OVER CURRENT RELAY [50/51x2][50/51x3] CE

DOC-M32D, DOC-M42D

Characteristics

Function

Computerized by having C. P. U built-in the function to high reliability and accuracy and stabilized sopisticated function through digital system. Easy detection of malfunction with self-checking set. Convenient operation, based on multifunction. As target was installed, overload and short circuit can be clearly detected phase by phase.

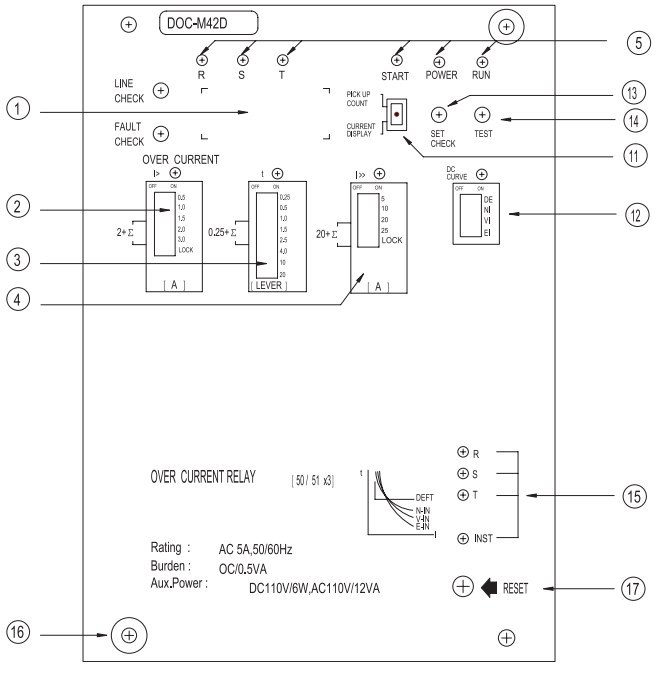
Display

Convenient meter scale indicates the load state of currents passing all the time. Setting value of operating current is clearly discernable and correct position, also detectable after setting. With time counter setting it can surely confirm operating condition. Based on test SW, easy check-up can be performed.

Construction

Case construction corresponding to EMC and inner circuit was specifically designed for ensuring high reliability. Drawout and non-draw out type was so well constructed that setting and field test can be conveniently performed. When drawing out, short bar keeps CT circuits from burning down.

Front plate



1. Current Display / Operating Count
2. Curr. Limits Element
3. Time Lever Element
4. Instantaneous Element
5. R - Phase Indicator
6. S - Phase Indicator
7. T - Phase Indicator
8. Over current Start Indicator
9. Power Lamp LED
10. CPU Run Indicator
11. Monitor Selection Switch
12. Time curve Selection Switch
13. Setting Check
14. Test
15. Fault Indicator
16. Draw - out Handle
17. Reset Button

DOC-M32D(Draw out)	2 phase	IEC255 JEC 2500, 2510
DOC-M42D(Draw out)	3 phase	

Specifications

■ 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	2~10A Lock(Steps of 0.5A)
Instantaneous range	20~80A Lock(Steps of 5A)

■ Time setting & curve IEC 255-3

Overcurrent time lever	0.25~40(Steps of 0.25)
Instantaneous	Less than40ms (over 200%)
· Normal inverse time	$NI=\frac{0.14}{I^{0.02}-1}\cdot\frac{tp}{10}$
· Very inverse time	$VI=\frac{13.5}{I-1}\cdot\frac{tp}{10}$
· Extremely inverse time	$EI=\frac{80}{I^{2}-1}\cdot\frac{tp}{10}$
· Definite time	$DE=2\cdot\frac{tp}{10}$
Resetting Value	〉95%
Reset time	〈100ms

■ Burden

Overcurrent	0.5VA
Aux Voltage	2VA(AC),6W(DC)

■ Contact

Output Relay		Trip 1c, Alarm 1a
Trip & Alam contact capacity		
	Make	AC 240V 10A(L/R=0ms)
		DC 1000W0.5sec(L/R=0ms)
	Break	AC 240V 3A(L/R=0ms)
		DC 30W 0.5sec(L/R=0ms)

■ Indicator

Operating start	LED(Red)
CPU RUN	LED(Gre)
Operating	LED(Red)

■ 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	300%
Degree Protection	IP52

Thermal Withstand Capability for 1s 80xIn Continuously 3xIn

■ Vibration resistance

Malfunction	10㎐ 5mm double amplitude
	30s each in X and Y directions
	16.7㎐ 2.5mm double amplitude
	600s each in X,Y, and Z directions

