



**Type CDG 11**  
**Overcurrent and Earthfault Relay**

**ALSTOM**

# Type CDG 11

## Overcurrent and Earthfault Relay

CDG 11  
drawn out from the case



### Features

- Identical time/current characteristics on all taps.
- Self-powered, no necessity for separate auxiliary supply.
- High torque, ensuring consistent timing even under adverse conditions.
- Very low overshoot.
- Simple construction, easily accessible.
- Comprehensive range of high-set unit ratings.
- Dustproof drawout case and tropicalised finish.

### Application

Selective phase and earthfault protection, in time graded systems for AC machines, transformers, feeders etc.

### General description

A non-directional heavily damped induction disc relay which has an adjustable inverse time/current characteristic with a definite minimum time. The relay has a high torque movement combined with low burden and low overshoot. The relay disc is so shaped that as it rotates the driving torque increases and offsets the changing restraining torque of the control spring. This feature combined with the high torque of the relay ensures good contact pressure even at currents near pick-up. Damping of the disc movement is by a removable high retentivity permanent magnet.

The unique method of winding the operating coil ensures that the time/current characteristics are identical on each of the seven current taps. Selection of the required current setting is by means of a plug setting bridge which has a single insulated plug. The maximum current tap is

automatically connected when the plug is withdrawn from the bridge, allowing the setting to be changed under load without risk of open circuiting the current transformers.

The IDMT relay has an auxiliary unit which is powered by a secondary winding on the electromagnet through a rectifier and as such a separate auxiliary supply is not required. The disc unit operates and closes its contacts, the auxiliary element connected across the secondary winding on the electromagnet operates, one normally open contact of the auxiliary element reinforces the disc contact. Two other contacts of the auxiliary element are brought out to the terminals of the relay (Refer Figure 4).

The relay operating time can be adjusted by movement of the disc backstop which is controlled by rotating a knurled moulded disc at the base of the graduated time multiplier scale.

A high-set instantaneous overcurrent/earth fault unit, type CAG17 can be fitted in the same case to provide instantaneous protection under maximum short circuit conditions and to improve discrimination on time graded protective systems.

For full details of the high-set instantaneous units refer to relevant publications.

Type CDG 21 relay is a single pole type CDG 11 relay with a high-set instantaneous unit. Type CDG 31 is a triple pole version of the type CDG 11 with three overcurrent units or two overcurrent units and one earthfault unit in the centre. Type CDG 61 relay is a triple pole version of type CDG 21 relay.

## Technical data

### Current ratings

1A or 5A.

### IDMT settings

- 50 - 200% in seven equal steps of 25%.
- 20 - 80% in seven equal steps of 10%.
- 10 - 40% in seven equal steps of 5%.
- Other setting ranges available on request.

### Starting current

103 - 105% of current setting.

### Closing current

Not more than 130% of current setting.

