GROUND OVER CURRENT RELAY (EARTH FAULT RELAY)[50/51N] CE

DCG-M22D

Feature

The OCGR is a microprocessor based digital type protective relay that has ground overcurrent detecting elements.

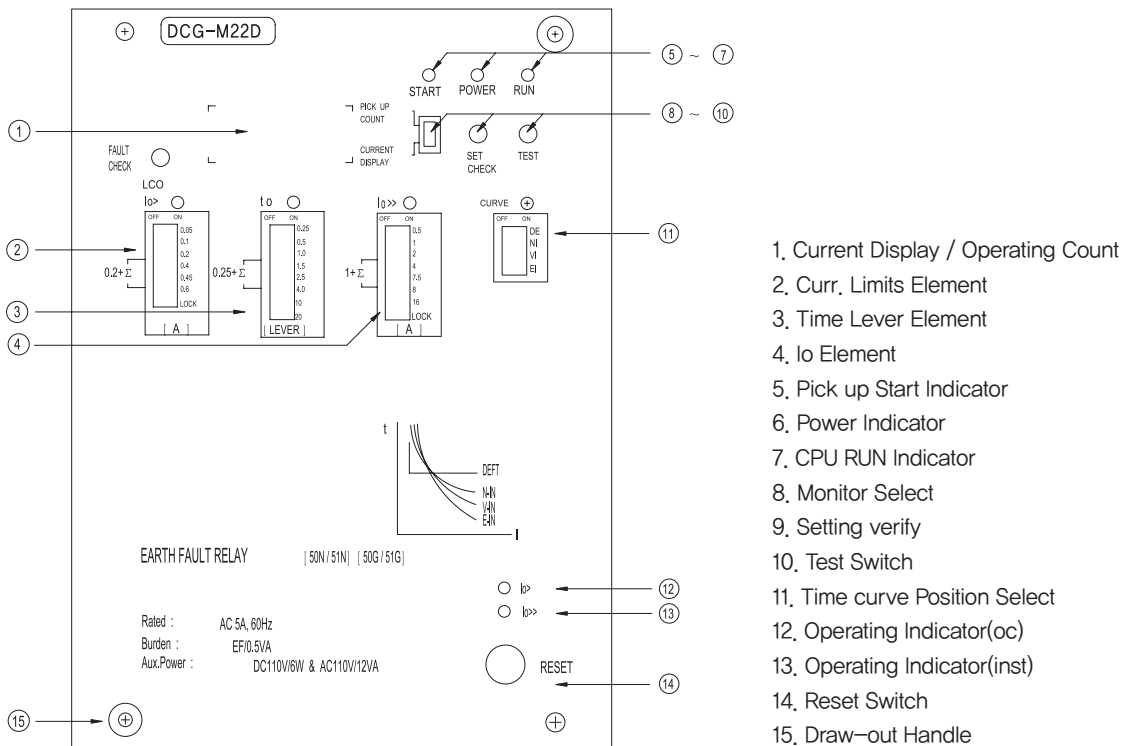For protecting coordination, it could be applied with:

1. Instant. GOC with one of normal inverse, very inverse, and extremely inverse curves or
2. Alone with definite time.

   Since a fault level is treated by A/D converter and calculated by CPU, the fault detected, is more correct and precise than E/M type or static type.

Application

The OCGR is applied to solid ground or resistance ground network. More-over the relay could be chosen at the begining of design stage, since its adjustable range is wider than other relays.

Front plate

1. Current Display / Operating Count
2. Curr. Limits Element
3. Time Lever Element
4. Io Element
5. Pick up Start Indicator
6. Power Indicator
7. CPU RUN Indicator
8. Monitor Select
9. Setting verify
10. Test Switch
11. Time curve Position Select
12. Operating Indicator(oc)
13. Operating Indicator(inst)
14. Reset Switch
15. Draw-out Handle

Specifications

■MODEL
DCG−M22D(Draw out)

■Rating
Rated current	AC 5A
Frequency	60/50㎐±5%
Auxiliary Voltage	AC/DC 110V(86~260V)
Ambient temperature	−10℃ to 60℃(with no icing)

■Current setting
Overcurrent range	0.2~2A Lock(Steps of 0.05A)
Instantaneous range	1~40A(Steps of 0.5A)

■Time setting & curve IEC 255
Overcurrent time lever	0.25~40(Steps of 0.25)
Instantaneous	Less than 40ms(over 200%)

· Normal inverse time $\quad NI= \dfrac{0.14}{I^{0.02}-1} \cdot \dfrac{tp}{10}$

· Very inverse time $\quad VI= \dfrac{13.5}{I-1} \cdot \dfrac{tp}{10}$

· Extremely inverse time $\quad EI= \dfrac{80}{I^{2}-1} \cdot \dfrac{tp}{10}$

· Definite time $\quad DE= 2 \cdot \dfrac{tp}{10}$

Resetting Value	〉95%
Reset time	〈100ms

■Burden
Overcurrent	0.5VA
Aux Voltage	12VA(AC),6W(DC)