■ Shock resistance

Destruction;	300㎳(approx. 30G)3 time each in 3 directions

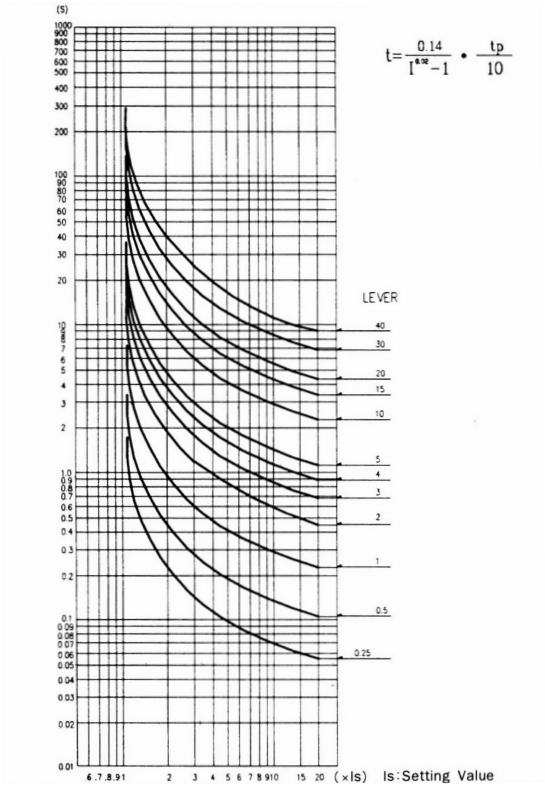
■ Insulation to IEC 255

Dielectric withstand	2kV 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	2kg

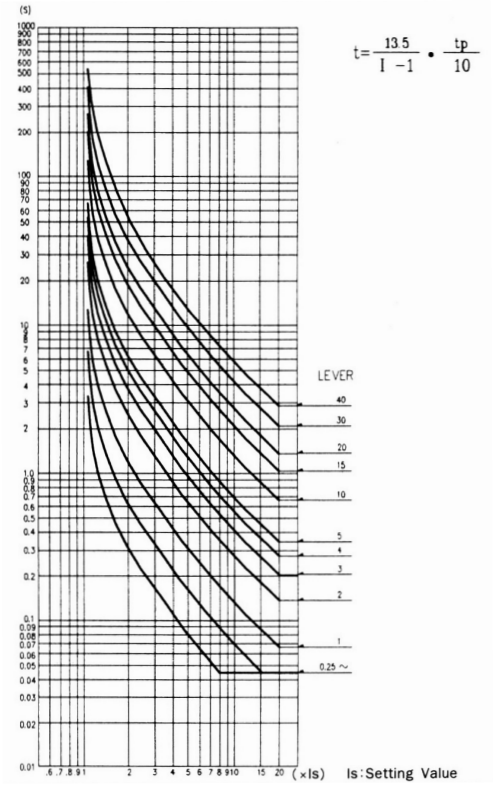
OVER CURRENT RELAY [50/51x2][50/51x3]

