

MVAX 12/21/31/91

Trip Circuit Supervision Relays

MVAX relays supervise the trip circuit of a circuit breaker, initiating audible alarms and visual indications if the trip circuit fails or the mechanism does not operate.

Simple and Robust

Four types are available providing the following supervision:

Relay Type	Faults Detected
MVAX 12	Failure of trip supply only
MVAX 21	Failure of trip supply
MVAX 31 & MVAX 91	Open circuit trip coil, or trip circuit wiring failure of circuit breaker tripping mechanism *MVAX 91 = 3 X MVAX 31

MVAX 31 provides supervision with the circuit breaker in either state MVAX 21 with the circuit breaker closed only. If required, the alarm units of types MVAX 21 and MVAX 31 can be operated via pilot wires. MVAX 91 consists of three separate MVAX 31's in a size 8 (40TE) case.

The relays are attracted armature units of simple and robust construction having a positive action without chatter.



Application Flexibility

- Trip circuit can be supervised with breaker open or closed
- Ensures the integrity of the protection scheme

Reliable and Easy to Use

- No mis-tripping of breaker by accidental short-circuits
- No false alarms given due to protection operation
- Design pedigree from >1 million auxiliary relays supplied
- Simple and robust design



Description

The MVAX12 is a single unit which is connected across the trip circuit supply as shown in Figure 2(a). The unit is normally energised and drops off if the trip voltage is lost or falls below approximately 40% of nominal. The unit picks up below 80% of rated voltage. To avoid operation due to voltage dips caused by faults in other circuits, a time delay circuit is incorporated to give 100 ms delayed drop off.

The MVAX 21 consists of two units connected as shown in Figure 2(b). Under healthy conditions with the circuit breaker closed, both units are energised. If the trip circuit becomes open or the supply fails, unit RL2 drops off and opens contact RL2-1 to de-energise unit RL1. When the circuit breaker is open, the auxiliary switch shunts contact RL2-1 to hold in unit RL1.

The units are delayed (by means of copper slugs) on drop-off for a total of 400 ms to prevent a false alarm due to voltage dips caused by faults in other circuits, or during a normal tripping operation, when unit RL2 is momentarily short circuited by the self reset trip relay contact.

If the trip relay fails to reset, due possibly to failure of the circuit breaker tripping mechanism, the alarm is initiated.

The MVAX 31 consists of three units connected as shown in Figure 2(c). Under healthy conditions with the circuit breaker closed, units RL2 and RL1 are energised and the operation is the same as type MVAX 21.

When the circuit breaker is open, unit RL3 is also energised via the normally closed auxiliary switch and unit RL1 is held in by contact RL3-1. Unit RL3 will detect trip circuit abnormalities with the circuit breaker open, in a similar manner to unit RL2 with the circuit breaker closed.

The units are delayed a total of 400 ms on drop off, as in type MVAX 21.

The MVAX 91 consists of three separate MVAX 31's connected as shown in Figure 2(d).

