

CEC Measurements

Type VAJ

Type VAJ relays are fast operating, multi-contact attracted armature relays with a high degree of mechanical stability and are suitable for control or tripping duties where a number of simultaneous switching operations are required. A typical application for a tripping relay is the isolation of a generator. When a fault occurs, the main field circuit breakers must be opened, steam valves closed, carbon dioxide injected into the case, an alarm sounded and other operations initiated as required.

Control relays generally have lower burdens than tripping relays and are used for applications such as starting and shutting down apparatus in automatic stations.

Relay Type	Pairs of Contacts	Contact Reset	Duty
VAJX11	8	Electrical or hand and electrical	Tripping relays meeting the requirements of Engineering Recommendation M16/2 Class EB*
VAJX12	12 or 18		
VAJX13	4		
VAJY11	8	Hand	
VAJY12	12 or 18		
VAJY13	4		
VAJZ11	8	Self	
VAJZ12	12 or 17		
VAJZ13	4		
VAJC11	8	Electrical	Control
VAJC12	12 or 18		
VAJH13	4	Hand	Low Burden Tripping
VAJS13	4	Self	

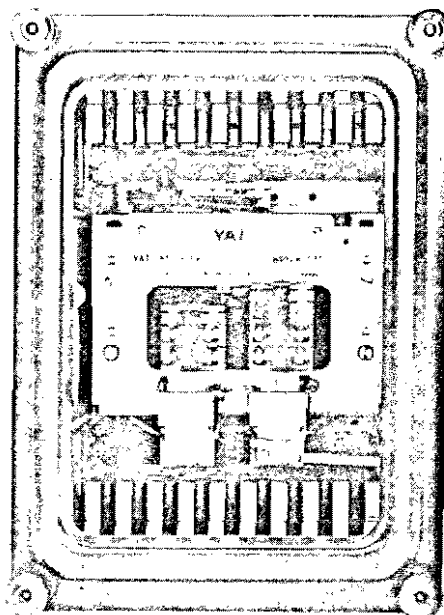
* Relays to Electricity Council Engineering Recommendation M16/2 Class EB have the following characteristics:

- They must operate at less than 53% of rated voltage.
- The current at operation must be greater than 100mA.
- The relay must remain unoperated when a 10 μ F capacitor charged to 150 volts is discharged through the operating circuit. This specification applies to relays rated at 125 volts d.c. only.

CONSTRUCTION AND OPERATION

Depending on the type of relay, the mechanical construction ranges from a basic attracted armature unit to more complex arrangements employing several mechanically linked contact stacks and a heavy duty armature assembly. All relays have a positive action without chatter.

Typical circuits of tripping relays are shown overleaf. Cut-off contacts are provided on hand and electrically reset relays. The contacts are time delayed on opening if required by employing two auxiliary attracted armature units as shown in circuit (a). When the main attracted armature unit (OP) is energised via normally closed contact B—1, a normally open contact (OP—1) closes to energise auxiliary unit A. Contact A closes to energise auxiliary unit B, and cut-off contact A—1 closes to maintain the operating current. Contact B—2 closes to short circuit the coil of unit A which, after a short time delay, drops off and contact A—1 opens to cut-off the operating current. Auxiliary unit B remains energised until the protective relay (PR) is reset. Contact OP—2 ensures that the protective relay (PR) is reset before the tripping relay.



Type VAJZ11 self reset tripping relay in size 1 draw-out case

Self reset tripping relays type VAJZ are arranged, as shown in circuit (c), to have a comparatively low continuous burden when operated. On operation, an auxiliary attracted armature unit A is energised via a normally open contact on the main attracted armature unit (OP). Contacts on unit A open circuit the parallel resistor R1 and introduce into the circuit a series resistor R2. The value of R2 is calculated to pass sufficient current to hold in the main unit (OP) at minimum rated voltage.

STANDARD VOLTAGE RATINGS

Operating and reset coils: 24, 30, 48, 50, 60, 110, 125, 220, 230, 240 and 250 volts d.c.

Tripping relays will satisfactorily operate between 53% and 120% of rated voltage, and reset between 80% and 120% of rated voltage (VAJX).

Control relays will satisfactorily operate and reset between 80% and 120% of rated voltage.

CONTACTS

The number of pairs of contacts available for tripping or control duties is shown in the table overleaf.

Any combination of normally open or normally closed contacts can be fitted.

Contacts are of a silver/copper alloy, shaped and positioned to ensure low resistance and maximum reliability.

Cut-off Contacts

Hand and electrically reset relays are fitted with heavy duty cut-off contacts. These contacts interrupt the operating circuit instantaneously when the relay has operated and latched in.

A cut-off contact in the reset circuit is provided if required at the expense of an outgoing contact. The cut-off contacts of relays rated at 125 volts and with 8 or more pairs of contacts can be arranged to have a minimum of 40/60 milliseconds time delay on opening.