Operating time curves

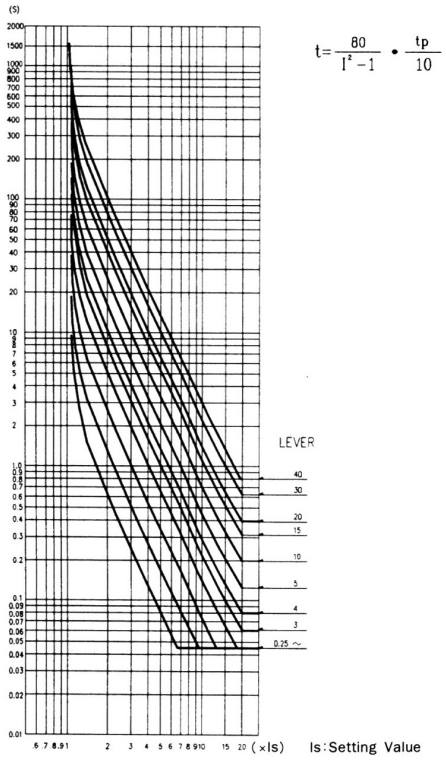
Normal Inverse



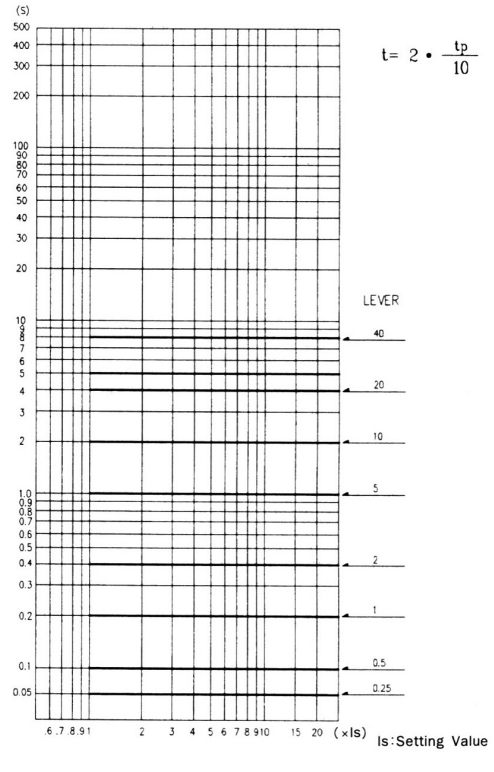
Very Inverse



Extermely Inverse



Definite Time



Current Setting Mode

Time limit current setting

In consideration of current transformer ratio, setting shall be conducted some where around contract demand 150%

$$I_{TAP} \fallingdotseq \frac{I_1 \times 5}{I_{CT}} \times 1.5$$

I_{TAP} = Relay setting tap

I_1 = Current value of contact demand

I_{CT} = Rated current of primary in transformer

Time limit setting

Required to set current it cooperate with electric corporation concerned.

Instantaneous current setting

Required to set power in consideration of primary and secondary protective coordination, that wrong operating fault can not occur due to exciting in-rush of transformer. Generally measuring capacity, setting shall be done at 1,000~1,600(current value)

$$I_{TAP} \fallingdotseq \frac{I_{1'} \times 5}{I_{CT}} \times (10 \sim 16)$$

I_{TAP} = Setting tap

$I_{1'}$ = Current value based on KVA

I_{CT} = Primary rated current of CT(Secondary Current 5A)

Dependent-time element current setting

Contract	CT Primary current(A)																											
demand	5		10		15		20		30		40		50		75		100		150		200		300					
(kw)	(A)TAP	α (%)	(A)TAP	α (%)	(A)TAP	α (%)	(A)TAP	α (%)	(A)TAP	α (%)	(A)TAP	α (%)	(A)TAP	α (%)	(A)TAP	α (%)	(A)TAP	α (%)	(A)TAP	α (%)	(A)TAP	α (%)	(A)TAP	α (%)				
50	6	136	3	136																								
			3.5	159																								
100			6	138	3.5	121	3	138																				
					41	38																						
					4.5	155	3.5	161																				
					5	172																						
200							6	137	3.5	120	3	137	3	171														
									4	137																		
									4.5	154	3.5	160																
									5	171																		
300									6	137	4	122	3.5	134	3	172												
											4.5	137	4	153														
											5	153	4.5	172														
500													6	137	3.5	120	3	137										
															4	137												
															4.5	154	3.5	160										
															5	171												
750															6	137	4	122	3	137								
																	4.5	137										
																	5	153	3.5	160								
1,000																	6	137	3.5	120	3	137						
																			4	137								
																			4.5	154	3.5	160						
																			5	171								
1,500																			6	137	4	122	3	137				
																					4.5	137						
																					5	153	3.5	160				

OVER CURRENT RELAY [50/51x2][50/51x3] CE

Characteristics

1. In case overload or short circuit current is fed to input terminals of the relay from external transformer, the current will then flow to built–in transducers for phase current detection and power supply.
2. In the detection circuit, signal current of different by microprocessor to determine if the signal level reached pick up point to activate the relay.
3. The level deciding operation finds out faulty phase (overloaded, two phase short, or three phase short) line and indicates the by target of repective phase. The Function Includes indication of: 1) current measurement. 2) start and time elapse, and 3) value of set tap.

Current measurement

The current of phase are date processed and operated for measurement of the currents. Only the largest current among phases but within the range of 0.2A and up to set value immediately before pick–up level is indicated by LED.

Start and time elapse

In case set value for start time limit is exceeded before starting, the indication turns to zero (0)which infer that the relay might activate to break in any moment. The time elapse is displayed counting from 0 tp 9 according to the level of current and at the moment display of 9 turns to 10, the relay trips momentarily. At this instance, operating start lamp (red LED) warns the operation by binking that time elapse lamp (red LED) warns the operation be pinking that time elapse nearing trip is visibly noticeable.

