

# ELC/CAG Earth Leakage Relay

ELCB007 R3, CRN 8274, Date: 03/11/2010

MDA.2102. QMD 91 6986XU

## 1. Description

The original GEC Earth Leakage Relay, type CAG-VTT11-VAA13 was not an approved Mines Department earth leakage relay. To correct this the CAG Earth leakage Relay is upgraded by installing the Ampcontrol ELC Earth Leakage Relay into the existing CAG case. The case has to be removed from service and sent to Ampcontrol for the modification, to construct the ELC/CAG Earth Leakage Relay.

To install the converted relay it is not necessary to alter the existing wiring (See Typical Connection Diagram, over-page). The GEC toroid must be removed and an appropriate Ampcontrol earth leakage toroid installed. Relay operated flags for both local and back up earth leakage trip indications are retained and are manually reset. The ELC/CAG Relay operates in the non-fail safe mode.

This type of modification can be carried out on other GEC non-approved earth leakage relays.

## 2. Features

- Utilises existing case and external wiring.
- Microprocessor based for high stability and accuracy.
- Adjustable trip level and time delay settings.
- Non-fail safe mode of operation.
- Bar graph to monitor leakage level.
- Mechanical flags to indicate E/L trips.
- Maximum leakage since last trip stored in memory.
- 415V Supply to internal transformer.
- Functions normally for a period of two (2) seconds during extreme power dip or power loss.
- Mines Department Approved.

## 3. Application

The ELC/CAG Relay is designed and approved to AS2081-3-1998 for use on fault limited systems. Relays used on unlimited systems require a protection module connected across the terminals of the toroid. A fuse protects the relay from damage on unlimited faults. A blown fuse or open circuited toroid will trip the relay and provide LED Indication of the trip (See Equipment List for replacement fuse part number). The relay is not suitable for personal protection, i.e. users of portable drills, grinders etc, which require trip levels of 20-30mA, with instantaneous operation. (Refer AS3190)

There are two methods of protection used. They are the Core Balance and Series Neutral earth leakage protection systems.



### 3.1 Core Balance

With this method the three phases are passed symmetrically through the toroid. If there is no earth fault the vector sum of the currents in a three phase supply is zero. If current from any phase flows to earth the system becomes unbalanced. The toroid produces an output, which trips the relay.

A test current is injected through the window of the toroid to test the operation of the relay.

### 3.2 Series Neutral

With this method the neutral connection of the supply transformer is passed through the toroid. An earth fault on any of the phase conductors causes an earth current which returns through the toroid to the star point of the transformer.

A test circuit can connect a test resistor between a phase and earth or inject a current through the toroid as previously described.

The ELC/CAG Earth Leakage Relay is reset by operating the external reset arm that resets both the flags and the relay. The reset button is also used to access the memory of the processor to view the maximum level of leakage since the last trip.

### 3.3 Toroids

A range of standard, split and high performance toroids are available. Window sizes range from 45mm to 203mm. Toroid ratios provide trip levels of 500 mA, 1A, 2A, 2.5A and 5A. Other non standard ratios are available on request.

See Application Note ELCB003 for installation details.

### 4. Specifications

**Relay Supply Volts:** 415VAC

**Trip Sensitivity:** 90 mA to 495 mA in 45 mA increments.

**Time Delay:** 50 ms to 500 ms in 50 ms increments.

#### LED Indication:

- Toroid fault or blown fuse
- Non fail-safe mode
- Relay tripped
- ELC healthy
- Dead Man Timer Fail - Indicates relay fault.

