

변압기 보호용 복합형 보호계전기

(50/51(50B), 50N/51N, 50/87T, 87G, 24, 46/46T, 50BF, 27/59, 64(59G) Cold Load, Inrush)



K-PAM T3300은 한전 154kV 변압기보호배전반 규격을 만족하는 변압기 보호용 복합형 계전기로서 전류 순시 / 비율 차동, 권선별 최대 3개까지의 단락 / 지락 / 역상 과전류, 과여자, 단상 과전압 / 저전압, 지락과 전압 등의 보호요소를 갖추고 있어서 2권선, 3권선 변압기뿐만 아니라 모터 / 발전기 권선보호에도 적용이 가능하며, K-PAM T3300은 보호, 제어, 감시기능 외에 다양한 전기량 계측, Demand 및 자기진단 등 다양한 감시기능이 있습니다. 단, 기존 유도형 계전기를 교체할 때 CCT를 제거해야 합니다.

K-PAM T3300 is the integrate type transformer protection relay that is satisfied with KEPCO 154kV Transformer protection switchboard standard that can apply to 2 winding, 3 winding transformer and motor/generator winding protection because of current high set over/ratio differential, up to 3 short-circuit/ground/negative current, V/Hz, phase over-voltage/undervoltage, Ground Over Voltage

etc. of each winding, and it has not only protection and control, but also monitoring, electricity measurement, demand and self-diagnosis functions.

If change the conventional induction to K-PAM T3300, you must remove the CCT before installation.

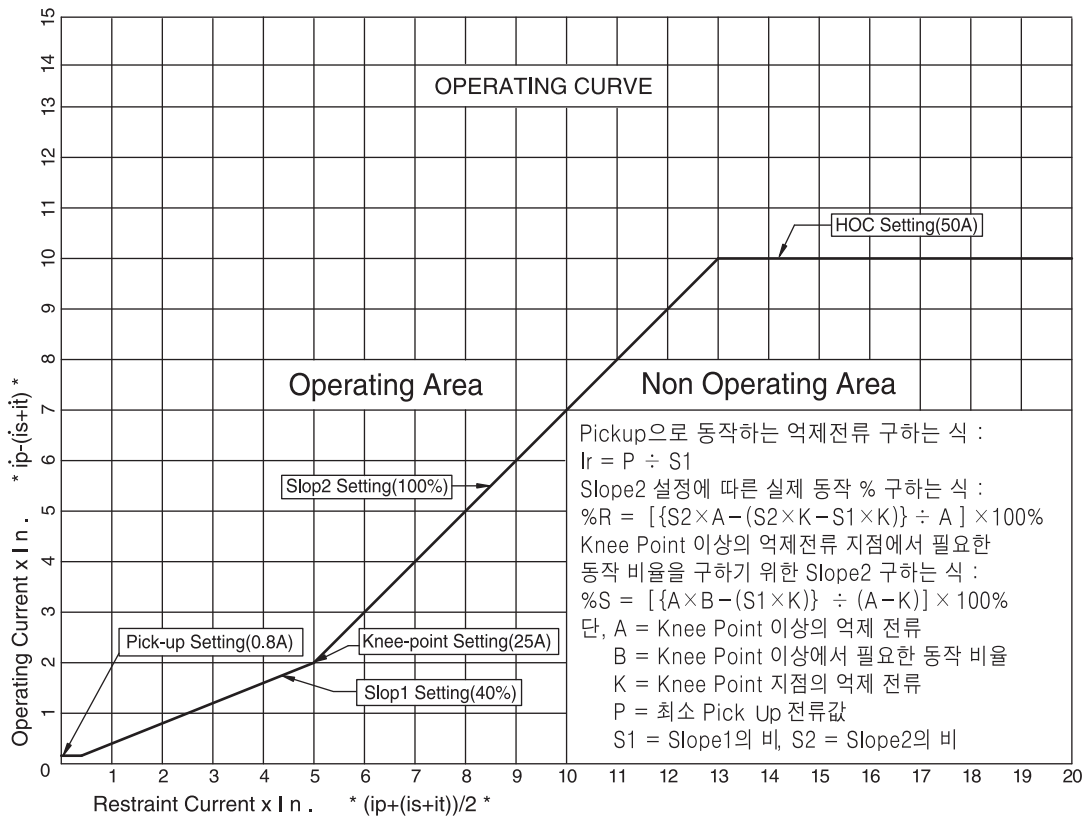
■ 주요사양 (Specification)

