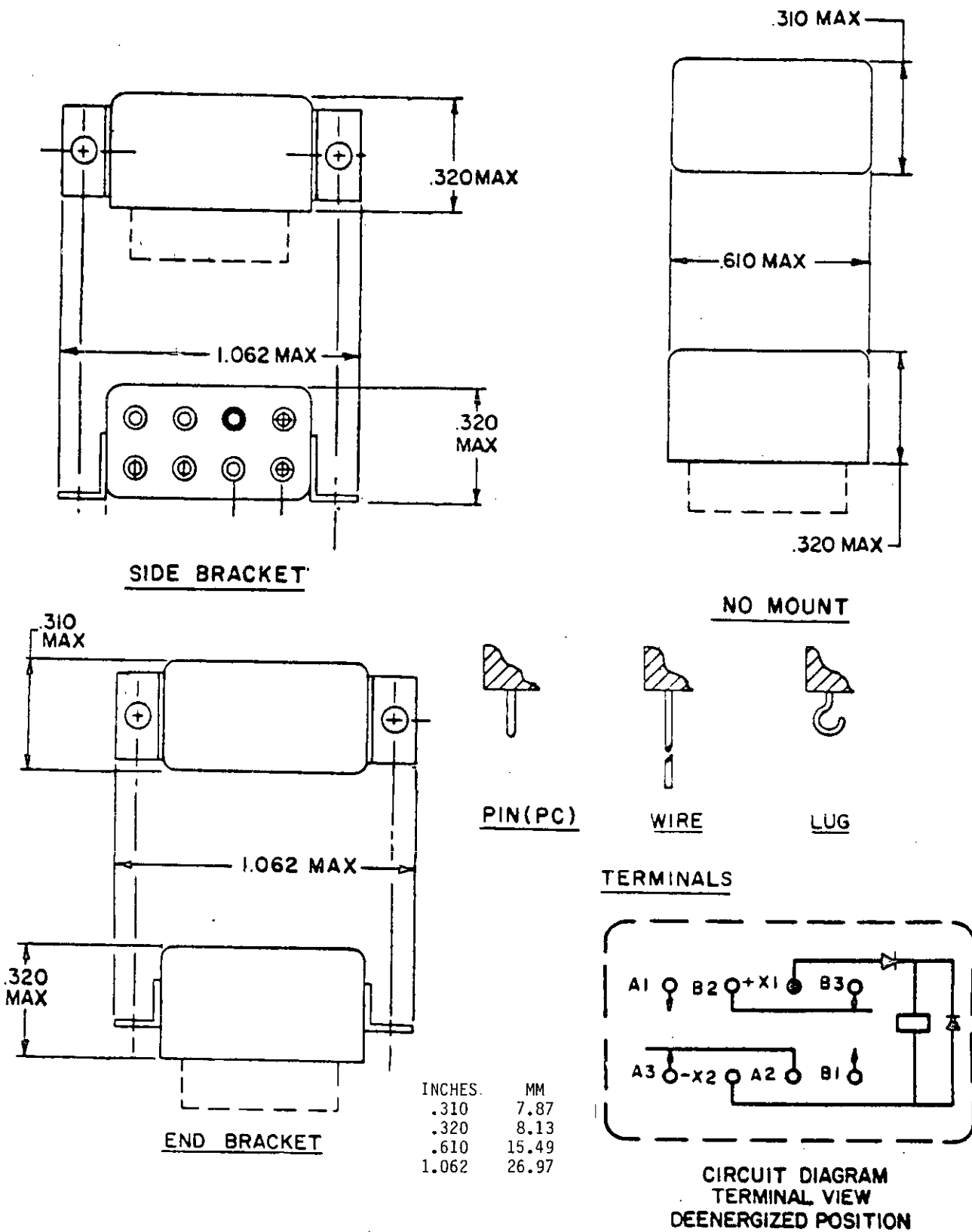


FIGURE 101-34. Relay, EM, ER, DPDT, low level to 2 amperes with internal diodes for coil transient suppression and polarity reversal protection (MIL-R-39016/38).

MIL-STD-1346B

SUBSECTION 102

RELAYS, ELECTROMAGNETIC (EM), ESTABLISHED
RELIABILITY (ER), AC OPERATED

(Applicable specification: MIL-R-6106)

SCOPE: This subsection covers relays with coils ac voltage rated and contacts nominally rated 5 amperes and up.

SUBSECTION 102
RELAYS, EM, ER, AC OPERATED
(Applicable specification: MIL-R-6106)

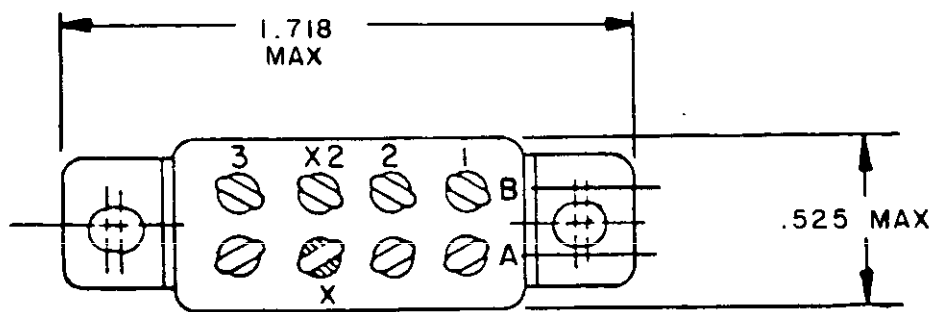
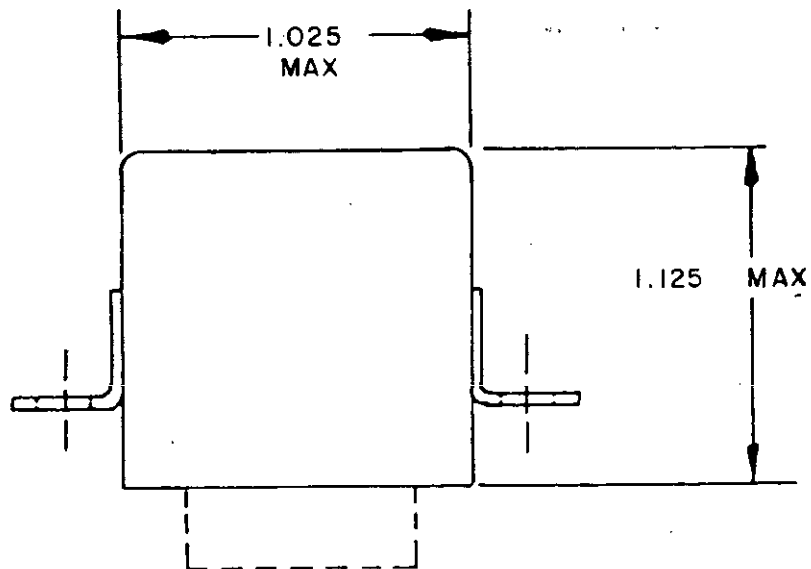
Duty cycle: Continuous
Enclosure: Hermetic sealed
Operating temperature range: G (see table I)

TABLE 102.1. Relays, EM, ER, ac operated, part numbers and characteristics.

Rated coil voltage	Part number I/	Figure Shock (see number table II)	Vibration (see table III)	System voltage and frequency - contact current in amperes												Terminal style (see table IV)								
				28 V dc			400 Hz			50/60 Hz			50/60 Hz											
				Resis- tive	Induc- tive	Motor	Resis- tive	Lamp	Motor	Resis- tive	Induc- tive	Motor	Resis- tive	Induc- tive	Motor		Resis- tive	Induc- tive	Motor					
				DPDT CONTACTS - 2 FORM C - (COIL 50/60/400 Hz)																				
115	MS27401 Conf 1 -34Z -36Z	102-1	9	10	8	4	2	10	8	4	2	10	8	4	2	2.5	2.5	2	1	2.5	2.5	2	1	L SKP
"	Conf 2 -35Z	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	L
"	Conf 3 -56Z -57Z	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	L SP
				3PDT CONTACTS - 3 FORM C - (COIL 50/60/400 Hz)																				
115	MS277432/ Conf 1 -25	102-2	6	10	8	4	2	10	8	4	2	10	8	4	2	---	---	---	---	---	---	---	---	L
"	Conf 3 -26	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	L
"	Conf 2 -27	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	SKP

See footnote at end of table.

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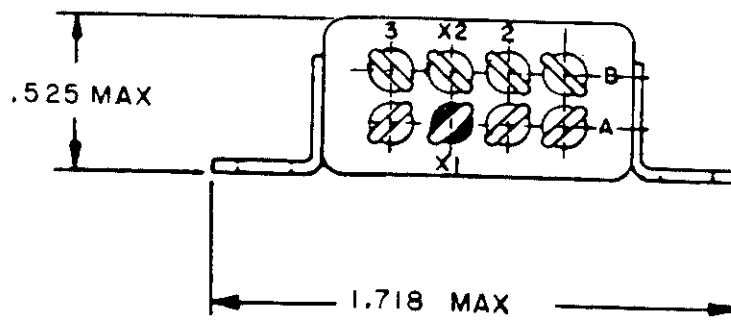
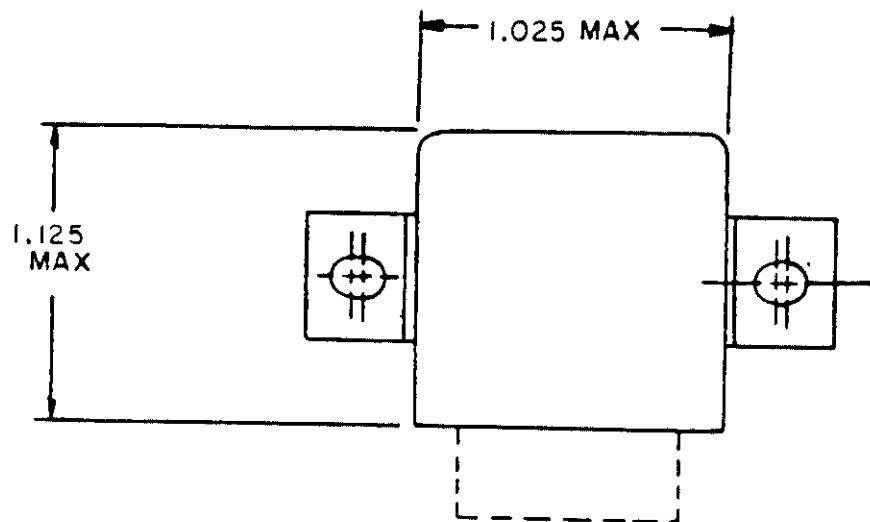


CONFIGURATION 1

INCHES	MM
.525	13.34
1.025	26.04
1.125	28.58
1.718	43.64

FIGURE 102-1. Relay, EM, ER, DPDT, 10 amperes (MS27401).

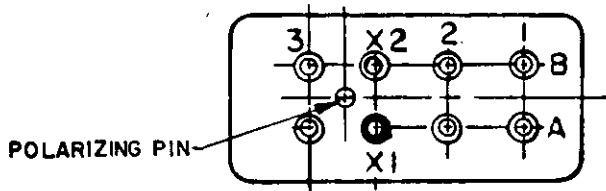
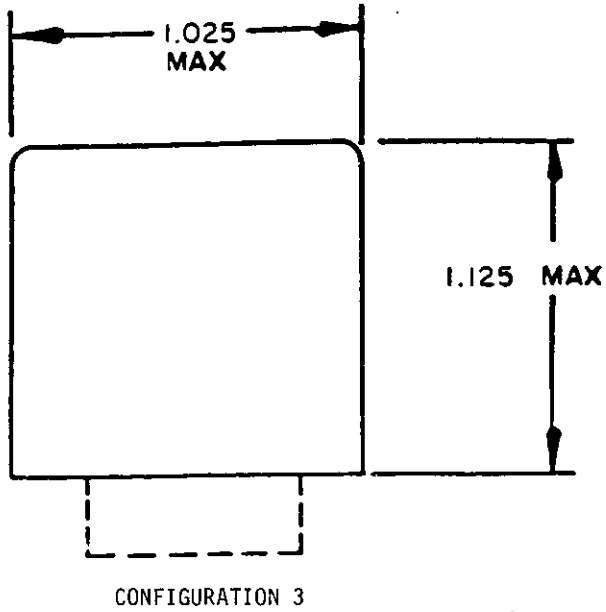
MIL-STD-1346B



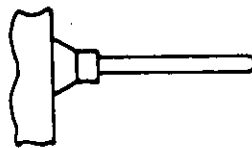
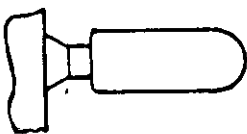
CONFIGURATION 2

FIGURE 102-1. Relay, EM, ER, DPDT, 10 amperes (MS27401) - Continued.

MIL-STD-1346B



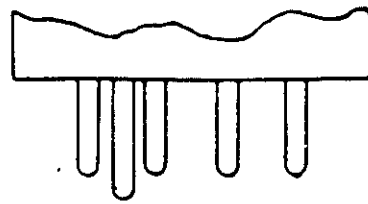
TERMINAL LAYOUT FOR ALL
STRAIGHT PIN 50/60/400 Hz RELAYS



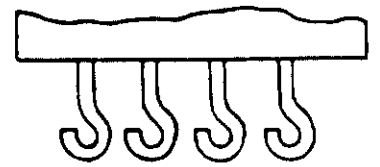
DETAIL POLARIZING PIN FOR
50/60/400 Hz RELAYS

FIGURE 102-1. Relay, EM, ER, DPDT, 10 amperes (MS27401) - Continued.

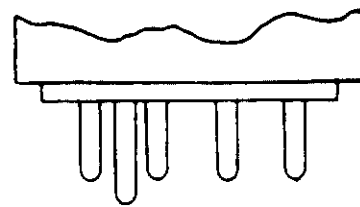
MIL-STD-1346B



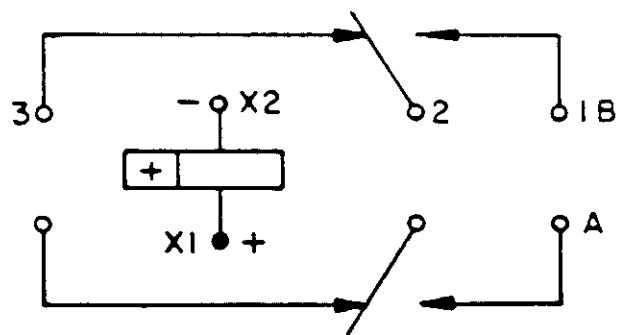
SOLDER PIN



SOLDER-HOOK



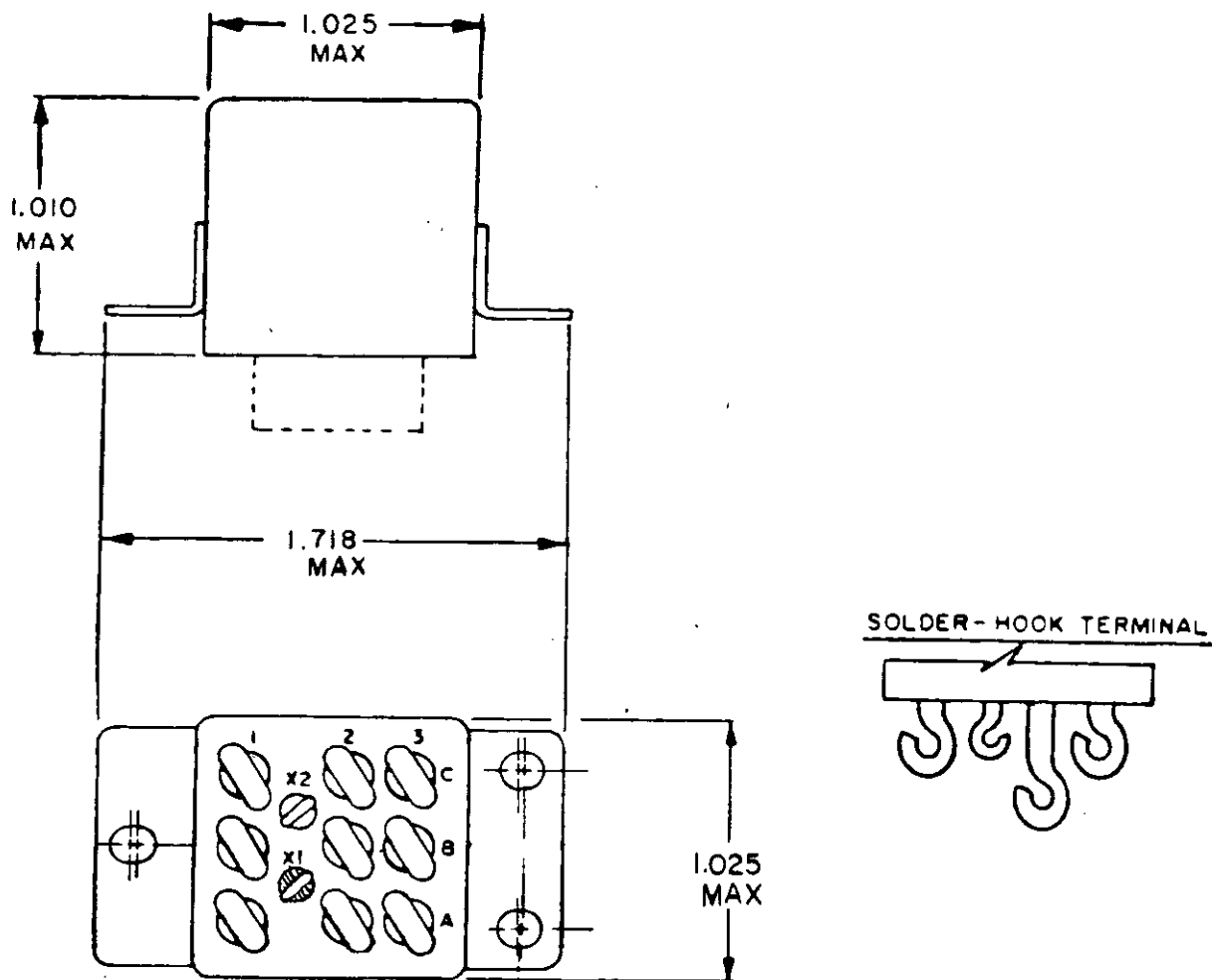
SOCKET PIN



CIRCUIT DIAGRAM

FIGURE 102-1. Relay, EM, ER, DPDT, 10 amperes (MS27401) - Continued.

MIL-STD-1346B



CONFIGURATION 1

FIGURE 102-2. Relay, EM, ER, 3PDT, 25 amperes (MS27743).

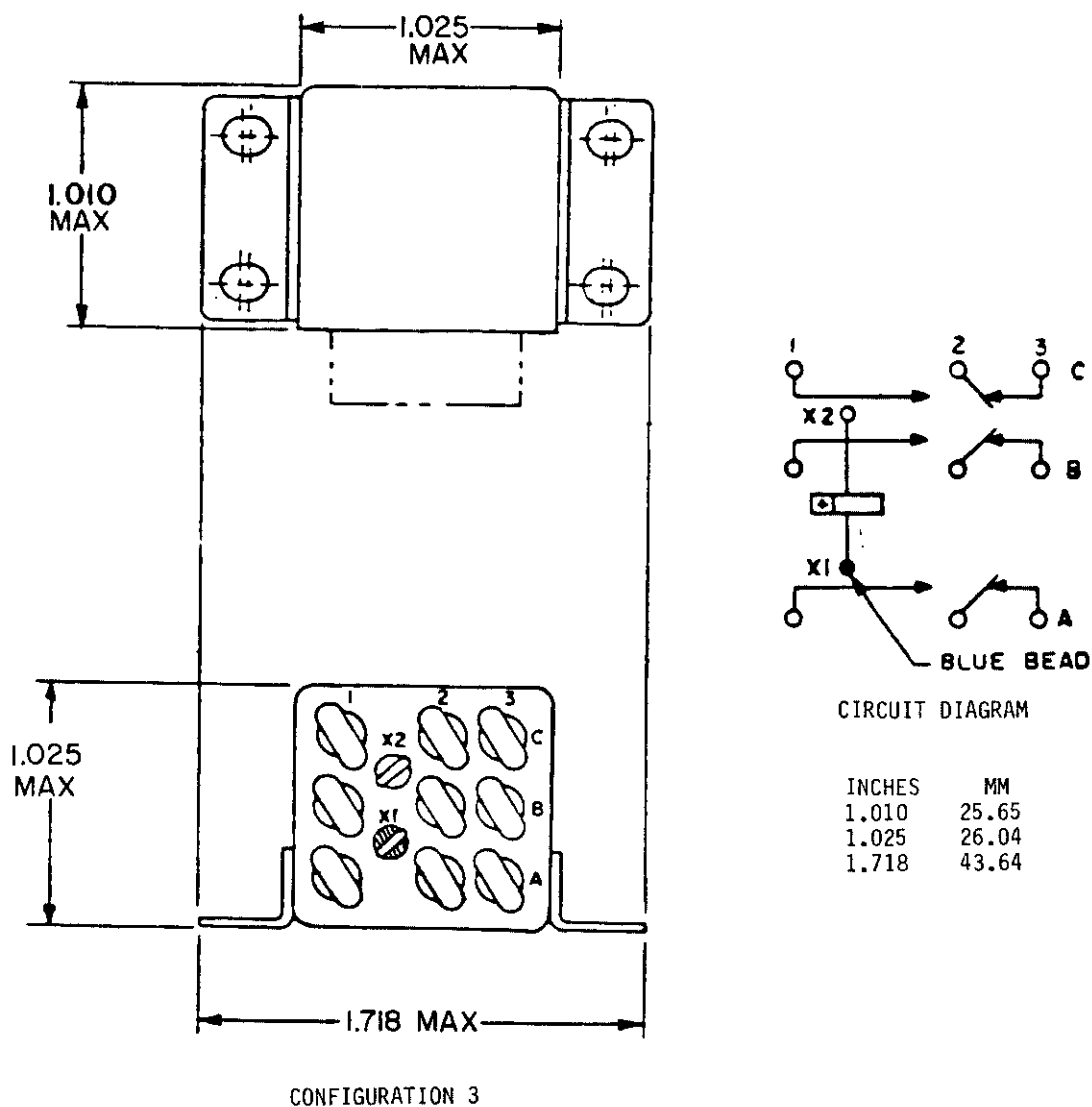
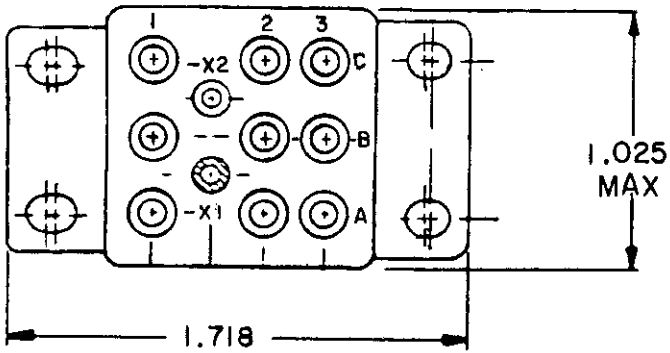
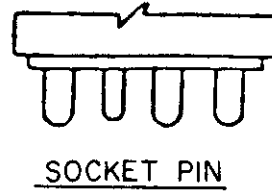
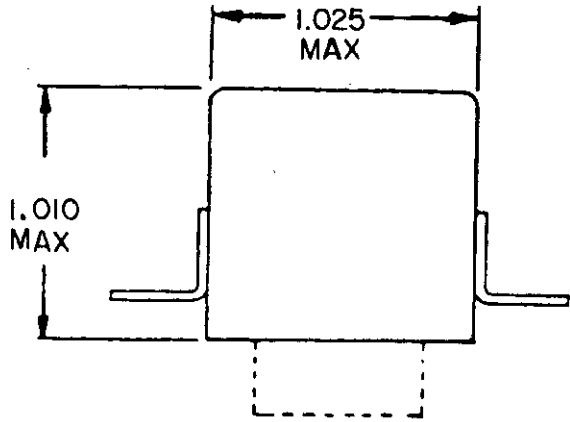


FIGURE 102-2. Relay, EM, ER, 3PDT, 25 amperes (MS27743) - Continued.

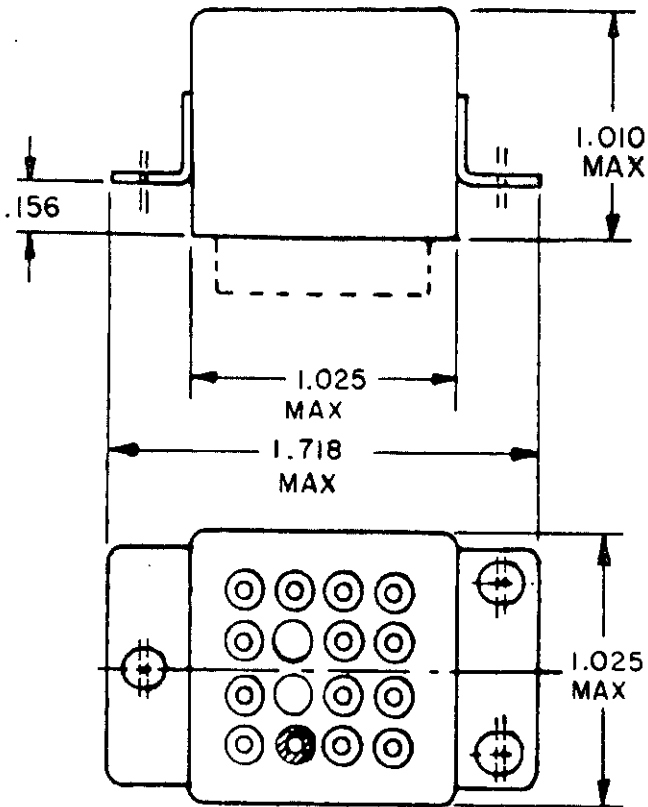
MIL-STD-1346B



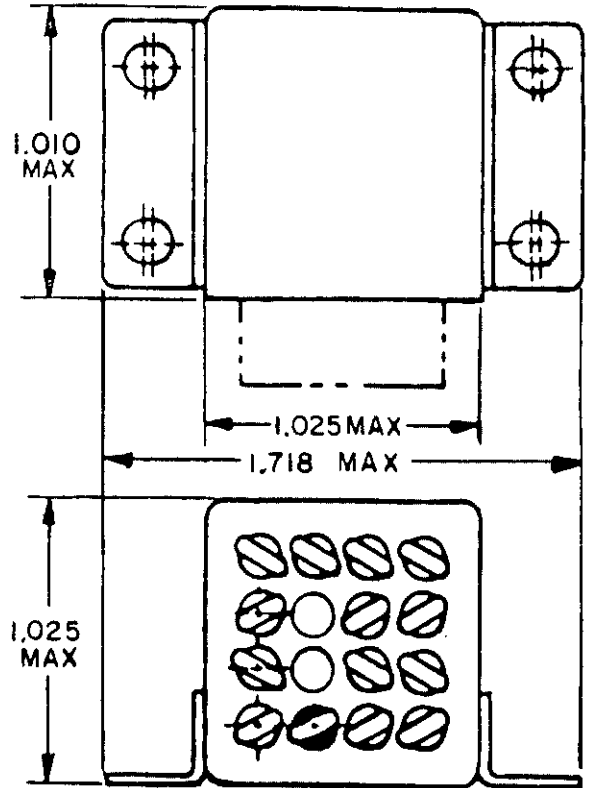
TERMINAL LAYOUT FOR ALL AC SOCKET PINS (GOLD-PLATED)

FIGURE 102-2. Relay, EM, ER, 3PDT, 25 amperes (MS27743) - Continued.

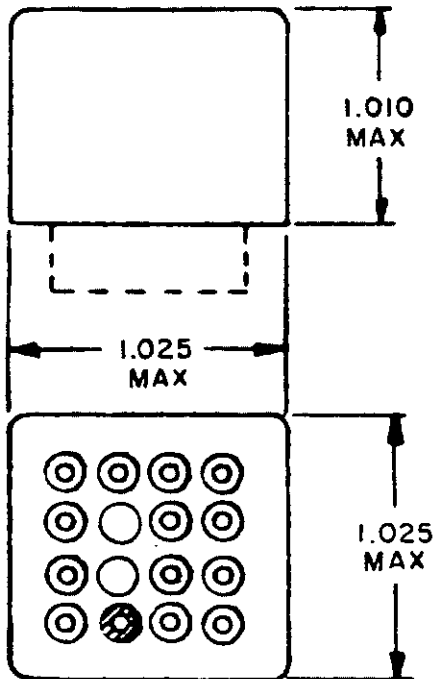
MIL-STD-1346B



CONFIGURATION 1



CONFIGURATION 2



CONFIGURATION 3

INCHES	MM
1.010	25.65
1.025	26.04
1.718	43.64

FIGURE 102-3. Relay, EM, ER, 4PDT, 10 amperes (MS27400).

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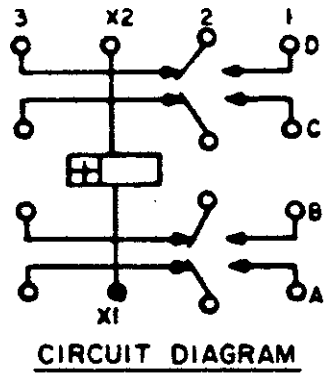
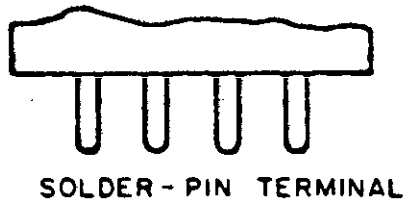
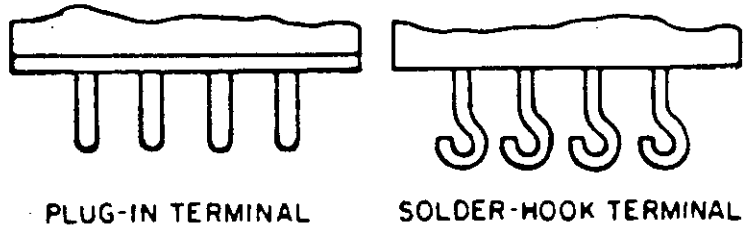
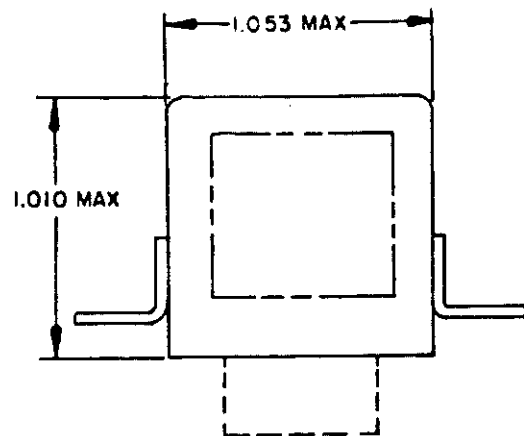


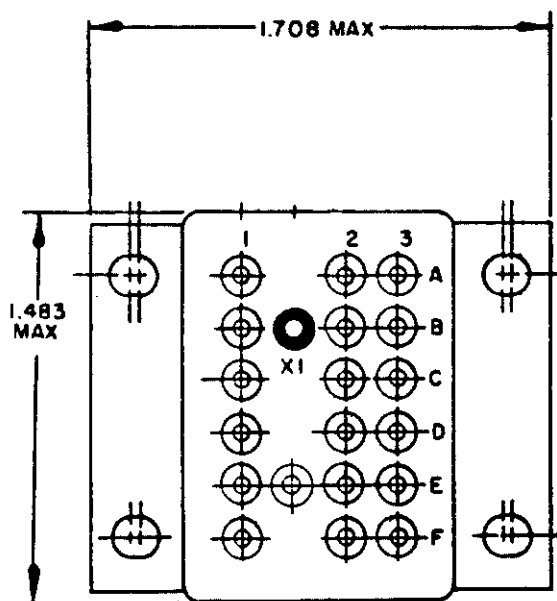
FIGURE 102-3. Relay, EM, ER, 4PDT, 10 amperes (MS27400) - Continued.



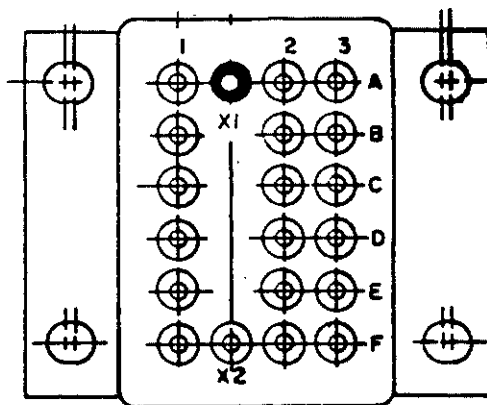
SOLDER HOOK TERMINAL



PLUG-IN TERMINAL



M6106/8-008
(PLUG-IN)

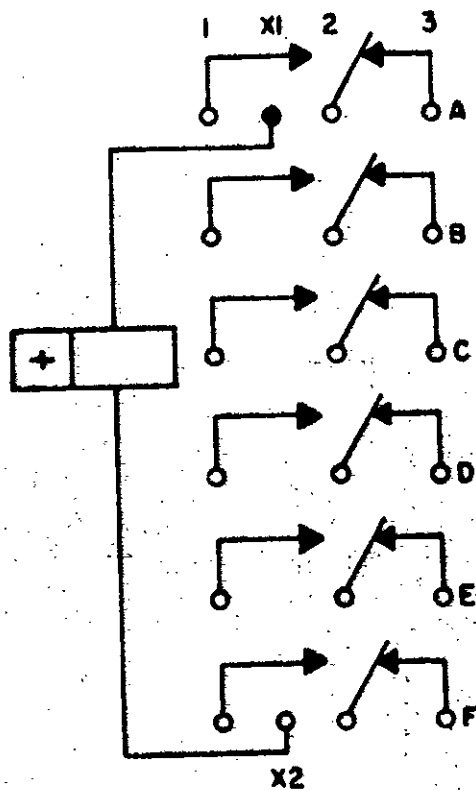


M6106/8-007
(SOLDER HOOK)

INCHES	MM
1.010	25.65
1.053	26.79
1.483	37.67

FIGURE 102-4. Relay, EM, ER, 6PDT, 10 amperes (MIL-R-6106/8).

MIL-STD-1346B



CIRCUIT DIAGRAM

FIGURE 102-4. Relay, EM, ER, 6PDT, 10 amperes (MIL-R-6106/8) - Continued.

MIL-STD-1346B

SUBSECTION 103

RELAYS, ELECTROMAGNETIC (EM), ESTABLISHED
RELIABILITY (ER), SENSITIVE, DC OPERATING

(Applicable specification: MIL-R-39016)

SCOPE: This subsection covers relays designed to operate with dc input coil power of 100 milliwatts or less, as applicable.

SECTION 103.1

RELAYS, ELECTROMAGNETIC (EM), ESTABLISHED RELIABILITY (ER), SENSITIVE, DC OPERATED

(Applicable specification: MIL-R-30010)

Duty cycle: Continuous
 Altitude: 70,000 feet
 Enclosure: Hermetically sealed
 Operating temperature range: B (see table I)

TABLE 103.1 V Relays, EM, ER, sensitive, dc operated, part numbers and characteristics.

Rated coil voltage	Part number	Figure number	Shock (see table II)	Vibration (see table III)	System voltage and frequency/Contact current in amperes						Terminal style (see table IV)		
					20 V dc	400 Hz	60 Hz	110 V 1-phase	110 V 3-phase	110 V 3-phase			
					100% live	100% Induc- tive	100% Induc- tive	100% Induc- tive	100% Induc- tive	100% Induc- tive	100% Induc- tive	100% Induc- tive	100% Induc- tive
SPDT CONTACTS - 1 FORM C													
5.0	10301A/1031	103-1	8	8	1.0	0.2	0.10	0.1	0.1	0.1	0.1	0.1	.107 .000
5.0	-010E -037E												.107 .000
6.0	-020E -037E												.107 .000
9.0	-020E -037E												.107 .000
12.0	-020E -037E												.107 .000
16.0	-030E -060E												.107 .000
24.0	-060E -070E												.107 .000
32.0	-060E -070E												.107 .000
40.0	-080E -030E												.107 .000

See footnotes at end of table.

TABLE 103.1 / Relays, EM, ER, sensitive, dc operated, part numbers and characteristics - Continued.

Rated coil voltage	Part number	Figure number	Shock (see table II)	Vibration (see table III)	System voltage and frequency-contact current in amperes						Terminal style (see table IV)		
					28 V dc		400 Hz		60 Hz				
					Resistive	Inductive	Resistive	Inductive	Resistive	Inductive			
SPDT CONTACTS - 1 FORM C - WITH DIODE COIL TRANSIENT SUPPRESSION													
5.0	M39016/263/	103-2	2	9	1.0	0.20	0.10	0.1	---	0.1	---	---	.187 .500
5.0	-025Z -033Z	"	"	"	"	"	"	"	"	"	"	"	.187 .500
6.0	-026Z -034Z	"	"	"	"	"	"	"	"	"	"	"	.187 .500
9.0	-031Z -039Z	"	"	"	"	"	"	"	"	"	"	"	.187 .500
12.0	-027Z -035Z	"	"	"	"	"	"	"	"	"	"	"	.187 .500
18.0	-037Z -040Z	"	"	"	"	"	"	"	"	"	"	"	.187 .500
26.5	-028Z -036Z	"	"	"	"	"	"	"	"	"	"	"	.187 .500
32.0	-029Z -037Z	"	"	"	"	"	"	"	"	"	"	"	.187 .500
40.0	-030Z -038Z	"	"	"	"	"	"	"	"	"	"	"	.187 .500
SPDT CONTACTS - 1 FORM C - WITH DIODE COIL TRANSIENT SUPPRESSION AND POLARITY REVERSAL PROTECTION													
5.0	M39016/263/	103-3	2	9	1.0	0.20	0.10	0.1	---	0.1	---	---	.187 .500
5.0	-025Z -033Z	103-3	2	9	1.0	0.20	0.10	0.1	---	0.1	---	---	.187 .500

See footnotes at end of table.

Rated coil voltage	Part number Z/	Figure number	Shock (see table II)	Vibration (see table III)	28 V dc			400 Hz			60 Hz			Terminal style (see table IV)
					Resistive	Inductive	Lamp	Resistive	Inductive	Lamp	Resistive	Inductive	Lamp	
SPDT CONTACTS - 1 FORM C - WITH DIODE COIL TRANSIENT SUPPRESSION AND POLARITY REVERSAL PROTECTION - Continued														
	M39016/263/													
6.0	-026Z	103-3	2	9	1.0	0.20	0.10	0.1	---	---	---	---	---	.187 .500
6.0	-034Z	"	"	"	"	"	"	"	"	"	"	"	"	.187 .500
9.0	-031Z	"	"	"	"	"	"	"	"	"	"	"	"	.187 .500
9.0	-039Z	"	"	"	"	"	"	"	"	"	"	"	"	.187 .500
12.0	-027Z	"	"	"	"	"	"	"	"	"	"	"	"	.187 .500
12.0	-035Z	"	"	"	"	"	"	"	"	"	"	"	"	.187 .500
18.0	-032Z	"	"	"	"	"	"	"	"	"	"	"	"	.187 .500
18.0	-040Z	"	"	"	"	"	"	"	"	"	"	"	"	.187 .500
26.5	-028Z	"	"	"	"	"	"	"	"	"	"	"	"	.187 .500
26.5	-036Z	"	"	"	"	"	"	"	"	"	"	"	"	.187 .500
32.0	-029Z	"	"	"	"	"	"	"	"	"	"	"	"	.187 .500
32.0	-037Z	"	"	"	"	"	"	"	"	"	"	"	"	.187 .500
40.0	-030Z	"	"	"	"	"	"	"	"	"	"	"	"	.187 .500
40.0	-038Z	"	"	"	"	"	"	"	"	"	"	"	"	.187 .500
DPDT CONTACTS - 2 FORM C														
	M39016/113/													
5.0	-018Z	103-4	2	9	1.0	0.2	0.10	0.1	---	---	---	---	---	.187 .500
5.0	-033Z	103-4	2	9	1.0	0.2	0.10	0.1	---	---	---	---	---	.187 .500

See footnotes at end of table.

TABLE 103.1 1/ Relays, EM, ER, sensitive, dc operated, part numbers and characteristics - Continued.

Rated coil voltage	Part number 2/	Figure number	Shock (see table II)	Vibration (see table III)	System voltage and frequency-contact current in amperes												Terminal style (see table IV)
					28 V dc			400 Hz			60 Hz			115 V 1-phase			
					Resis- tive	Induc- tive	Lamp	Resis- tive	Induc- tive	Lamp	Resis- tive	Induc- tive	Lamp	Resis- tive	Induc- tive	Lamp	
DPDT CONTACTS - 2 FORM C - Continued																	
6.0	M39016/112/	103-4	2	9	1.0	0.2	0.10	0.1	---	---	---	0.1	---	---	.187 .500		
6.0	-020Z -034Z	"	"	"	"	"	"	"	"	"	"	"	"	"	"		
9.0	-030Z -039Z	"	"	"	"	"	"	"	"	"	"	"	"	"	.187 .500		
12.0	-027Z -035Z	"	"	"	"	"	"	"	"	"	"	"	"	"	.187 .500		
18.0	-032Z -040Z	"	"	"	"	"	"	"	"	"	"	"	"	"	.187 .500		
26.5	-024Z -036Z	"	"	"	"	"	"	"	"	"	"	"	"	"	.187 .500		
36.0	-026Z -037Z	"	"	"	"	"	"	"	"	"	"	"	"	"	.187 .500		
48.0	-028Z -038Z	"	"	"	"	"	"	"	"	"	"	"	"	"	.187 .500		

See footnotes at end of table.

Rated coil voltage	Part number Z/	Figure number	Shock (see table II)	Vibration (see table III)	Resistive	inoc-tive	Lamp	Resistive	inoc-tive	Lamp	Resistive	inoc-tive	Lamp	Terminal style (see table IV)
DPDT CONTACTS - 2 FORM C - Continued														
	M39016/413/													
5.0	-033Z	103-5	2	9	1.0	0.2	0.1	0.1	0.1	0.1	0.1	---	---	---
5.0	-041Z													
6.0	-034Z													
6.0	-042Z													
9.0	-039Z													
9.0	-047Z													
12.0	-035Z													
12.0	-043Z													
18.0	-040Z													
18.0	-048Z													
26.5	-036Z													
26.5	-044Z													
36.0	-037Z													
36.0	-045Z													
48.0	-038Z													
48.0	-046Z													

See footnotes at end of table.

TABLE 103.1 I/ Relays, EM, ER, sensitive, dc operated, part numbers and characteristics - Continued.

Rated coil voltage	Part number	Figure number	Shock (see table II)	Vibration (see table III)	System voltage and frequency-contact current in amperes						Terminal style (see table IV)			
					28 V dc		400 Hz		60 Hz					
					Resistive	Lamp	Resistive	Inductive	Resistive	Inductive		Resistive	Lamp	
5.0	M39016/443/ Flange B	103-6	3	9	2.0	0.75	0.10	0.1	--	--	0.1	--	--	L SP
5.0	001Z 002Z													L SP
5.0	Flange C													L SP
5.0	004Z 005Z													L SP
5.0	No mount													L SP
5.0	007Z 008Z													L SP
6.0	Flange B													L SP
6.0	010Z 011Z													L SP
6.0	Flange C													L SP
6.0	013Z 014Z													L SP
6.0	No mount													L SP
6.0	016Z 017Z													L SP

DPDT CONTACTS - 2 FORM C - Continued

See footnotes at end of table.

TABLE 103.1 I/ Relays, EM, ER, sensitive, dc operated, part numbers and characteristics - Continued.

Rated coil voltage	Part number	Figure number	Shock (see table II)	Vibration (see table III)	System voltage and frequency-contact current in amperes						Terminal style (see table IV)		
					28 V dc		400 Hz		60 Hz				
					Resistive	Inductive	Resistive	Inductive	Resistive	Inductive			
	M39016/A43/ Flange B												
12.0	019Z	103-6	3	9	2.0	0.75	0.10	0.10	0.10	---	---	---	L SP
12.0	020Z												L SP
	Flange C												L SP
12.0	022Z												L SP
12.0	023Z												L SP
	No mount												L SP
12.0	025Z												L SP
12.0	026Z												L SP
	Flange B												L SP
26.5	028Z												L SP
26.5	029Z												L SP
	Flange C												L SP
26.5	031Z												L SP
26.5	032Z												L SP
	No mount												L SP
26.5	034Z												L SP
26.5	035Z												L SP

DPDT CONTACTS - 2 FORM C - Continued

See footnotes at end of table.

TABLE 103.1 I/ Relays. EM, ER, sensitive, dc operated, part numbers and characteristics - Continued.

Rated coil voltage	Part number	Figure number	Shock (see table II)	Vibration (see table III)	System voltage and frequency-contact current in amperes						Terminal style (see table IV)			
					28 V dc		400 Hz		60 Hz					
					Resistive	Inductive	Resistive	Inductive	Resistive	Inductive				
36.0	M39016/443/ Flange B	103-6	3	9	2.0	0.75	0.10	0.10	0.10	0.10	---	---	---	L
36.0	037Z 038Z													SP
36.0	Flange C													L
36.0	040Z 041Z													SP
36.0	No mount													L
36.0	043Z 044Z													SP
5.0	M39016/483/	103-7			0.5	0.1	---	---	---	---	---	---	---	SP
12.0	001Z				0.5	0.1								SP
26.5	002Z 003Z				0.5	0.1								SP
DPDT CONTACTS - 2 FORM C - WITH DIODE COIL TRANSIENT SUPPRESSION														
5.0	M39016/163/	103-8	2	9	1.0	0.2	0.10	0.10	0.10	0.10	---	---	---	.187
5.0	-025Z -033Z	103-8	2	9	1.0	0.2	0.10	0.10	0.10	0.10	---	---	---	.500

See footnotes at end of table.

Rated coil voltage	Part number	Figure number	Shock (see table II)	Vibration (see table III)	Resistive	Inductive	Lamp	Resistive	Inductive	Lamp	Resistive	Inductive	Lamp	Terminal style (see table IV)
DPDT CONTACTS - 2 FORM C - WITH DIODE COIL TRANSIENT SUPPRESSION - Continued														
6.0	M39016/163/	103-8	2	9	1.0	0.2	0.10	0.10	0.10	---	0.10	---	---	.187
6.0	-026Z	"	"	"	"	"	"	"	"	"	"	"	"	.500
9.0	-031Z	"	"	"	"	"	"	"	"	"	"	"	"	.187
9.0	-039Z	"	"	"	"	"	"	"	"	"	"	"	"	.500
12.0	-027Z	"	"	"	"	"	"	"	"	"	"	"	"	.187
12.0	-035Z	"	"	"	"	"	"	"	"	"	"	"	"	.500
18.0	-032Z	"	"	"	"	"	"	"	"	"	"	"	"	.187
18.0	-040Z	"	"	"	"	"	"	"	"	"	"	"	"	.500
26.5	-028Z	"	"	"	"	"	"	"	"	"	"	"	"	.187
26.5	-036Z	"	"	"	"	"	"	"	"	"	"	"	"	.500
36.0	-029X	"	"	"	"	"	"	"	"	"	"	"	"	.187
36.0	-037X	"	"	"	"	"	"	"	"	"	"	"	"	.500
48.0	-030X	"	"	"	"	"	"	"	"	"	"	"	"	.187
48.0	-038X	"	"	"	"	"	"	"	"	"	"	"	"	.500
5.0	M39016/423/	103-9	2	9	1.0	0.2	0.1	0.10	0.10	---	0.10	---	---	.500
5.0	-033Z	"	"	"	"	"	"	"	"	"	"	"	"	.187
6.0	-041Z	"	"	"	"	"	"	"	"	"	"	"	"	.500
6.0	-042Z	"	"	"	"	"	"	"	"	"	"	"	"	.187
9.0	-039Z	"	"	"	"	"	"	"	"	"	"	"	"	.500
9.0	-047Z	"	"	"	"	"	"	"	"	"	"	"	"	.187
12.0	-035Z	"	"	"	"	"	"	"	"	"	"	"	"	.500
12.0	-043Z	"	"	"	"	"	"	"	"	"	"	"	"	.187
18.0	-040Z	"	"	"	"	"	"	"	"	"	"	"	"	.500
18.0	-048Z	"	"	"	"	"	"	"	"	"	"	"	"	.187

See footnotes at end of table.

TABLE 103.1.1/ Relays, EM, ER, sensitive, dc operated, part numbers and characteristics - Continued.

Rated coil voltage	Part number ^{2/}	Figure number (see table I)	Shock (see table II)	Vibration (see table III)	System voltage and frequency-contact current in amperes												Terminal style (see table IV)
					28 V dc			400 Hz			60 Hz			115 V 1-phase			
					Resis- tive	Induc- tive	Lamp	Resis- tive	Induc- tive	Lamp	Resis- tive	Induc- tive	Lamp	Resis- tive	Induc- tive	Lamp	
DPDT CONTACTS - 2 FORM C - WITH DIODE COIL TRANSIENT SUPPRESSION - Continued																	
	M39016/423/																
26.5	-036Z	103-9	2	9	1.0	0.2	0.1	0.10	0.10	---	---	---	0.10	---	---	.500 .187	
26.5	-044Z	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	.500
36.0	-037Z	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	.187
36.0	-045Z	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	.500
48.0	-038Z	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	.187
48.0	-046Z	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	.187
DPDT CONTACTS - 2 FORM C - WITH DIODE COIL TRANSIENT SUPPRESSION AND POLARITY REVERSAL PROTECTION																	
	M39016/213/																
5.0	-019Z	103-10	2	9	1.0	0.2	0.10	0.10	0.10	---	---	---	0.10	---	---	.187 .500	
5.0	-033Z	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	.500
6.0	-020Z	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	.187
6.0	-034Z	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	.500
9.0	-021Z	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	.187
9.0	-035Z	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	.500
12.0	-022Z	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	.187
12.0	-036Z	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	.500
18.0	-023Z	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	.187
18.0	-037Z	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	.500
26.5	-024Z	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	.187
26.5	-038Z	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	.500

See footnotes at end of table.

Rated coil voltage	Part number 2/	Figure number	Shock (see table I)	Vibration (see table III)	Resistive	Inductive	Lamp	Resistive	Inductive	Lamp	Resistive	Inductive	Lamp	Terminal style (see table IV)
DPDT CONTACTS - 2 FORM C - WITH DIODE COIL TRANSIENT SUPPRESSION AND POLARITY REVERSAL PROTECTION - Continued														
	M39016/213/													
36.0	-031Z	103-10	2	9	1.0	0.2	0.10	0.10	---	---	0.10	---	---	.187 .500
36.0	-039Z													
48.0	-037Z													.187
48.0	-040Z													.500
	M39016/433/													
5.0	-033Z	103-11												.500
5.0	-041Z													.187
6.0	-034Z													.500
6.0	-042Z													.187
9.0	-035Z													.500
9.0	-043Z													.187
12.0	-036Z													.500
12.0	-044Z													.187
18.0	-037Z													.500
18.0	-045Z													.187
26.5	-038Z													.500
26.5	-046Z													.187
36.0	-039Z													.500
36.0	-047Z													.187
48.0	-040Z													.500
48.0	-048Z													.187

1/ These relays are not recommended in critical applications or in applications where a less sensitive relay can be used.
 2/ The symbol "Z" is used to indicate that a failure rate symbol is required. See table V and the latest qualified products list (QPL) of the specification being used.
 3/ Relay possesses high level and low level capabilities. The low level rating is 10-50 microamperes at 10-50 millivolts or peak ac.

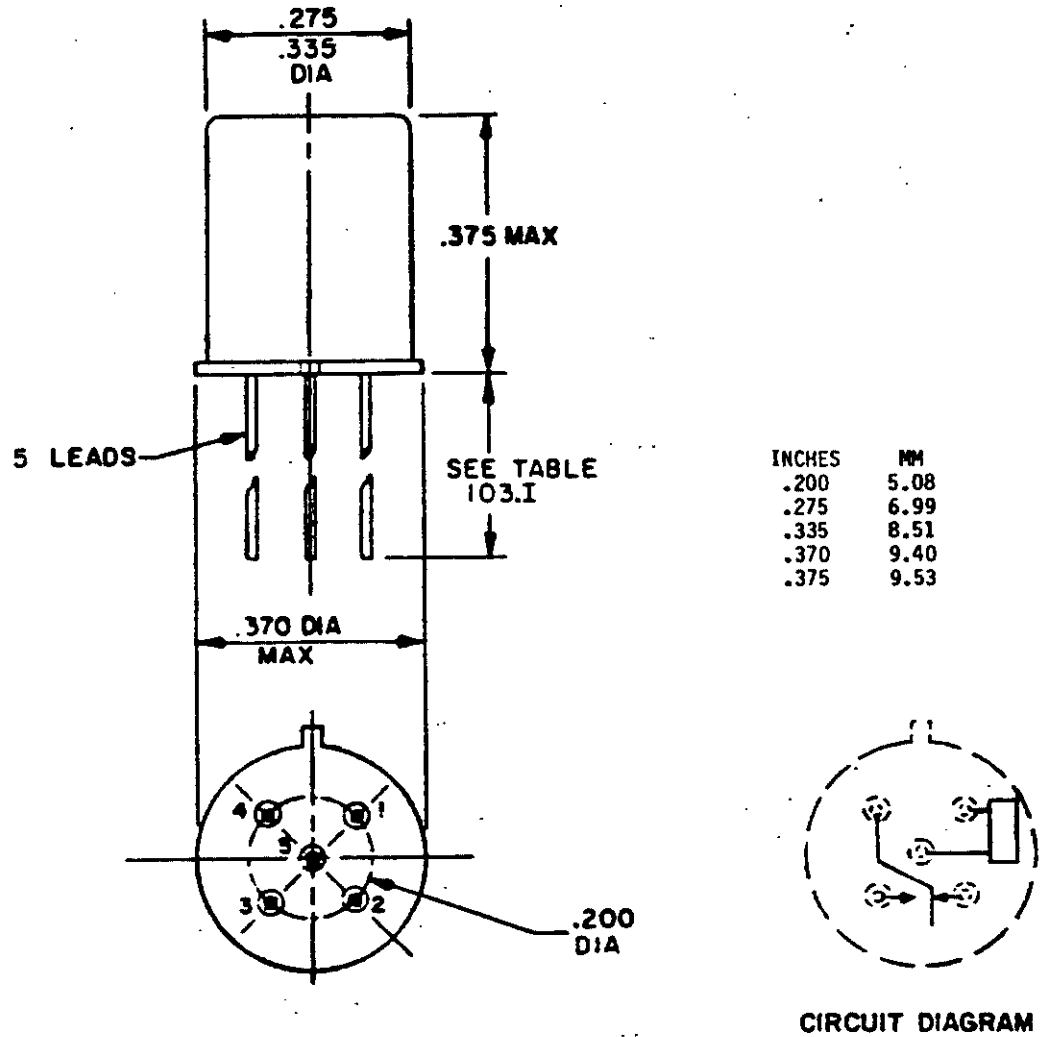


FIGURE 103-1. Relay, EM, ER, SPDT, low level to 1 ampere (sensitive, 40 milliwatts) (MIL-R-39016/10).

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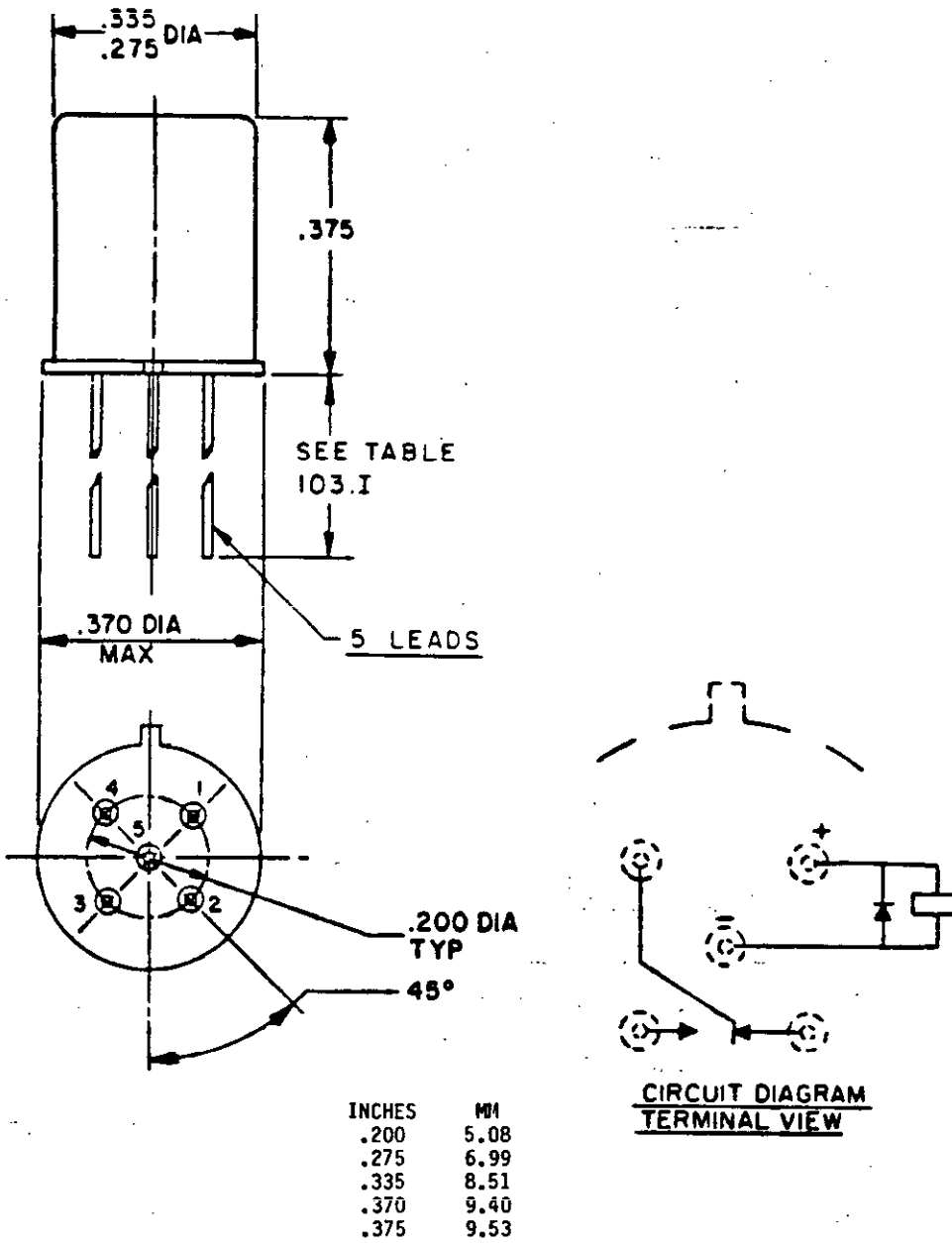


FIGURE 103-2. Relay, EM, ER, SPDT, low level to 1 ampere (sensitive, 40 milliwatts) with an internal diode for coil transient suppression (MIL-R-39016/25).

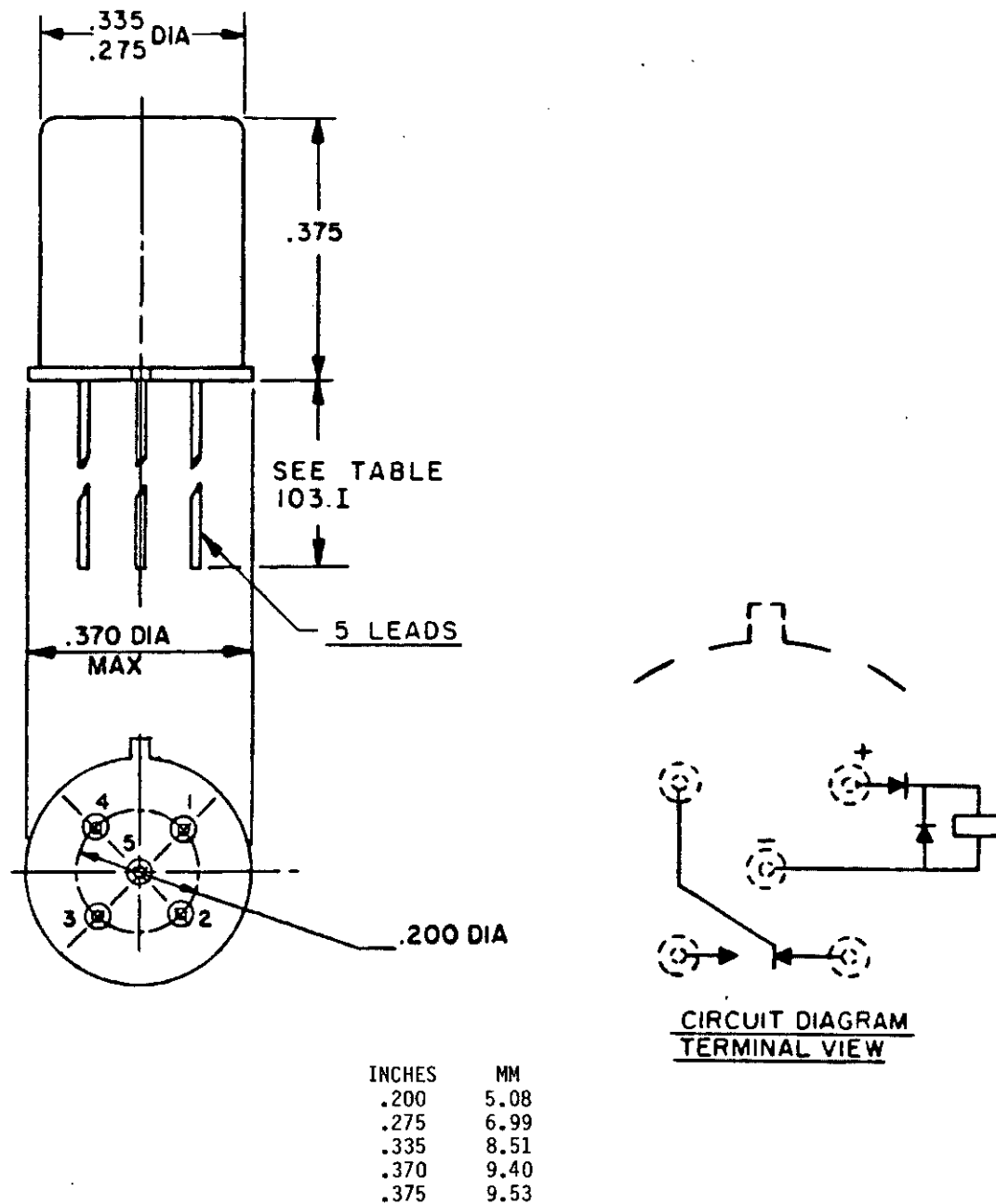
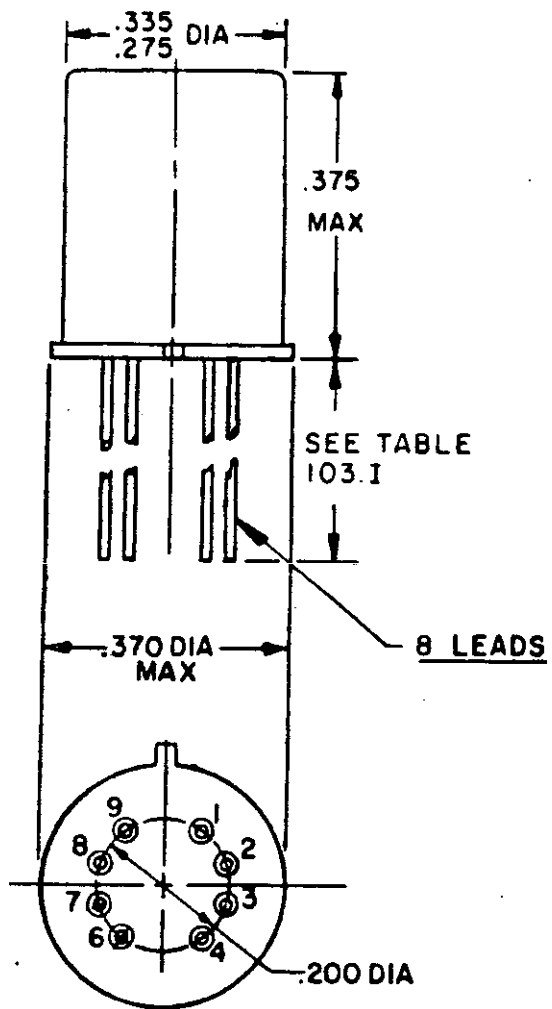
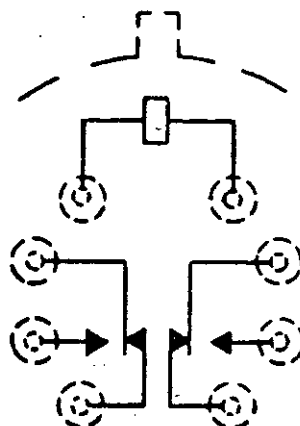


FIGURE 103-3. Relay, EM, ER, SPDT, low level to 1 ampere (sensitive, 40 milliwatts) with internal diodes for coil transient suppression and polarity reversal protection (MIL-R-39016/26).

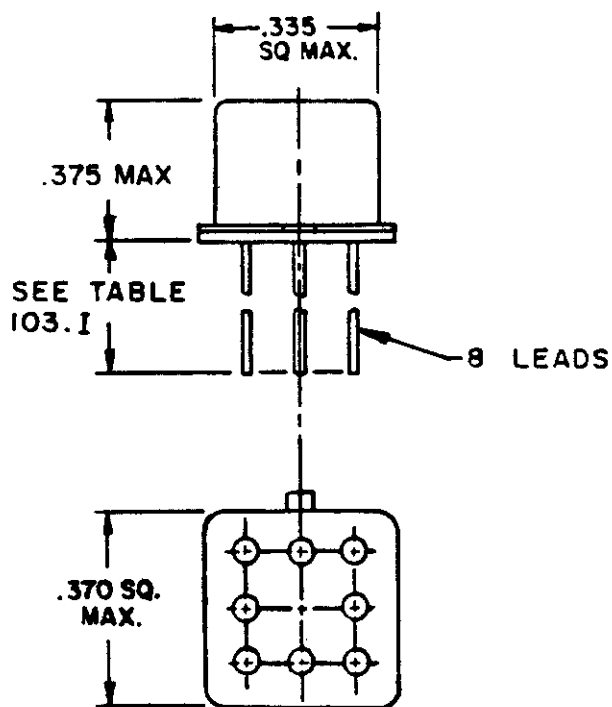


INCHES	MM
.200	5.08
.275	6.99
.335	8.51
.370	9.40
.375	9.53

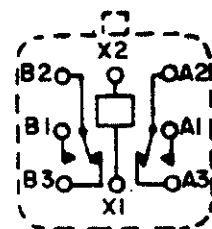


CIRCUIT DIAGRAM
TERMINAL VIEW

FIGURE 103-4. Relay, EM, ER, DPDT, low level to 1 ampere (sensitive, 60 milliwatts)
(MIL-R-39016/11).

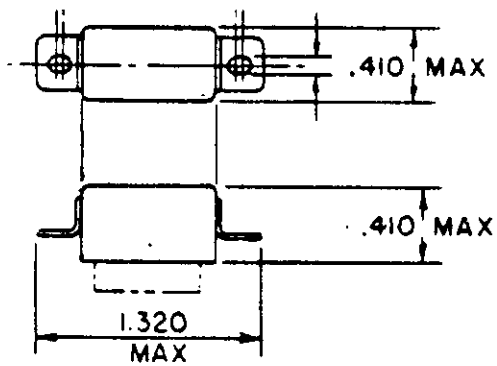
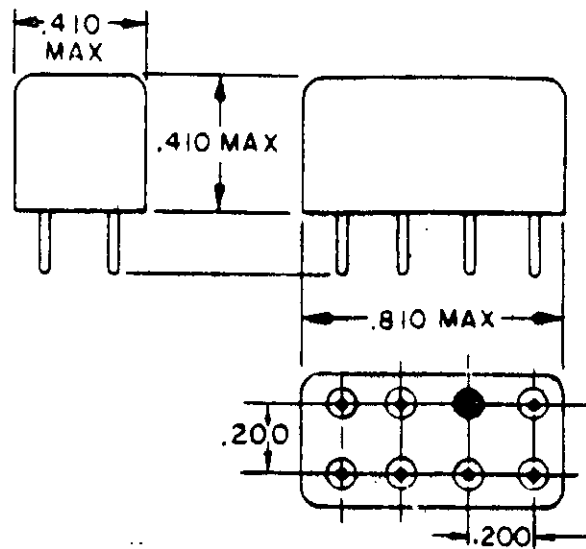
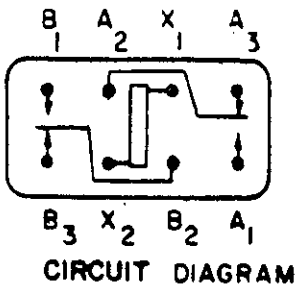


INCHES	MM
.335	8.51
.375	9.53
.370	9.40

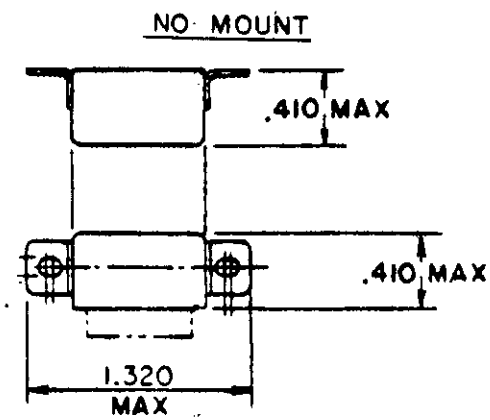


CIRCUIT DIAGRAM
TERMINAL VIEW

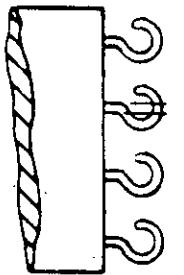
FIGURE 103-5. Relay, EM, ER, DPDT, low level to 1 ampere (sensitive, 60 milliwatts)
(MIL-R-39016/41).



FLANGE MOUNT "B"

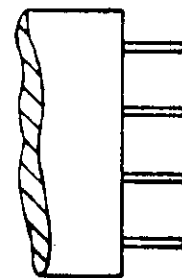


FLANGE MOUNT C



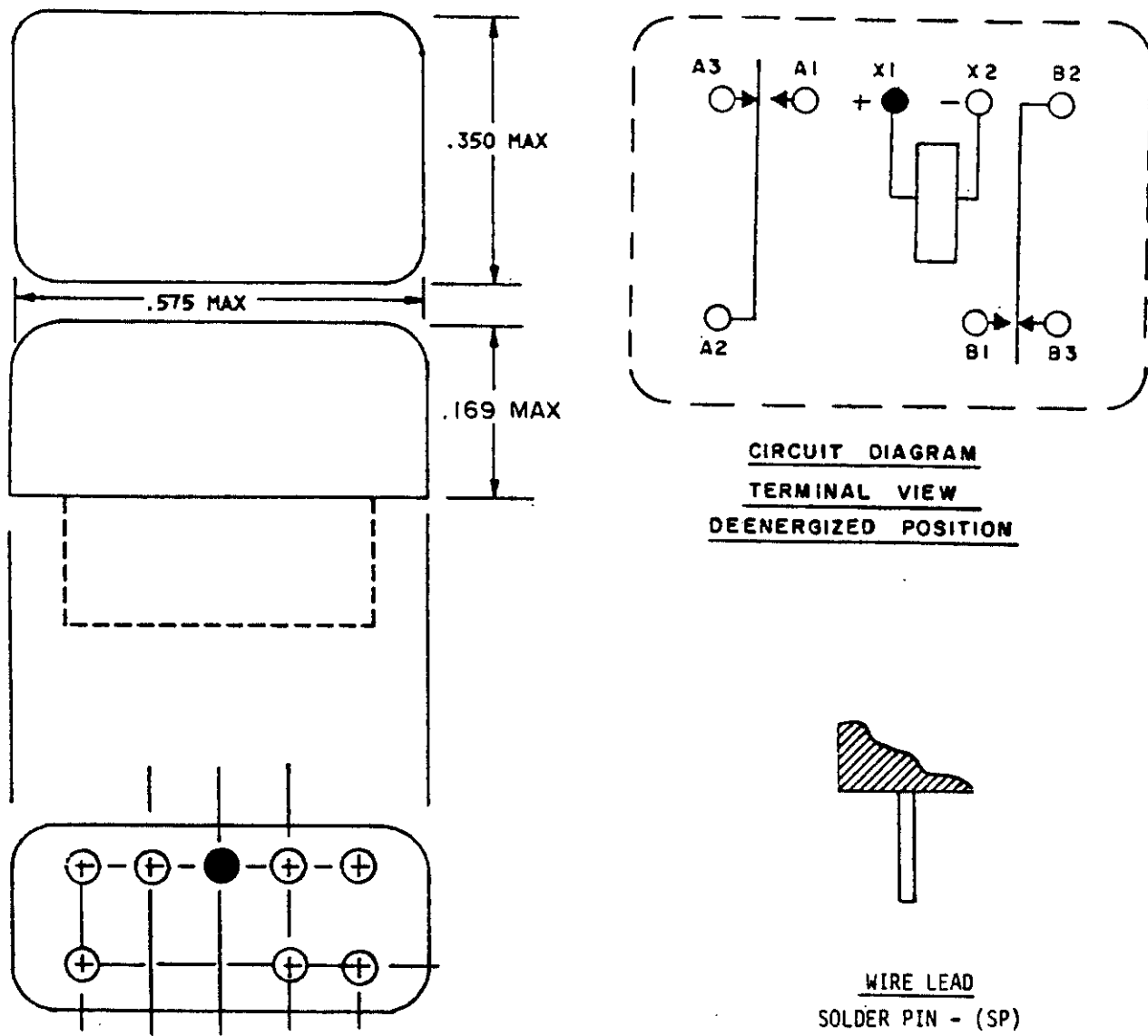
SOLDER LUG

INCHES	MM
.200	5.08
.410	10.41
1.320	33.53



PIN
(PRINTED CIRCUIT)

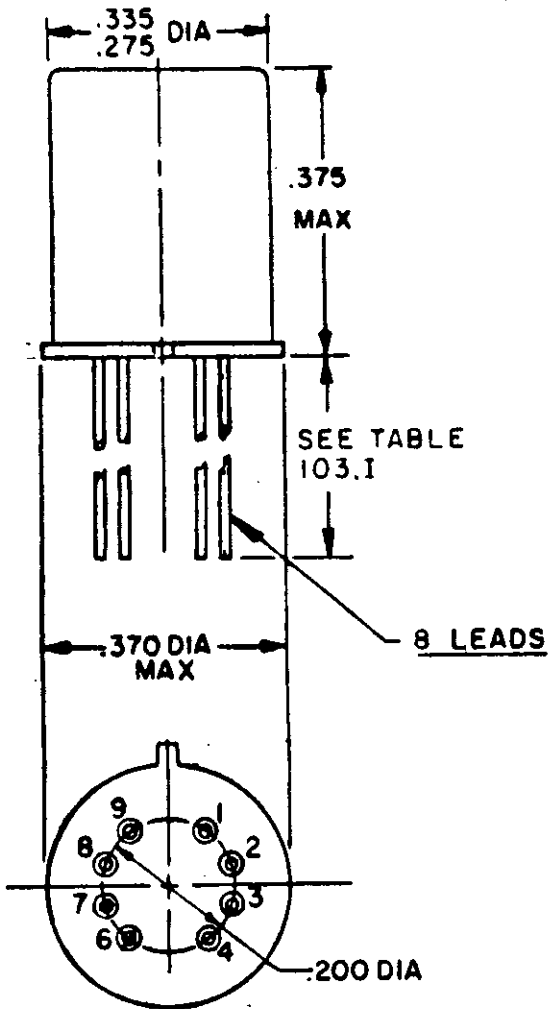
FIGURE 103-6. Relay, EM, ER, DPDT, low level to 2 amperes, (sensitive, 100/125 milliwatts), (MIL-R-39016/44).



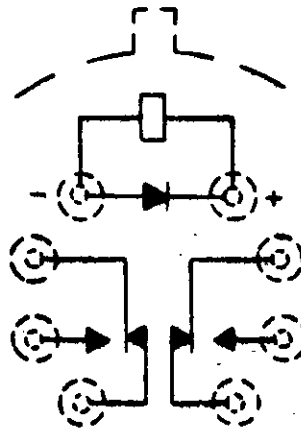
INCHES	MM
.169	4.29
.350	8.89
.575	14.60

FIGURE 103-7. Relay, EM, ER, DPDT, low level to 0.5 ampere, sensitive (MIL-R-39016/48).

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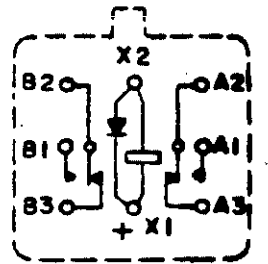
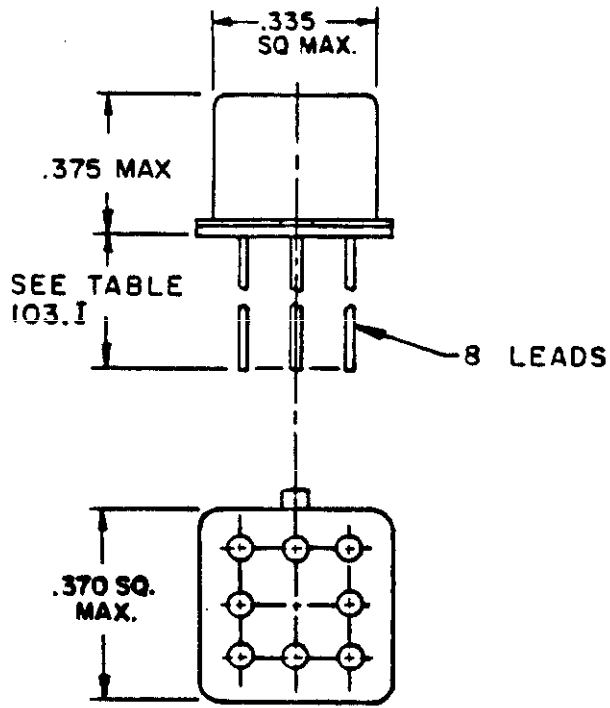


INCHES	MM
.200	5.08
.275	6.99
.335	8.51
.370	9.40
.375	9.53



CIRCUIT DIAGRAM
TERMINAL VIEW

FIGURE 103-8. Relay, EM, ER, DPDT, low level to 1 ampere (sensitive, 60 milliwatts) with internal diode for coil transient suppression (MIL-R-39016/16).

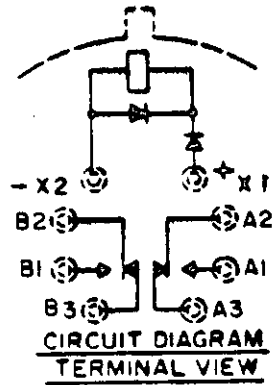
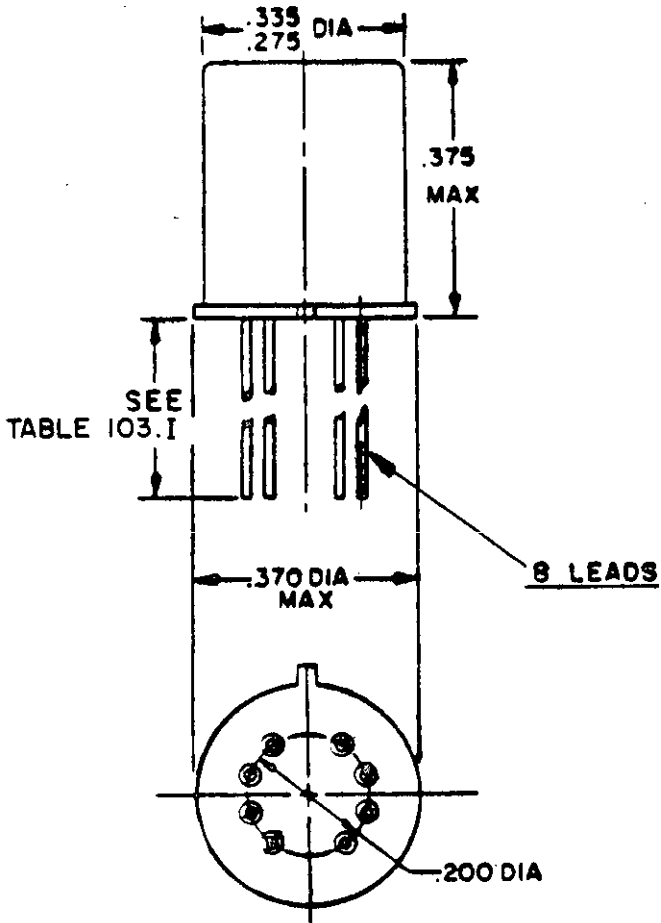


CIRCUIT DIAGRAM
TERMINAL VIEW

INCHES	MM
.335	8.51
.370	9.40
.375	9.53

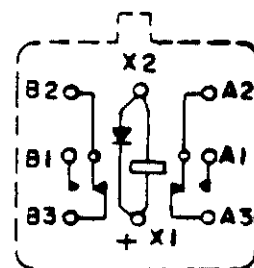
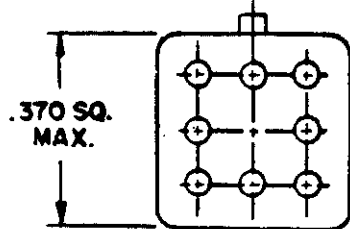
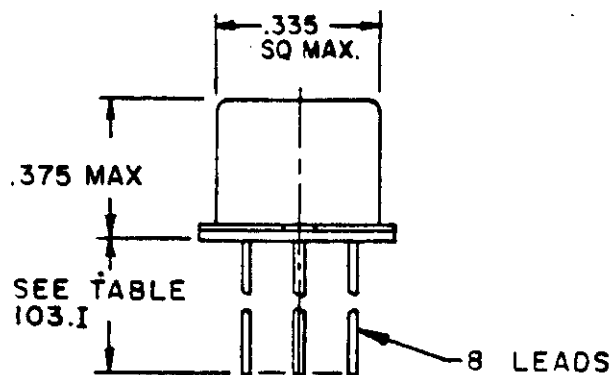
FIGURE 103-9. Relay, EM, ER, DPDT, low level to 1 ampere (sensitive, 60 milliwatts) with internal diode for coil transient suppression (MIL-R-39016/42).

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INCHES	MM
.200	5.08
.275	6.99
.335	8.51
.370	9.40
.375	9.53

FIGURE 103-10. Relay, EM, ER, DPDT, low level to 1 ampere (sensitive, 60 milliwatts) with internal diode for coil transient suppression and polarity reversal protection (MIL-R-39016/21).



CIRCUIT DIAGRAM
TERMINAL VIEW

INCHES	MM
.100	2.54
.335	8.51
.370	9.40
.375	9.53

FIGURE 103-11. Relay, EM, ER, DPDT, low level to 1 ampere (sensitive, 60 milliwatts) with internal diode for coil transient suppression and polarity reversal protection (MIL-R-39016/43).

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SUBSECTION 104

RELAYS, ELECTROMAGNETIC (EM), ESTABLISHED RELIABILITY (ER),
LATCHING, DC OPERATED

(Applicable specification: MIL-R-39016)

SCOPE: This subsection covers relays with coils dc voltage rated. Latching relays maintain their contacts in the last position assumed without the need of maintaining coil energization.

TABLE 104.1. Relays, EM, ER, latching, dc operated, part numbers and characteristics - Continued.

Rated coil voltage	Part number	Figure number	Shock (see table II)	Vibration (see table III)	System voltage and frequency - contact current in amperes												Terminal style (see table IV)
					28 V dc				400 Hz				50/60 Hz				
					Resis- tive	Induc- tive	Motor	Lamp	Resis- tive	Induc- tive	Motor	Lamp	Resis- tive	Induc- tive	Motor	Lamp	
SPDT CONTACTS - 1 FORM C, LATCHING, WITH DIODE COIL TRANSIENT SUPPRESSION - Continued																	
	M39016/27 2/																
12.0	-02Z	104-2	3	9	.5	.1	.05	.05	.05	.05	.05	.05	.05	.05	.05	.187 .500	
12.0	-028Z	"	"	"	"	"	"	"	"	"	"	"	"	"	"	.187 .500	
18.0	-023Z	"	"	"	"	"	"	"	"	"	"	"	"	"	"	.187 .500	
18.0	-029Z	"	"	"	"	"	"	"	"	"	"	"	"	"	"	.187 .500	
26.5	-024Z	"	"	"	"	"	"	"	"	"	"	"	"	"	"	.187 .500	
26.5	-030Z	"	"	"	"	"	"	"	"	"	"	"	"	"	"	.187 .500	
SPDT CONTACTS - 1 FORM C, LATCHING, WITH DIODE COIL TRANSIENT SUPPRESSION AND POLARITY REVERSAL PROTECTION																	
	M39016/28 2/																
5.0	-019Z	104-3	3	9	.5	.1	.05	.05	.05	.05	.05	.05	.05	.05	.05	.187 .500	
5.0	-025Z	"	"	"	"	"	"	"	"	"	"	"	"	"	"	.187 .500	
6.0	-020Z	"	"	"	"	"	"	"	"	"	"	"	"	"	"	.187 .500	
6.0	-026Z	"	"	"	"	"	"	"	"	"	"	"	"	"	"	.187 .500	
9.0	-021Z	"	"	"	"	"	"	"	"	"	"	"	"	"	"	.187 .500	
9.0	-027Z	"	"	"	"	"	"	"	"	"	"	"	"	"	"	.187 .500	
12.0	-022Z	"	"	"	"	"	"	"	"	"	"	"	"	"	"	.187 .500	
12.0	-028Z	"	"	"	"	"	"	"	"	"	"	"	"	"	"	.187 .500	
18.0	-023Z	"	"	"	"	"	"	"	"	"	"	"	"	"	"	.187 .500	
18.0	-029Z	"	"	"	"	"	"	"	"	"	"	"	"	"	"	.187 .500	
26.5	-024Z	"	"	"	"	"	"	"	"	"	"	"	"	"	"	.187 .500	
26.5	-030Z	"	"	"	"	"	"	"	"	"	"	"	"	"	"	.187 .500	
DPDT CONTACTS - 2 FORM C, LATCHING																	
	M39016/12 2/																
5.0	-037Z	104-5	3	9	1.0	.2	.1	.1	.1	.1	.1	.1	.1	.1	.1	.187 .500 .500	
"	-043Z	"	"	"	"	"	"	"	"	"	"	"	"	"	"	.187 .500 .500	
"	-049Z	"	"	"	"	"	"	"	"	"	"	"	"	"	"	.187 .500 .500	
"	-055Z	"	"	"	"	"	"	"	"	"	"	"	"	"	"	.187 .500 .500	

See footnotes at end of table.

