

# MVAPM 32

## Voltage Balance Relay

**MVAPM32 is a voltage balance relay which monitors the threephase voltage supply and operates if the supply is interrupted or becomes unbalanced due to failure of the VT primary or secondary fuses.**

### Features

- 3 phase relay in MIDOS size 4 case.
- Less panel space and less panel wiring.
- Less than 0.1 amp/phase at rated voltage and dc burden less than 3 watts.
- Confirms to IS/IEC-255 with respect to high voltage withstand.

### Application

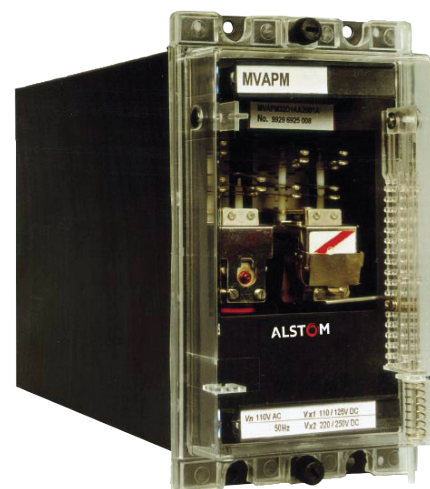
Normally generator circuits have more than one voltage transformer, for protection, metering and for automatic voltage regulator (AVR). These will be, in general, Star/Star connected with primary and secondary neutrals earthed. They will also have fuses both on primary and secondary sides. However, standard fuse failure relay schemes connected across secondary fuses will not be adequate for monitoring the healthiness of such VTs as these schemes cannot detect primary fuse failure. In such cases, the voltage balance principle is used for detecting the failure of the VT due to either primary or secondary fuse failure. The relay recommended from our MIDOS range for this application is type MVAPM 32 which monitors the three phase voltage supply and operates if the supply is interrupted or becomes unbalanced due to failure of the VT primary or secondary fuses.

One MVAPM 32 relay per VT is to be used and a scheme for two VTs is as shown in Figure 2. The output contacts of the two relays are connected in such a way as to monitor the individual VT supply voltages. The relay output contacts can be used to block relays or other devices that will operate incorrectly when the associated VT primary and/or secondary fuses blow and to give an alarm indicating the faulty VT.

In the event of a primary system fault causing the voltage supplied to the relays to become unbalanced or when machine excitation is being run up or down, the MVAPM 32 relays of all VTs will operate together. Hence no alarm is sounded. The inherent delay on pickup of the output relays of the MVAPM 32 will further ensure stability in the event of transient operations.

### Relay description

Three attracted armature units are employed as shown in Figure 1. Unit A is fed from a resistance / capacitance network which under healthy conditions with negligible harmonics has zero output. An operating voltage appears across the coil of Unit A when the secondary voltages become unbalanced due to loss of any one primary or secondary fuse. Unit B is energised via the normally closed contact



on Unit A from two phases of the supply.

Unit B has three changeover contacts and this unit drops off on operation of Unit A, or on complete loss of supply, or on loss of two primary or secondary phases. Unit C is a dc auxiliary unit energised by normally closed contact of Unit B.

The Unit C has 30 to 40 m. sec. time delay on pickup. Unit C has 2 N/O + 2 C/O output contacts, which can be used to block protection trip and sound VT faulty alarm when VT fault occurs.

### Customer Benefits

- Less panel space due to MIDOS casing.
- Voltage balance scheme to detect fault on either sides of the VT.

## Voltage balance scheme operation

### Coil rating

Figure 2 shows the voltage balance scheme for monitoring healthiness of two VTs, viz VT1 and VT2 supplies. The C Unit of both MVAPM 32 relays 27C1 and 27C2 are connected through a combination of contacts of B units 27B1 and 27B2 such that:

- Under healthy conditions neither 27C1 nor 27C2 is energised.
- When the machine is shut down neither 27C1 nor 27C2 is energised.
- When the VT1 becomes faulty 27C1 is energised and when VT2 becomes faulty, unit 27C2 is energised.

The contacts on the auxiliary units 27C1 and 27C2 can be used for blocking/alarm purposes, depending upon which VT has become defective. Where there are more than two VTs, (say, one each for protection, metering and AVR) one MVAPM32 relay per VT can be used. In this case the VTs are monitored two-by-two principle as illustrated in Figure 3.

## Technical data

### Voltage ratings

110/125V ac.