항 목		형 식	K-PAM T3300		
제어 전원			AC/DC 110~220V (Free Voltage)		
주파수			50Hz 또는 60Hz (Program 설정)		
표시 장치			그래픽 LCD(240×128, 30글자×16줄)		
입출력	디지털 입력	16점, AC/DC 110~220V, 5~10mA/Point			
	디지털 출력	T/S1~T/S6 (1a×6)		폐로용량 : 16A at AC250V, 30A at DC125V, 저항부하	
		T/S7~T/S16 (1a×8, 1c×2)		폐로용량 : 5A at AC250V, 5A at DC125V, 저항부하	
				개로용량 : 1A at AC250V, 1A at DC125V, COS ϕ =0.1, 시정수(25ms)	
	아날로그 입력	전류 : 12회로, 전압 : 1회로, 지락전압 : 1회로			
		전 류	정 격	AC 5A	
			부 담	< 0.5VA / Phase	
		전 압	정 격	AC 63.5 ~ 110V	
			부 담	< 0.5VA / Phase	
		지 락 전 압	정 격	AC 190V	
부 담	< 0.5VA				
통 신	프로토콜	Modbus			
	RS-485	1Port (후면)			
	RS-232C	1 Port (전면)			
시각동기	IRIG-B000	1Port (후면)			
자기 진단			Memory, Setting, AD converter, Calibration, DC Power, CPU Except, DSP, EasyLogic, DO/DI CIRCUIT, AC Power		
기록 기능	Event	최대 1024개 (분해능 1ms)			
	Waveform	최대 5개까지 저장			
적용 규격			GS-6110-0074 (154kV 변압기 보호배전반)		
제품 크기 (W×H×D : mm)			230 × 285 × 231 (외형치수 : 47page 참조)		
중 량			≒ 8.5kg		

■ 동작특성 (Operation Characteristic)