TABLE 104.1. Relays, EM, ER, Latching, dc operated, part numbers and characteristics - Continued.

Rated coil voltage	Part number	Figure number	Shock (see table II)	Vibration (see table III)	System voltage and frequency - contact current in amperes												Terminal style (see table IV)
					28 V dc		115 V 1-phase		400 Hz		115 V 1-phase		50/60 Hz		115/200 V 3-phase		
					Resistive	Induc-Motor	Lamp	Resistive	Induc-Motor	Lamp	Resistive	Induc-Motor	Lamp	Resistive	Induc-Motor	Lamp	
DPDT CONTACTS - 2 FORM C, LATCHING, WITH DIODE COIL TRANSIENT SUPPRESSION - Continued																	
	M39016/29																
18.0	M39016/29 -040Z 3/ -047Z 4/ -052Z 3/ -059Z 4/	104-7	3	9													.187 .187 .500 .500
26.5	M39016/29 -041Z 3/ -048Z 4/ -053Z 3/ -060Z 4/																.187 .187 .500 .500
DPDT CONTACTS - 2 FORM C, LATCHING, WITH DIODE COIL TRANSIENT SUPPRESSION AND POLARITY REVERSAL PROTECTION																	
	M39016/30																
5.0	M39016/30 -042Z 3/ -043Z 4/ -054Z 3/ -055Z 4/	104-8	3	9													.187 .187 .500 .500
6.0	M39016/30 -037Z 3/ -044Z 4/ -049Z 3/ -056Z 4/																.187 .187 .500 .500
9.0	M39016/30 -038Z 3/ -045Z 4/ -050Z 3/ -057Z 4/																.187 .187 .500 .500
12.0	M39016/30 -039Z 3/ -046Z 4/ -051Z 3/ -058Z 4/																.187 .187 .500 .500
18.0	M39016/30 -040Z 3/ -047Z 4/ -052Z 3/ -059Z 4/																.187 .187 .500 .500

See footnotes at end of table.

TABLE 104.1. Relays, EM, ER, latching, dc operated, part numbers and characteristics - Continued.

Rated coil voltage	Part number	Figure number	Shock (see table 11)	Vibration (see table 11)	System voltage and frequency - contact current in amperes												Terminal style (see table 1V)
					28 V dc		115 V 1-phase		400 Hz		115/200 V 3-phase		50/60 Hz		115/200 V 3-phase		
					Resis- tive	Induc- tive	Motor Lamp	Resis- tive	Induc- tive	Motor Lamp	Resis- tive	Induc- tive	Motor Lamp	Resis- tive	Induc- tive	Motor Lamp	
DPDT CONTACTS - 2 FORM C, LATCHING, WITH DIODE COIL TRANSIENT SUPPRESSION AND POLARITY REVERSAL PROTECTION - Continued																	
26.5	M39016/30 2/ -041Z 3/ -048Z 4/ -053Z 5/ -060Z 6/	104-8	3	9	1.0	.2	---	.1	---	---	---	---	---	---	---	---	.187 .187 .500 .500
4PDT CONTACTS - 4 FORM C																	
6.0 6.0	M39016/31 2/ -001Z -004Z	104-9	3	9	2.0	.5	---	.125	---	---	---	---	---	.125	---	---	SP L
12.0 12.0	M39016/31 2/ -002Z -005Z	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	SP L
26.5 26.5	M39016/31 2/ -003Z -006Z	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	SP L
4PDT CONTACTS - 4 FORM C, LATCHING, WITH DIODE COIL TRANSIENT SUPPRESSION																	
6.0 6.0	M39016/35 2/ -001Z -004Z	104-10	3	9	2.0	.5	---	.125	---	---	---	---	---	.125	---	---	SP L
12.0 12.0	M39016/35 2/ -002Z -005Z	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	SP L
26.5 26.5	M39016/35 2/ -003Z -006Z	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	SP L

See footnotes at end of table.

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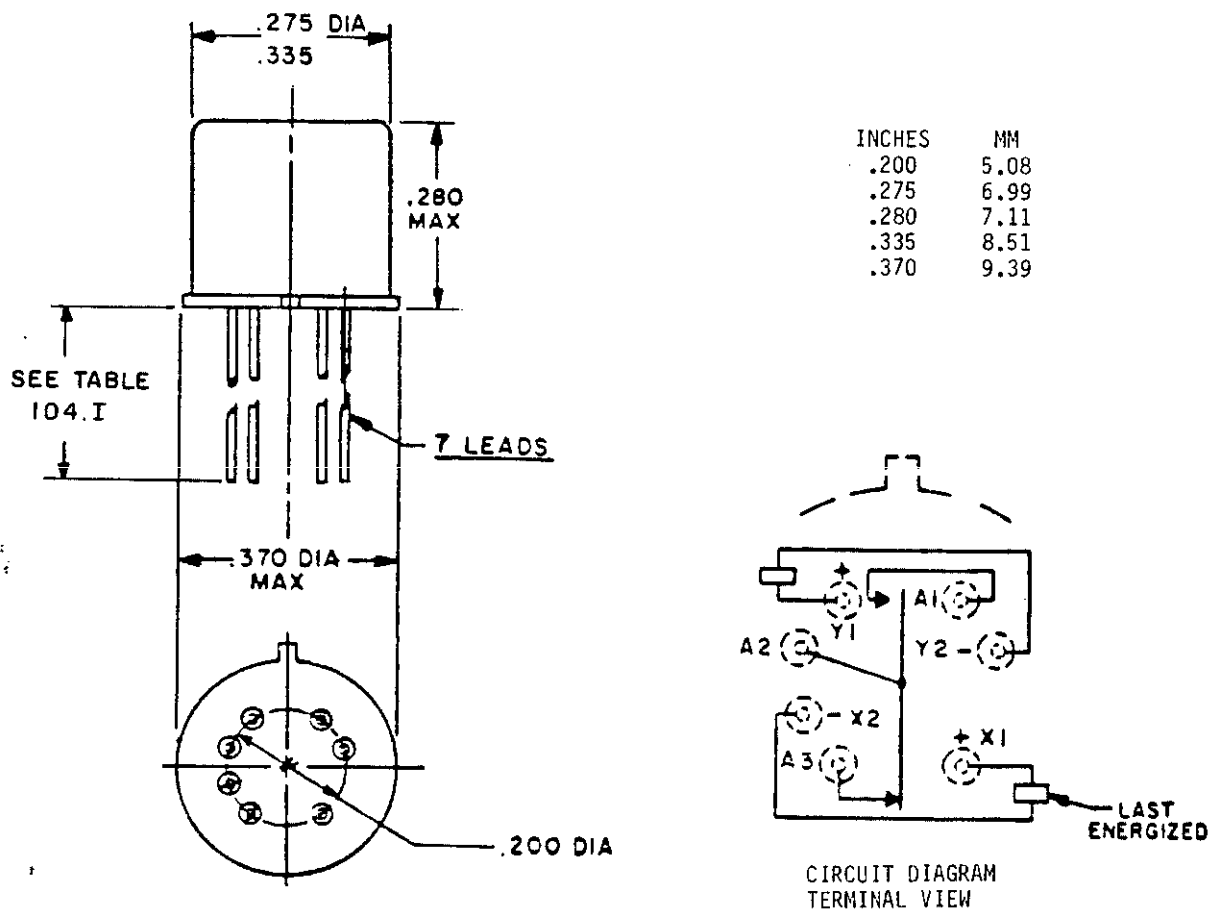
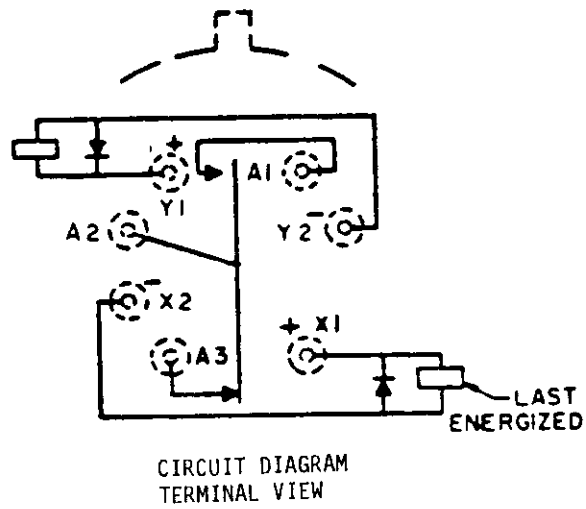
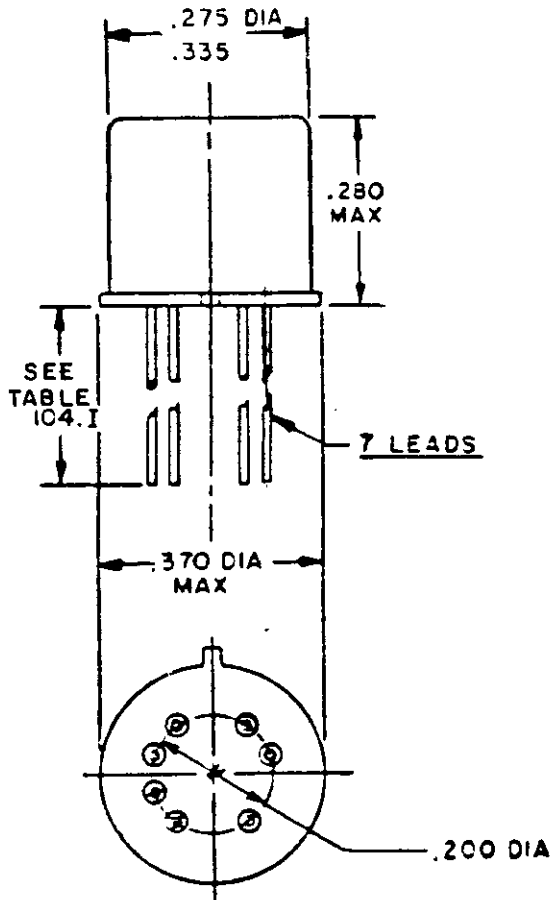


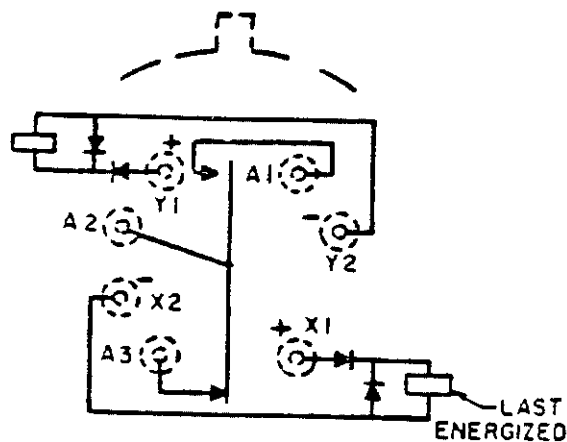
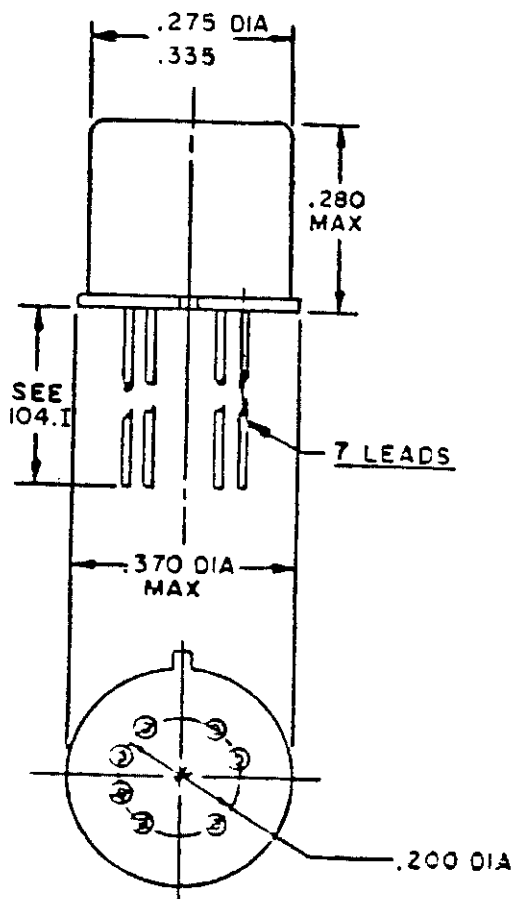
FIGURE 104-1. Relay, EM, ER, SPDT, low level to 0.5 ampere (latching) (MIL-R-39016/8).

MIL-STD-1346B



INCHES	MM
.200	5.08
.275	6.99
.280	7.11
.335	8.51
.370	9.39

FIGURE 104-2. Relay, EM, ER, SPDT, low level to 0.5 ampere (latching) with internal diodes for coil transient suppression (MIL-R-39016/27).

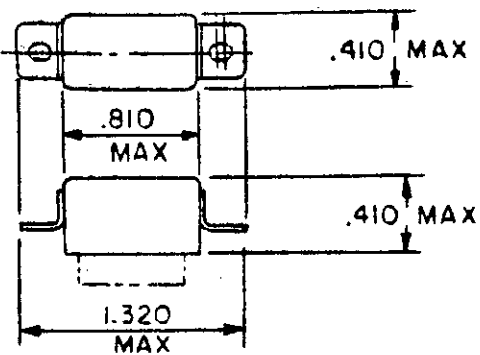


CIRCUIT DIAGRAM
TERMINAL VIEW

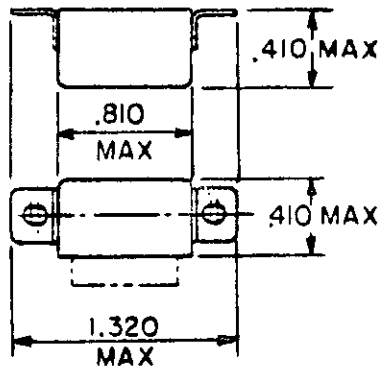
INCHES	MM
.200	5.08
.275	6.99
.280	7.11
.335	8.51
.370	9.39

FIGURE 104-3. Relay, EM, ER, SPDT, low level to 0.5 ampere (latching) with internal diodes for coil transient suppression and polarity reversal protection (MIL-R-39016/28).

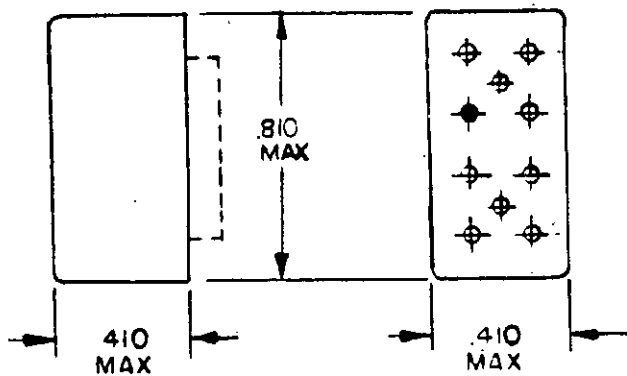
MIL-STD-1346B



FLANGE MOUNT B



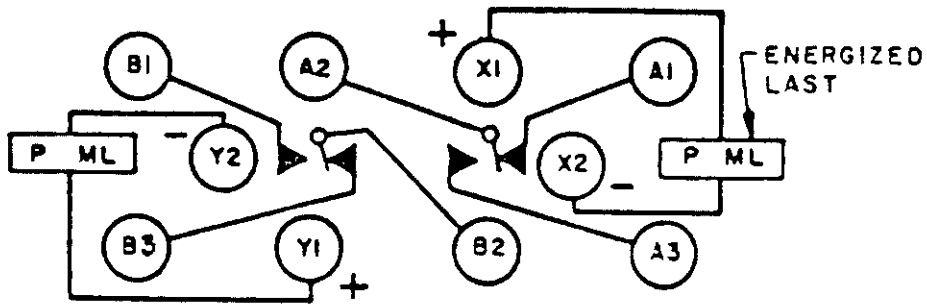
FLANGE MOUNT C



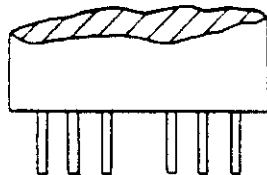
NO MOUNT

INCHES	MM
.410	10.19
.810	20.35
1.320	33.53

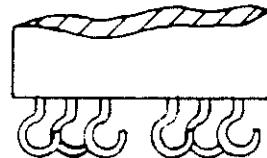
FIGURE 104-4. Relay, EM, ER, DPDT, low level to 2 amperes (latching)
(MIL-R-39016/45).



TERMINAL VIEW
CIRCUIT DIAGRAM



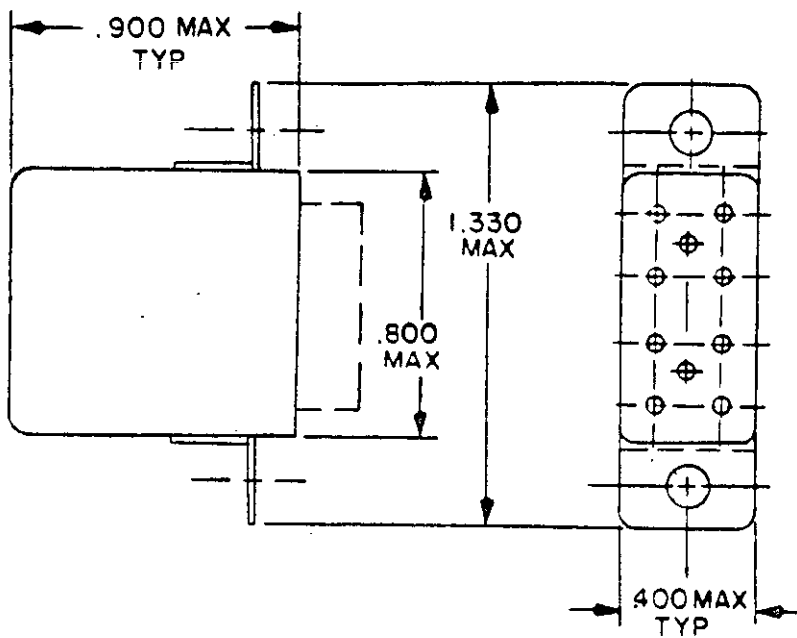
PIN (PC)



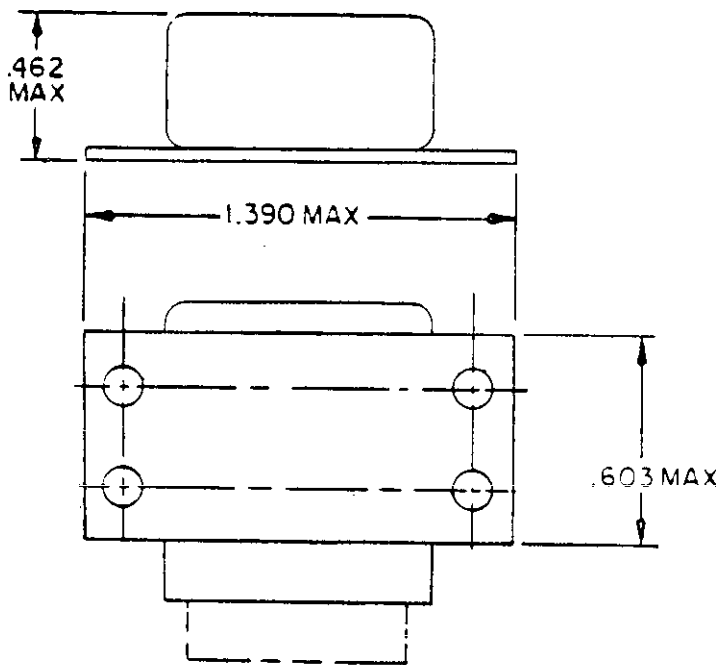
SOLDER LUG

FIGURE 104-4. Relay, EM, ER, DPDT, low level to 2 amperes (latching) (MIL-R-39016/45) - Continued.

MIL-STD-1346B



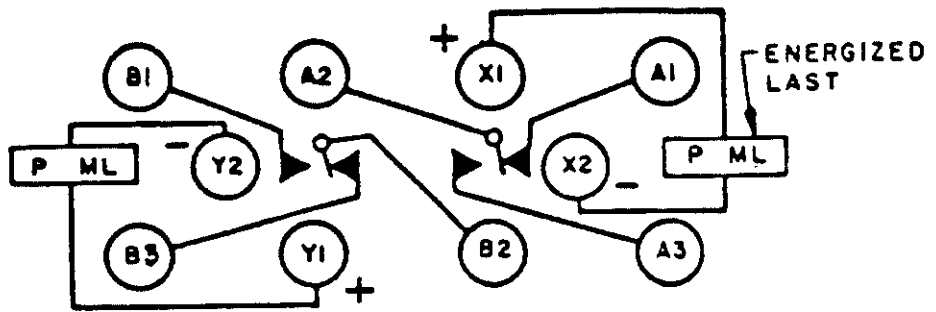
FLANGE MOUNT



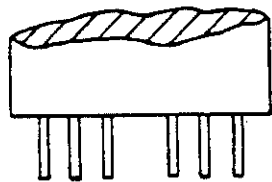
BRACKET MOUNT

INCHES	MM
.400	10.16
.462	11.73
.603	15.32
.800	20.32
.900	22.86
1.330	33.78
1.390	35.31

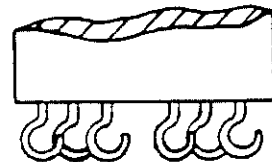
FIGURE 104-5. Relay, EM, ER, DPDT, low level to 2 amperes (latching) (MIL-R-39016/32).



TERMINAL VIEW
CIRCUIT DIAGRAM



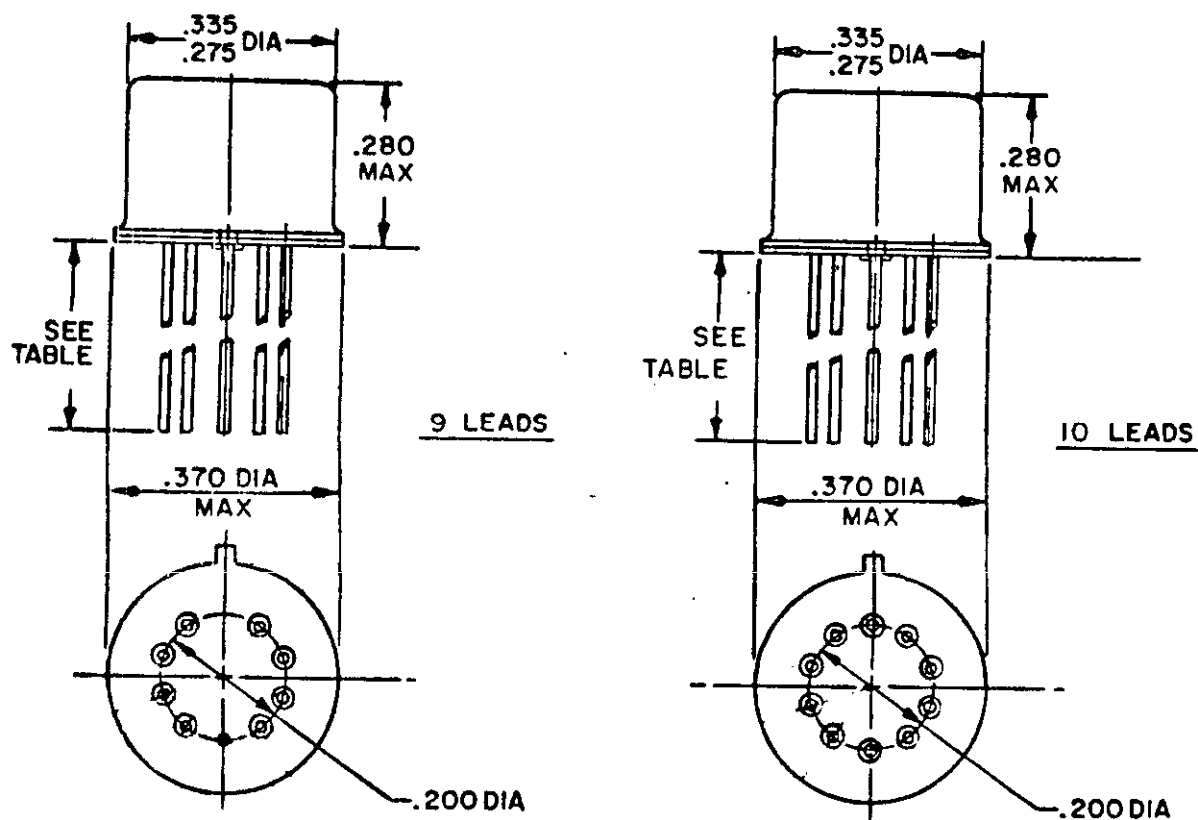
PIN (PC)



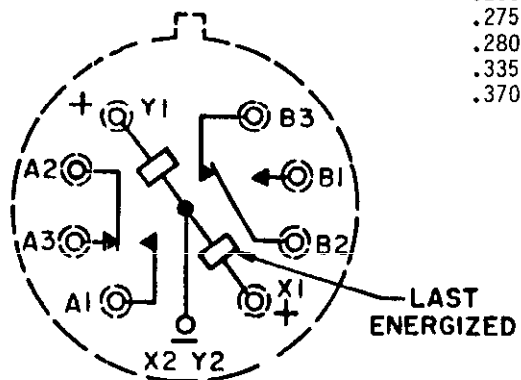
SOLDER LUG

FIGURE 104-5. Relay, EM, ER, DPDT, low level to 2 amperes (latching) (MIL-R-39016/32) - Continued.

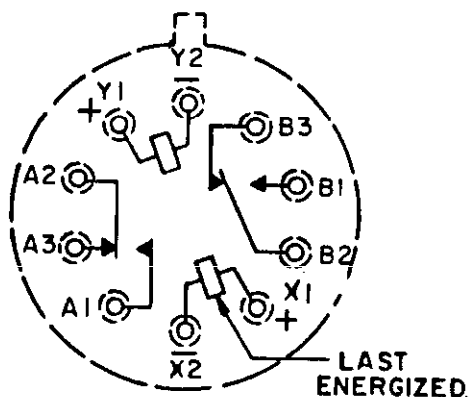
MIL-STD-1346B



INCHES	MM
.200	5.08
.275	6.99
.280	7.11
.335	8.51
.370	9.40



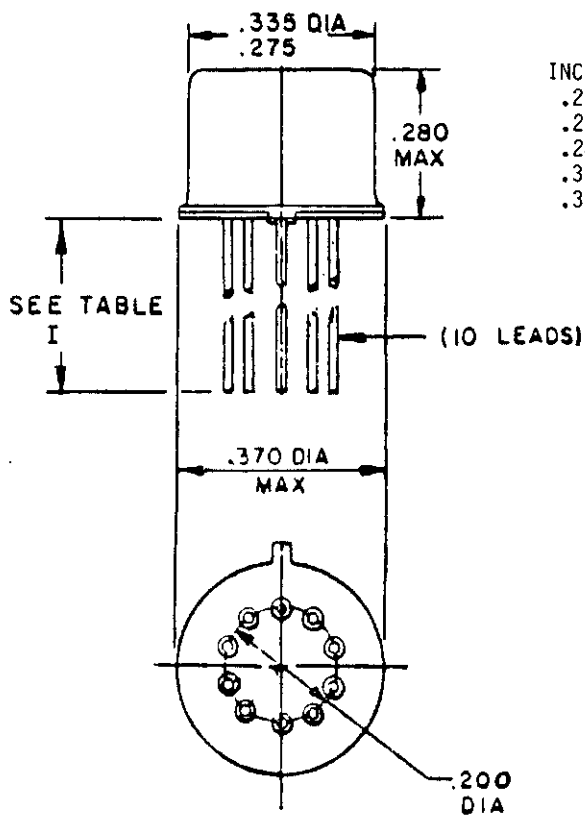
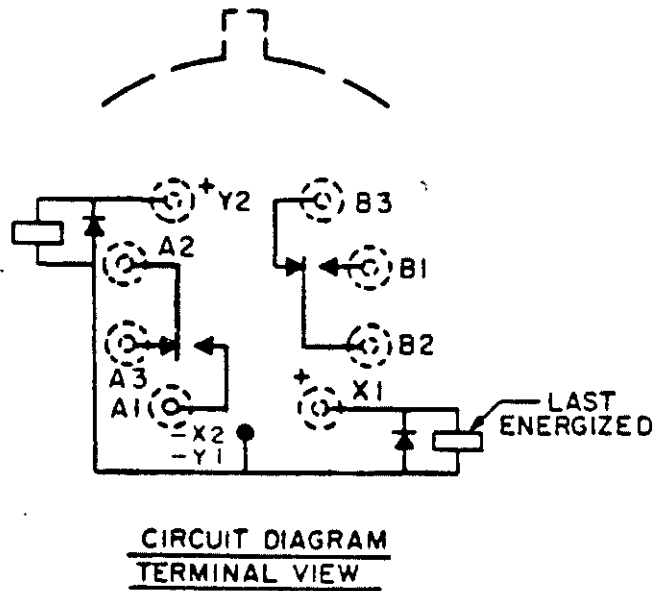
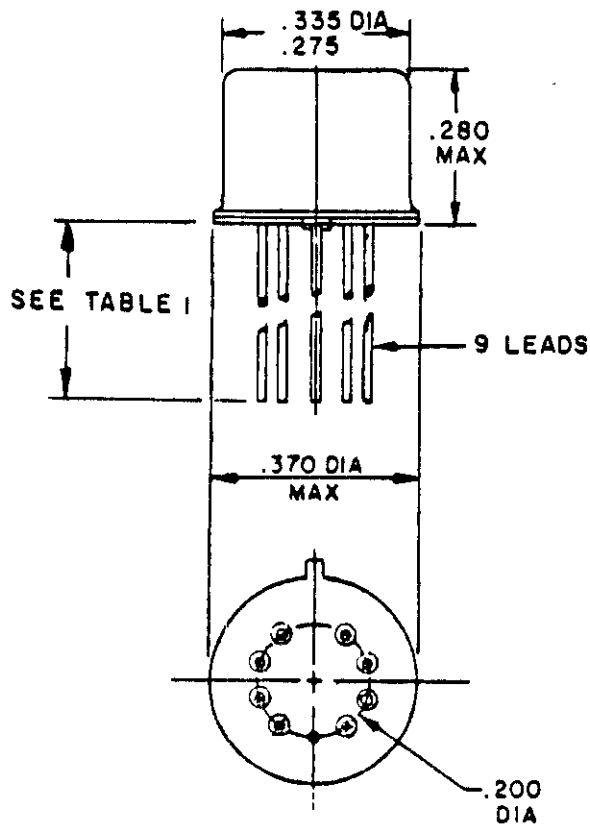
CIRCUIT DIAGRAM
TERMINAL VIEW



CIRCUIT DIAGRAM
TERMINAL VIEW

FIGURE 104-6. Relay, EM, ER, DPDT, low level to 1 ampere (latching) (MIL-R-39016/12).

MIL-STD-1346B



INCHES	MM
.200	5.08
.275	6.99
.280	7.11
.335	8.51
.370	9.40

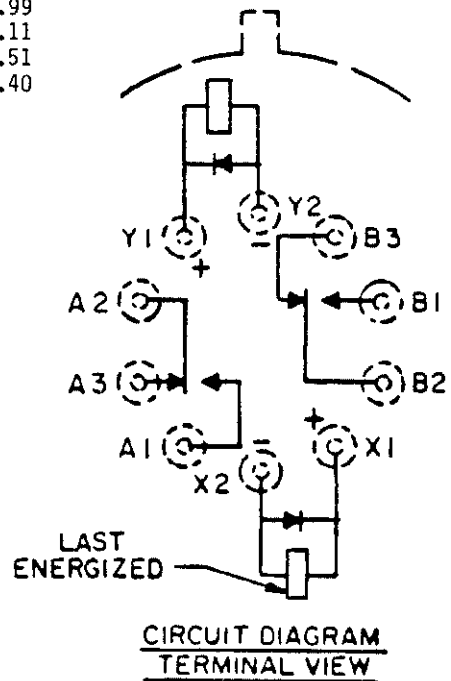
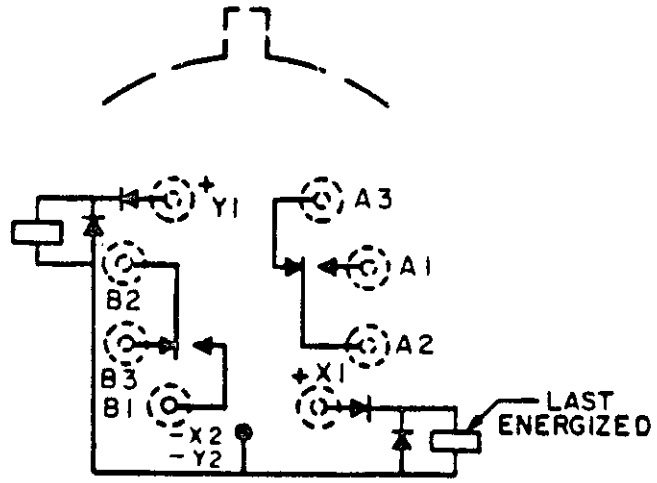
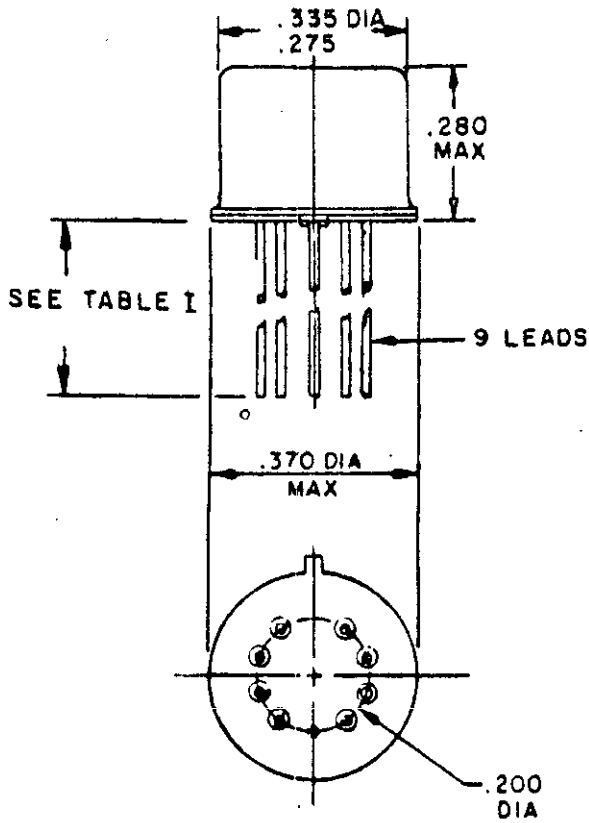


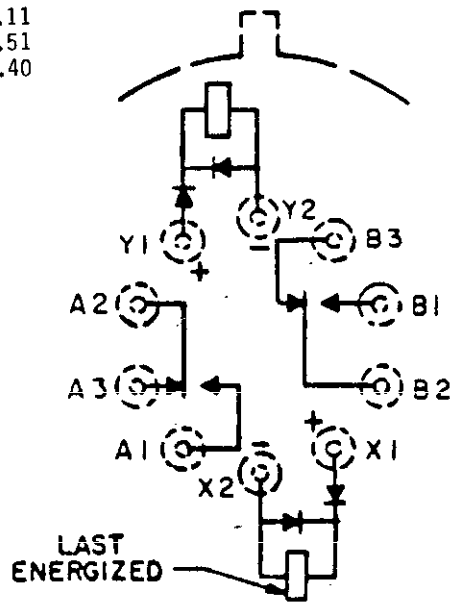
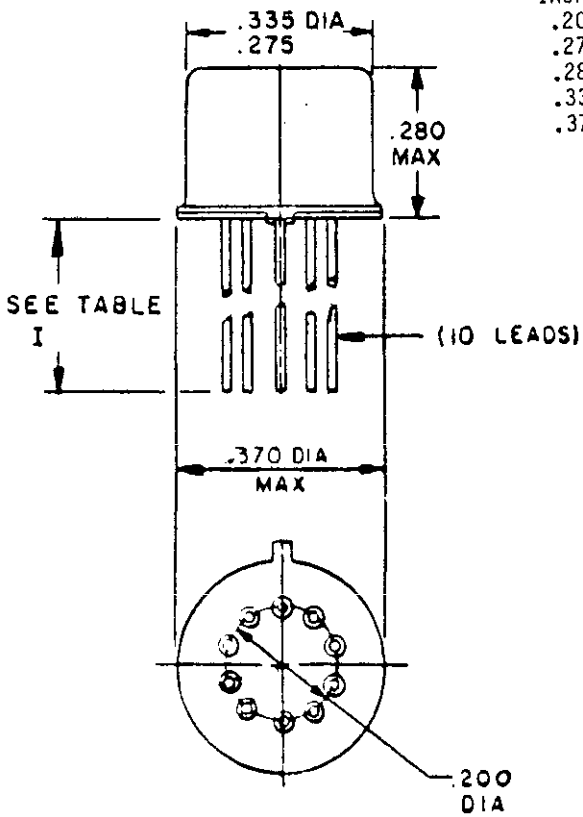
FIGURE 104-7. Relay, EM, ER, DPDT, low level to 1 ampere (latching) with internal diodes for coil transient suppression (MIL-R-39016/29).

MIL-STD-1346B



CIRCUIT DIAGRAM
TERMINAL VIEW

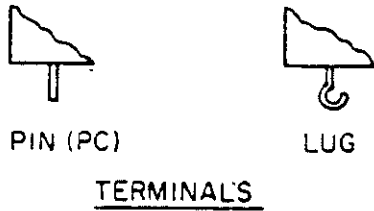
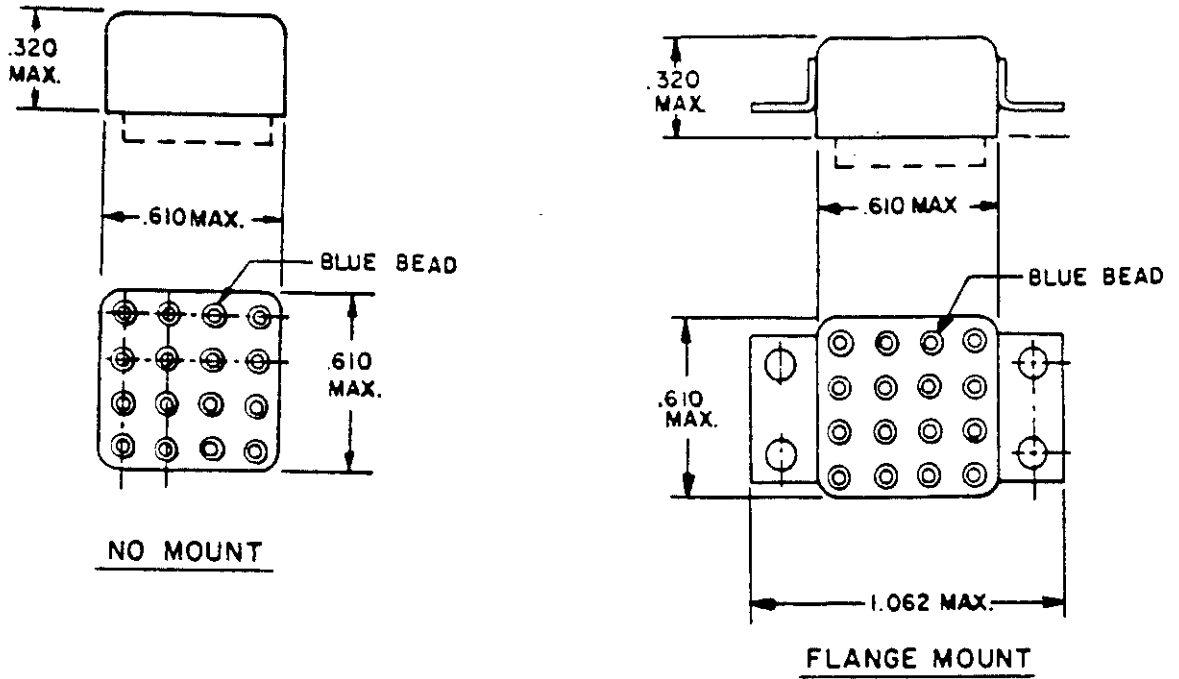
INCHES	MM
.200	5.08
.275	6.99
.280	7.11
.335	8.51
.370	9.40



CIRCUIT DIAGRAM
TERMINAL VIEW

FIGURE 104-8. Relay, EM, ER, DPDT, low level to 1 ampere (latching) with internal diodes for coil transient suppression and polarity reversal protection (MIL-R-39016/30).

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INCHES	MM
.320	8.13
.610	15.49
1.062	26.97

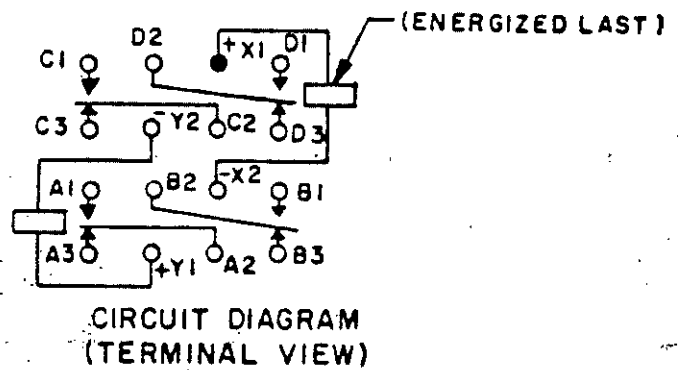
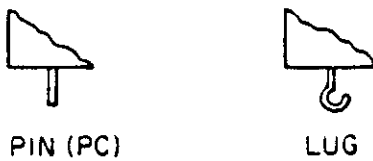
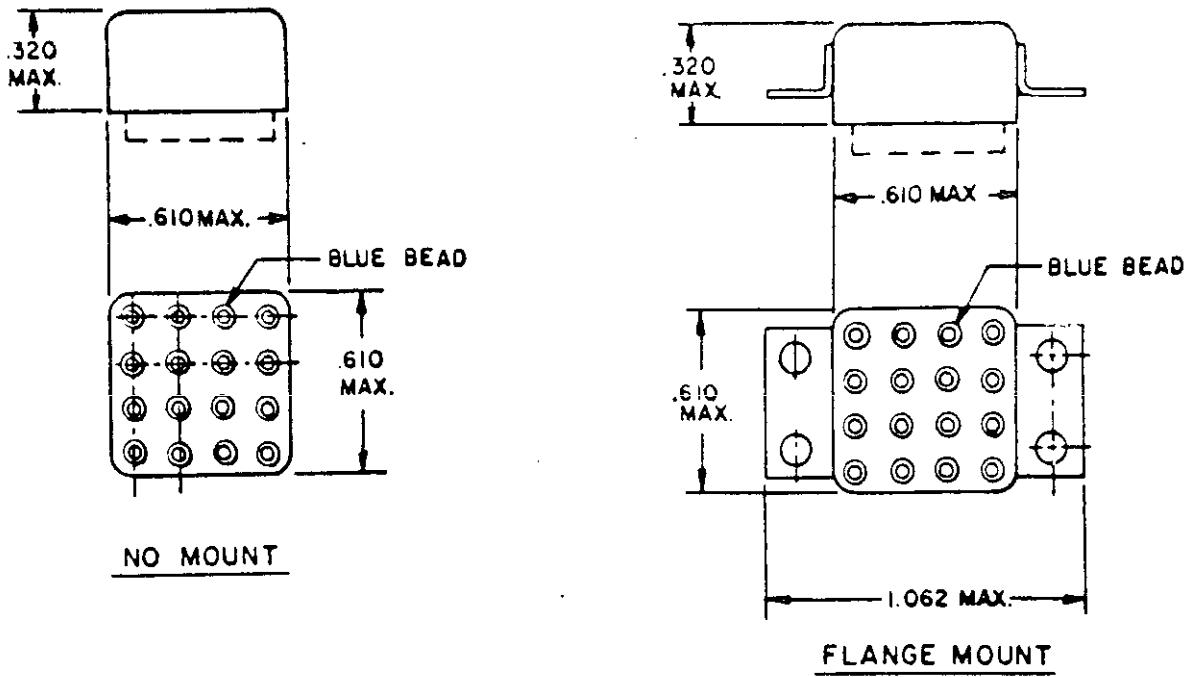


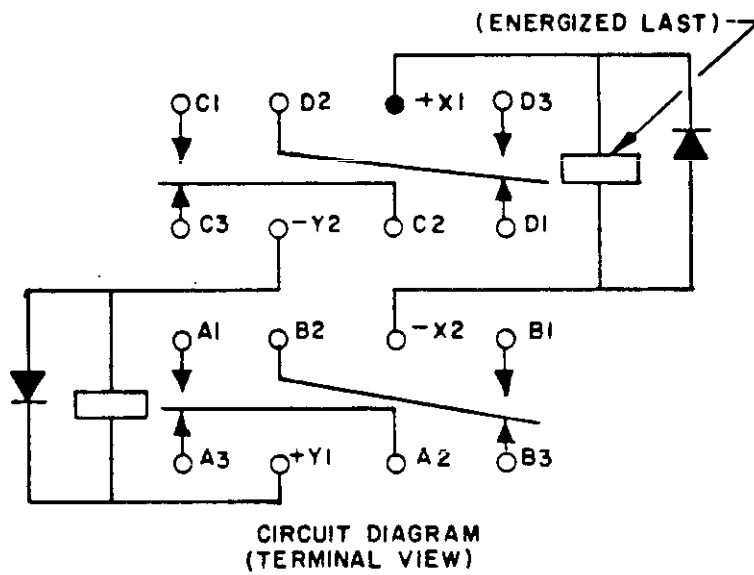
FIGURE 104-9. Relay, EM, ER, 4PDT, low level to 2 amperes (0.105 inch terminal spacing), (latching) (MIL-R-39016/31).

MIL-STD-1346B



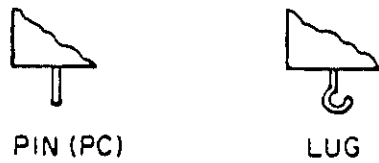
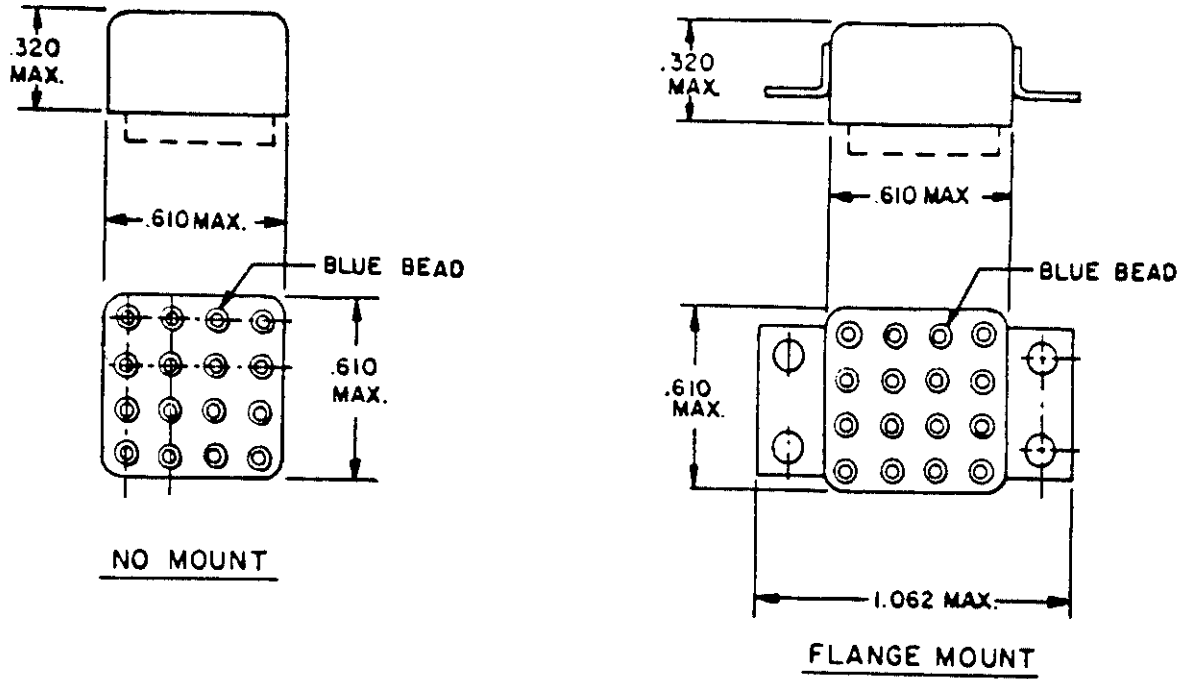
TERMINALS

INCHES	MM
.320	8.13
.610	16.49
1.062	26.97



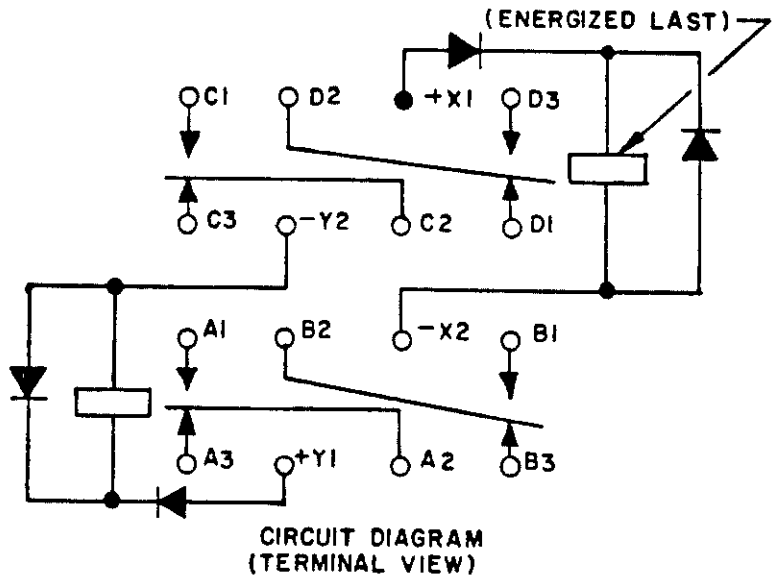
**CIRCUIT DIAGRAM
(TERMINAL VIEW)**

FIGURE 104-10. Relays, EM, ER, 4PDT, low level to 2 amperes (0.150 inch terminal spacing), (latching), with internal diodes for coil transient suppression (MIL-R-39016/35).



TERMINALS

INCHES	MM
.320	8.13
.610	15.49
1.062	26.97



CIRCUIT DIAGRAM (TERMINAL VIEW)

FIGURE 104-11. Relays, EM, ER, 4PDT, low level to 2 amperes (0.150 inch terminal spacing), (latching, with internal diodes for coil transient suppression and reverse polarity protection (MIL-R-39016/36)).

MIL-STD-1346B

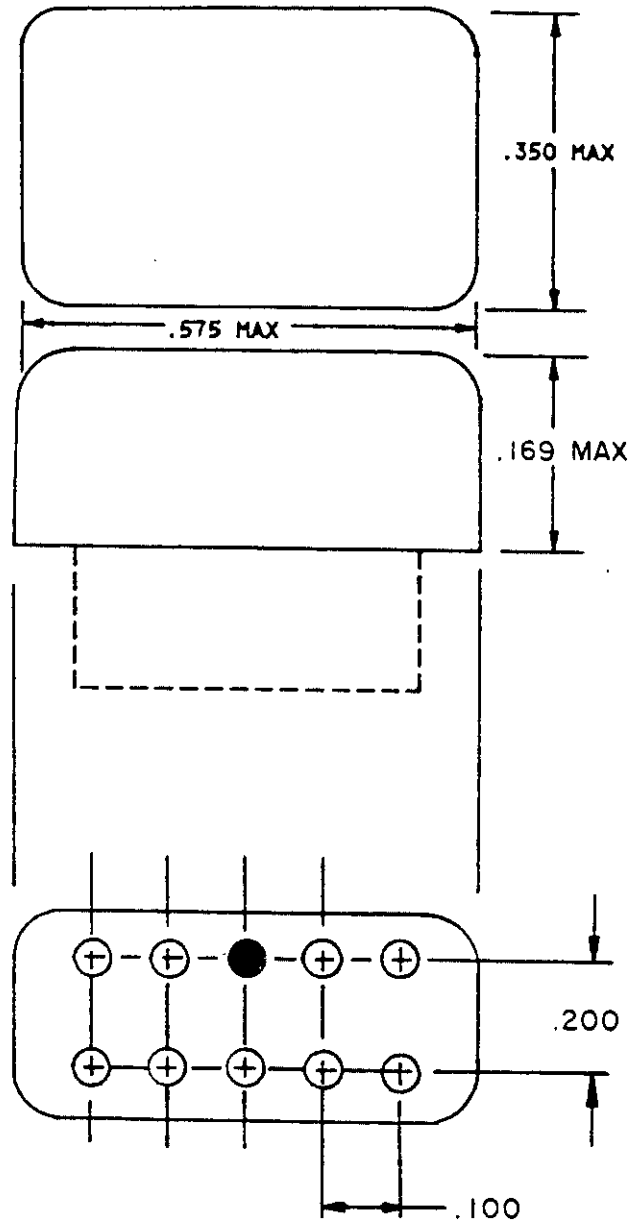
SUBSECTION 105

RELAYS, ELECTROMAGNETIC (EM), ESTABLISHED RELIABILITY (ER),
LATCHING, SENSITIVE, DC OPERATED

(Applicable specification: MIL-R-39016)

SCOPE: This subsection covers relays with coils dc voltage rated. Latching relays maintain their contacts in the last position assumed without the need of maintaining coil energization.

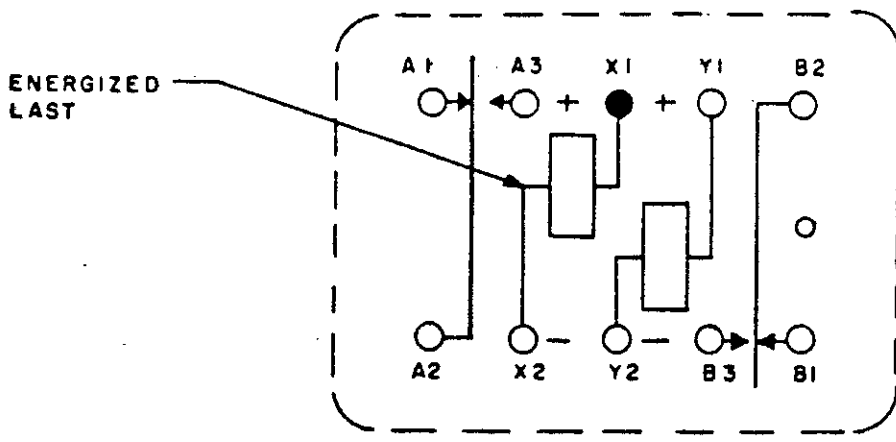
MIL-STD-1346B



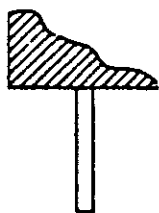
INCHES	MM
.100	2.54
.169	4.29
.200	5.08
.350	8.89
.575	14.61

FIGURE 105-1. Relay, EM, ER, sensitive, DPDT, low level to 2 amperes (latching) (MIL-R-39016/47).

MIL-STD-1346B



CIRCUIT DIAGRAM
TERMINAL VIEW



SOLDER PIN - (SP)

FIGURE 105-1. Relay, EM, ER, sensitive DPDT, low level to 2 amperes (latching)
(MIL-R-39016/47) - Continued.

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SUBSECTION 106

RELAYS, ELECTROMAGNETIC (EM), ESTABLISHED RELIABILITY (ER),
RADIO FREQUENCY (COAXIAL), DC OPERATED

(Applicable specification: MIL-R-39016)

SCOPE: This subsection covers relays with coils dc voltage rated. Radio frequency rating dc to 1 GHz.

SUBSECTION 106

RELAYS, EM, ER, RADIO FREQUENCY (COAXIAL), DC OPERATED

(Applicable specification: MIL-R-39016)

Duty cycle: Continuous
Enclosure: Hermetically sealed
Operating temperature range: B (see table I)

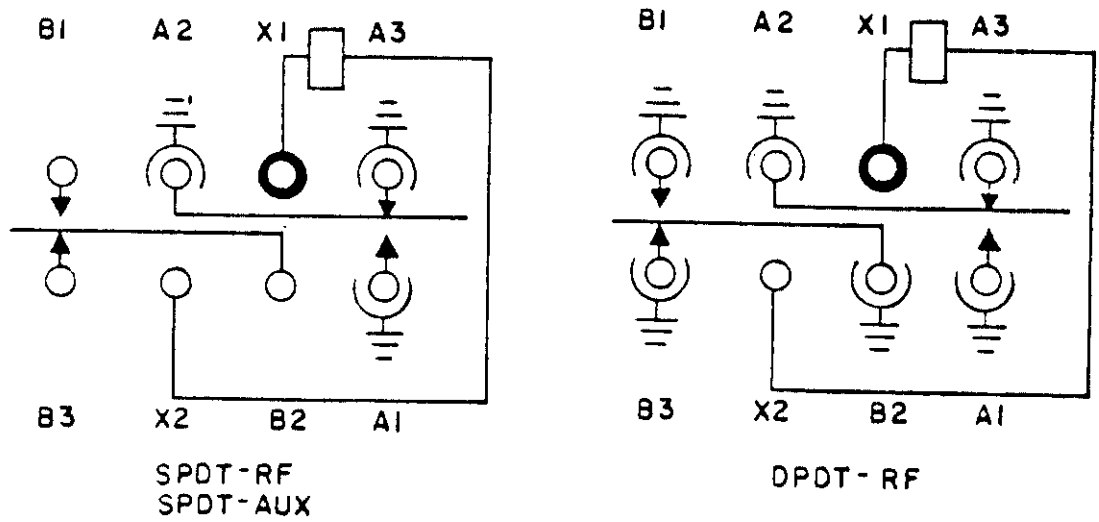
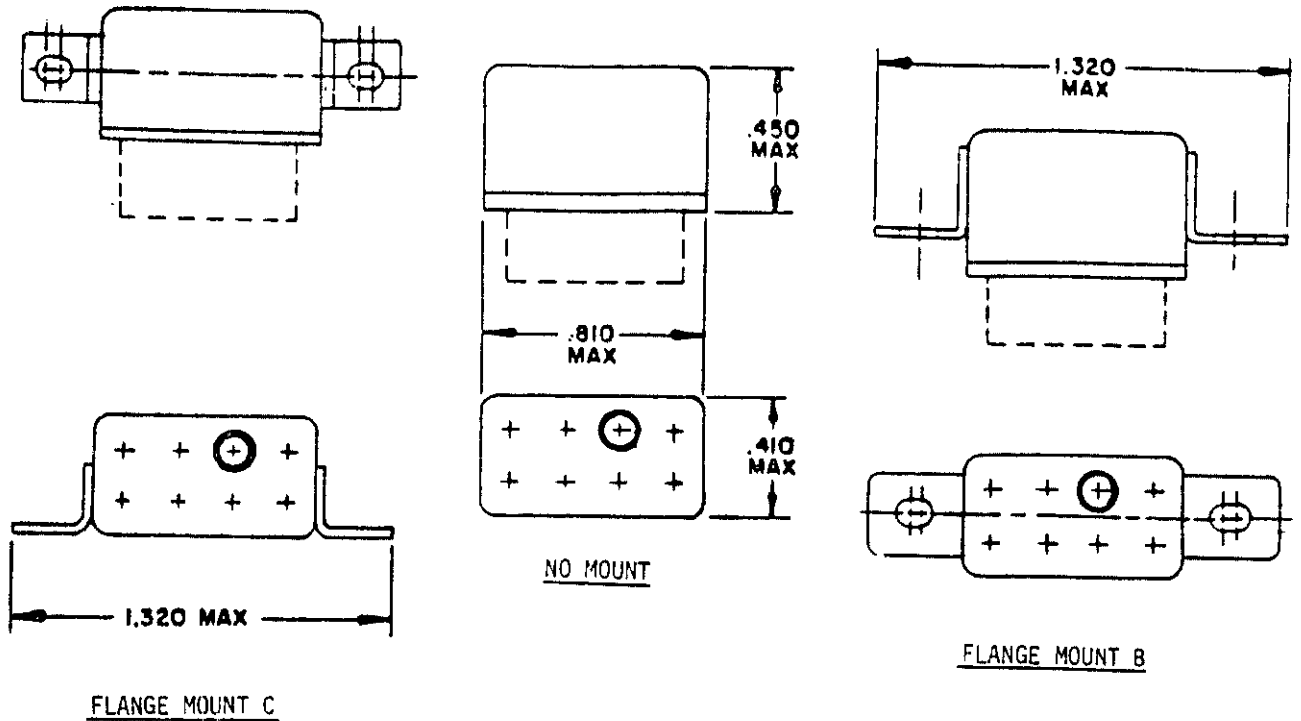
TABLE 106.1. Relays, EM, ER, radio frequency (coaxial), dc operated, part numbers and characteristics.

Rated coil voltage	Part number 1/	Figure number	Shock (see table II)	Vibration (see table III)	System voltage and frequency - contact current in amperes												Terminal style (see table IV)
					28 V dc			400 Hz			50/60 Hz						
					Resistive	Inductive	Motor	Resistive	Inductive	Motor	Resistive	Inductive	Motor	Resistive	Inductive	Motor	
SPDT - RF, SPDT AUX																	
6.0	M39016/33 2/ -006Z " -018Z " -024Z	106-1 " " " "	3 " " " "	9 " " " "													
12.0	-004Z " -016Z " -022Z	" " " " " "	" " " " " "	" " " " " "													
26.5	-002Z " -014Z " -020Z	" " " " " "	" " " " " "	" " " " " "													
RF power handling capability: 80 watts at 100 MHz. 50 watts at 500 MHz. 30 watts at 1,000 MHz. Load rating (all contacts): High level: Resistive: 2 amperes at 28 V dc maximum Inductive: .5 amperes at 28 V dc maximum (200 mH). Lamp: 0.160 ampere at 28 V dc. Low level: Resistive: 10 to 50 μ A at 10 to 50 mV dc or peak ac.																	
DPDT - RF																	
6.0	M39016/33 2/ -005Z " -017Z " -023Z	106-1 " " " "	3 " " " "	9 " " " "													
12.0	-003Z " -015Z " -021Z	" " " " " "	" " " " " "	" " " " " "													
26.5	-001Z " -013Z " -019Z	" " " " " "	" " " " " "	" " " " " "													
Load ratings, see above.																	

1/ The symbol "Z" is used to indicate that a failure rate symbol is required. See table V and the latest qualified products list (OPL) of the specification being used.

2/ Each relay possesses high level and low level capabilities. However, relays previously tested of used above 10 mA resistive at 5 V dc maximum or peak ac open circuits not recommended of subsequent use in low level applications.

MIL-STD-1346B



CIRCUIT DIAGRAMS

INCHES	MM
.410	10.41
.450	11.43
.810	20.57
1.320	33.53
8.50	215.90

FIGURE 106-1. Relay, EM, ER, radio frequency (coaxial) (MIL-R-39016/33).

MIL-STD-1346B

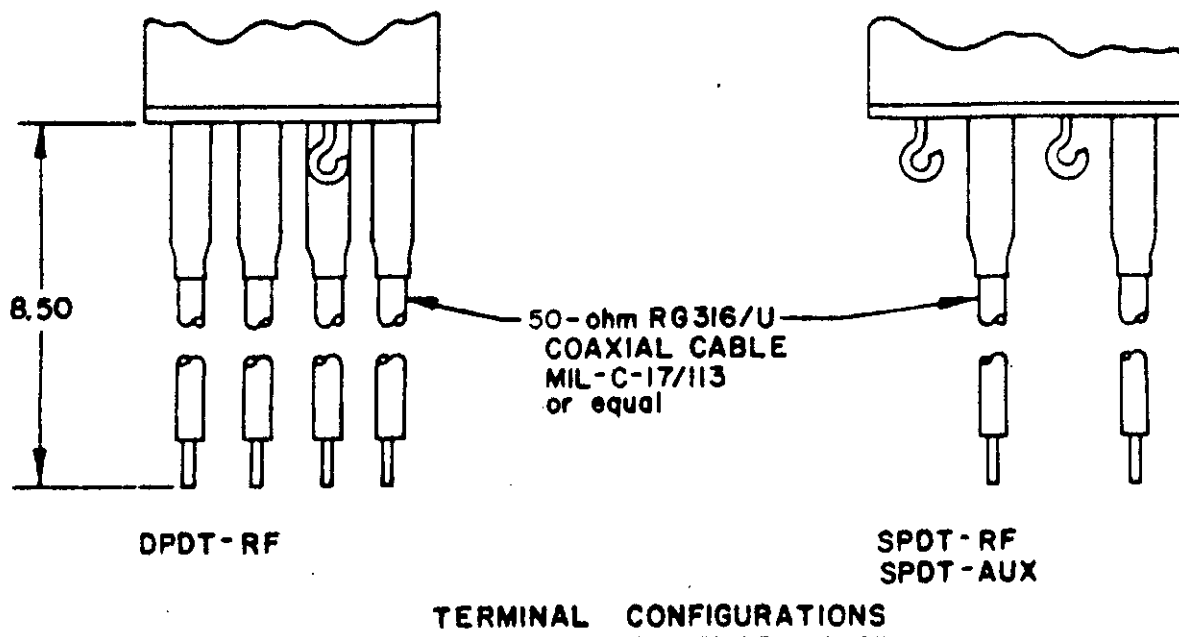


FIGURE 106-1. Relay, EM, ER, radio frequency (coaxial) (MIL-R-39016/33) - Continued.

MIL-STD-1346B

SECTION 200

RELAYS, HYBRID, ESTABLISHED RELIABILITY (ER)

(Applicable specification, MIL-R-28776)

Subsection

201 Relays, Hybrid, ER, dc operated.

202 Relays, Hybrid, ER, dc operated, sensitive.

MIL-STD-1346B

SUBSECTION 201

RELAYS, HYBRID, ESTABLISHED RELIABILITY (ER),
DC OPERATED

SCOPE: This subsection covers relays that use a combination of solid state circuit input functioning with an electromechanical relay that performs the switching functions.

SECTION 201

RELAYS, HYBRID, ESTABLISHED RELIABILITY (ER), DC OPERATED

(Applicable specification: MIL-R-287)

Duty cycle: Continuous
 Altitude: 70,000 feet
 Enclosure: Hermetically sealed
 Operating temperature range: B (see table 1).

TABLE 201.1. Relays, hybrid, ER, dc operated, part numbers and characteristics. 1/

Rated supply voltage (V dc)	Part number	Figure number	Sketch (see table 1)	Vibration (see table 111)	System voltage and contact current in amperes: 2/			Maximum base current to assure turn-on (mA)	Terminal style (see table 11)
					Resistive	Inductive	Lamp		
DPDT CONTACTS - 2 FORM C - (TRANSISTOR DRIVEN) (ELECTROMECHANICAL OUTPUT) WITH DIODE COIL SUPPRESSION									
5.0	HE8776/1	201-1	2	9	1.0	0.2	0.1	.75	.187
5.0	-019E -025E							.75	.500
6.0	-020E -026E							.55	.187
6.0	-021E -027E							.55	.500
9.0	-022E -028E							.36	.187
9.0	-023E -029E							.36	.500
12.0	-024E -030E							.27	.187
12.0	-025E -031E							.27	.500
18.0	-026E -032E							.16	.187
18.0	-027E -033E							.16	.500
26.5	-028E -034E							.13	.187
26.5	-029E -035E							.13	.500
SPDT CONTACTS - 1 FORM C - (TRANSISTOR DRIVEN) (ELECTROMECHANICAL OUTPUT) WITH DIODE COIL SUPPRESSION									
5.0	HE8776/9	201-2	2	9	1.0	0.2	0.1	.62	.187
5.0	-019E -025E	201-2	2	9	1.0	0.2	0.1	.62	.500

See footnotes at end of table.

TABLE 201.1. Relays, hybrid, E_s, dc operated, part numbers and characteristics - Continued. 1/

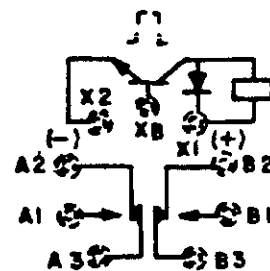
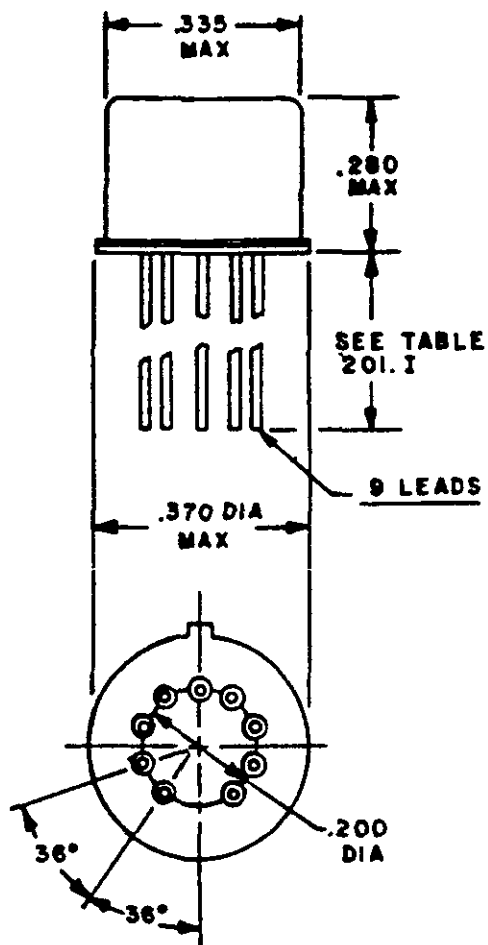
Rated supply voltage (V dc)	Part number 2/	Figure number	Shock (see table III)	Vibration (see table III)	System voltage and contact current in amperes 3/		Maximum base current to assure turn-on (mA)	Terminal style (see table IV)
					Resistive	Inductive Lamp		
SPDT CONTACTS - 1 FORM C - (TRANSISTOR DRIVEN) (ELECTROMECHANICAL OUTPUT) WITH DIODE COIL SUPPRESSION - Continued								
6.0	HE8776/5	201-2	2	9	1.0	0.2	0.1	.187 .500
6.0	-020Z -026Z							.42 .42
9.0	-021Z -027Z							.27 .500
12.0	-022Z -028Z							.21 .500
18.0	-023Z -029Z							.12 .500
26.5	-024Z -030Z							.10 .500
DPDT CONTACTS - 2 FORM C - INTERNAL MOSFET DRIVE (ELECTROMECHANICAL OUTPUT) WITH DIODE COIL SUPPRESSION								
6.0	HE8776/6	201-3	2	9	1.0	0.2	0.1	.500 .500
6.0	-001Z -002Z							.500 .500
9.0	-003Z -004Z							.500 .500
12.0	-005Z -006Z							.500 .500
18.0	-007Z -008Z							.500 .500
26.5	-009Z							.500

1/ Each relay possesses high level and low level capabilities. However, relays previously tested or used above 10 mA resistive at 6 V dc maximum or peak ac open circuits not recommended for subsequent use in low level applications. The low level rating is 10-50 milliamperes at 10-50 millivolts.

2/ The symbol "2" is used to indicate that a failure rate symbol is required. See table V and the latest qualified products list (QPL) of the specification being used.

3/ These relays also have a rating of 100 mA resistive at 115 V ac @ 60 and 400 Hz.

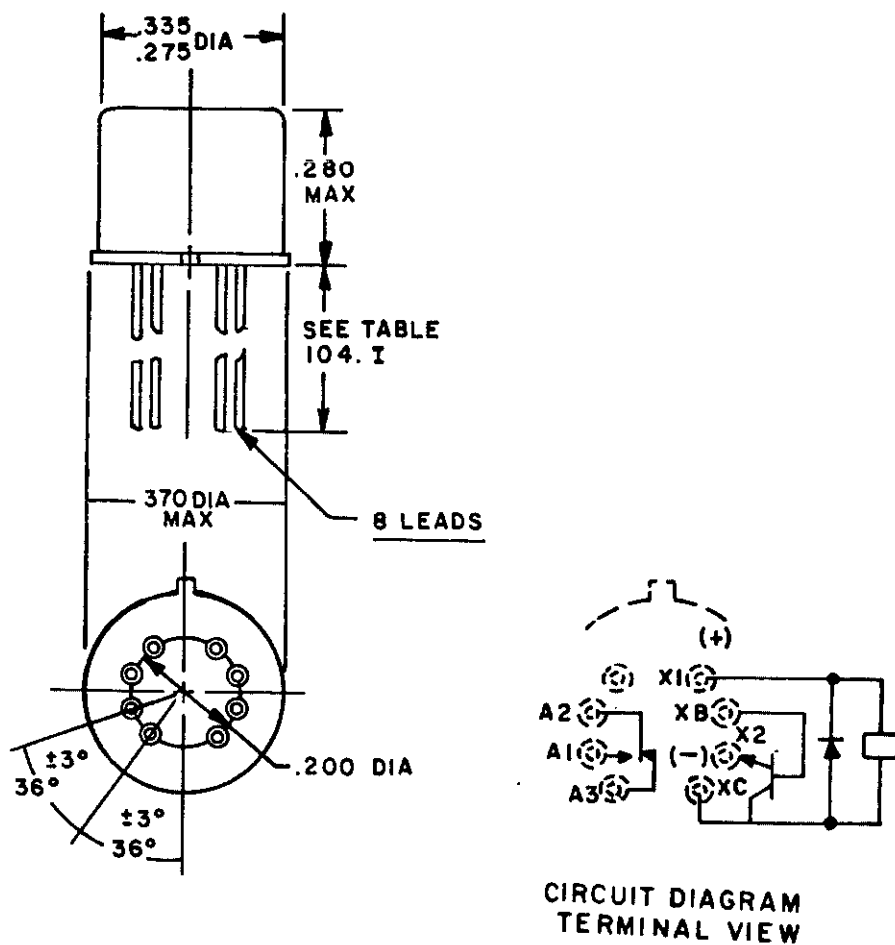
MIL-STD-1346B



CIRCUIT DIAGRAM
TERMINAL VIEW

INCHES	MM
.200	5.08
.280	7.11
.335	8.51
.370	9.40

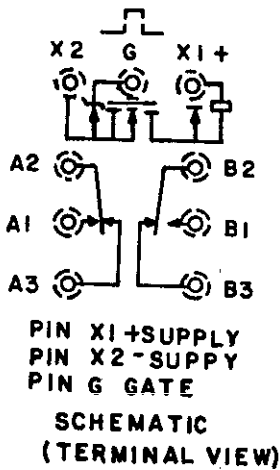
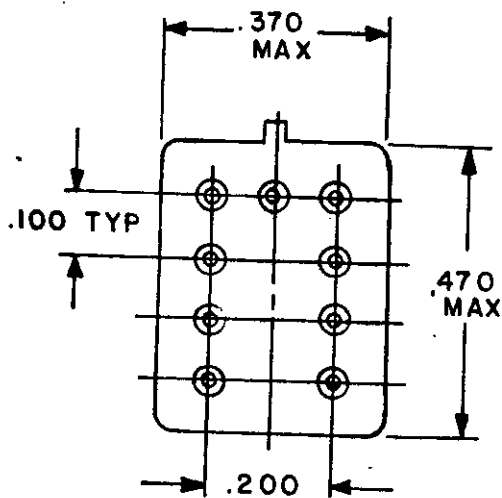
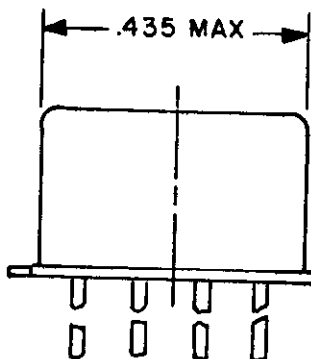
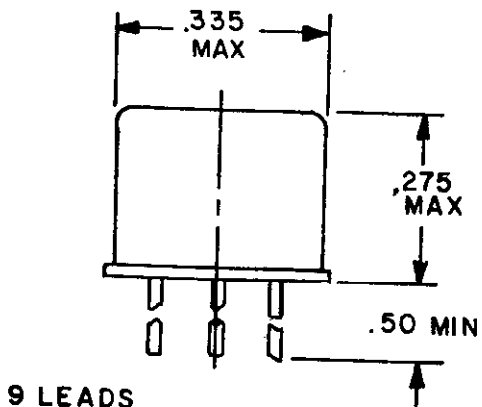
FIGURE 201-1. Relay, hybrid, ER, DPDT, low level to 1 ampere (transistor driven) (electromechanical output) (MIL-R-28776/1).



INCHES	MM
.200	5.08
.275	6.98
.280	7.11
.335	8.51
.370	9.40

FIGURE 201-2. Relay, hybrid, ER, SPDT, low level to 1 ampere (transistor driven) (electromechanical output) (MIL-R-28776/5).

MIL-STD-1346B



INCHES	MM
.100	2.54
.200	5.08
.335	8.51
.370	9.40
.375	9.53
.435	11.05
.490	11.94
.500	12.70

FIGURE 201-3. Relay, hybrid, ER, DPDT, internal mosfet drive with zener diode gate protection (MIL-R-28776/6).

MIL-STD-1346B

SUBSECTION 202

RELAYS, HYBRID, ESTABLISHED RELIABILITY (ER),
DC OPERATED, SENSITIVE

SCOPE: This subsection covers relays that use a combination of solid state circuit input functioning with an electromechanical relay that performs the switching functions.

SECTION 202 1/

RELAYS, HYBRID, ESTABLISHED RELIABILITY (ER), DC OPERATED, SENSITIVE
(Applicable specification: MIL-R-28776)

Duty cycle: Continuous
Altitude: 70,000 feet
Enclosure: Hermetically sealed
Operating temperature range: B (see table I).

TABLE 202.1. Relays, hybrid, ER, dc operated, sensitive, part numbers and characteristics, 2/

Rated supply voltage (V dc)	Part number 3/	Figure number	Shock (see table II)	Vibration (see table III)	System voltage and contact current in amperes 4/			Maximum base current to assure turn-on (mA)	Terminal style (see table IV)
					Resistive	Inductive	Lamp		
SPDT CONTACTS - 1 FORM C - (SENSITIVE) (TRANSISTOR DRIVEN) (ELECTROMECHANICAL OUTPUT) WITH DIODE COIL SUPPRESSION									
5.0	M28776/4	202-1	2	9	1.0	0.2	0.1	.28	.187
5.0	-025Z	"	"	"	"	"	"	.28	.500
5.0	-033Z	"	"	"	"	"	"	.20	.187
6.0	-026Z	"	"	"	"	"	"	.20	.500
6.0	-034Z	"	"	"	"	"	"	.13	.187
9.0	-027Z	"	"	"	"	"	"	.13	.500
9.0	-035Z	"	"	"	"	"	"	.10	.187
12.0	-028Z	"	"	"	"	"	"	.10	.500
12.0	-036Z	"	"	"	"	"	"	.07	.187
18.0	-029Z	"	"	"	"	"	"	.07	.500
18.0	-037Z	"	"	"	"	"	"	.05	.187
26.5	-030Z	"	"	"	"	"	"	.05	.500
26.5	-038Z	"	"	"	"	"	"	.04	.187
36.0	-031Z	"	"	"	"	"	"	.04	.500
36.0	-039Z	"	"	"	"	"	"	.03	.187
40.0	-032Z	"	"	"	"	"	"	.03	.500
40.0	-040Z	"	"	"	"	"	"	.03	.187

TABLE 202.1. Relays, hybrid, ER, dc operated, sensitive, part numbers and characteristics. 2/

Rated supply voltage (V dc)	Part number 3/	Figure number	Shock (see table II)	Vibration (see table III)	System voltage and contact current in amperes 4/			Maximum base current to assure turn-on (mA)	Terminal style (see table IV)
					28 V dc	Inductive	Lamp		
DPDT CONTACTS - 2 FORM C - (TRANSISTOR DRIVEN) (ELECTROMECHANICAL OUTPUT) (SENSITIVE WITH DIODE COIL SUPPRESSION)									
5.0	M28776/3	202-2	2	9	1.0	0.2	0.1	.37	.187
5.0	-025Z	"	"	"	"	"	"	.37	.500
6.0	-026Z	"	"	"	"	"	"	.25	.187
6.0	-034Z	"	"	"	"	"	"	.25	.500
9.0	-027Z	"	"	"	"	"	"	.18	.187
9.0	-035Z	"	"	"	"	"	"	.18	.500
12.0	-028Z	"	"	"	"	"	"	.12	.187
12.0	-036Z	"	"	"	"	"	"	.12	.500
18.0	-029Z	"	"	"	"	"	"	.09	.187
18.0	-037Z	"	"	"	"	"	"	.09	.500
26.5	-030Z	"	"	"	"	"	"	.06	.187
26.5	-038Z	"	"	"	"	"	"	.06	.500
36.0	-031Z	"	"	"	"	"	"	.034	.187
36.0	-039Z	"	"	"	"	"	"	.034	.500
48.0	-032Z	"	"	"	"	"	"	.026	.187
48.0	-040Z	"	"	"	"	"	"	.026	.500
DPDT CONTACTS - 2 FORM C - INTERNAL MOSFET DRIVE (ELECTROMECHANICAL OUTPUT) (SENSITIVE WITH DIODE COIL SUPPRESSION)									
5.0	M28776/7	202-3	2	9	1.0	0.2	0.1	(Gate turn-on voltage - 4.3 V dc minimum, 15 V dc maximum)	.500
6.0	-001Z	"	"	"	"	"	"	"	.500
9.0	-002Z	"	"	"	"	"	"	"	.500
12.0	-003Z	"	"	"	"	"	"	"	.500
18.0	-004Z	"	"	"	"	"	"	"	.500
18.0	-005Z	"	"	"	"	"	"	"	.500
26.5	-006Z	"	"	"	"	"	"	"	.500

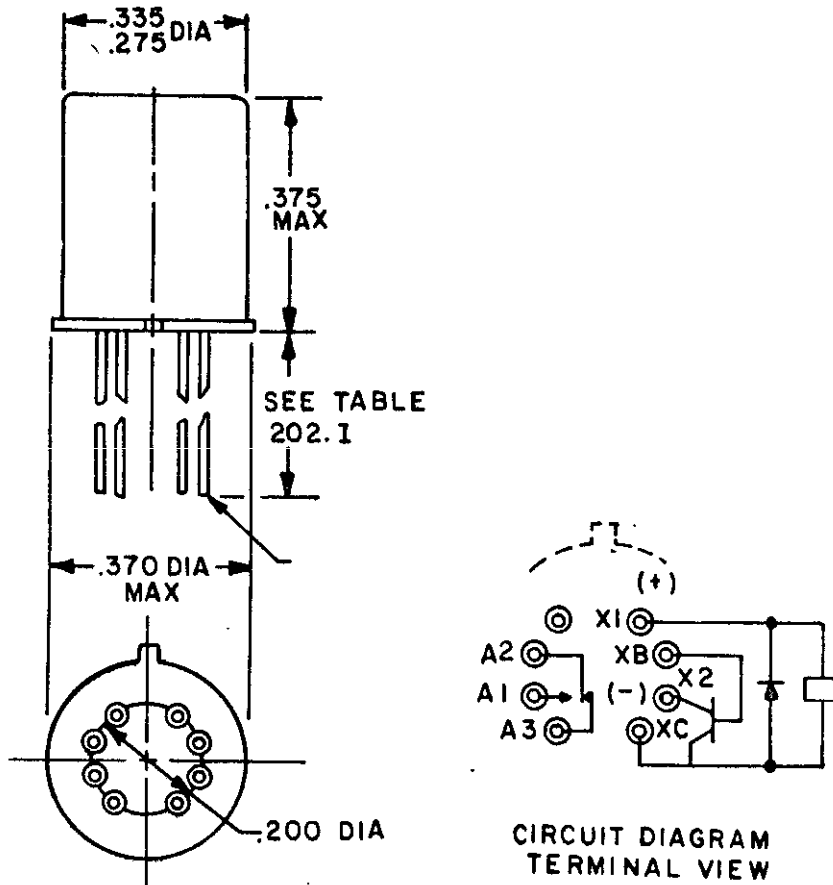
1/ These relays are not recommended in critical applications or in applications where a less sensitive relay can be used.

2/ Each relay possesses high level and low level capabilities. However, relays previously tested or used above 10 mA resistive at 6 V dc maximum or peak ac open circuits not recommended for subsequent use in low level applications. The low level rating is 10-50 microamperes at 10-50 millivolts.

3/ The symbol "Z" is used to indicate that a failure rate symbol is required. See table V and the latest qualified products list (QPL) of the specification being used.

4/ These relays also have a rating of 100 mA at 115 V ac 60 and 400 Hz.