■Contact
Output Relay	Trip 1c, Alarm 1a
Trip & Alam contact capacity	

	Make	AC 240V 10A(L/R=0ms)
		DC 1000W 0.5Sec(L/R=0ms)
	Break	AC 240V 3A(L/R=0ms)
		DC 30W 0.5Sec(L/R=0ms)

Indicator
Operating start	LED(Red)
Operating	LED(Gre)

■Operating time
Over Current	Lever #10
Normal inverse time	300% 6.3 sec
	700% 3.5 sec
Very inverse time	300% 6.75 sec
	700% 2.25 sec
Extremely inverse time	300% 10 sec
	700% 1.67 sec
Instantaneous time	less then 0.04 sec
	(200% overcurrent)
Degree Protection	IP52
Thermal Withstand Capability for 1s 80xln Continuously 3xln	

■Vibration resistance
Malfunction	10㎐5mm double amplitude 30s each in X and Y directions 6.7㎐ 2.5mm double amplitude 600s each in X,Y, and Z directions

■Shock resistance
Destruction;	300㎧(approx. 30G) 3 time each in 3 directions

■Insulation to IEC 255
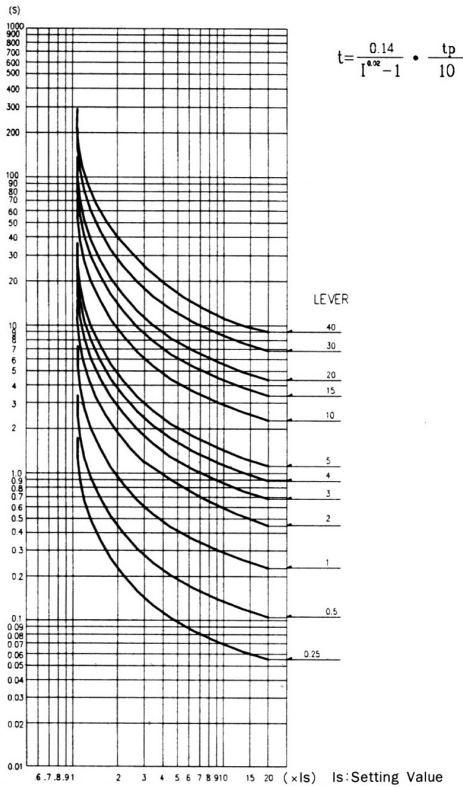|	
Dielectric withstand	2㎸ for 1 minute between all terminals and case earth
Insulation resistance at	500V 〉100㏁
Impluse Voltage Withstand	5kV−1.2/50 ㎲
Surge transient simulator	2.5kV 1MHz/200Ω
Weight	2.0kg

Operating time curves

Normal Inverse

$$t = \frac{0.14}{I^{0.02} - 1} \cdot \frac{tp}{10}$$

Very Inverse

$$t = \frac{13.5}{I - 1} \cdot \frac{tp}{10}$$

Extermely Inverse

$$t = \frac{80}{I^2 - 1} \cdot \frac{tp}{10}$$

Definite Time

$$t = 2 \cdot \frac{tp}{10}$$
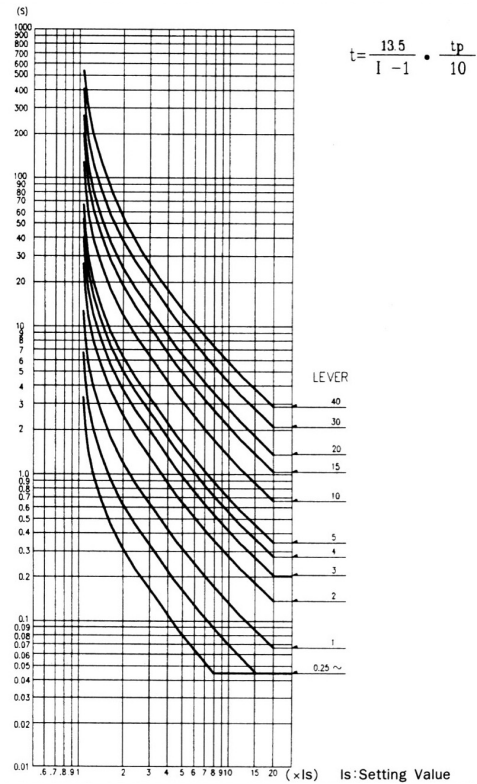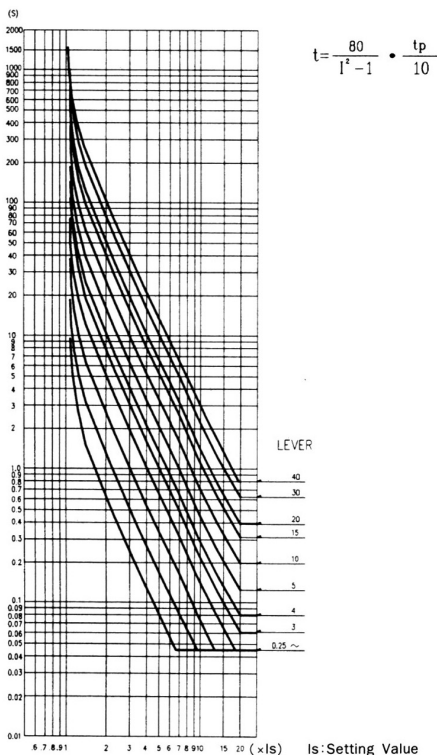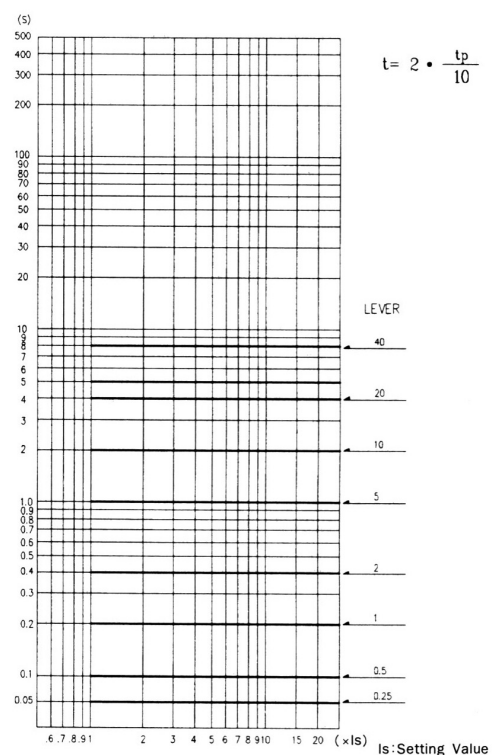
Calculation