계전 요소		동작 구분		동작치 정정		동작 시간 특성		
				정정 범위	정정 단위	정정 범위	정정 단위	특
24	과여자 보호	한 시	최소전압	5 ~ 50V	1V	0.05~180.00sec	0.01sec	DT
			V/Hz 동작치	1.00~4.00V/Hz	0.01V/Hz			
59/27	과/저전압 (O/UVR)	한 시		5~170V	1V	0.010~10.000 (Time Dial)	0.001	59 : 반한시 (NI) 27 : 역반한시 (NI)
						0.04~60.00sec	0.01sec	DT
64 (59G)	지락 과전압 (OVGR)	순 시		5~170V	1V	—	—	INST (40ms 이하 동작)
		한 시				0.04~180.00sec	0.01sec	DT
						0.010~10.000 (Time Dial)	0.001	INV_TRIP, INV_ALARM
						0.04~60.00sec	0.01sec	DT
46/ 46T	역상 과전류 (NSOCR)	순 시		0.50~100.00A	0.01A	—	—	INST(40ms 이하 동작)
		한 시				0.04~60.00sec	0.01sec	DT
						0.010~10.000 (Time Dial)	0.001	IEC_NI, IEC_VI, IEC_EI, IEC_LI, ANSI_I, ANSI_SI, ANSI_LI, ANSI_MI, ANSI_VI, ANSI_EI, ANSI_DI, KNI, KVI, KDNI
						0.04~60.00sec	0.01sec	DT
50BF	차단실패	한 시		0.20 ~ 5.00A	0.01A	0.04~60.00sec	0.01sec	DT
50/51 (50B)	과전류 (OCR)	순 시		0.50~100.00A	0.01A	—	—	INST(40ms 이하 동작)
		한 시				0.04~60.00sec	0.01sec	DT
						0.010~10.000 (Time Dial)	0.001	IEC_NI, IEC_VI, IEC_EI, IEC_LI, ANSI_I, ANSI_SI, ANSI_LI, ANSI_MI, ANSI_VI, ANSI_EI, ANSI_DI, KNI, KVI, KDNI
						0.04~60.00sec	0.01sec	DT
50N/ 51N	지락 과전류 (OCGR)	순 시		0.10~100.00A	0.01A	—	—	INST(40ms 이하 동작)
		한 시				0.04~60.00sec	0.01sec	DT
						0.010~10.000 (Time Dial)	0.001	IEC_NI, IEC_VI, IEC_EI, IEC_LI, ANSI_I, ANSI_SI, ANSI_LI, ANSI_MI, ANSI_VI, ANSI_EI, ANSI_DI, KNI, KVI, KDNI
						0.04~60.00sec	0.01sec	DT
50/87	전류차동 (DCR)	순시 차동 (HOC)		10~150A	1A	—	—	INST (40ms 이하 동작)
비율 차동 (RDR)		동작 차전류 0.20~2.50A 0.01A Slope1 5~100% 1% Slope2 20~200% 1% Knee Point 5.0~100.0A 0.1A 2고조파 비율 5.0~40.0% 0.1% 5고조파 비율 5.0~40.0% 0.1%		0.04~60.00sec	0.01sec	DT		
				0.04~60.00sec 0.01sec DT				
87G		지락 비율 차동		동작 차전류 0.20~2.50A 0.01A Slope 5~100% 1%		0.04~60.00sec	0.01sec	DT
		한 시		0.10 ~ 5.00A 0.01A		0~1000sec	1 sec	동작 지연시간 설정 복귀 지연시간 설정
Inrush		한 시	최소전류		0.10~2.50A 0.01A	0.04~60.00sec	0.01sec	DT
	2고조파/기본파		10 ~ 100% 1%					

■ 비율특성 곡선 (Ratio Characteristic Curve)



■ 계측기능 (Measurement)

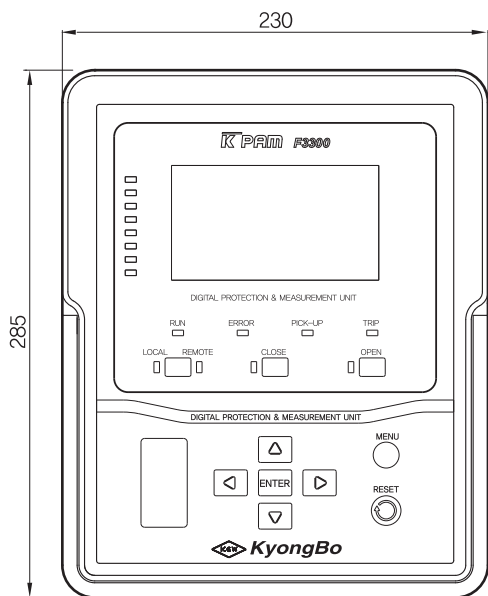
계측범위는 2차측으로 계측 가능한 범위이며 CT, VT(EVT)비를 입력하면 1차측 크기로 표시합니다.