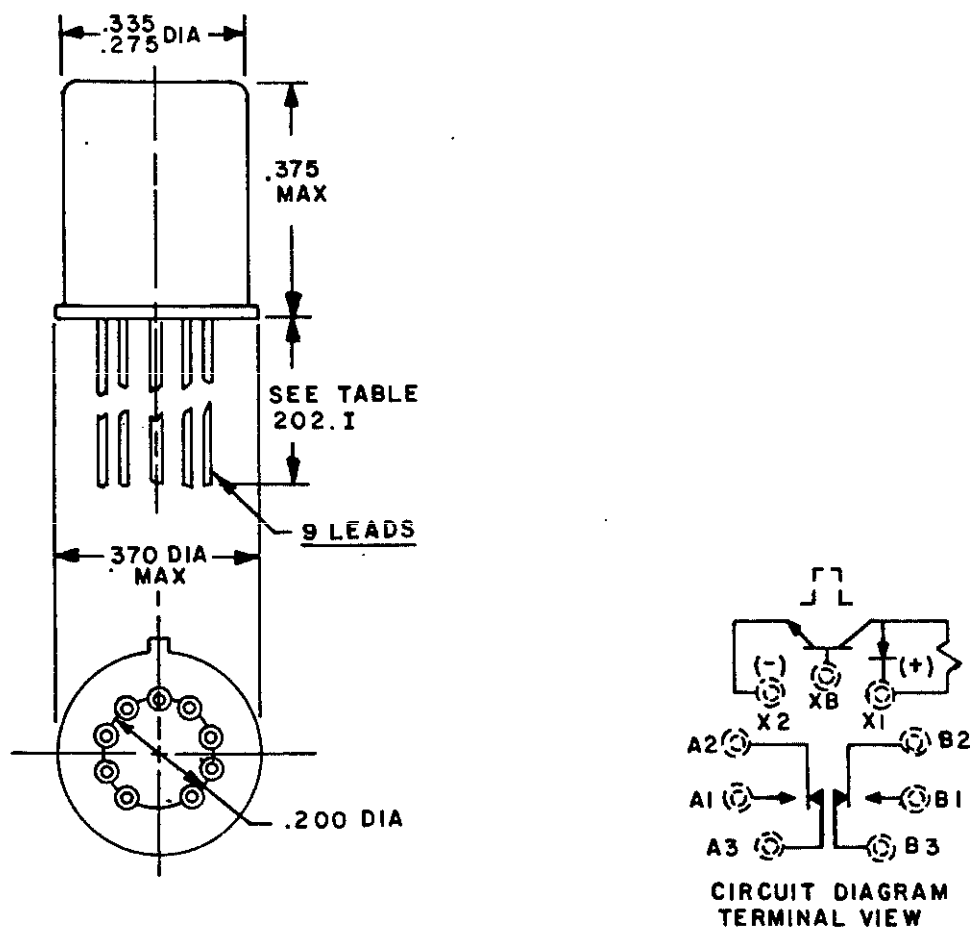
MIL-STD-1346B



INCHES	MM
.200	5.08
.275	6.98
.335	8.51
.370	9.40
.375	9.52

FIGURE 202-1. Relay, hybrid, ER, SPDT, low level to 1 ampere (sensitive), (transistor driven) (electromechanical output) (MIL-R-28776/4).

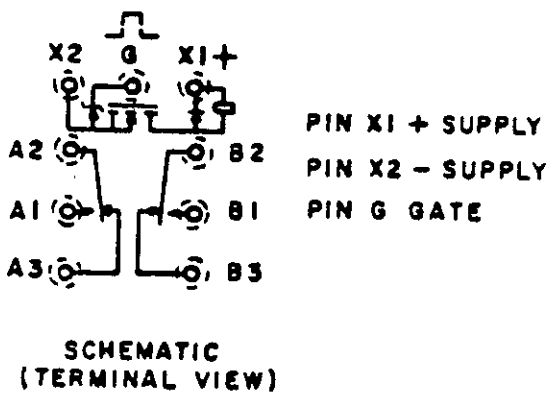
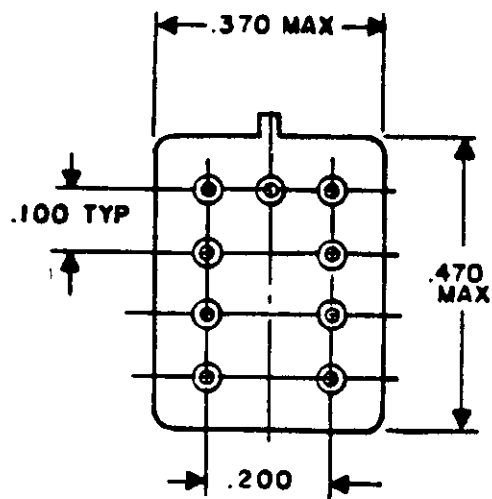
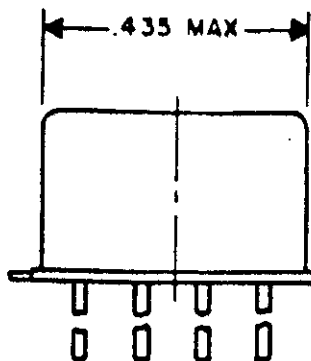
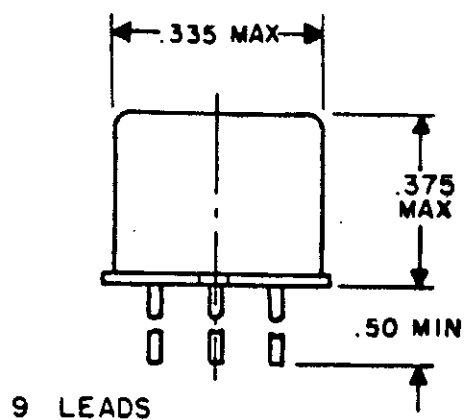
MIL-STD-1346B



INCHES	MM
.200	5.08
.275	6.98
.335	8.51
.370	9.40
.375	9.52

FIGURE 202-2. Relay, hybrid, ER, DPDT, low level to 1 ampere (sensitive), (transistor driven) (electromechanical output) (MIL-R-28776/3).

MIL-STD-1346B



INCHES	MM
.100	2.54
.200	5.08
.335	8.51
.370	9.40
.375	9.53
.435	11.05
.490	11.94
.500	12.70

FIGURE 202-3. Relay, hybrid, ER, DPDT, low level to 1 ampere, sensitive, internal mosfet drive with zener diode gate protection (MIL-R-28776/7).

MIL-STD-1346B

SECTION 300

RELAYS, ELECTROMAGNETIC (EM), GENERAL PURPOSE

Subsection:

- 301 Relays, EM, dc operated (MIL-R-5757).
- 302 Relays, EM, dc operated (MIL-R-6106).
- 303 Relays, EM, ac operated (MIL-R-5757).
- 304 Relays, EM, ac operated (MIL-R-6106).
- 305 Relays, EM, sensitive, dc operated (MIL-R-5757).
- 306 Relays, EM, latching, dc operated (MIL-R-6106).
- 307 Relays, EM, latching, ac operated (MIL-R-6106).
- 308 Relays, EM, latching, dc/ac operated (MIL-R-6106).

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MIL-STD-1346B

SUBSECTION 301

RELAYS, ELECTROMAGNETIC, DC OPERATED (MIL-R-5757)

SCOPE: This section covers relays with coils dc voltage rated and contacts nominally rated up to and including 10 amperes for use in electronic equipment.

TABLE 301.1. Relays, EM, dc operated, part numbers and characteristics - Continued.

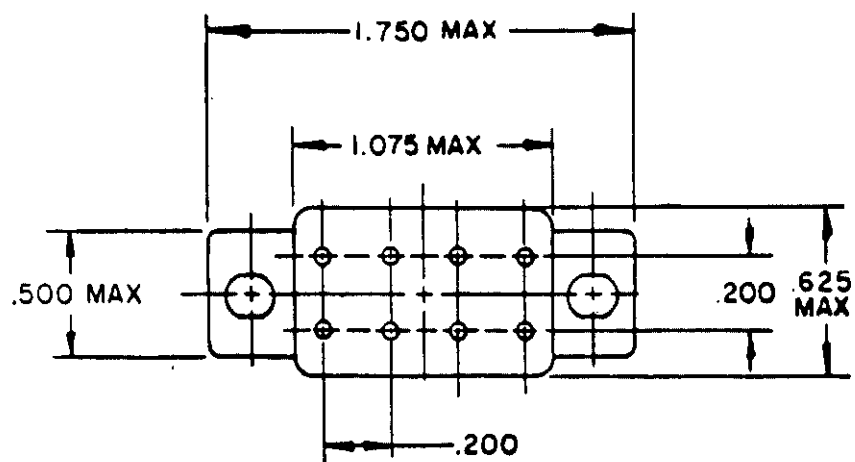
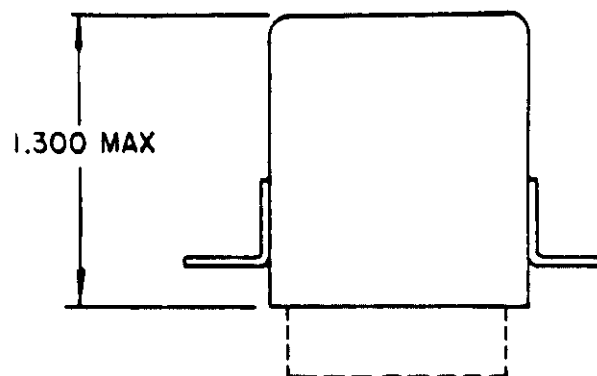
Rated coil voltage	Part number	Figure Shock (see number table II)	Vibration (see table III)	System voltage and frequency - contact current in amperes												Terminal style (see table IV)			
				28 V dc						60 Hz									
				Resistive	Inductive	Motor	Lamp	Resistive	Inductive	Motor	Lamp	Resistive	Inductive	Motor	Lamp				
				115 V 1-phase	115 V 1-phase	115/200 V 3-phase	115 V 1-phase	115 V 1-phase	115/200 V 3-phase	115 V 1-phase	115 V 1-phase	115/200 V 3-phase	115/200 V 3-phase						
26.5	M575/23 RA flange -001 -003 No mount -005 Lay flange -031	301-1	6	10.0	6.0	3.0	1.0	5.0	2.5	3.0	0.8	0.8	3.0	2.0	1.5	1.0	0.5	---	L SKP
46.0	M575/23 RA flange -016 -018 No mount -020 Lay flange -034	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	L SKP
120.0	M575/23 RA flange -026 -028 No mount -030 Lay flange -036	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	L SKP
6.0	M575/10 No mount -059	301-2	"	2.0	1.0	---	0.1	0.3	0.3	0.3	0.1	0.1	0.3	0.3	0.3	0.1	---	---	SP
12.0	M575/10 No mount -060	301-2	"	2.0	1.0	---	0.1	0.3	0.3	0.3	0.1	0.1	0.3	0.3	0.3	0.1	---	---	SP

DPDT CONTACTS - 2 FORM C - Continued

TABLE 301.1. Relays, EM, dc operated, part numbers and characteristics - Continued.

Rated coil voltage	Part number	Figure Shock (see table II)	Vibration (see table III)	System voltage and frequency - contact current in amperes												Terminal style (see table IV)							
				28 V dc			400 Hz			60 Hz			115 V 1 phase				115/200 V 3-phase						
				Resistive	Inductive	Motor	Resistive	Lamp	Motor	Resistive	Lamp	Motor	Resistive	Lamp	Motor		Resistive	Lamp	Motor	Resistive	Lamp	Motor	
DPDT CONTACTS - 2 FORM C - Continued																							
26.5	M5757/10 Bracket	301-2	3	6	2.0	1.0	---	0.1	0.3	0.3	0.3	---	0.1	---	---	---	---	---	---	---	---	---	L
"	Flange	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	L SP
"	-039	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	L SP
"	-040	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	L SP
"	No mount	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	L SP
"	-052	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	L SP
"	-054	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	L SP
"	PC mount	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	L SP
"	-056	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	SP
26.5	M5757/8	301-3	"	5	"	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	L
4PDT CONTACTS - 4 FORM C																							
26.5	M5757/7	301-4	3	5	2.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	L
"	-001	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	L
"	M5757/15	301-5	"	"	5.0	3.0	"	.8	5.0	3.0	"	---	---	---	---	---	---	---	---	---	---	---	L
"	-001	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	L
"	M5757/18	301-6	"	"	10.0	6.0	"	2.0	10.0	10.0	"	2.0	10.0	10.0	"	2.0	6.0	4.0	1.5	6.0	4.0	"	L
"	-001	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	L
6PDT CONTACTS - 6 FORM C																							
26.5	M5757/1	301-7	3	6	2.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	L
"	-027	301-7	"	6	2.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	L
"	-028	301-7	"	6	2.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	L
"	M5757/16	301-8	"	5	5.0	3.0	"	.8	5.0	3.0	"	.8	5.0	3.0	"	.8	5.0	3.0	"	5.0	3.0	"	L
"	-001	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	L

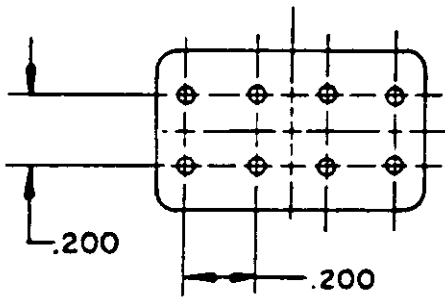
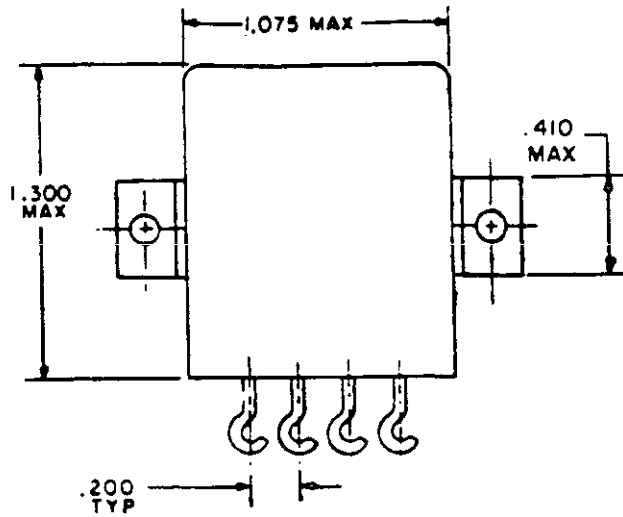
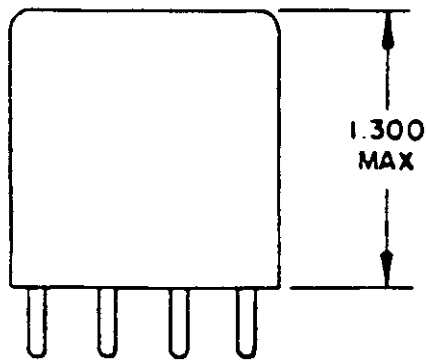
MIL-STD-1346B



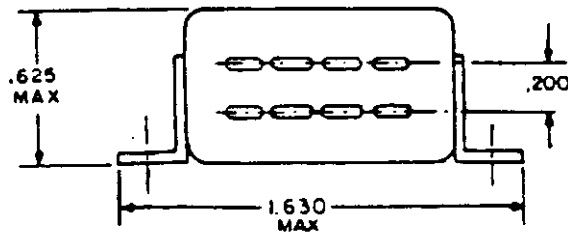
RAISED-FLANGE MOUNT

FIGURE 301-1. Relay, EM, DPDT, 10 amperes (MIL-R-5757/23).

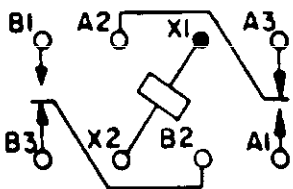
MIL-STD-1346B



PLUG-IN MOUNT



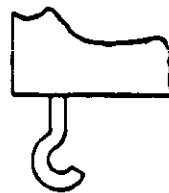
LAYDOWN FLANGE MOUNT



CIRCUIT DIAGRAM



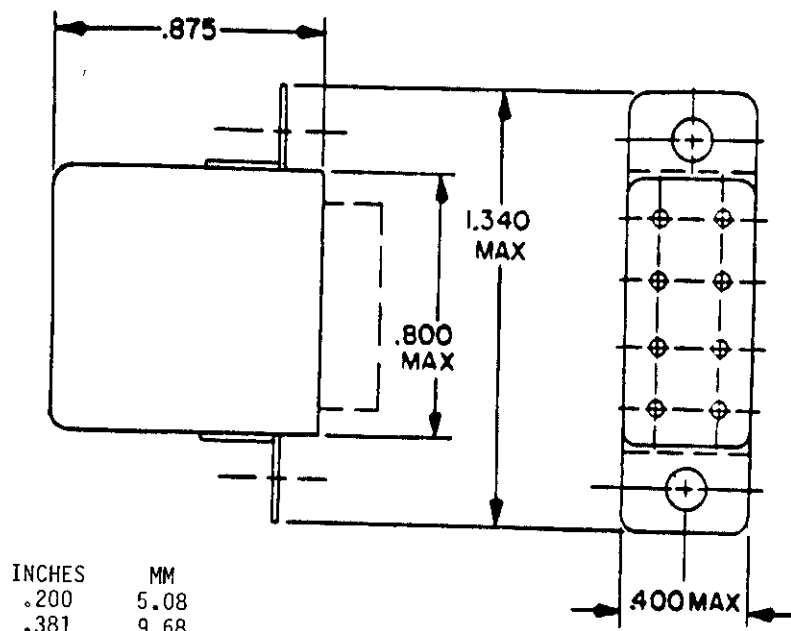
PIN



LUG

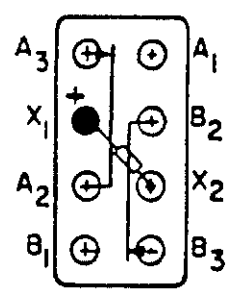
INCHES	MM
.200	5.08
.410	10.41
.500	12.70
.625	15.88
1.075	27.31
1.300	33.02
1.630	41.40
1.750	44.45

FIGURE 301-1. Relay, EM, DPDT, 10 amperes (MIL-R-5757/23) - Continued.

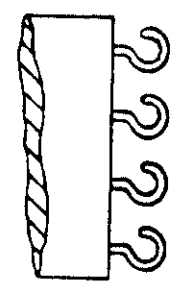


INCHES	MM
.200	5.08
.381	9.68
.400	10.16
.460	11.68
.800	20.32
.875	22.23
1.266	32.16
1.340	34.04

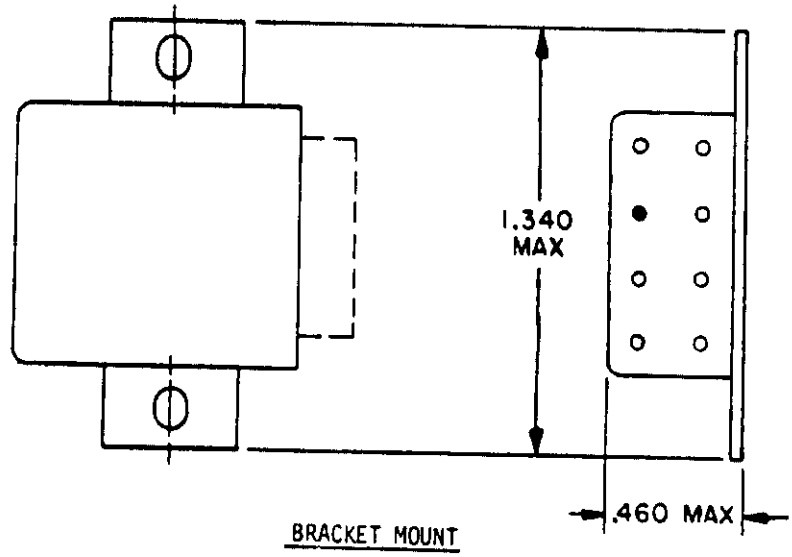
FLANGE MOUNT



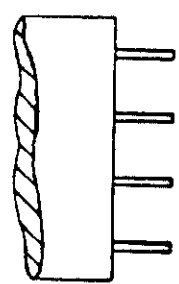
CIRCUIT DIAGRAM



SOLDER LUG (L)



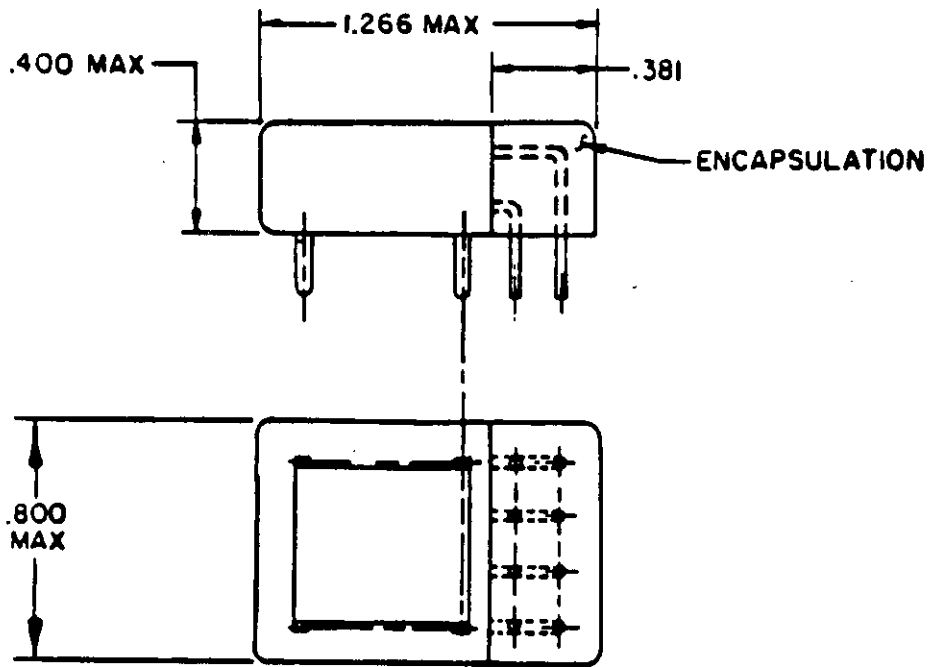
BRACKET MOUNT



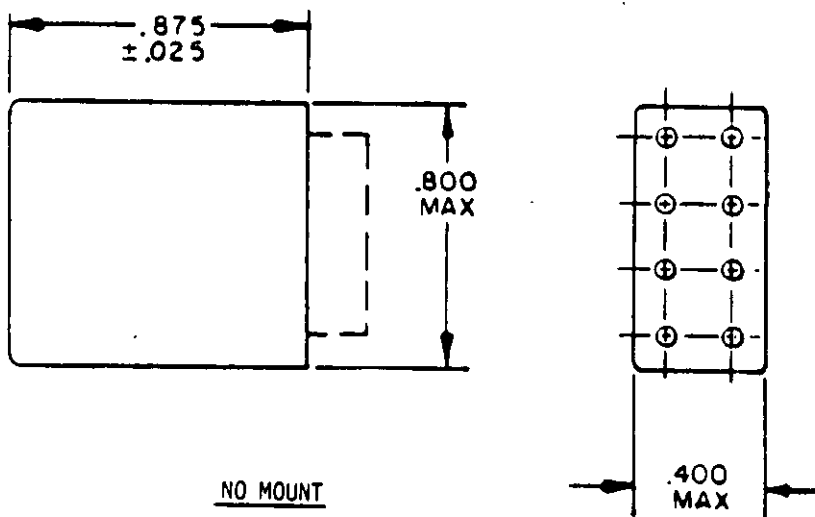
PIN (PC)

FIGURE 301-2. Relay, EM, DPDT, 2 amperes (MIL-R-5757/10).

MIL-STD-1346B



PC MOUNT



NO MOUNT

FIGURE 301-2. Relay, EM, DPDT, 2 amperes (MIL-R-5757/10) - Continued.

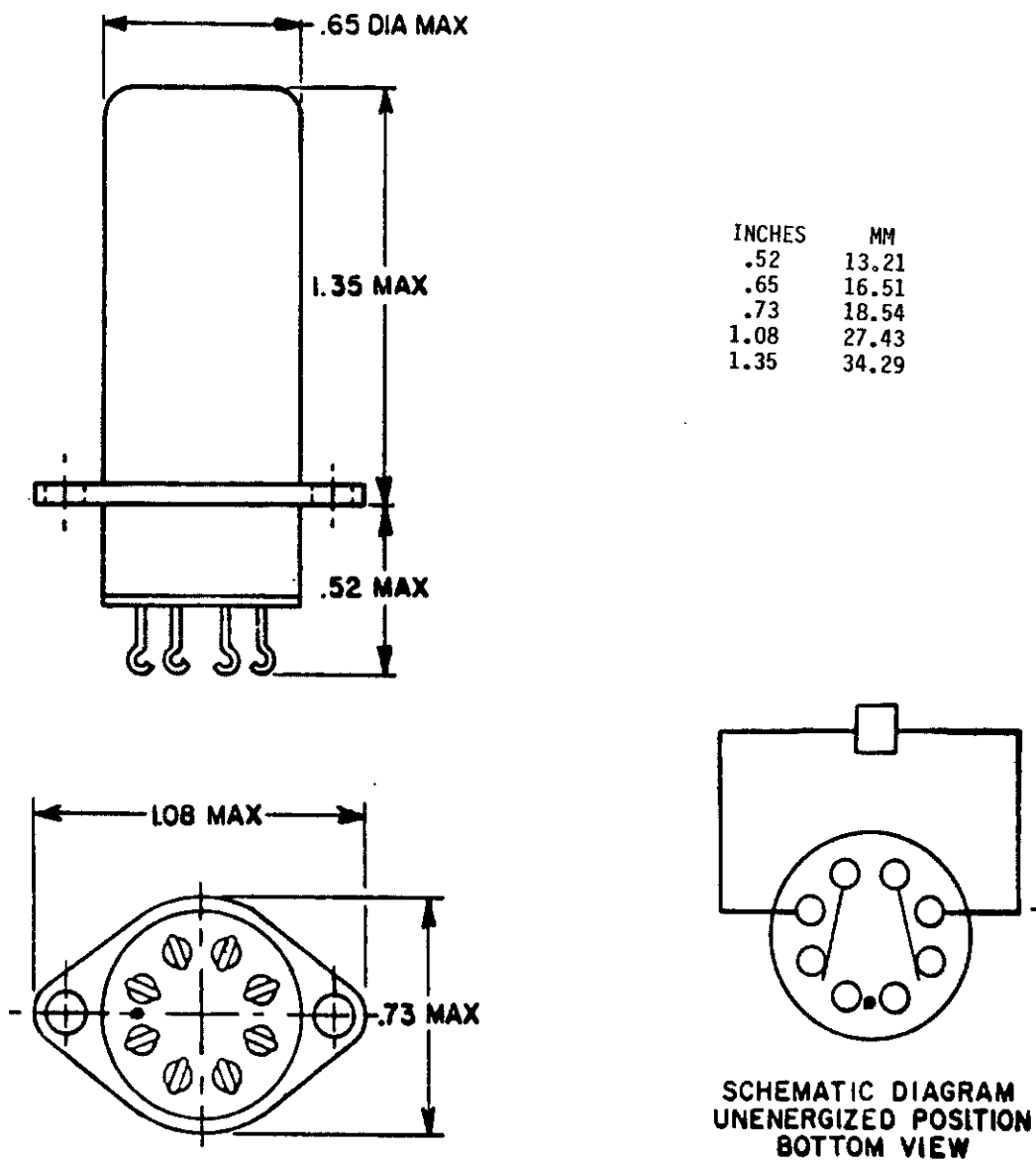
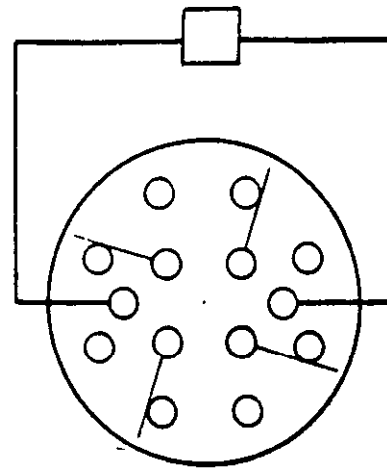
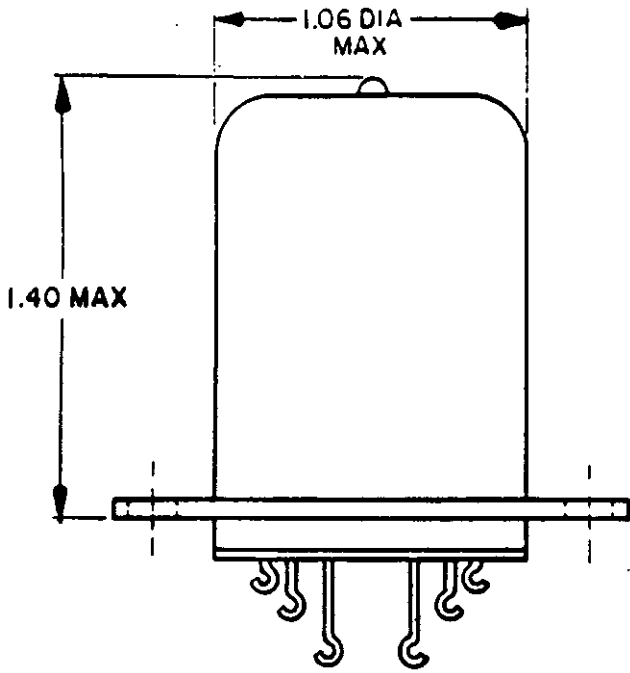
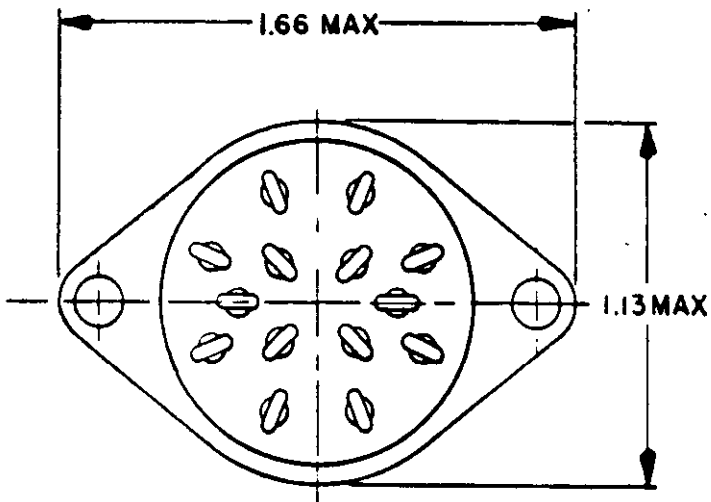


FIGURE 301-3. Relay, EM, DPDT, 2 amperes (MIL-R-5757/8).

MIL-STD-1346B

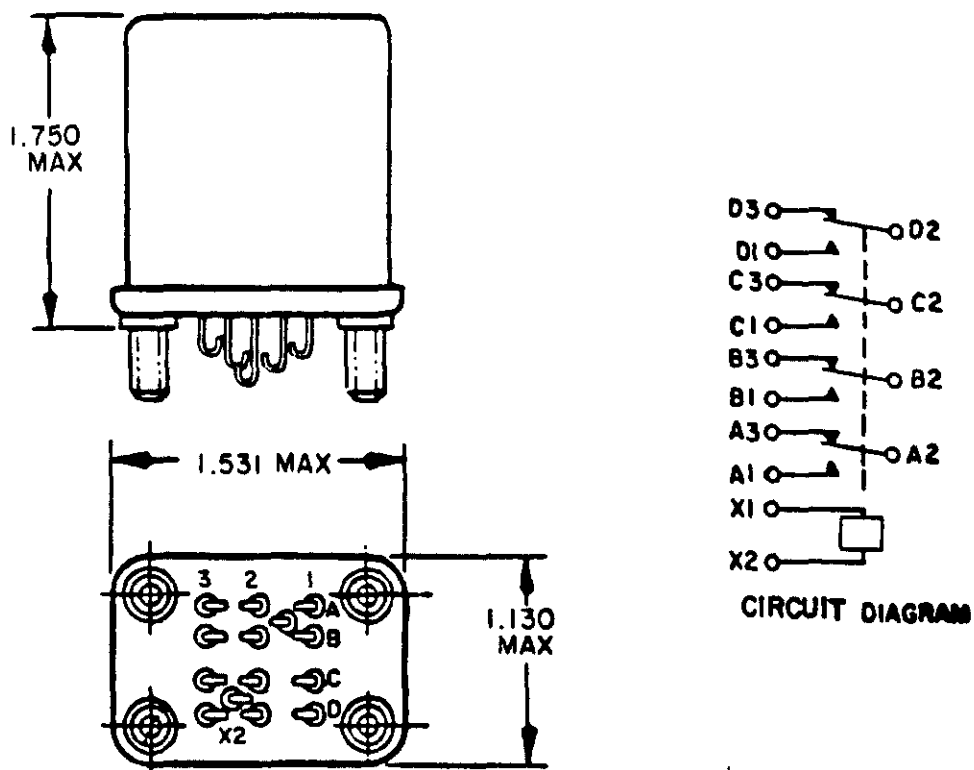


CIRCUIT DIAGRAM



INCHES	MM
1.06	26.92
1.13	28.70
1.40	35.56
1.66	42.16

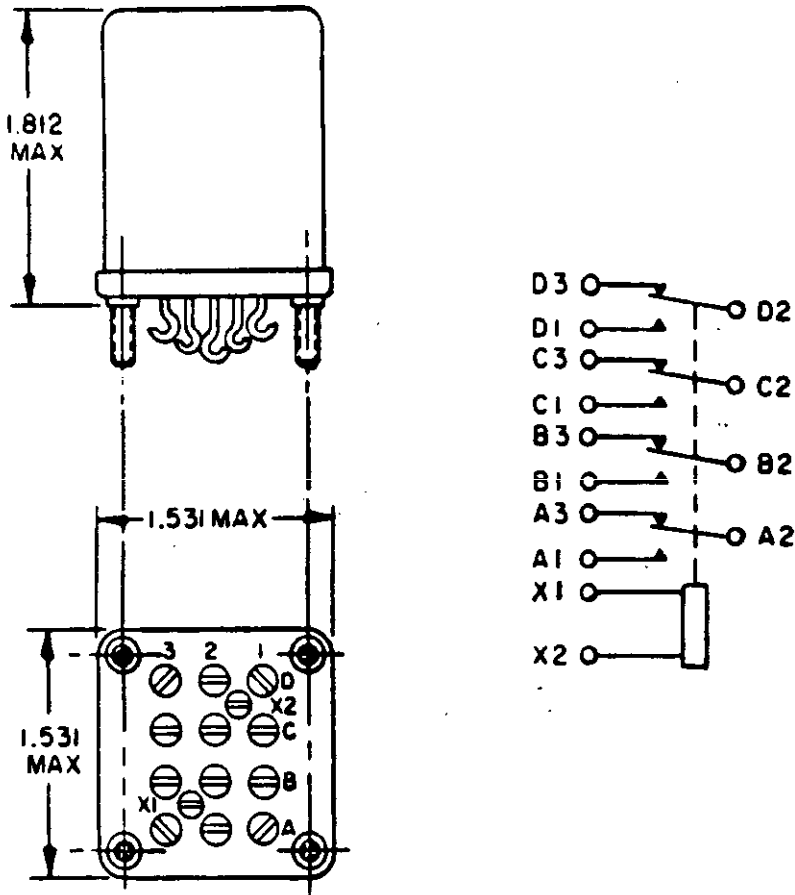
FIGURE 301-4. Relay, EM, 4PDT, 2 amperes (MIL-R-5757/7).



INCHES	MM
1.130	28.70
1.531	38.89
1.750	44.45

FIGURE 301-5. Relay, EM, 4PDT, 5 amperes (MIL-R-5757/15).

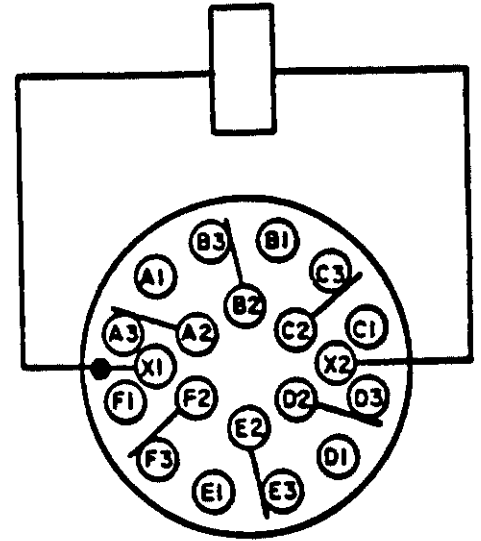
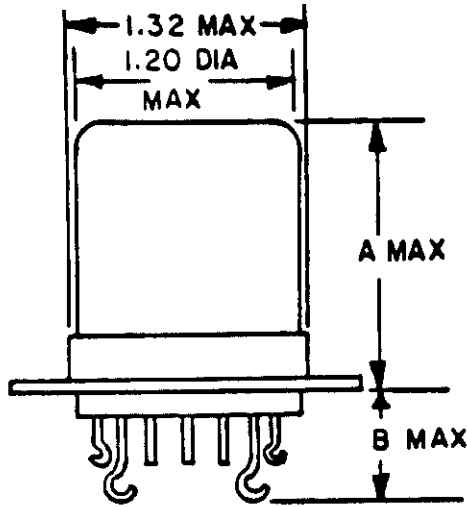
MIL-STD-1346B



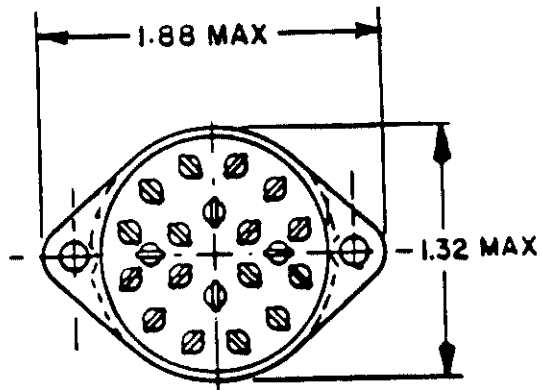
INCHES	MM
1.531	38.89
1.812	46.02

FIGURE 301-6. Relay, EM, 4PDT, 10 amperes (MIL-R-5757/18).

MIL-STD-1346B



SCHEMATIC DIAGRAM
UNENERGIZED POSITION
BOTTOM VIEW

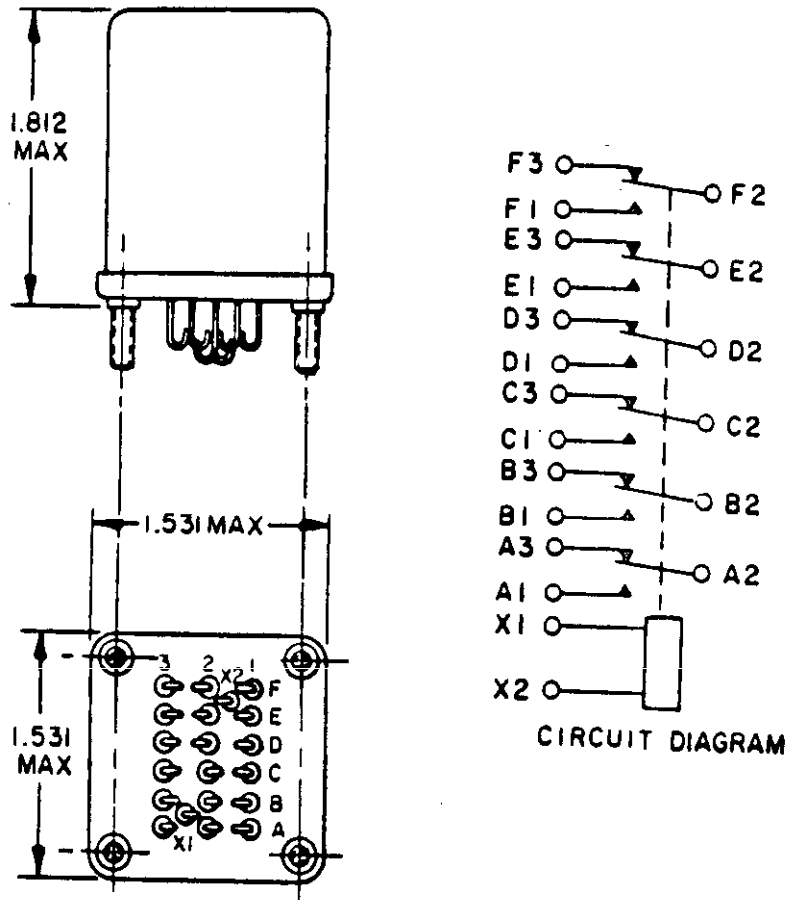


INCHES	MM
1.20	30.5
1.32	33.5
1.88	47.8

Dash number	A max	B max
-027	1.38 (35.1)	.56 (14.2)
-028	1.10 (27.9)	.84 (21.3)

FIGURE 301-7. Relay, EM, 6PDT, low level to 2 amperes (MIL-R-5757/1).

MIL-STD-1346B



INCHES	MM
1.531	38.89
1.812	46.02

FIGURE 301-8. Relay, EM, 6PDT, 5 amperes (MIL-R-5757/16).

MIL-STD-1346B

SUBSECTION 302

RELAYS, ELECTROMAGNETIC (EM), DC OPERATED (MIL-R-6106)

SCOPE: This section covers dc voltage rated relays nominally rated 5 amperes and up for use in electrical systems. The relays are capable of meeting the electrical and environmental requirements when mounted directly to the structure.

SUBSECTION 302

RELAYS, ELECTROMAGNETIC (EM), DC OPERATED
(Applicable specification: MIL-R-6106)

Duty cycle: Continuous
Rated coil voltage: 28 V dc

TABLE 302.1. Relays, EM, dc operated, part numbers and characteristics.

Part number	Figure number	Operating temp range (see table I)	Shock (see table II)	Vibration (see table III)	System voltage and frequency-contact current in amperes															
					28 V dc			115 V 1-phase			115/200 V 3-phase			50/60 Hz						
					Resis-tive	Induc-tive	Motor	Lamp	Resis-tive	Induc-tive	Motor	Lamp	Resis-tive	Induc-tive	Motor	Lamp	Resis-tive	Induc-tive	Motor	
*MS24185-D1	302-1	D	See spec	1	400	100	400													
MS24184-D1	302-2	"	"	"	300	"	250													
MS24184-D2 1/	302-2	"	"	"	300	"	250													
MS24142-D1	302-3	G	"	"	200	"	200													
MS24142-D2 1/	302-3	G	"	"	200	"	200													
MS24171-D1	302-4	D	"	1	"	"	"													
MS24183-D1	302-36	"	"	"	200	"	150													
MS24182-D1	302-37	"	"	"	100	"	75	50												
MS24141-D1	302-5	G	"	"	"	"	"													
MS24141-D2 1/	302-5	G	"	"	"	"	"													
MS24140-D1	302-6	"	"	"	50	50	50	25												
MS24140-D2 1/	302-6	"	"	"	50	50	50	25												
*MS24166-D1	302-7	D	"	1	"	"	"	"												
SPST CONTACTS - 1 FORM A																				
M6106/19	302-55	G	6	See spec																
-003	"	"	"	"	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
-004	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
-025	"	"	"	"	25	12	10	5	25	15	10	5	5	5	5	5	5	5	5	5
-010	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
-011	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
-012	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
-013	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
-014	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
SPDT CONTACTS - 1 FORM C																				
M6106/19	302-55	G	6	See spec																
-015	"	"	"	"	25	12	10	5	25	15	10	5	5	5	5	5	5	5	5	5
-016	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
-017	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
-018	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
-019	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
SPDT CONTACTS - 1 FORM C - WITH COIL SUPPRESSION																				
M6106/19	302-55	G	6	See spec																
-015	"	"	"	"	25	12	10	5	25	15	10	5	5	5	5	5	5	5	5	5
-016	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
-017	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
-018	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
-019	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"

See footnotes at end of table.

TABLE 302.1. Relays, EM, dc operated, part numbers and characteristics - Continued.

Part number	Figure number	Operating temp range (see table I)	Shock (see table II)	Vibration (see table III)	System voltage and frequency-contact current in amperes																	
					28 V dc			400 Hz			50/60 Hz			115/200 V 3-phase								
					Induc-tive	Motor	Lamp	Resis-tive	Lamp	Motor	Induc-tive	Resis-tive	Lamp	Motor	Induc-tive	Resis-tive	Lamp	Motor	Induc-tive	Resis-tive	Lamp	Motor
DPDT CONTACTS - 2 FORM C																						
M6106/27	101-111	G	See spec	See spec	5	3	2	1	5	5	3	1	1	5	5	3	1	1	5	5	3	1
-001																						
-005																						
-009																						
-013																						
-017																						
-021																						
-025																						
-029																						
-033																						
-037																						
DPDT CONTACTS - 2 FORM C - WITH COIL SUPPRESSION																						
M6106/27	101-131	G	See spec	See spec	5	3	2	1	5	5	3	1	1	5	5	3	1	1	5	5	3	1
-003																						
-007																						
-011																						
-015																						
-019																						
-023																						
-027																						
-031																						
-035																						
-039																						
MS27401	302-401		6	9	10	8	4.0	2.0	10	8	4.0	2.0	1	10	8	4.0	2.0	1	10	8	4.0	2.0
-25																						
-26																						
-27																						
-39																						
-43																						
-48																						
-49																						

See footnotes at end of table.

TABLE 302.1. Relays, EM, dc operated, part numbers and characteristics - Continued.

Part number	Figure number	Operating Temp range (see table I)	Shock (see table II)	Vibration (see table III)	System voltage and frequency-contact current in amperes												
					28 V dc				115 V 1-phase 400 Hz				115 V 1-phase 50/60 Hz				
					Induc-tive	Motor	Lamp	Resis-tive	Induc-tive	Motor	Lamp	Resis-tive	Induc-tive	Motor	Lamp	Resis-tive	
3PST CONTACTS - 3 FORM A																	
MS27418-38	302-05	G	1	See spec	25	15	20	10,0	25	20	10	25	12	10	25	10	25
MS27418-28	302-45	G	1	See spec	25	15	20	10	25	20	10	25	12	10	25	20	25
MS27751-3 2/1	302-21	D	See spec	"	50	20	"	"	60	40	15	60	40	15	"	"	"
MS27751-5 1/2	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
MS27751-13 2/1	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
MS27751-15 1/2	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
MS27706-18	302-47	G	"	4	20	15	"	5,0	20	20	5	20	20	5	15	20	20
MS27706-23	302-47	"	"	4	20	15	"	5,0	20	20	5	20	20	5	15	20	20
M6106/10-001	302-38	"	"	See spec	---	---	---	---	60	40	20	60	40	20	---	---	---
M6106/10-002 1/	302-38	"	"	See spec	---	---	---	---	60	40	20	60	40	20	---	---	---
3PST CONTACTS - 3 FORM A - WITH COIL SUPPRESSION																	
M6106/10-005	302-38	G	See spec	See spec	---	---	---	---	60	40	20	60	40	20	---	---	---
3PST CONTACTS - 3 FORM A - WITH SPDT AUXILIARY																	
M6106/13-001	302-60	G	6	9	25	12	10	5	25	15	10	5	15	10	5	---	---
M6106/13-002	302-60	G	6	9	25	12	10	5	25	15	10	5	15	10	5	---	---
3PST CONTACTS - 3 FORM B																	
M6106/11-001	302-50	G	See spec	See spec	---	---	---	---	60	40	20	60	40	20	---	---	---
M6106/11-002 1/	302-50	G	See spec	See spec	---	---	---	---	60	40	20	60	40	20	---	---	---
3PST CONTACTS - 3 FORM C																	
M6106/9-001	302-51	G	See spec	See spec	---	---	---	---	60	40	20	60	40	20	---	---	---
M6106/9-001 1/	302-51	"	See spec	See spec	---	---	---	---	60	40	20	60	40	20	---	---	---
M6106/29-001	302-57	"	"	"	10	6	4	2	8	4	2	8	4	2	"	"	"
M6106/29-005	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
M6106/29-009	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
M6106/29-013	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
M6106/29-017	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
M6106/29-021	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
M6106/29-025	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"

See footnotes at end of table.

TABLE 302.1. Relays, EM, dc operated, part numbers and characteristics - Continued.

Part number	Figure number	Operating temp range (see table I)	Shock (see table II)	Vibration (see table III)	System voltage and frequency-contact current in amperes												
					28 V dc			115 V 1-phase			115/200 V 3-phase			50/60 Hz			
					Resistive	Inductive	Motor	Lamp	Resistive	Inductive	Motor	Lamp	Resistive	Inductive	Motor	Lamp	Resistive
M6106/29																	
-029	302-57	G	See spec	See spec		6	4	4	2	10	8	4	2	10	8	4	2
-033	302-57					6	4	4	2	10	8	4	2	10	8	4	2
MS27743-4	302-25					12	10	10	5	25	15	10	5	25	15	10	5
-5																	
-6																	
-16 3/4																	
-17 3/4																	
-18 3/4																	
-22																	
-23																	
-24																	
-28																	
-29																	
-32 3/4																	
-33 3/4																	
MS27751-1	302-21	D				15	15	10	10	50	50	40	15	50	50	40	15
MS27751-7 1/2																	
MS27751-9 1/2																	
MS27751-11 1/2																	
MS27751-17 1/2																	
MS27751-19 1/2																	
M6106/29																	
-003	302-57	G	See spec	See spec		6	4	4	2	10	8	4	2	10	8	4	2
-007																	
-011																	
-015																	
-019																	
-023																	
-027																	
-031																	
-035																	
MS27751-21	302-21	0				50	20	20	10	60	60	40	15	60	60	40	15
MS27750-1 2/3	302-30	D	See spec	See spec		25	15	15	10	50	50	30	15	50	50	30	15
MS27750-2 2/3	302-30					25	15	15	10	50	50	30	15	50	50	30	15

3PDT CONTACTS - 3 FORM C

3PDT CONTACTS - 3 FORM C - WITH COIL SUPPRESSION

3PDT CONTACTS - 3 FORM K

See footnotes at end of table.

number	number range (see table I)	(see table III)	4PDT CONTACTS - 4 FORM C - Continued																			
			time	time	time	time	time	time	time	time	time	time										
MS24568-D1	302-27	See spec	10	10	6	3	15	10	6	3	15	10	6	3	15	10	6	3	15	10	6	3
MS27254-2	302-48	6	"	"	5	"	"	10	"	"	5	"	"	10	"	"	5	"	"	10	"	"
MS27255-2	302-28	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
MS27255-4	302-28	"	8	"	4	2	"	"	8	"	4	2	"	"	8	"	4	2	"	"	8	"
MS27400	302-49	See spec	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
-10	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
-21	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
-35	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
-40	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
-41	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
MS25271-D1	302-29	"	"	6	"	"	"	"	6	"	"	"	"	"	"	"	"	"	"	"	"	"
MS25327-D1	302-31	4	"	6	"	"	"	"	6	"	"	"	"	"	"	"	"	"	"	"	"	"
MS25267-D1	302-32	"	5	3	1.5	0.8	5	3	1.5	0.8	5	3	1.5	0.8	5	3	1.5	0.8	5	3	1.5	0.8
MS25325-D1	302-33	"	5	3	1.5	0.8	5	3	1.5	0.8	5	3	1.5	0.8	5	3	1.5	0.8	5	3	1.5	0.8
MS27709	302-59	"	10	8	4	2	10	8	4	2	10	8	4	2	10	8	4	2	10	8	4	2
-1	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
-2	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
-3	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
4PDT CONTACTS - 4 FORM C - WITH COIL SUPPRESSION																						
M6106/28	302-58	See spec	5	3	2	1	5	5	3	1	5	5	3	1	5	5	3	1	5	5	3	1
-003	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
-007	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
-011	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
-015	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
-019	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
-023	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
-027	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
-031	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
-035	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
MS27400	302-49	"	10	8	4	2	10	8	4	2	10	8	4	2	10	8	4	2	10	8	4	2
-17	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
-23	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
-24	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
-37	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
-42	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
-43	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"

See footnotes at end of table.

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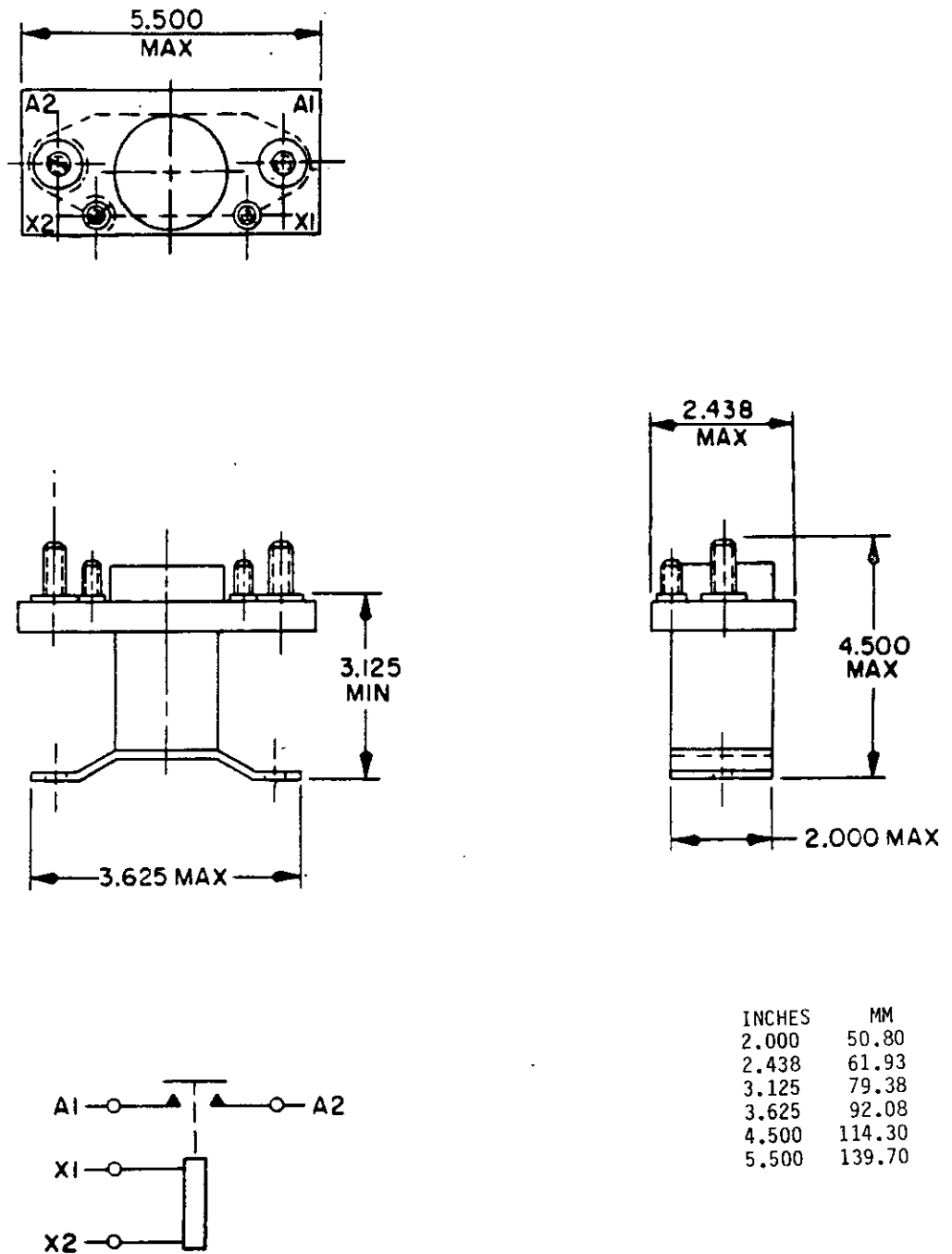


FIGURE 302-1. Relay, EM, unsealed, SPST, normally open, 400 amperes (MS24185-D1).

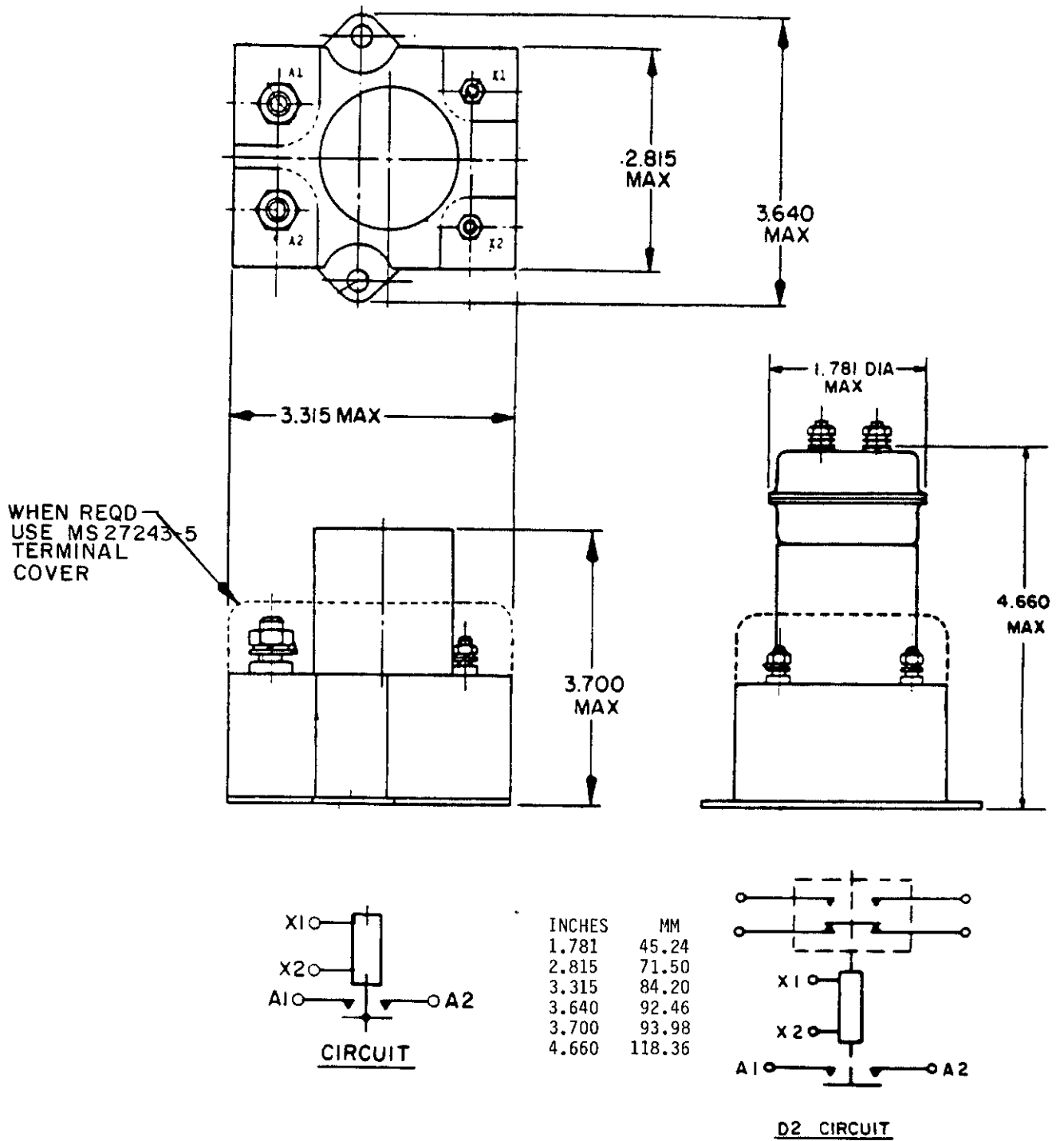
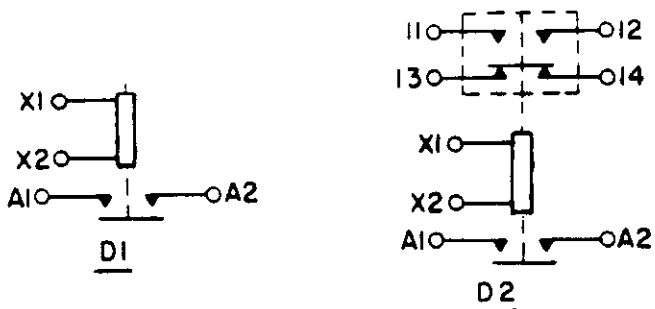
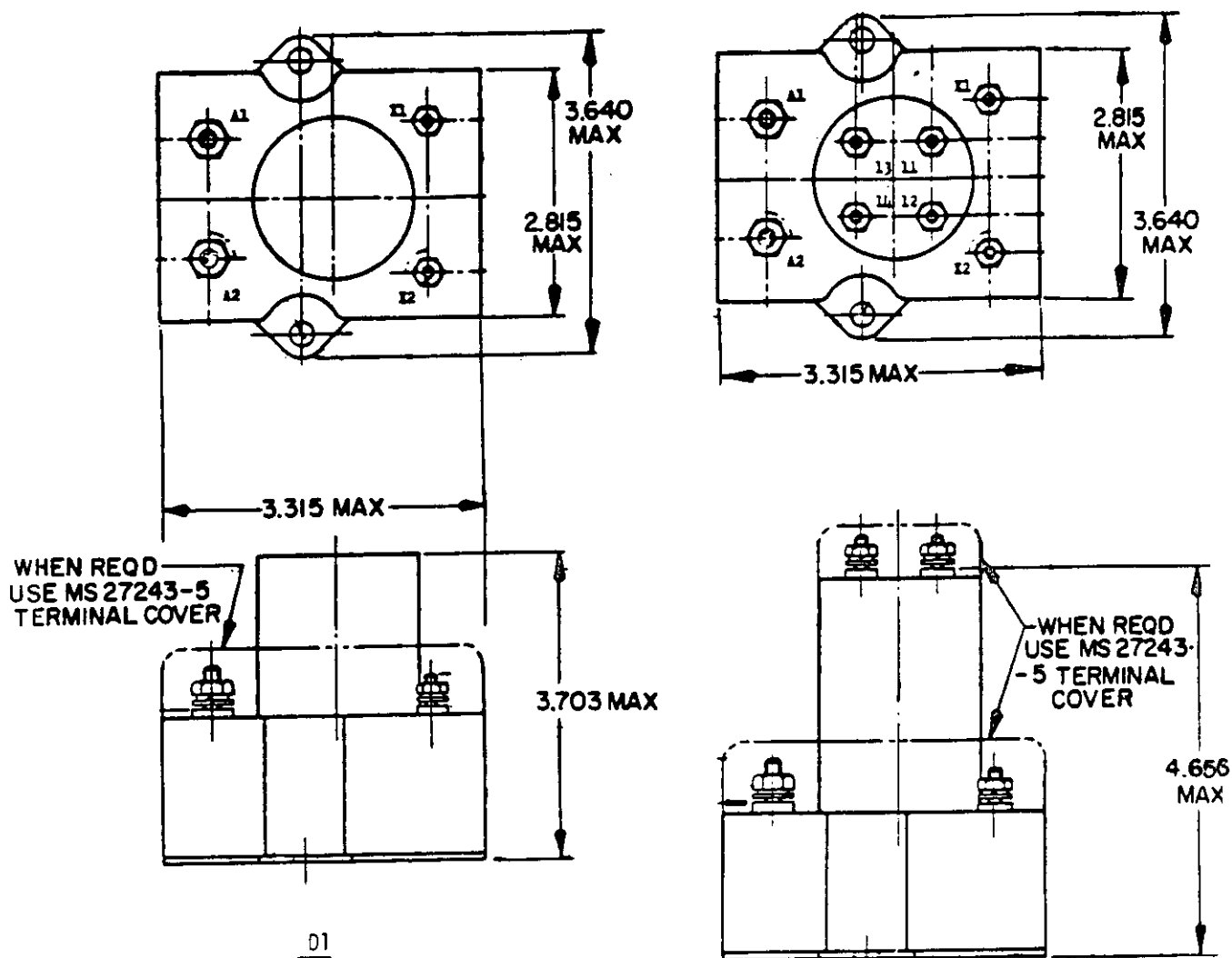


FIGURE 302-2. Relay, EM, SPST, normally open, 300 amperes (MS24184).

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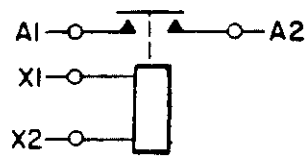
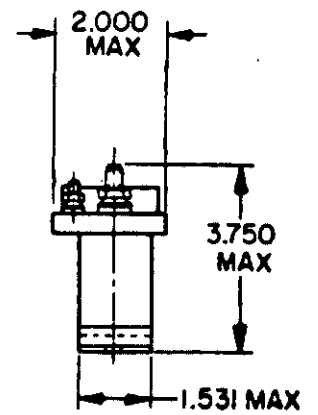
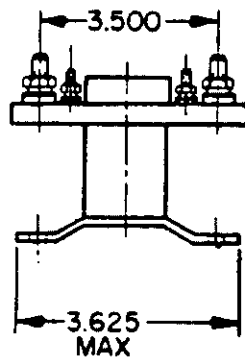
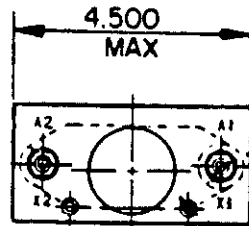


CIRCUIT DIAGRAM

D2	
INCHES	MM
.063	1.60
.750	19.05
2.063	52.40
2.815	71.50
3.315	84.20
3.640	92.46
3.703	94.06
4.656	118.26

FIGURE 302-3. Relay, EM, SPST, normally open, 200 amperes (MS24142).

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CIRCUIT

INCHES	MM
1.531	38.89
2.000	50.80
3.500	88.90
3.625	92.08
3.750	95.25
4.500	114.30

FIGURE 302-4. Relay, EM, unsealed, SPST, normally open, 200 amperes (MS24171-D1).

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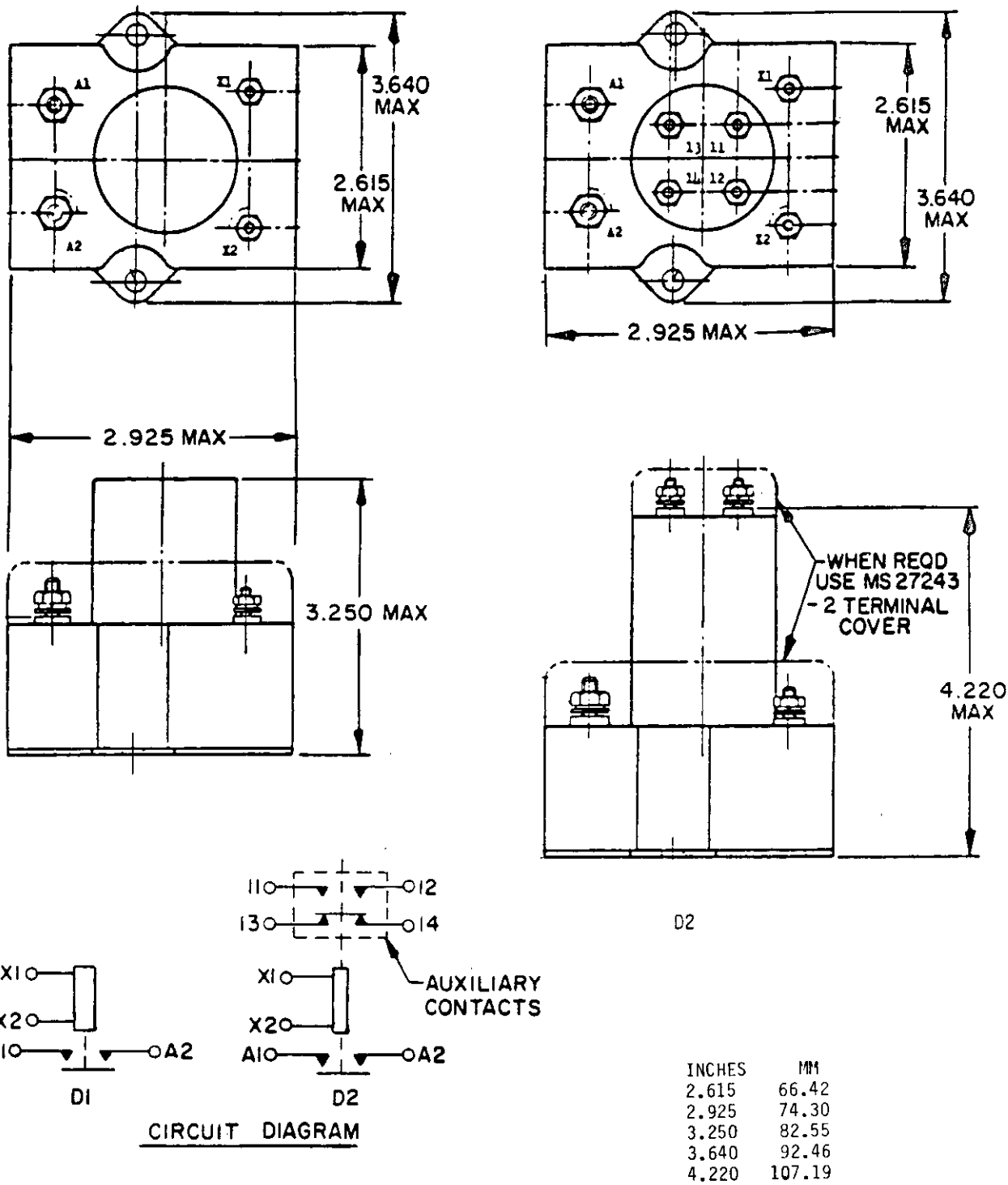


FIGURE 302-5. Relay, EM, SPST, normally open, 100 amperes (MS24141).

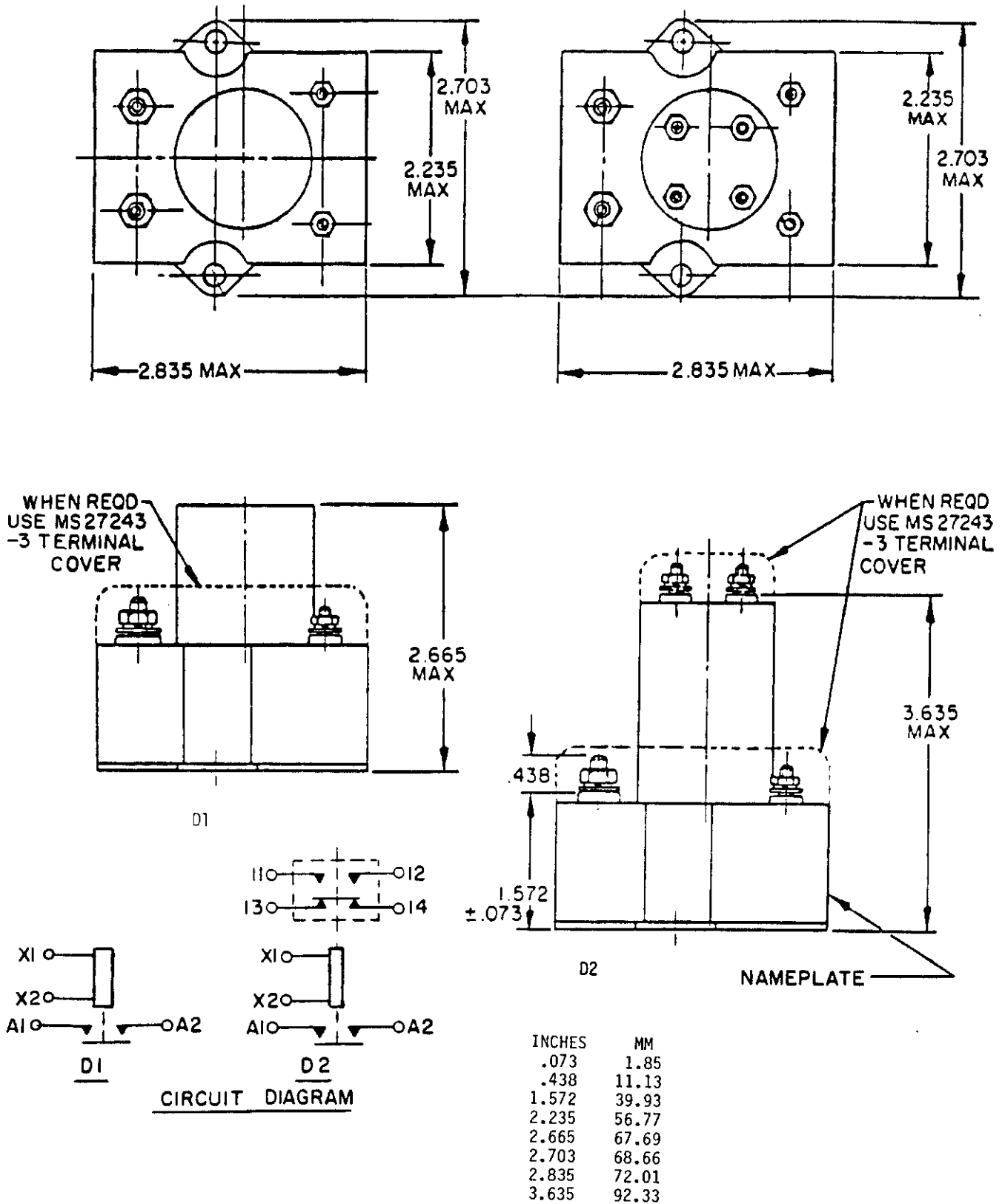
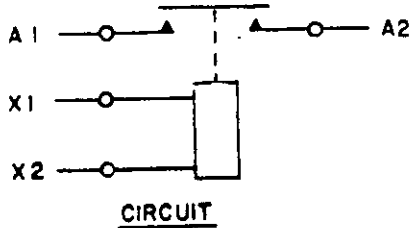
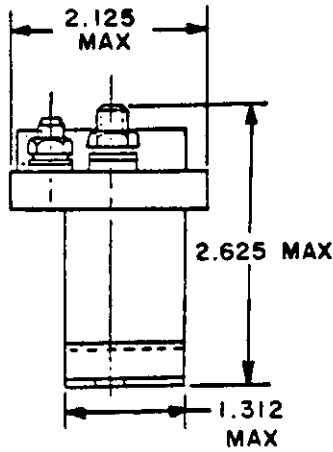
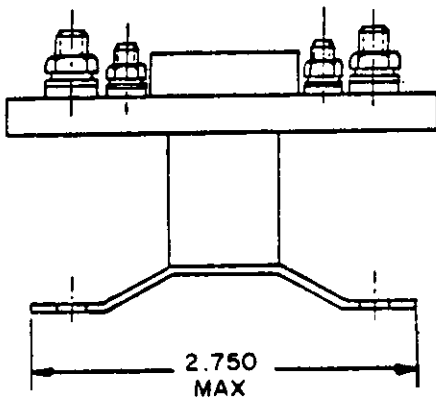
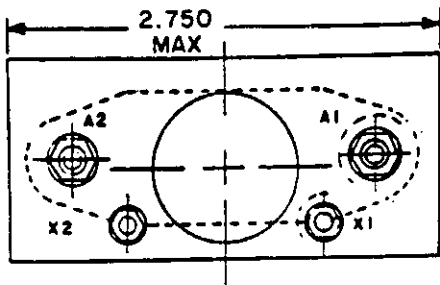


FIGURE 302-6. Relay, EM, SPST, normally open, 50 amperes (MS24140).

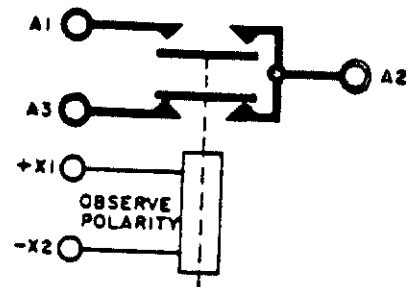
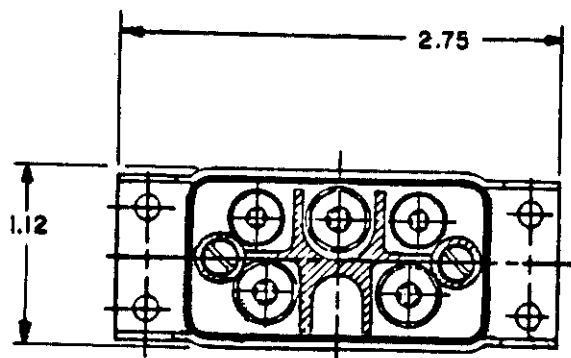
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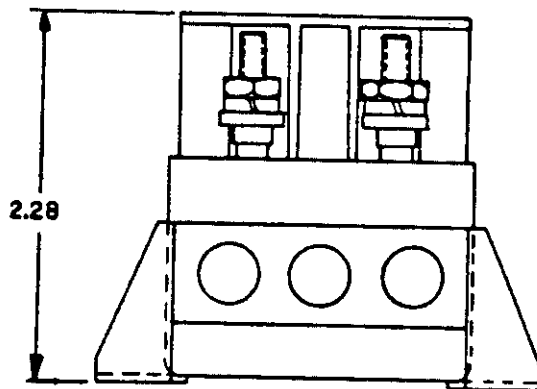
INCHES	MM
1.312	33.32
2.125	53.98
2.625	66.68
2.750	69.85

FIGURE 302-7. Relay, EM, unsealed, SPST, normally open, 50 amperes (MS24166-D1).

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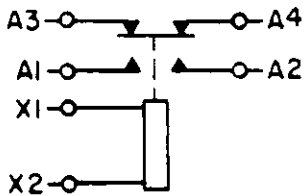
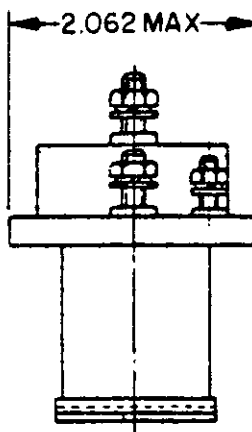
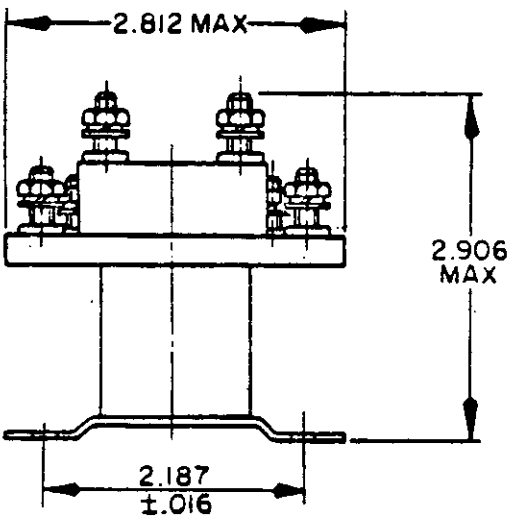
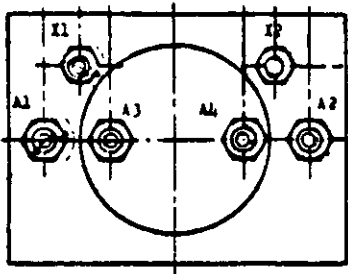
CIRCUIT



INCHES	MM
1.12	28.45
2.28	50.91
2.375	60.33
2.75	69.85

FIGURE 302-8. Relay, EM, SPDT, 50 amperes (MIL-R-6106/15).

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CIRCUIT DIAGRAM

INCHES	MM
.016	0.41
2.062	52.37
2.187	55.55
2.812	71.42
2.906	73.81

FIGURE 302-9. Relay, EM, unsealed, SPDT, 50 amperes normally open and 25 amperes normally closed (MS24187-D2).

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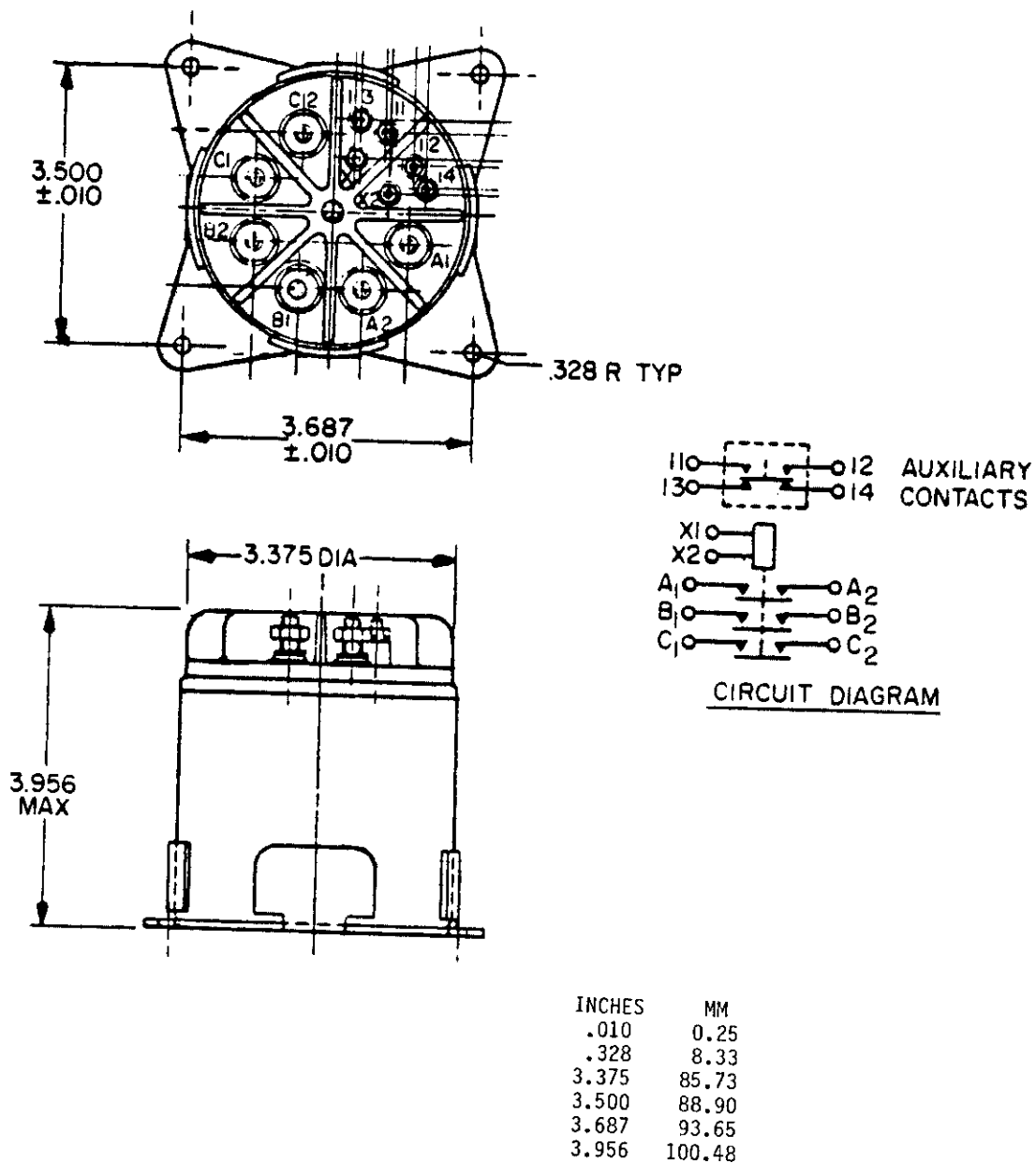


FIGURE 302-10. Relay, EM, coil and contacts individually sealed, 3PST, normally open, 150 amperes (MS27715).