### Instantaneous highset settings

- E/F 100 - 800%
- O/C 250 - 2000%

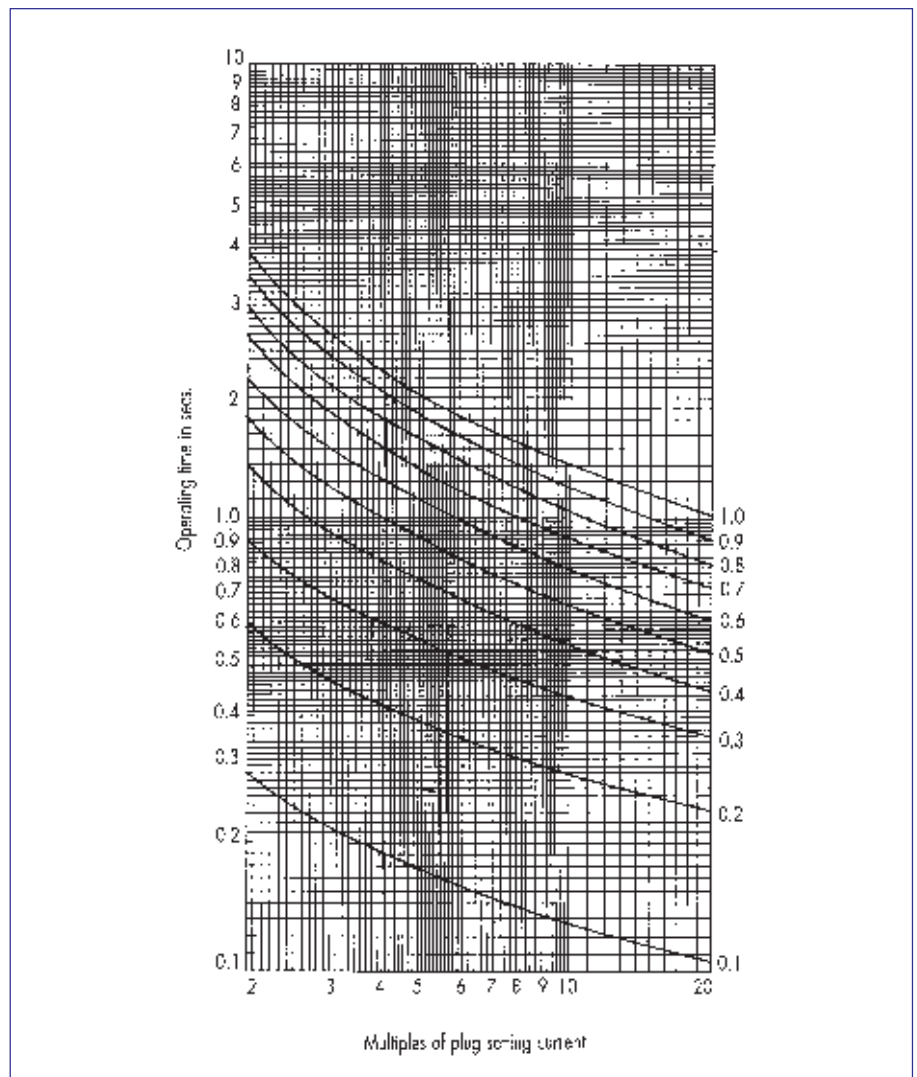


Figure 1:  
Time-current characteristic  
inverse time relay CDG11 1.3 sec.

## Time settings

### Operating time

0 - 3 seconds or 0 - 1.3 seconds } of 10 times  
current setting.  
Time/current characteristics given in  
Figures 1 and 2.

### Resetting time

4 seconds for 1.3 seconds relay.  
9 seconds for 3 seconds relay. } with time multiplier at 1.0.

### Overshoot

Overshoot time on removal of 20 times setting current.

- Less than 0.065 second for 1.3 seconds relay
- Less than 0.04 second for 3 seconds relay.

## Thermal rating

- Maximum continuous current rating for 60°C rise in coil temperature.

Operating coil tap	1	2	3	4	5	6	7
Times current setting	4.5	3.7	3.2	2.7	2.6	2.4	2.2

- Withstand 20 times maximum setting current for 3 seconds.

## Accuracy

Error class index  
E7.5 as per BS 142-1966  
7.5 as per IS 3231-1965

## Frequency error

Timing error less than 8% for 2 Hz frequency variations. Time grading unaffected by such small error, since

all relays are similarly affected.

### Temperature error

For 10 times setting current, at ambient temperature between +45°C and -5°C, percentage timing errors are as follows:

- 3 seconds relay: -3% and +4%
- 1.3 seconds relay: -4% and +4%.

### Auxiliary units and operation indicators

Self-powered auxiliary unit will have following contact combinations:

1. S/R-2N/O  
or
2. H/R-2N/O + 2 N/C.

### Contact ratings auxiliary unit contact

Make and carry for 0.5 second  
7500 VA with maxima of 30 amps/  
660 volts ac/dc.

### Insulation

The relay meets the requirements of  
IS 3231-1965/IEC.265-6 series  
C-2 kV for 1 minute.

### External and internal circuit connections

See Figure 4.

### Burden

3VA nominal  
2VA on the lowest tap  
3.5VA on high-set tap.  
Typical impedance/current curves  
given in Figure 3.

### Case and finish

1D vertical or 3D vertical, horizontal case suitable for flush or projection mounting and finished eggshell black and tropicalised. Suitable trip isolating switch and CT shorting switches provided on the cradle assembly/case.