### Operative range

80% -125% of rated voltage

### Frequency

50 Hz.

### Auxiliary voltage

110/220V dc.

## Burden

### AC

Less than 0.1 amp per phase at rated voltage.

### DC

Less than 3 watts.

### Contacts

2 N/O + 2 C/O contacts are provided for block/alarm functions.

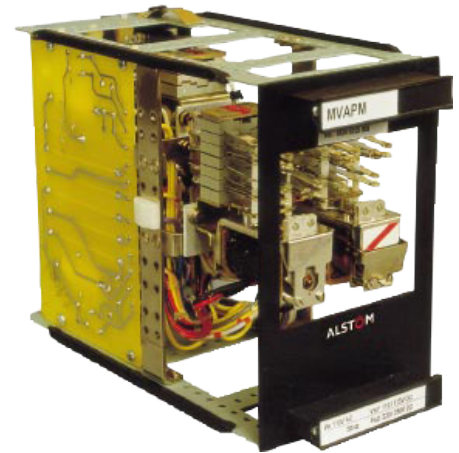


Figure 1 : MVAPM 32 drawn out from case .

**Temperature**

Operating:

-10°C to +55°C

Storage & transport:

-25°C to +70°C.

**Insulation**

The relay meets the requirements of IS.3231: 196/IEC 255-5

Series C-2kv for 1 minute.

**High voltage impulse**

The relay complies with IEC 255.6.

**Case**

Size 4 MIDOS.

**Contact ratings**

	Make and carry continuously	Make and carry continuously for 3 seconds	Break
AC	1250VA with maxima of 5A and 660V	7500VA with maxima of 30A and 660V	1250VA with maxima of 5A and 660V