MIL-STD-1346B

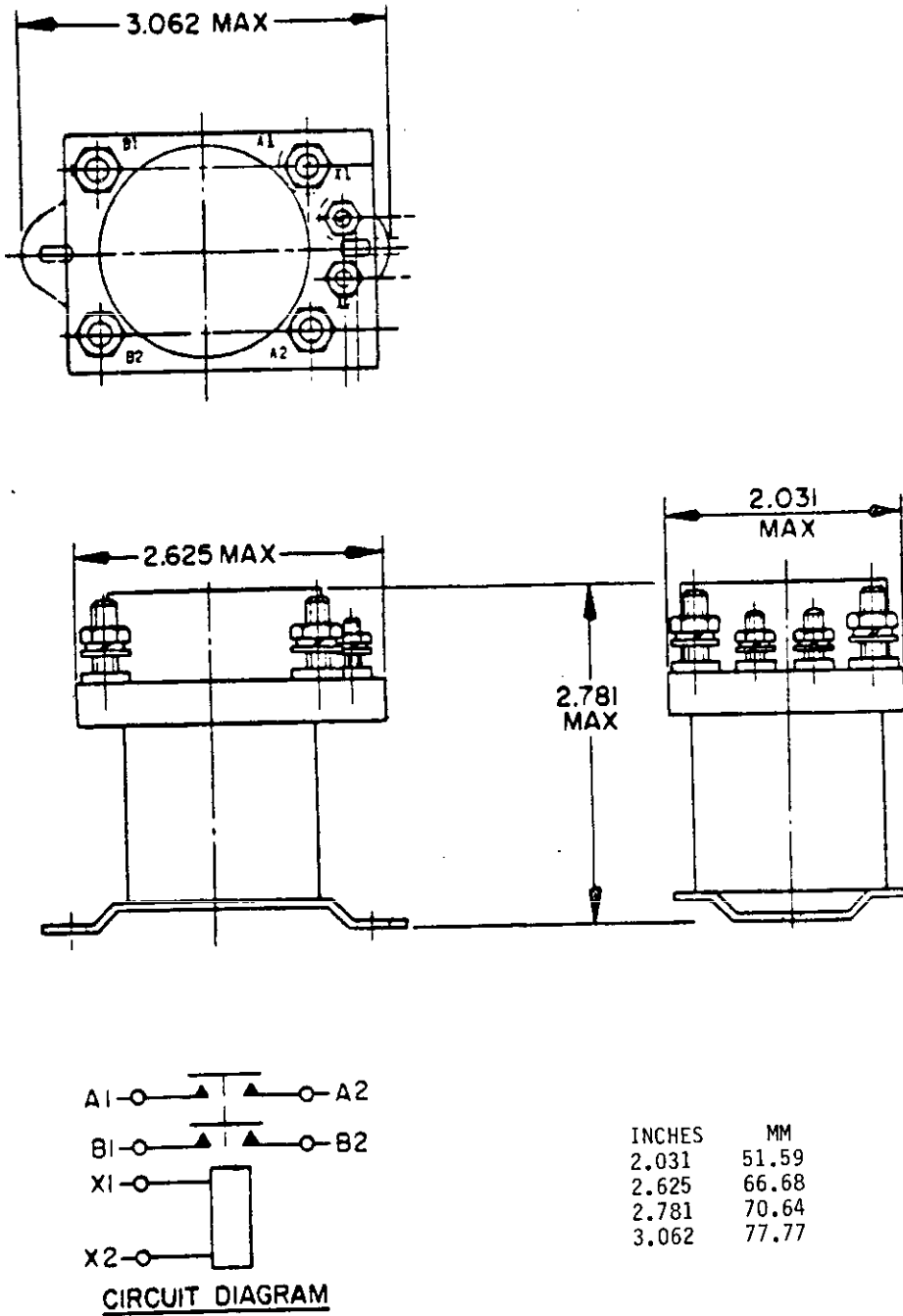
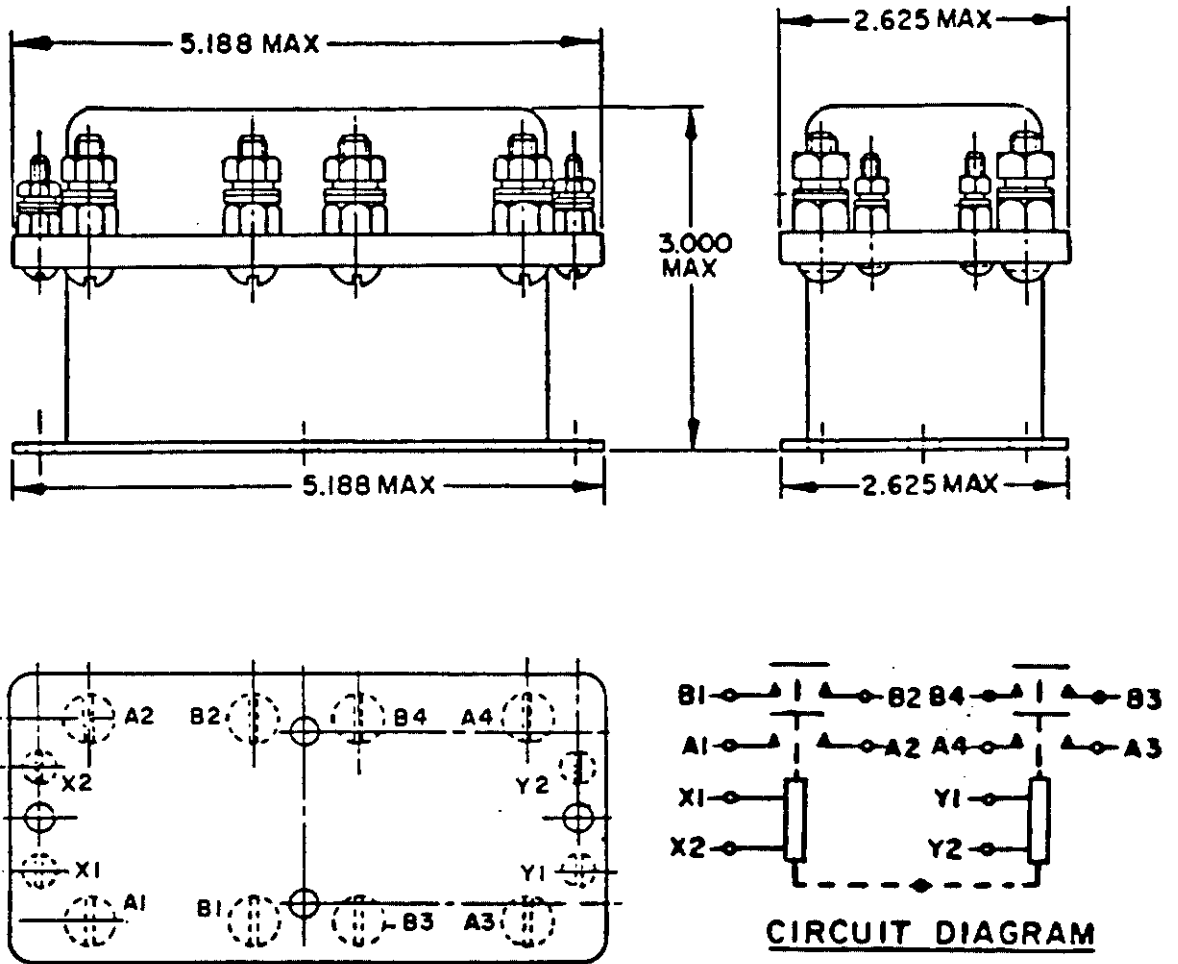


FIGURE 302-11. Relay, EM, unsealed, DPST, normally open, 55 amperes (MS24178-D1).

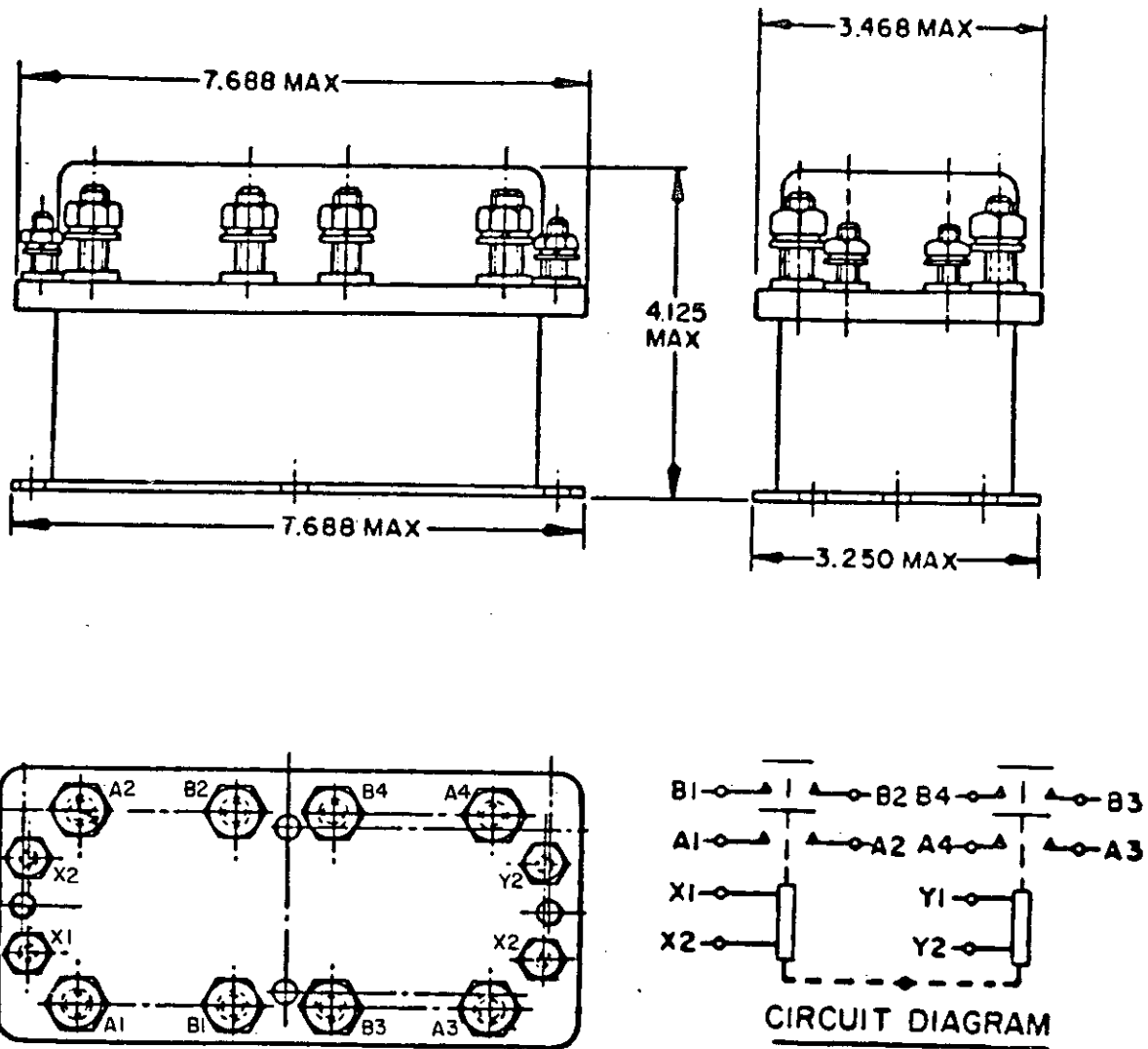
MIL-STD-1346B



INCHES	MM
2.625	66.68
3.000	76.20
5.188	131.78

FIGURE 302-12. Relay, EM, 50 amperes, 2 PDT, N.O. type II, nonhermetically sealed, mechanically interlocked (MS25030-D1B).

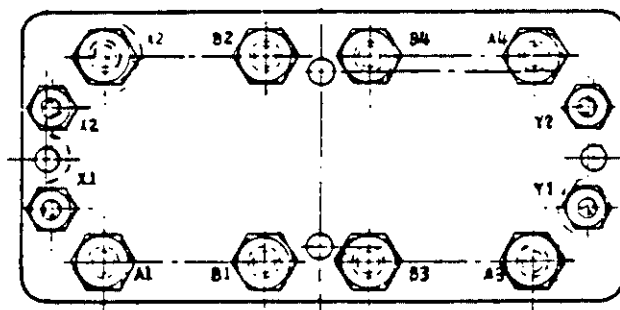
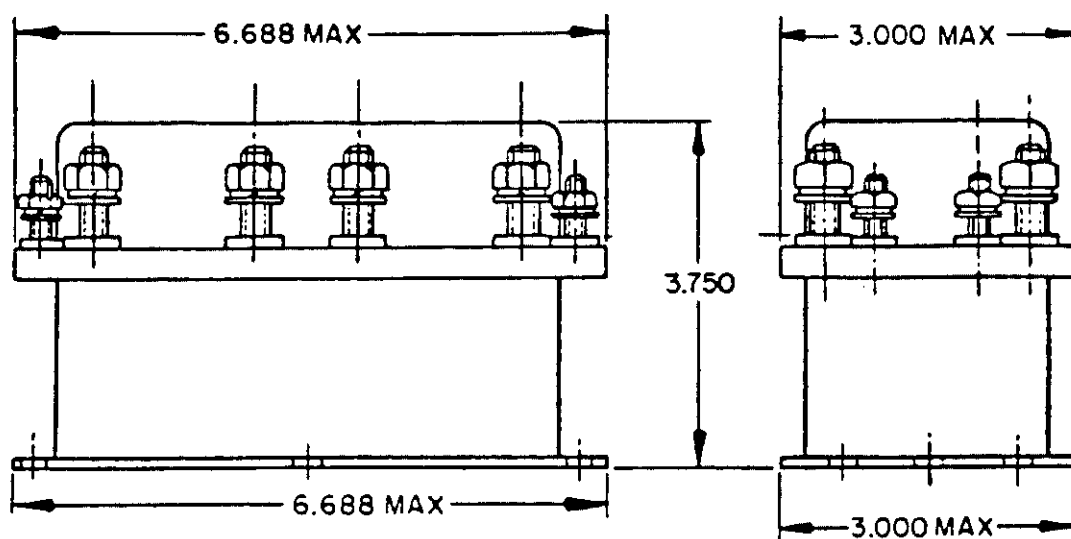
MIL-STD-1346B



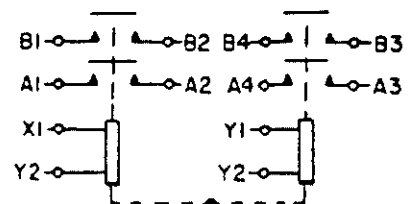
INCHES	MM
3.250	82.55
3.468	88.09
4.125	104.76
7.688	195.28

FIGURE 302-13. Relay, EM, 200 amperes, 2PDT, N.O. type II, nonhermetically sealed, mechanically interlocked (MS25032-D1).

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BOTTOM VIEW

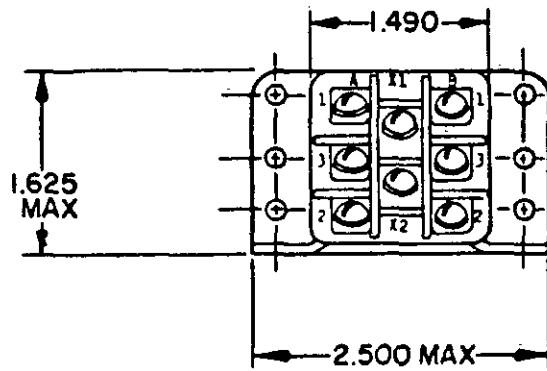
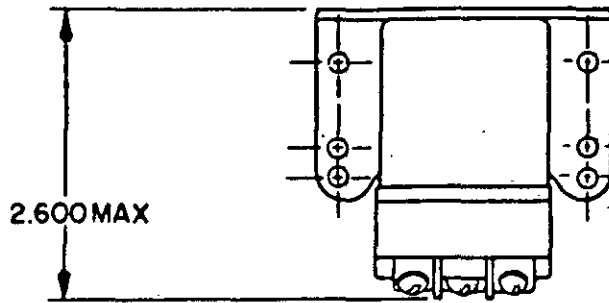


CIRCUIT DIAGRAM

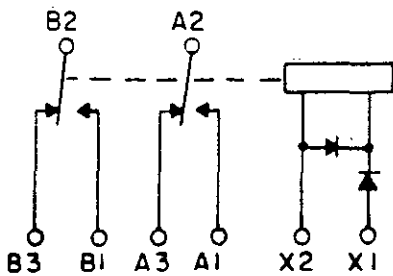
INCHES	MM
.093	2.36
.531	13.49
3.000	76.20
3.750	95.25
6.688	169.88

FIGURE 302-14. Relay, EM, 100 amperes, 2PDT, N.O. type, nonhermetically sealed, mechanically interlocked (MS25031-D1B).

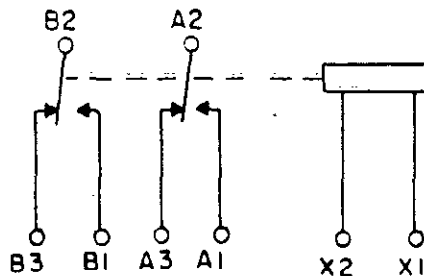
MIL-STD-1346B



INCHES	MM
1.490	37.85
1.625	41.28
2.500	63.50
2.600	66.04



CIRCUIT DIAGRAM A

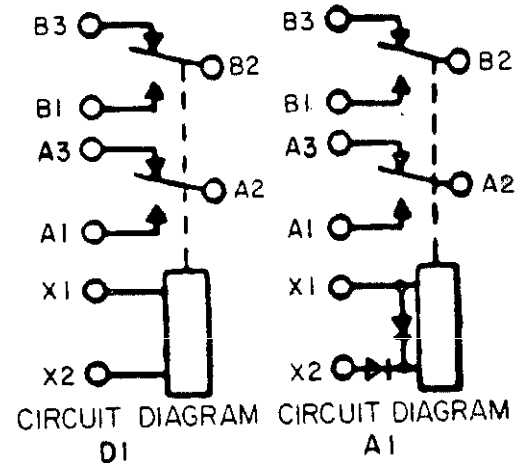
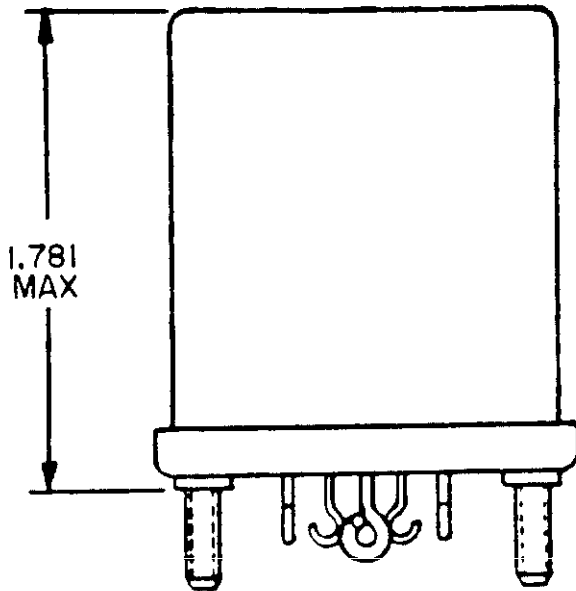


CIRCUIT DIAGRAM D

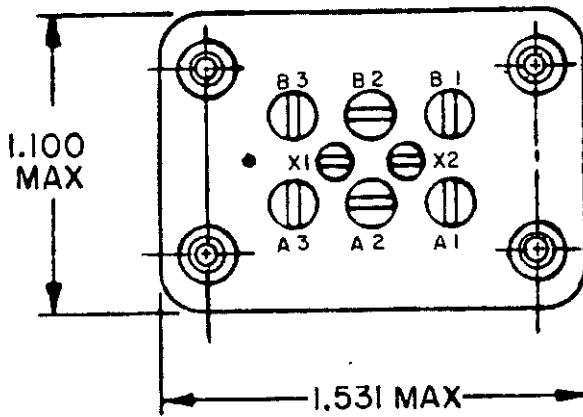
THE USE OF DIODES ON AC RELAYS
IS OPTIONAL

FIGURE 302-15. Relay, EM, DPDT, 10 amperes (MS24149).

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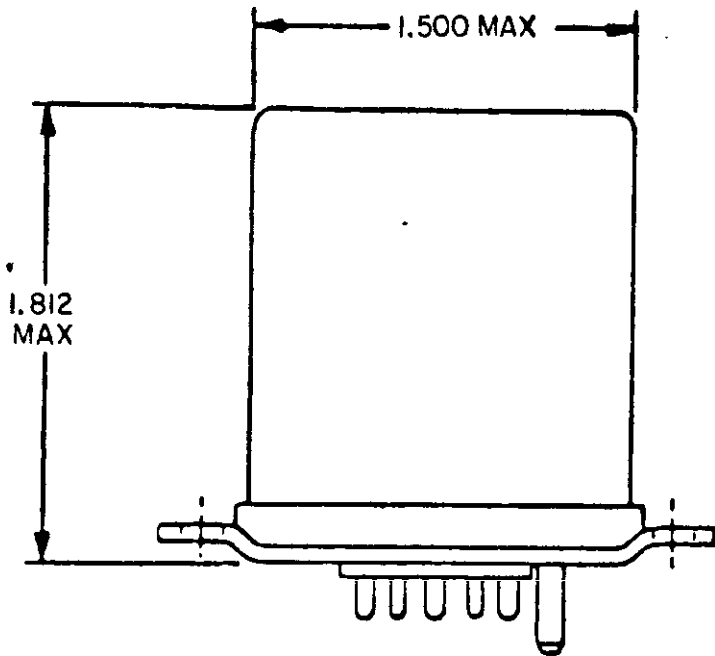
THE USE OF DIODES ON AC RELAYS IS OPTIONAL



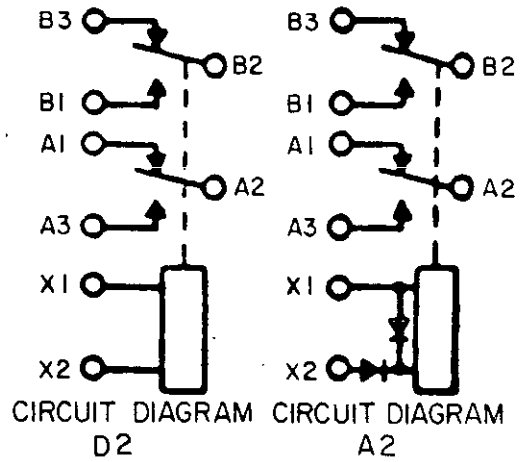
INCHES	MM
1.100	27.94
1.531	38.89
1.781	45.24

FIGURE 302-16. Relay, EM, DPDT, 10 amperes, solder terminals (MS25273).

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INCHES	MM
1.031	26.19
1.500	38.10
1.812	46.02
2.187	55.55



THE USE OF DIODES ON AC RELAYS IS OPTIONAL

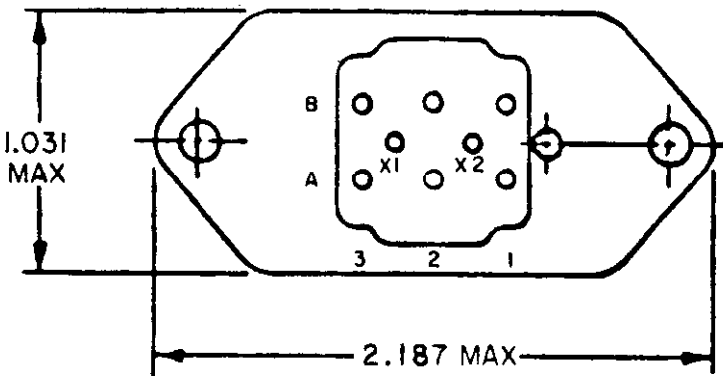


FIGURE 302-17. Relay, EM, DPDT, 10 amperes, socket mounted (MS25323).

MIL-STD-1346B

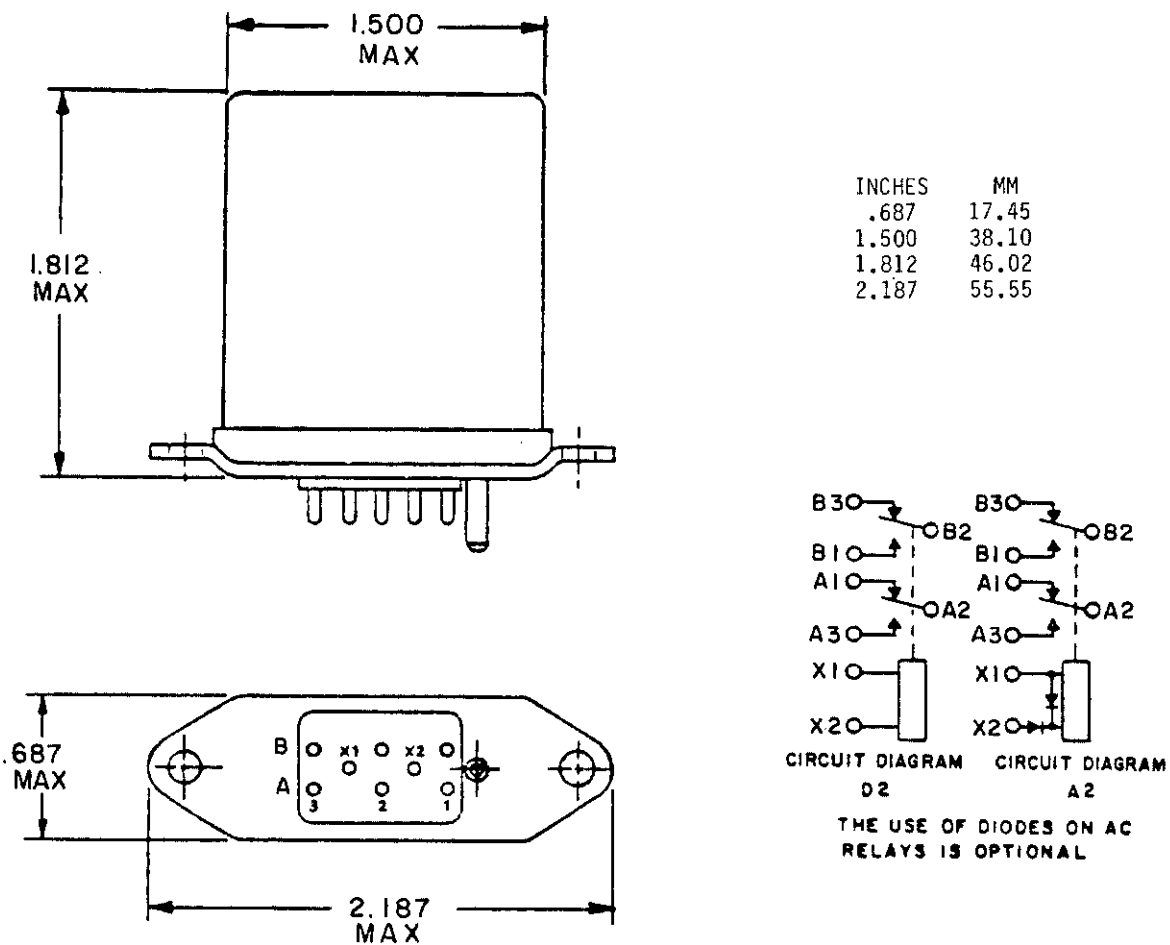


FIGURE 302-18. Relay, EM, DPDT, 5 amperes, socket mounted (MS25321).

MIL-STD-1346B

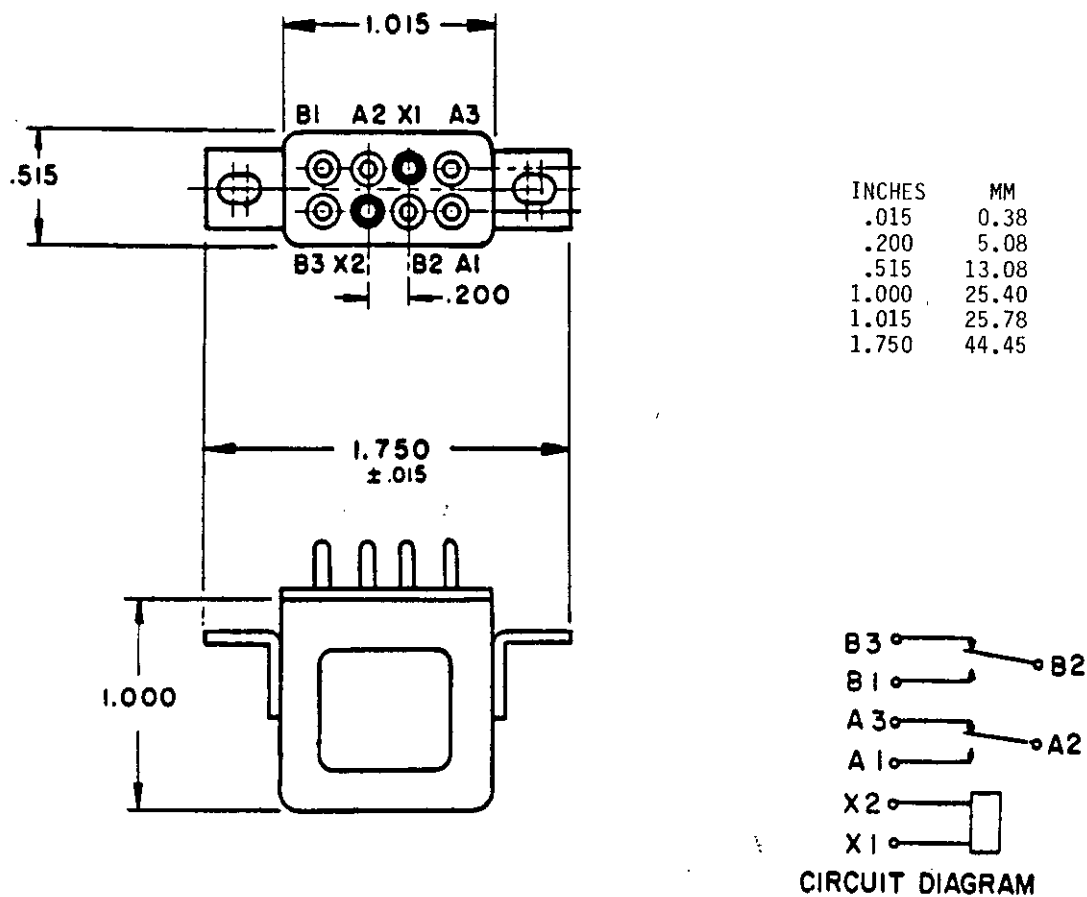
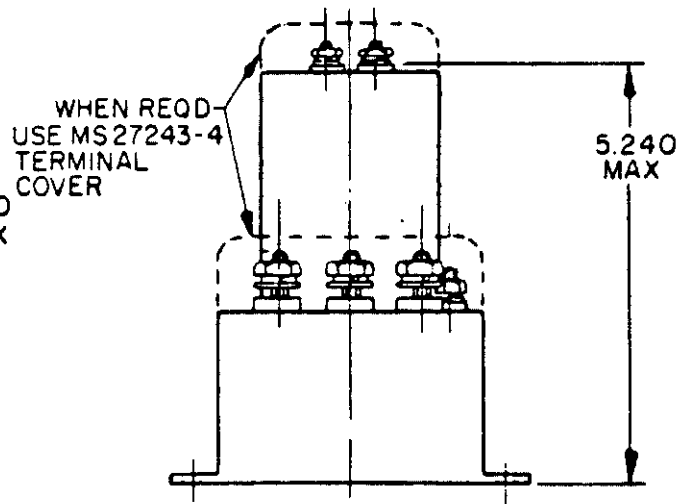
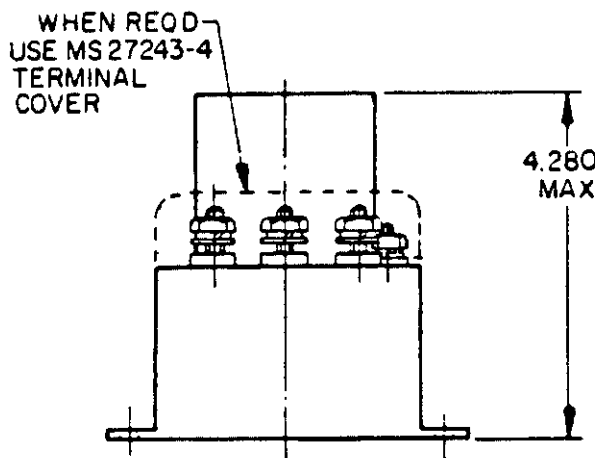
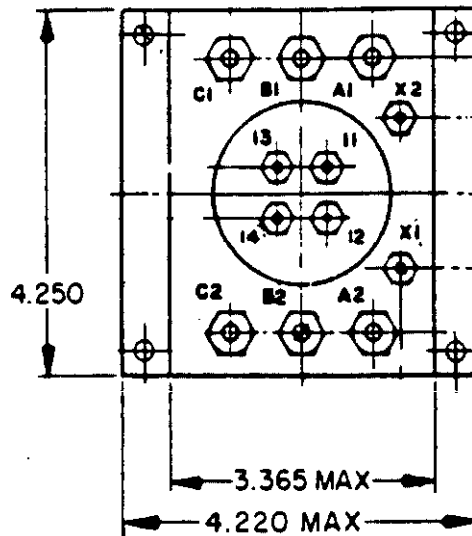
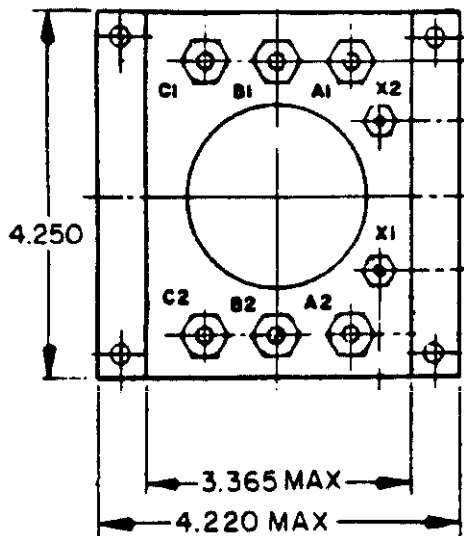


FIGURE 302-19. Relay, EM, DPDT, 10 amperes (MS27247).



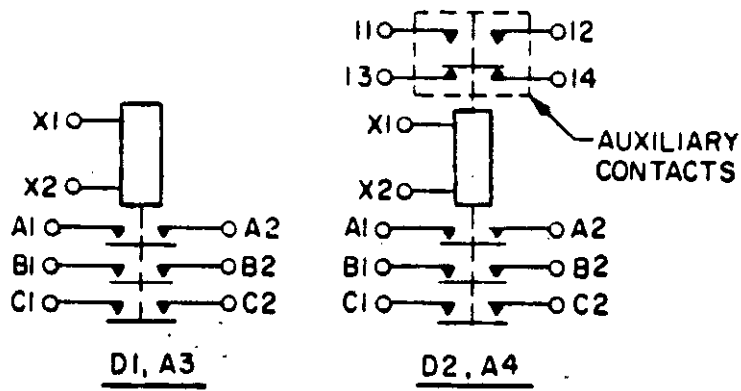
D1, A3

D2, A4

INCHES	MM
3.365	85.47
4.220	107.19
4.250	107.95
4.280	108.71
5.240	133.10

FIGURE 302-20. Relay, EM, 3PST, normally open, 100 amperes (MS24168).

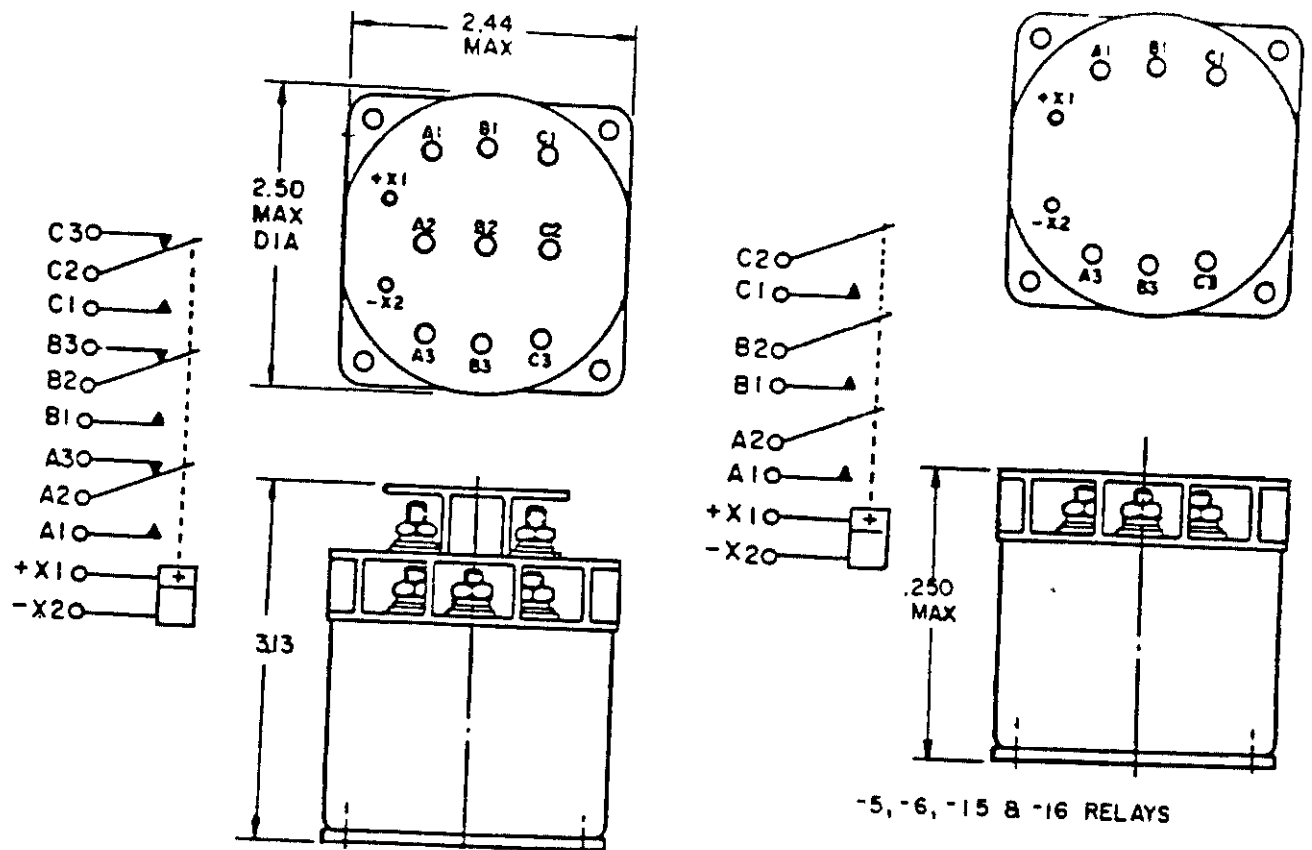
MIL-STD-1346B



CIRCUIT DIAGRAM

FIGURE 302-20. Relay, EM, 3PST, normally open, 100 amperes (MS24168) - Continued.

MIL-STD-1346B



-5, -6, -15 & -16 RELAYS

INCHES	MM
2.44	61.98
2.50	63.50
3.13	79.50

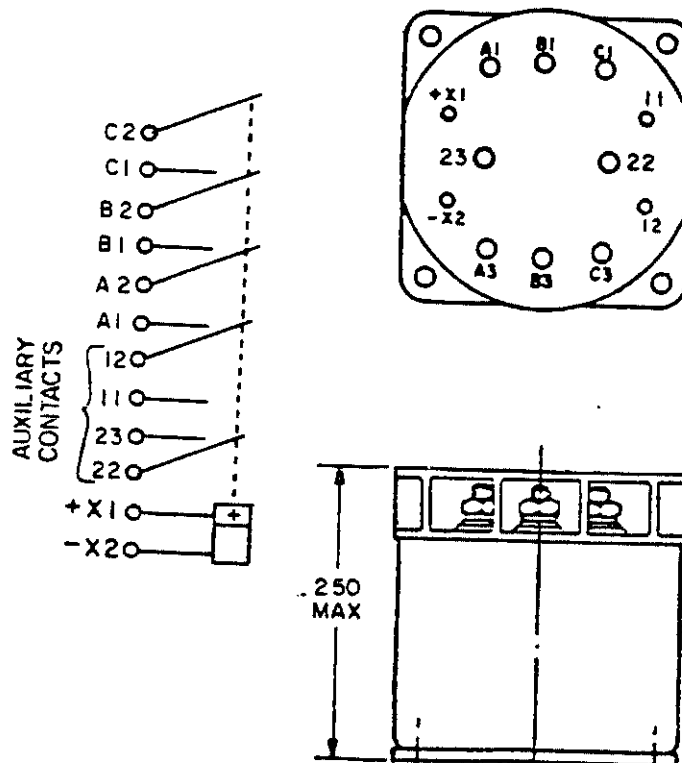
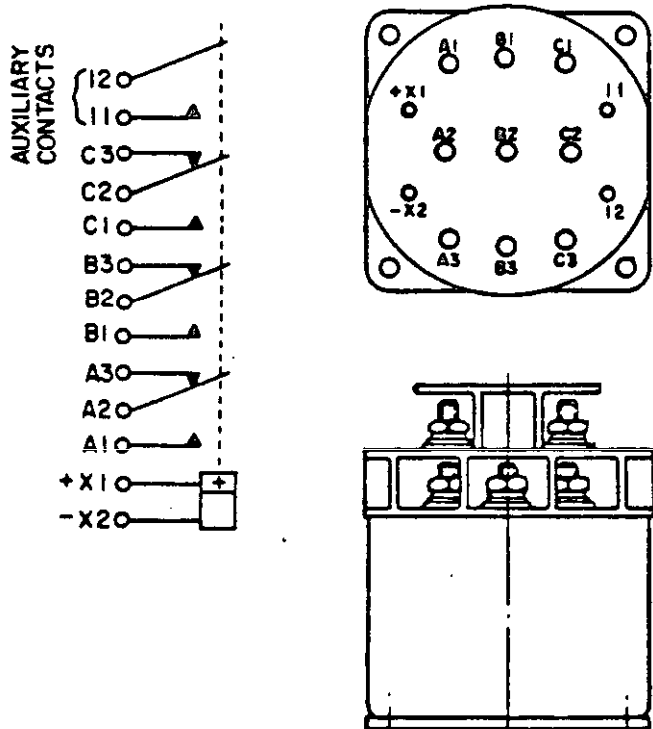


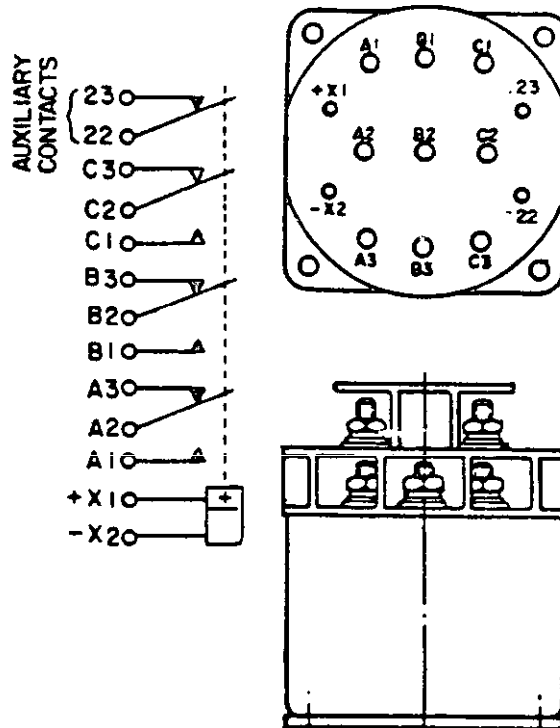
FIGURE 302-21. Relay, EM, 3PDT or 3PST contacts, 50 amperes, permanent magnet drive (MS27751).

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-7, -8, -17 & -18 RELAYS



-9, -10, -19 & -20 RELAYS



-21 RELAYS

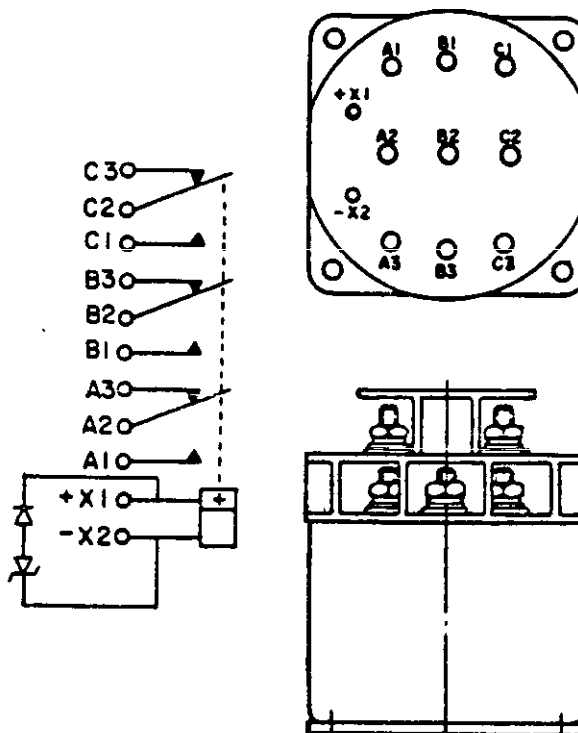


FIGURE 302-21. Relay, EM, 3PDT or 3PST contacts, 50 amperes, permanent magnet drive (MS27751) - Continued.

MIL-STD-1346B

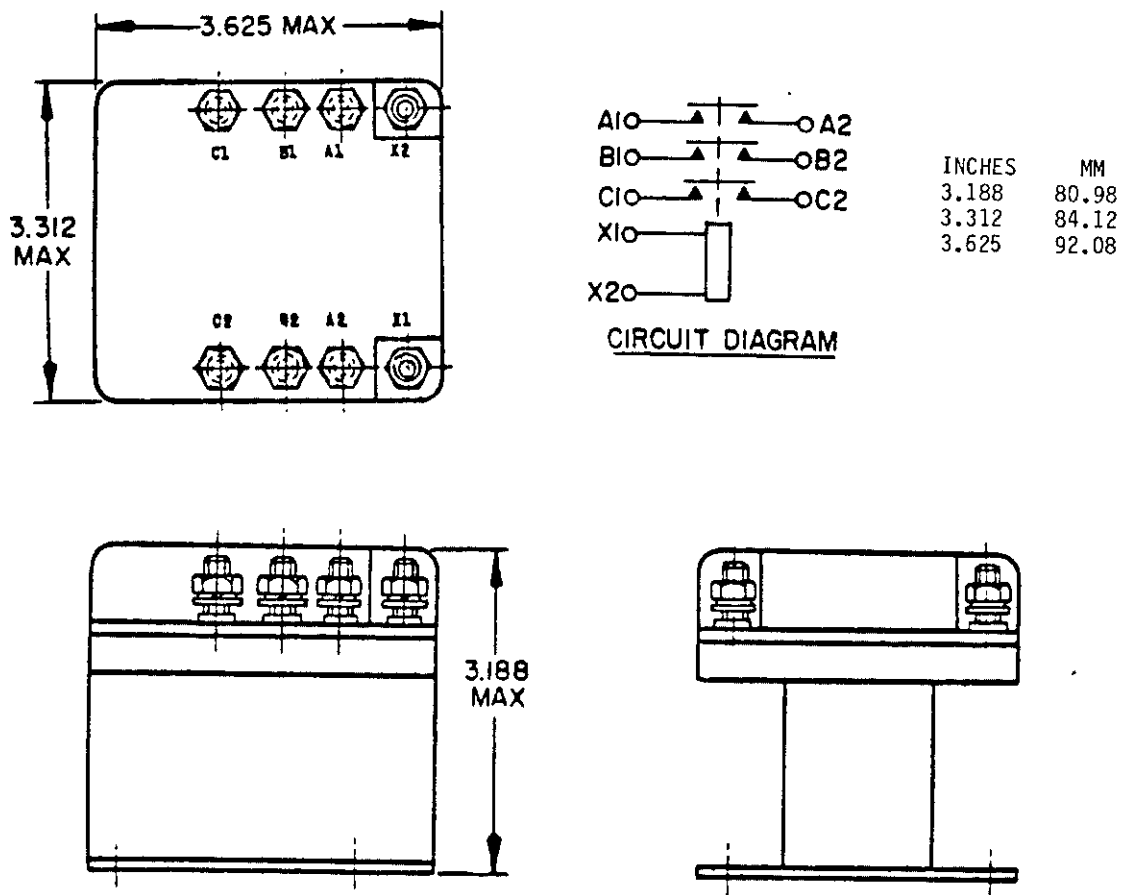


FIGURE 302-22. Relay, EM, unsealed, 3PST, normally open, 50 amperes (MS24193).

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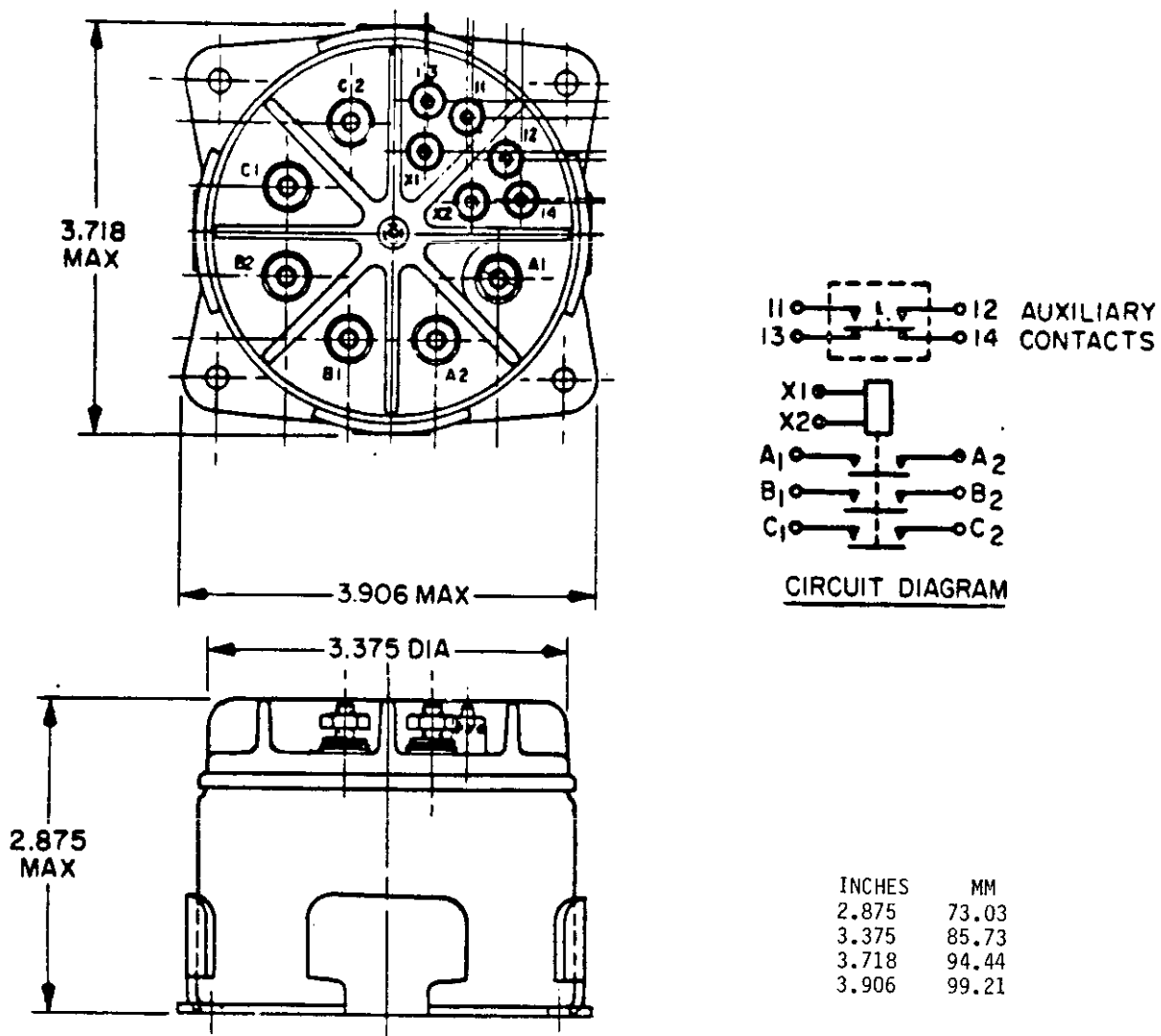
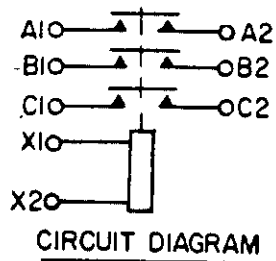
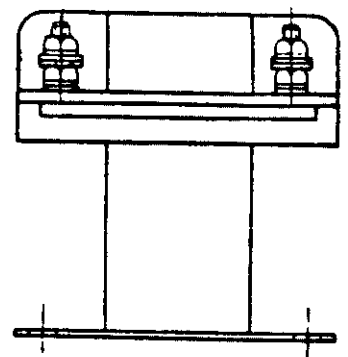
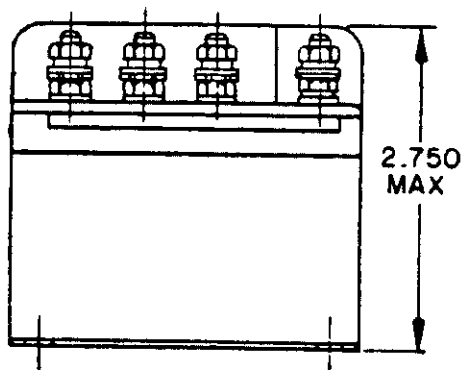
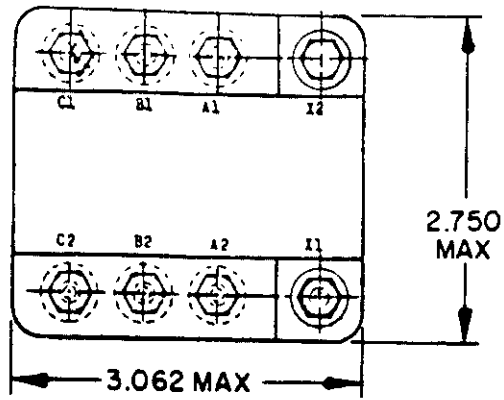


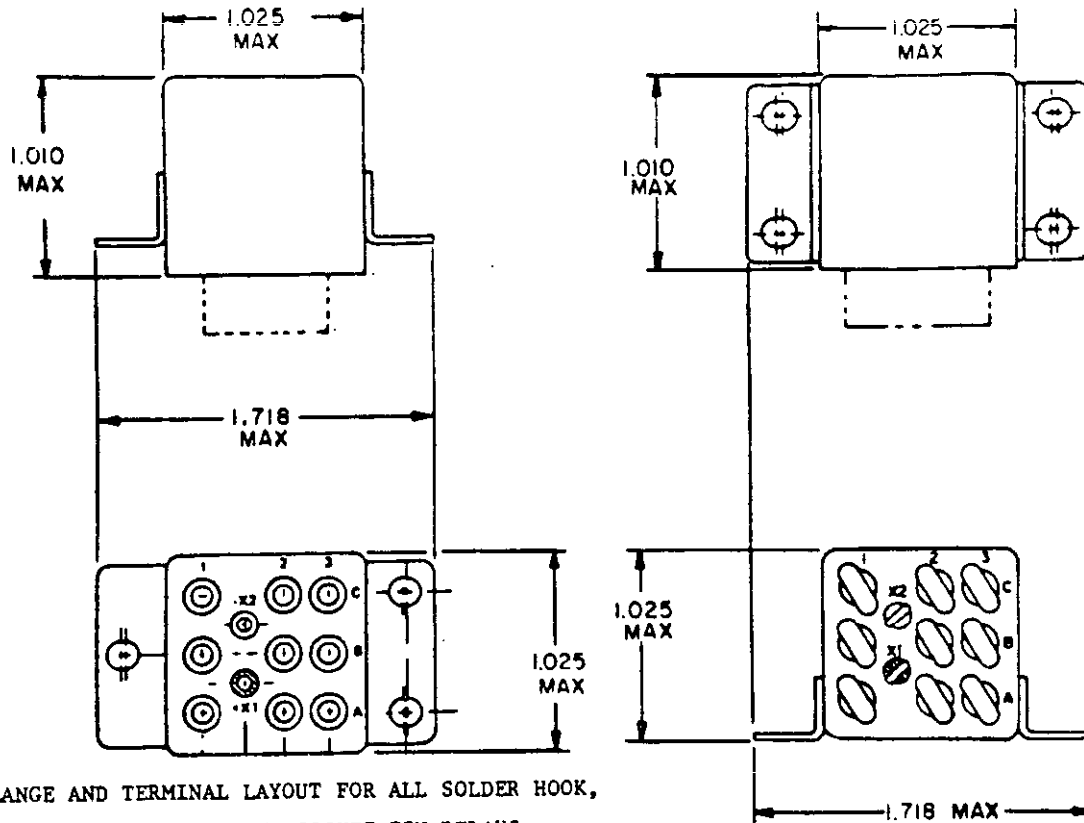
FIGURE 302-23. Relay, EM, coil and contacts individually sealed, 3PST contacts, normally open, 75 amperes (MS27714).



INCHES	MM
2.750	69.85
3.062	77.77

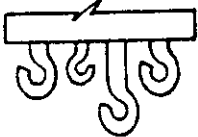
FIGURE 302-24. Relay, EM, unsealed, 3PST, normally open, 25 amperes (MS24192).

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FLANGE AND TERMINAL LAYOUT FOR ALL SOLDER HOOK,
DC SOLDER PIN AND SOCKET PIN RELAYS

SOLDER HOOK TERMINALS



PLUG-IN TERMINALS



SOLDER PINS



INCHES	MM
1.010	25.65
1.025	26.04
1.718	43.64

TYPE A

TYPE B

CIRCUIT DIAGRAM

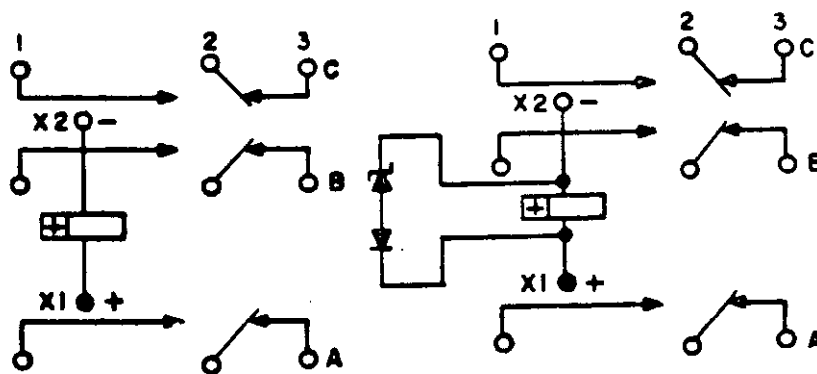
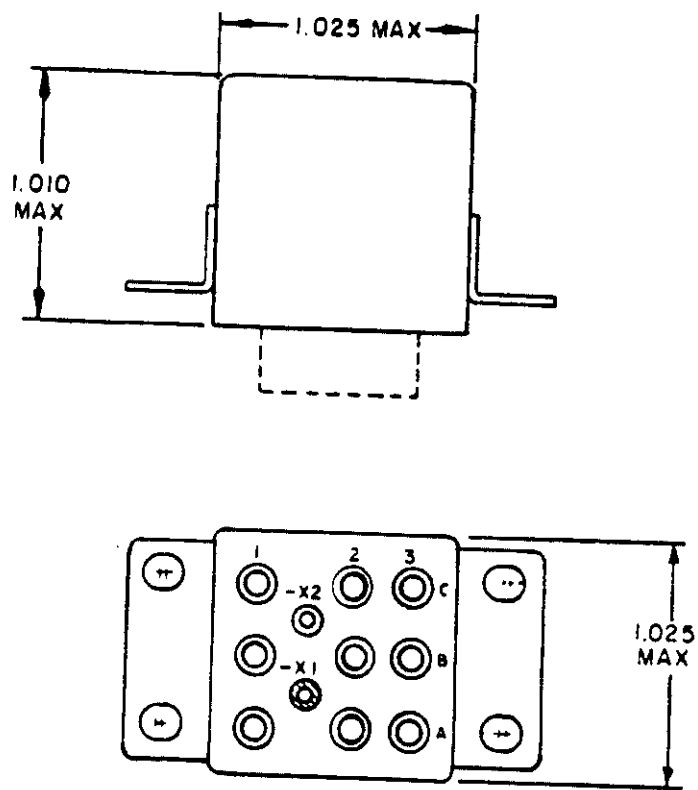


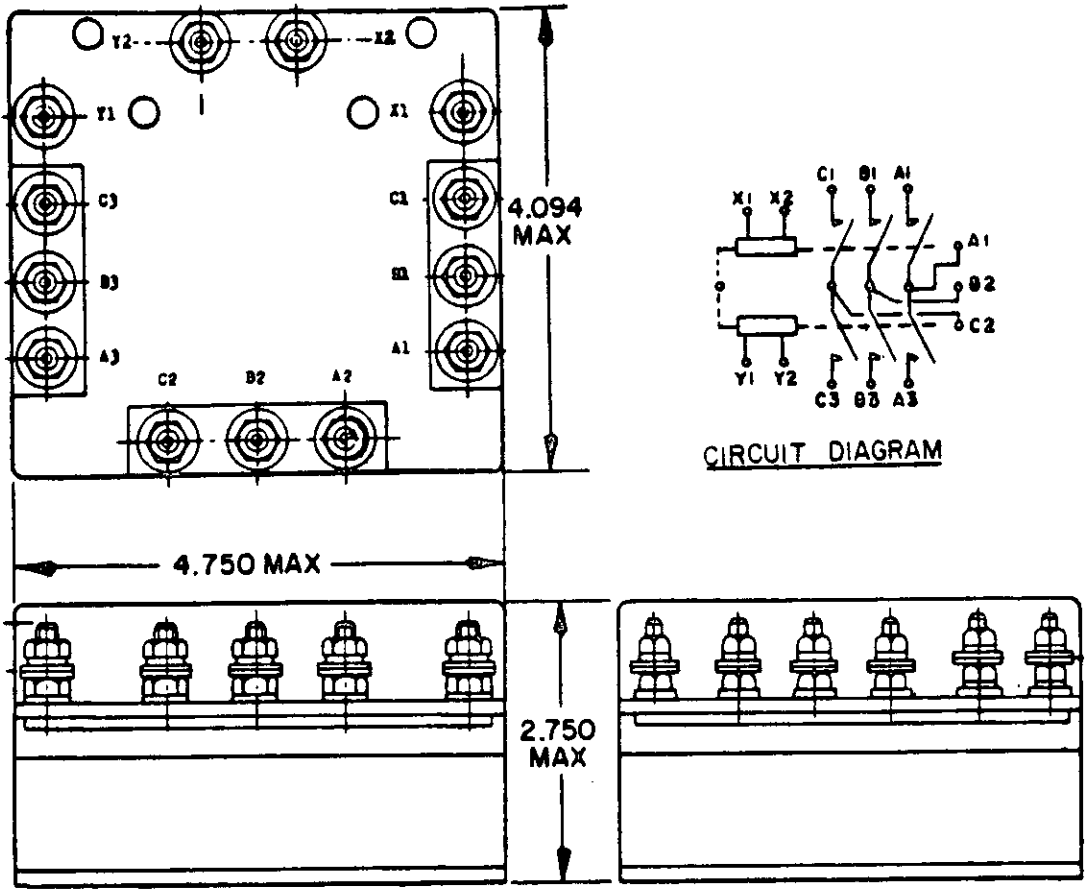
FIGURE 302-25. Relay, EM, 3PDT, 25 amperes, permanent magnet drive (MS27743).



FLANGE AND TERMINAL LAYOUT FOR ALL AC SOCKET PINS (GOLD-PLATED)

FIGURE 302-25. Relay, EM, 3PDT, 25 amperes, permanent magnet drive (MS27743) - Continued.

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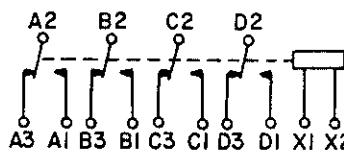
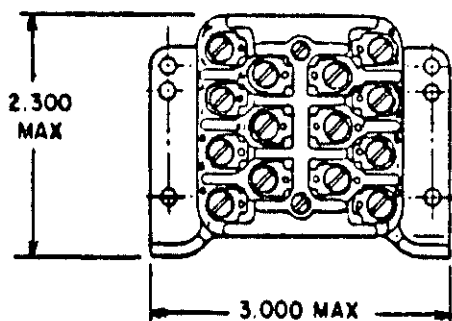
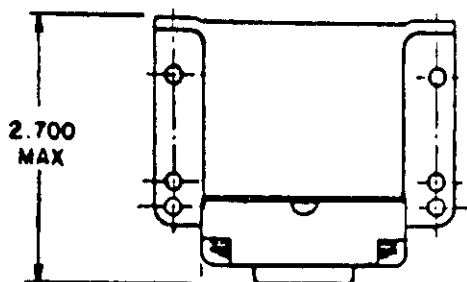


CIRCUIT DIAGRAM

INCHES	MM
2.750	69.85
4.094	103.99
4.750	120.65

FIGURE 302-26. Relay, EM, 3PDT, N.O., non-hermetically sealed, mechanically interlocked (MS24152).

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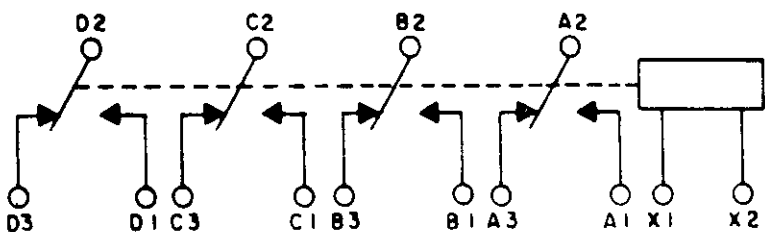
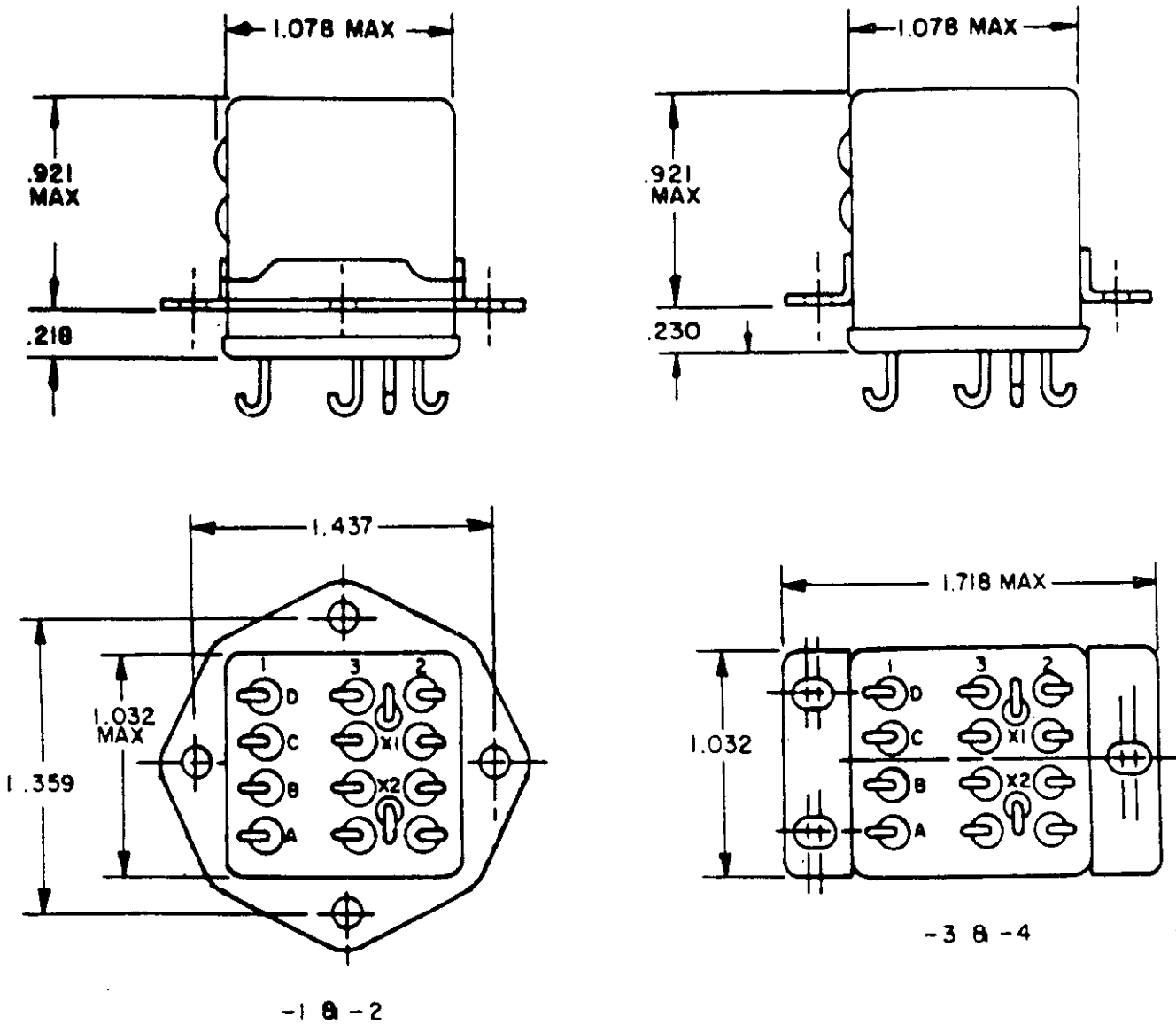
CIRCUIT DIAGRAM

THE USE OF DIODES ON AC RELAYS IS OPTIONAL

INCHES	MM
2.300	58.42
2.700	68.58
3.000	76.2

FIGURE 302-27. Relay, EM, 4PDT, 10 amperes (MS24568).

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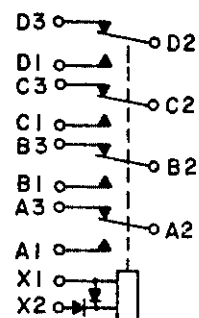
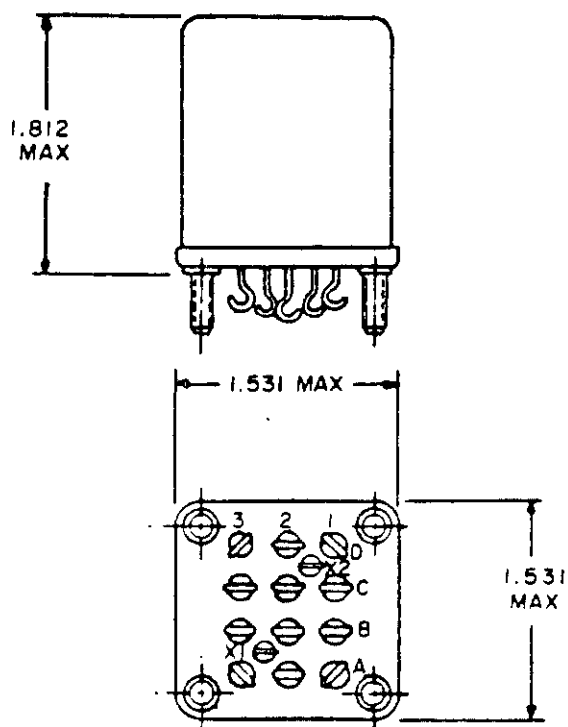


INCHES	MM
.218	5.54
.230	5.84
.921	23.39
1.032	26.21
1.078	27.38
1.359	34.52
1.437	36.50
1.718	43.64

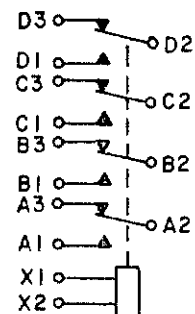
CIRCUIT DIAGRAM

FIGURE 302-28. Relay, EM, 4PDT, 10 amperes, solder hooks (MS27255).

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CIRCUIT DIAGRAM-AI
THE USE OF DIODES IS OPTIONAL

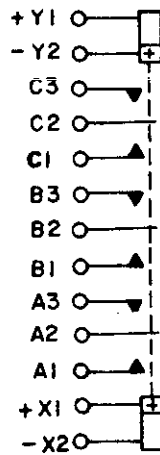
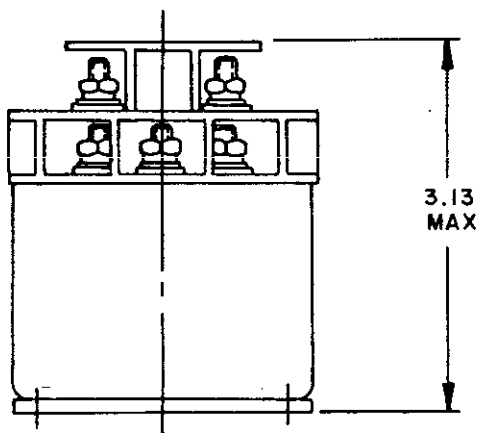
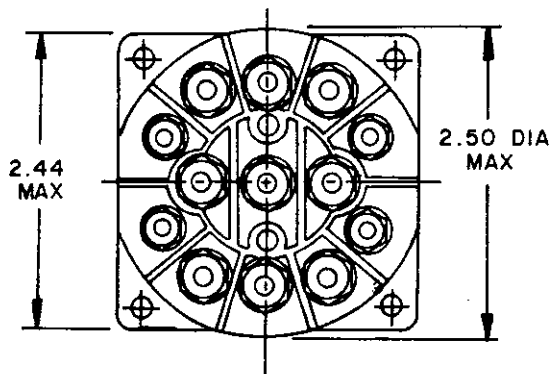


CIRCUIT DIAGRAM-DI

INCHES	MM
1.531	38.89
1.812	46.02

FIGURE 302-29. Relay, EM, 4PDT, 10 amperes (MS25271).

MIL-STD-1346B

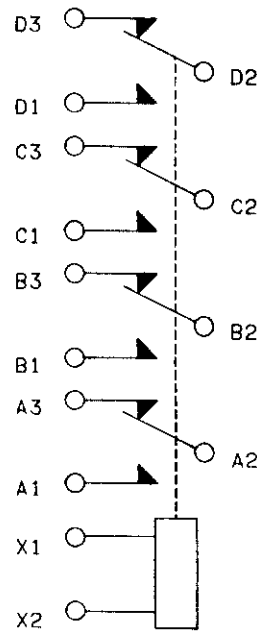
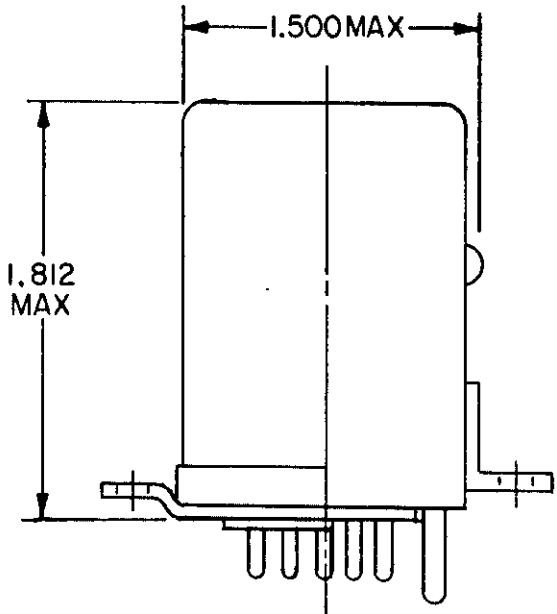


CIRCUIT DIAGRAM

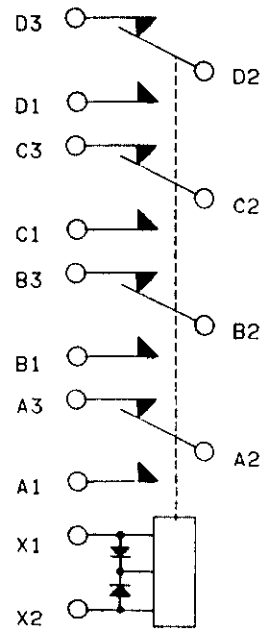
INCHES	MM
2.44	61.98
2.50	63.50
3.13	79.50

FIGURE 302-30. Relay, EM, 3PDT-NO, 50 amperes (MS27750).

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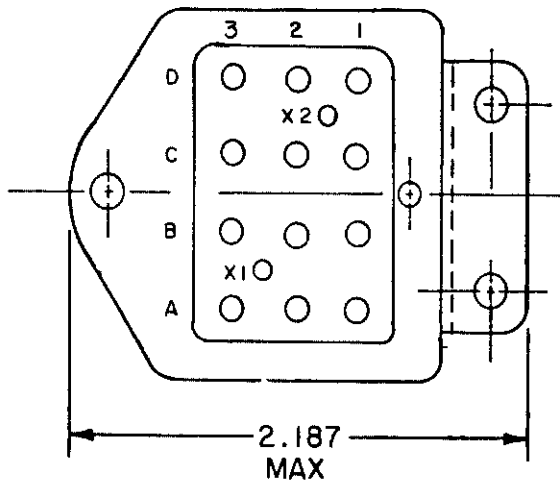


CIRCUIT DIAGRAM D-1



CIRCUIT DIAGRAM A-1

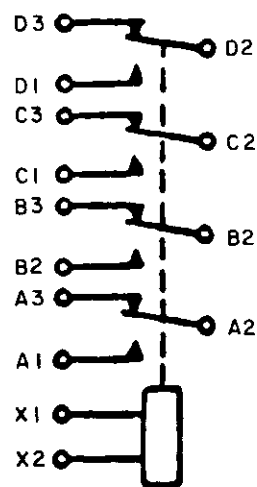
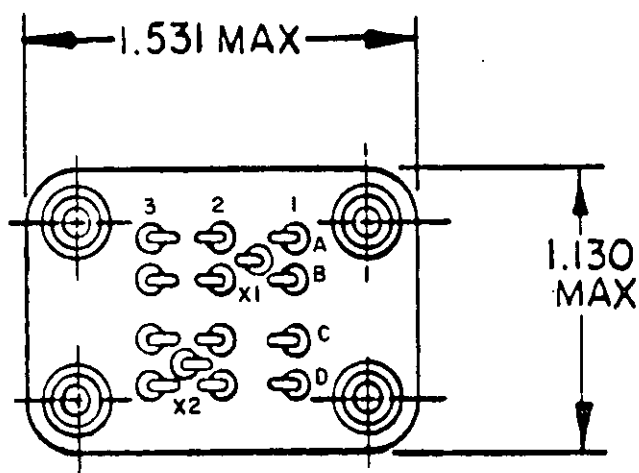
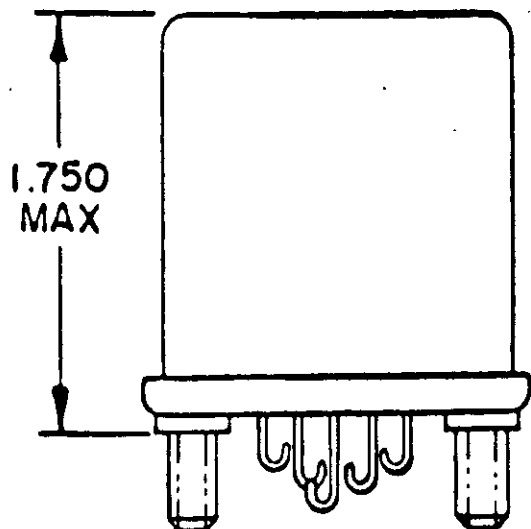
THE USE OF DIODES ON AC RELAYS IS OPTIONAL



INCHES	MM
1.500	38.10
1.812	46.02
2.187	55.55

FIGURE 302-31. Relay, EM, 4PDT, 10 amperes (MS25327).

MIL-STD-1346B



CIRCUIT DIAGRAM

INCHES	MM
1.130	28.70
1.531	38.89
1.750	44.45

FIGURE 302-32. Relay, EM, 4PDT, 5 amperes (MS25267).

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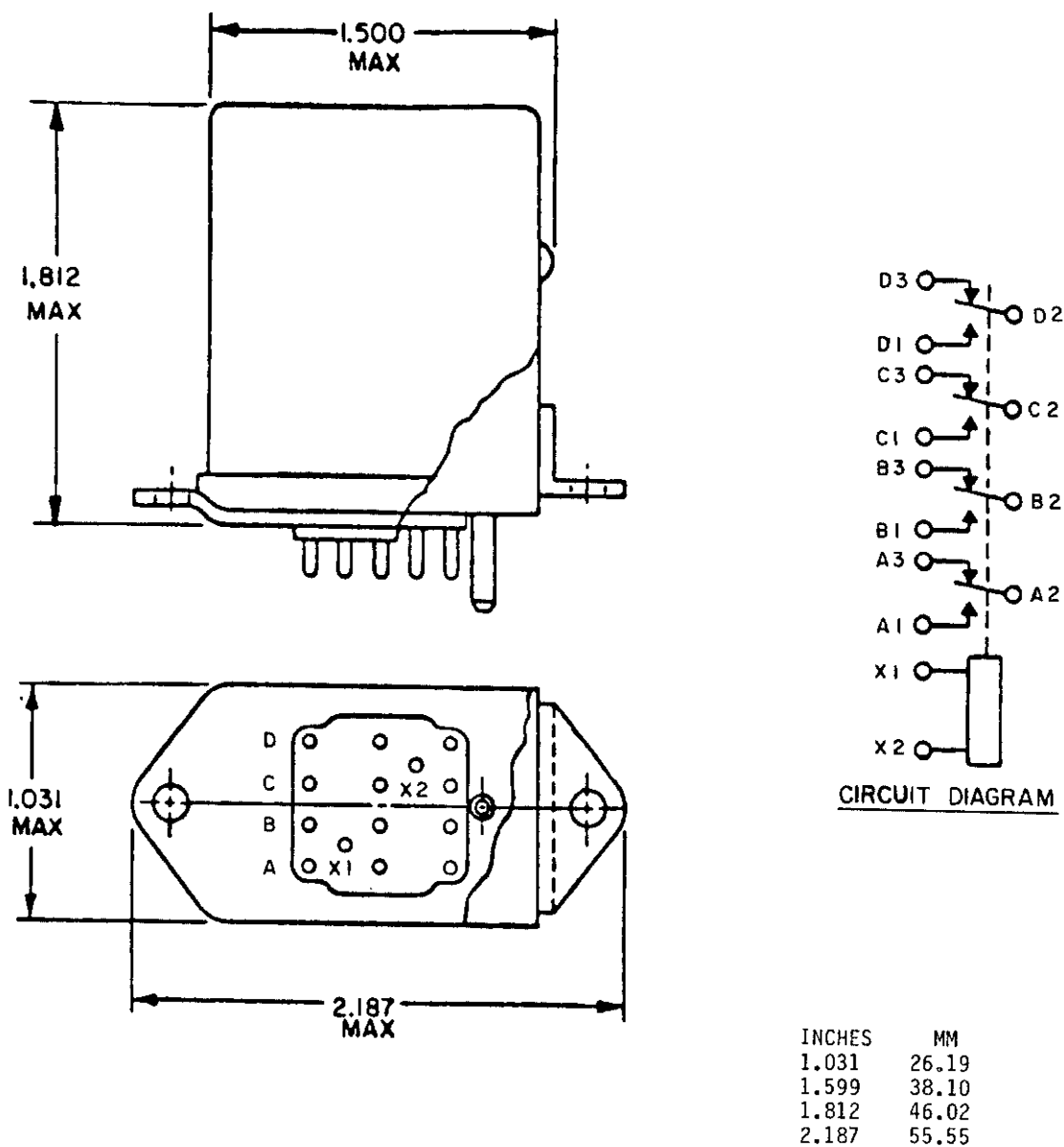


FIGURE 302-33. Relay, EM, 4PDT, 5 amperes (MS25325).

MIL-STD-1346B

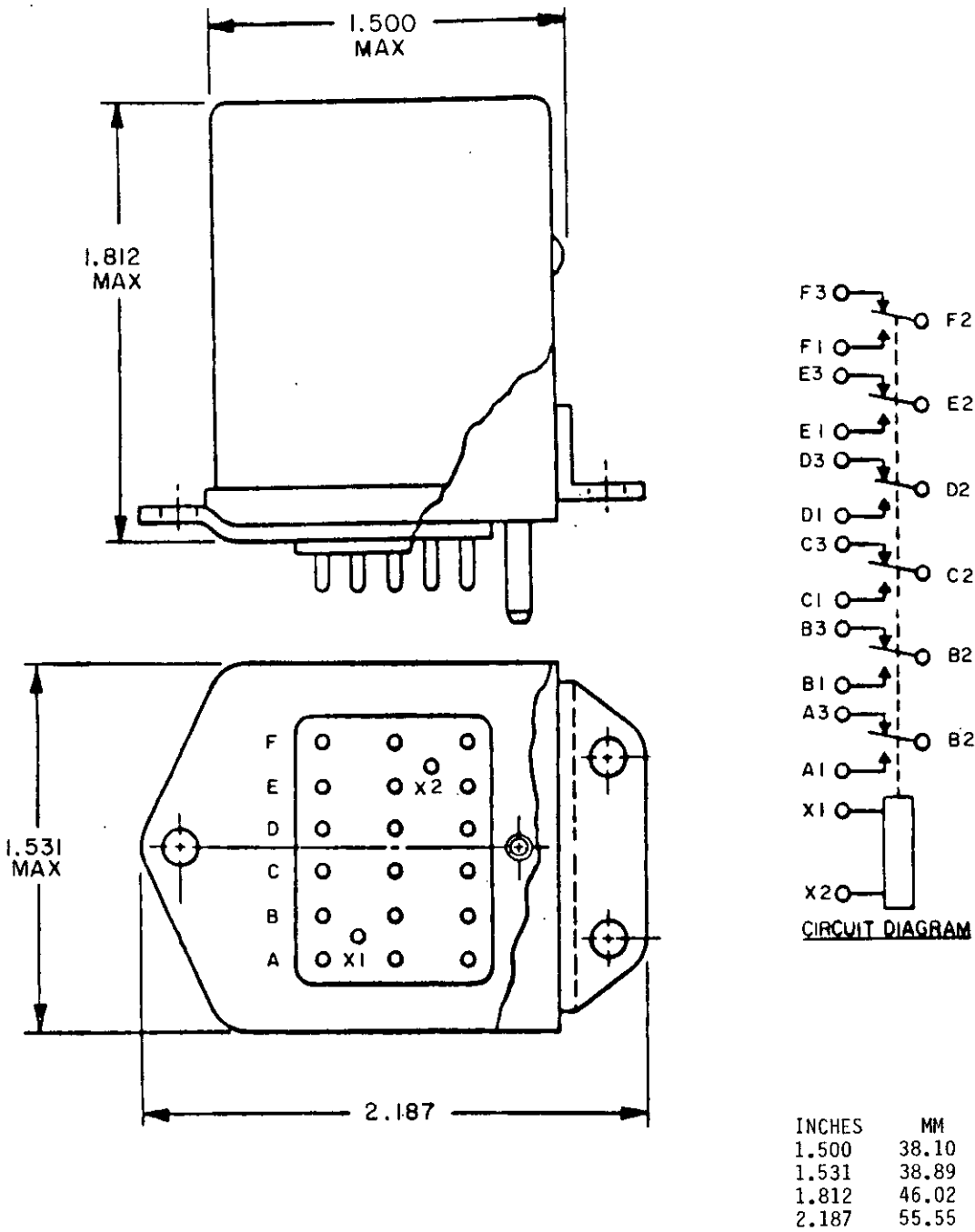
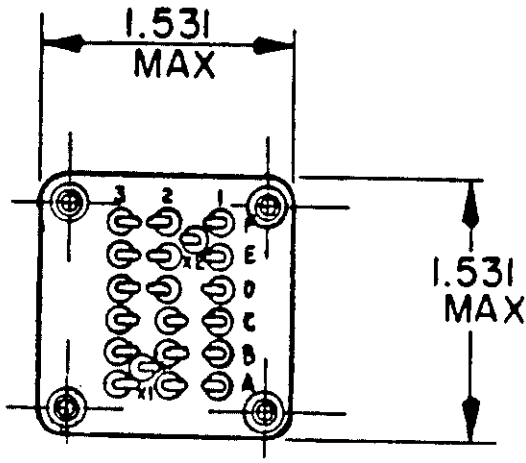
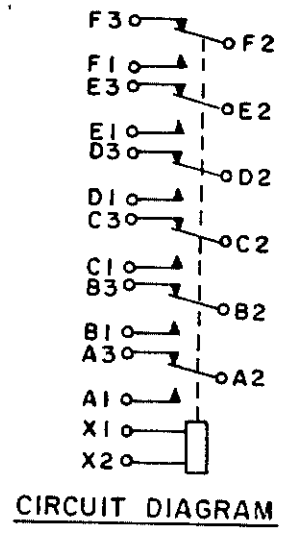
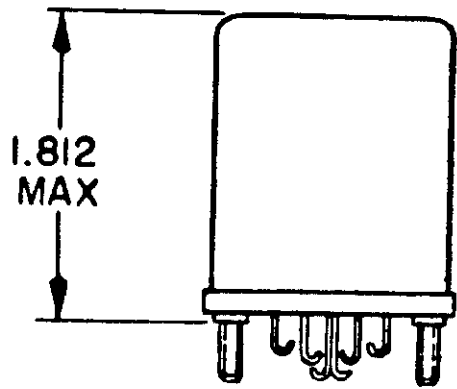


FIGURE 302-34. Relay, EM, 6PDT, 5 amperes (MS25329).