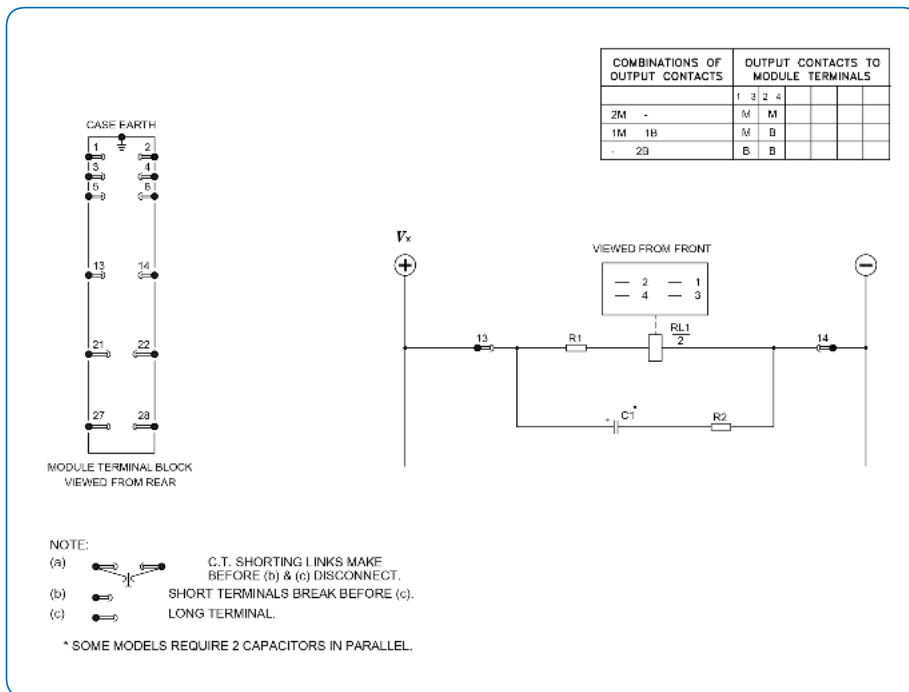


Figure 2 (a) MVAX 12 trip supply supervision

MVAX Supervision - the state of “trip-readiness” ensures the integrity of your protection scheme