As a mode that neutral point grounds by means of conductor
directly, one wire earthing current is equal to short current. So earth current is the largest one comparing with other grounding method. In case of earth fault time, the electric potential is very small. Accordingly, this can decrease insulation intensity level of transformer and power line, also be economical. But inductive disturbance is very serious problem. Therefore high speed circuit breaking should be instantly taken. Also this method is adapted in measurement of high voltage because of high reliability.

Example 6,600V Neutral NGR 38Ω Resistance

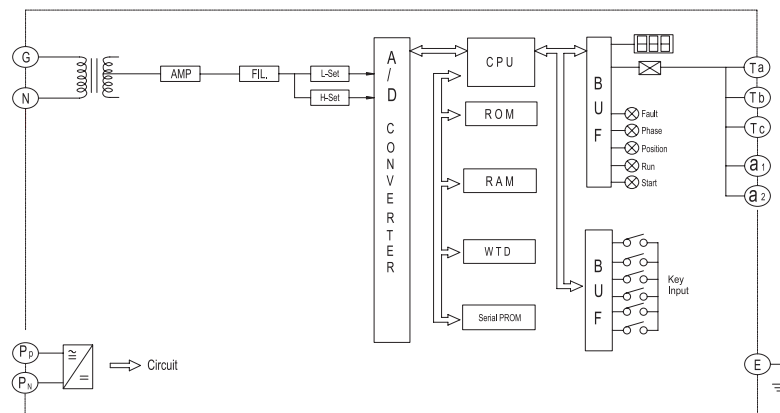$$Ig = \frac{3Ea}{Zo} \qquad Ea = \frac{6,600}{\sqrt{3}}$$

$Zo = 3RN = 3 \times 38$

　　　(3 RN is accountable for 1 line zero phase,
　　　and to RN flowes 3 lines zero phases.)

$$\therefore Ig = \frac{3Ea}{Zo} \qquad Ea = \frac{3 \times 6,600/\sqrt{3}}{3 \times 38} = 100A$$
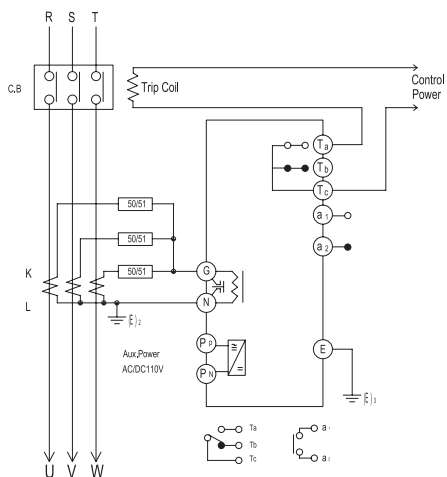
Ig = ground fault current

Block diagram

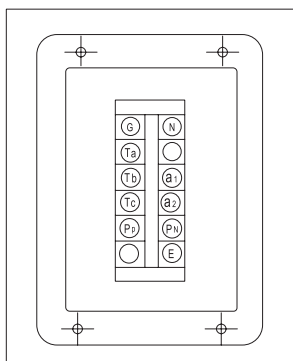# GROUND OVER CURRENT RELAY (EARTH FAULT RELAY)[50/51N] $C \in$

Wiring

Draw out

Terminal arrangement

Draw out

Demension

Digital type draw out
Case : ABS(Non flamable)
Color : Black(N1.5)

Cutting Size: 165 X 122mm