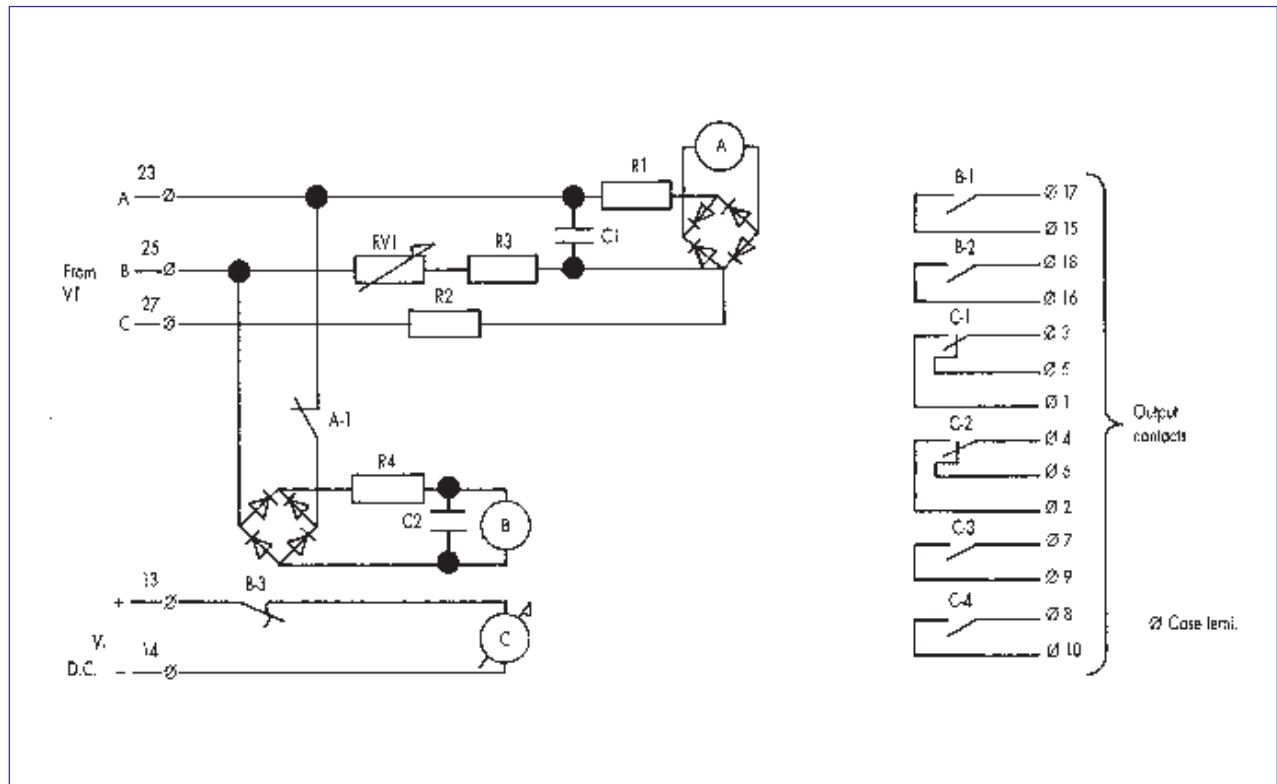


Figure 1 : MVAPM 32 Wiring Diagram

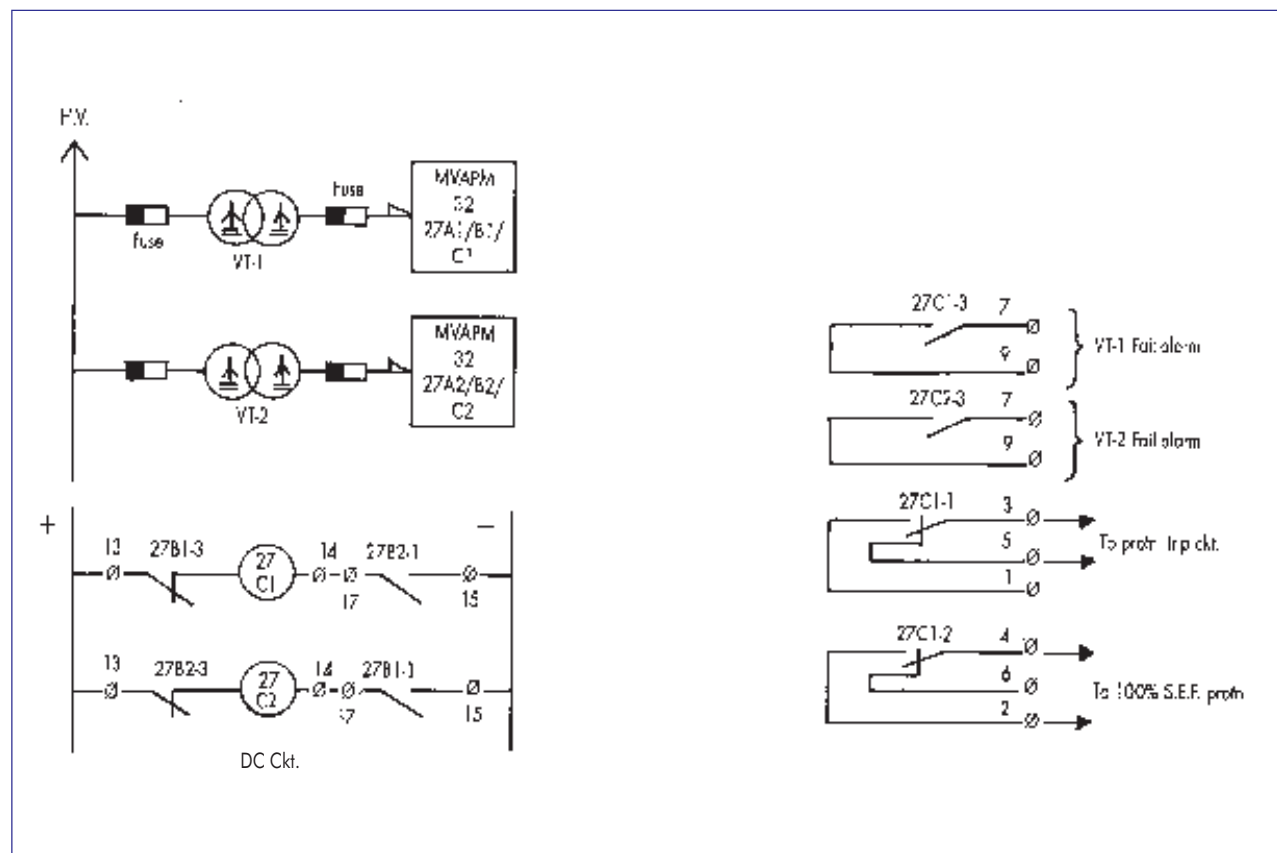


Figure 2 : Voltage balance scheme for two VT's

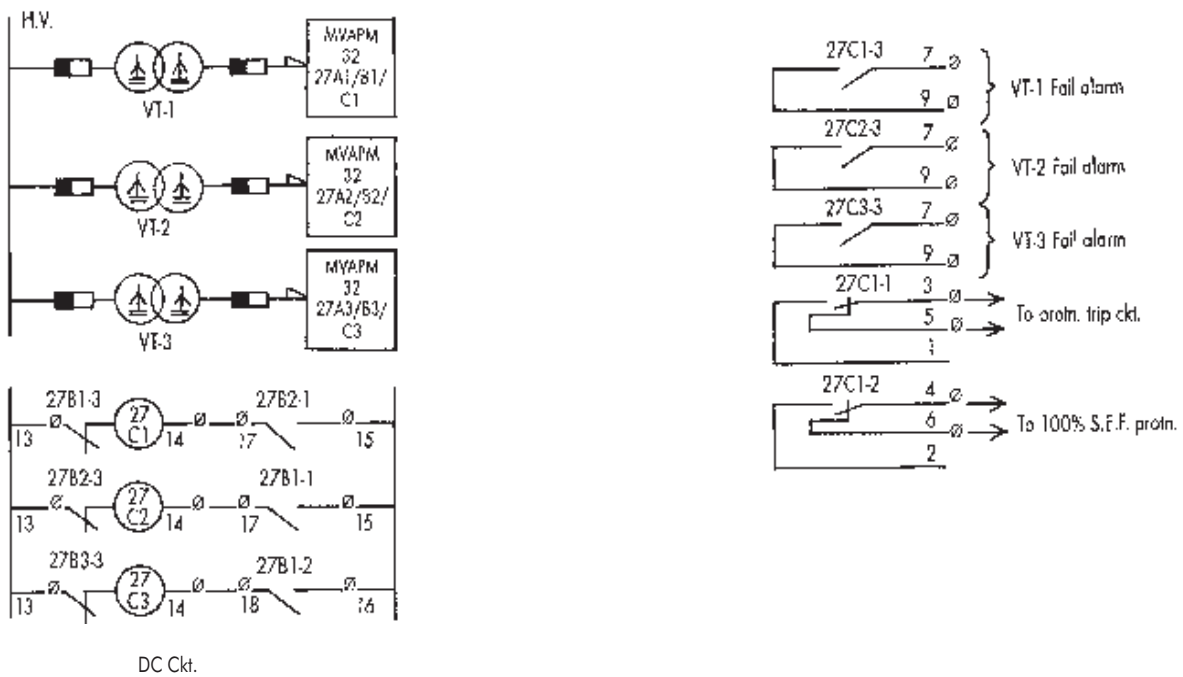