CONTACT RATING

Contacts for tripping and control duties are rated as follows:

	Make and Carry Continuously	Make and Carry for 0.5 second	Break
a.c.	1250VA with maxima of 5 amps and 660 volts	7500VA with maxima of 30 amps and 660 volts	1250VA with maxima of 5 amps and 660 volts
d.c.	1250 watts with maxima of 5 amps and 660 volts	7500 watts with maxima of 30 amps and 660 volts	100 watts resistive 50 watts inductive with maxima of 5 amps and 660 volts

OPERATING TIME AND BURDENS

Relay Type	At rated coil voltage			
	Nominal Operating Burden watts	Maximum Burden Operated watts	Nominal Reset Coil Burden watts	Maximum Operating Time milliseconds
VAJX	150	0	50	10
VAJY	150	0	—	10
VAJZ11	120	8 to 13	—	10
VAJZ12	150	18 to 20	—	10
VAJZ13	110	5 to 11	—	10
VAJC11	20	0	20	15
VAJC12	25	0	25	25
VAJH13	25	0	—	10
VAJS13	20	20	—	10

THERMAL RATING

Self reset tripping relays type VAJS13 are 2 minute rated only. All other tripping and control relays are arranged so that 120% rated voltage can be applied continuously. Reset coils, which are normally energised through a push-button, are short time rated.

OPERATION INDICATORS

Tripping relays are available with or without a hand reset operation indicator.

Control relays have an operation indicator which follows the contacts, i.e. resets when the contacts are electrically reset.

INFORMATION REQUIRED WITH ORDER

Relay type
Voltage rating
Number and combination of contacts for tripping or control duties
Hand reset operation indicator required
Instantaneous or time delayed cut-off contact
Case size, type and mode of mounting

INSULATION

The relay will withstand 2.0 kV a.c. r.m.s. 50 Hz for 1 minute between all circuits and earth and between electrically separate circuits. It will also withstand 1.0 kV for 1 minute between normally open contacts.

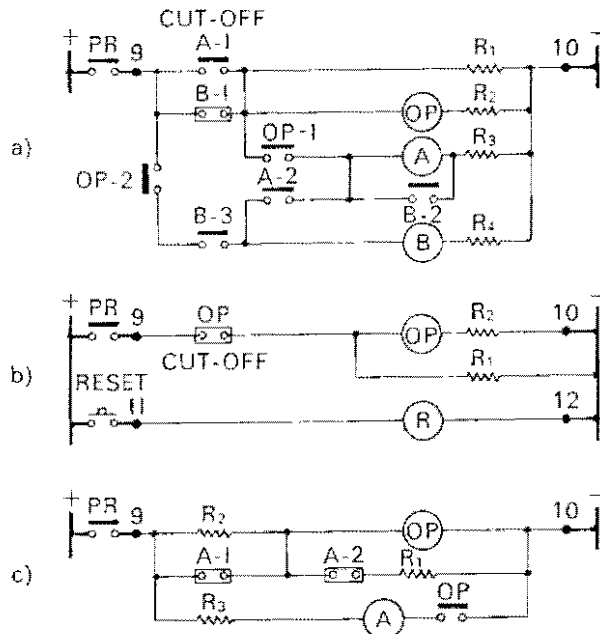
CASES

Relays are supplied in drawout (D type) or moulded non-drawout (N type) cases as follows:

Number of Pairs of Contacts	Case Size and Type	Maximum Overall Dimensions						Maximum Number of Terminals
		Height		Width		Depth*		
		ins	mm	ins	mm	ins	mm	
4	$\frac{1}{2}$ N	4 $\frac{1}{2}$	124	6	153	5 $\frac{1}{2}$	130	12
4 or 8	1D	9 $\frac{1}{2}$	233	6 $\frac{1}{2}$	170	7 $\frac{1}{2}$	197	20
12, 17 or 18	1 $\frac{1}{2}$ D	14 $\frac{1}{2}$	362	6 $\frac{1}{2}$	170	7 $\frac{1}{2}$	197	40

*Add 2ins. (51 mm) for maximum length of 2BA terminal studs.

Dimensioned drawings of case outlines, panel cut-outs, and panel mounting details are available on request.



RELAY CASE TERMINALS HEAVY LINES DENOTE EXTERNAL CIRCUITS

Typical tripping relay circuits a) hand reset with delayed cut-off controls (VAJY11) b) electrical reset (VAJX) c) self reset (VAJZ). Outgoing contacts are not shown—see CONTACTS

Cases are suitable for flush or projecting mounting. All cases are finished phenolic black as standard. Relays for use in exceptionally severe environments can be finished to B.S. 2011 : 20/50/56 at extra cost; standard relays are finished to B.S. 2011 : 20/40/4 and are satisfactory for normal tropical use.

Our policy is one of continuous product development and the right is reserved to supply equipment which may vary slightly from that described.

GEC Measurements

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