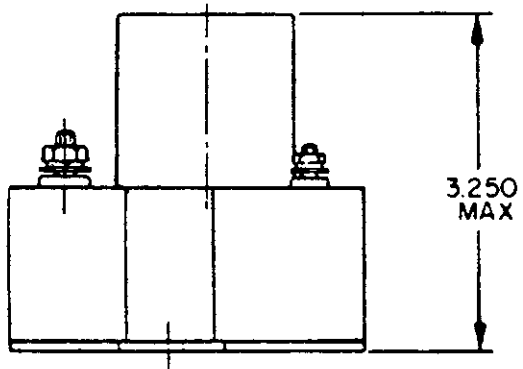
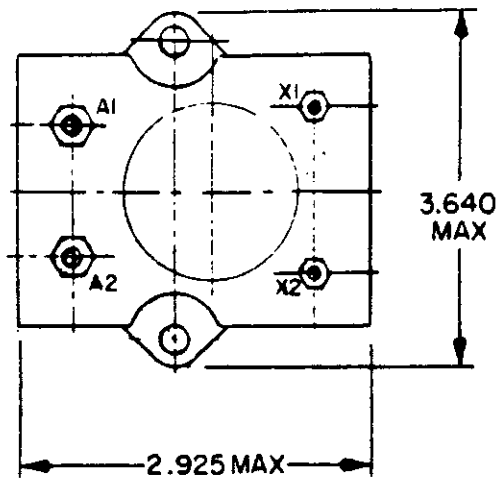
MIL-STD-1346B



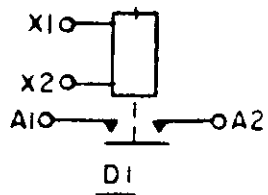
INCHES	MM
1.531	38.89
1.812	46.02

FIGURE 302-35. Relay, EM, 6PDT, 5 amperes (MS25269).

MIL-STD-1346B



D1



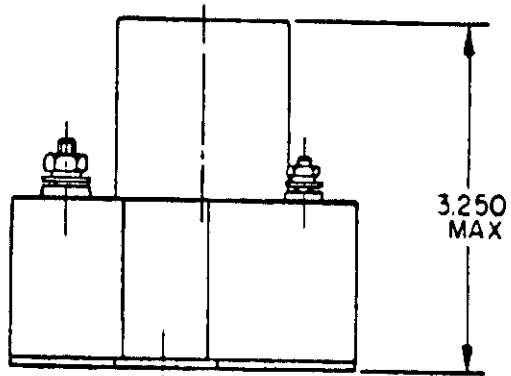
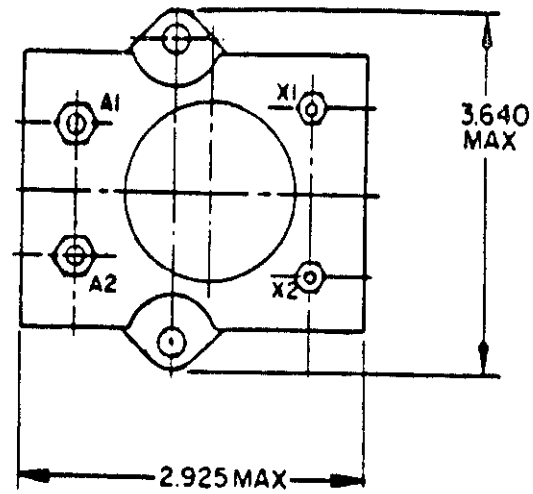
D1

INCHES	MM
2.925	74.30
3.250	82.55
3.640	92.46

CIRCUIT DIAGRAM

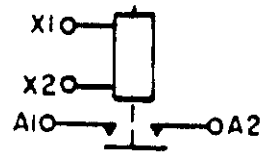
FIGURE 302-36. Relay, EM, SPST, N.O., 200 amperes (MS24183).

MIL-STD-1346B



DI

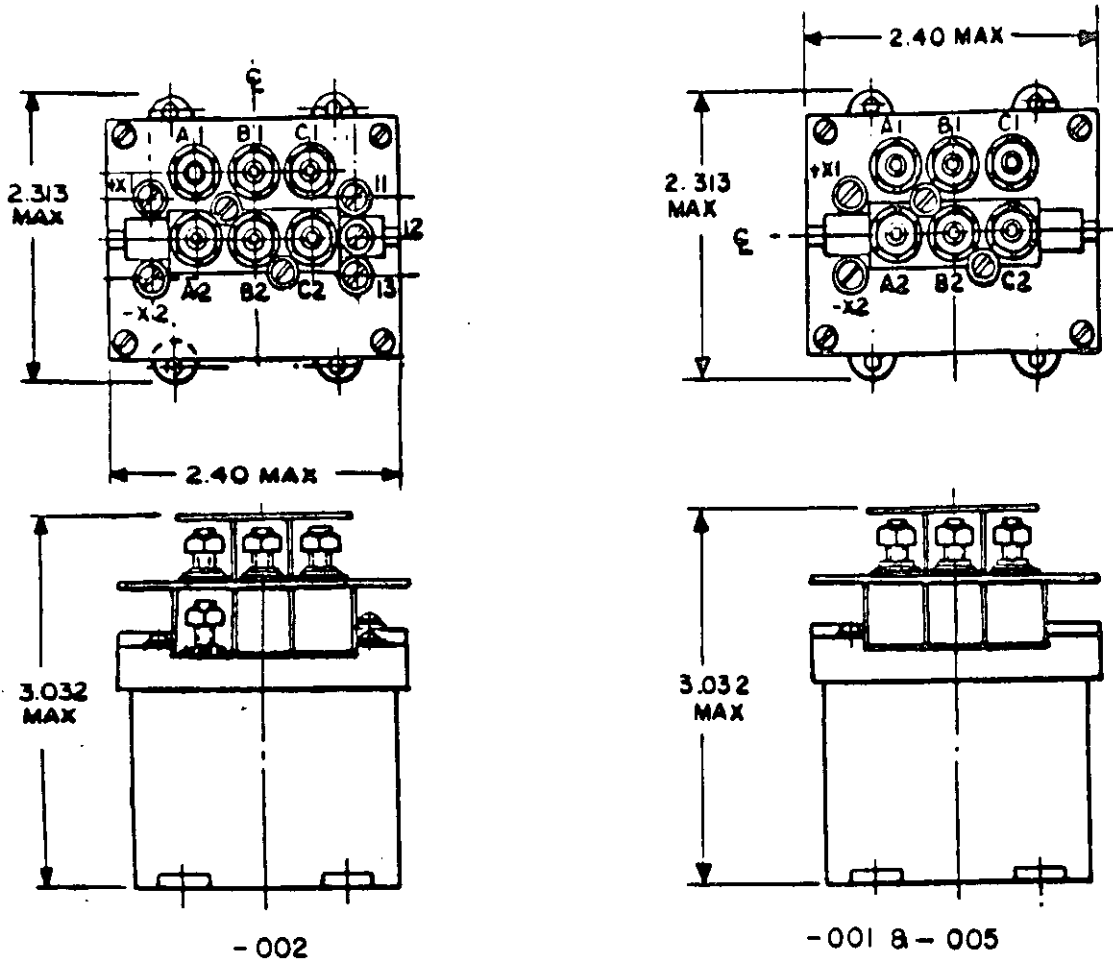
INCHES	MM
2.925	74.30
3.250	82.55
3.640	92.46



DI

FIGURE 302-37. Relay, EM, SPST, N.O., 100 amperes (MS24182).

MIL-STD-1346B



-002

-001 8-005

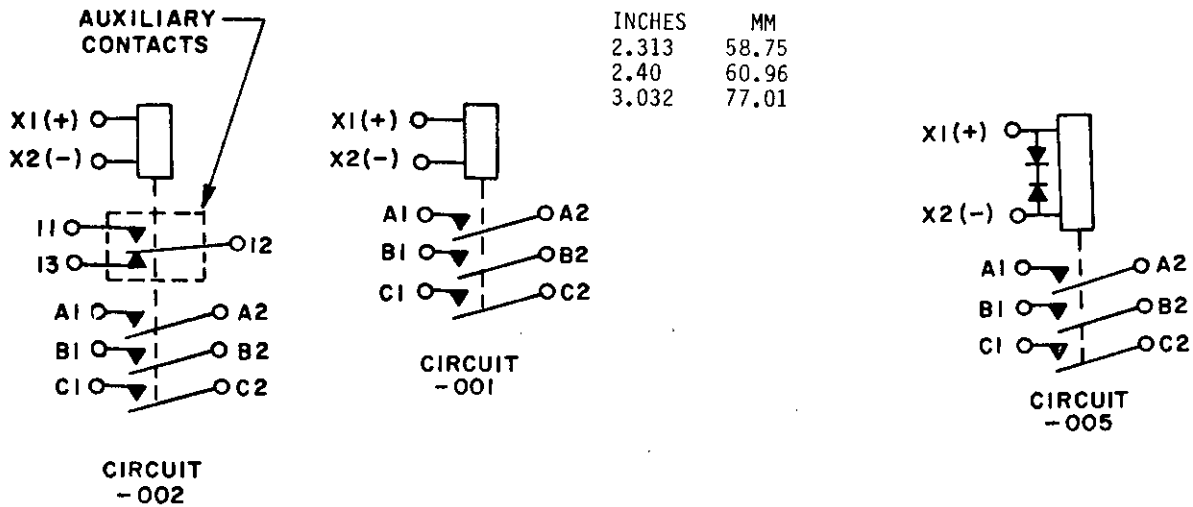
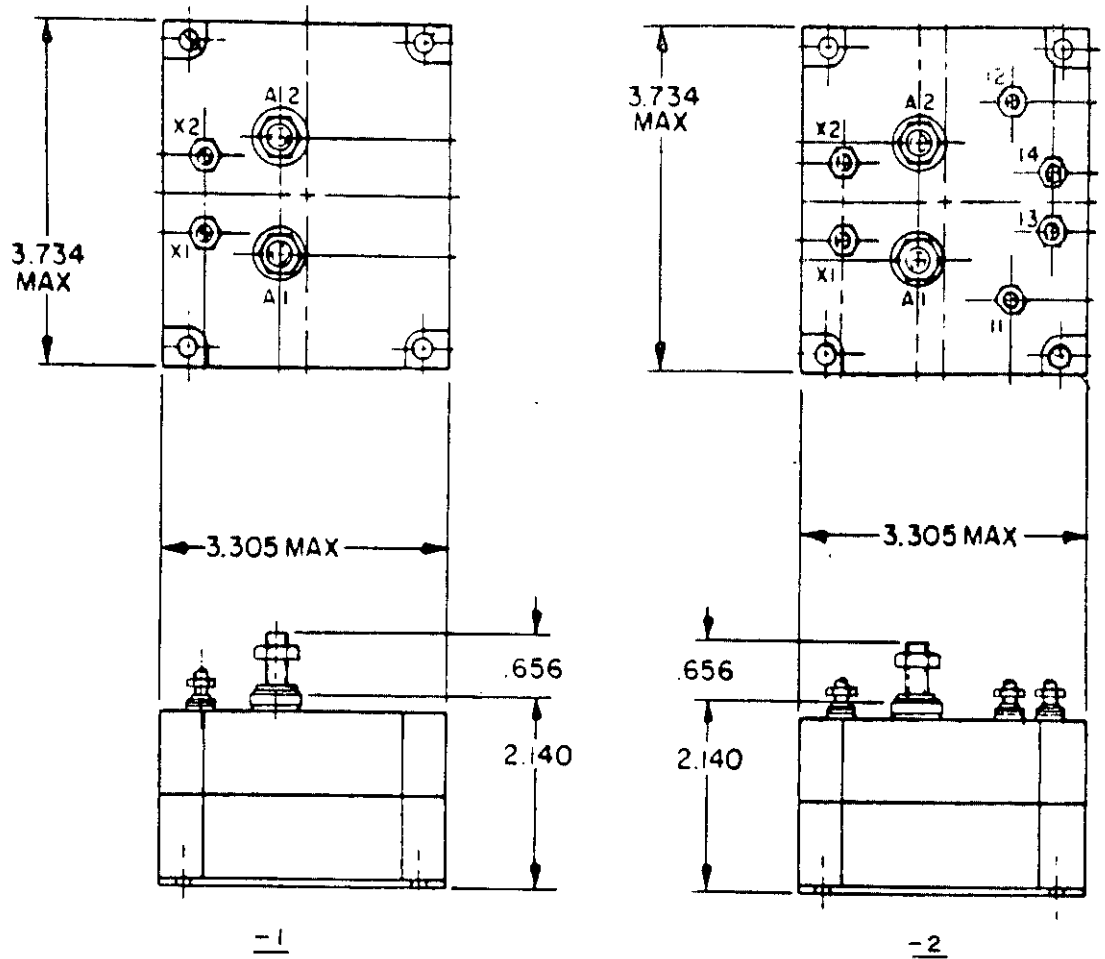
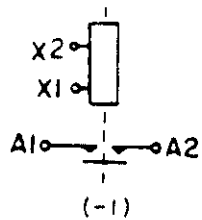


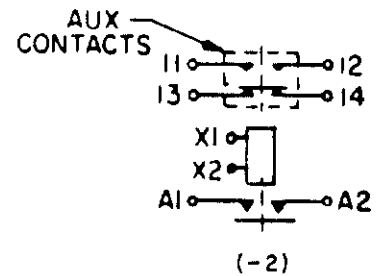
FIGURE 302-38. Relay, EM, 3PST, N.O., 60 amperes, environmentally sealed (MIL-R-6106/10).



INCHES	MM
.656	16.66
2.140	54.36
3.305	83.95
3.734	94.84



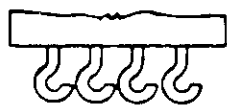
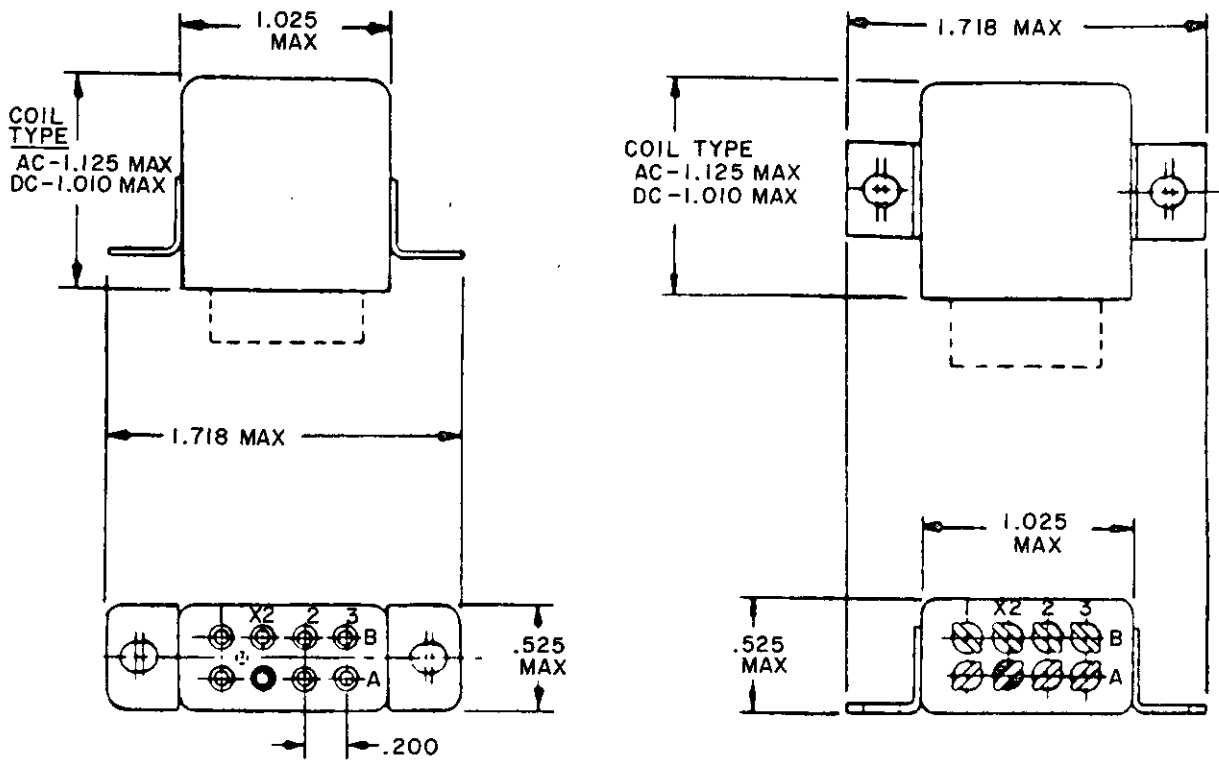
CIRCUIT DIAGRAM



CIRCUIT DIAGRAM

FIGURE 302-39. Relay, EM, SPST, N.O., 100 amperes (MS27242).

MIL-STD-1346B



SOLDER HOOK TERMINAL



PLUG-IN TERMINAL



SOLDER PIN TERMINAL

INCHES	MM
.200	5.08
.525	13.34
1.010	25.65
1.025	26.04
1.125	28.58
1.718	43.64

FIGURE 302-40. Relay, EM, DPDT, 10 amperes, permanent magnet drive (MS27401).

MIL-STD-1346B

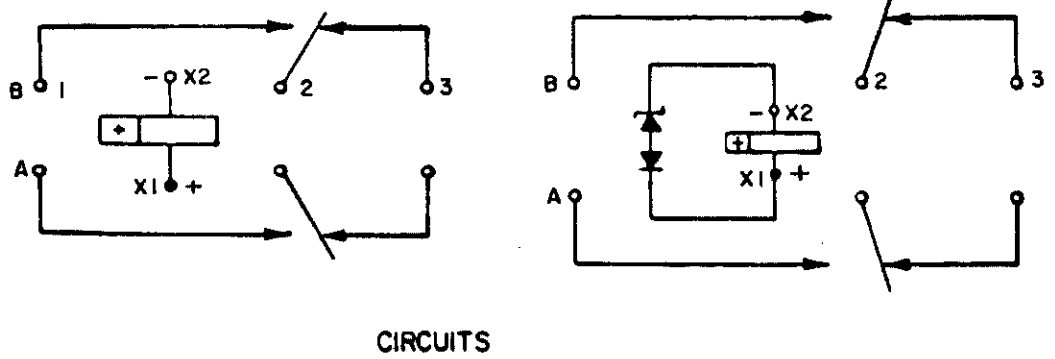
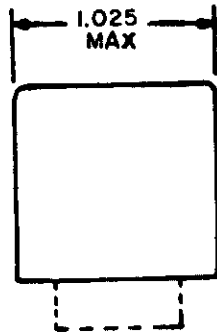
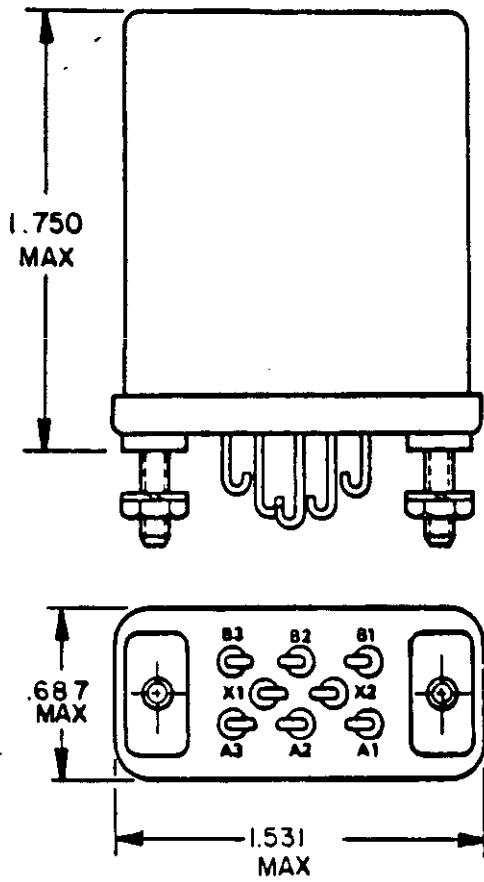


FIGURE 302-40. Relay, EM, DPDT, 10 amperes, permanent magnet drive (MS27401) - Continued.

MIL-STD-1346B



INCHES	MM
.687	17.45
1.531	38.89
1.750	44.45

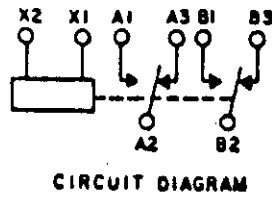
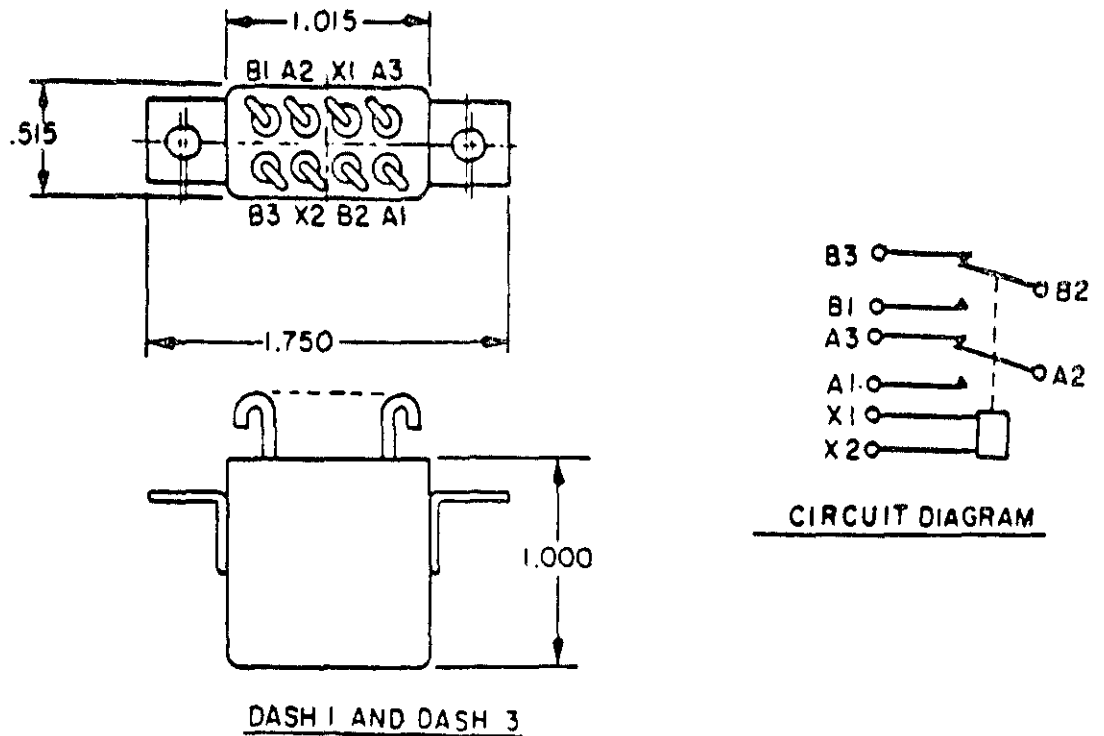


FIGURE 302-41. Relay, EM, DPDT, 5 amperes (MS25395).



INCHES	MM
.515	13.08
1.000	25.40
1.015	25.78
1.750	44.45

Dash number	Coll type	Terminal type	115/200V ac, 3PH contact rating
-1	DC	solder	N/A
-3	DC	solder	applicable

FIGURE 302-42. Relay, EM, DPDT, 10 amperes (MS27245).

MIL-STD-1346B

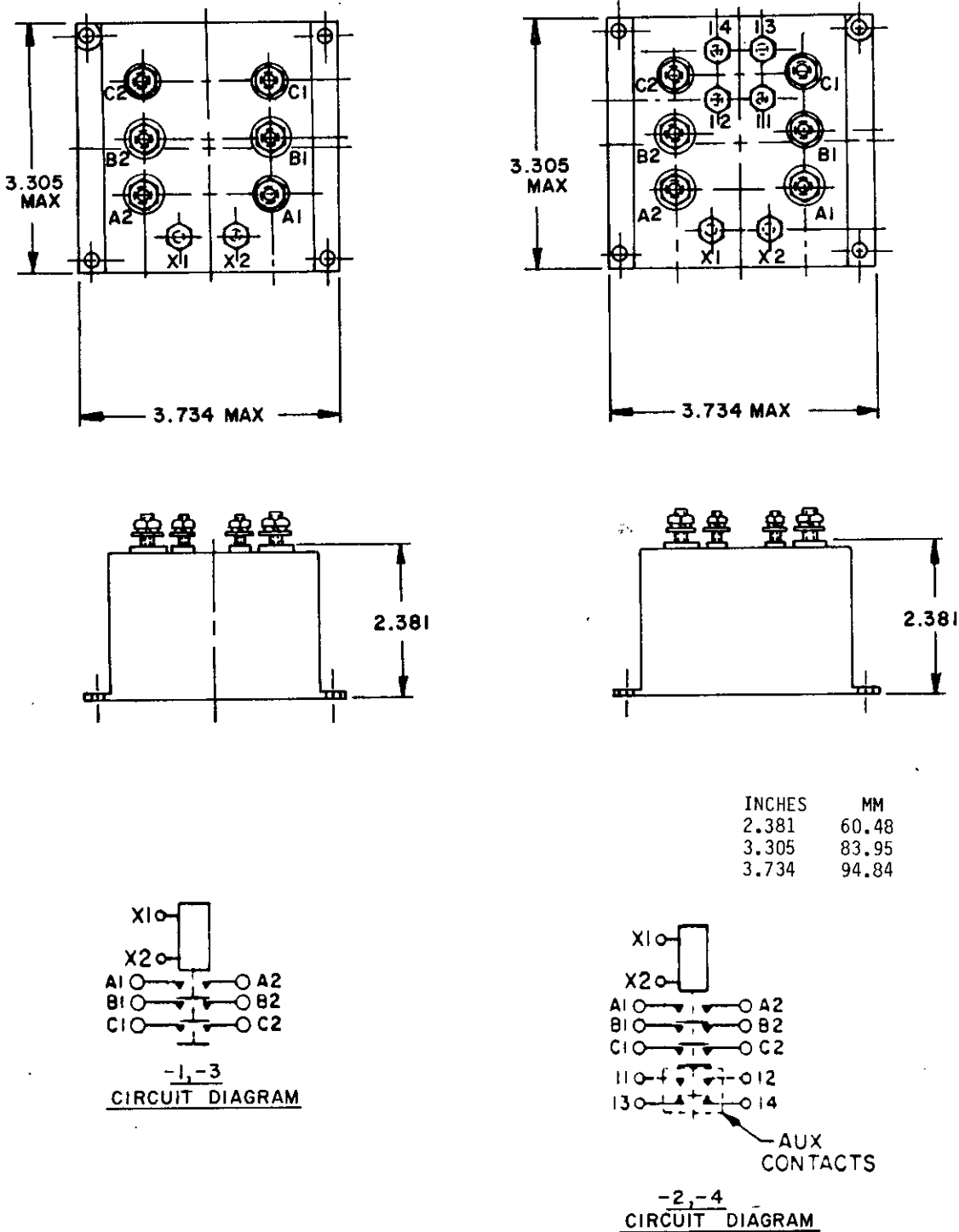
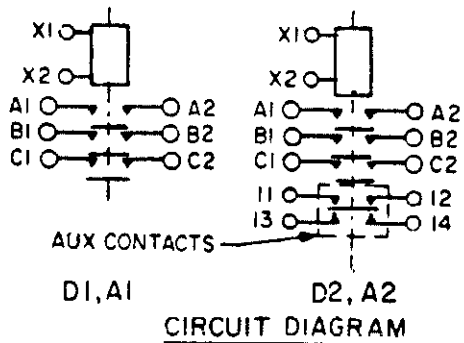
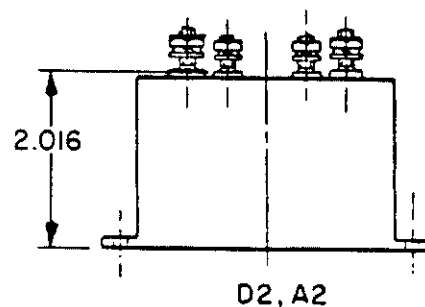
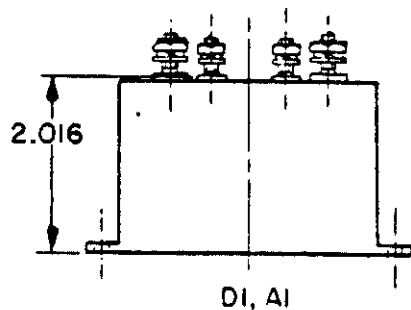
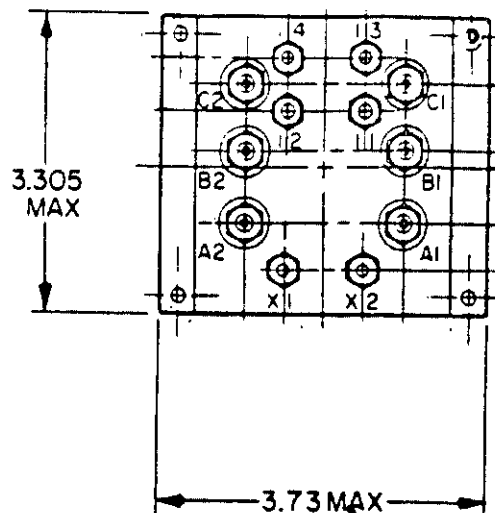
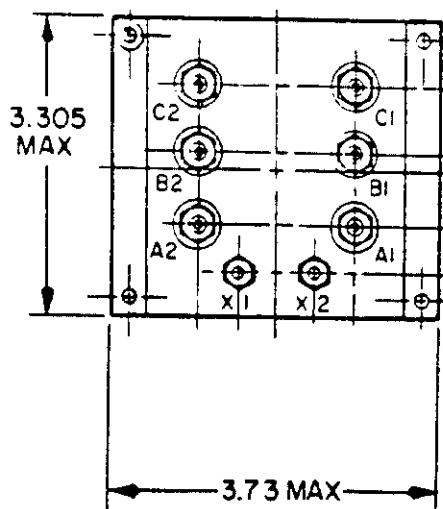


FIGURE 302-43. Relay, EM, 3PST, N.O., 50 amperes (MS27222).



INCHES	MM
2.016	51.21
3.305	83.95
3.73	94.74

FIGURE 302-44. Relay, EM, 3PST, N.O., 25 amperes (MS27997).

MIL-STD-1346B

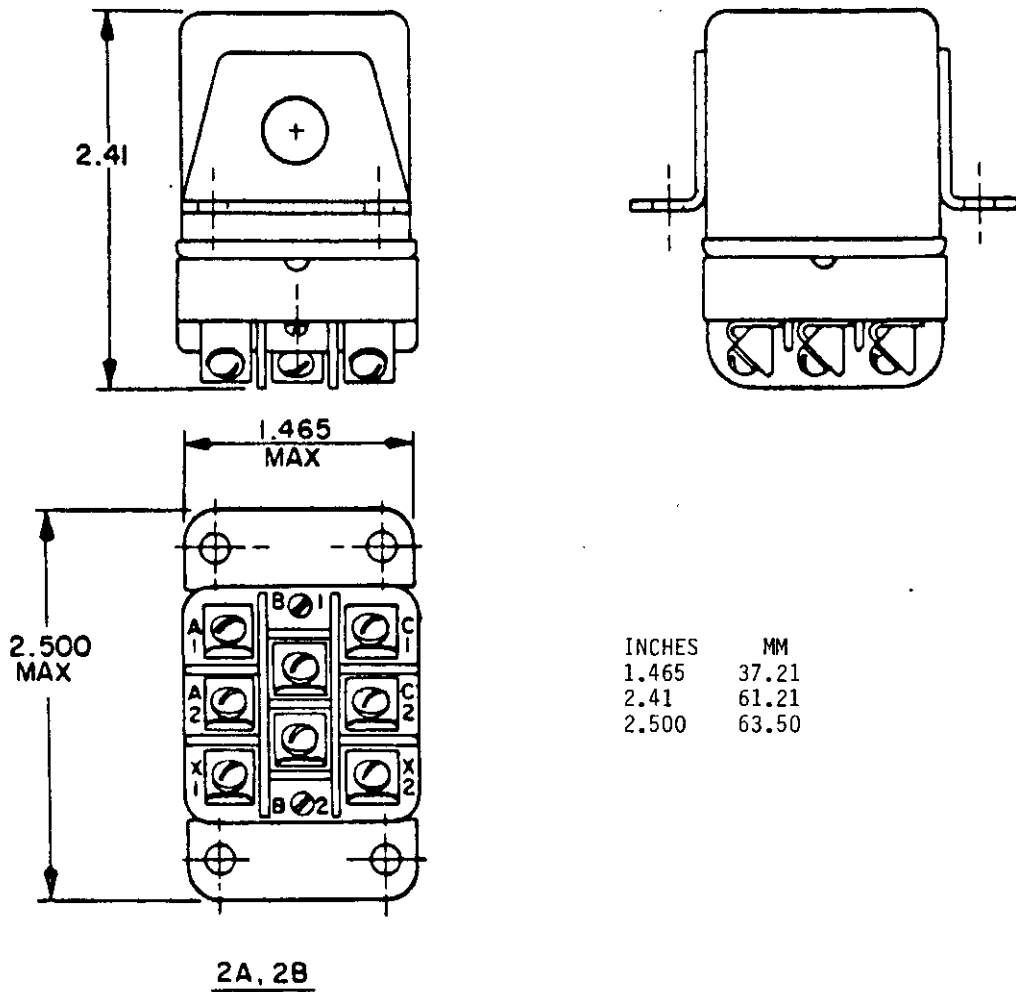
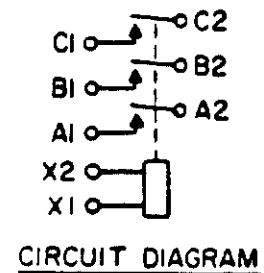
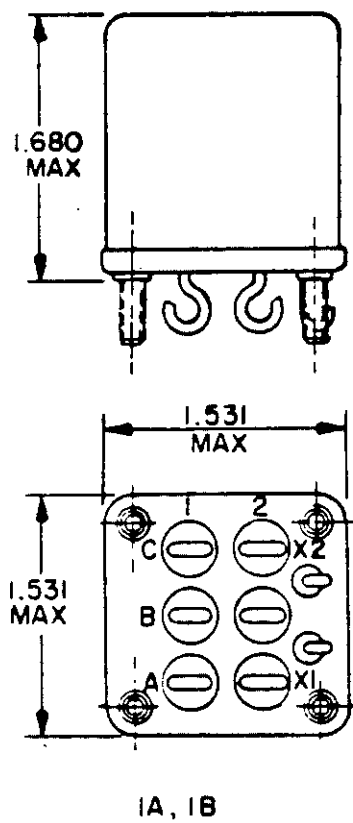


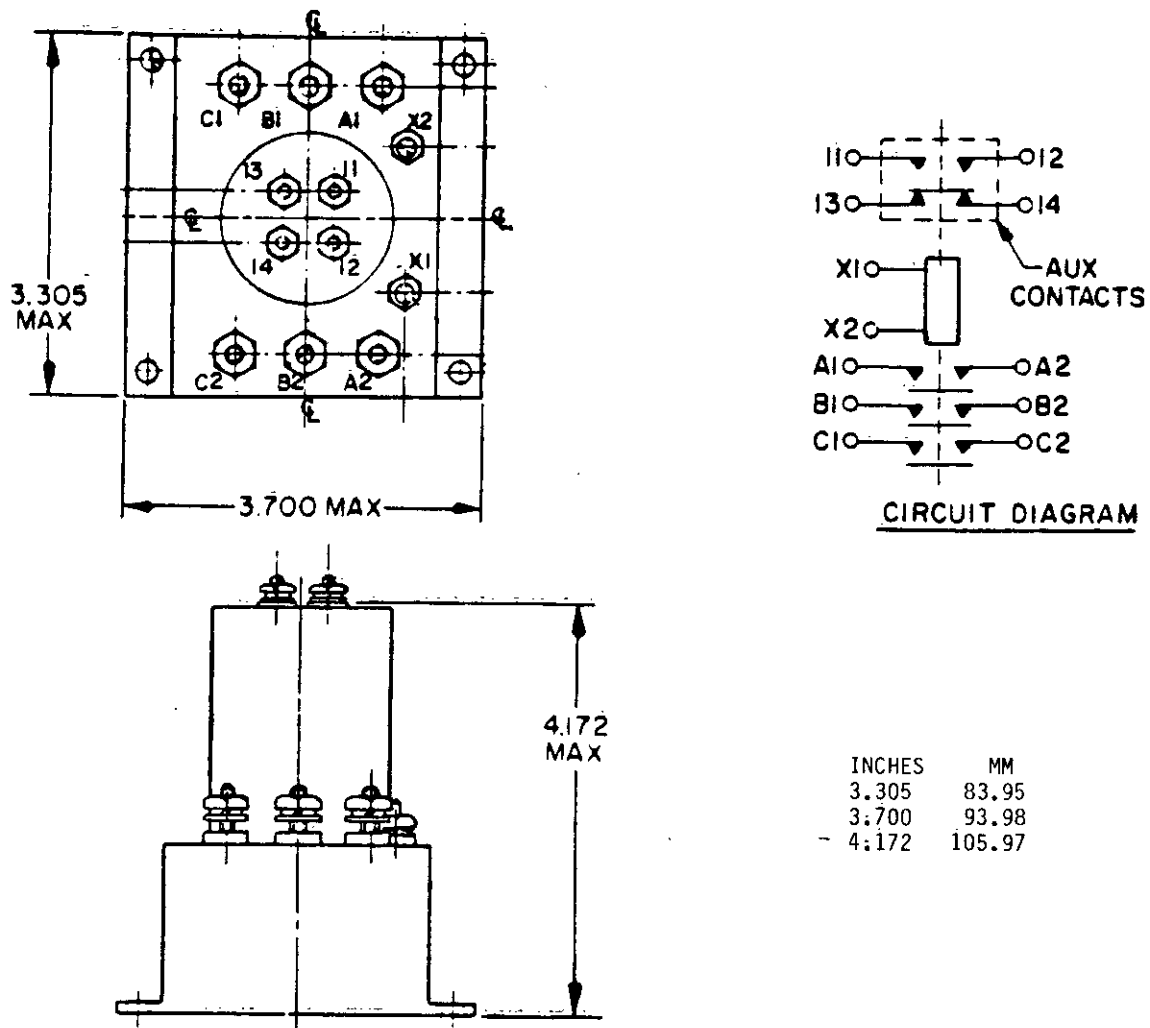
FIGURE 302-45. Relay, EM, 3PST, N.O., 25 amperes, hook and screw terminals (MS27418).



INCHES	MM
1.465	37.21
1.531	38.89
1.680	42.67
2.41	61.21
2.500	63.50

FIGURE 302-45. Relays, EM, hook and screw terminals, 3PST, normally open, 25 amperes - Continued.

MIL-STD-1346B



CIRCUIT DIAGRAM

INCHES	MM
3.305	83.95
3.700	93.98
4.172	105.97

FIGURE 302-46. Relay, EM, 3PST, N.O., 12 amperes (MS21330).

MIL-STD-1346B

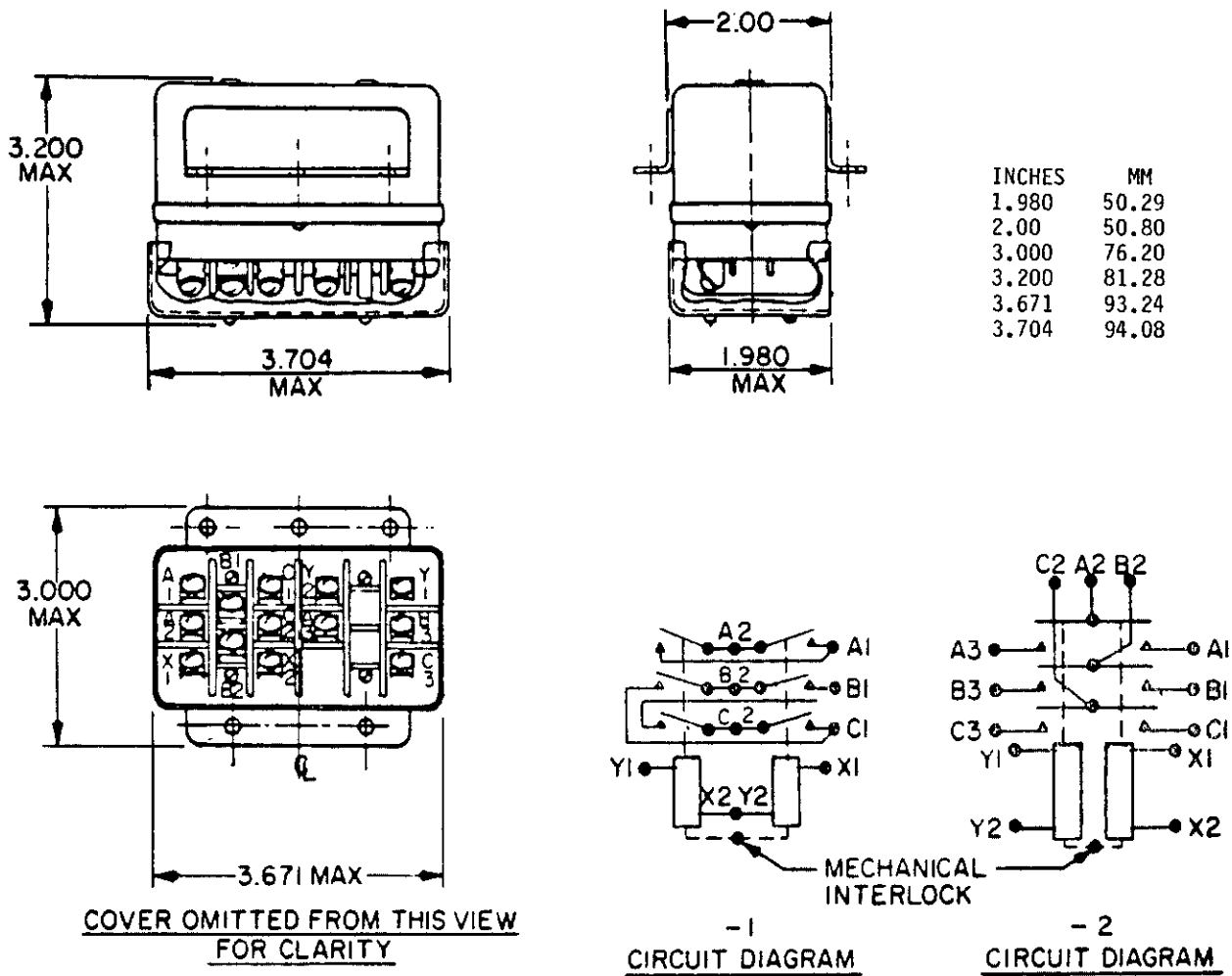
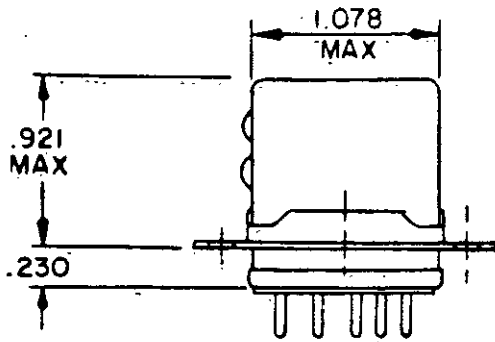
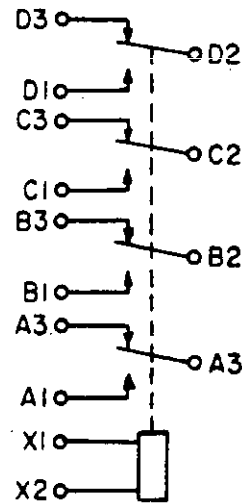
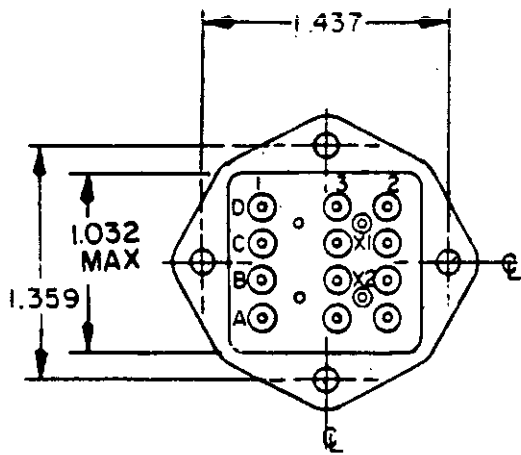


FIGURE 302-47. Relay, EM, 3PST, 20 amperes (mechanically interlocked) center off (MS27706).

MIL-STD-1346B



INCHES	MM
.230	5.84
.921	23.39
1.032	26.21
1.078	27.38
1.359	34.52
1.437	36.50



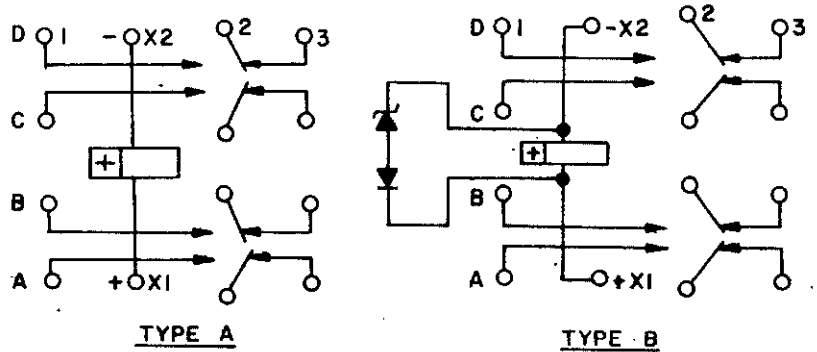
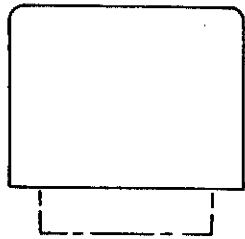
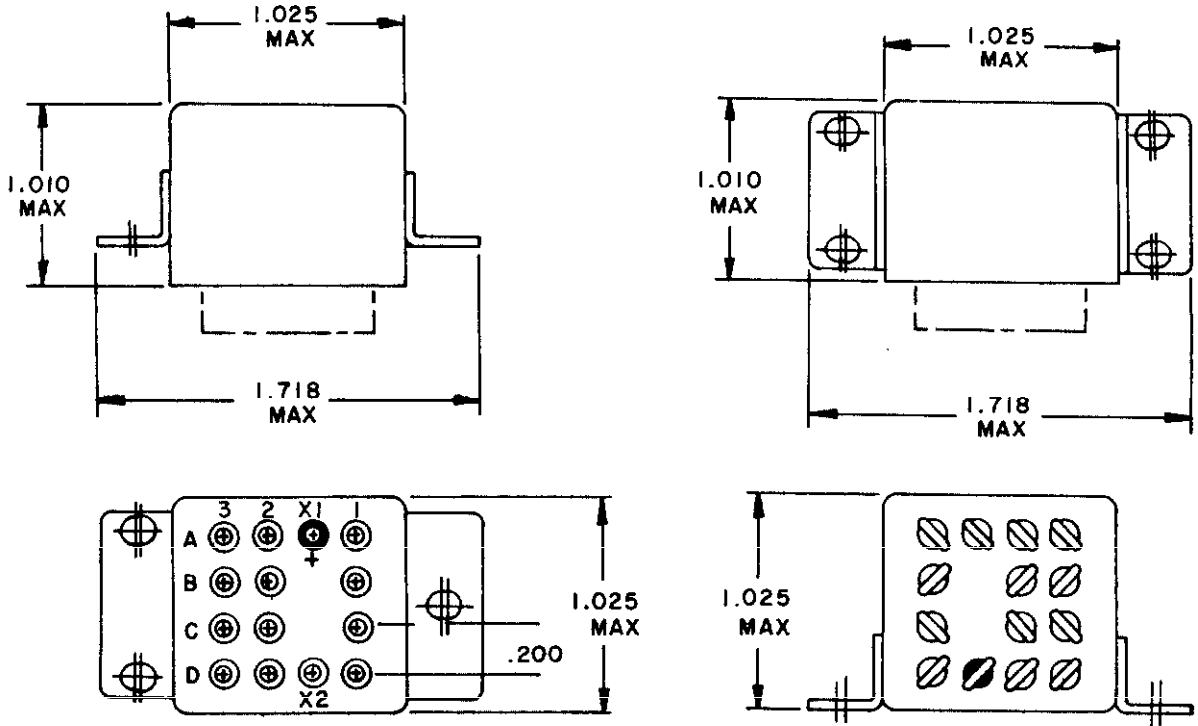
CIRCUIT DIAGRAM

-182

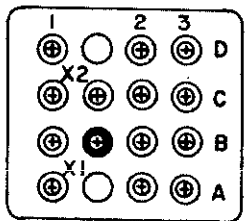
THE USE OF DIODES ON AC RELAYS IS OPTIONAL

FIGURE 302-48. Relay, EM, 4PDT, 10 amperes (MS27254).

MIL-STD-1346B

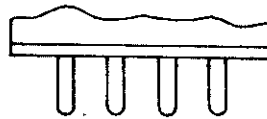


CIRCUIT DIAGRAM

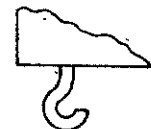


TERMINAL LAYOUT FOR ALL AC PIN RELAYS

INCHES	MM
.200	5.08
1.010	25.65
1.025	26.04
1.718	43.64



PLUG-IN TERMINAL



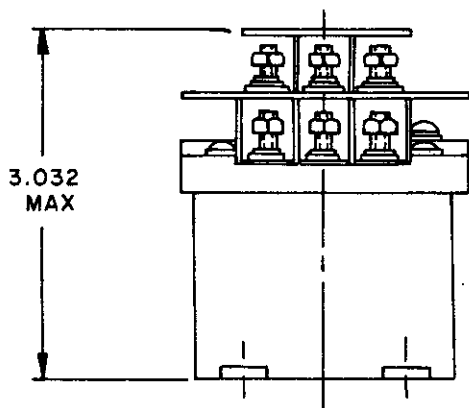
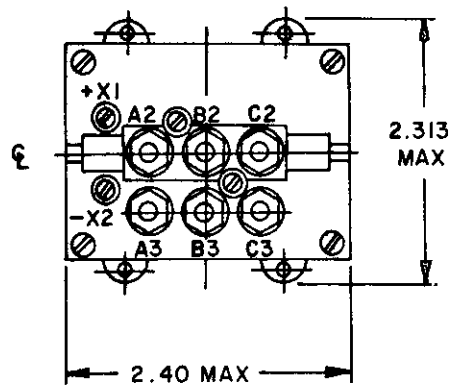
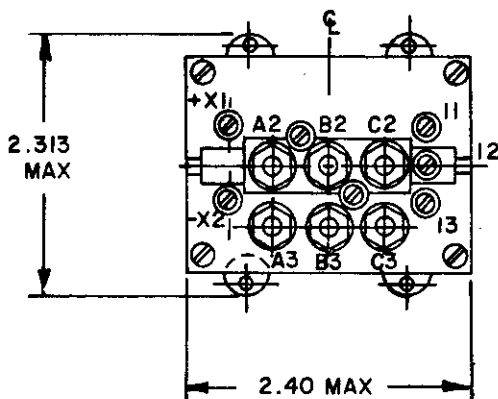
SOLDER-HOOK TERMINAL



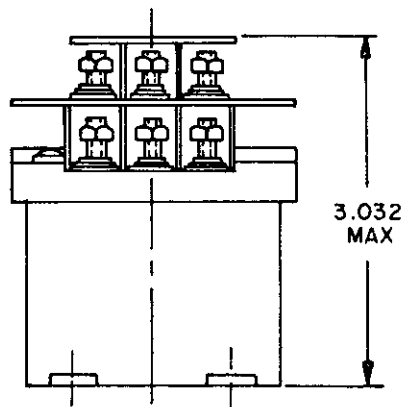
SOLDER-PIN TERMINAL

FIGURE 302-49. Relay, EM, 4PDT, 10 amperes, permanent magnet drive (MS27400).

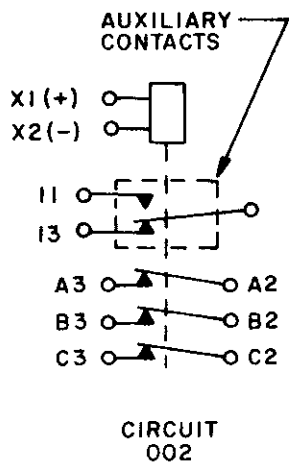
MIL-STD-1346B



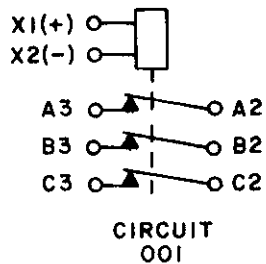
-002 & -004



-001 & -003



CIRCUIT 002

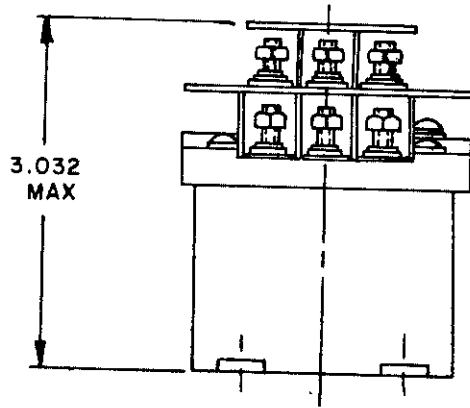
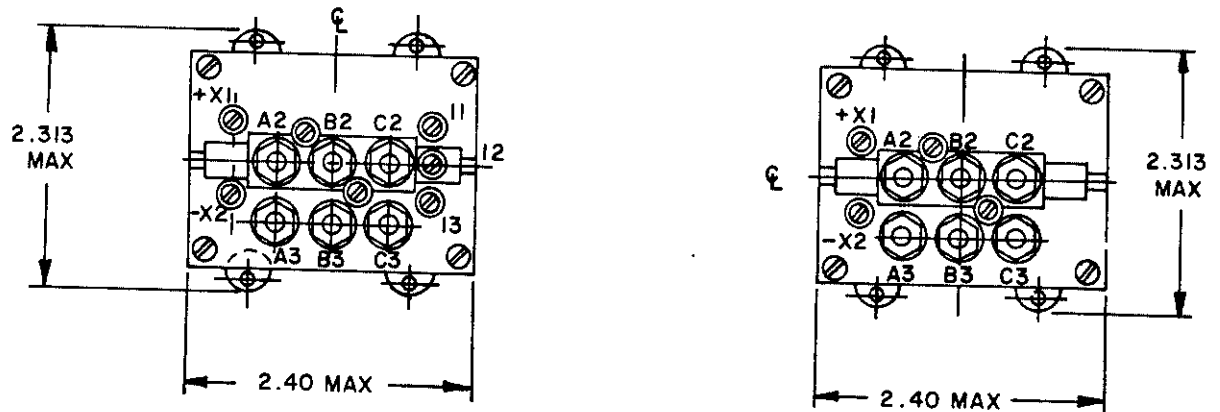


CIRCUIT 001

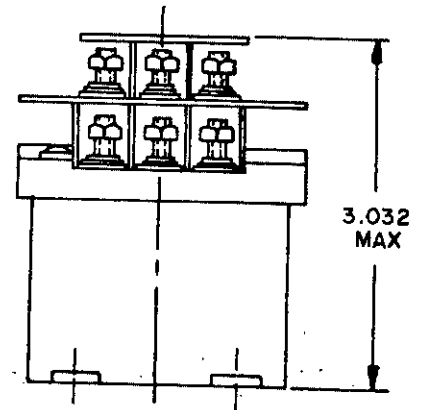
INCHES	MM
2.313	58.75
2.40	60.96
3.032	77.01

FIGURE 302-50. Relay, EM, 3PST, N.C., 60 amperes, environmentally sealed (MIL-R-6106/11).

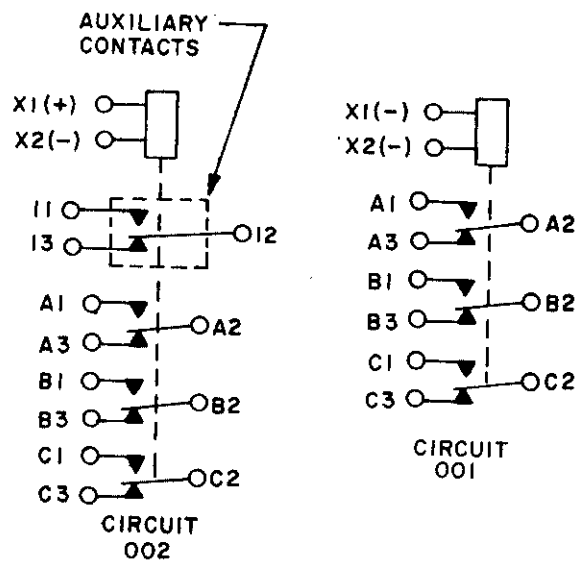
MIL-STD-1346B



-002 & -004



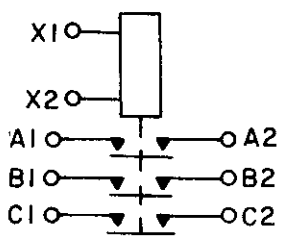
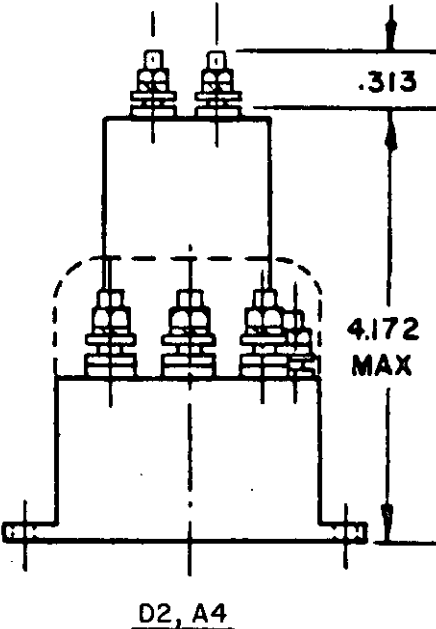
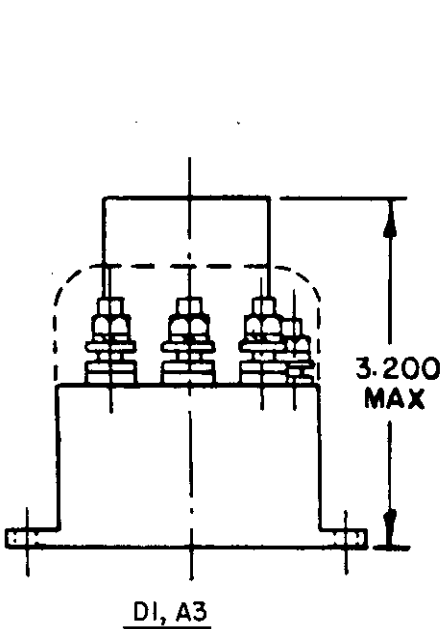
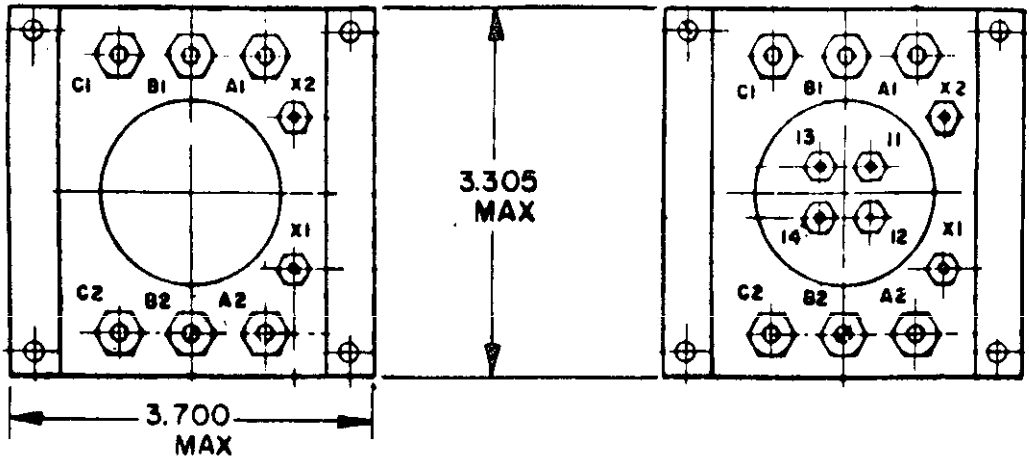
-001 & -003



INCHES	MM
2.313	58.75
2.40	60.96
3.032	77.01

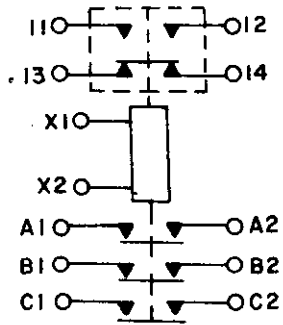
FIGURE 302-51. Relay, EM, 3PDT, 60 amperes, environmentally sealed (MIL-R-6106/9).

MIL-STD-1346B



INCHES	MM
.313	7.95
3.200	81.28
3.305	83.95
3.700	93.98

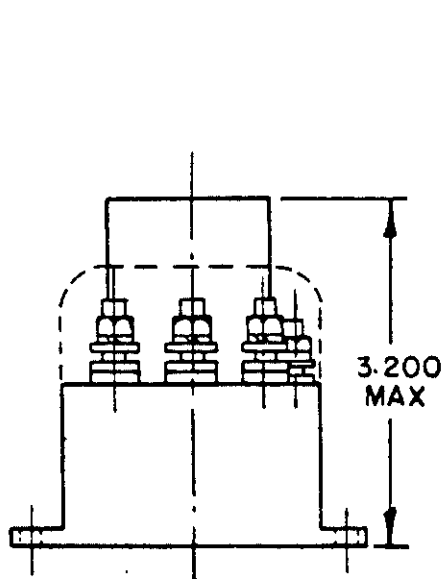
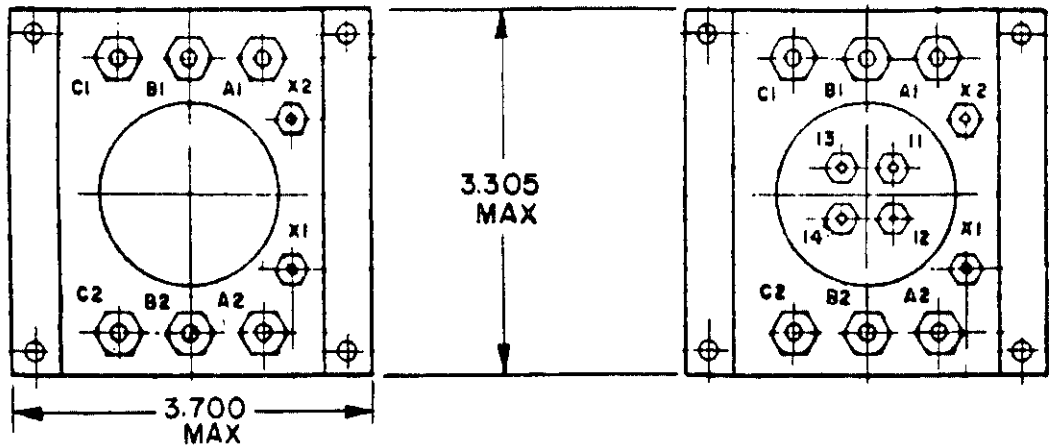
CIRCUIT DIAGRAM



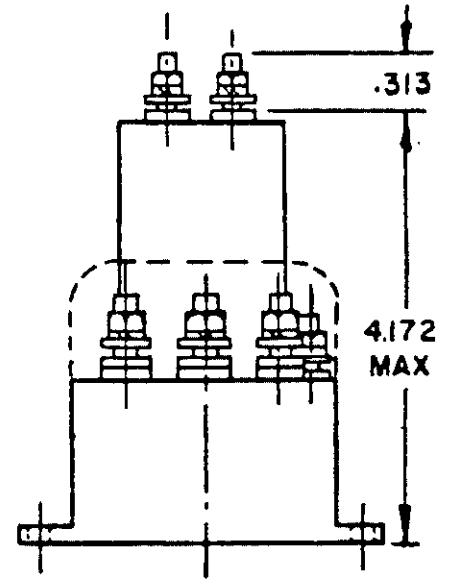
CIRCUIT DIAGRAM

FIGURE 302-52. Relay, EM, 3PST, N.O., 25 amperes (MS24143).

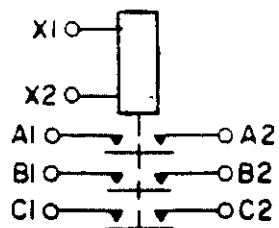
MIL-STD-1346B



D1, A3

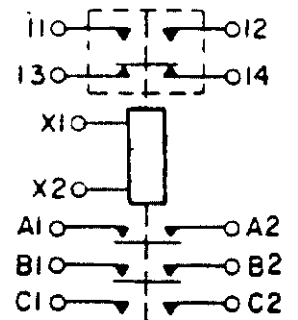


D2, A4



CIRCUIT DIAGRAM

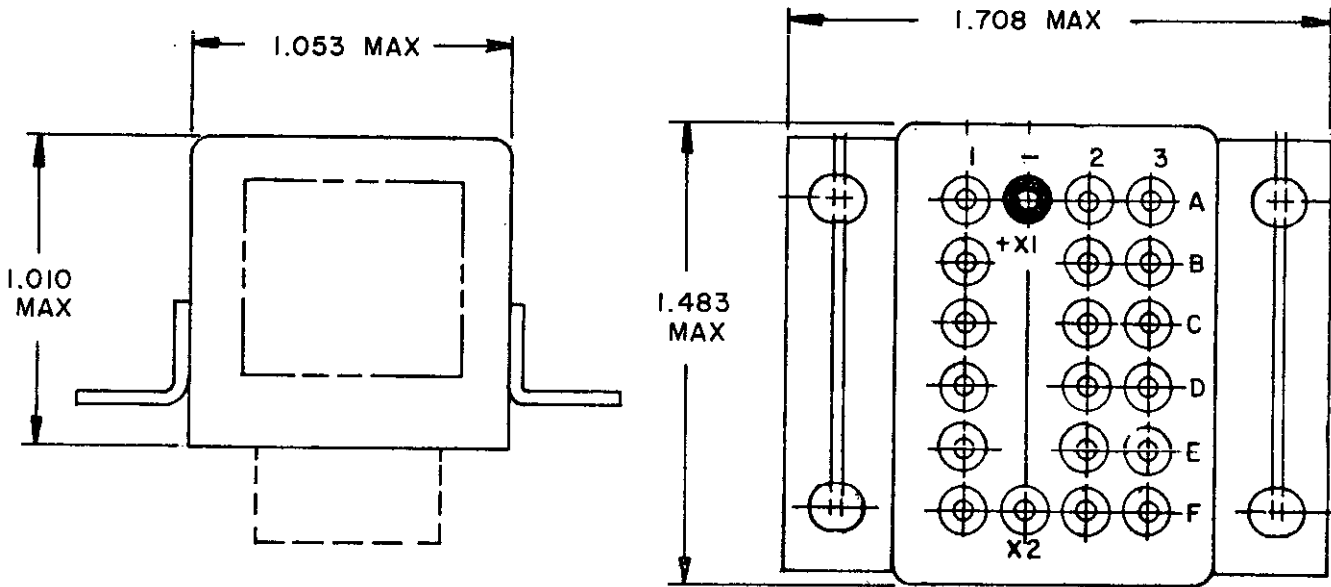
INCHES	MM
.313	7.95
3.200	81.28
3.305	83.95
3.700	93.98



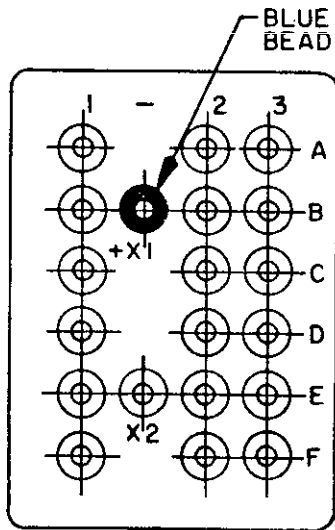
CIRCUIT DIAGRAM

FIGURE 302-53. Relay, EM, 3PST, N.O., 50 amperes (MS24376).

MIL-STD-1346B

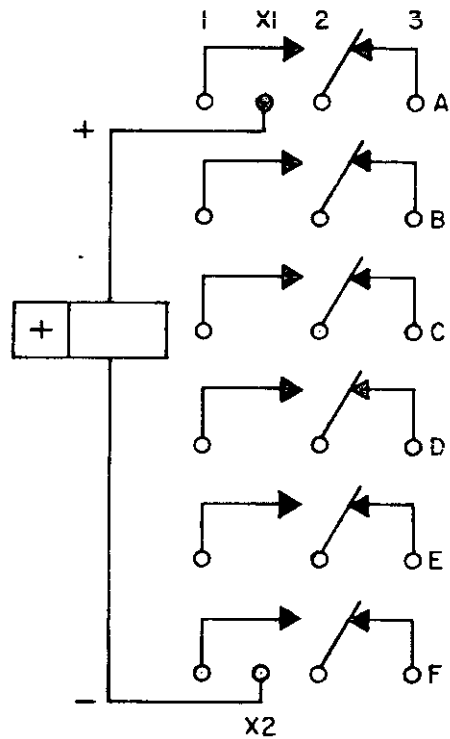


TERMINAL LAYOUT -003, -005, -006, -013, AND 014



TERMINAL LAYOUT -004

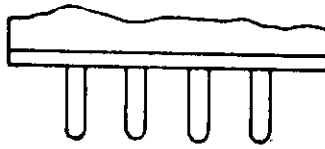
INCHES	MM
1.010	25.65
1.053	26.75
1.483	37.67
1.708	43.38



CIRCUIT



SOLDER-HOOK TERMINAL



PLUG-IN TERMINAL

FIGURE 302-54. Relay, EM, 6PDT, 10 amperes, permanent magnet drive (MIL-R-6106/8).

MIL-STD-1346B

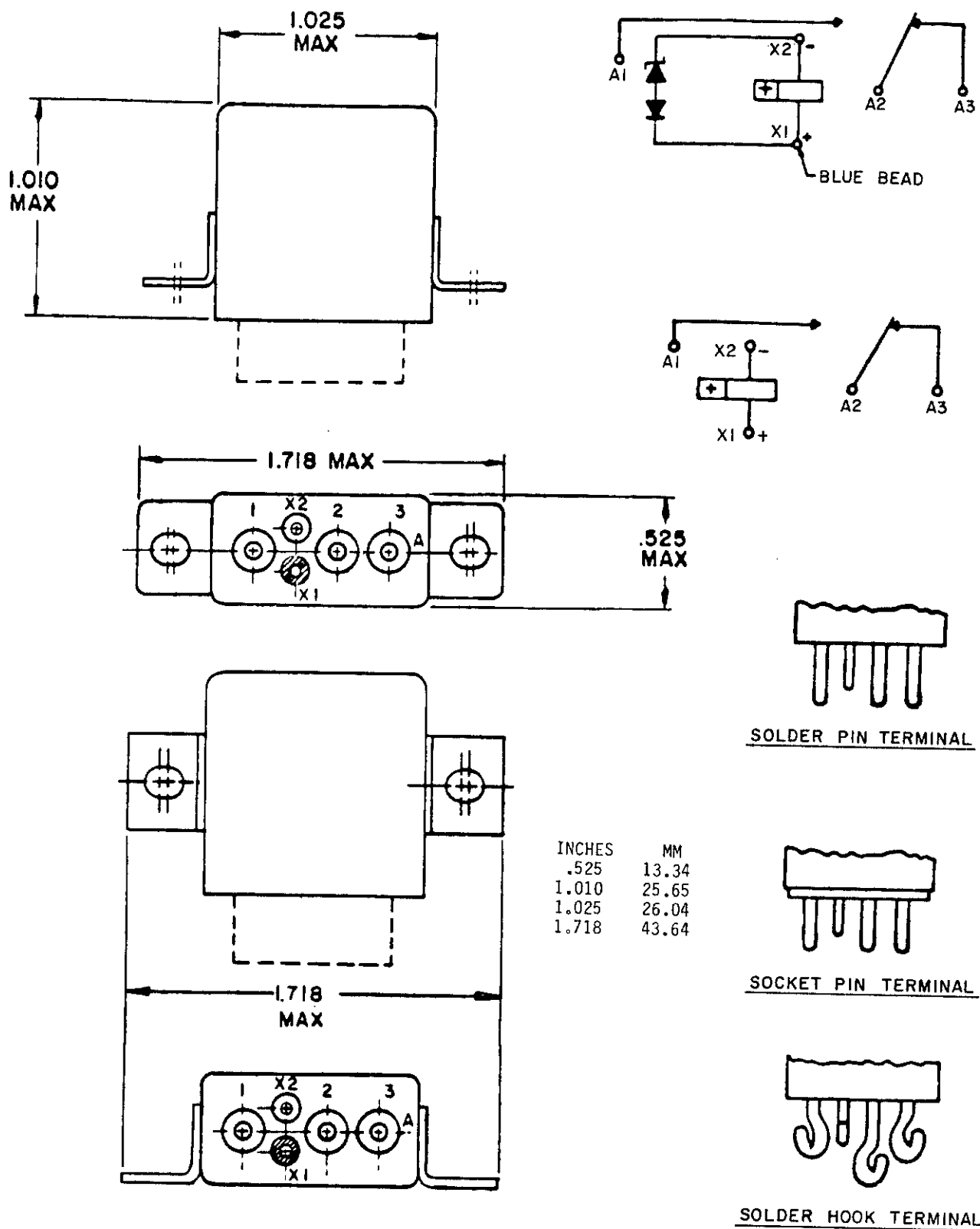
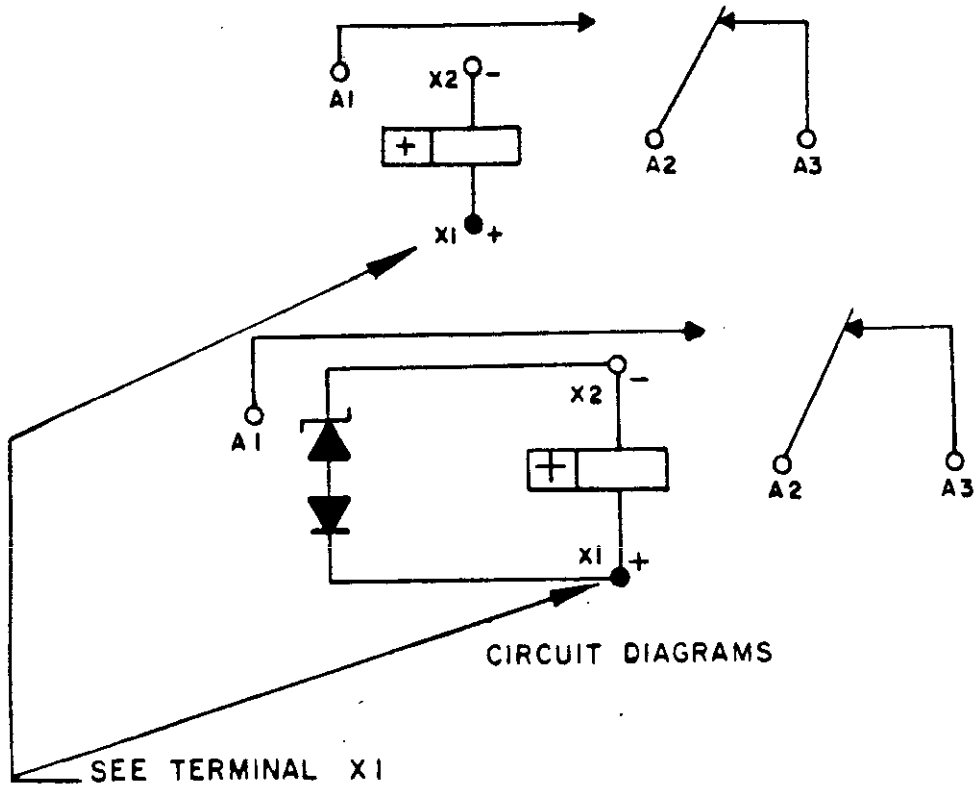
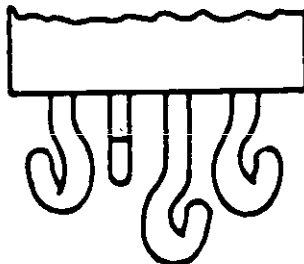


FIGURE 302-55. Relay, EM, SPDT, 25 amperes (MIL-R-6106/19).

MIL-STD-1346B



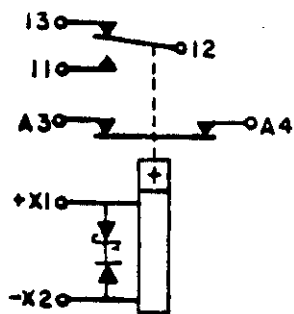
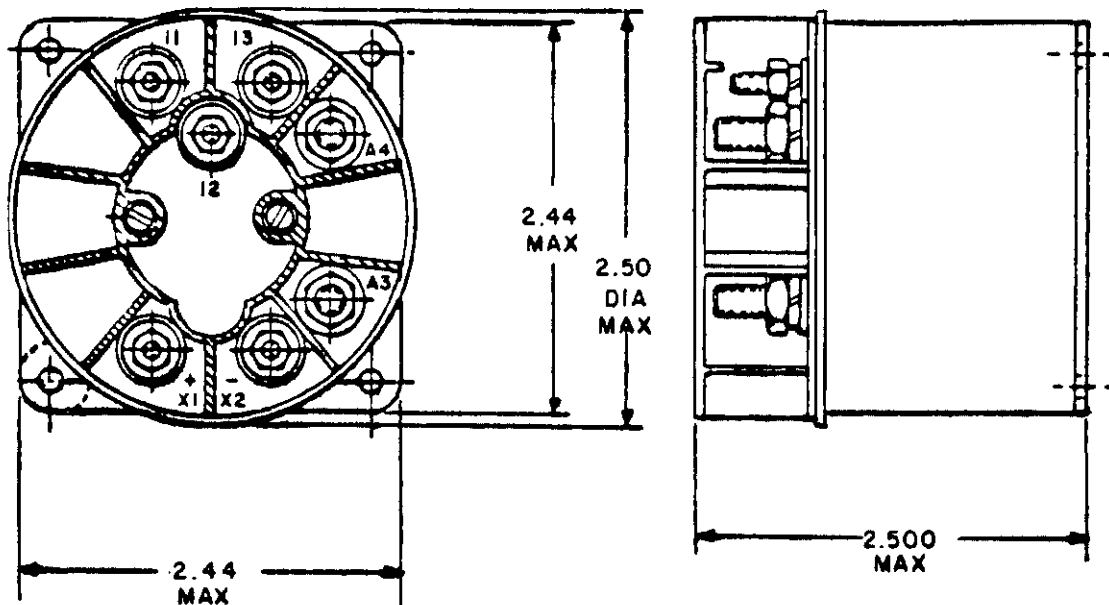
PLUG-IN AND SOLDER
PIN TERMINAL



SOLDER HOOK TERMINAL

FIGURE 302-55. Relay, EM, SPDT, 25 amperes (MIL-R-6106/19) - Continued.

MIL-STD-1346B

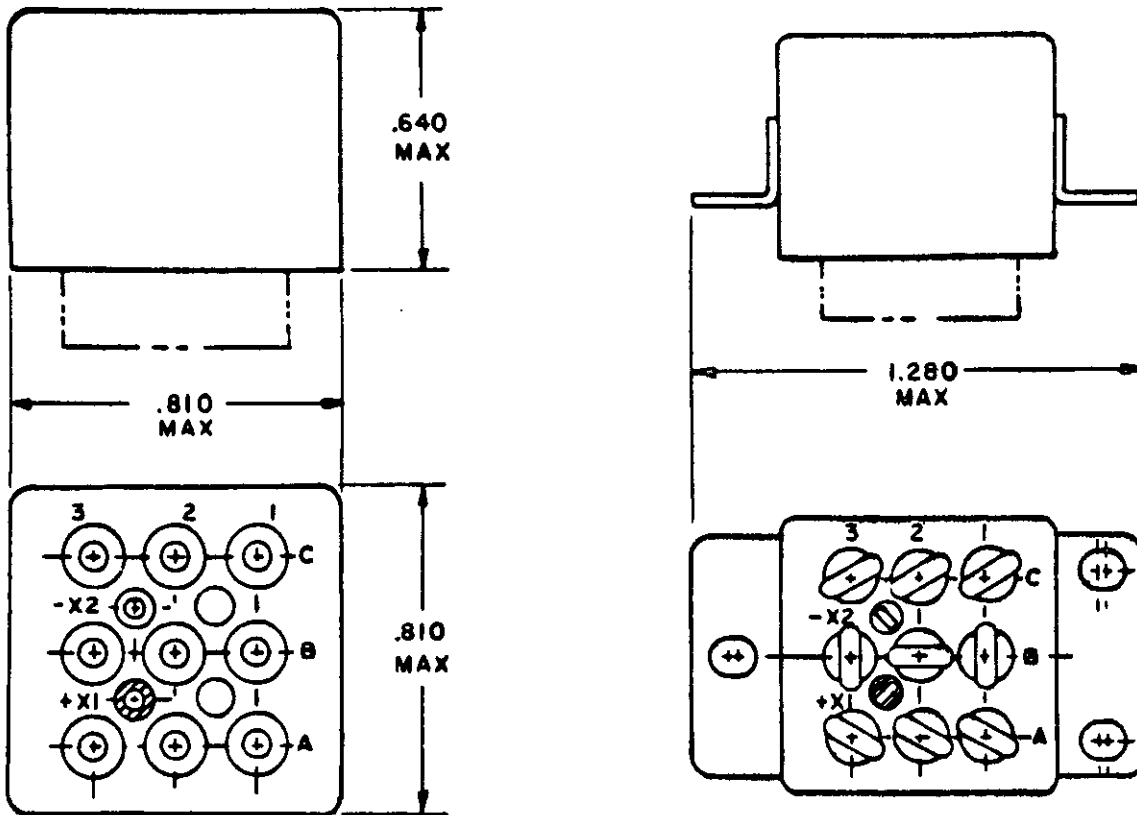


CIRCUIT DIAGRAM

INCHES	MM
2.44	6.20
2.50	6.35

FIGURE 302-56. Relay, EM, SPST, N.C., 50 amperes (MIL-R-6106/26).

MIL-STD-1346B



INCHES	MM
.640	16.26
.810	20.57
1.280	32.51

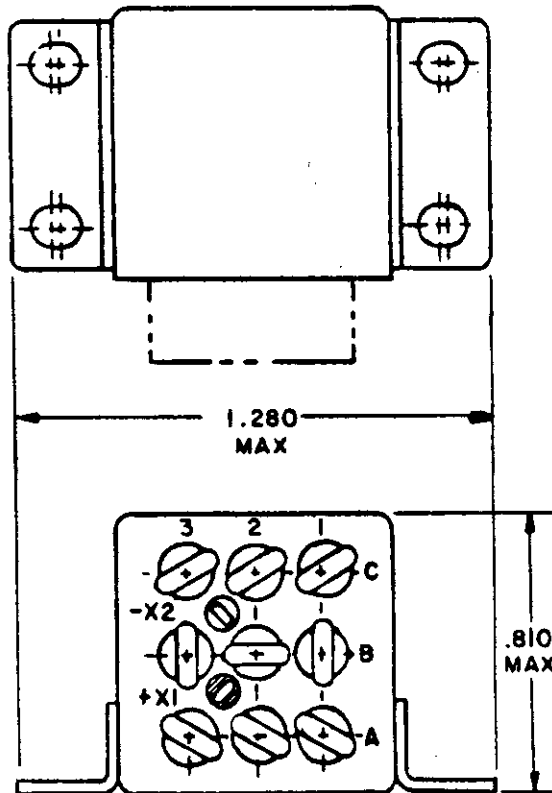
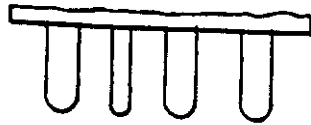
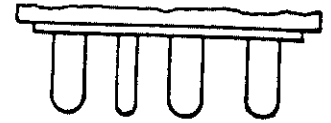


FIGURE 302-57. Relay, EM, low level to 10 amperes, 3PDT, permanent magnet drive (MIL-R-6106/29).

