TERMS, DEFINITIONS, ABBREVIATIONS, SYMBOLS, AND UNITS FOR ELECTROMAGNETIC RELAYS

ESCC Basic Specification No. 2133600

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1. SCOPE

This specification forms part of ESCC Basic Specification No. 21300, Terms, Definitions, Abbreviations, Symbols and Units, and covers electromagnetic relays.

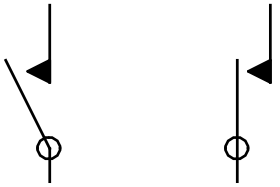
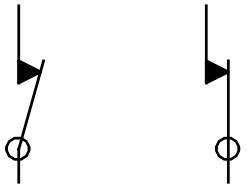
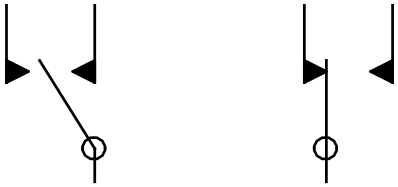
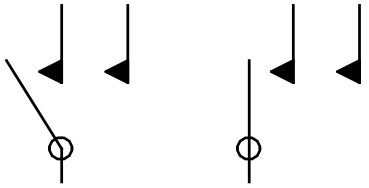
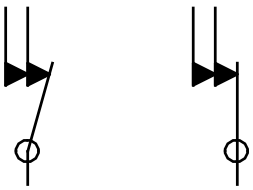
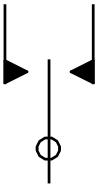
2. TERMS, DEFINITIONS AND ABBREVIATIONS

Armature	The moving magnetic member of an electromagnetic relay structure that converts electrical energy into mechanical work.
Chatter, Contact (contact bounce)	The undesired vibration of mating contacts during which there may or may not be actual physical contact opening. If there is no actual opening, but only a change in resistance, it is referred to as dynamic resistance and appears as grass on the screen of an oscilloscope with adequate sensitivity and resolution.
Coil	An assembly consisting of 1 or more magnet wire windings, usually wound over an insulated iron core on a bobbin or spool, or self-supporting, with terminals and any other required parts such as a sleeve or slug.
Coil, Rated Voltage (V_C)	
Coil Resistance (R_B) Latch (R_{BL}) Reset (R_{BR})	
Contacts	The surfaces of current-carrying members at which electrical circuits are opened or closed.
Contacts, Double Throw	A contact combination having 2 positions, such as in break-make, make-break, etc.
Contacts, Dry Circuit	(a) Contacts that neither break nor make current. (b) Erroneously used for low level contacts.
Contacts, Low Level	Contacts that control only the flow of relatively small currents in relatively low voltage circuits, i.e. a maximum closed circuit current of 10mA and a maximum open circuit voltage of 10mV, either ac or dc.
Contacts, Normally Closed (N/C) (Break contacts)	Contact pairs that are closed when the armature is in its non-operative position.
Contacts, Normally Open (N/O) (Make contacts)	Contact pairs that are open when the armature is in its non-operative position.
Contact Force	The pressure exerted by a movable contact against a fixed contact when the contacts are closed.
Contact Gap	The distance between a pair of mating relay contacts when the contacts are open.
Contact Load	The electrical power demands encountered by a contact set in any particular application.
Contact Miss	Failure of a contact-mating pair to establish the intended circuit electrically. This may be a circuit resistance in excess of a specified maximum value.