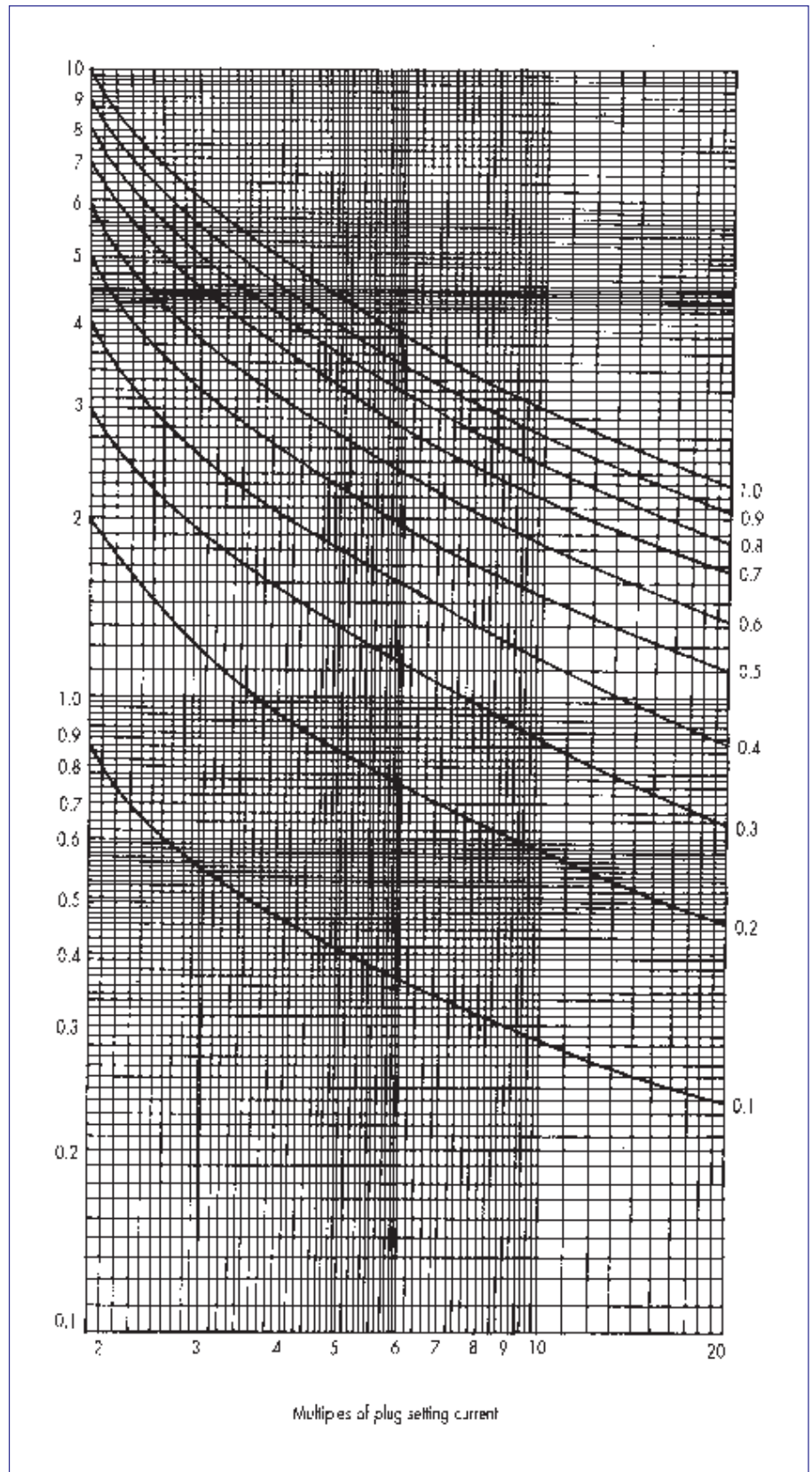


Figure 2:  
Time-current characteristic  
inverse time relay CDG11 3 sec.

## Dimensions and weights

Relay	Case size	Maximum overall dimensions			Approximate gross weight Kg.
		Height mm	Width mm	Depth* mm	
CDG 11/21	1D Vert.	233	170	203	6.0
CDG 31/61	3D Horz.	233	454	203	15.5
	3D Vert.	524	170	203	15.0

\* Add 76 mm for maximum length of terminal studs, alternatively, 29 mm for terminal screws.

The approximate gross weights given above are inclusive of cartons, mounting appendages and terminal details.