Confirmation display of set values

The display indicates set values of OCR so that set values of time limit current(A) and time limit time(TAP) can be confirmed.

Indication

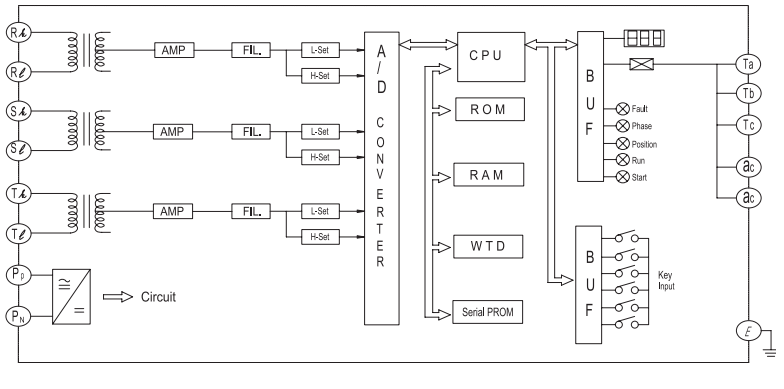
2 Phase

Circuit Trouble		Indicator	Trip			
2Phase	over current	RS	●	···	···	···
		ST	···	···	●	···
		TR	●	···	●	···
		RST	●	···	●	
	instantaneous	RS	●	···	···	●
		ST	···	···	●	●
		TR	●	···	●	●
		RST	●	···	●	●

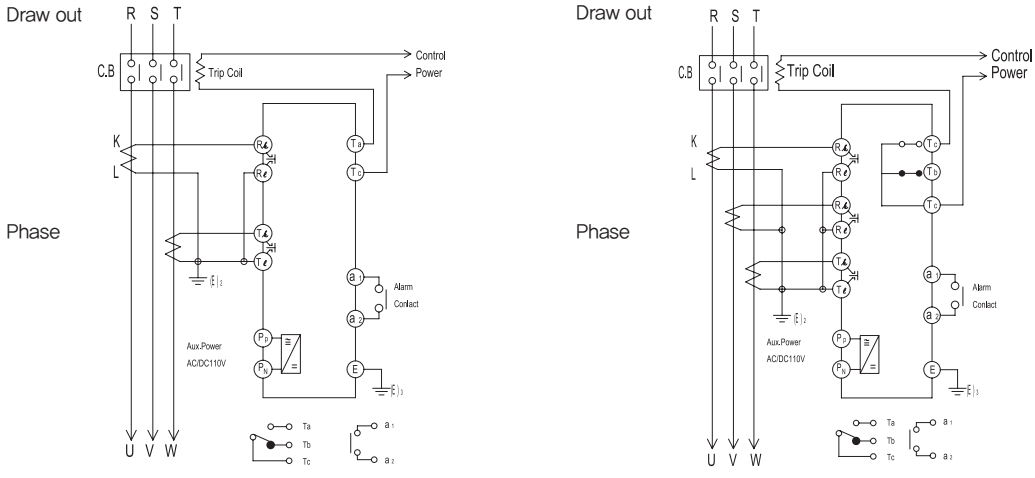
3 Phase

Circuit Trouble		Indicator	Trip			
2Phase	over current	RS	●	●		
		ST		●	●	
		TR	●		●	
		RST	●	●	●	
	instantaneous	RS	●	●	···	●
		ST	···	●	●	●
		TR	●	···	●	●
		RST	●	●	●	●

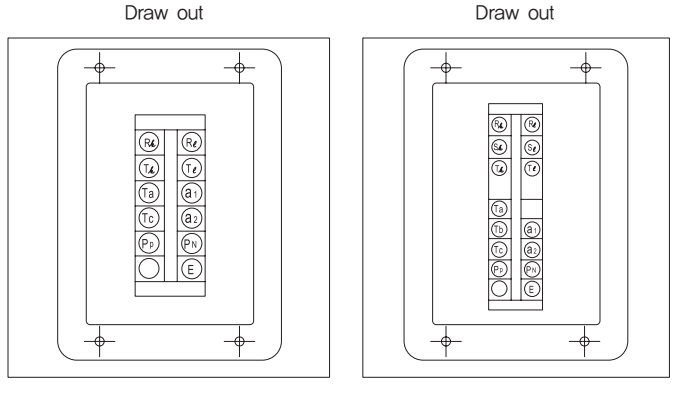
Block diagram



Wiring



Terminal Arrangement



Dimension

Case : ABS(Non flamable)
Color : Black(N1,5)

Digital type draw out

Cutting Size: 165 X 122mm