### Test Resistors

Test resistor ratings for 500mA Trip:

110 V supply - 100 ohm 50 Watt

240 V supply - 200 ohm 50 Watt

415 V supply - 400 ohm 50 watt

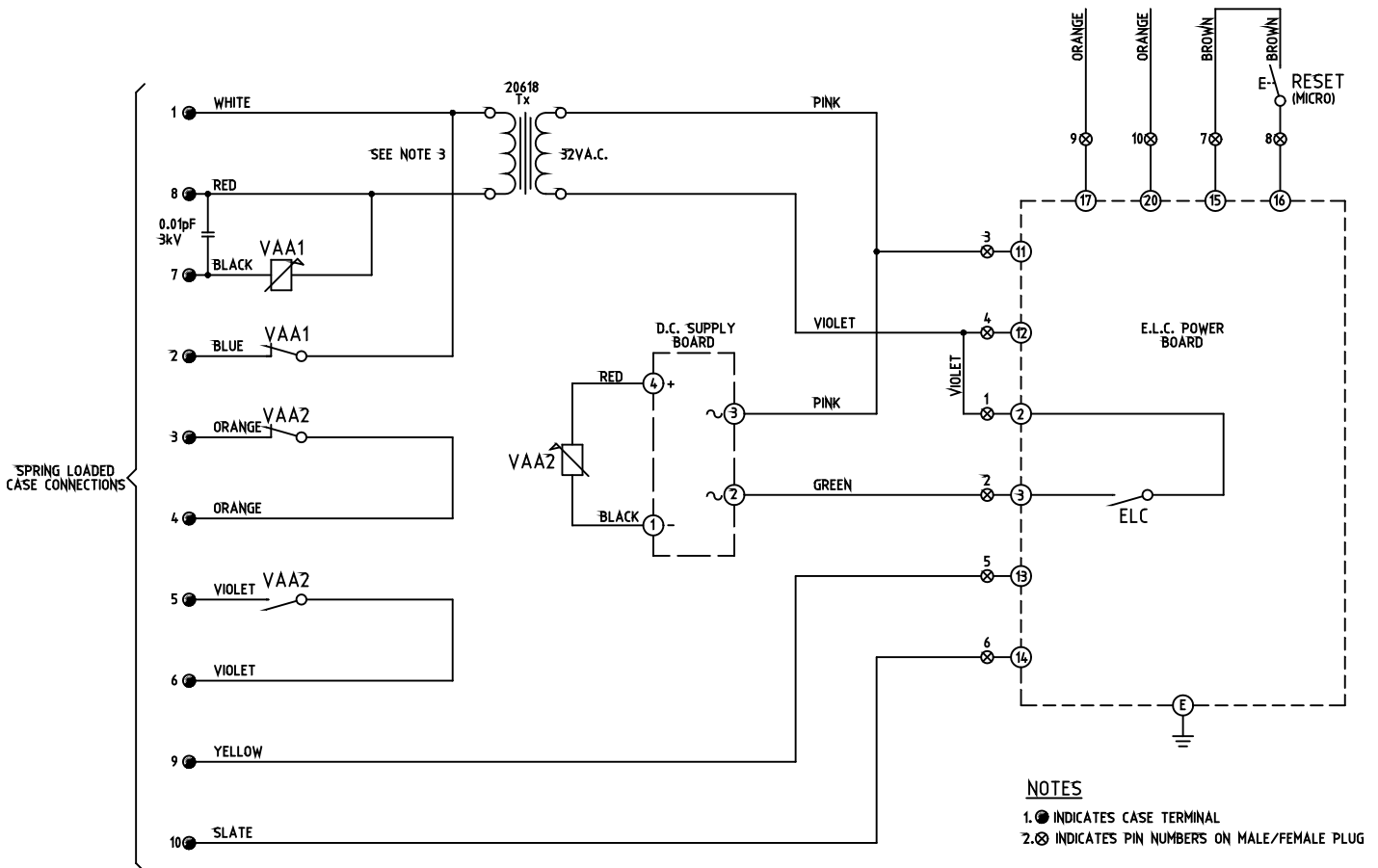
### Enclosure:

Existing CAG Enclosure

### Part Numbers

116913 ELC/CAG Earth Leakage Relay

101707 M205 x 20mm 1A Slow Blow Fuse



TYPICAL CONNECTION DIGRAM

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