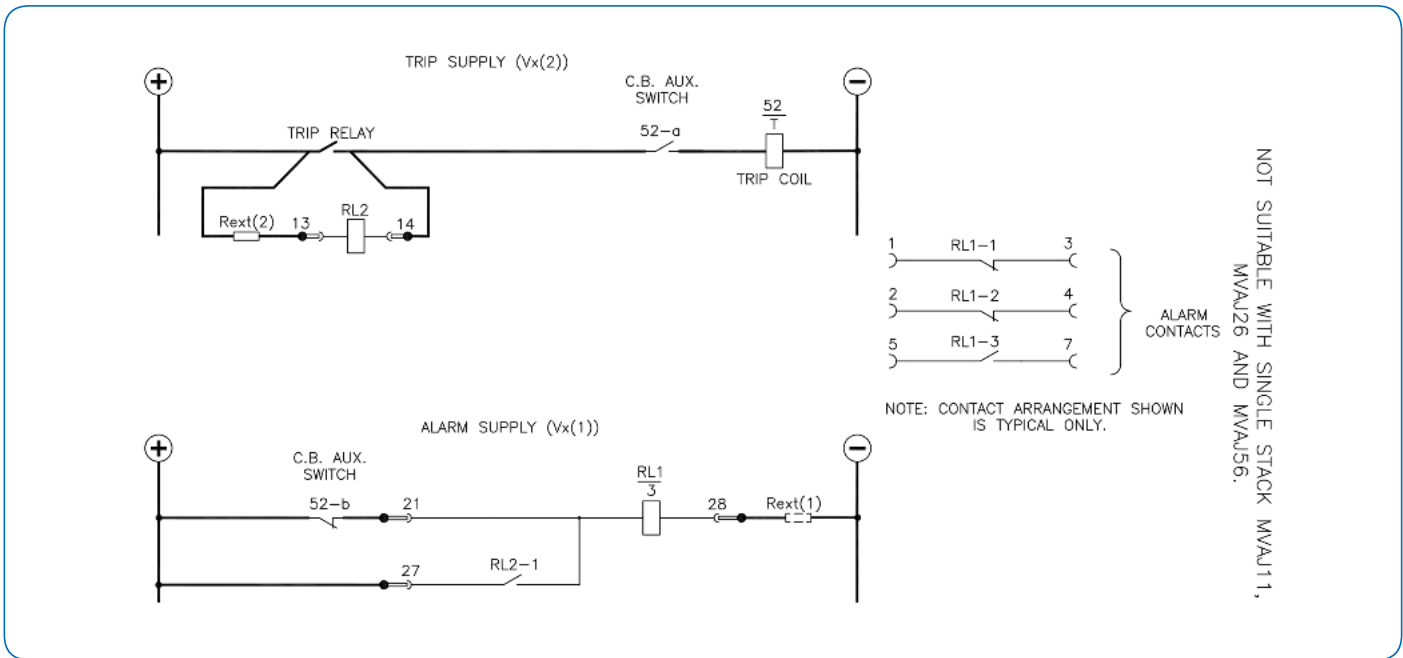


Figure 2 (b) MVAX 21 trip circuit supervision