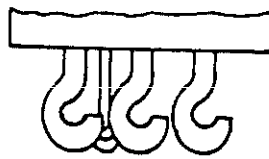
MIL-STD-1346B



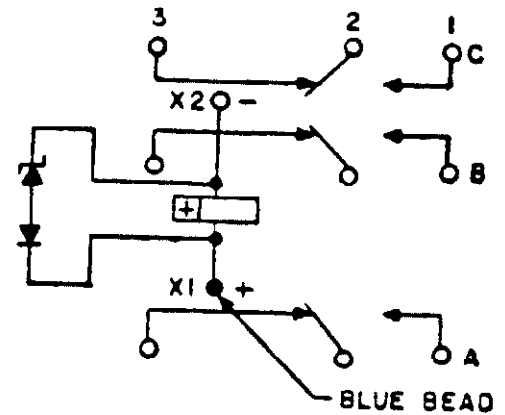
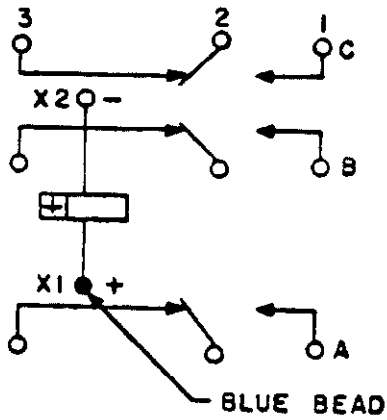
SOLDER PIN



SOCKET PIN



SOLDER HOOK



CIRCUIT DIAGRAMS

FIGURE 302-57. Relay, EM, low level to 10 amperes, 3PDT permanent magnet drive (MIL-R-6106/29) - Continued.

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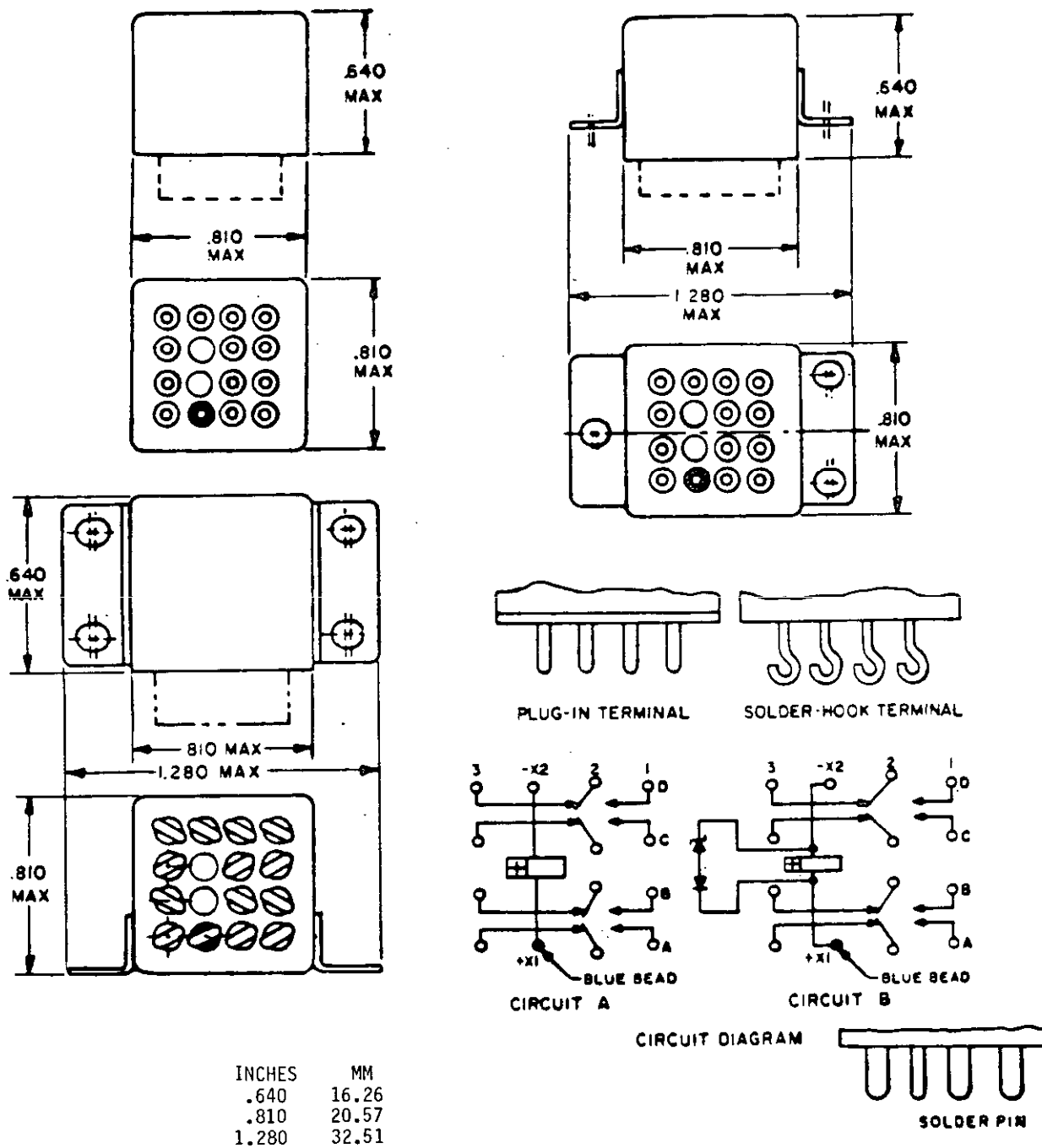


FIGURE 302-58. Relay, EM, low level to 5 amperes, 4PDT, permanent magnet drive (MIL-R-6106/28).

MIL-STD-1346B

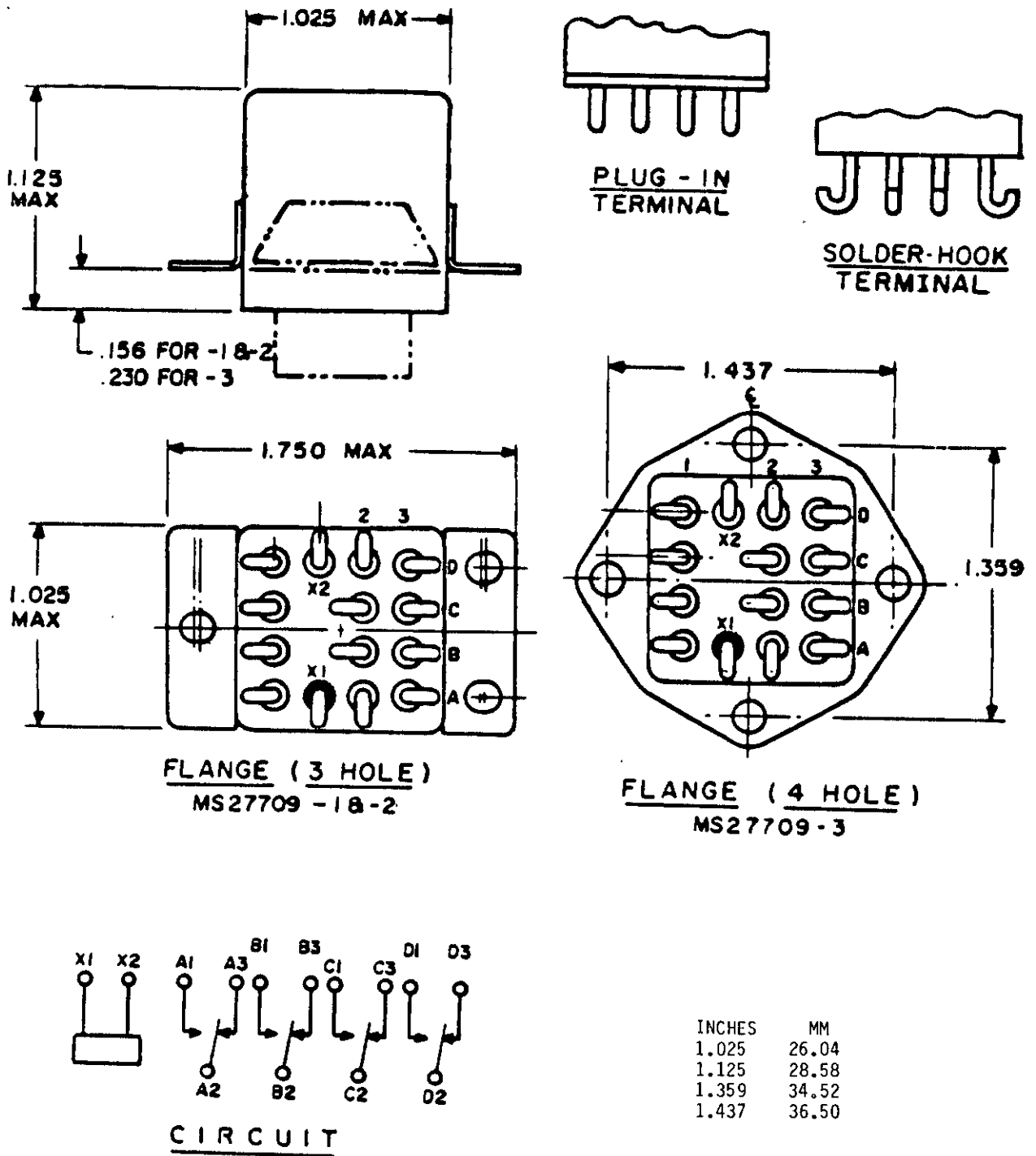


FIGURE 302-59. Relay, EM, 4PDT, 10 amperes (MS27709).

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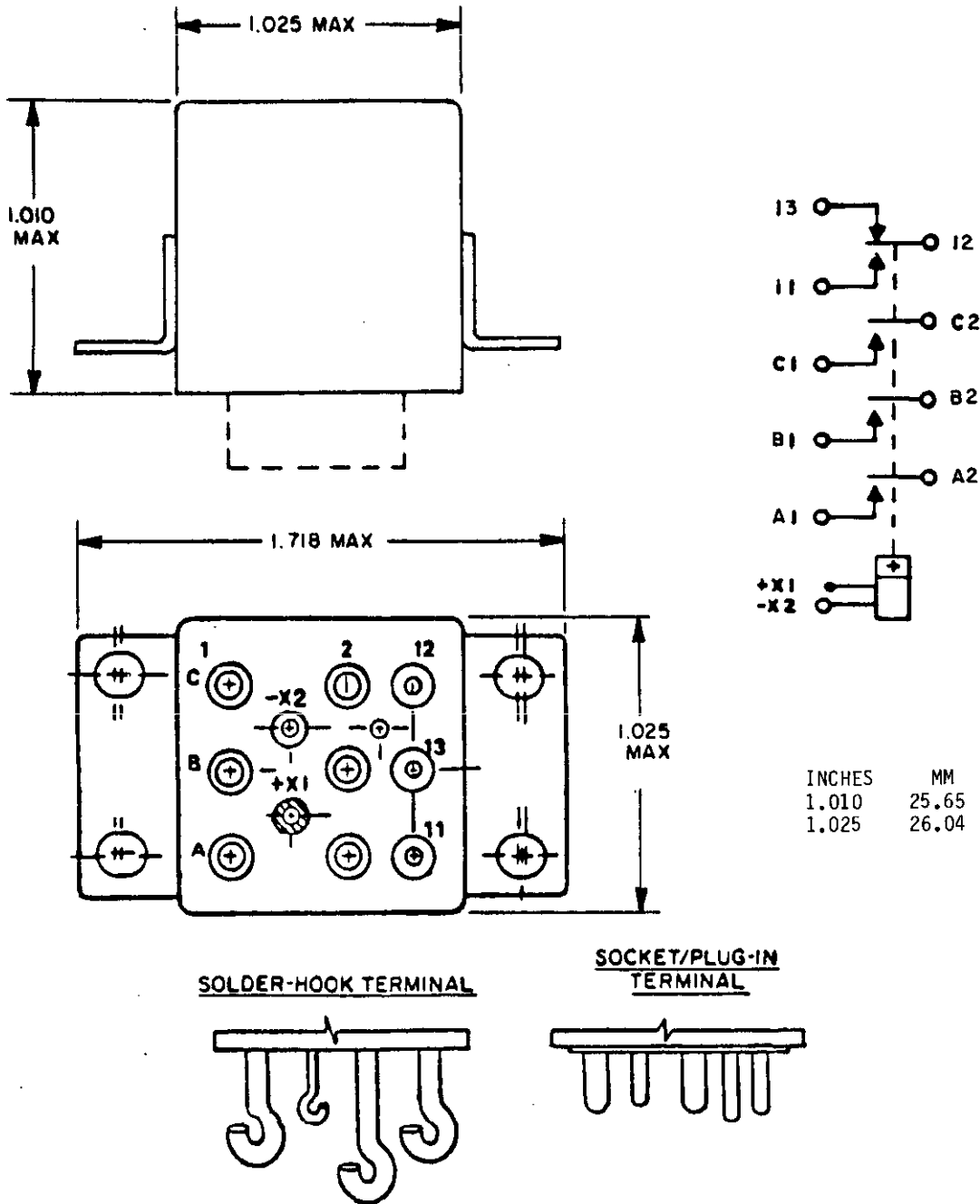


FIGURE 302-60. Relay, EM, 3PST, N.O., with 2 ampere, SPDT auxiliary contacts 25 amperes (MIL-R-6106/13).

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SUBSECTION 303

RELAYS, ELECTROMAGNETIC (EM), AC OPERATED (MIL-R-5757)

SCOPE: This section covers relays with coils ac voltage rated and contacts nominally rated up to and including 10 amperes for use in electronic equipment.

SUBSECTION 303

RELAYS, ELECTROMAGNETIC (EM), AC OPERATED
(Applicable specification: MIL-R-5757)

Duty cycle: Continuous
Altitude: 70,000 feet
Enclosure: Hermetically sealed
Rated coil voltage: 115 volts
Operating temperature range: B

TABLE 303.1. Relays, EM, ac operated, part numbers and characteristics.

Rated coil frequency Hz	Part number	Figure Shock number (see table II)	Vibration (see table III)	System voltage and frequency - contact current in amperes												Terminal style (see table IV)									
				28 V dc			400 Hz			80 Hz			115 V 1-phase				115/200 V 3-phase								
				Resistive	Inductive	Motor	Resistive	Inductive	Motor	Resistive	Inductive	Motor	Resistive	Inductive	Motor		Resistive	Inductive	Motor						
60 400	M5757/15 -005 -003	301-5	5	5	3	---	0.8	---	0.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	L	
		301-5	"	"	3	"	"	0.8	"	0.8	"	"	"	"	"	"	"	"	"	"	"	"	"	"	L
50/60 400	M5757/18 -007 -003	301-6	"	"	---	"	2	10	2	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	L
		301-6	"	"	---	"	2	10	2	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	L
60 400	M5757/16 -005 -003	301-8	5	5	3	---	.8	---	.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	L
		301-8	"	"	3	"	"	.8	"	.8	"	"	"	"	"	"	"	"	"	"	"	"	"	"	L

4PDT CONTACTS - 4 FORM C

6PDT CONTACTS - 6 FORM C

MIL-STD-1346B

SUBSECTION 304

RELAYS, ELECTROMAGNETIC (EM), AC OPERATED (MIL-R-6106)

SCOPE: This section covers ac voltage operated relays nominally rated 5 amperes and up for use in electrical systems. The relays are capable of meeting the electrical and environmental requirements when mounted directly to the structure.

TABLE 304.1. Relays, EM, ac operated, part numbers and characteristics - Continued.

Part number	Figure number	Operating temp range (see table 1)	Coil frequency Hz	Vibration (see table III)	System voltage and frequency-contact current in amperes											
					28 V dc			115 V 1-phase			115/200 V 3-phase			50/60 Hz		
					Resis- tive	Induc- tive	Motor	Resis- tive	Induc- tive	Motor	Resis- tive	Induc- tive	Motor	Resis- tive	Induc- tive	Motor
3PST CONTACTS - 3 FORM X - Continued																
MS24168	302-20	G	400	See spec	100	100	100	100	100	100	100	100	100	100		
-A3 1/	302-20	"	"	"	100	100	100	100	100	100	100	100	100	100		
-A4 1/ 2/					---											
MS24376																
-A3 1/	302-53	"	"	"	50	50	50	50	50	50	50	50	50	50		
-A4 1/ 2/	302-53	"	"	"	50	50	50	50	50	50	50	50	50	50		
MS27937-A1	302-44	"	60/400	"	25	25	25	25	25	25	25	25	25	25		
MS27937-A2	302-44	"	60/400	"	25	25	25	25	25	25	25	25	25	25		
2/					25	25	25	25	25	25	25	25	25	25		
3PST CONTACTS - 3 FORM C																
MS27751-2,-12	302-21	D	400	See spec	---	15	15	15	15	15	15	15	15	15		
1/ 3/	302-21	"	"	"	---	15	15	15	15	15	15	15	15	15		
MS27751-8,-18	302-21	"	"	"	---	15	15	15	15	15	15	15	15	15		
1/ 2/ 3/					---	15	15	15	15	15	15	15	15	15		
MS27751-10,-20	302-21	"	"	"	---	15	15	15	15	15	15	15	15	15		
1/ 2/ 3/					---	15	15	15	15	15	15	15	15	15		
MS27743	302-25	G	50/400	"	25	12	10	10	15	10	5	5	10	5		
-19	"	"	"	"	25	12	10	10	15	10	5	5	10	5		
-20	"	"	"	"	25	12	10	10	15	10	5	5	10	5		
-21	"	"	"	"	25	12	10	10	15	10	5	5	10	5		
MS27715-2	302-10	"	400	"	150	100	100	100	100	100	100	100	100	100		
4PDT CONTACTS - 4 FORM C																
MS27254-1	302-48	6	400	6	10	10	5	3	10	10	5	3	10	5		
MS27255-1	302-28	"	"	"	10	10	5	3	10	10	5	3	10	5		
MS27255-3	302-28	"	"	"	10	10	5	3	10	10	5	3	10	5		
MS27400					10	10	5	3	10	10	5	3	10	5		
-26	302-49	"	50/400	See spec	10	10	5	3	10	10	5	3	10	5		
-27	"	"	"	"	10	10	5	3	10	10	5	3	10	5		
-28	"	"	"	"	10	10	5	3	10	10	5	3	10	5		
-39	"	"	"	"	10	10	5	3	10	10	5	3	10	5		
-48	"	"	"	"	10	10	5	3	10	10	5	3	10	5		
-49	"	"	"	"	10	10	5	3	10	10	5	3	10	5		
MS25271-A1	302-29	"	400	4	6	6	6	6	6	6	6	6	6	6		
1/					6	6	6	6	6	6	6	6	6	6		
MS25327-A1	302-31	"	"	"	6	6	6	6	6	6	6	6	6	6		
1/					6	6	6	6	6	6	6	6	6	6		
MS25267-A1	302-32	"	"	"	5	3	1.5	.8	5	3	1.5	.8	5	3		
1/					5	3	1.5	.8	5	3	1.5	.8	5	3		

See footnotes at end of table.

TABLE 304. I. Relays, EM, ac operated, part numbers and characteristics - Continued.

Part number	Figure number	Operating temp range (see table I)	Coil frequency Hz	Vibration (see table III)	System voltage and frequency-contact current in amperes												
					28 V dc			115 V 1-phase			400 Hz			50/60 Hz			
					Resis- tive	Induc- tive	Motor	Lamp	Resis- tive	Induc- tive	Motor	Lamp	Resis- tive	Induc- tive	Motor	Lamp	Resis- tive
4PDT CONTACTS - 4 FORM C - Continued																	
MS25325-A2	302-33	G	50/400	4	5	3	1.5	.8	5	3	1.5	.8	---	---	---	---	---
MS24568-A1 MS24568-A2	302-27 302-27	" "	400 50/60	See spec	10 10	10 10	6 6	3 3	15 15	10 10	6 6	3 3	15 10	10 10	6 6	3 3	10 10
6PDT CONTACTS - 6 FORM C																	
MS25329-A1 1/ MS25269-A1 1/	302-34 302-35	G G	400 400	4 4	5 5	3 3	1.5 1.5	.8 .8	5 5	3 3	1.5 1.5	.8 .8	---	---	---	---	---
6PDT CONTACTS - 6 FORM C, MAGNET DRIVE																	
MS10678 -003 -004	302-54 302-54	G G	400 400	6 6	10 10	8 8	4 4	2 2	10 10	8 8	4 4	2 2	10 8	10 8	4 4	2 2	10 10

- 1/ Capable of being derated to 60 Hz (see specification).
- 2/ Relay possesses auxiliary contacts (see specification).
- 3/ This relay is designed for load transfer; other relays should not be used to transfer loads.

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SUBSECTION 305

RELAYS, ELECTROMAGNETIC (EM), SENSITIVE (MIL-R-5757/13)

SCOPE: This section covers relays designed to operate with input coil power of 100 milliwatts or less (as applicable).

SUBSECTION 305

RELAYS, EM, SENSITIVE

(Applicable specification: MIL-R-5757)

Duty cycle: Continuous
 Altitude: 70,000 feet
 Enclosure: Hermetically sealed
 Operating temperature range: B (see table I)

TABLE 305.1 I/ Relays, EM, sensitive, dc operated, part numbers and characteristics.

Rated coil current, (milli-amperes)	Part number	Figure number (see table II)	Shock (see table III)	Vibration (see table III)	System voltage and frequency-contact current in amperes										Terminal style (see table IV)		
					28 V dc		400 Hz 115 V 1-phase		60 Hz 115 V 1-phase		Resistive		Inductive			Lamp	
					Resistive	Inductive @ 0.32 H	Resistive	Inductive	Resistive	Inductive	Resistive	Inductive	Resistive	Inductive		Resistive	Inductive
4	M5757/13 Flange -050 -060 Bracket -081	305-1	3	5	2.0	0.75	0.1	0.3	---	---	---	0.3	---	---	---	---	L SP
6	Flange -048 -058 Bracket -079	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	L SP
8	Flange -047 -057 Bracket -078	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	L SP
13	Flange -044 -054 Bracket -075	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	L SP

DPOI CONTACTS - 2 FORM C

See footnotes at end of table.

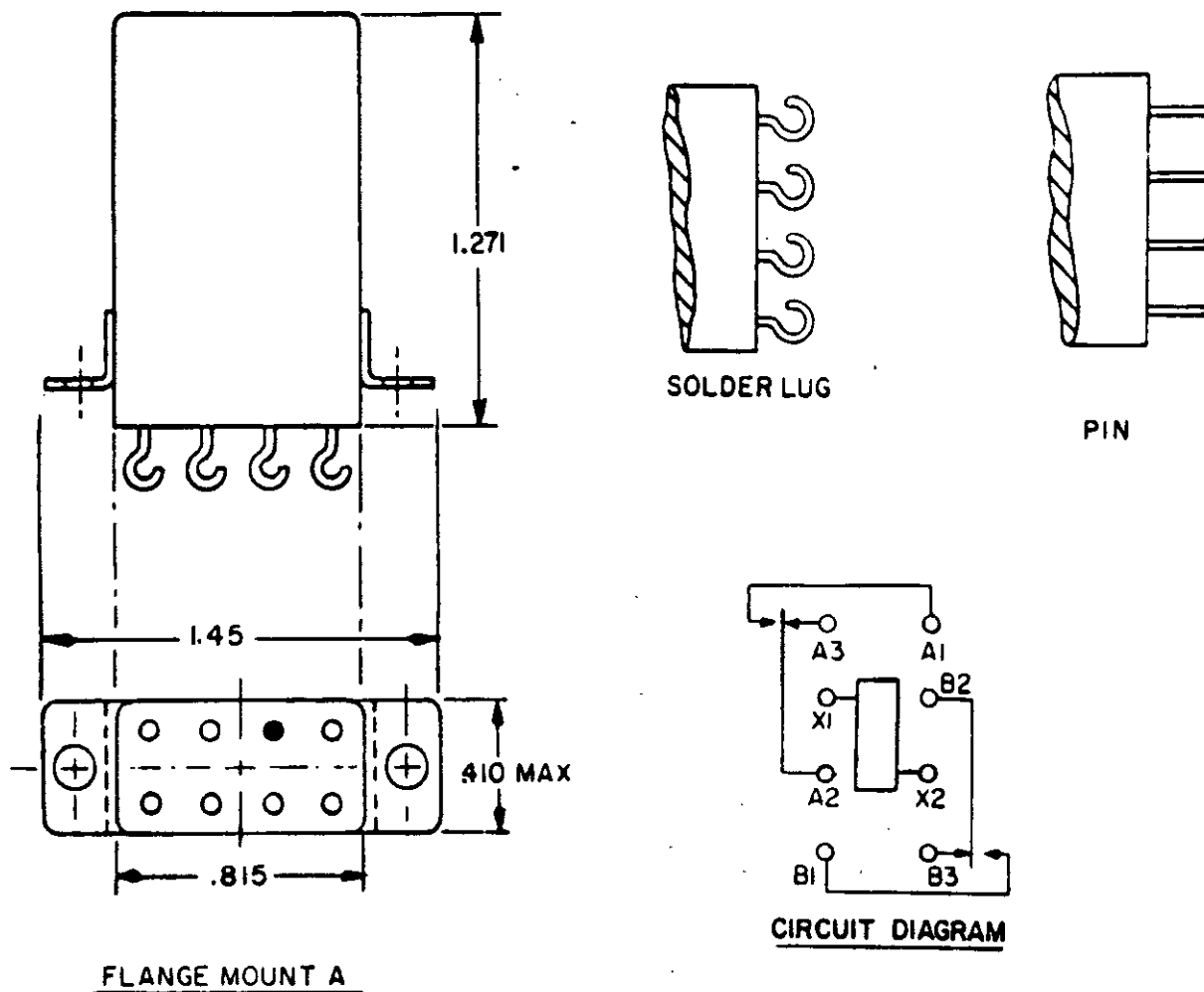
TABLE 305.1 1/ Relays, EM, sensitive, dc operated, part numbers and characteristics - Continued.

Rated coil current, nom (milli-amperes)	Part number	Figure number (see table II)	Shock (see table II)	Vibration (see table III)	System voltage and frequency-contact current in amperes								Terminal style (See table IV)		
					28 V dc		400 Hz 115 V 1-phase		60 Hz 115 V 1-phase		Inductive Lamp	Resistive Lamp		Inductive Lamp	Resistive Lamp
					Resistive	Inductive	Resistive	Inductive	Resistive	Inductive					
18	M5757/13 Flange	305-1	3	5	2.0	0.75	0.1	0.3	---	---	---	---	---	L SP	
	-043				"	"	"	"	"	"	"	"	"	"	"
	-053				"	"	"	"	"	"	"	"	"	"	"
40	Bracket	"	"	"	"	"	"	"	"	"	"	"	"	L	
	-074				"	"	"	"	"	"	"	"	"	"	"
					"	"	"	"	"	"	"	"	"	"	"
90	Flange	"	"	"	"	"	"	"	"	"	"	"	"	L SP	
	-042				"	"	"	"	"	"	"	"	"	"	"
	-052				"	"	"	"	"	"	"	"	"	"	"
"	Bracket	"	"	"	"	"	"	"	"	"	"	"	"	L	
	-073				"	"	"	"	"	"	"	"	"	"	"
					"	"	"	"	"	"	"	"	"	"	"
"	Flange	"	"	"	"	"	"	"	"	"	"	"	"	L SP	
	-041				"	"	"	"	"	"	"	"	"	"	"
	-051				"	"	"	"	"	"	"	"	"	"	"
"	Bracket	"	"	"	"	"	"	"	"	"	"	"	"	L	
	-072				"	"	"	"	"	"	"	"	"	"	"
					"	"	"	"	"	"	"	"	"	"	"

DPO7 CONTACTS - 2 FORM C - Continued

1/ These relays are not recommended in critical applications or in applications where a less sensitive relay can be used.

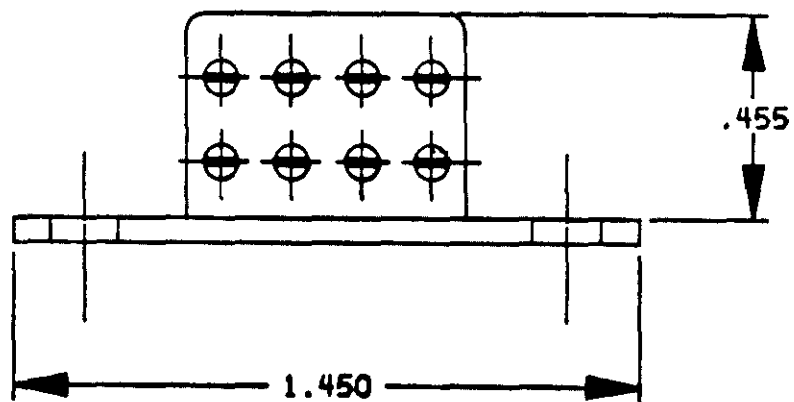
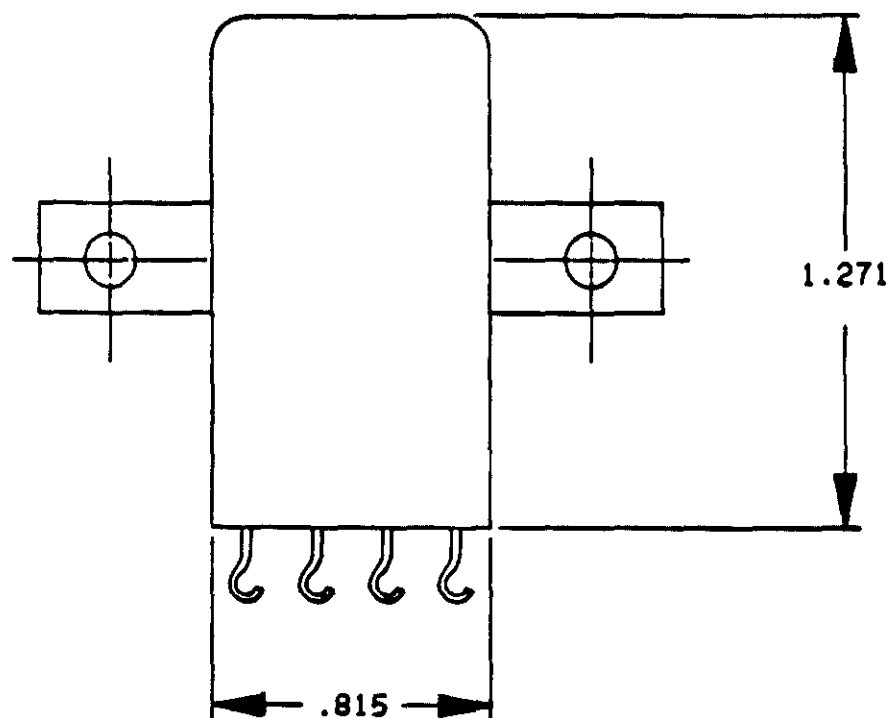
MIL-STD-1346B



INCHES	MM
.410	10.41
.810	20.70
1.271	30.73
1.45	36.83

FIGURE 305-1. Relay, EM, DPDT, 2 amperes, (sensitive, 40 milliwatts) (MIL-R-5757/13).

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BRACKET MOUNT C

FIGURE 305-1. Relay, EM, DPDT, 2 amperes, (sensitive, 40 milliwatts) (MIL-R-5757/13) - Continued.

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SUBSECTION 306

RELAYS, ELECTROMAGNETIC (EM), LATCHING, DC OPERATED

(Applicable specification: MIL-R-6106)

SCOPE: This subsection covers relays with coils dc voltage rated. Latching relays maintain their contacts in the last position assumed without the need of maintaining coil energization.

TABLE 306.1. Relays, EM, latching, dc operated, part number and characteristics - Continued.

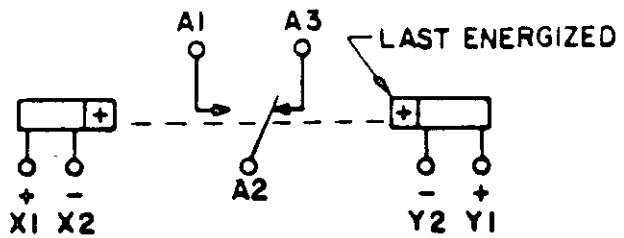
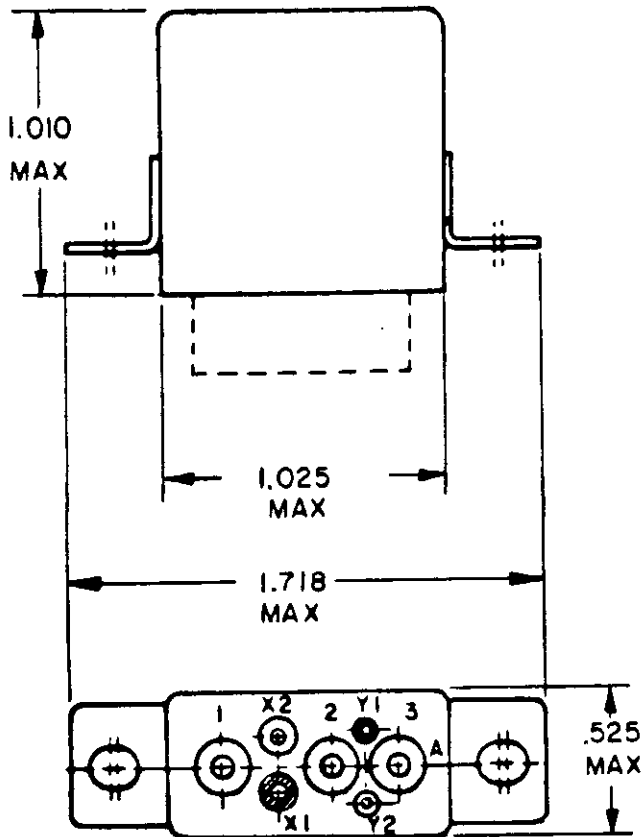
Rated coil frequency Hz	Part number	Figure Shock (see table II)	Vibration (see table III)	System voltage and frequency - contact current in amperes												Terminal style (see table IV)														
				28 V dc			400 Hz			60 Hz			115 V 1-phase				115/200 V 3-phase													
				Resistive	Inductive	Motor	Lamp	Resistive	Inductive	Motor	Lamp	Resistive	Inductive	Motor	Lamp		Resistive	Inductive	Motor	Lamp	Resistive	Inductive	Motor	Lamp						
28.0	MS25461-D1	306-9	4	10.0	6.0	4.0	2.0	10.0	4.0	2.0	10.0	4.0	2.0	10.0	4.0	2.0	6	4	3	11.5	6	4	3	11.5	6	4	3	11.5	SKP	
"	MS25468-D1	306-10	"	10.0	6.0	4.0	2.0	10.0	4.0	2.0	10.0	4.0	2.0	10.0	4.0	2.0	6	4	3	11.5	6	4	3	11.5	6	4	3	11.5	L	
"	MS25459-D1	306-11	"	5.0	3.0	1.5	0.8	5.0	3.0	1.5	0.8	5.0	3.0	1.5	0.8	---	---	4	2	1	0.6	---	---	---	---	---	---	---	---	SKP
"	MS25467-D1	306-12	"	5.0	3.0	1.5	0.8	5.0	3.0	1.5	0.8	---	---	---	---	---	4	2	1	0.6	---	---	---	---	---	---	---	---	L	
"	MS27745																													
"	-1	306-13	9	10.0	8.0	4.0	2.0	10.0	8.0	4.0	2.0	10.0	8.0	4.0	2.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	L
"	-2	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	SKP	
"	-5	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	SKP	
"	MS106/39																												L	
"	-001	306-18	See spec	5	3	2	1	5	5	3	1	5	5	3	1	"	"	"	"	"	"	"	"	"	"	"	"	"	L	
"	-002	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	SKP	
"	-003	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	SP	
4PDT CONTACTS - 4 FORM C																6PDT CONTACTS - 6 FORM C														
28.0	MS25463-D1	306-14	4	5.0	3.0	1.5	0.8	5.0	3.0	1.5	0.8	---	---	---	---	---	4	.2	1	0.6	---	---	---	---	---	---	---	---	SKP	
28.0	MS25469-D1	306-15	4	5.0	3.0	1.5	0.8	5.0	3.0	1.5	0.8	---	---	---	---	---	4	.2	1	0.6	---	---	---	---	---	---	---	---	L	

1/ This relay is designed for load transfer; other relays should not be used to transfer loads. See spec sheet for load transfer ratings.

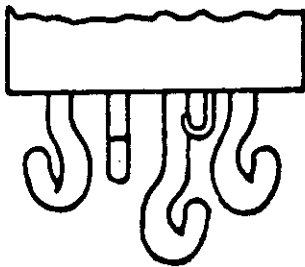
2/ Operating temperature range -55°C to 71°C.

3/ With coil transient suppression.

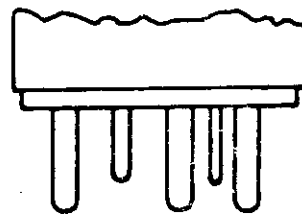
MIL-STD-1346B



CIRCUIT DIAGRAM
(POLARIZED BISTABLE)



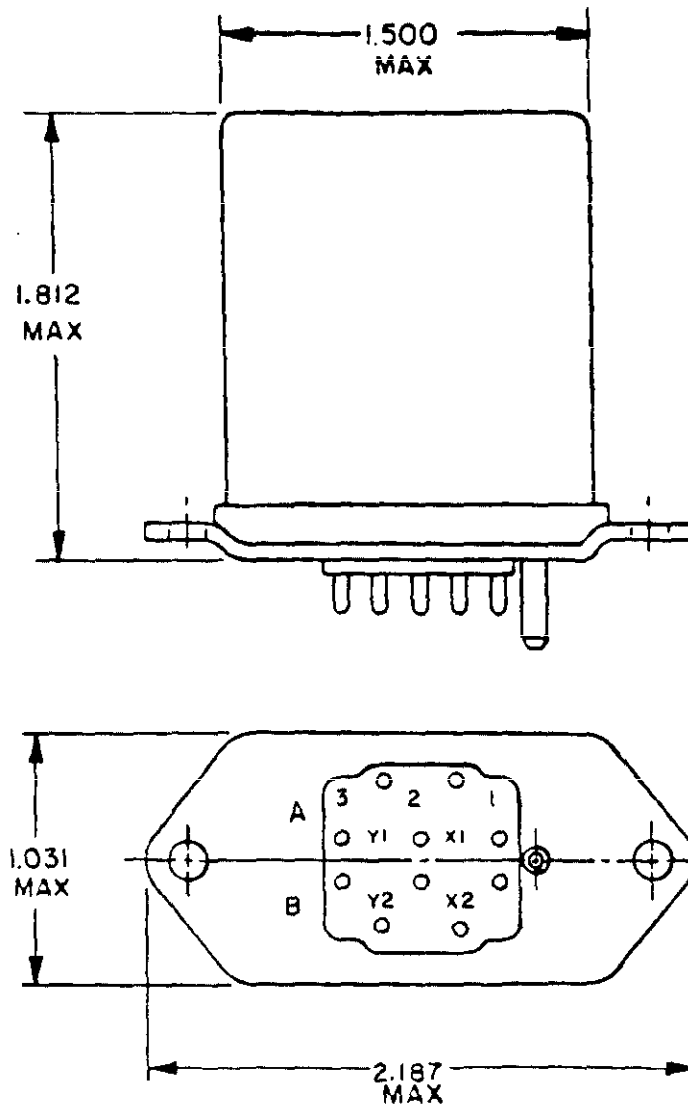
SOLDER HOOK TERMINAL
FOR -001



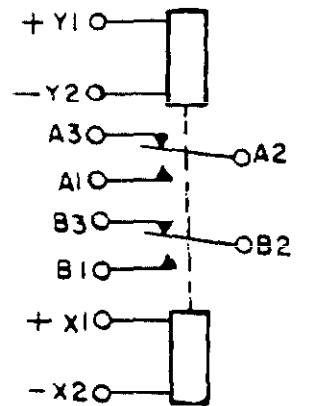
PLUG-IN TERMINAL
FOR -002

INCHES	MM
.525	13.34
1.010	25.65
1.025	26.04
1.718	43.64

FIGURE 306-1. Relay, EM, latch, SPDT, 25 amperes (MIL-R-6106/20).



INCHES	MM
1.031	26.19
1.500	38.10
1.812	46.02
2.187	55.55

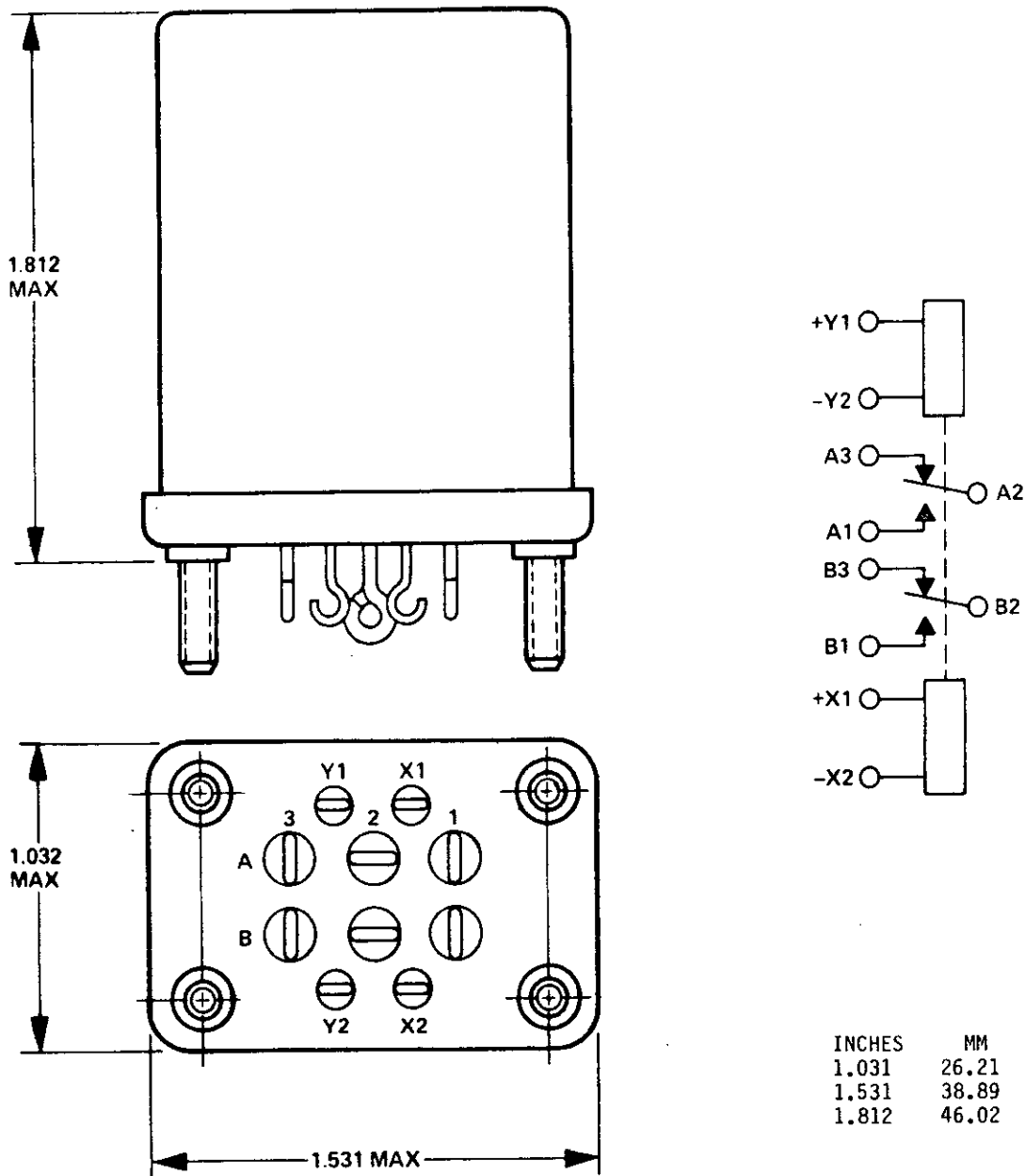


CIRCUIT DIAGRAM

To close No. 1 contacts energize X1 and X2
 To close No. 3 contacts energize Y1 and Y2

FIGURE 306-2. Relay, EM, latch, DPDT, 10 amperes (MS25457).

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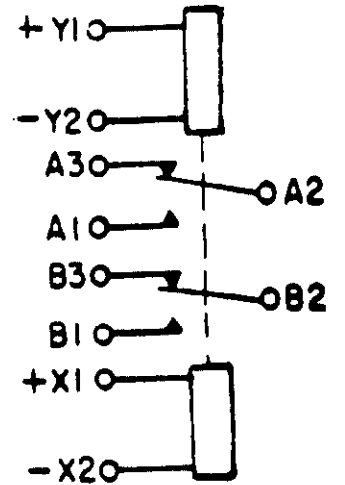
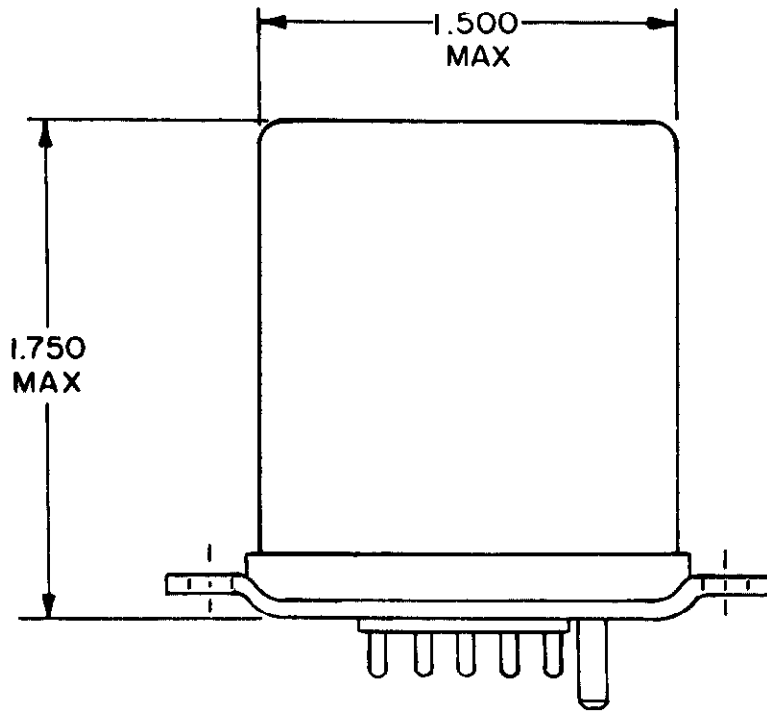


INCHES	MM
1.031	26.21
1.531	38.89
1.812	46.02

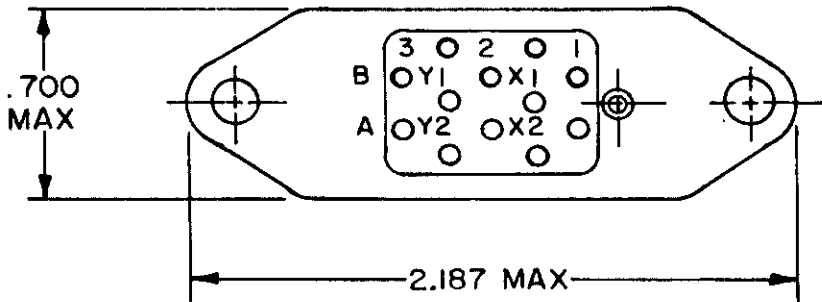
To close No. 1 contacts energize X1 and X2
 To close No. 3 contacts energize Y1 and Y2

FIGURE 306-3. Relay, EM, latch, DPDT, 10 amperes (MS25466).

MIL-STD-1346B



CIRCUIT DIAGRAM

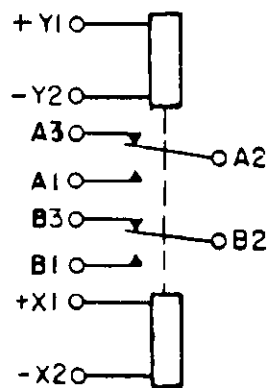
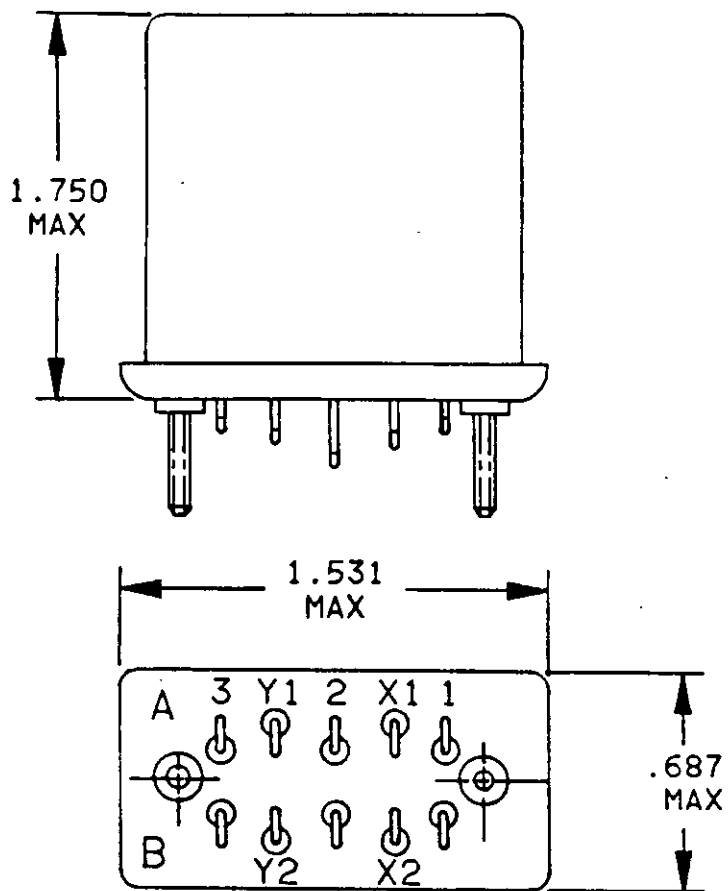


INCHES	MM
.700	17.78
1.500	38.10
1.750	44.45
2.187	55.55

To close No. 1 contacts energize X1 and X2
 To close No. 3 contacts energize Y1 and Y2

FIGURE 306-4. Relay, EM, latch, DPDT, 5 amperes (MS25455).

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CIRCUIT DIAGRAM

To close No. 1 contacts energize X1 and X2
To close No. 3 contacts energize Y1 and Y2

INCHES	MM
.687	17.45
1.531	38.89
1.750	44.45

FIGURE 306-5. Relay, EM, latch, DPDT, 5 amperes (MS25465).

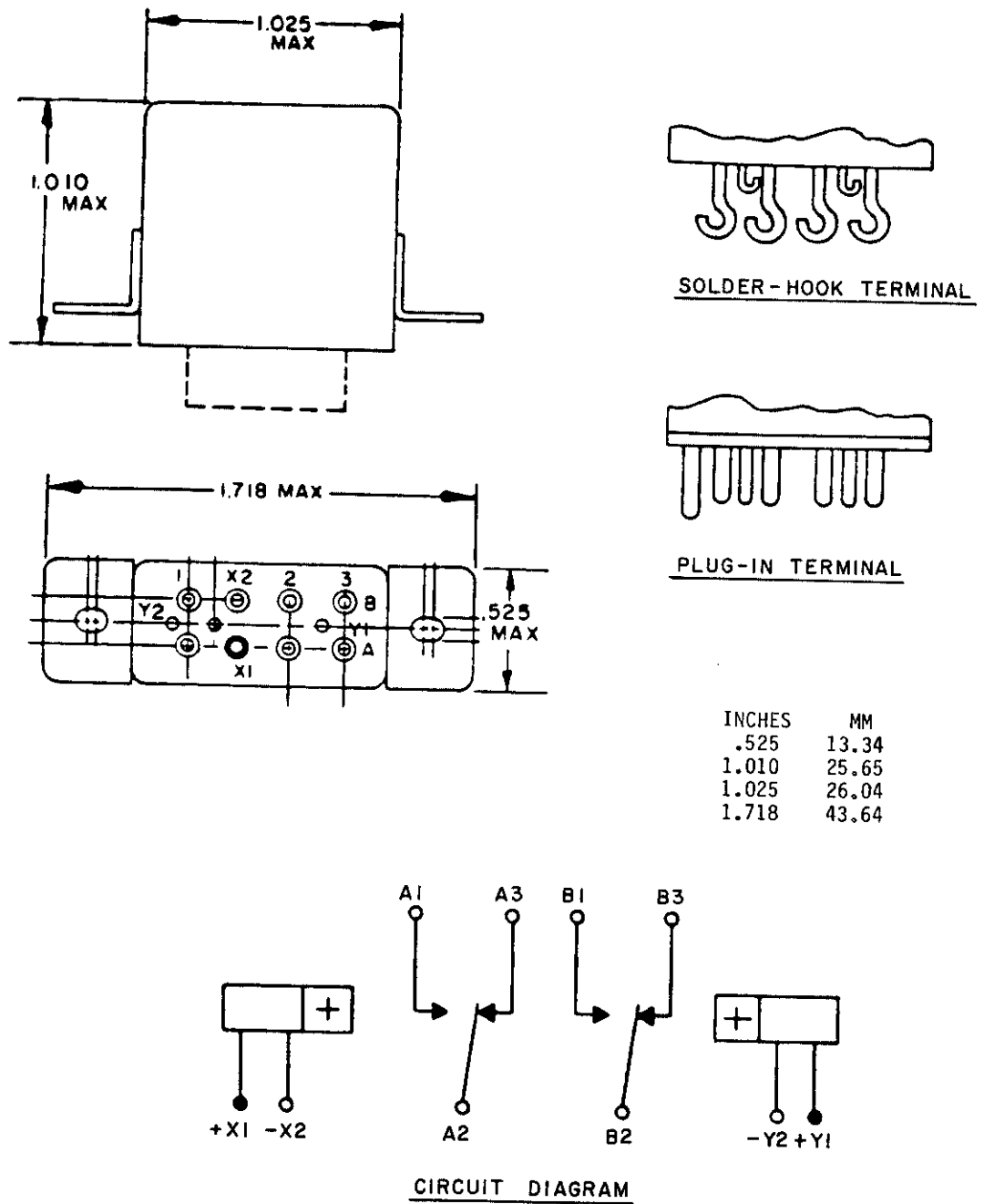
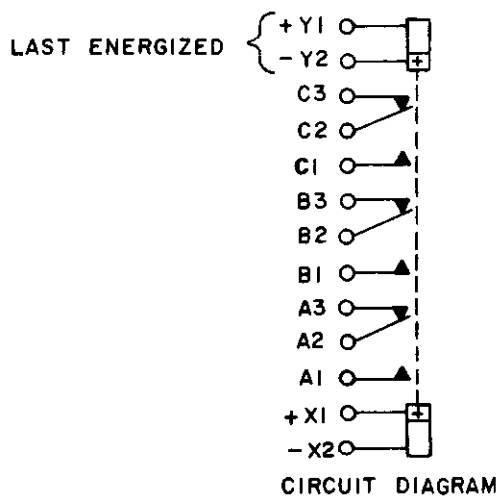
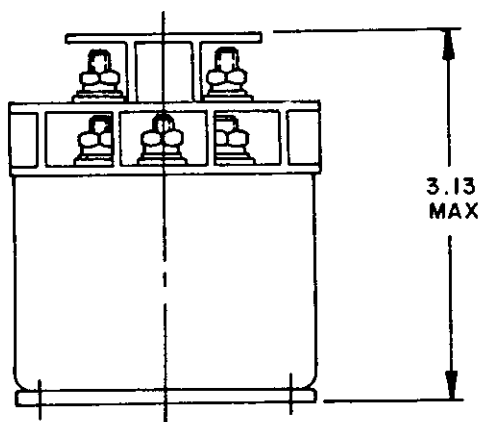
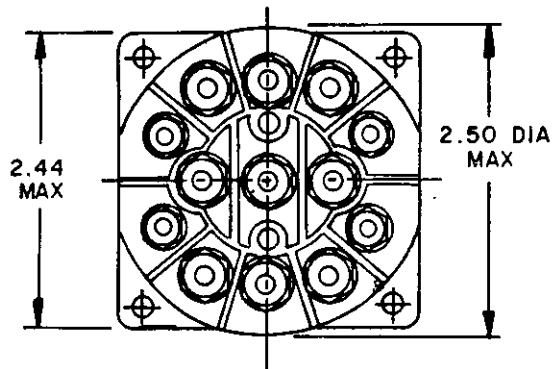


FIGURE 306-6. Relay, EM, latch, DPDT, 10 amperes (MS27744).

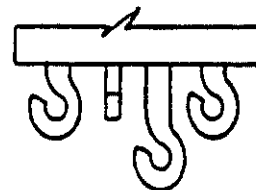
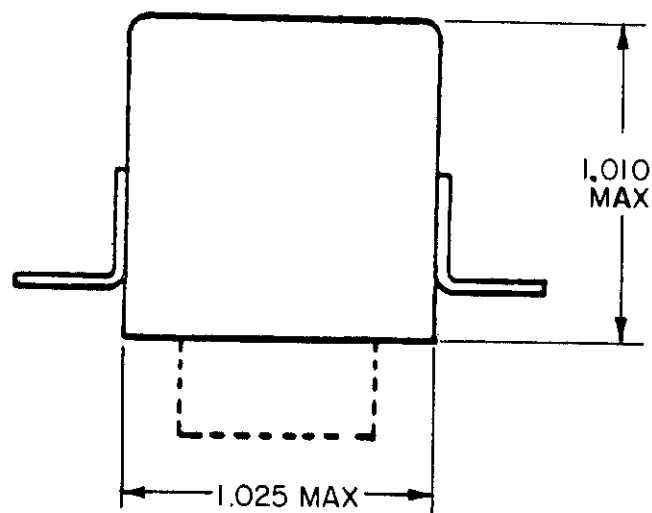
MIL-STD-1346B



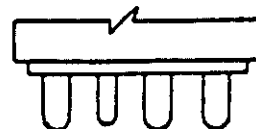
INCHES	MM
2.44	61.98
2.50	63.50
3.13	79.50

FIGURE 306-7. Relay, EM, latch, 3PDT, 50 amperes (MS27749).

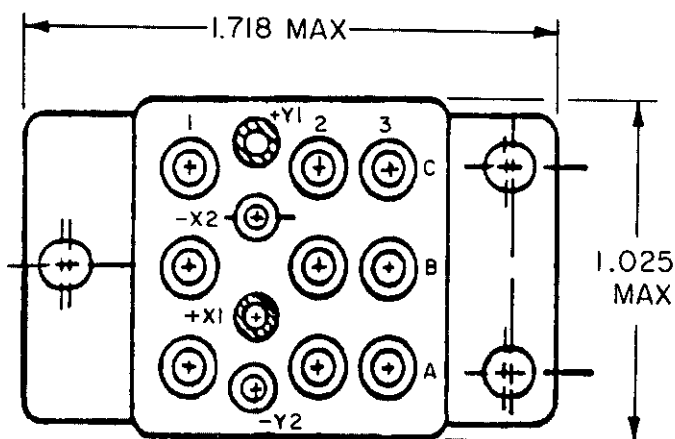
MIL-STD-1346B



SOLDER-HOOK TERMINAL



PLUG-IN TERMINAL



INCHES	MM
1.010	25.65
1.025	26.04
1.718	43.64

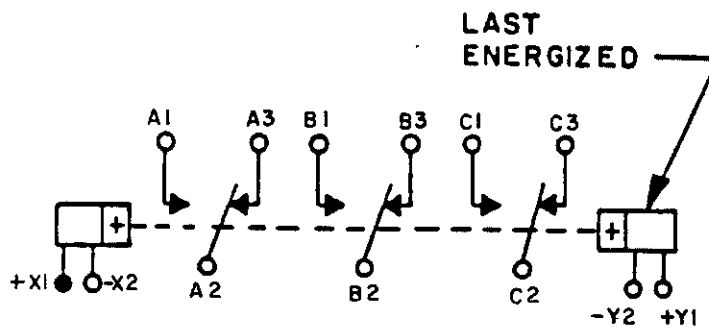
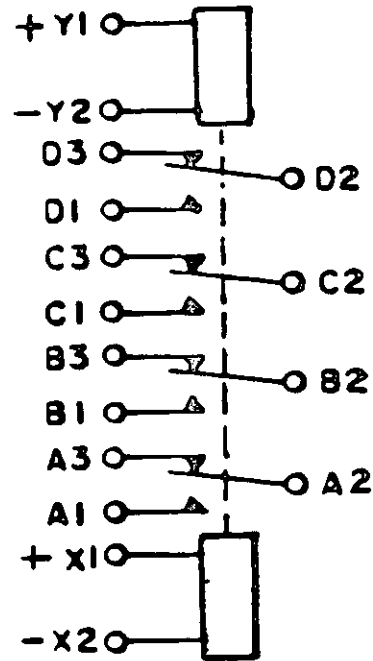
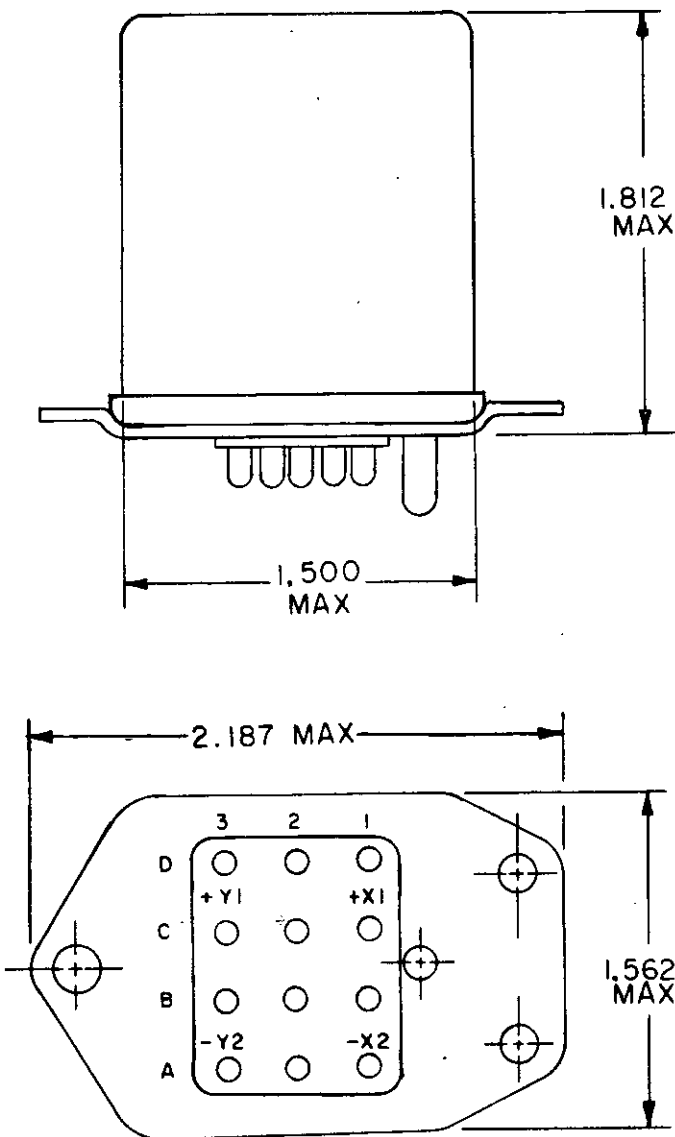


FIGURE 306-8. Relay, EM, latch, 3PDT, 25 amperes (MS27742).

MIL-STD-1346B



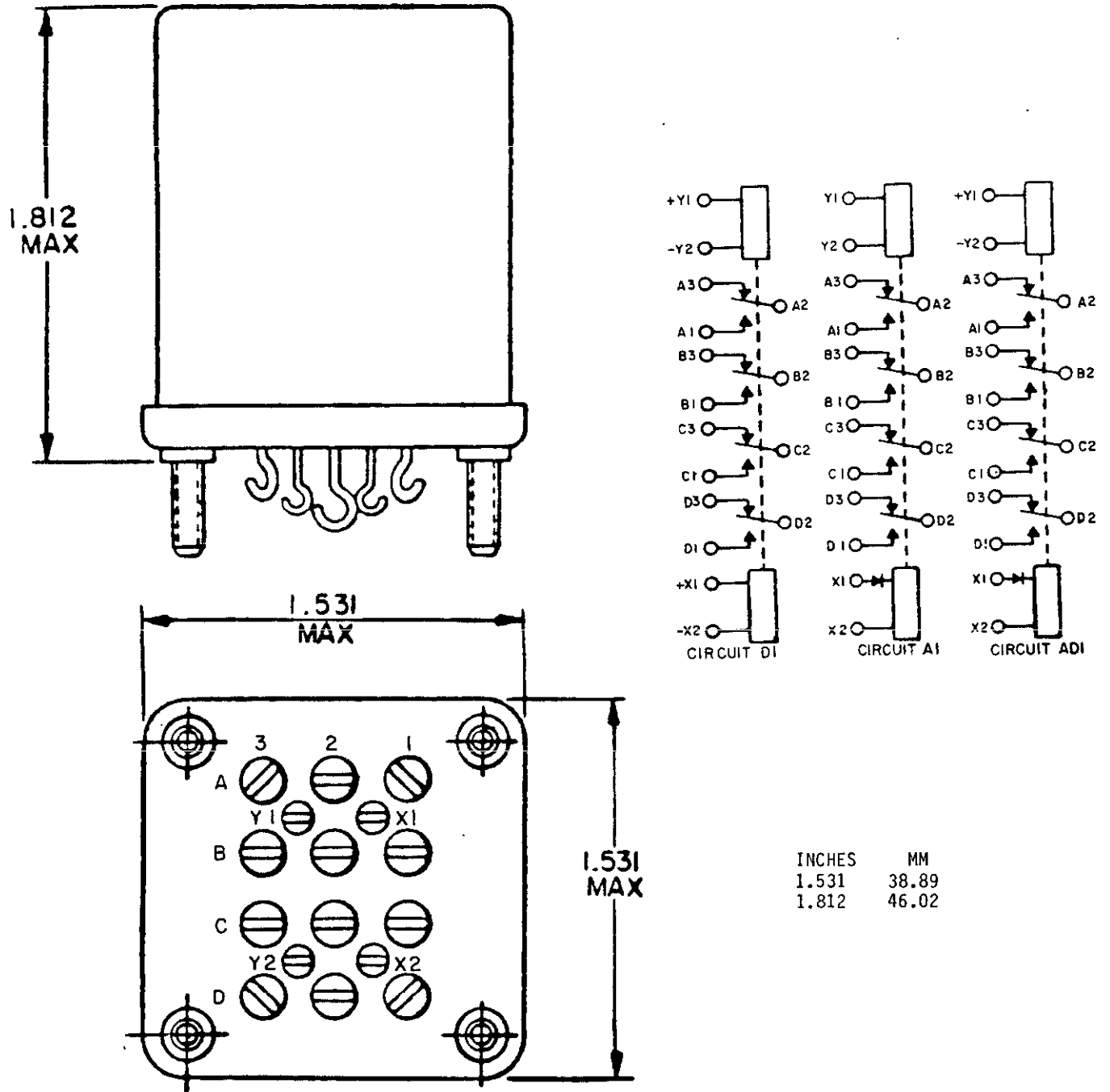
CIRCUIT DIAGRAM

INCHES	MM
1.500	38.10
1.562	39.67
1.812	46.02
2.187	55.55

To close No. 1 contacts energize X1 and X2
 To close No. 3 contacts energize Y1 and Y2

FIGURE 306-9. Relay, EM, latch, 4PDT, 10 amperes (MS25461).

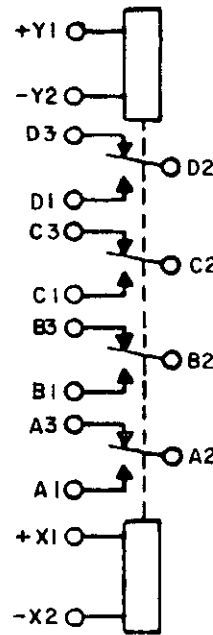
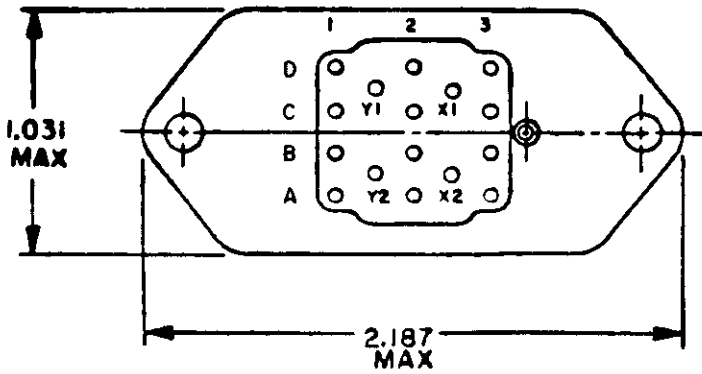
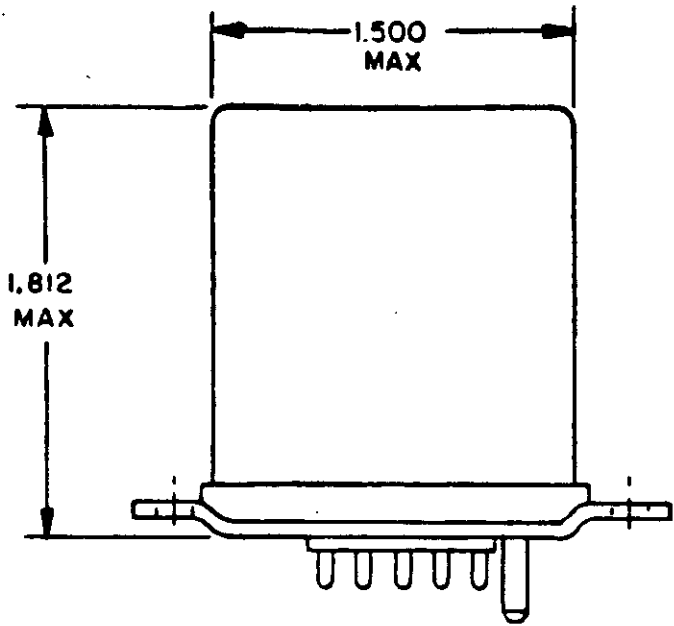
MIL-STD-1346B



To close No. 1 contacts energize X1 and X2
 To close No. 3 contacts energize Y1 and Y2

FIGURE 306-10. Relay, EM, latch, 4PDT, 10 amperes (MS25468).

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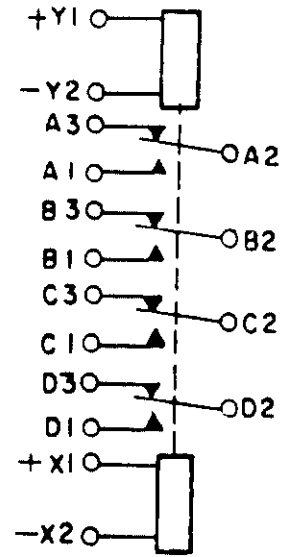
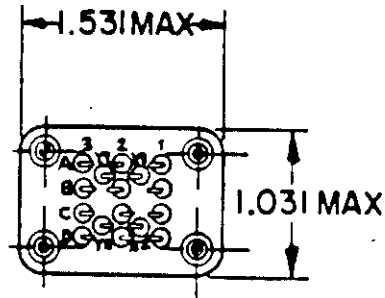
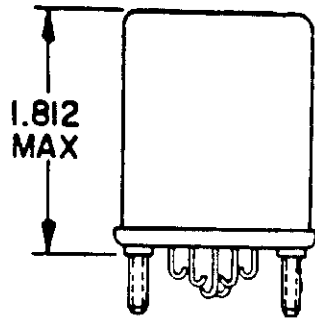
CIRCUIT DIAGRAM

To close No. 1 contacts energize X1 and X2
 To close No. 3 contacts energize Y1 and Y2

INCHES	MM
1.031	26.19
1.500	38.10
1.812	46.02
2.187	55.55

FIGURE 306-11. Relay, EM, latch, 4PDT, 5 amperes (MS25459).

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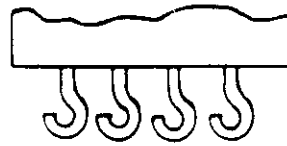
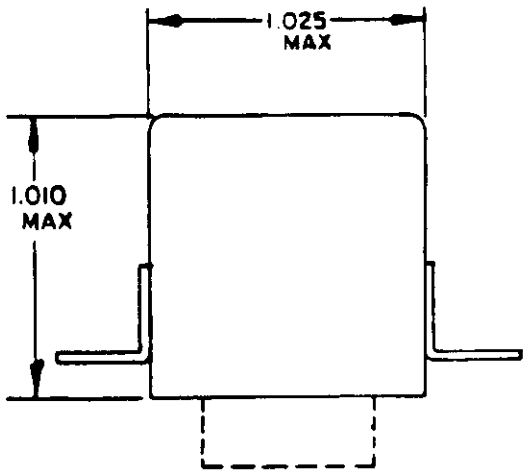
CIRCUIT DIAGRAM

TO CLOSE NO. 1 CONTACTS ENERGIZE X1 AND X2
TO CLOSE NO. 3 CONTACTS ENERGIZE Y1 AND Y2

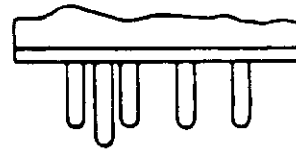
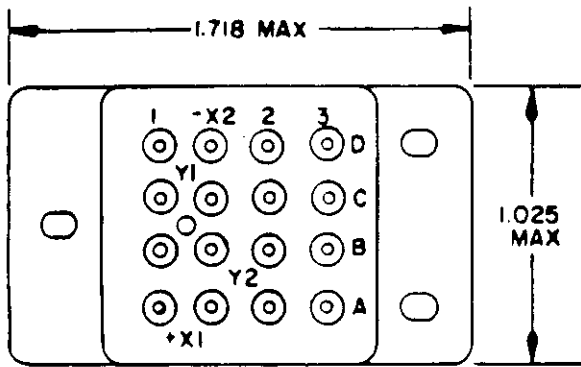
INCHES	MM
1.031	26.19
1.531	38.89
1.812	46.02

FIGURE 306-12. Relay, EM, latch, 4PDT, 5 amperes (MS25467).

MIL-STD-1346B

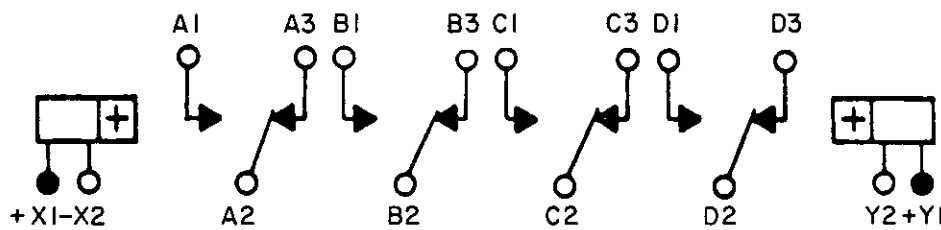


SOLDER-HOOK TERMINAL



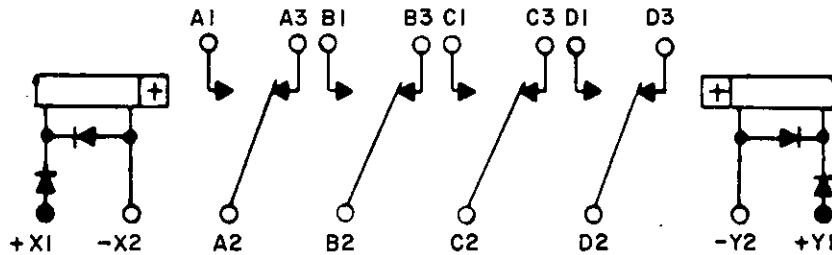
PLUG IN TERMINAL

INCHES	MM
1.010	25.65
1.025	26.04
1.718	43.64



CIRCUIT DIAGRAM - 1-2-3-4

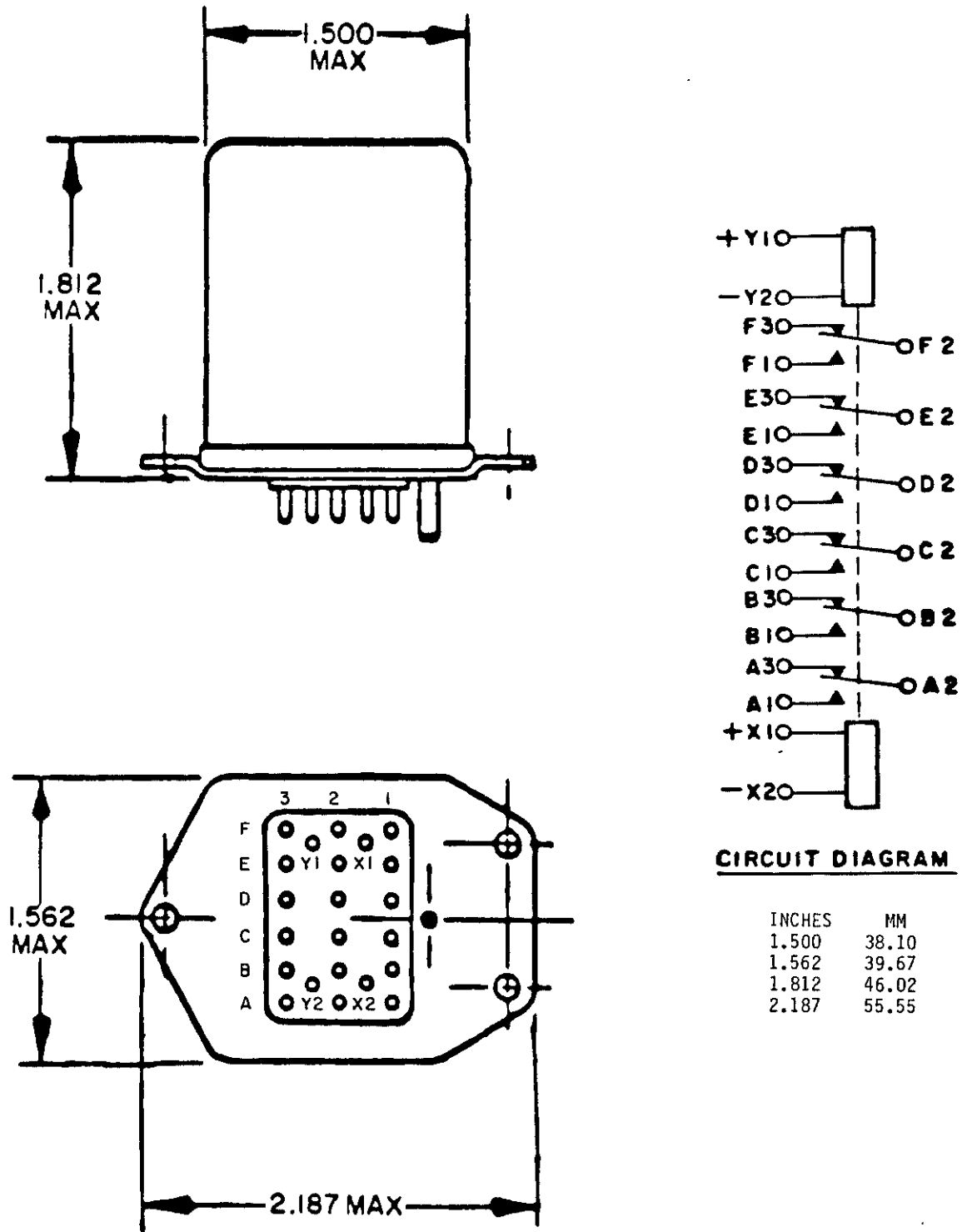
TO CLOSE NO. 1 CONTACTS (OPERATE)
ENERGIZE X1 AND X2
TO CLOSE NO. 3 CONTACTS (RESET)
ENERGIZE Y1 AND Y2



CIRCUIT DIAGRAM - 5

WHEN ENERGIZED WITH POLARITY INDICATED CONTACTS
WILL TRANSFER

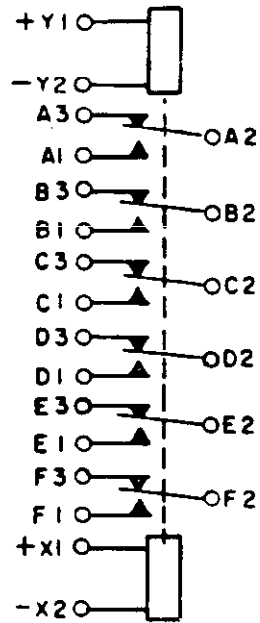
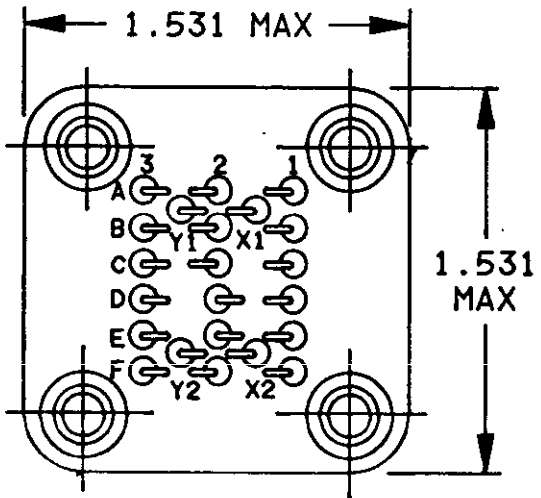
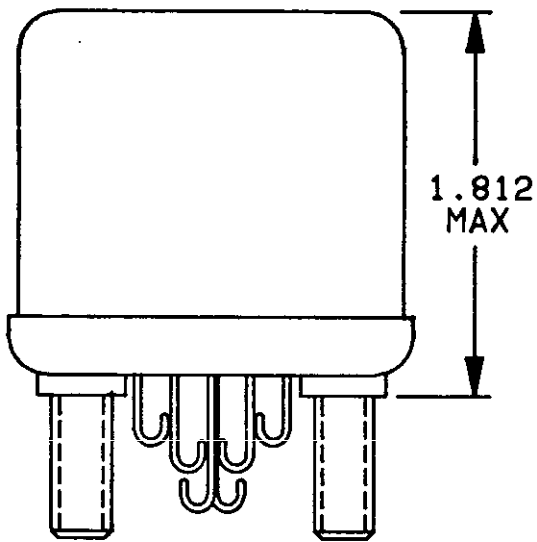
FIGURE 306-13. Relay, EM, latch, 4PDT, 10 amperes (MS27745).



To close No. 1 contacts energize X1 and X2
 To close No. 3 contacts energize Y1 and Y2

FIGURE 306-14. Relay, EM, latch, 6PDT, 5 amperes (MS25463).

MIL-STD-1346B



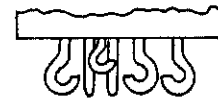
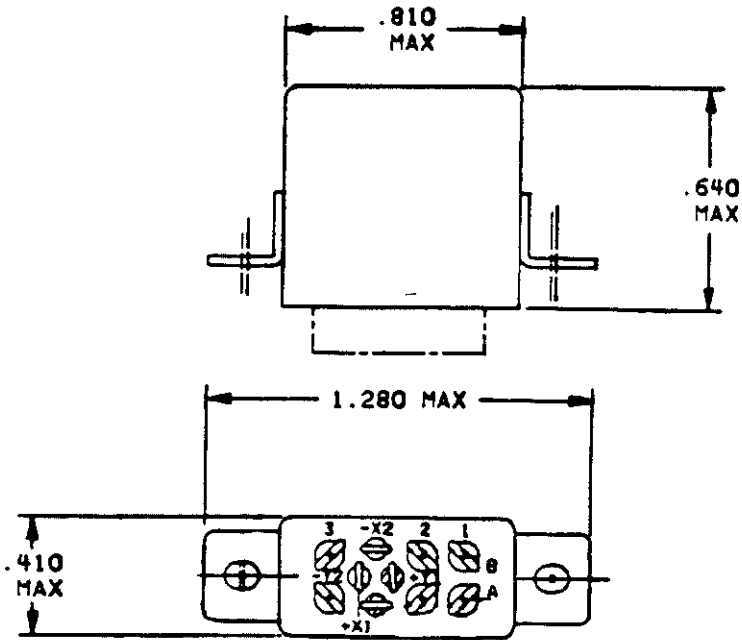
CIRCUIT DIAGRAM

INCHES	MM
1.531	38.89
1.812	46.02

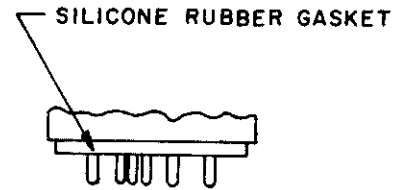
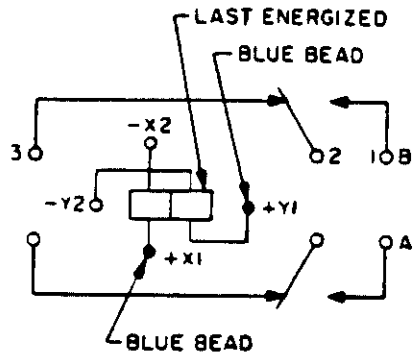
To close No. 1 contacts energize X1 and X2
 To close No. 3 contacts energize Y1 and Y2

FIGURE 306-15. Relay, EM, latch, 6PDT, 5 amperes (MS25469).

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SOLDER HOOK FOR -001

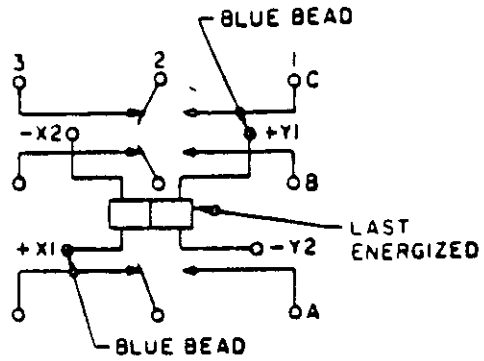
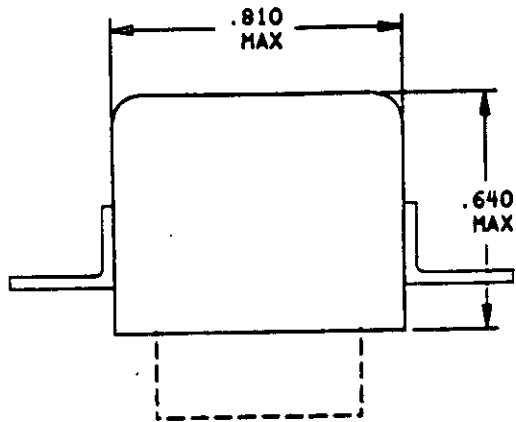


SOCKET PIN FOR -002

INCHES	MM
.410	10.41
.640	16.26
.810	20.57
1.280	32.51

FIGURE 306-16. Relay, EM, latch, low level to 5 amperes, DPDT (MIL-R-6106/38).

