

## GEC Measurements

# VERY INVERSE TIME OVERCURRENT AND EARTH FAULT RELAY

## Type CDG13

The type CDG13 relay is a heavily damped induction disc unit with a very inverse definite minimum time/current characteristic. The relay gives selective phase and earth fault overcurrent protection on systems where the fault current decreases appreciably as the distance from the power source increases (see Application Sheet R5087).

The operating coil is wound to give time/current curves of the same shape on each of the seven current taps which are selected by a plug setting bridge. The highest current tap is automatically selected when the plug is removed, so that adjustments can be made on load without open circuiting the current transformer.

The relay has a high torque movement to ensure consistent timing even under adverse conditions, and a low burden and overshoot. Adjustment of the time setting is made by rotating a knurled moulded disc against a graduated time multiplier scale.

A high set overcurrent unit (type CAG) can be fitted in the same case to provide instantaneous protection under maximum short circuit conditions (see Application Sheet R5087).

The type CDG23 relay is either a double pole version (with two earth fault units or two overcurrent units) of the type CDG13, or a type CDG13 with an instantaneous unit.

The type CDG33 relay is a triple pole version (with three overcurrent units or two overcurrent units and one earth fault unit in the centre) of the type CDG13.

### CURRENT SETTINGS

#### Tap Ranges

10–40%, 20–80% or 50–200% of 0.5, 1.0 or 5.0 amps and 30–120% or 80–320% of 5 amp 50 or 60Hz adjustable in seven unequal steps as follows 25%, 30%, 37.5%, 50%, 60%, 75% and 100% of top tap value.

**Starting Current** 103–105% of current setting

**Closing Current** 120% of current setting

**Resetting Current** The maximum current up to which the disc will completely reset is 90% of current setting.

### TIME SETTINGS

0–1.5 seconds at 10 times current setting (see characteristics overleaf)

**Resetting Time** 50 seconds with the time multiplier set at 1.0

**Overshoot** 0.065 second on removal of a current equal to 20 times current setting

### BURDENS

1VA at current setting on lowest tap

1.6VA at current setting on highest tap

Impedance details for coils can be supplied on request.

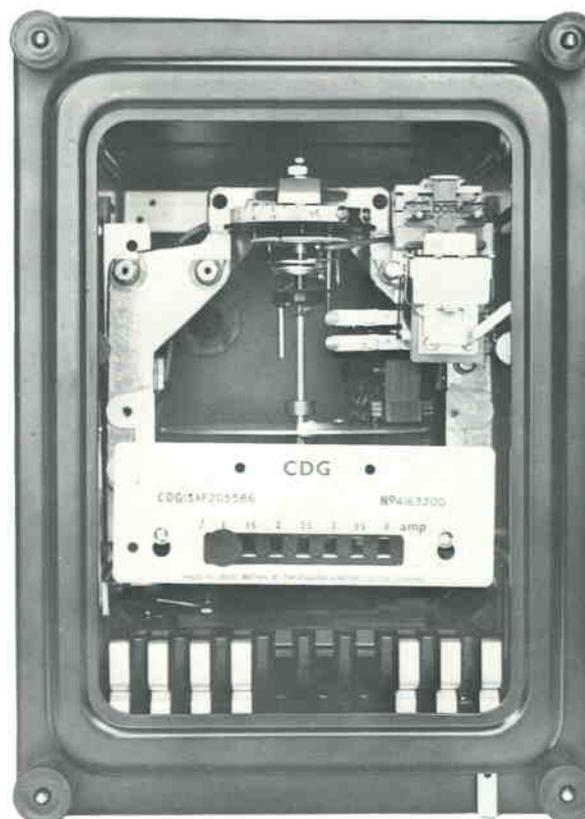
### THERMAL RATING

The relay will withstand twice the setting current continuously and 20 times the maximum setting current for 3 seconds.

### ACCURACY

The relay is calibrated at 50 & 60 Hz and 20°C and falls into error index class E7.5 as given in B.S. 142:1966.

**Frequency Error** Less than 8% for frequency variation of 2 cycles; the time grading of a protective system would be unaffected by this error since all the relays would be similarly



Type CDG13 relay

**Temperature Error** For an overload equal to 10 times the current setting, the percentage timing errors at +45°C and –5°C are respectively +1% and –1%.

### AUXILIARY UNITS AND OPERATION INDICATORS

An auxiliary attracted armature unit with a hand reset operation indicator, for either shunt reinforcing or series seal in is fitted as standard.

**Standard Coil Ratings** Voltage operated (shunt) auxiliary units: 30, 110, 125 or 220 volts d.c. at a nominal burden of 3 watts continuously rated.

Current operated (series) auxiliary units:

Minimum operating current in amps (two taps)	0.5 second current rating in amps	Coil resistance in ohms
0.1 and 0.3	18 and 22	9.2 and 2.1
0.2 and 2.0	22 and 92	6.0 and 0.125
0.6 and 2.4	92 and 188	0.29 and 0.031

Other coil ratings can be supplied for both types of auxiliary unit.