Figure 3 : Voltage balance scheme for three VT's

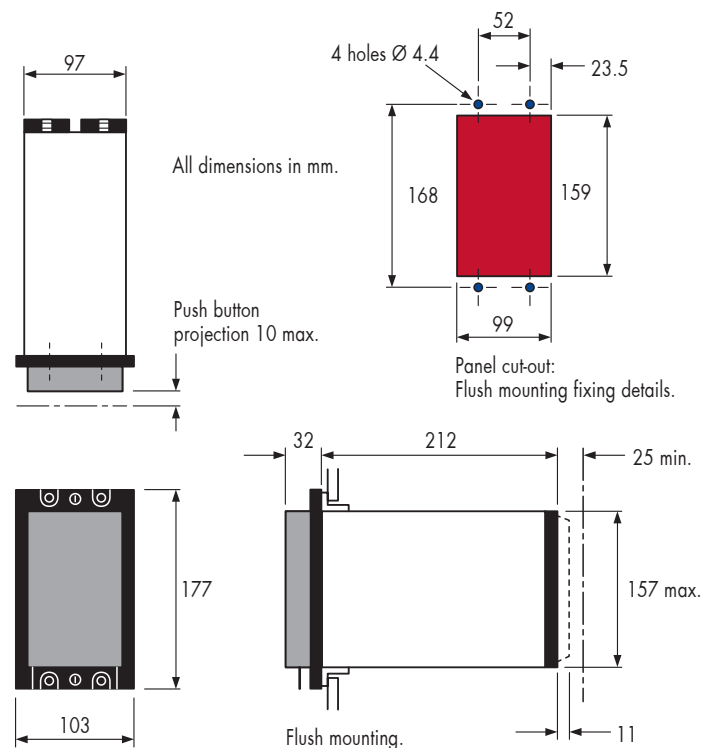


Figure 4 : Outline and mounting details for single size 4 MIDOS case.

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