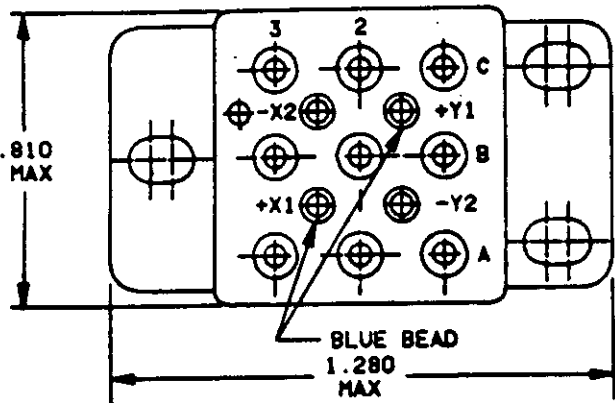
MIL-STD-1346B



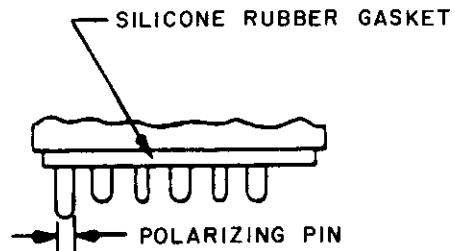
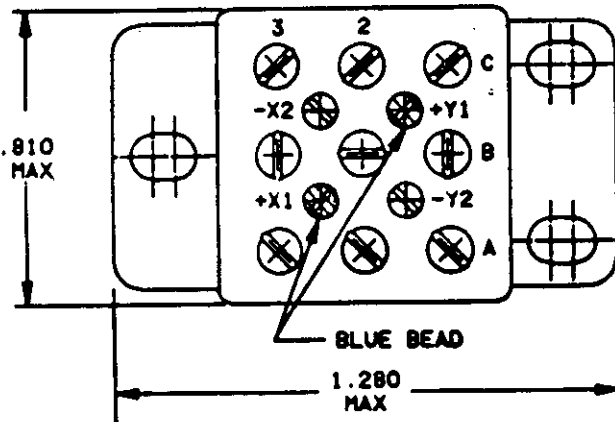
CIRCUIT DIAGRAM

TO CLOSE NO.1 CONTACTS (OPERATE)
ENERGIZE X1 AND X2

TO CLOSE NO.3 CONTACTS (RESET)
ENERGIZE Y1 AND Y2



SOLDER HOOK FOR -001



SOCKET PIN FOR -002

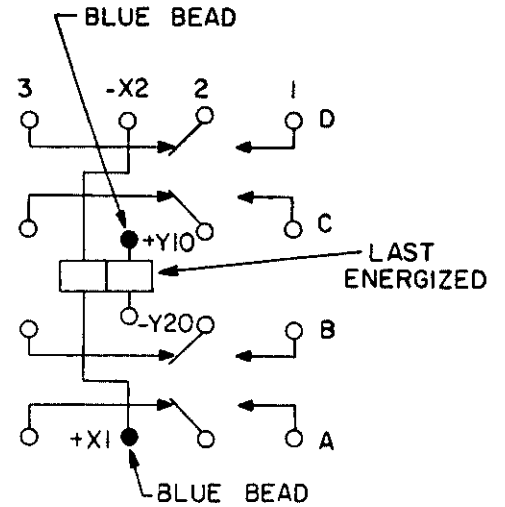
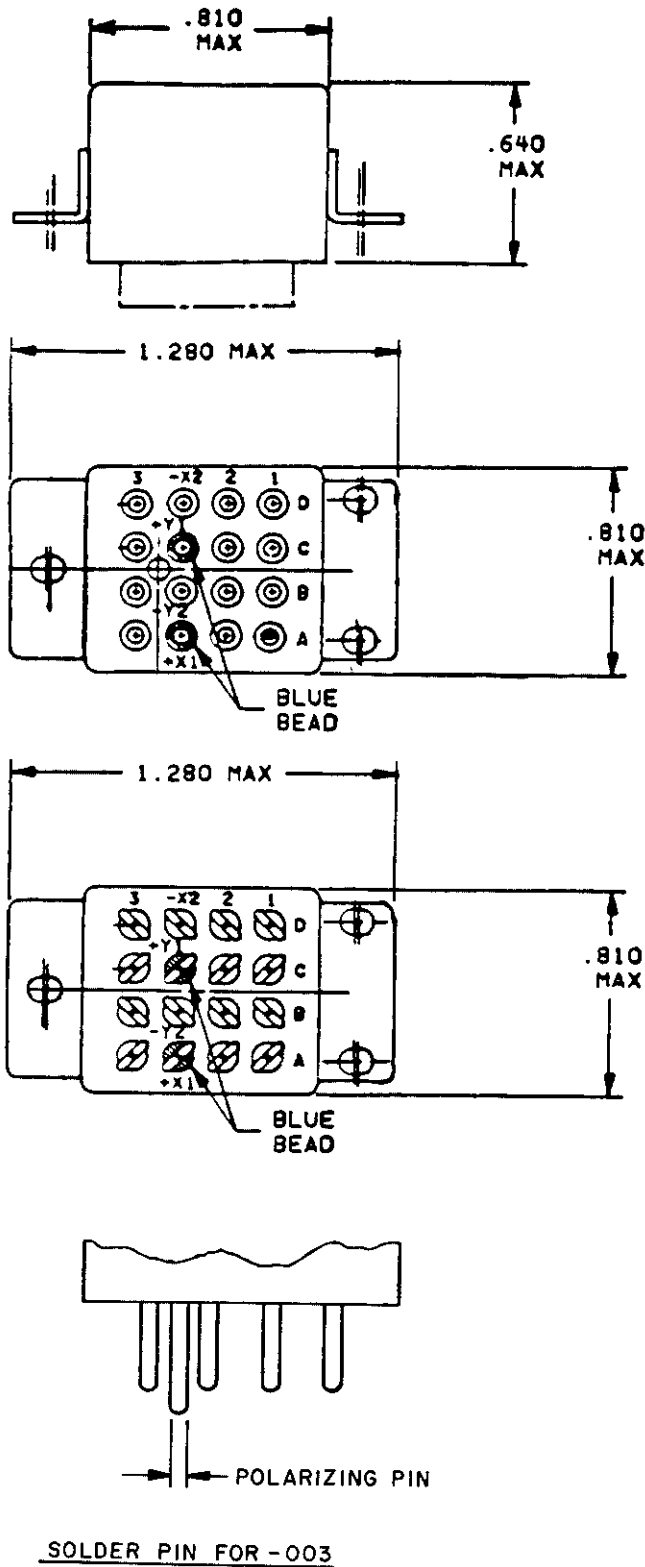
-001 SOLDER HOOK



SOLDER PIN FOR -003

INCHES	MM
.640	16.26
.810	20.57
1.280	32.51

FIGURE 306-17. Relay, EM, latch, low level to 10 amperes, 3PDT, (MIL-R-6106/40).



CIRCUIT DIAGRAM
 TO CLOSE NO. 1 CONTACTS (OPERATE)
 ENERGIZE XI AND X2
 TO CLOSE NO. 3 CONTACTS (RESET)
 ENERGIZE Y1 AND Y2

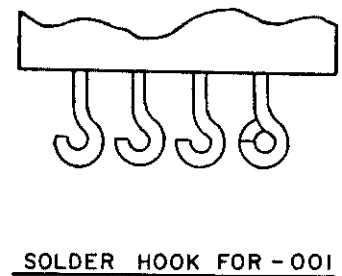
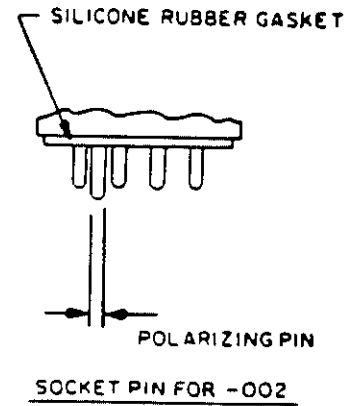
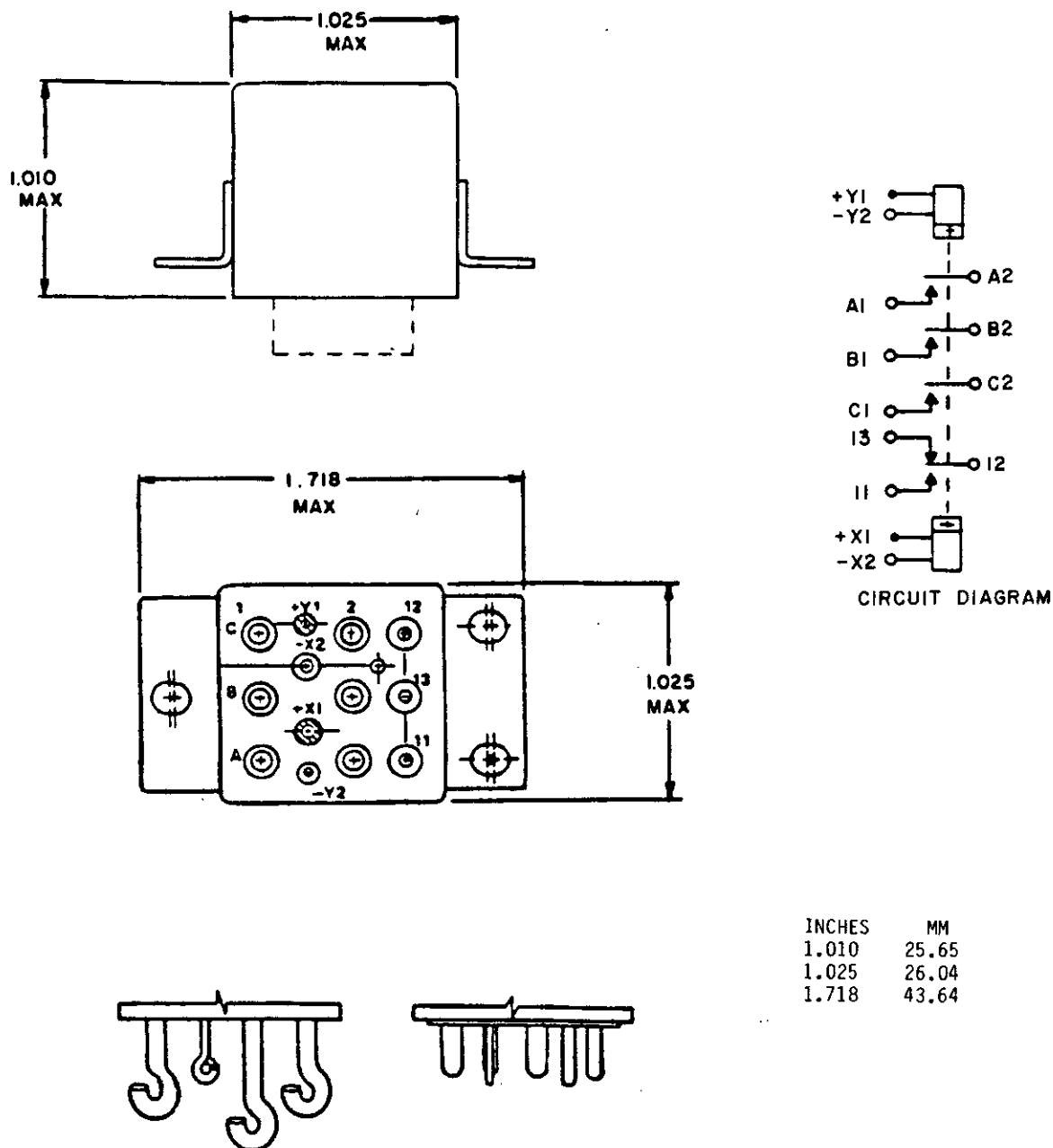


FIGURE 306-18. Relay, EM, latch, low level to 5 amperes, 4PDT, (MIL-R-6106/39).

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INCHES	MM
1.010	25.65
1.025	26.04
1.718	43.64

FIGURE 306-19. Relay, EM, latch, 25 ampere, 3PNO with 2 ampere SPDT auxiliary contacts (MIL-R-6106/12).

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SUBSECTION 307

RELAYS, ELECTROMAGNETIC (EM), LATCHING, AC OPERATED

(Applicable specification: MIL-R-6106)

SCOPE: This subsection covers relays with coils ac voltage rated. Latching relays maintain their contacts in the last position assumed without the need of maintaining coil energization.

SUBSECTION 307

RELAYS, ELECTROMAGNETIC (EM), LATCHING, AC OPERATED

(Applicable specification: MIL-R-6106)

Duty cycle: Continuous
 Enclosure: Hermetically sealed
 Latch and reset rated coil voltage: 115 V 400 Hz
 Operating temperature range: B (see table I)
 Shock: 3 (see table II)
 Vibration: 4 (see table III)

TABLE 307.1. Relays, EM, latching, ac operated, part numbers and characteristics.

Part number	System voltage and frequency-contact current in amperes															
	28 V dc		115 V 1 phase			115/200 V 3 phase			115 V 1-phase			115/200 V 3 phase				
	Resis- tive	Induc- tive	Lamp	Induc- tive	Resis- tive	Induc- tive	Lamp	Induc- tive	Resis- tive	Induc- tive	Lamp	Induc- tive	Resis- tive	Induc- tive	Lamp	
DPDT CONTACTS - 2 FORM C																
MS25457-A1	10	6	4	2	10	10	4	2	10	10	4	2	6	4	3	1.5
MS25466-A1	10	6	4	2	10	10	4	2	10	10	4	2	6	4	3	1.5
MS25458-A1	5	3	1.5	1.8	5	3	1.5	1.8	5	3	1.5	1.8	4	2	1	.6
MS25465-A1	5	3	1.5	1.8	5	3	1.5	1.8	5	3	1.5	1.8	4	2	1	.6
MS27744																
-3 I/	10	8	4	2	10	8	4	2	10	8	4	2	4	2	---	---
-4 I/	10	8	4	2	10	8	4	2	10	8	4	2	4	2	---	---
4PDT CONTACTS - 4 FORM C																
MS25461-A1	10	6	4	2	10	10	4	2	10	10	4	2	6	4	3	1.5
MS25468-A1	10	6	4	2	10	10	4	2	10	10	4	2	6	4	3	1.5
MS25459-A1	5	3	1.5	1.8	5	3	1.5	1.8	5	3	1.5	1.8	4	2	1	.6
MS25467-A1	5	3	1.5	1.8	5	3	1.5	1.8	5	3	1.5	1.8	4	2	1	.6
MS27745																
-3 I/	10	8	4	2	10	8	4	2	10	8	4	2	4	2	---	---
-4 I/	10	8	4	2	10	8	4	2	10	8	4	2	4	2	---	---
6PDT CONTACTS - 6 FORM C																
MS25463-A1	5	3	1.5	1.8	5	3	1.5	1.8	5	3	1.5	1.8	4	2	1	.6
MS25469-A1	5	3	1.5	1.8	5	3	1.5	1.8	5	3	1.5	1.8	4	2	1	.6

1/ For shock, vibration and operating temperature range, see spec.

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SUBSECTION 308

RELAYS, ELECTROMAGNETIC (EM), LATCHING, DC/AC OPERATED

(Applicable specification: MIL-R-6106)

SCOPE: This subsection covers relays with one coil dc voltage rated and the other coil ac voltage rated. Latching relays maintain their contacts in the last position assumed without the need of maintaining coil energization.

SUBSECTION 308

RELAYS, ELECTROMAGNETIC (EM), LATCHING, DC/AC OPERATED

(Applicable specification: MIL-R-6106)

- Duty cycle: Continuous
- Enclosure: Hermetically sealed
- Rated coil voltage: 28 V dc, 115 V 400 Hz
- Operating temperature range: B (see table I)
- Shock: 3 (see table II)
- Vibration: 4 (see table III)

TABLE 308.I. Relays, EM, latching, dc/ac operated, part number and characteristics.

Part number	Figure number	Latching voltage dc	System voltage and frequency - Contact current in amperes																								
			28 V dc			115 V 1 phase			115/200 V 3 phase			115 V 1 phase			115/200 V 3 phase												
			Resistive	Inductive	Motor	Resistive	Inductive	Motor	Resistive	Inductive	Motor	Resistive	Inductive	Motor	Resistive	Inductive	Motor										
MS25468-AD1	306-10	28	115	10	6	4	2	10	10	4	2	10	10	4	2	10	10	4	2	6	4	3	11.5	6	4	3	1.5

4PDT CONTACTS - 4 FORM C

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SECTION 400

RELAYS, SOLID STATE, FOR ELECTRONIC AND COMMUNICATION
TYPE EQUIPMENT

Section

401 Relays, solid state, for electronic and communication type equipment,
dc input.

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SUBSECTION 401

RELAYS, SOLID STATE, FOR ELECTRONIC AND COMMUNICATION
TYPE EQUIPMENT

SCOPE: This section covers solid state relays in which the specified input and output switching functions are performed by semiconductor and passive circuit devices.

MIL-STD-1346B

SECTION 401

RELAYS, SOLID STATE, FOR ELECTRONIC AND COMMUNICATION
TYPE EQUIPMENT, DC INPUT

(Applicable specification: MIL-R-28750)

TABLE 401.I Relays, solid state, for electronic and communications type equipment,
dc input, part numbers and characteristics.

Part number <u>1/</u>	Figure number	Operating temperature range (see table I)	Shock (see table II)	Vibration (see table III)	Input data	Output data	Terminals
M28750/5							
-001Z	401-1	J	1	6	4.0 to 7.0 V dc	<u>3/</u>	WL
M28750/6							
-001Z	"	"	"	"	"	"	WL
M28750/7							
-001Z	"	"	"	"	"	"	WL
M28750/9							
-001Z	401-2	-55 to +110°C	<u>2/</u>	"	3.8 to 32.0 V dc	"	L
M28750/10							
-001Z	401-3	"	1	"	4.0 to 32.0 V dc	"	L
-002Z	401-3	"	1	"	4.0 to 32.0 V dc	"	L

1/ Complete part number shall include a "W", "Y" or "X" to indicate applicable screening level.2/ MIL-STD-202, method 213, test condition I (100 G).3/ For rated output current versus input voltage and temperature see applicable specification.

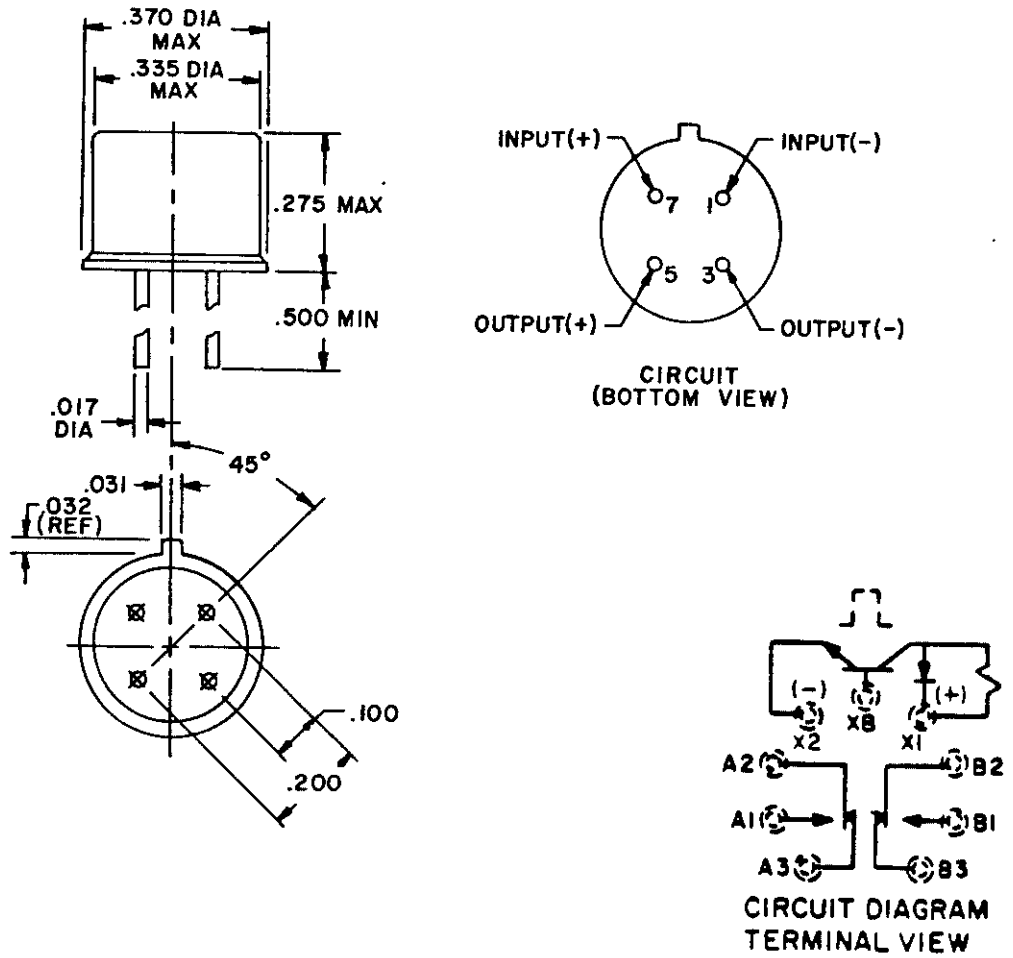


FIGURE 401-1. Relay, solid state, signal switching (MIL-R-28750/5 thru MIL-R-28750/7).

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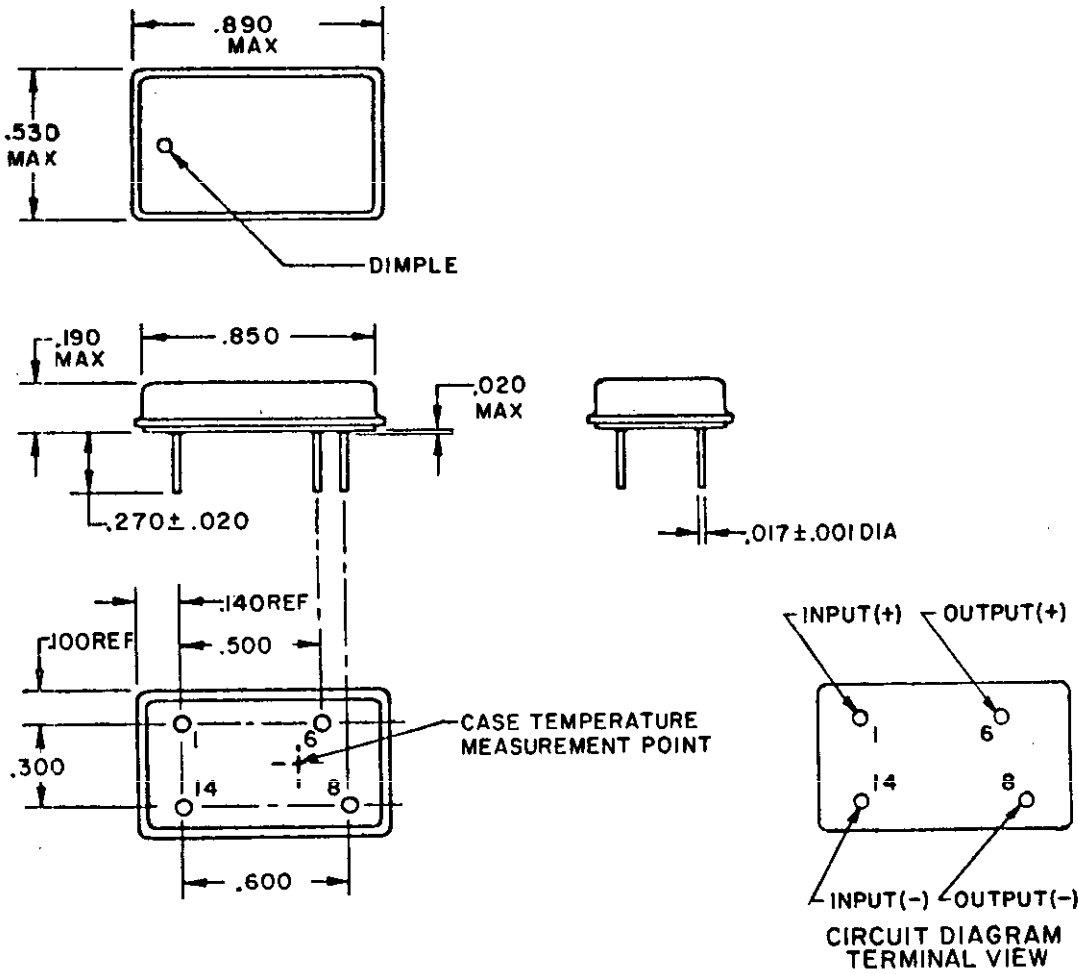


FIGURE 401-2. Relay, solid state, power switching (MIL-R-28750/9).

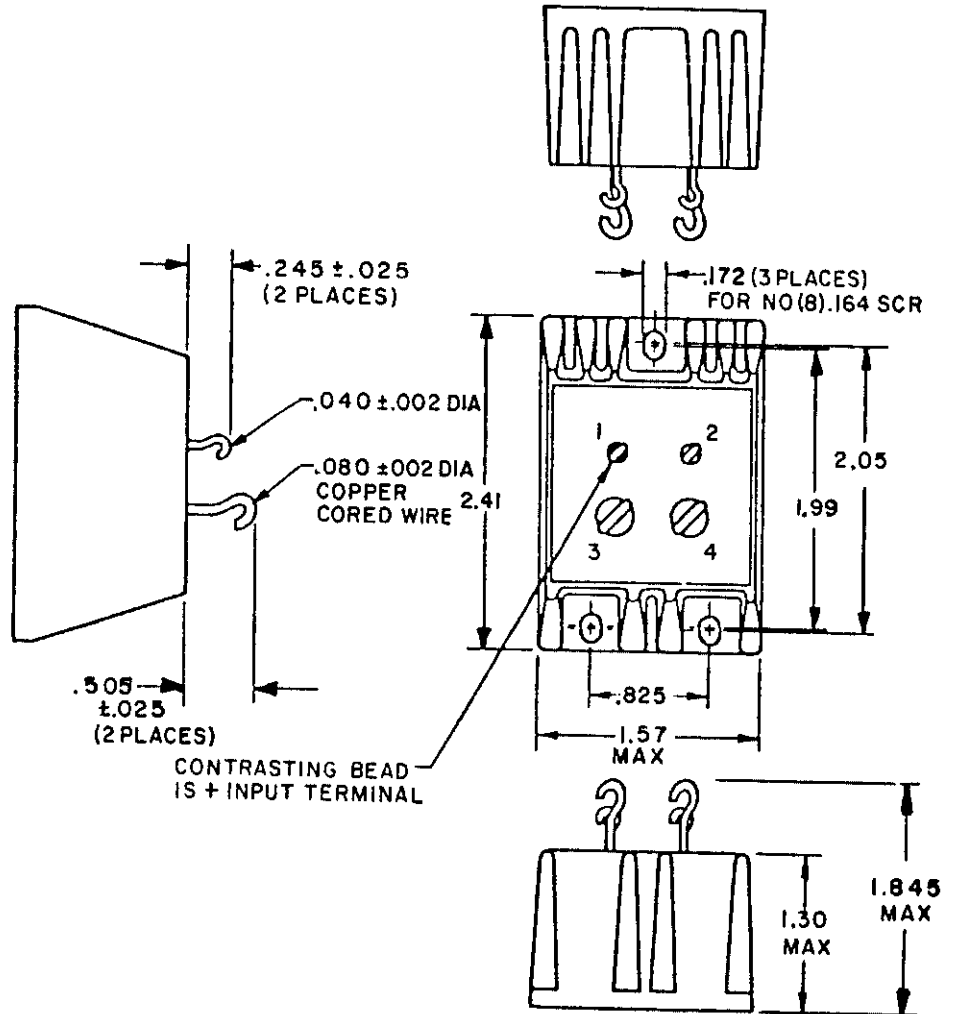


FIGURE 401-3. Relay, solid state, sealed, power switching (MIL-R-28750/10).

SECTION 500

RELAYS, REED

Section

501 Relays, dry reed

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SECTION 501

RELAYS, DRY REED

SCOPE: This section covers relays consisting of one or more reed switch capsules and one or more coils.

NOTE: As of this date, no selected standard dry reed relays have been established.

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SECTION 600

RELAYS, TIME DELAY

(Applicable specification: MIL-R-83726)

Section

601 Relays, time delay, hybrid

602 Relays, time delay, solid state

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SECTION 601

RELAYS, TIME DELAY,

HYBRID

(Applicable specification: MIL-R-83726)

SCOPE: This section covers time delay relays in which the specified time delay interval is obtained through the use of hybrid circuitry.

SECTION 601

RELAYS, TIME DELAY

(Applicable specification: MIL-R-83726)

Duty cycle: Continuous

TABLE 601.1. Relays, time delay, hybrid, part numbers and characteristics.

Rated input dc voltage	Part number M83726/	Figure Shock (see table II)	Vibration (see table III)	Time delay (seconds) ±10%	Contact data										Recycle time in minutes (see table IV)		
					28 V dc		115/200 V 1 & 3 phase 400 Hz		115 V 1-phase 60 to 400 Hz		Resistive		Inductive			Lamp	
					On operate	Release	On operate	Release	On operate	Release	On operate	Release	On operate	Release			
18 to 31	601-1	1	7	.060	2	1	---	.1	.3	---	.1	.3	.1	.3	.1	2/50	
"	-1000	"	"	.100	"	"	"	"	"	"	"	"	"	"	"	"	"
"	-5000	"	"	.500	"	"	"	"	"	"	"	"	"	"	"	"	"
"	-7500	"	"	1.750	"	"	"	"	"	"	"	"	"	"	"	"	"
"	-1001	"	"	1	"	"	"	"	"	"	"	"	"	"	"	"	"
"	-2001	"	"	2	"	"	"	"	"	"	"	"	"	"	"	"	"
"	-3001	"	"	3	"	"	"	"	"	"	"	"	"	"	"	"	"
"	-5001	"	"	5	"	"	"	"	"	"	"	"	"	"	"	"	"
"	-7001	"	"	7	"	"	"	"	"	"	"	"	"	"	"	"	"
"	-1002	"	"	10	"	"	"	"	"	"	"	"	"	"	"	"	"
"	-1202	"	"	12	"	"	"	"	"	"	"	"	"	"	"	"	"
"	-2002	"	"	20	"	"	"	"	"	"	"	"	"	"	"	"	"
"	-3002	"	"	30	"	"	"	"	"	"	"	"	"	"	"	"	"
"	-4502	"	"	45	"	"	"	"	"	"	"	"	"	"	"	"	"
"	-6002	"	"	60	"	"	"	"	"	"	"	"	"	"	"	"	"
"	-1203	"	"	120	"	"	"	"	"	"	"	"	"	"	"	"	"
"	-1803	"	"	180	"	"	"	"	"	"	"	"	"	"	"	"	"
"	-3003	"	"	300	"	"	"	"	"	"	"	"	"	"	"	"	"
"	8-1001	601-2	"	1	"	"	"	"	"	"	"	"	"	"	"	"	2/25
"	-2001	"	"	2	"	"	"	"	"	"	"	"	"	"	"	"	"
"	-3001	"	"	3	"	"	"	"	"	"	"	"	"	"	"	"	"
"	-4001	"	"	4	"	"	"	"	"	"	"	"	"	"	"	"	"
"	-8001	"	"	8	"	"	"	"	"	"	"	"	"	"	"	"	"
"	-1002	"	"	10	"	"	"	"	"	"	"	"	"	"	"	"	"
"	-1402	"	"	14	"	"	"	"	"	"	"	"	"	"	"	"	"
"	-3002	"	"	30	"	"	"	"	"	"	"	"	"	"	"	"	"
"	-4502	"	"	45	"	"	"	"	"	"	"	"	"	"	"	"	"
"	-6002	"	"	60	"	"	"	"	"	"	"	"	"	"	"	"	"
"	-1203	"	"	120	"	"	"	"	"	"	"	"	"	"	"	"	"
"	-1803	"	"	180	"	"	"	"	"	"	"	"	"	"	"	"	"
"	-3003	"	"	300	"	"	"	"	"	"	"	"	"	"	"	"	"

See footnotes at end of table.

TABLE 601.1. Relays, time delay, hybrid, part numbers and characteristics - Continued.

Rated input dc voltage	Part number H63726/	Figure number	Shock (see table II)	Vibration (see table III)	Time delay (seconds) ±10%	Contact data															
						28 V dc				115/200 V 1 & 3 phase 400 Hz				115 V 1-phase 60 to 400 Hz				Recycle time in milliseconds (see table IV)			
						On operate	Resis- tive	Induc- tive	Lamp	On operate	Resis- tive	Induc- tive	Lamp	On operate	Resis- tive	Induc- tive	Lamp				
20 to 30	28-1001X 3/ -500X -750X 1001X -2001X -3001X -5001X -7001X -1002X -1202X -1502X -2002X -3002X -4502X -6002X -1203X -1803X -3003X	601-6	3	9	On operate 100 500 750 1 2 3 5 7 10 12 14 20 30 45 60 120 180 300	10	8	4	2	10	8	4	2	8	4	2	---	---	50	S or P	
"	29-1001X 3/ -2001X -3001X -4001X -6001X -1002X -1402X -3002X -4502X -6002X -1203X -1803X -3003X	601-7	"	"	Type 11A 1 2 3 4 8 10 14 30 45 60 120 180 300	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
"	30-1001X 3/ -500X -750X 1001X -2001X -3001X -5001X -7001X -1002X -1202X -1502X -2002X -3002X -4502X -6002X -1203X -1803X -3003X	601-8	"	"	100 500 750 1 2 3 5 7 10 12 14 20 30 45 60 120 180 300	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"

See footnotes at end of table.

TABLE 601.I. Relays, time delay, hybrid, part numbers and characteristics - Continued.

Rated input dc voltage	Part number M83726/	Figure Shock number (see table II)	Vibration (see table III)	Time delay (seconds) ±10%	Contact data										Recycle time in milliseconds (see table IV)
					28 V dc		115/200 V 1 & 3 phase 400 Hz		115 V 1-phase 60 to 400 Hz						
					On operate	Resis-Induc-Lamp	Motor	Induc-Lamp	Resis-Induc-Lamp	Induc-Lamp	Resis-Induc-Lamp	Induc-Lamp	Resis-Induc-Lamp	Induc-Lamp	
20 to 30	31-1001X 601-9	3	9	---	1	10	8	4	2	10	8	4	2	---	50
"	3/4/-2001X	"	"	---	2	"	"	"	"	"	"	"	"	"	"
"	-3001X	"	"	"	3	"	"	"	"	"	"	"	"	"	"
"	-4001X	"	"	"	4	"	"	"	"	"	"	"	"	"	"
"	-8001X	"	"	"	8	"	"	"	"	"	"	"	"	"	"
"	-1002X	"	"	"	10	"	"	"	"	"	"	"	"	"	"
"	-1202X	"	"	"	12	"	"	"	"	"	"	"	"	"	"
"	-1402X	"	"	"	14	"	"	"	"	"	"	"	"	"	"
"	-3002X	"	"	"	30	"	"	"	"	"	"	"	"	"	"
"	-4502X	"	"	"	45	"	"	"	"	"	"	"	"	"	"
"	-6002X	"	"	"	60	"	"	"	"	"	"	"	"	"	"
"	-1203X	"	"	"	120	"	"	"	"	"	"	"	"	"	"
"	-1803X	"	"	"	180	"	"	"	"	"	"	"	"	"	"
"	-3003X	"	"	"	300	"	"	"	"	"	"	"	"	"	"

1/ Add ±10 milliseconds for any timing less than one second.
 2/ See specification.
 3/ Complete part number shall consist of a "S" or "P" after the dash number to specify either solder lug or plug-in. Example: M783726/28-1000S or M83726/31-3003P.
 4/ Requires external resistor.

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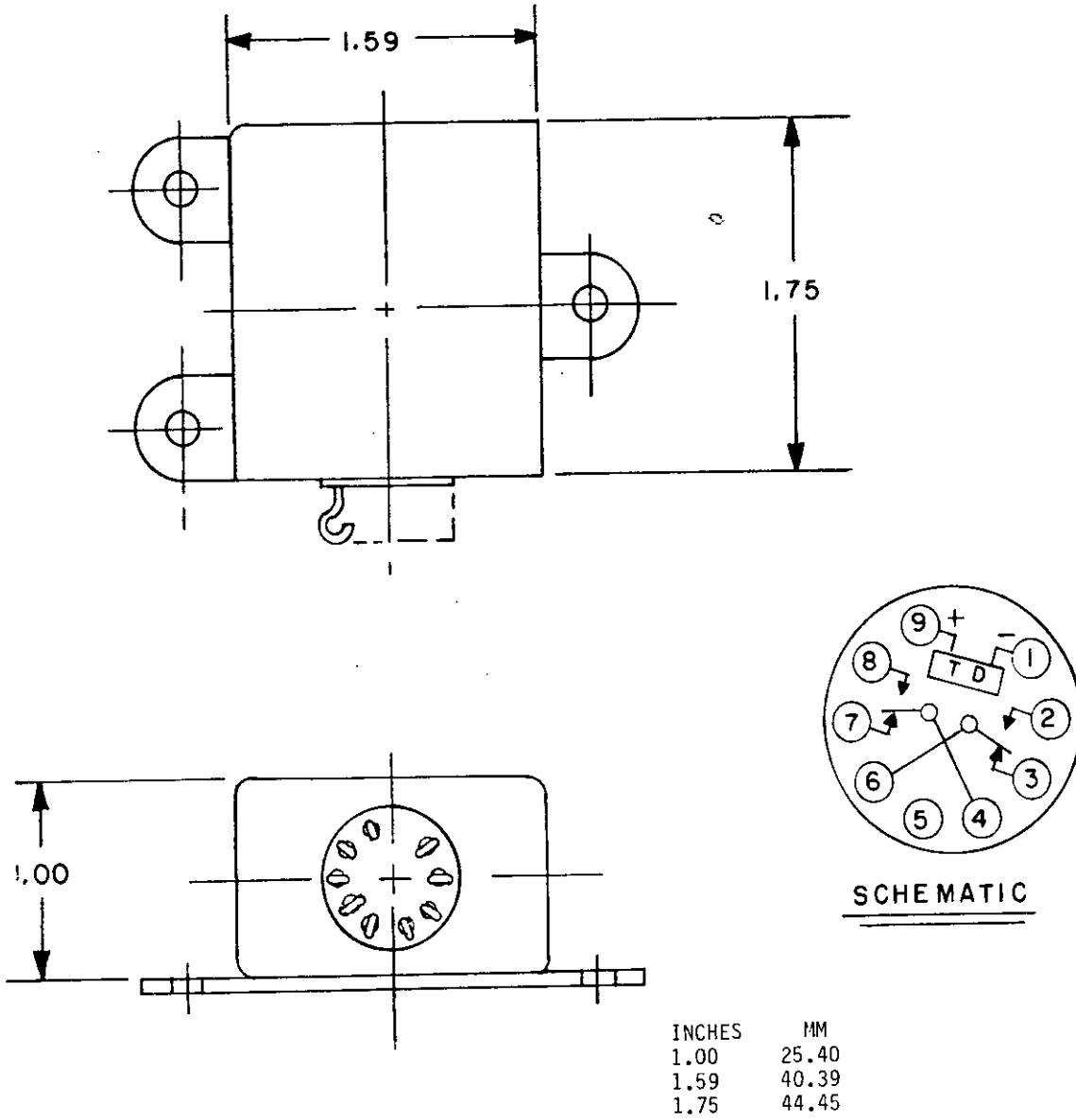
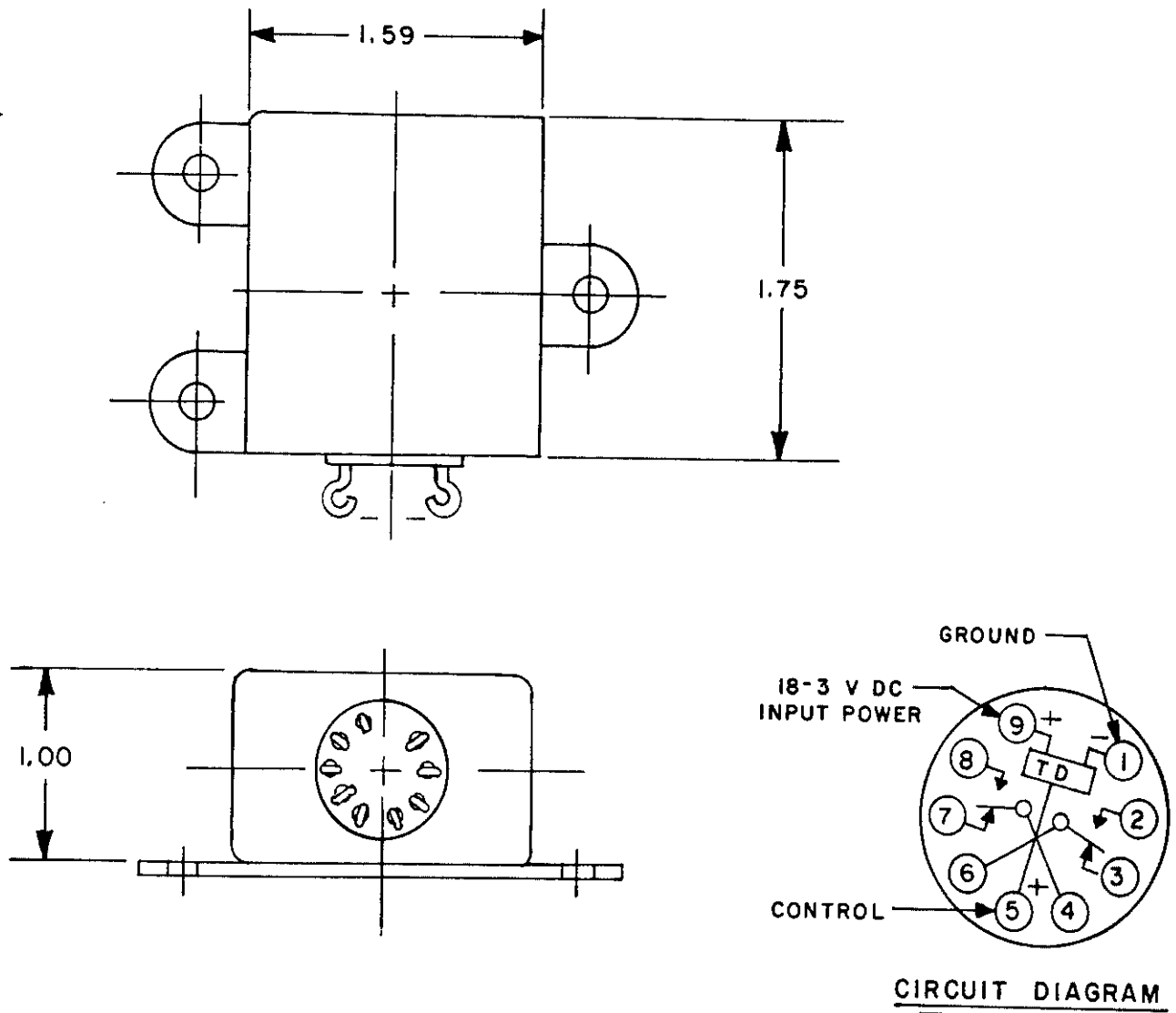


FIGURE 601-1. Relay, time delay on operate, DPDT, 2 amperes (MIL-R-83726/7).

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INCHES	MM
1.00	25.40
1.59	40.39
1.75	44.45

FIGURE 601-2. Relay, time delay on release, type IIA, DPDT, 2 amperes (MIL-R-83726/8).

MIL-STD-1346B

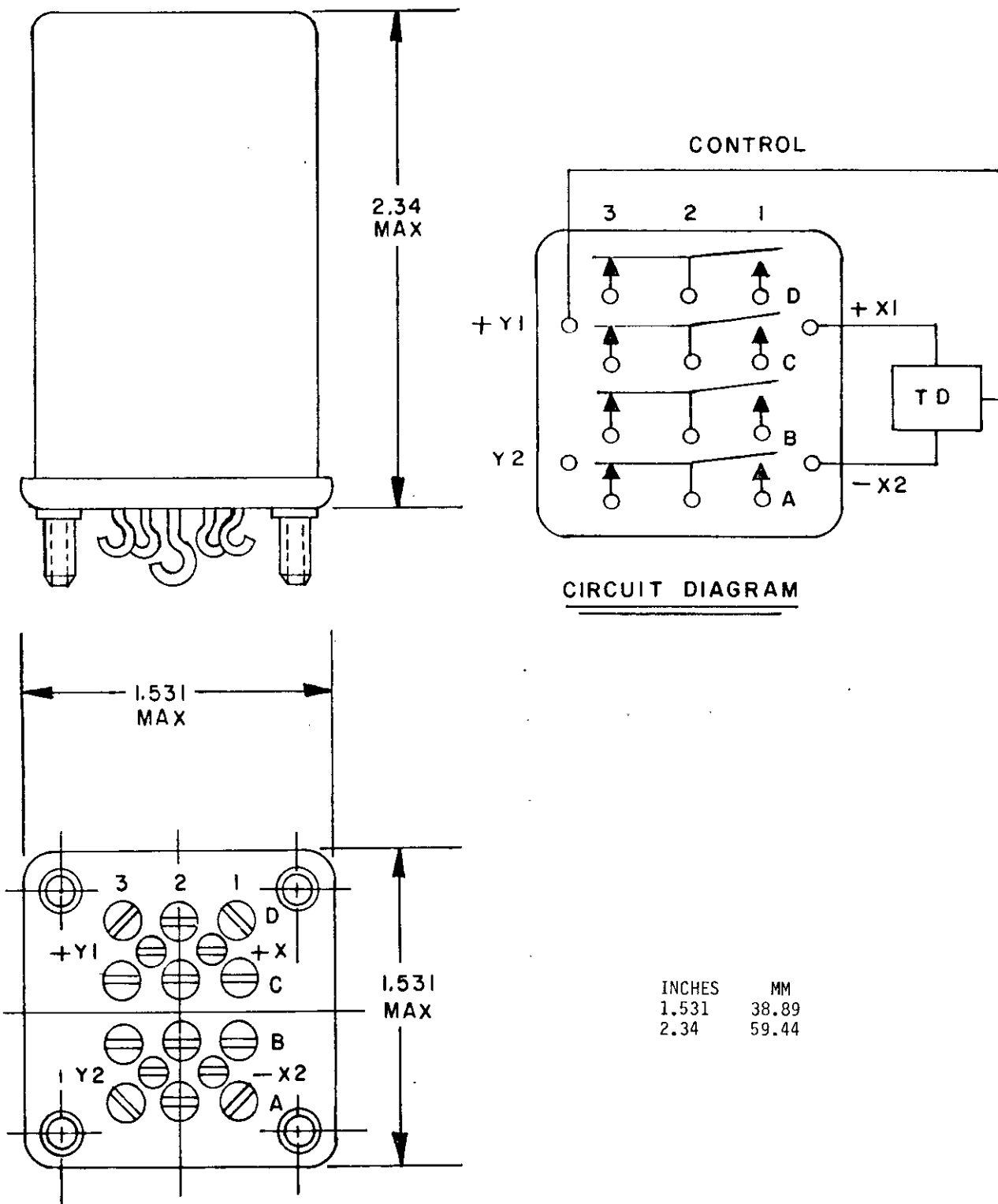
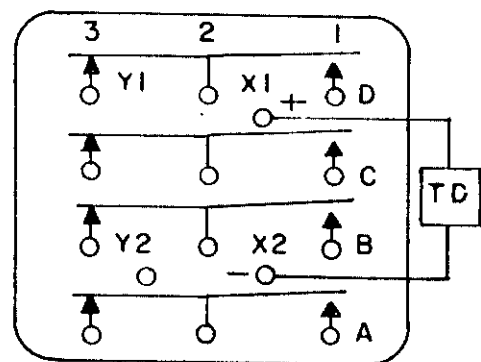
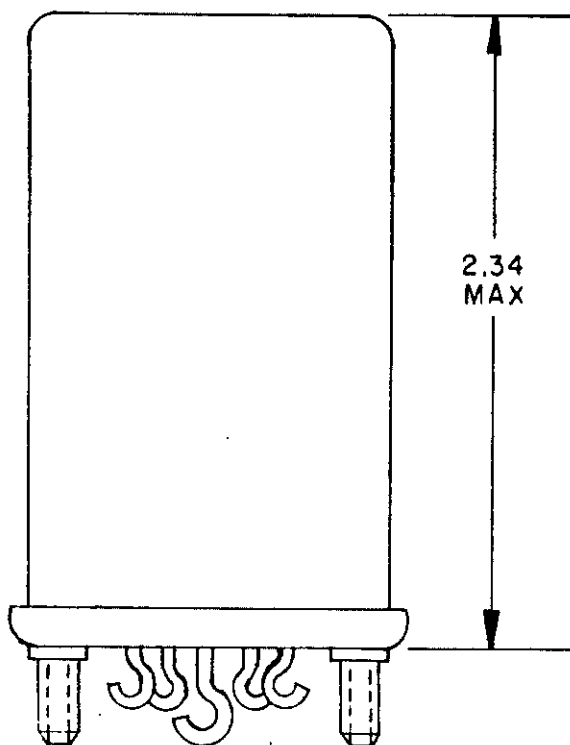
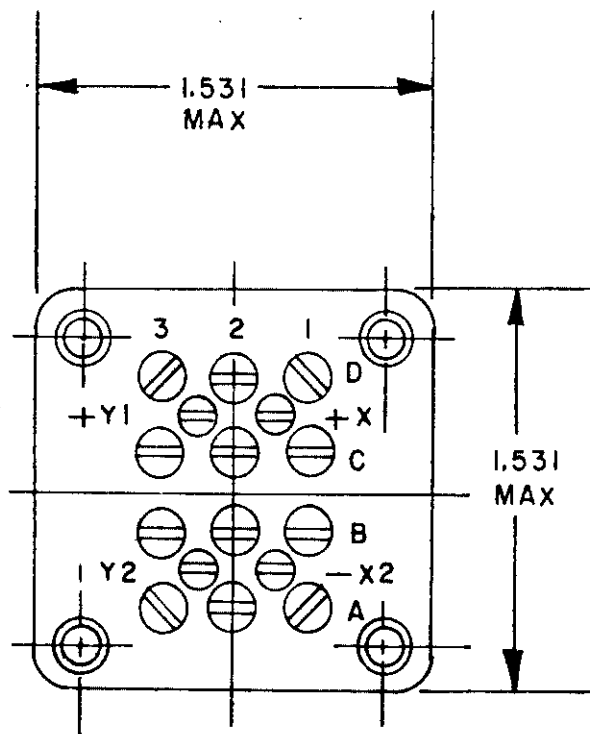


FIGURE 601-3. Relay, time delay on release, type IIA, 4PDT, 10 amperes (MIL-R-83726/12).

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CIRCUIT DIAGRAM



INCHES	MM
1.531	38.89
2.34	59.44

FIGURE 601-4. Relay, time delay on operate, 4PDT, 10 amperes (MIL-R-83726/14).

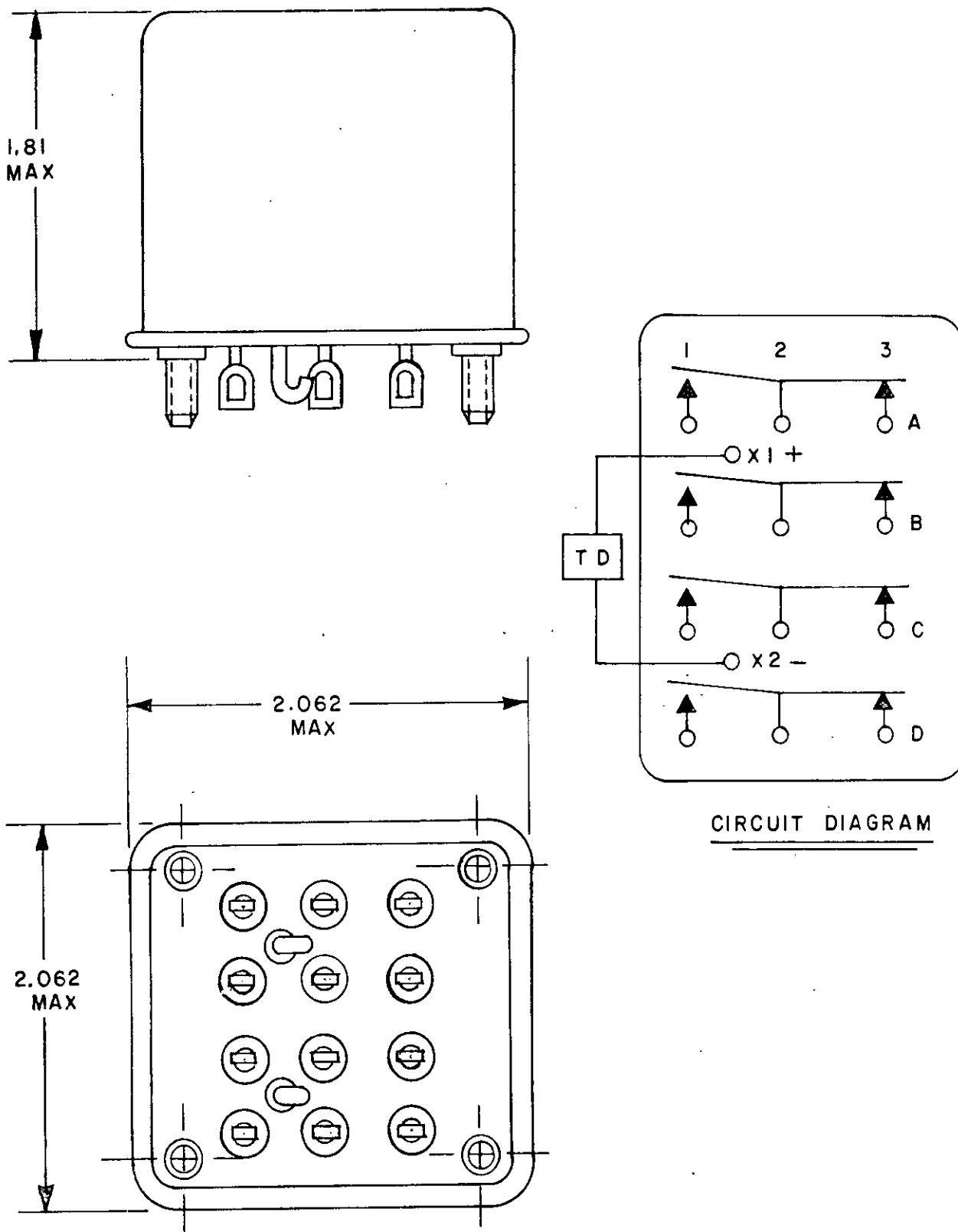


FIGURE 601-5. Relay, time delay on release, type IIB, 4PDT, 10 amperes (MIL-R-83726/23).

MIL-STD-1346B

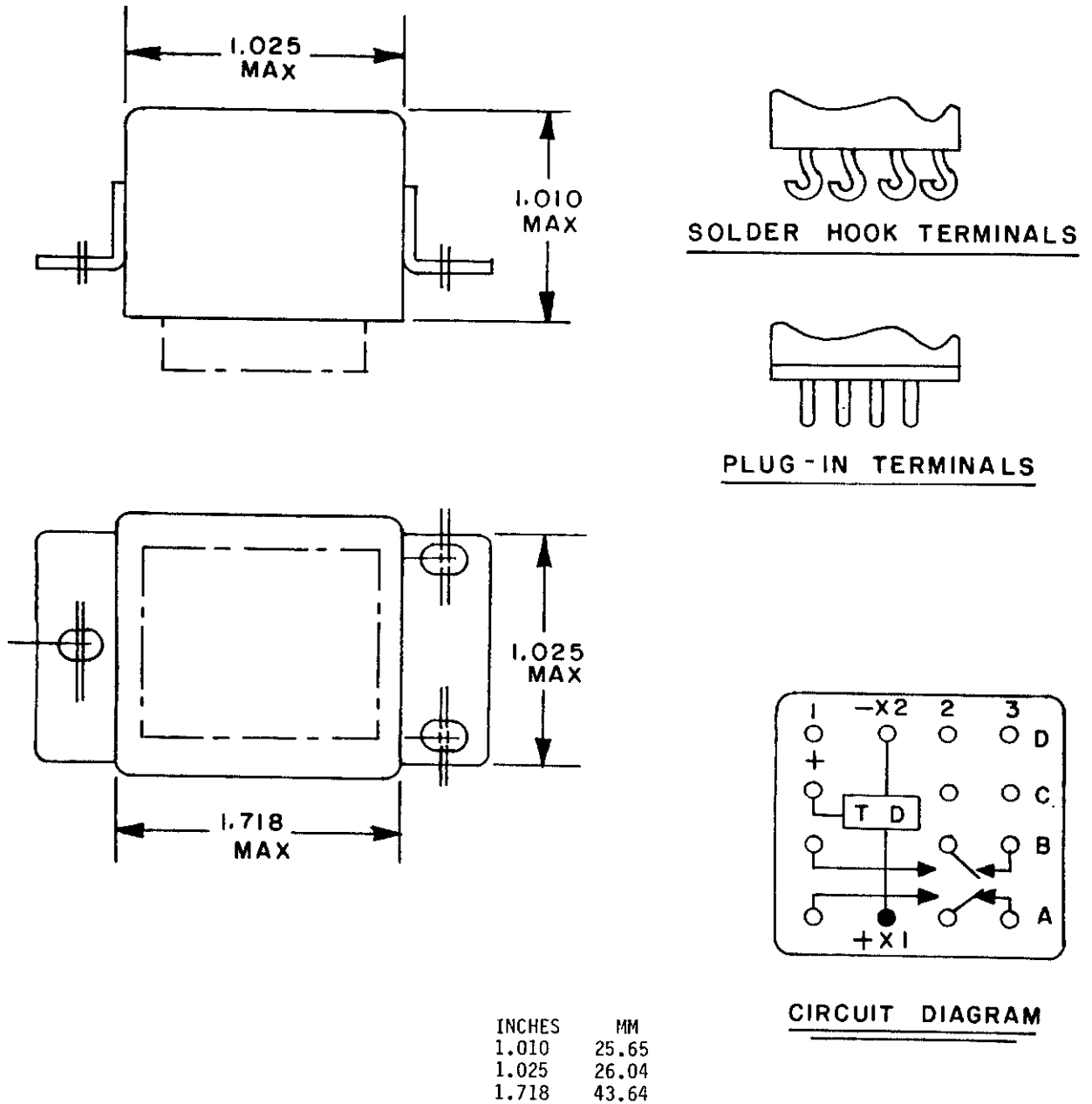


FIGURE 601-6. Relay, time delay on operate, DPDT, 10 amperes (MIL-R-83726/28).

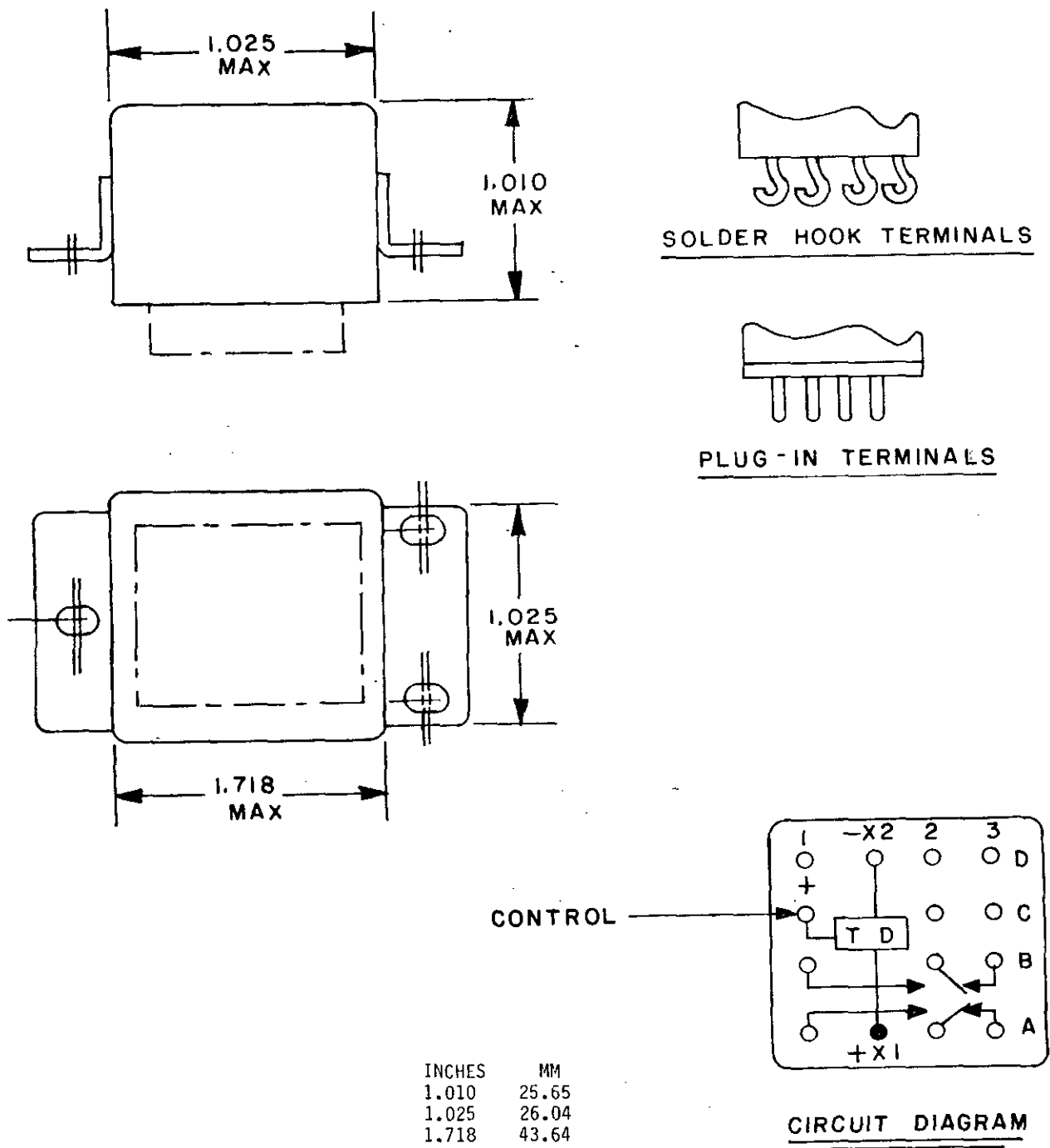


FIGURE 601-7. Relay, time delay on release, type IIA, DPDT, 10 amperes (MIL-R-83726/29).

MIL-STD-1346B

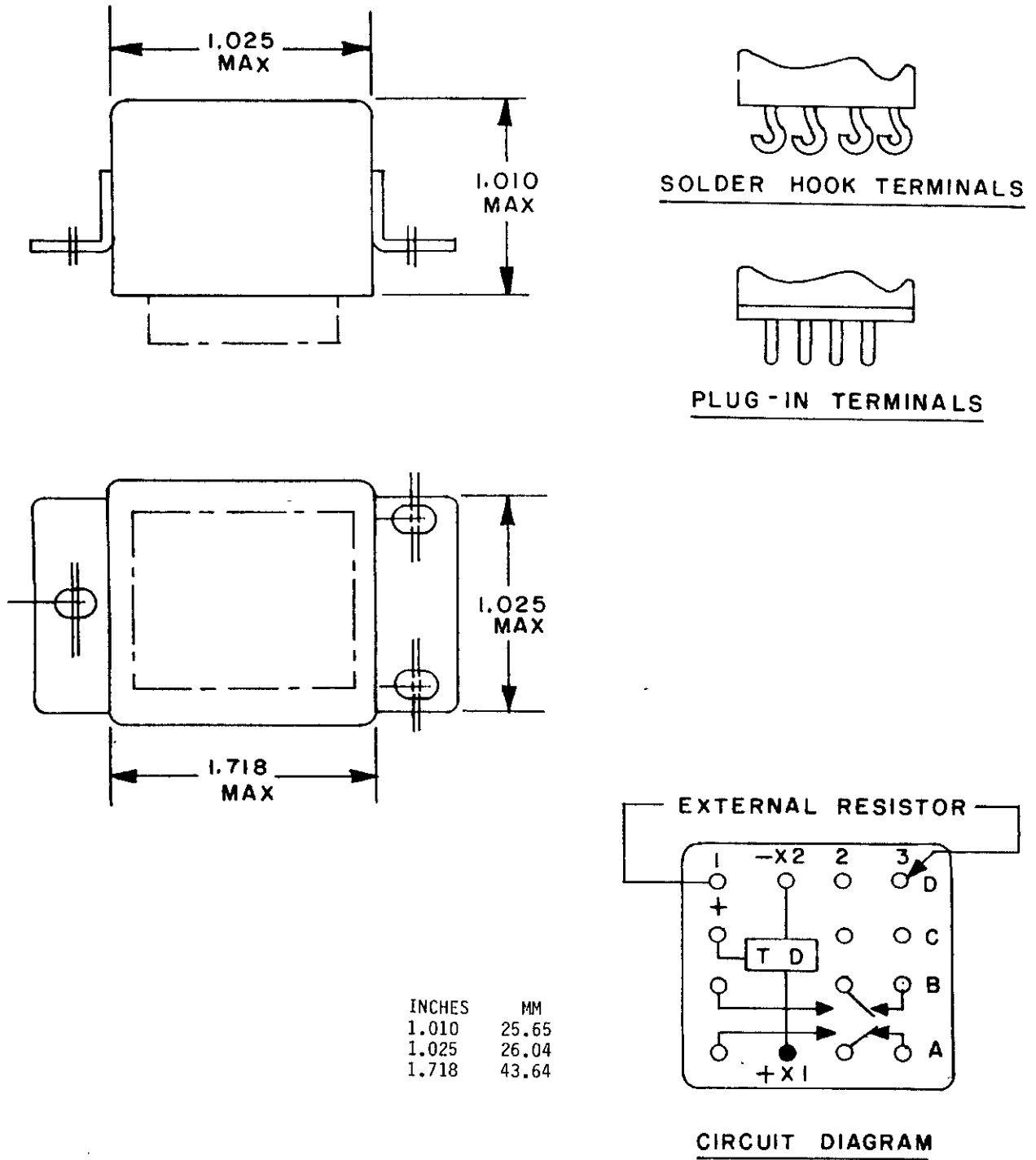
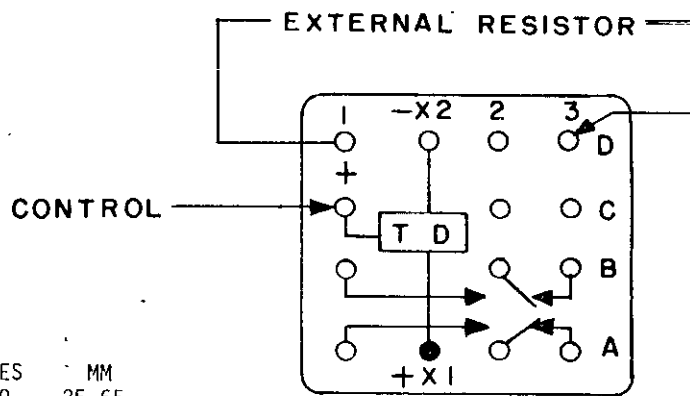
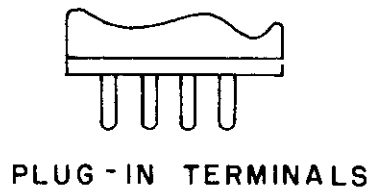
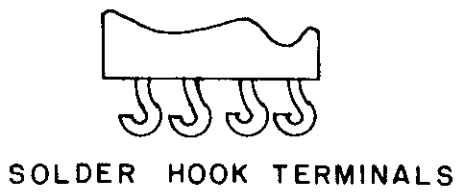
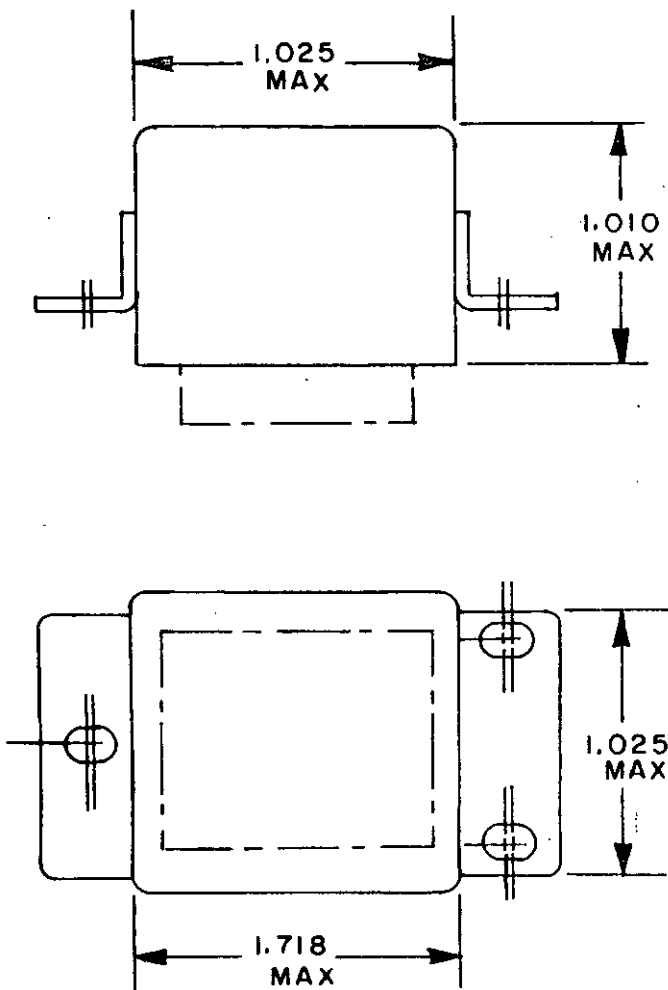


FIGURE 601-8. Relay, adjustable time delay on operate, DPDT, 10 amperes (MIL-R-83726/30).



INCHES	MM
1.010	25.65
1.025	26.04
1.718	43.64

CIRCUIT DIAGRAM

FIGURE 601-9. Relay, adjustable time delay on release, type IIA, DPDT, 10 amperes (MIL-R-83726/31).

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SECTION 602

RELAYS, TIME DELAY,

SOLID STATE

(Applicable specification: MIL-R-83726)

SCOPE: This section covers time delay relays in which the specified time delay interval is obtained through the use of electronic circuits.

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SECTION 602

(Applicable specification: MIL-R-83726)

TABLE 602.I. Relays, time delay, solid state, part numbers and characteristics.

Rated input voltage (V dc)	Part number M83726/	Figure number	Shock (see table II)	Vibration (see table III)	Time delay (seconds) ±10%		Resistive (28 V dc)	Recycle time in milliseconds max	Terminal style (see table IV)
					On operate	On release			
18 to 31	13-1000	602.1	8	14	.100	---	.3	10	SP
"	-5000	"	"	"	.500	"	"	"	"
"	-7500	"	"	"	.750	"	"	"	"
"	-1001	"	"	"	1	"	"	"	"
"	-2001	"	"	"	2	"	"	"	"
"	-3001	"	"	"	3	"	"	"	"
"	-5001	"	"	"	5	"	"	"	"
"	-7001	"	"	"	7	"	"	"	"
"	-1002	"	"	"	10	"	"	"	"
"	-1202	"	"	"	12	"	"	"	"
"	-1502	"	"	"	15	"	"	"	"
"	-2002	"	"	"	20	"	"	"	"
"	-3002	"	"	"	30	"	"	"	"
"	-4502	"	"	"	45	"	"	"	"
"	-6002	"	"	"	60	"	"	"	"
"	-1203	"	"	"	120	"	"	"	"
"	-1803	"	"	"	180	"	"	"	"
"	-3003	"	"	"	300	"	"	"	"
18 to 32	20-1000 1/	602.2	9	"	.100	"	.250	"	SP or L
"	-5000	"	"	"	.500	"	"	"	1/
"	-7500	"	"	"	.750	"	"	"	"
"	-1001	"	"	"	1	"	"	"	"
"	-2001	"	"	"	2	"	"	"	"
"	-3001	"	"	"	3	"	"	"	"
"	-5001	"	"	"	5	"	"	"	"
"	-7001	"	"	"	7	"	"	"	"
"	-1002	"	"	"	10	"	"	"	"
"	-1202	"	"	"	12	"	"	"	"
"	-1502	"	"	"	15	"	"	"	"
"	-2002	"	"	"	20	"	"	"	"
"	-3002	"	"	"	30	"	"	"	"
"	-4502	"	"	"	45	"	"	"	"
"	-6002	"	"	"	60	"	"	"	"
"	-1203	"	"	"	120	"	"	"	"
"	-1803	"	"	"	180	"	"	"	"
"	-3003	"	"	"	300	"	"	"	"

See footnotes at end of table.

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SECTION 602

(Applicable specification: MIL-R-83726)

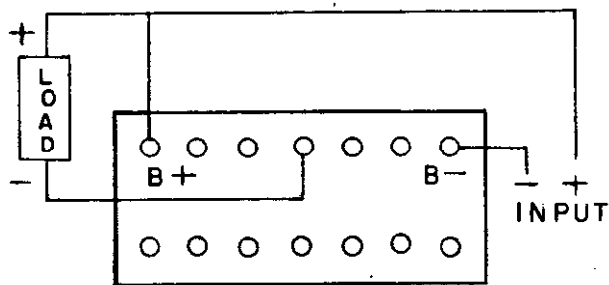
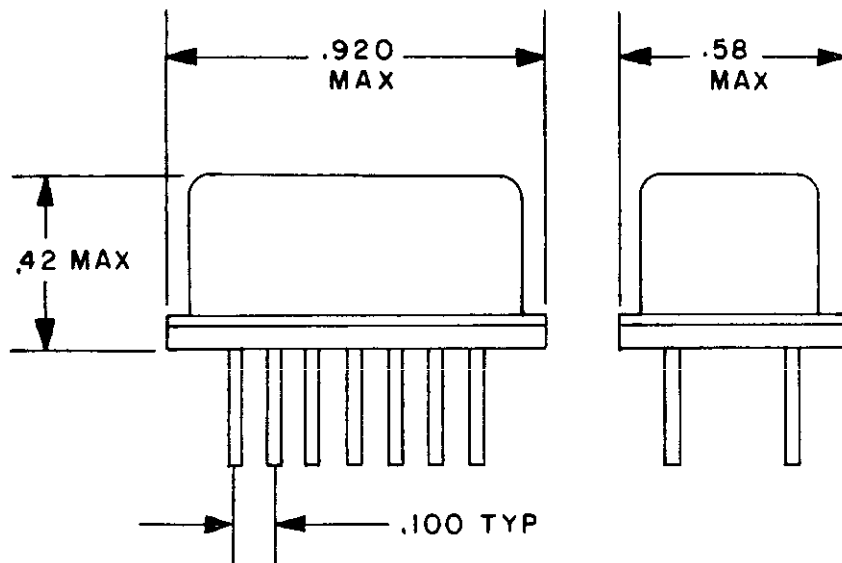
TABLE 602.I. Relays, time delay, solid state, part numbers and characteristics - Continued.

Rated input voltage (V dc)	Part number M83726/	Figure number	Shock (see table II)	Vibration (see table III)	Time delay (seconds) ±10%		Resistive 28 V dc	Recycle time in milliseconds max	Terminal style (see table IV)
					On operate	On release			
18 to 32 "	21-001 -005	602.3 "	9 "	14 "	.05-.5 <u>2/</u>	--- "	.250 "	10 "	SP L
" "	-002 -006	" "	" "	" "	.5-5 <u>2/</u>	" "	" "	" "	SP L
" "	-003 -007	" "	" "	" "	5-50 <u>2/</u>	" "	" "	" "	SP L
" "	-004 -008	" "	" "	" "	50-500 <u>2/</u>	" "	" "	" "	SP L
"	22-XXXX <u>3/</u>	602.4	"	"	Repeat cycle timer (seconds ±10%) .1-60 <u>3/</u>		"	"	SP or L <u>1/</u>

1/ Relays are available with printed circuit type or solder lug termination. To specify solder lug terminals and a flange mount add a suffix letter "A" following the last digit of the part number. (Example: M83726/20-1000A). To receive a printed circuit type termination suffix letter shall be left off (Example: M83726/20-1000).

2/ Variable time delays must be used with external resistor. See specification sheet for the determination of the value of the resistor.

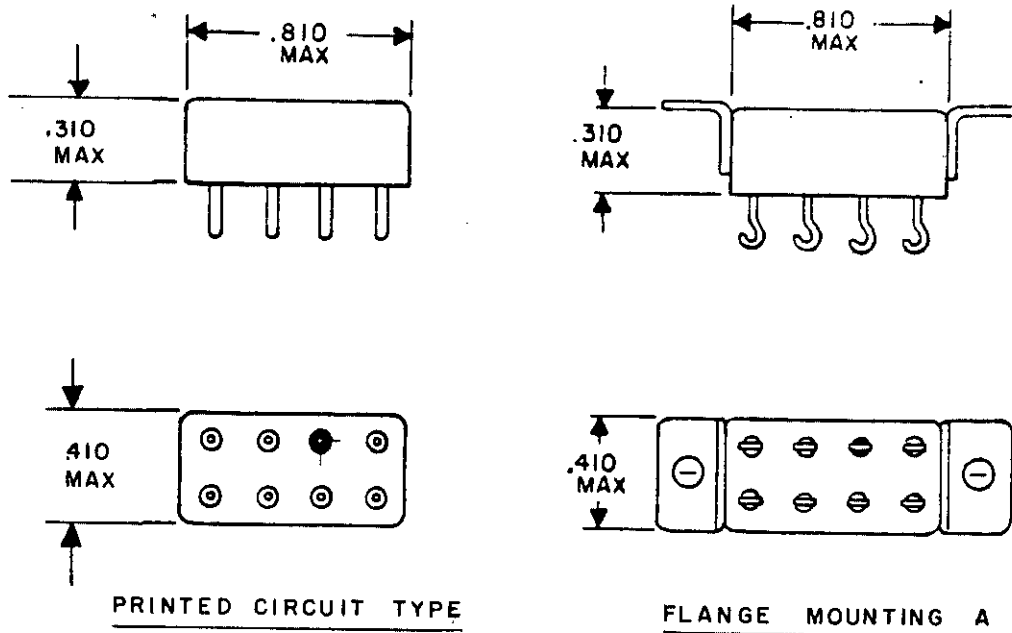
3/ Repeat cycle timer within the listed complete cycle range are available. To establish a part number use the following information: The part number consists of the basic number of this specification sheet and a dash number denoting the length of one complete cycle, expressed in milliseconds. The first three digits are significant figures, the last digit is the number of zeros following the first three.



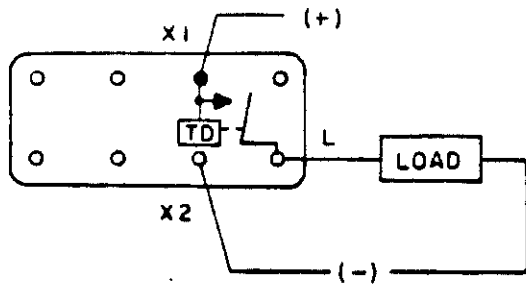
INCHES	MM
.42	10.7
.58	14.7
.920	23.37

FIGURE 602-1. Relay, time delay on operate SPST, N.O., 300 milliamperes (MIL-R-83726/13).

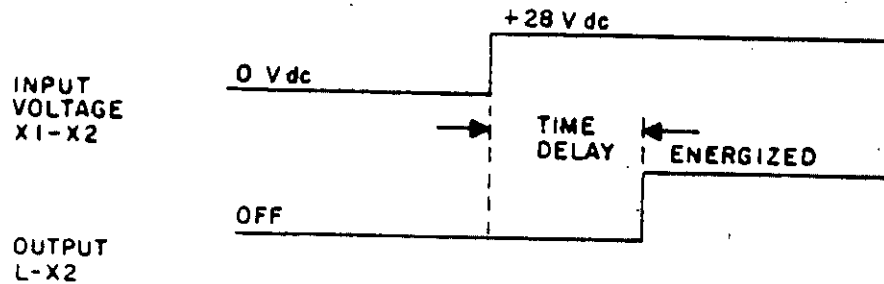
MIL-STD-1346B



INCHES	MM
.310	7.87
.410	10.41
.810	20.57



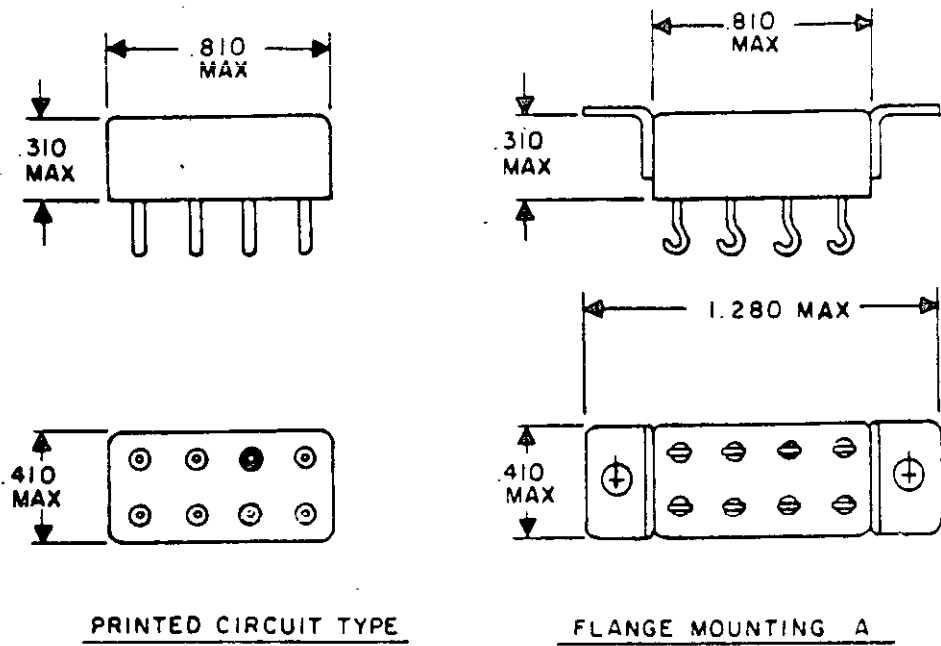
CIRCUIT DIAGRAM



TIMING DIAGRAM

FIGURE 602-2. Relay, time delay on operate, SPST, N.O., 250 milliamperes (MIL-R-83726/20).

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INCHES	MM
.310	7.87
.410	10.41
.810	20.57
1.062	26.97
1.280	32.51

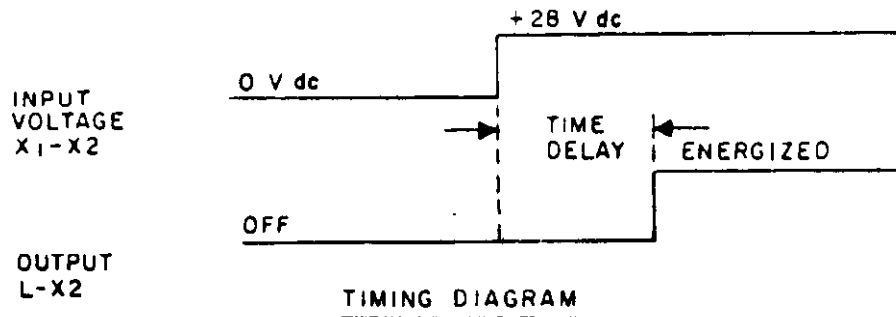
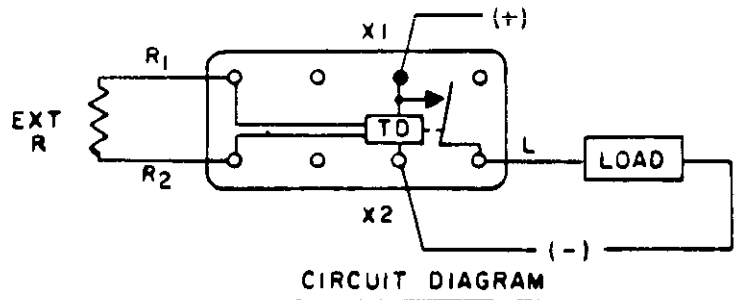
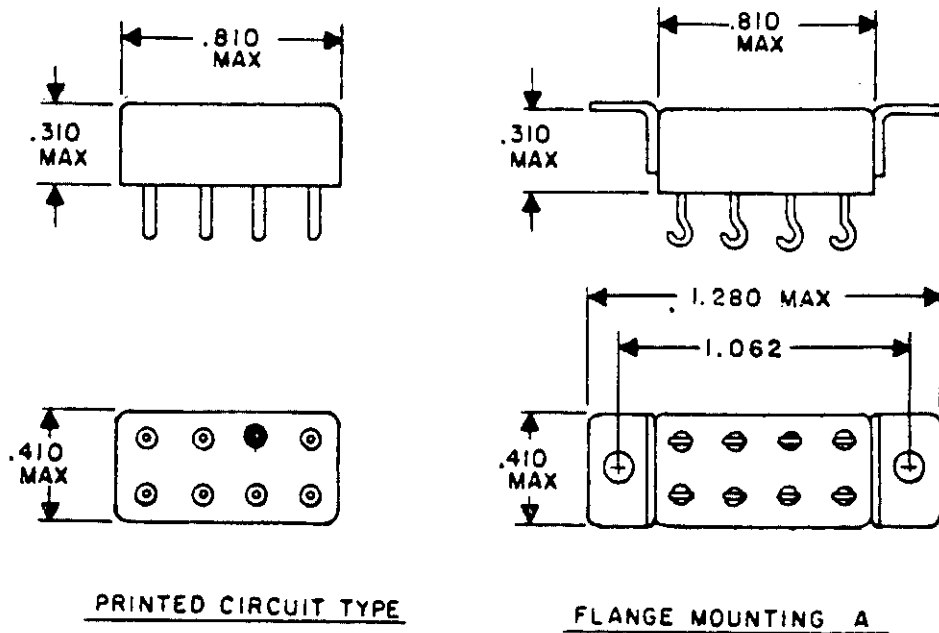


FIGURE 602-3. Relay, variable time delay on operate, SPST, N.O., 250 milliamperes (MIL-R-83726/21).