**Contacts** Two electrically separate normally open self or hand reset contacts are fitted which will make and carry 7500VA for 0.5 second with maxima of 30 amps and 660 volts

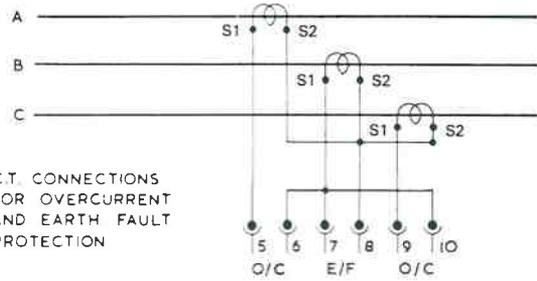
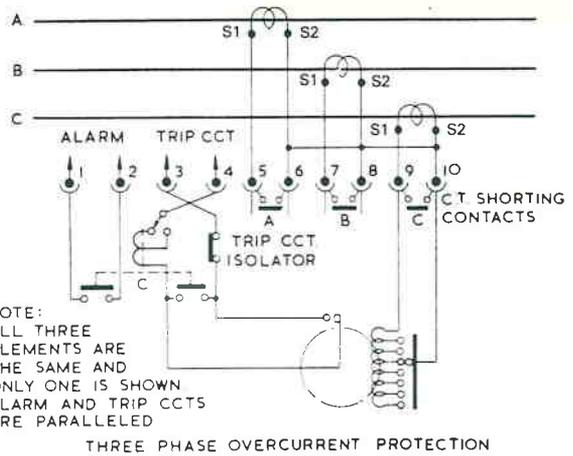
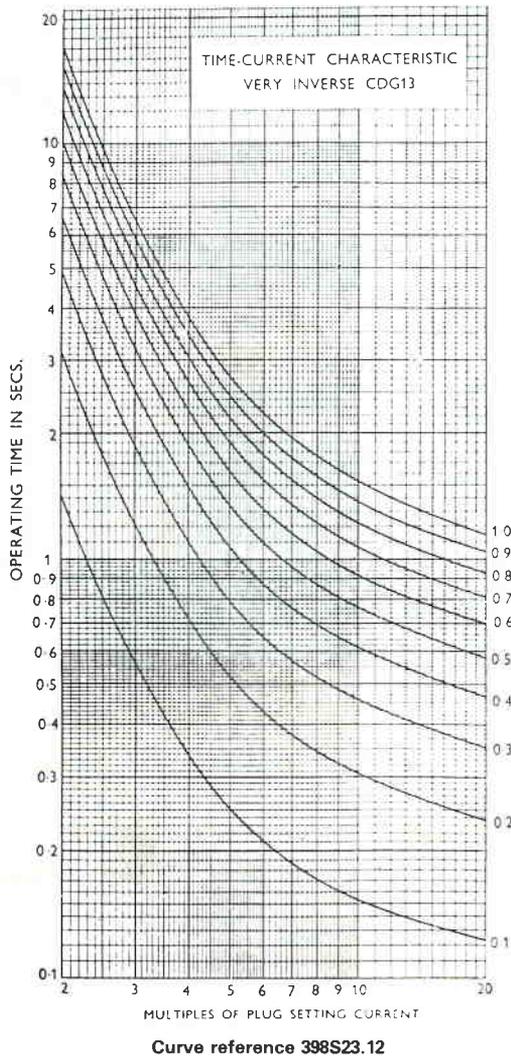
**A.C. Trip Circuit** Where a tripping supply is not available, a modified relay can be supplied which trips the circuit breaker directly using current from the line transformer. The a.c. tripping circuit incorporates a current transformer and an instantaneous unit which will safely control a.c. trip coil currents up to 150 amps at 150 volts. Applications where the trip current exceeds this value can also be catered for.

**CASES**

The relays are supplied in drawout cases available for flush or projecting mounting, and finished in phenolic black as standard. Relays for use in exceptionally severe environments can be finished to BS.2011:20/50/56 at extra cost; standard relays are finished to BS.2011:20/40/4 and are satisfactory for normal tropical use.

**INSULATION**

The relay will withstand 2.5 kV 50 Hz for one second between all terminals connected together and the case, between all terminals not intended to be connected together and 1.25 kV 50 Hz for one second between all normally open contacts.



Typical application and internal circuit diagram of CDG33 relay with series seal in

**EARTHING ARRANGEMENTS**

Although not included in the diagram, it is assumed that secondary C.T. and/or V.T. circuits will be earthed as necessary in compliance with standard safety requirements and determined by the switchgear contractor or user. If in doubt, please consult GEC Measurements for advice.

**CASE DIMENSIONS**

Relay	Case	Maximum Overall Dimensions		
		Height mm	Width mm	Depth* mm
CDG13 CDG23	1D	237	173	198
CDG23 (double-pole)	2D (Vert)	425	174	199
CDG33	3D (Vert)	527	174	199
	3D (Horiz)	238	458	199

\* Add 21 mm for maximum length of M5 terminal studs. Dimensioned drawings of case outlines, panel cut-outs and mounting details are available on request.

**INFORMATION REQUIRED WITH ORDER**

- Relay type
- Current setting range
- Current transformer secondary rating
- Trip circuit (series seal in, shunt reinforcing or a.c.)
- Trip circuit current (series seal in)
- Trip circuit voltage (shunt reinforcing)
- Operation indicator inscription if required
- Auxiliary contacts (hand or self reset)
- Details of instantaneous unit (CAG) is required
- Case mounting

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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