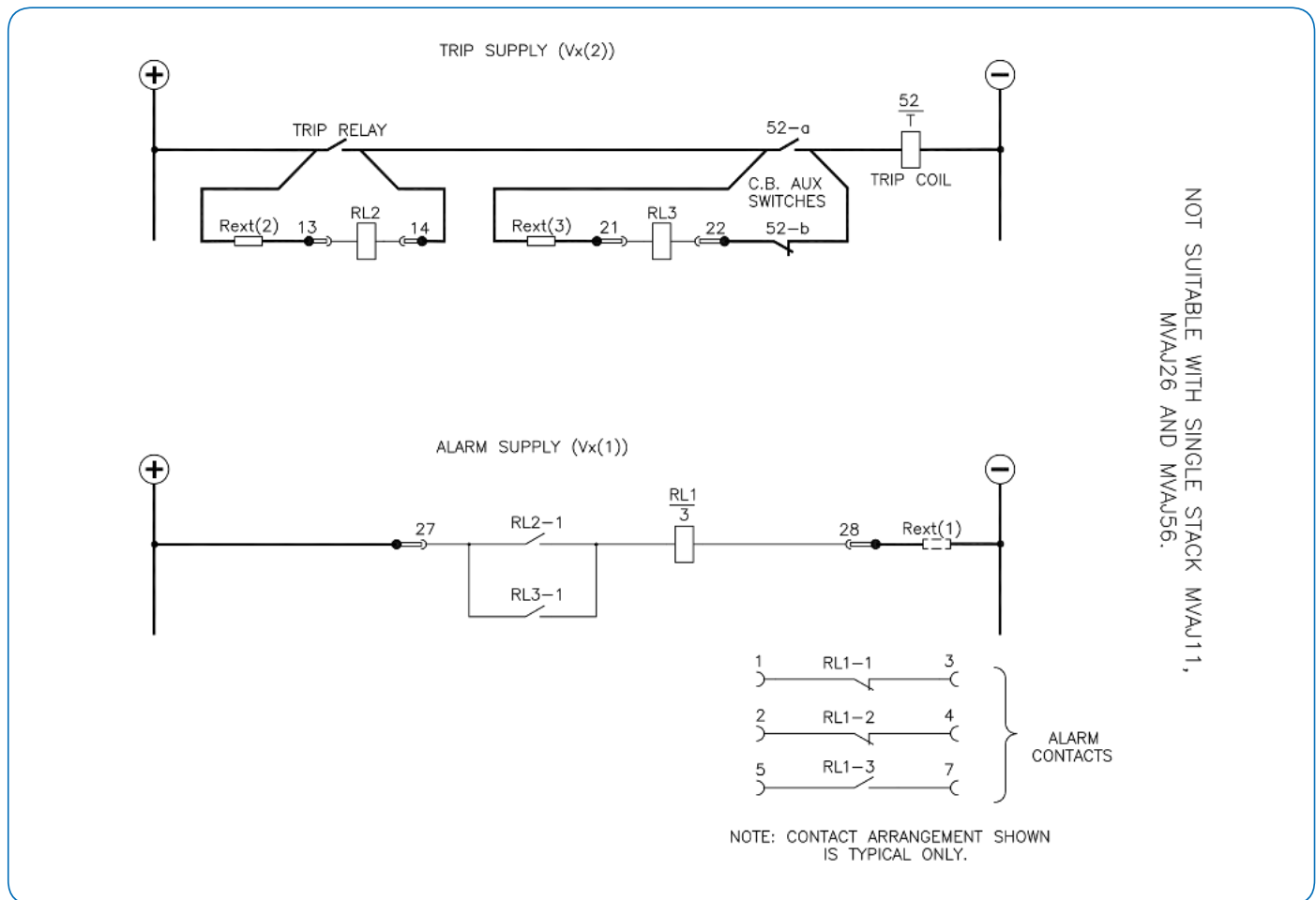


Figure 2 (c) MVAX 31 trip circuit supervision