INCHES	MM
.310	7.87
.410	10.41
.810	20.57
1.062	26.97
1.280	32.51

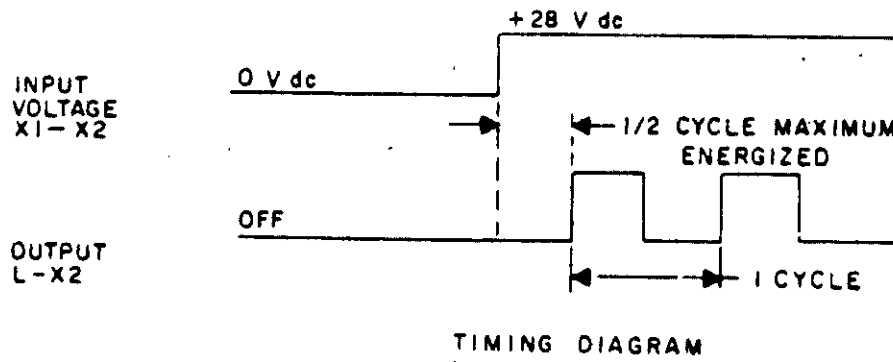
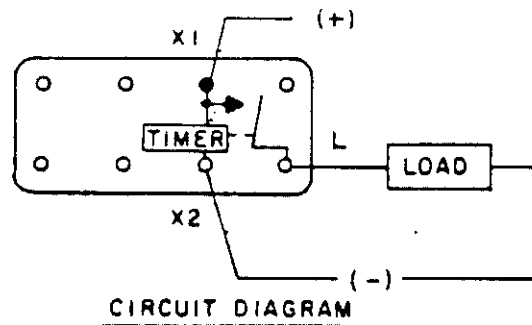


FIGURE 602-4. Relay, repeat cycle timer, SPST, N.O., 250 milliamperes (MIL-R-83726/22).

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SECTION 700

RELAYS, VACUUM, HIGH VOLTAGE

(Applicable specification: MIL-R-83725)

Section

701

Relays, vacuum, high voltage (dc coil operated)

MIL-STD-1346B

SECTION 701

RELAYS, VACUUM, HIGH VOLTAGE
(DC COIL OPERATED)

(Applicable specification: MIL-R-83725)

SCOPE: This section covers relays, vacuum, high voltage, operated from a direct current coil.

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SECTION 701

(Applicable specification: MIL-R-83725)

TABLE 701.1 Relays, vacuum, high voltage, dc coil operated, part numbers and characteristics.

Rated coil voltage dc	Part number	Figure number	Operating temperature (see range (see table I)	Vibration (see table III)	Load ratings					
					Carry only			Switching		
					Frequency	Voltage kV	Current amperes	Frequency	Voltage kV	Current amperes
	M83725/1									
26.5	-001	701-1	J	11	dc-60 Hz	12	15			
"	-002	"	"	"	dc-2.5 MHz	10	10			
"	-003	"	"	"	dc-16 MHz	8	6			
"	-004	"	"	"						
"	-005	"	"	"						
"	-006	"	"	"						
	M83725/2									
"	-001	701-2	"	13	dc-60 Hz	25	25			
"	-002	701-2	"	13	dc-2.5 MHz	20	13			
"	-003	701-2	"	13	dc-16 MHz	15	8			
	M83725/3									
"	-001	701-3	A	13	dc-60 Hz	2	8		1	1
"	-002	701-3	A	13	dc-2.5 MHz	2	6		2	.5
					dc-16 MHz	2	4	1kHz - 60 MHz	1	2
	M83725/4									
15	-001	701-4	J	13	dc	2.5	3			
	-002	701-4	J	13	dc	.1	18			
	M83725/5									
26.5	-001	701-5	J	13	dc-60 Hz	3.5	18			
					dc-2.5 MHz	2.5	14			
					dc-16 MHz	2.0	9			
					dc-32 MHz	1.5	7			

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TABLE 701.I Relays, vacuum, high voltage, dc coil operated,
part numbers and characteristics - Continued.

Rated coil voltage dc	Part number	Figure number	Operating temperature range (see table I)	Vibration (see table III)	Load ratings					
					Carry only			Switching		
					Frequency	Voltage kV	Current amperes	Frequency	Voltage	Current
26.5	M83725/6									
	-001	701-6	J	13	dc-60 Hz	3.6	12			
	-002	701-6	"	"	dc-2.5 MHz	3.6	10			
	-003	701-6	"	"	dc-16 MHz	3.2	6			
	-004	701-6	"	"	dc-2.5 MHz	4.0	10			
					dc-16 MHz	3.2	8			
"	M83725/7									
	-001	701-7	"	13	dc-60 Hz	3.6	12			
	-002	701-7	"	"	dc-2.5 MHz	3.6	10			
					dc-16 MHz	3.2	6			
	-003	701-7	"	"	dc-16 MHz	3.2	8			
					dc-2.5 MHz	4.0	10			
"	M83725/8									
	-001	701-8	"	13	dc-60 Hz	3.6	12			
	-002	701-8	"	"	dc-2.5 MHz	3.6	10			
					dc-16 MHz	3.2	6			
	-003	701-8	"	"	dc-16 MHz	3.2	8			
					dc-2.5 MHz	4.0	10			
"	M83725/9									
	-001	701-9	"	13	dc-60 Hz	7	12			
	-002	701-9	"	"	dc-2.5 MHz	7	10			
	-003	701-9	"	"	dc-16 MHz	6	6			
	-003	701-8	"	"	dc-16 MHz	6	8			
					dc-2.5 MHz	9	10			
"	M83725/10									
	-001	701-10	"	13	dc-60 Hz	10	12			
	-002	701-10	"	"	dc-2.5 MHz	8	10			
					dc-16 MHz	6	6			
"	M83725/11									
	-001	701-11	"	13						
	-002	701-11	"	"	dc-60 Hz	3.6	12			
	-003	701-11	"	"	dc-2.5 MHz	3.6	10			
					dc-16 MHz	3.2	6			
	-004	701-11	"	"	dc-16 MHz	3.2	8			
					dc-2.5 MHz	4.0	10			

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TABLE 701.I Relays, vacuum, high voltage, dc coil operated,
part numbers and characteristics - Continued.

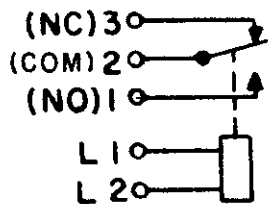
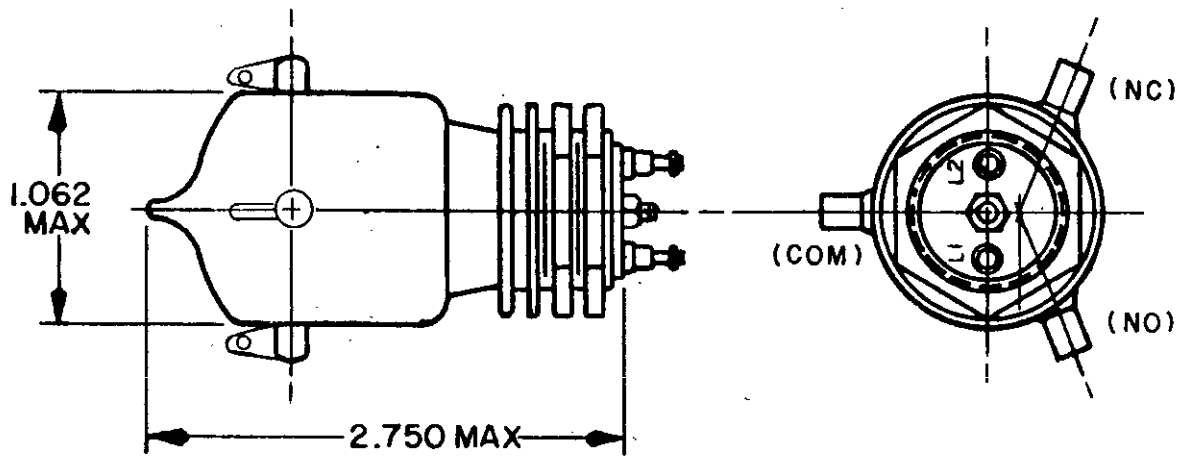
Rated coil voltage dc	Part number	Figure number	Operating temperature (see table I)	Vibration (see table III)	Load ratings					
					Carry only			Switching		
					Frequency	Voltage kV	Current amperes	Frequency	Voltage	Current
M83725/12										
12.0	-001	701-12	J	2	dc-60 Hz	3.6	12			
26.5	-002	701-12	"	"	dc-2.5 MHz	3.6	10			
12.0	-003	701-12	"	"	dc-16 MHz	3.2	6			
26.5	-004	701-12	"	"						
M83725/13										
26.5	-001	701-13	J	2	dc-60 Hz	9	12			
26.5	-002	701-13	"	"	dc-2.5 MHz	7	10			
26.5	-003	701-13	"	"	dc-16 MHz	6	6			
26.5	-004	701-13	"	"	dc-16 MHz	6	8			
26.5		701-13	"	"	dc-2.5 MHz	9	10			
M83725/14										
DASH NUMBERS AND CHARACTERISTICS OMITTED PENDING COMPLETION OF QUALIFICATION.										
M83725/15										
6	-001	701-15	J	---	dc-60 Hz	15	75			
12	-002	701-15	"	"	dc-2.5 MHz	13	22			
26.5	-003	701-15	"	"	dc-16 MHz	10	15			
48	-004	701-15	"	"						
115	-005	701-15	"	"						
M83725/16										
12	-001	701-16	J	13	dc-60 Hz	9	12			
26.5	-002	701-16	"	"	dc-2.5 MHz	7	10			
12	-003	701-16	"	"	dc-16 MHz	6	6			
26.5	-004	701-16	"	"						
M83725/17										
26.5	-001	701-17	J	13	dc-60 HZ	10	12			
26.5	-002	701-17	"	"	dc-2.5 MHz	7	10			
					dc-16 MHz	6	6 amp			

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TABLE 701.I Relays, vacuum, high voltage, dc coil operated,
part numbers and characteristics - Continued.

Rated coil voltage dc	Part number	Figure number	Operating temperature range (see table I)	Vibration (see table III)	Load ratings						
					Carry only			Switching			
					Frequency	Voltage kV	Current amperes	Frequency	Voltage	Current	
	M83725/18										
26.5	-001	701-18	J	See spec	dc	7.5	8				
"	-002	701-18	"	See spec	dc-60 Hz	7.5	12				
"			"		dc-2.5 MHz	7.5	10				
"			"		dc-16 MHz	7.0	5				
"			"		dc-30 MHz	5.0	2				
"	-003	701-18	"	See spec	dc	7.5	8				
					dc-60 Hz	7.5	12				
					dc-2.5 MHz	7.5	10				
					dc-16 MHz	7.0	5				
					dc-32 MHz	5.0	5				

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CIRCUIT DIAGRAM

INCHES	MM
1.062	26.97
2.750	69.85

FIGURE 701-1. Relay, vacuum, SPST, 15 amperes, 12 kilovolts (MIL-R-83725/1(USAF)).

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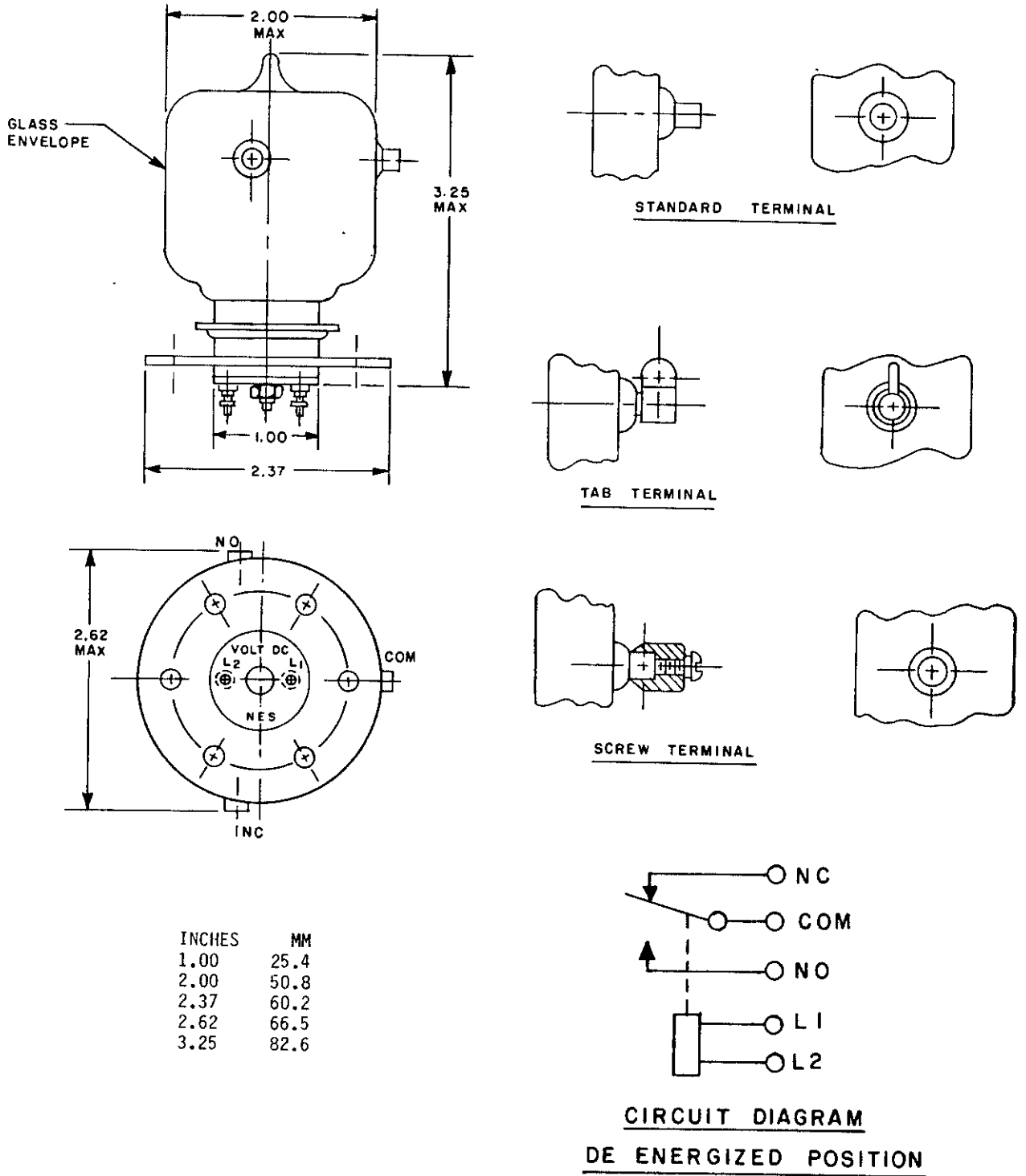


FIGURE 701-2. Relay, vacuum, SPDT, 25 amperes, 25 kilovolts (MIL-R-83725/2(USAF)).

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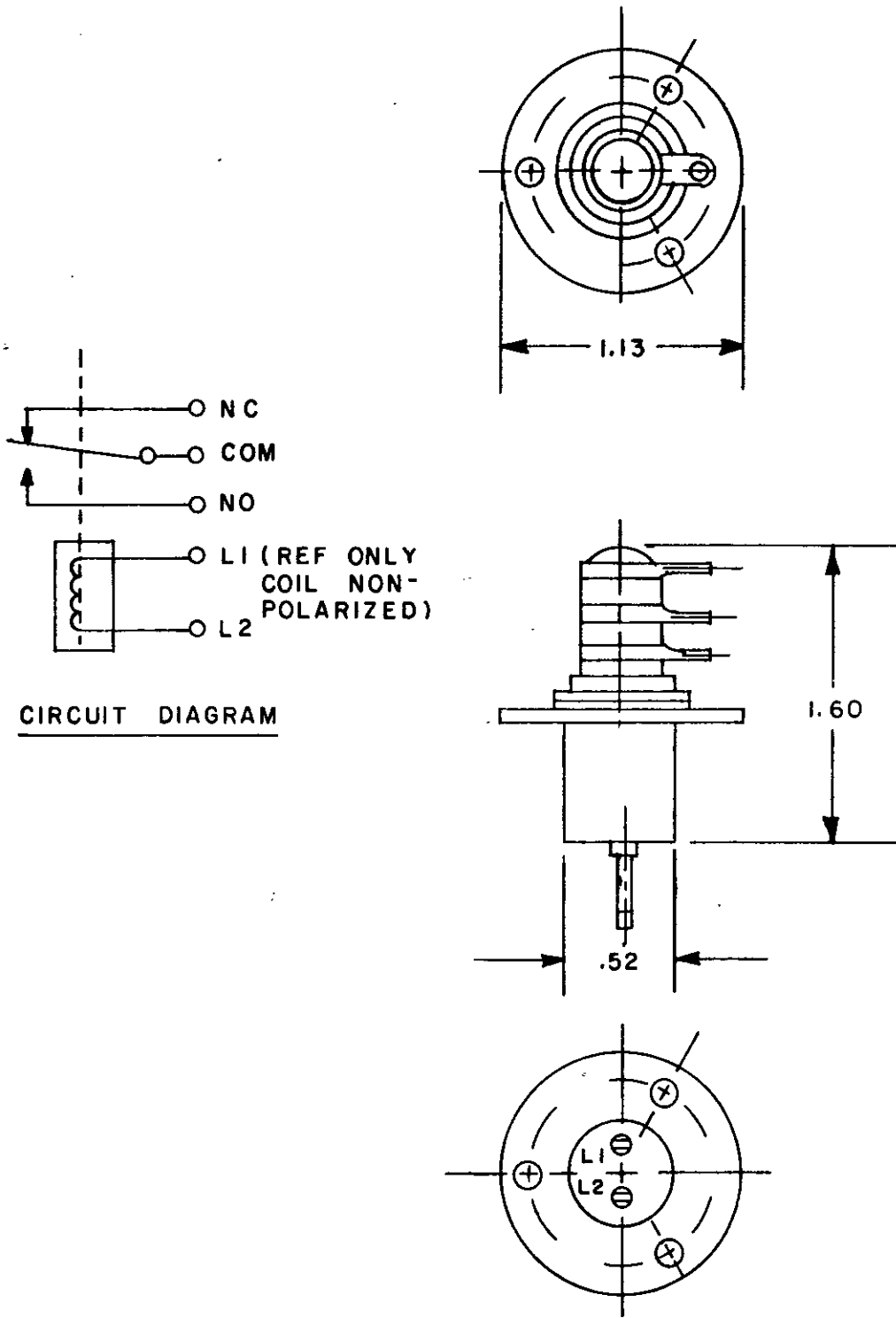


FIGURE 701-3. Relay, vacuum, SPDT, dc, 8 amperes (MIL-R-83725/3(USAF)).

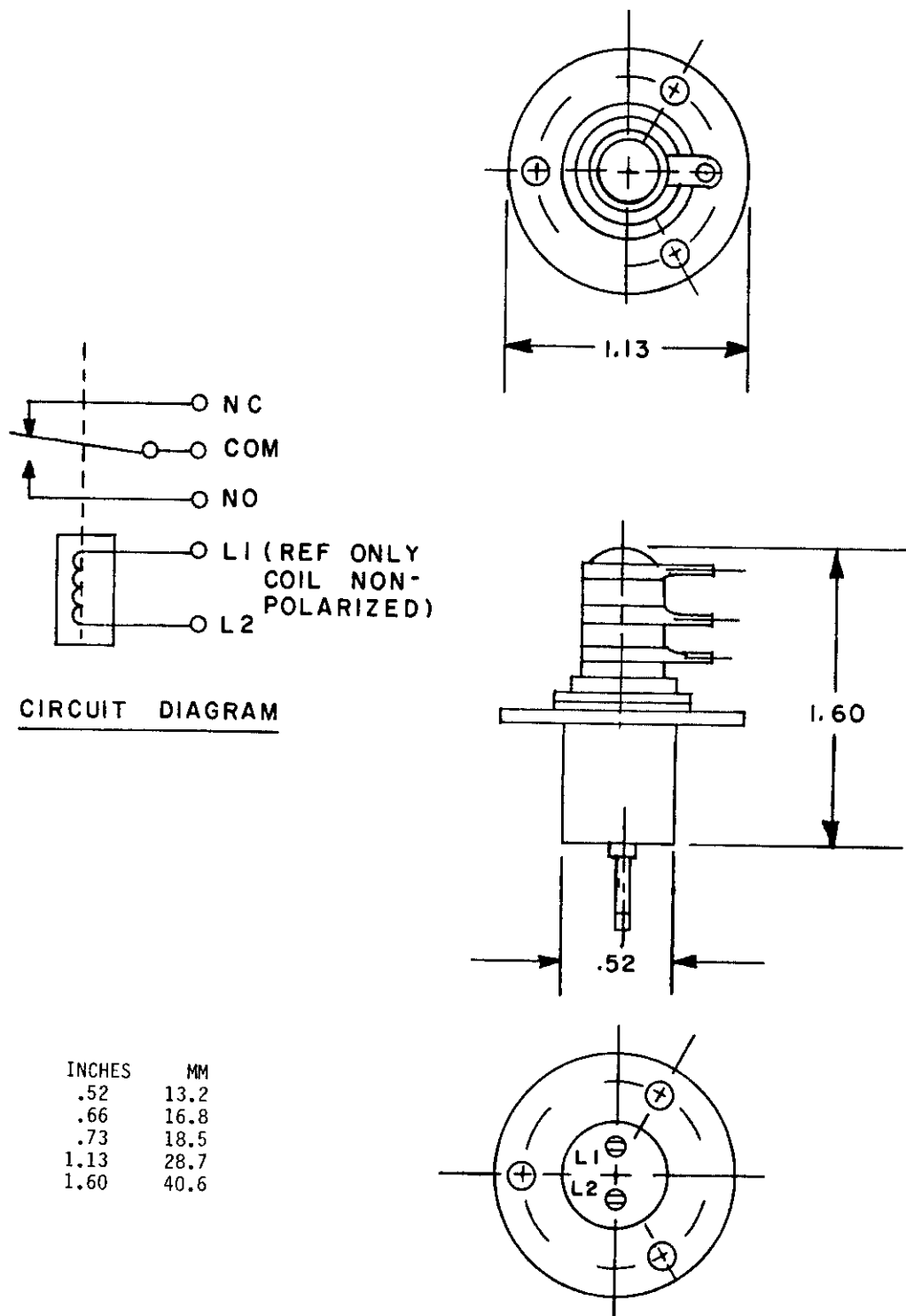
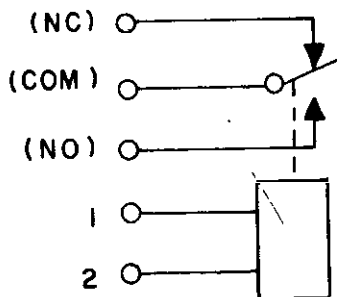
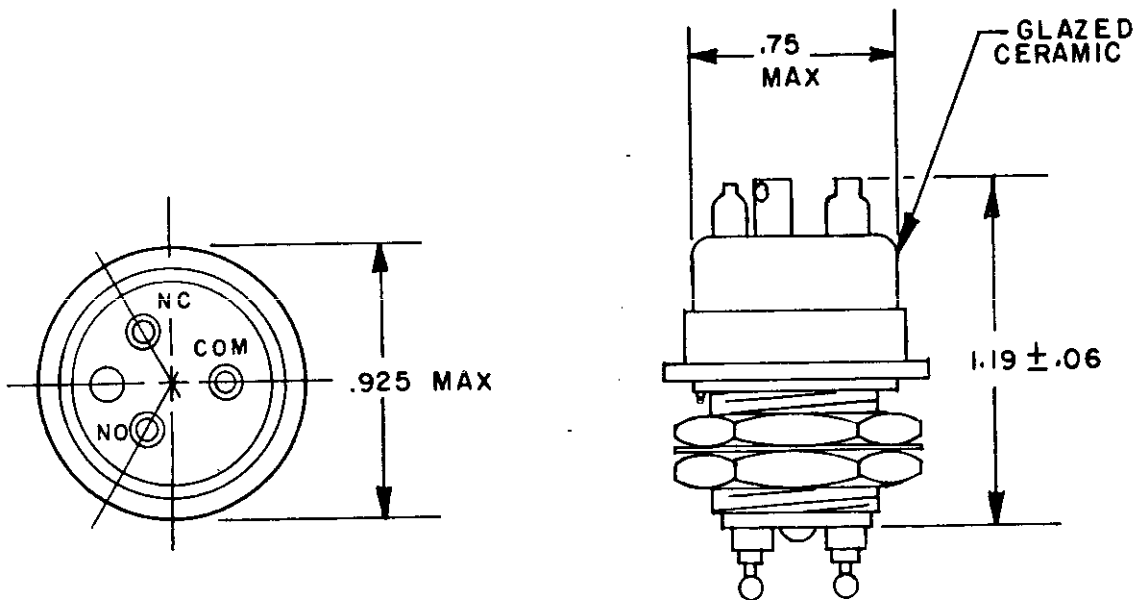


FIGURE 701-3. Relay, vacuum, SPDT, 8 amperes (MIL-R-83725/3(USAF) - Continued.

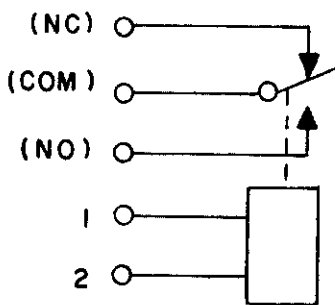
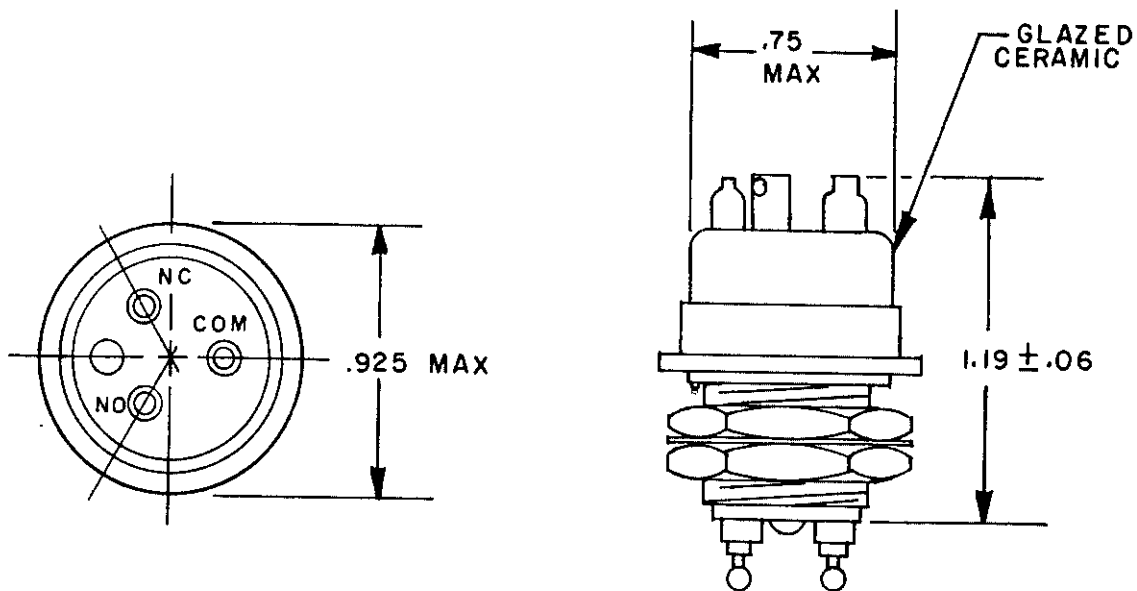
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CIRCUIT DIAGRAM

INCHES	MM
.06	1.52
.75	19.05
.925	23.40
1.19	30.23

FIGURE 701-4. Relay, vacuum, SPDT, 3 ampere load switching, 2.5 kilovolts, dc (MIL-R-83725/4(USAF)).



CIRCUIT DIAGRAM

INCHES	MM
.06	1.52
.75	19.05
.925	23.40
1.19	30.23

FIGURE 701-5. Relay, vacuum, SPDT, 18 amperes, 3.5 kilovolts (MIL-R-83725/5(USAF).

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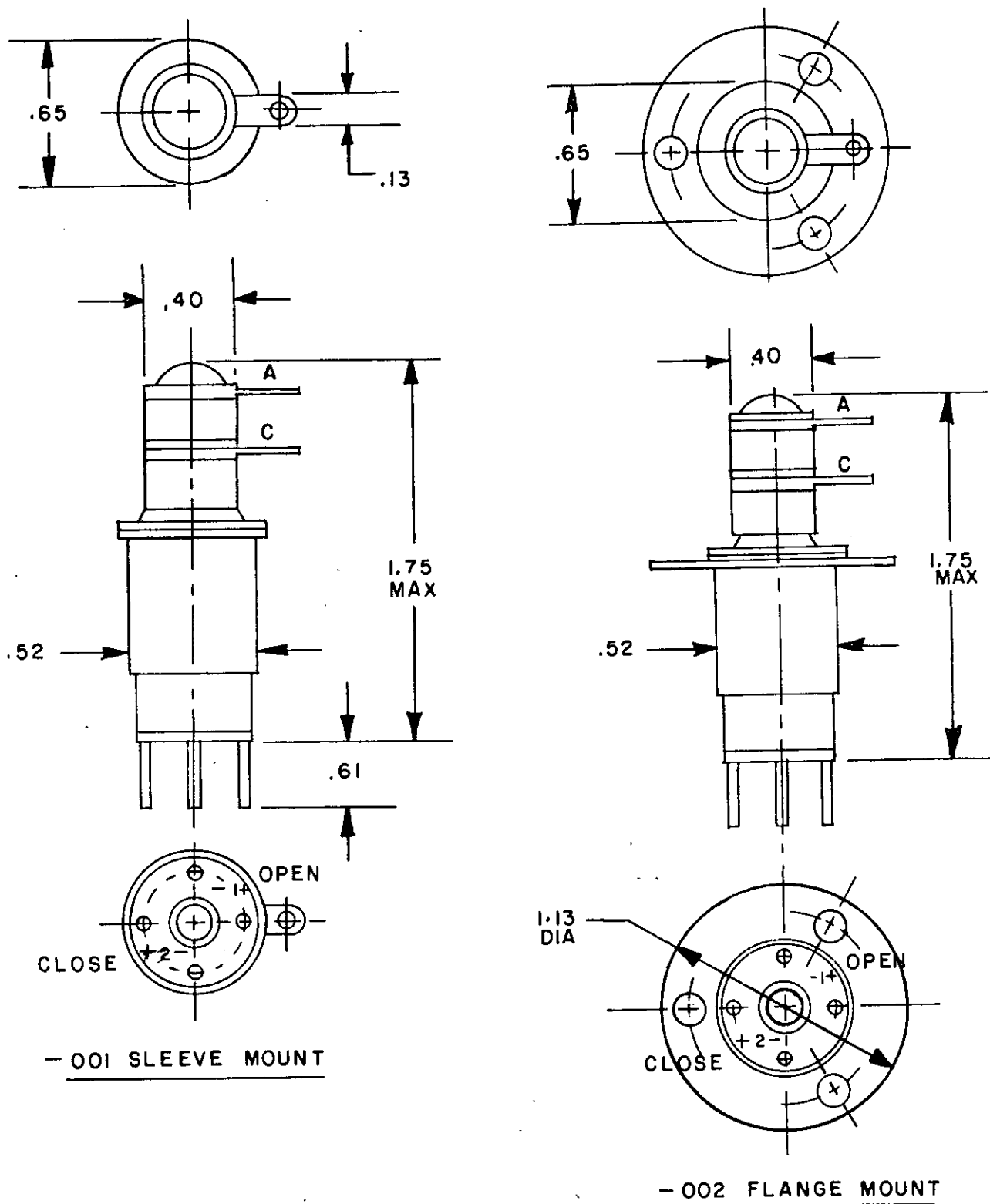
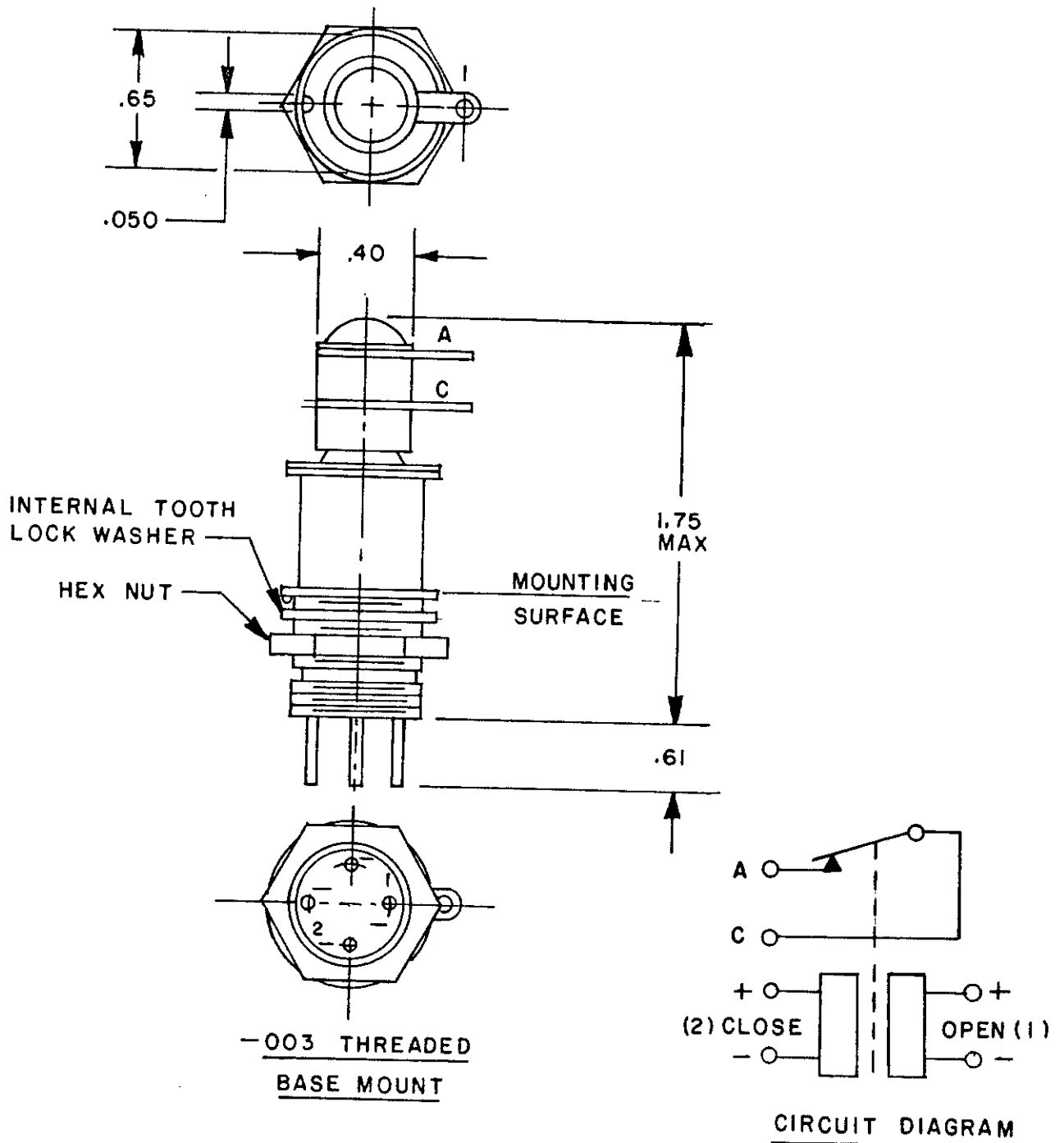


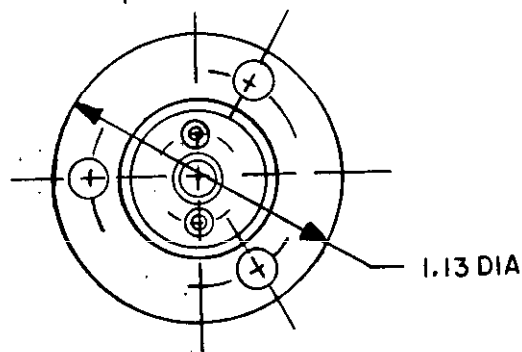
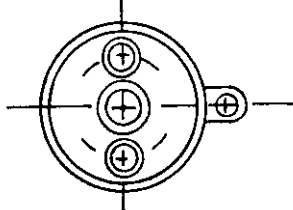
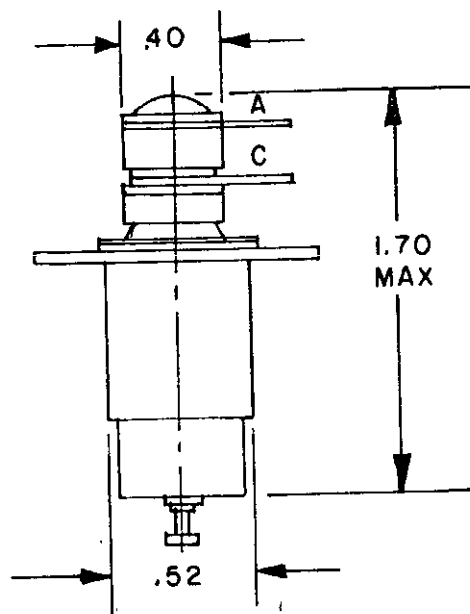
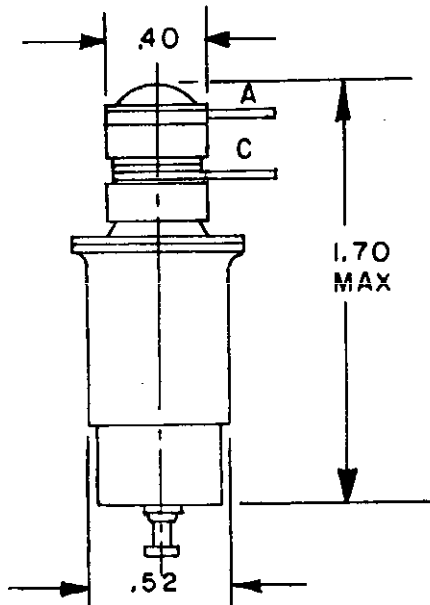
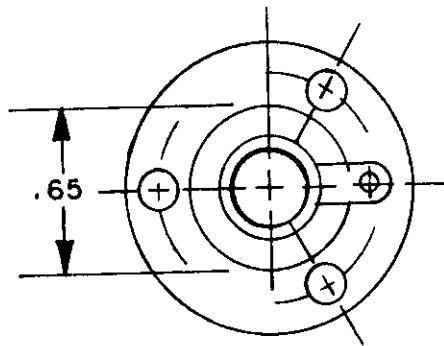
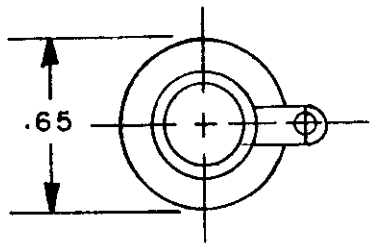
FIGURE 701-6. Relay, vacuum, SPST, 12 amperes, 3.6 kilovolts (MIL-R-83725/6(USAF)).



INCHES	MM
.050	1.27
.40	10.2
.61	15.5
.65	16.5
1.75	44.4

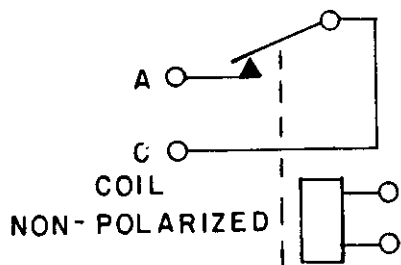
FIGURE 701-6. Relay, vacuum, SPST, 12 amperes, 3.6 kilovolts (MIL-R-83725/6) - Continued.

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-001 SLEEVE MOUNT

-002 FLANGE MOUNT

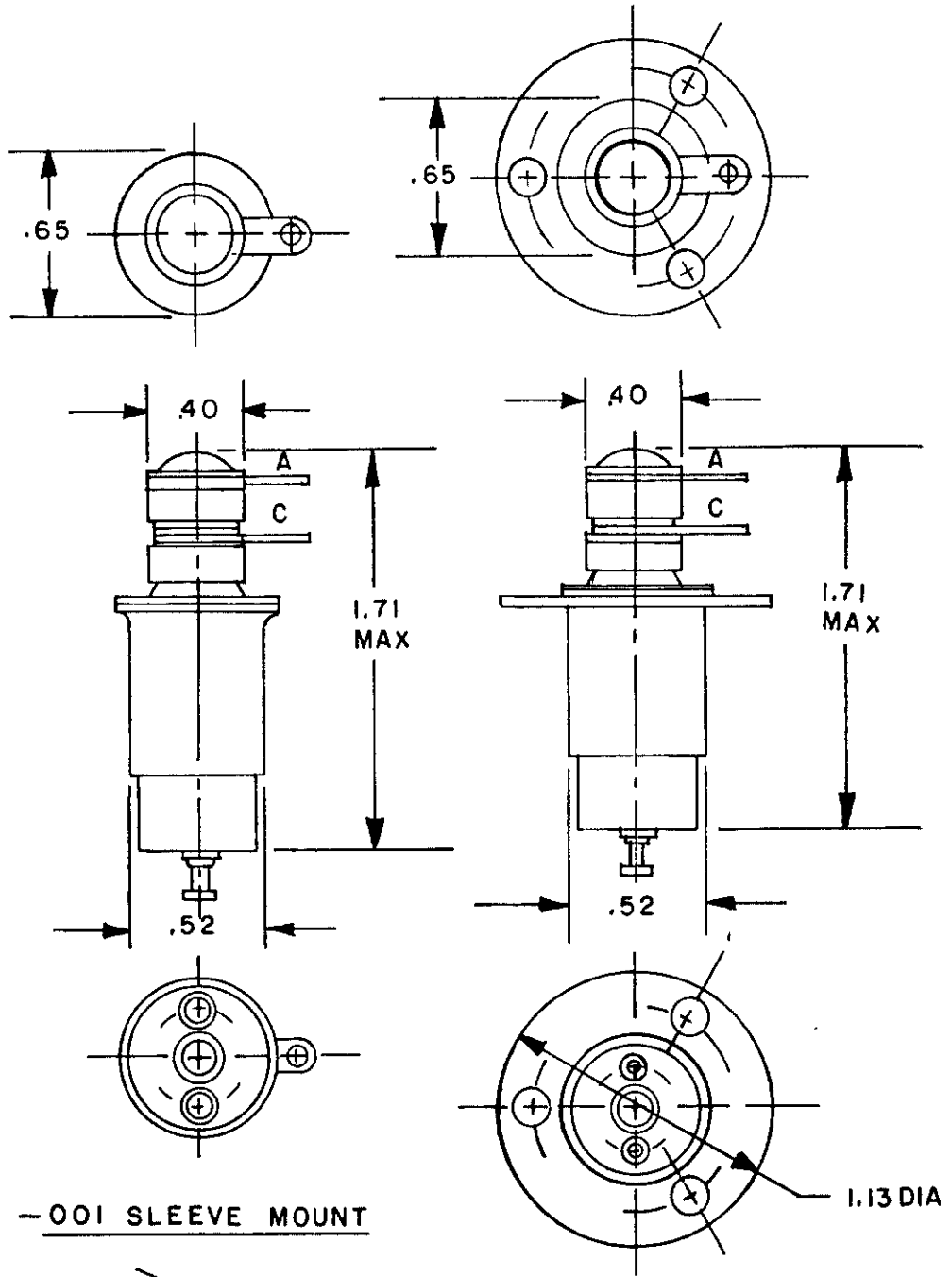


CIRCUIT DIAGRAM

INCHES	MM
.40	10.2
.52	13.2
.65	16.5
1.13	28.7
1.70	43.2

FIGURE 701-7. Relay, vacuum, SPST, N.O., 12 amperes, 3.6 kilovolts (MIL-R-83725/7(USAF)).

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-001 SLEEVE MOUNT

-002 FLANGE MOUNT

(COIL DEENERGIZED)
CIRCUIT DIAGRAM

INCHES	MM
.40	10.2
.52	13.2
.65	16.5
1.13	28.7
1.71	43.4

FIGURE 701-8. Relay, vacuum, SPDT, N.O., 12 amperes, 3.6 kilovolts (MIL-R-83725/8(USAF)).

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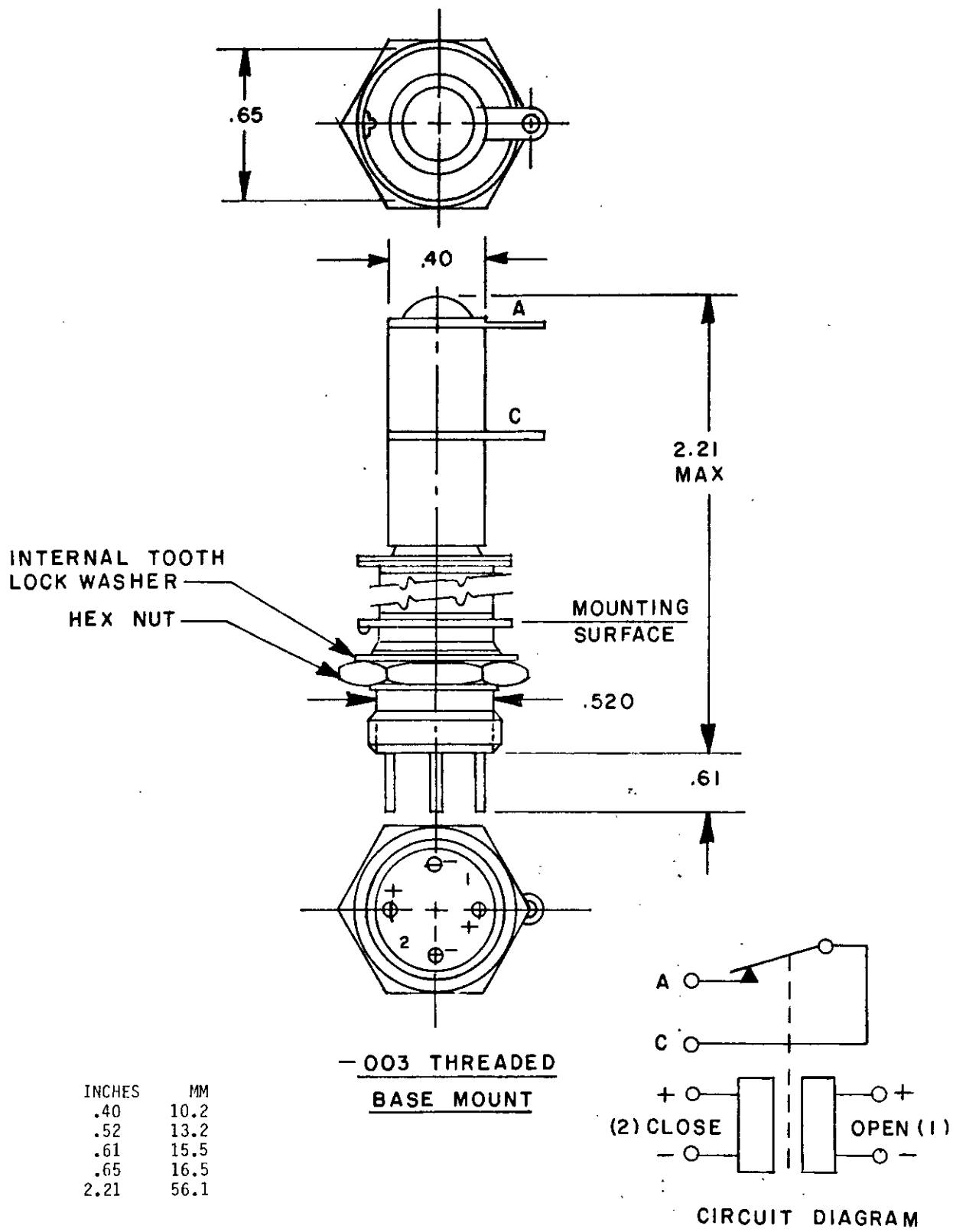


FIGURE 701-9. Relay, vacuum, SPST, lock-up, 12 amperes, 7 kilovolts (MIL-P-83725/9(USAF)).

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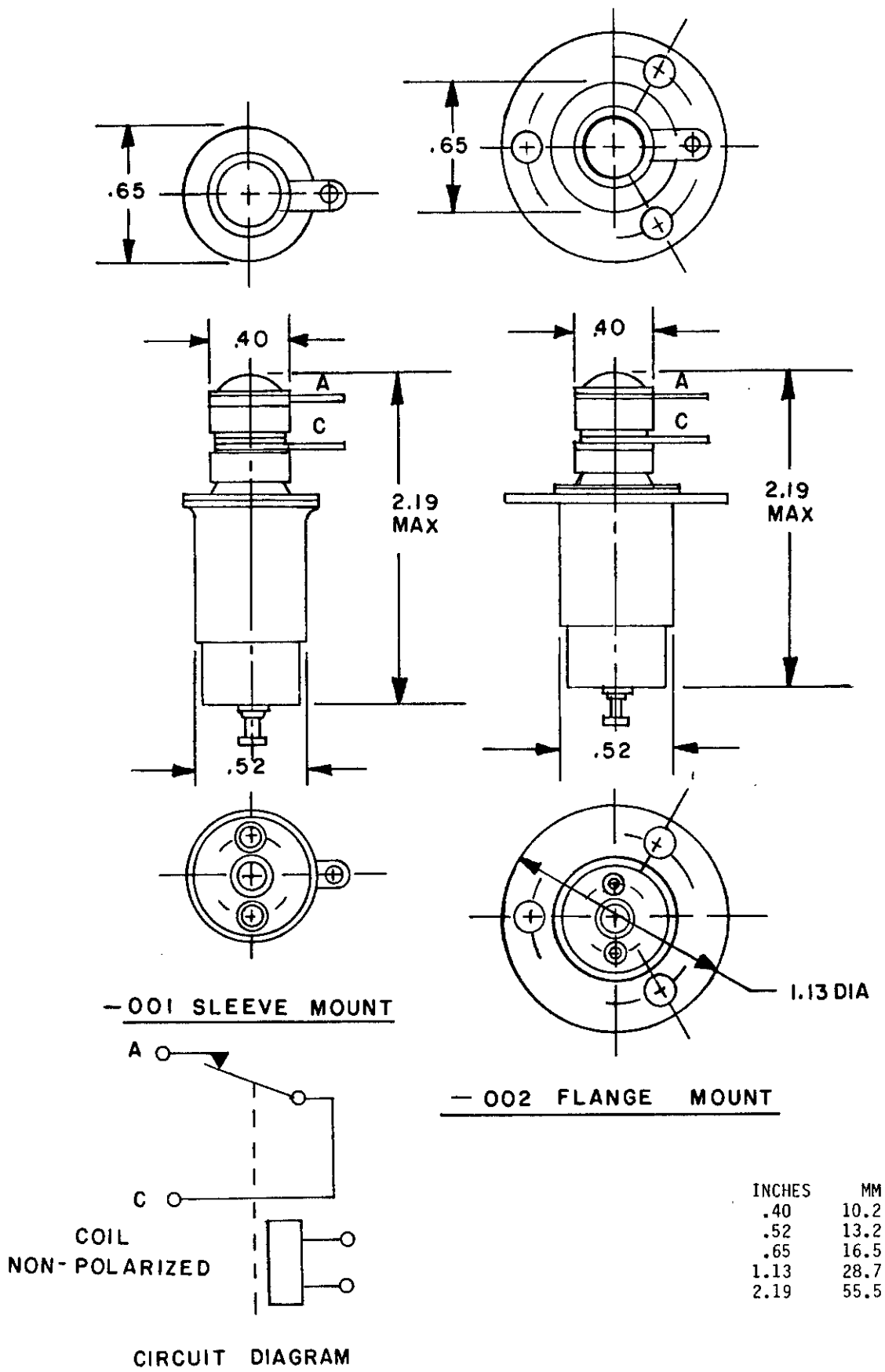


FIGURE 701-10. Relay, vacuum, SPST, N.O., 12 amperes, 10 kilovolts (MIL-R-83725/10(USAF)).

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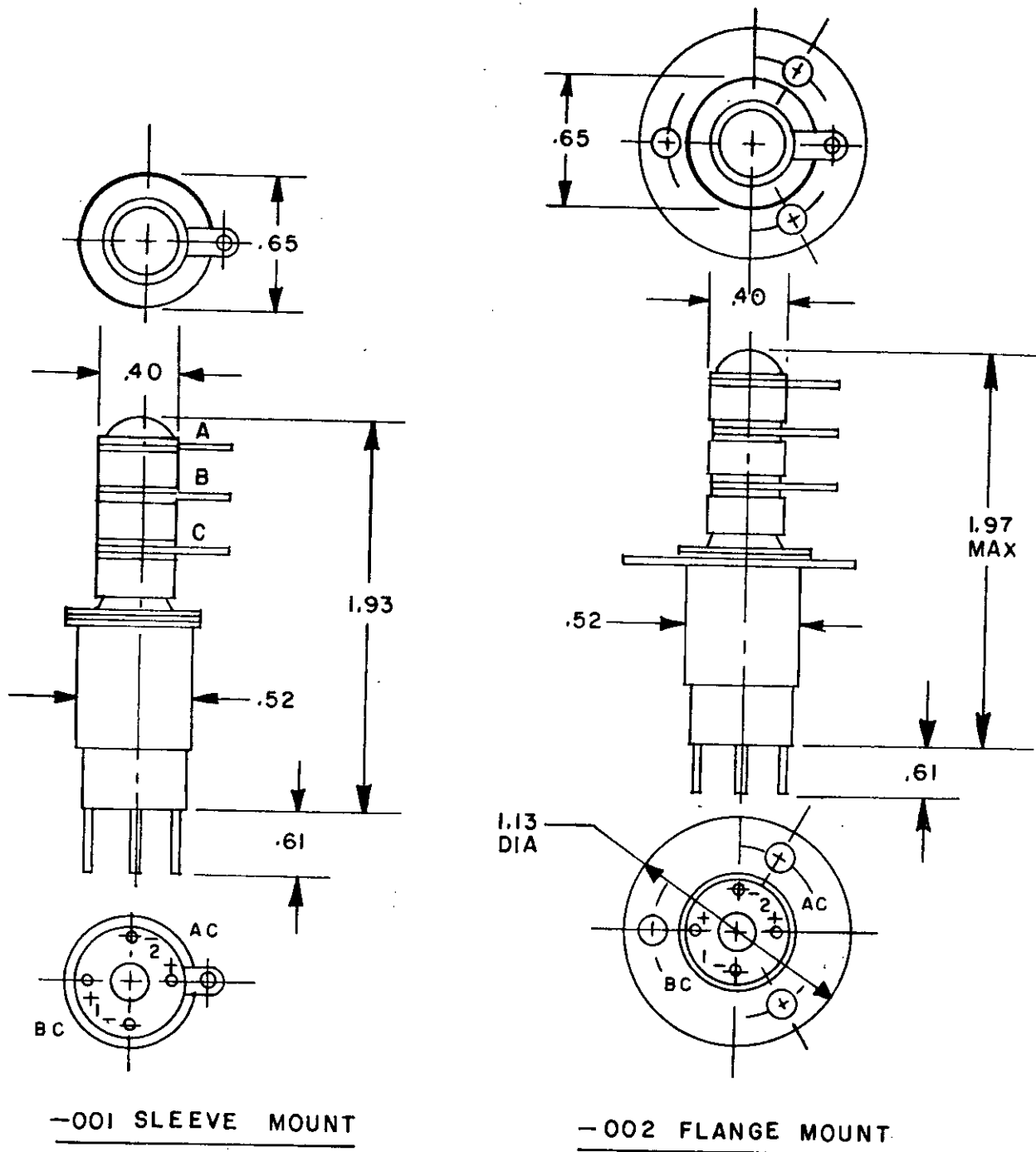


FIGURE 701-11. Relay, vacuum, SPDT, lock-up, 12 amperes, 3.6 kilovolts (MIL-R-83725/11(USAF).

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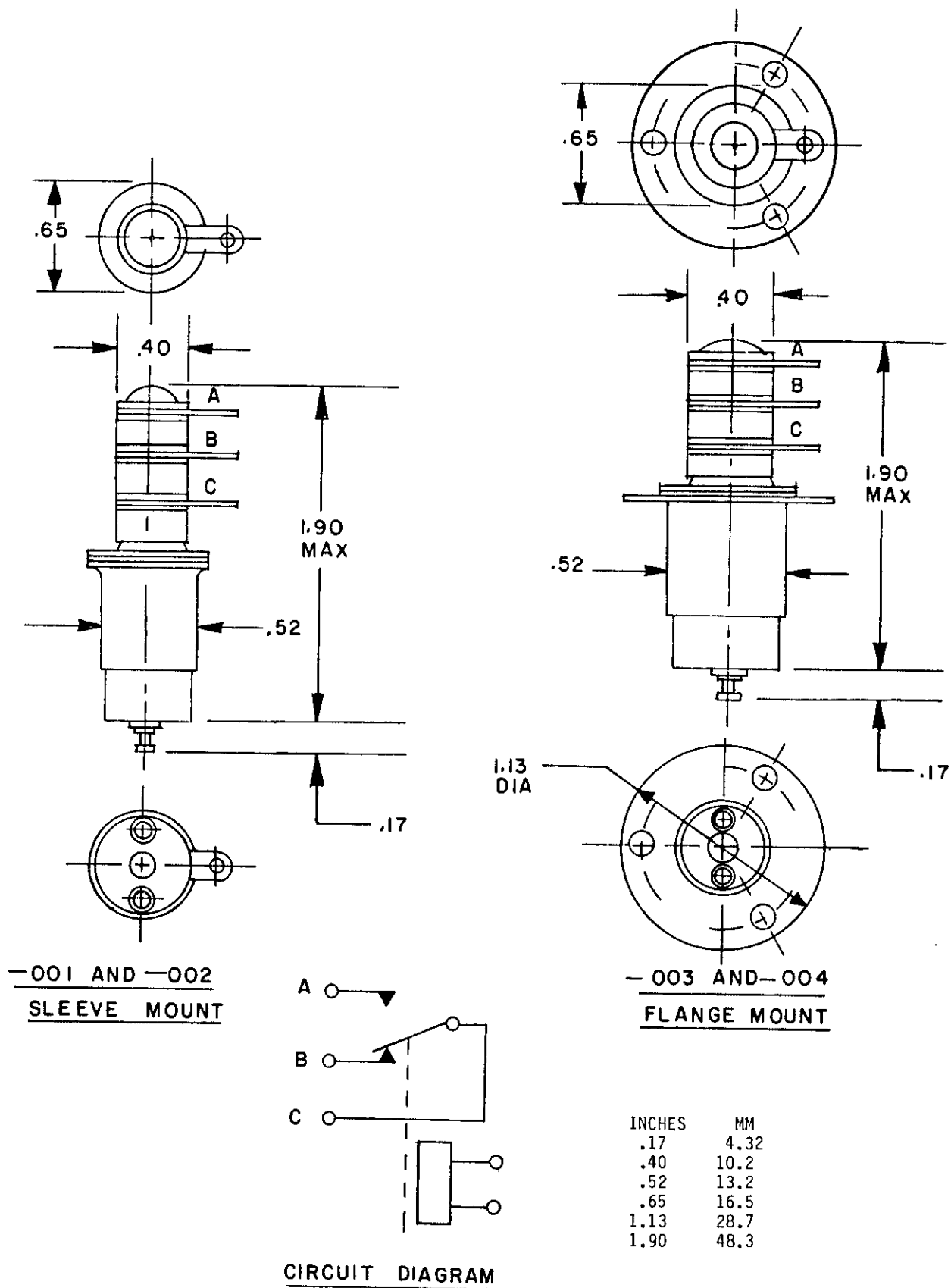


FIGURE 701-12. Relay, vacuum, SPDT, 12 amperes, 3.6 kilovolts (MIL-R-83725/12(USAF)).

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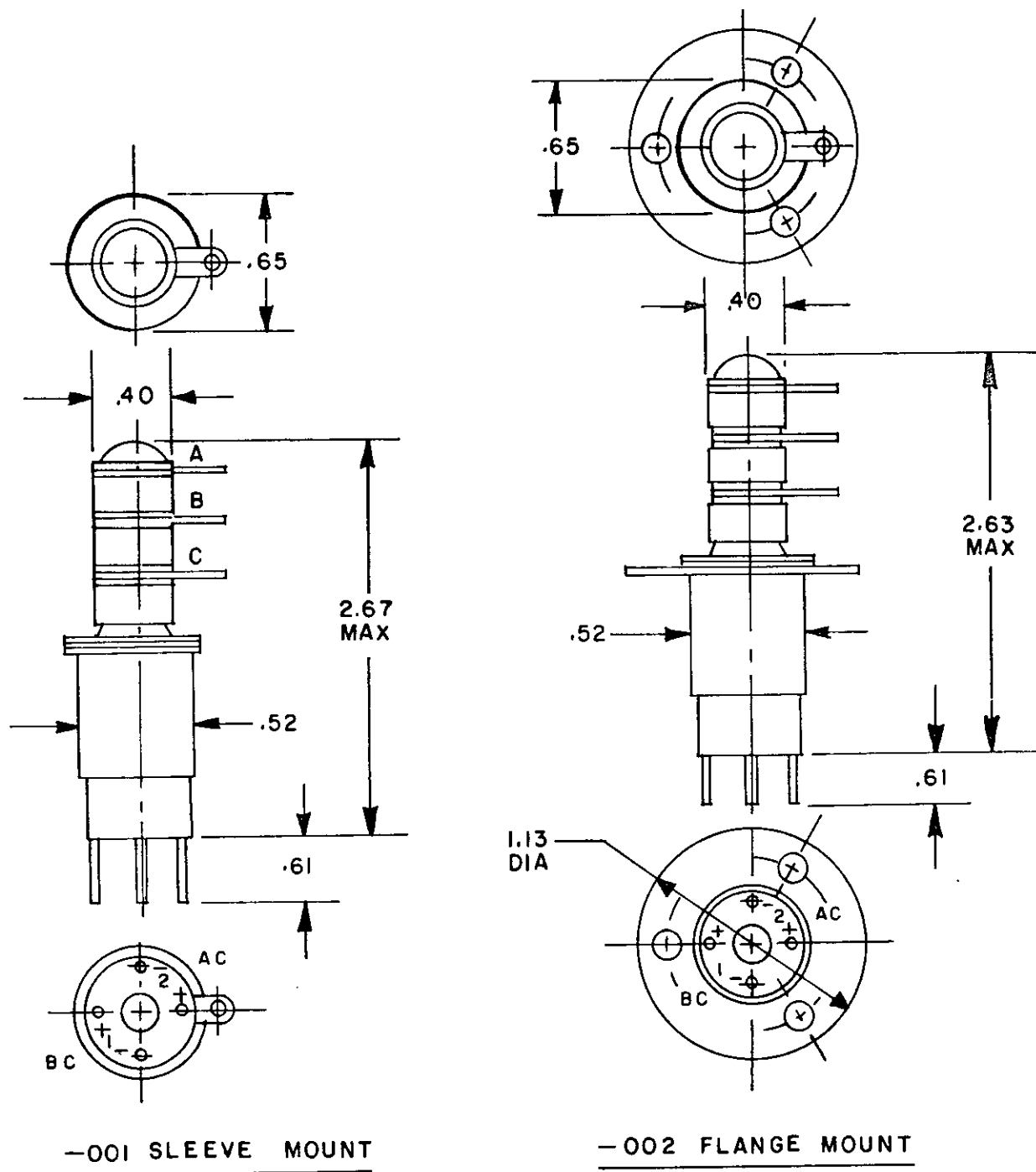


FIGURE 701-13. Relay, vacuum, SPDT, lock-up, 12 amperes, 9 kilovolts (MIL-R-83725/13(USAF)).

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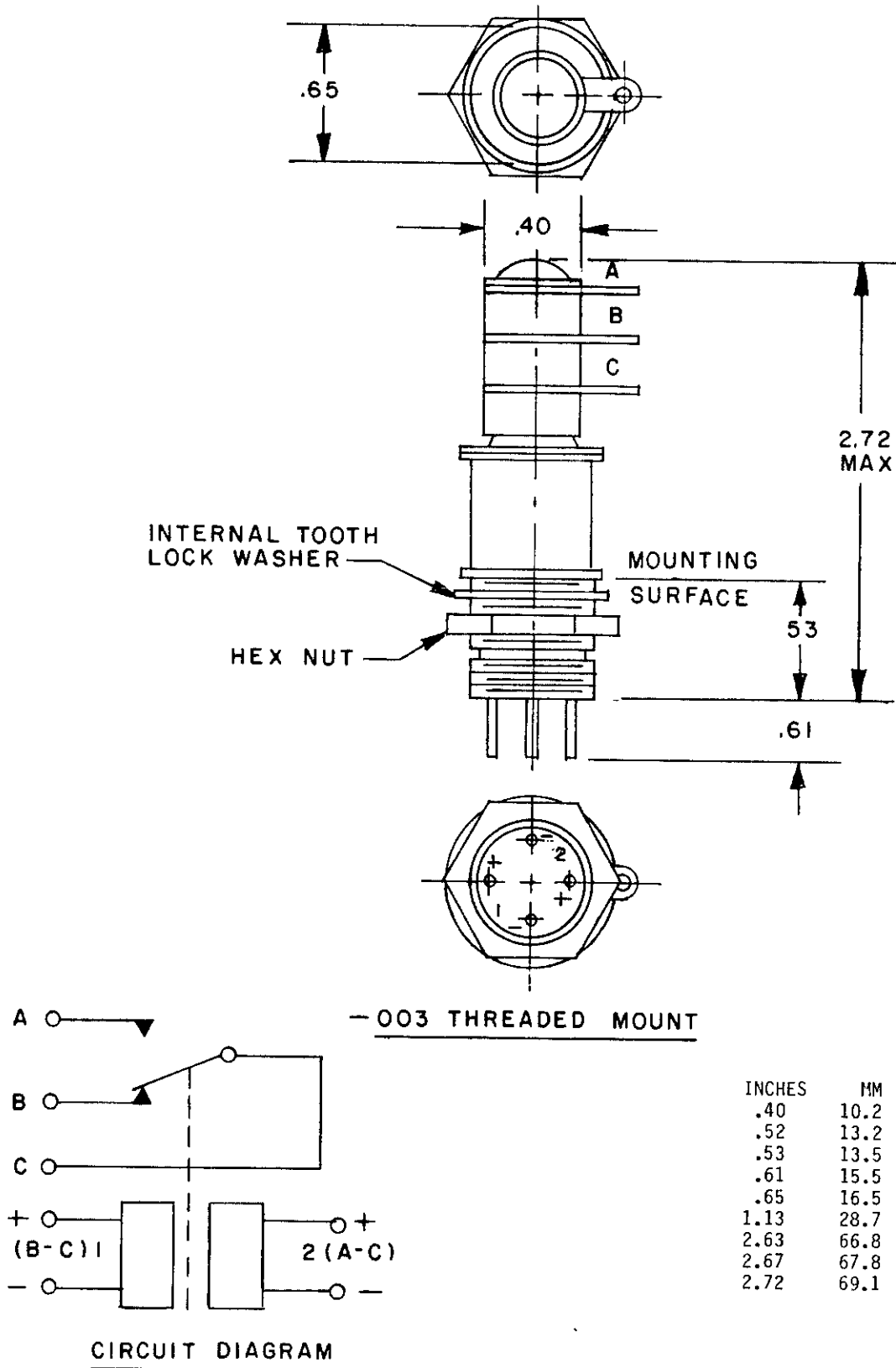


FIGURE 701-13. Relay, SPDT lock-up, 12 amperes, 9 kilovolts (MIL-R-83725/13) - Continued.

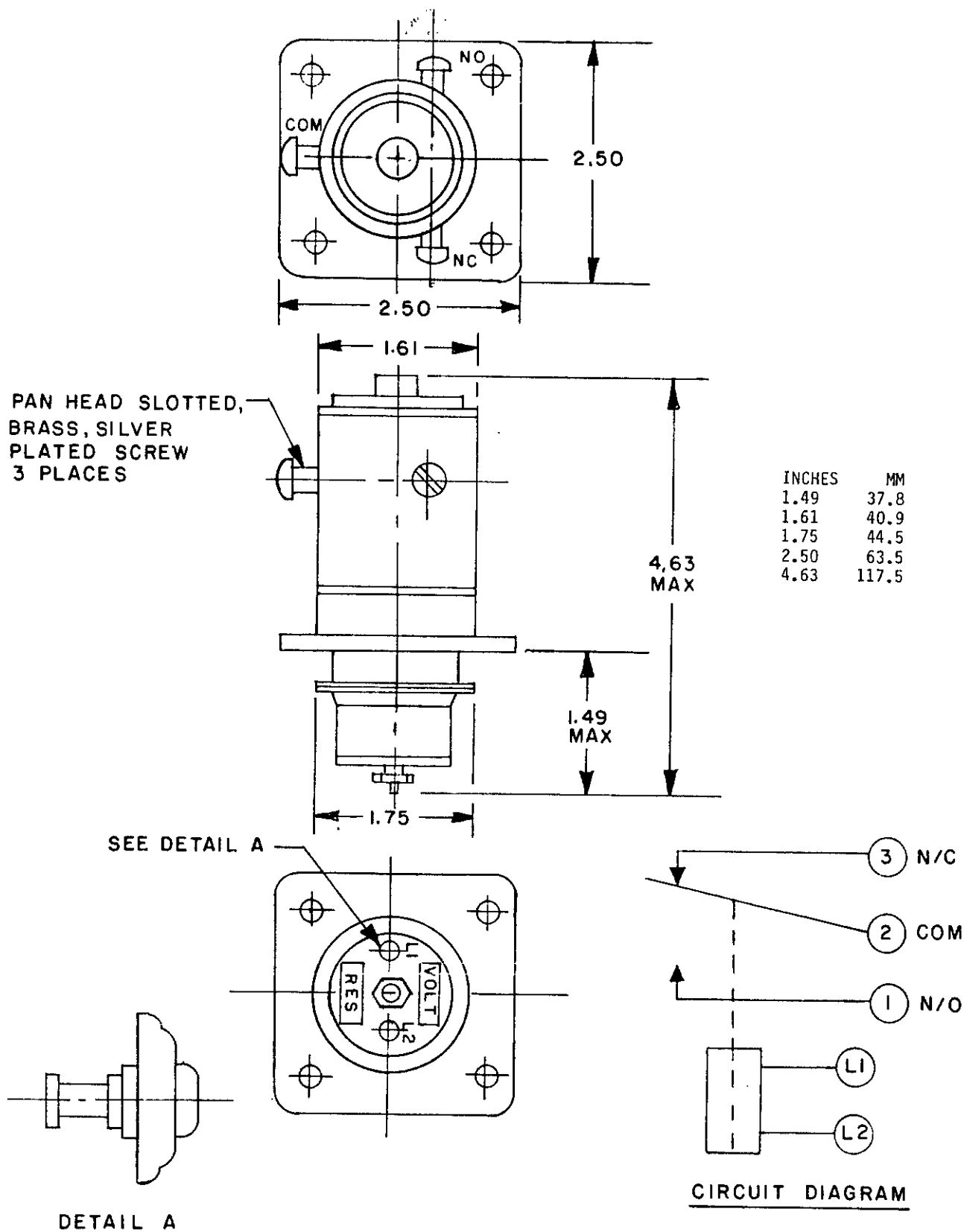
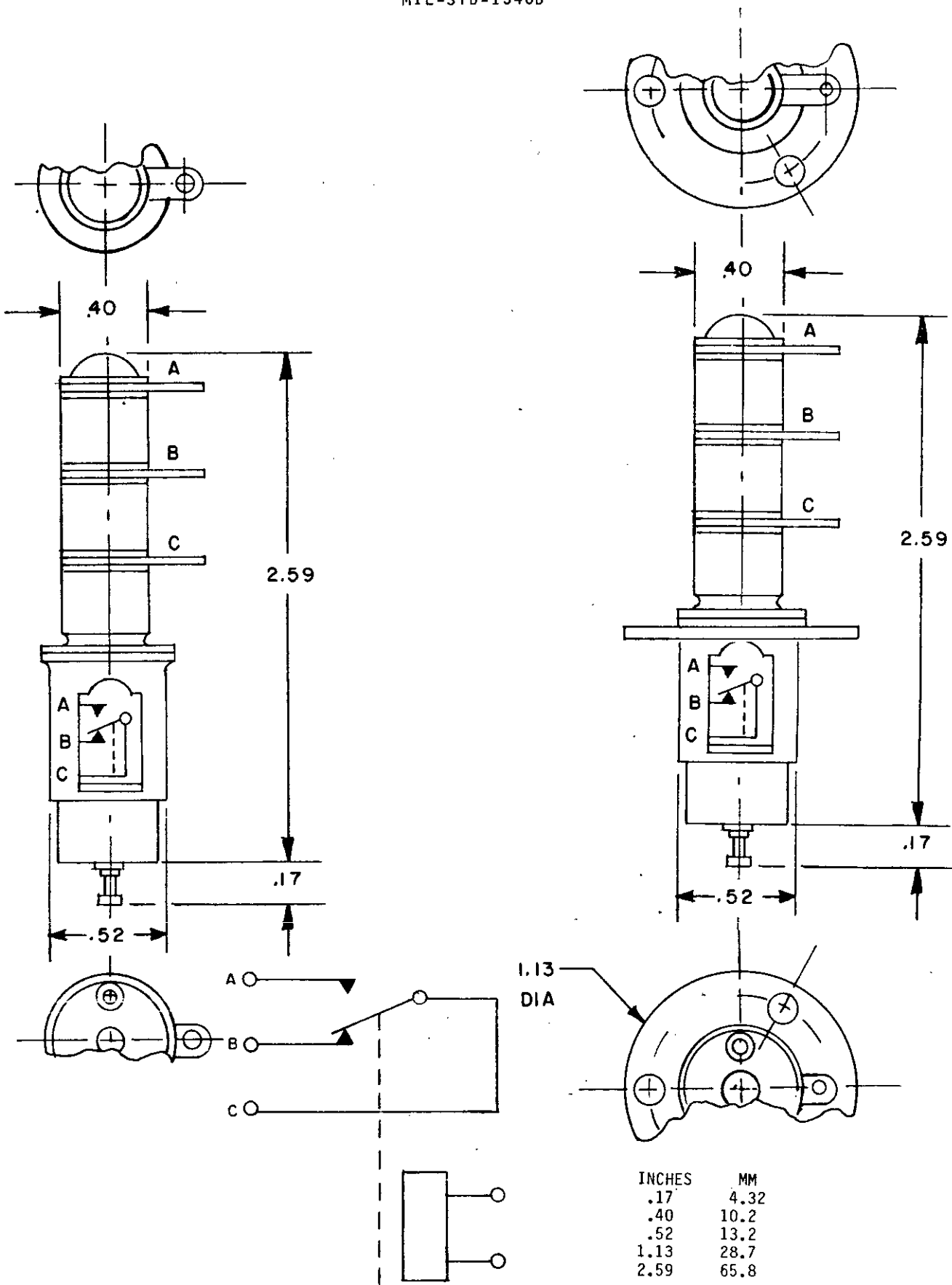


FIGURE 701-15. Relay, vacuum, SPDT, 75 amperes, 15 kilovolts (MIL-R-83725/15(USAF)).

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CIRCUIT DIAGRAM

FIGURE 701-16. Relay, vacuum, SPDT, lock-up, 12 amperes dc or 60 hertz RMS, 9 kilovolts or 60 hertz peak (MIL-R-83725/16(USAF)).

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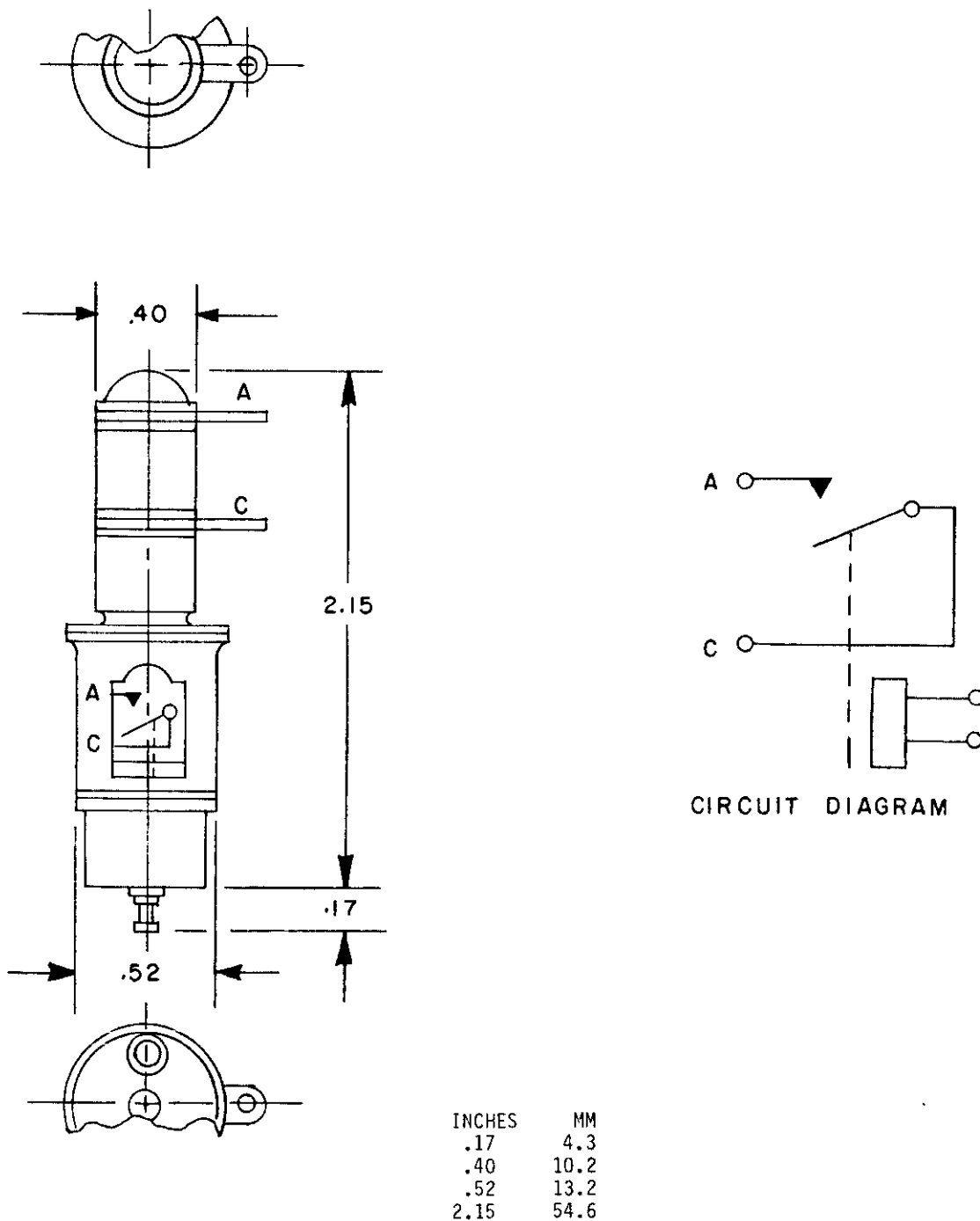
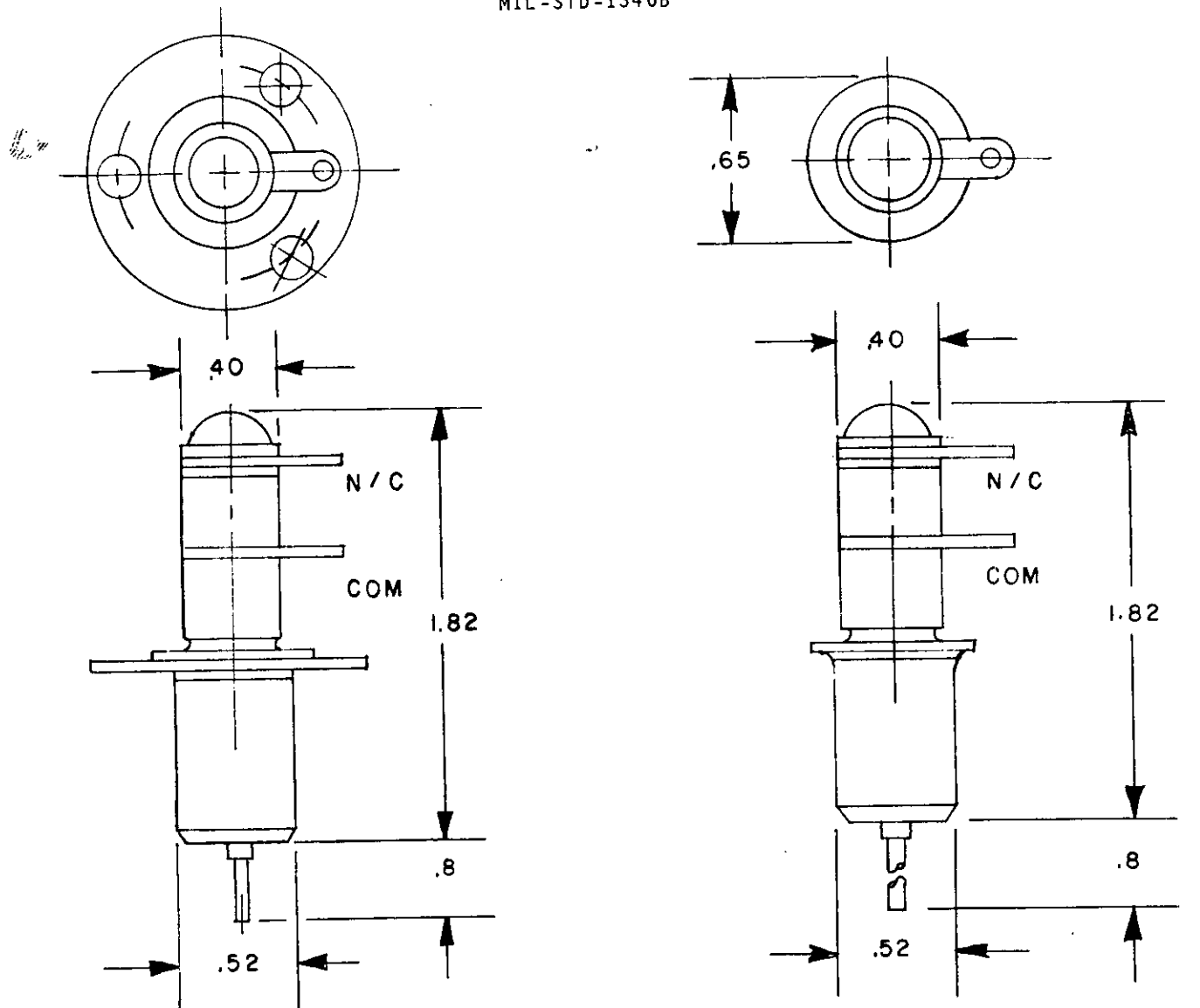
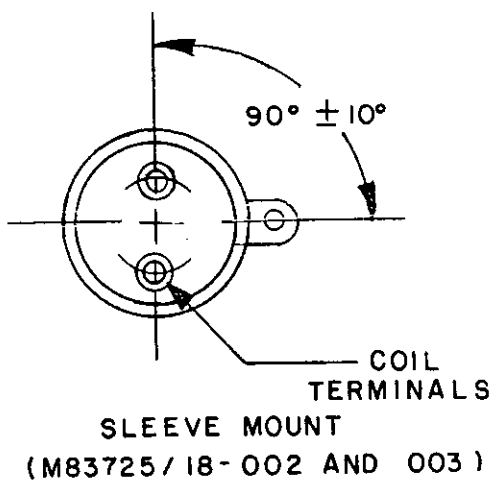
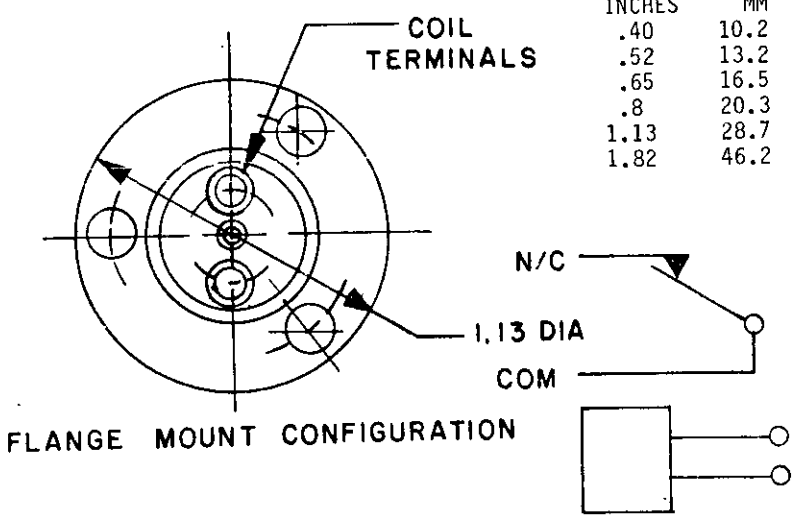


FIGURE 701-17. Relay, vacuum, SPST, N.O., 12 amperes dc, or 60 hertz RMS, 10 kilovolts peak dc (MIL-R-83725/17(USAF)).

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INCHES	MM
.40	10.2
.52	13.2
.65	16.5
.8	20.3
1.13	28.7
1.82	46.2



COIL NON-POLARIZED
/ CIRCUIT DIAGRAM

FIGURE 701-18. Relays, vacuum, SPST, NC, dc, and amperes (MIL-R-83725/18(USAF)).