The relays comply fully with the requirements of IS 3231-1965 and are suitable for use in normal tropical environments.

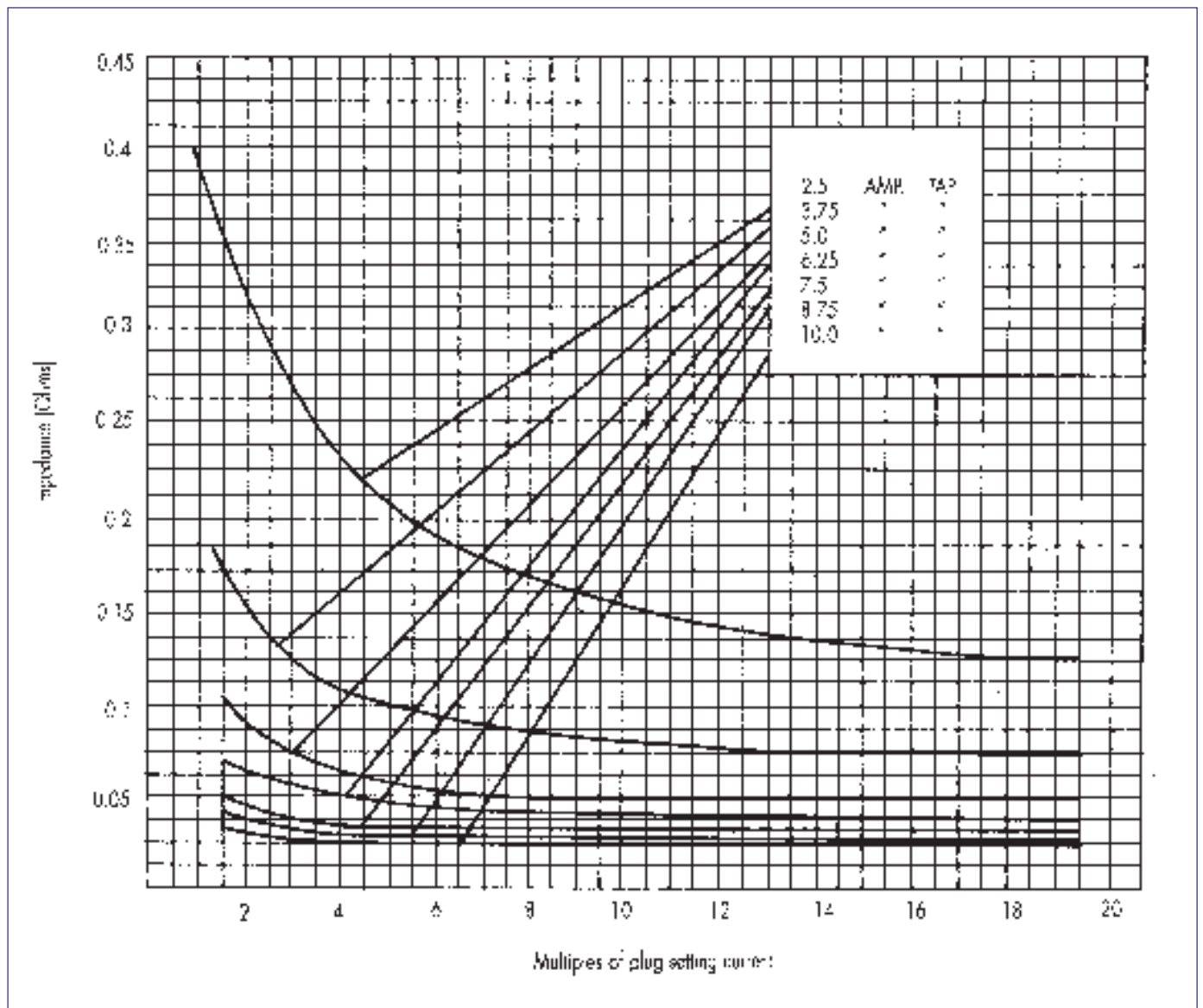


Figure 3:  
Impedance/Current Curves for type CDG relays  
2.5-10 AMP 3 VA 50 Cycle Multi-strand Coil

**Information required with order**

1. Type of relay (CDG 11, 21, 31 or 61) and system frequency.
2. Current transformer secondary rating.
3. Current setting range.
4. Characteristic (0 - 3.0 sec. or 0 - 1.3 sec. at 10 times current setting).
5. Operation indicator inscription, if required.
6. Auxiliary contacts – hand or self reset.
7. Current setting range of high-set unit, if required.
8. Case size.
9. Type of mounting – flush or projection.