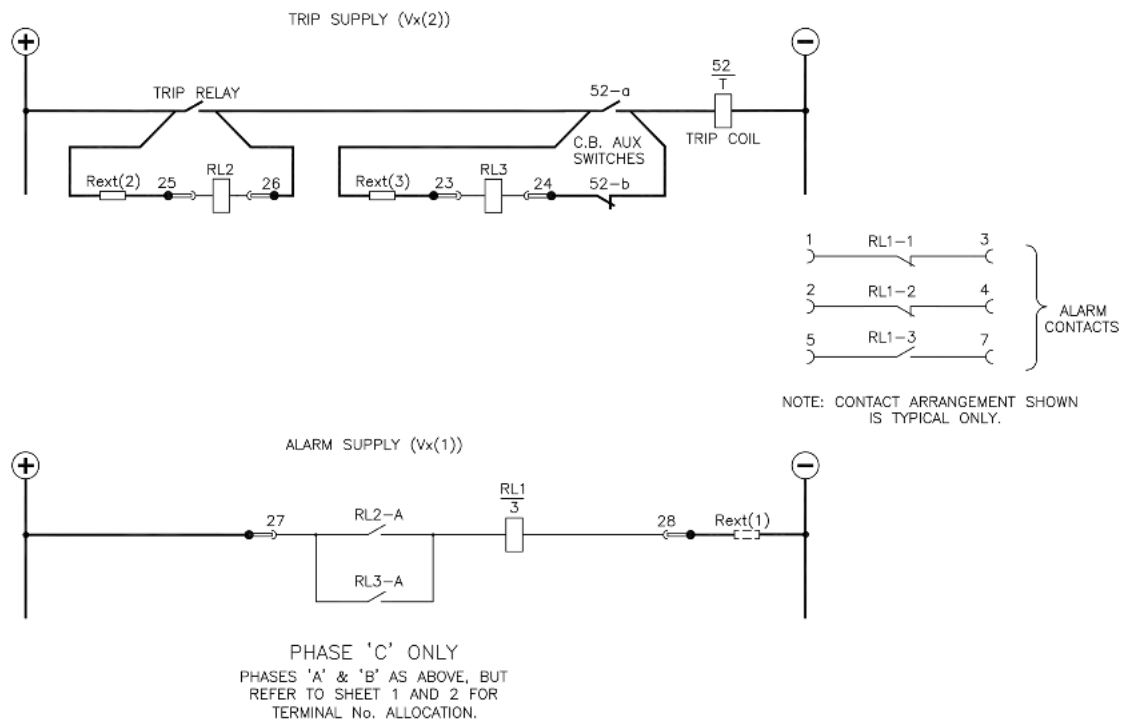
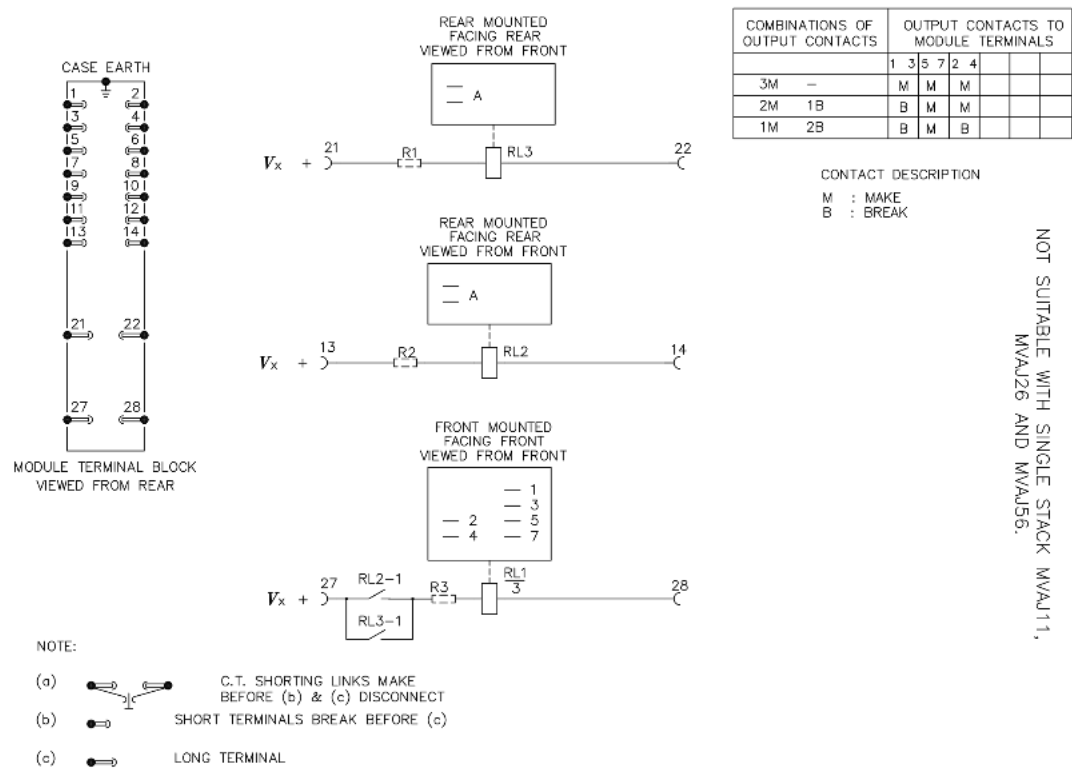