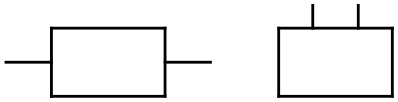
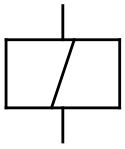
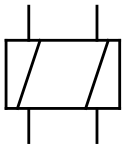
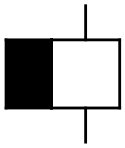
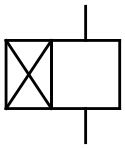
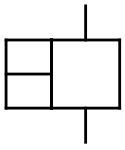
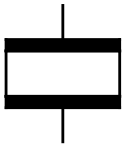
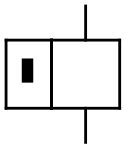
Contact Rating	The maximum current for a given type of load (i.e. voltage frequency and nature of impedance) which the relay (contacts) will make, carry, break (unless otherwise specified) for its rated life.
Contact Resistance (R_C)	The electrical resistance of operated contacts as measured at their associated contact spring terminals.
Contact Spring	A current-carrying spring to which the contacts are fastened.
Contact Spring Terminals	Those portions of contact springs to which the current-carrying conductors are attached.
Contact Transfer Time	The interval between opening of the closed contacts and closing of the opened contacts of a contact combination.
Core, Coil	That portion of the magnetic structure of a relay around which the coil is usually wound.
Crystal Can Relay	A term used to identify a micro-miniature relay housed in a hermetically sealed enclosure that was originally used to enclose a frequency control type of quartz crystal.
De-energisation	The removal of power from a relay coil. Also commonly used to indicate a change in coil applied power adequate to produce drop-out.
Double Pole Double Throw (2PDT)	2 sets of double-throw contacts. Double-throw contact sets have 3 contacts. The middle one is in contact with the second, but not with the third in 1 position of a relay, and reverses this connection in the other relay position. The basic double-throw contact combination is the make-break (form C).
Drop-out, Specified Drop-out Voltage (U_d) Drop-out Current (I_d)	The specified maximum current or voltage at which a relay - (b) Erroneously used for low level contacts.
Dry Circuit	A mechanically closed circuit with no appreciable applied voltage.
Electromagnetic Relay	A relay whose operation depends upon the electromagnetic effects of current flowing in an energising winding.
Energisation	The application of power to a coil winding of a relay (coil energised - coil de-energised).
Frame	The main supporting portion of a relay which may include parts of the magnetic structure.
Half Crystal Can Relay	Relay housed in a half-size crystal can.
Header	The sub-assembly that supports and insulates the leads passing through the walls of a sealed relay.
Housing (Can, Case)	An enclosure or cover for 1 or more relays, with or without accessories, usually providing access to the terminals.
Insulation Resistance (I_R) (of a device)	Resistance of insulation measured (in Ω) at a specified (of a device) dc voltage and under ambient conditions after the current becomes constant. The resistance to leakage current of an intended insulator.
Intermediate Current	The range of contact current at which there is insufficient energy under arcing conditions at the mating contact surfaces to ensure good contacting for the type of contact material, shape and forces employed.

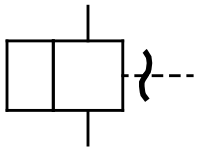
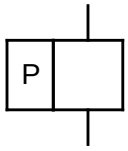
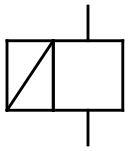
Latching Relay Bi-stable relay Polarised (magnetically latched relay)	A relay that maintains its contact in the last position assumed without the need for maintaining coil energisation by means of remanent magnetism until reset electrically.
Miss Test (Low Level Test)	A test made to detect a contact miss.
Pick-up, Specified -Pick-up Voltage (U_c) -Pick-up Current (I_c) -Latch Voltage (U_L -Reset Voltage (U_R)	Latch and reset for latching relays. The current or voltage at, or below which, the armature is required to come into contact with the coil core or pole piece by assuming its fully operated position.
Pole Piece	The end of an electromagnet, sometimes separable from the main section, and usually shaped so as to distribute the magnetic field in a pattern best suited to the application.
Rated Coil Currrent	The steady state coil current on which a relay is intended to operate for the prescribed duty cycle.
Rated Coil Voltage	The coil voltage on which a relay is intended to operate for the prescribed duty cycle.
Rated Contact Current (I_{CR})	The current which contacts are designed to handle during their rated life.
Switch-over (Change-over)	A relay is switched over when it picks up or drops out.
Time, Contact Bounce (R_{eb})	The time interval from initial actuation of a contact to the end of bounce brought about during pick-up or drop-out or from external causes.
Time, Operate (T_E) -Latch (T_L) -Reset (T_R)	Latch time, reset time for latching relays. The time interval from coil energisation to the functioning time of the last contact to function. Where not otherwise stated, the functioning time of the contact in question is taken at its initial functioning time (i.e. excluding contact bounce time).
Time, Release (T_D)	The time interval from coil de-energisation to the functioning time of the last contact to function. Where not otherwise stated, the functioning time of the contact in question is taken at its initial functioning time (i.e. excluding contact bounce time).

3. SYMBOLS FOR MOST COMMONLY USED RELAY CONTACT COMBINATIONS

FORM	SYMBOL	DESCRIPTION
A		Make contact or SPST N/O
B		Break contact or SPST N/C
C		Change over contact break before make SPDT
D		Make-before-break contact
F		Contact with 2 makes making in succession
G		Contact with 2 breaks breaking in succession
K		Two-way contact with neutral position

4. SYMBOLS FOR RELAY COILS

SYMBOL	DESCRIPTION
	Relay coil
	Relay coil with 1 winding
	Relay coil with 2 windings
	Relay coil of a slow-releasing relay
	Relay coil of a slow-operating relay
	Relay coil of a high speed relay
	Relay coil of a relay unaffected by alternating current
	Relay coil of an a.c. relay

SYMBOL	DESCRIPTION
	Relay coil of a mechanically resonant relay
	Relay coil of a polarised relay
	Relay coil of a remanent relay