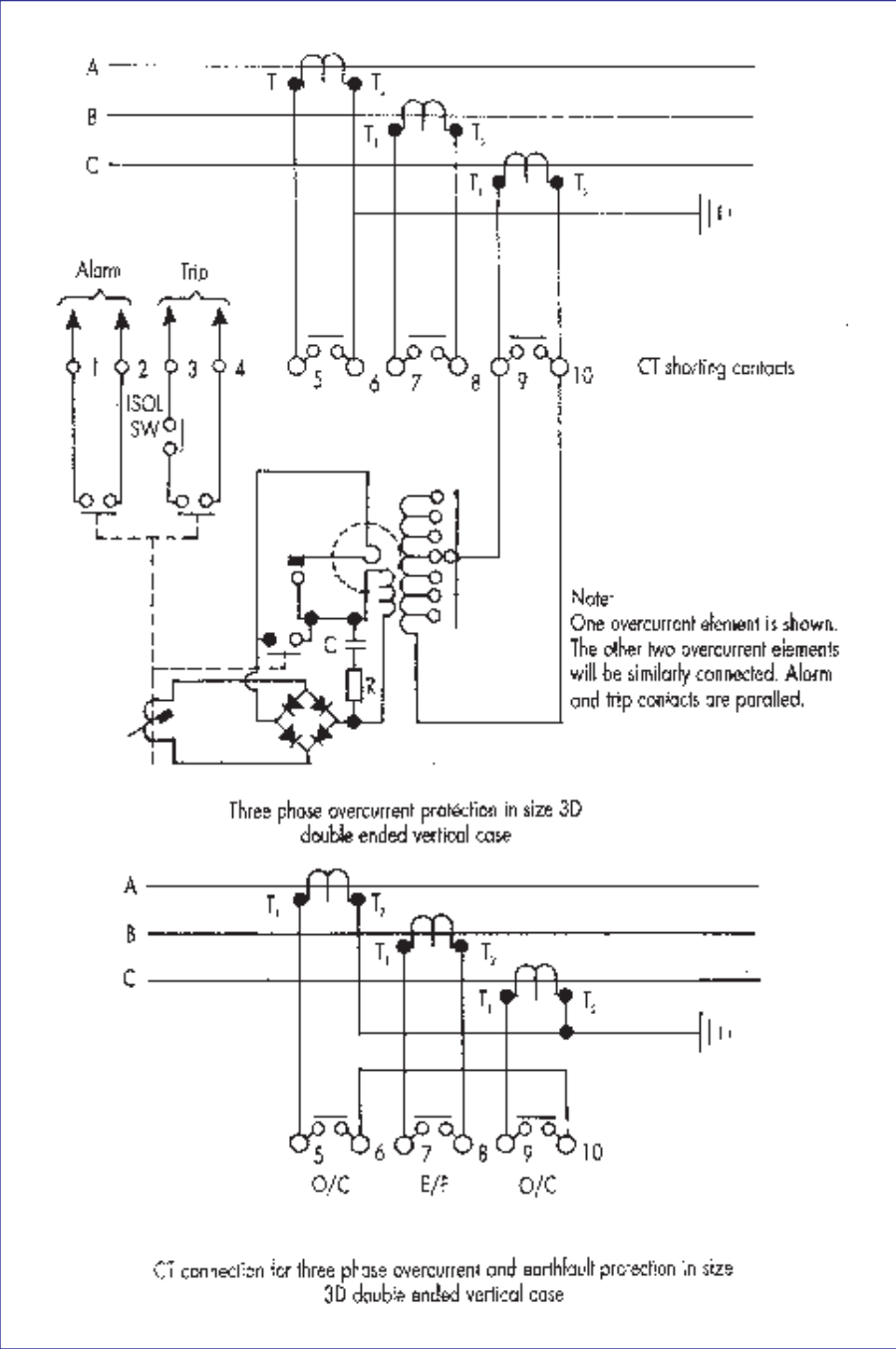


Figure 4:  
Typical external and internal connections  
for type CDG 31 relay





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