Figure 2 (d) MVAX 91 trip circuit supervision



NOT SUITABLE WITH SINGLE STACK MVA111, MVAJ26 AND MVAJ56.

Figure 2 (e) MVAX 31 trip circuit supervision relay with pre-closing supervision

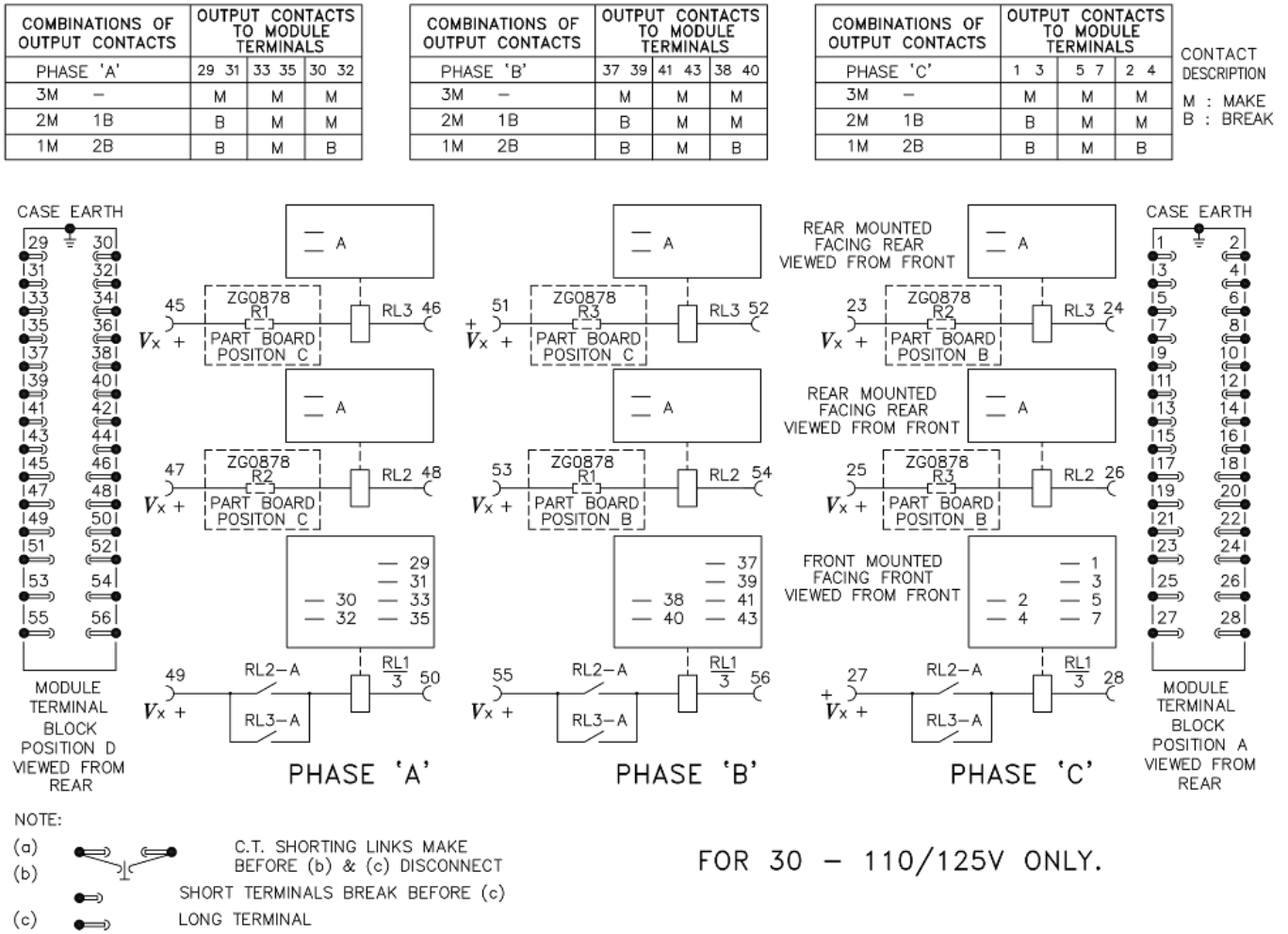


Figure 2 (f) MVAX 91 trip circuit supervision relay with pre-closing supervision

External resistors guarantee no tripping in the event of accidental shorting of any component in the scheme

Technical Data

Note: For AC supervision relays, the technical information is the same as for DC versions.

Operating/Resetting Times

- Typical operating times
 MVAX 12 <30 ms
 MVAX 21, 31, 91 <80 ms
- Typical resetting times
 MVAX 12 >100 ms
 MVAX 21, 31, 91 >400 ms

Contacts

- MVAX 12
 2 pairs of electrically separate contacts in any combination of normally open or closed
- MVAX 21, 31, 91
 3 pairs of electrically separate contacts in any combination of normally open or closed

Contact Ratings

- Make and carry continuously:
 AC 1250 VA
 with maxima of 5 A or 300 V
 DC 1250 W
 with maxima of 5 A or 300 V
- Make and carry for 3 s:
 AC 7,500 VA
 with maxima of 30 A or 300 V
 DC 7500 W
 with maxima of 30 A or 300 V
- Break:
 AC 1250 VA
 with maxima of 5 A or 300 V
 DC 100 W (resistive)
 50 W (inductive)
 with maxima of 5 A or 300 V

Cases

Type MVAX 12 is available in a size 2 case (see Figure 3). Types MVAX 21 and MVAX 31 are available in size 3 cases (see Figure 4). Type MVAX 91 is available in a size 8 case (see Figure 5).

Maximum Pilot Loop Resistance of Alarm Supply

Rating (V dc)	Maximum pilot loop resistance in ohms
24/27	100
30/34	200
48/54	400
110/125	400
220/250	400

Voltage Ratings

Rating (V dc)	Operative range (V dc)
24/27	19 – 30
30/34	24 – 37.5
48/54	37.5 – 60
110/125	87.5 – 137.5
220/250	175 – 275

All relays will withstand the maximum voltage in the operative range continuously. Note: MVAX 91 not available in 220/250 V range.

Burden

Rating (V dc)	MVAX 12		MVAX 21, 31 and 91 (see notes)			
	mA	W	Trip		Alarm	
	mA	W	mA	W	mA	W
24/27	75	2	55	1.5	80	2.5
30/34	65	2.2	35	1.5	80	3
48/54	40	2	20	1	80	4
110/125	24	2.7	20	2.5	63	8
220/250	15	3.25	20	4.5	60	15

Notes:

- 1 All the burdens are at the maximum rated value.
- 2 All burdens are less than the figures quoted.
- 3 With the circuit breaker open the trip supply burden of the MVAX 21 is zero.
- 4 MVAX 91 = 3 x MVAX 31 (mA/W) = 3 separate units.

Design pedigree resulting from over a million auxiliary relays manufactured by GE

Information Required with the Order

- Relay type (see models available)
- Rated current and frequency
- DC auxiliary voltage range
- Hand or self-reset

Device Track Record - Trip Circuit Supervision

Developed from the same robust family as MVAA and MVAJ auxiliary relays.

Over a million auxiliary relays shipped.

MVAX range launched in 1983, with over 280,000 units in service worldwide.

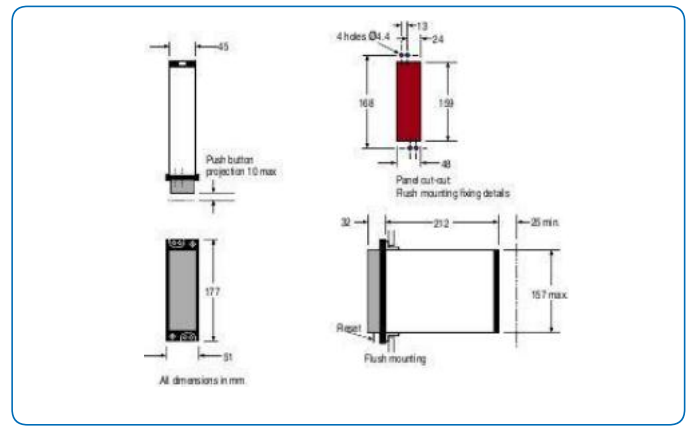


Figure 3 Case outline size 2

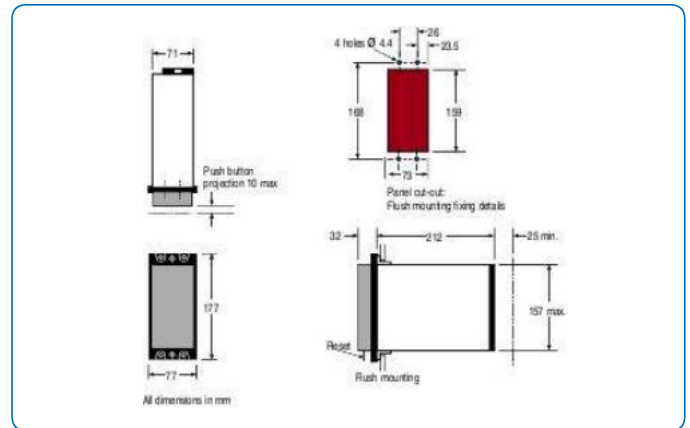


Figure 4 Case outline size 3

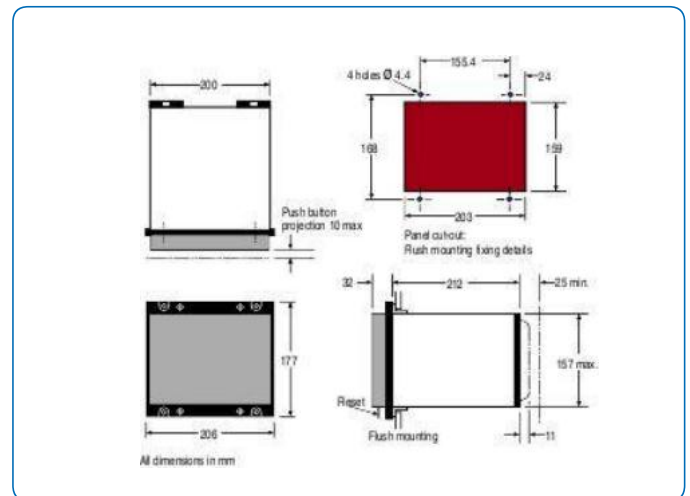


Figure 5 Case outline size 8

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Imagination at work