계측요소	계측범위
1, 2, 3권선 전류 실효치 및 위상	W1_IA, W2_IA, W3_IA, W1_IB, W2_IB, W3_IB, W1_IC, W2_IC, W3_IC, W1_IN, W2_IN, W3_IN
전압 실효치 및 위상	V _M
지락전압 실효치 및 위상	V _G
주파수(A상 전압기준)	Frequency
기본파/2조파/5조파, 차전류	DIFF_IA, DIFF2_IA, DIFF5_IA, DIFF_IB, DIFF2_IB, DIFF5_IB, DIFF_IC, DIFF2_IC, DIFF5_IC
기본파, 억제전류	R_IA, R_IB, R_IC
1, 2, 3권선 보정전류 실효치 및 위상	W1_C_IA, W2_C_IA, W3_C_IA, W1_C_IB, W2_C_IB, W3_C_IB, W1_C_IC, W2_C_IC, W3_C_IC
1, 2, 3권선 정상, 역상, 영상 전류 실효치 및 위상	W1_I1, W1_I2, W1_I0, W2_I1, W2_I2, W2_I0, W3_I1, W3_I2, W3_I0
1, 2, 3권선 전류 크기보상 Factor	W1_MFAC, W2_MFAC, W3_MFAC

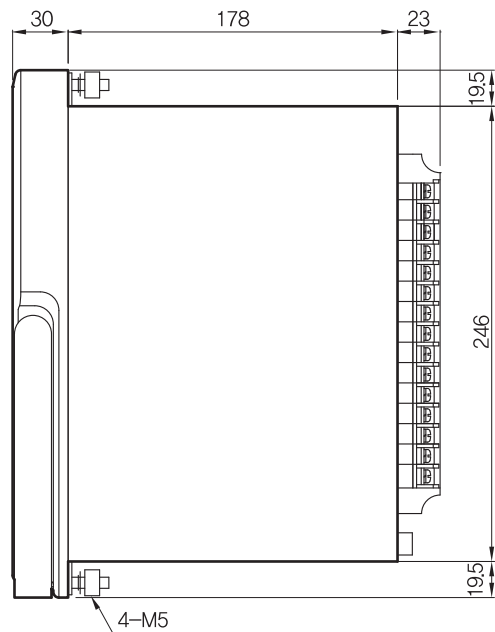
■ K-PAM F, DG, M, T3300의 외형치수 (Dimension)

unit : mm

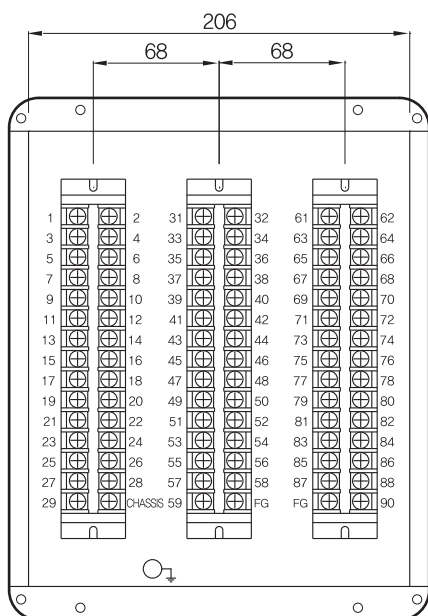
■ 정면부



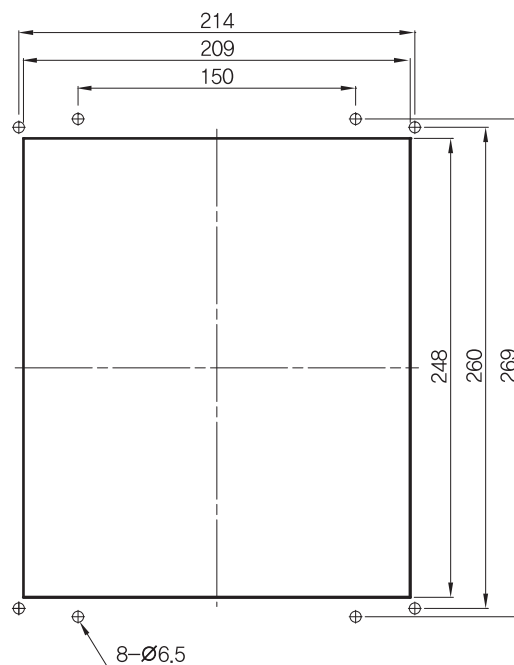
■ 측면부



■ 후면부



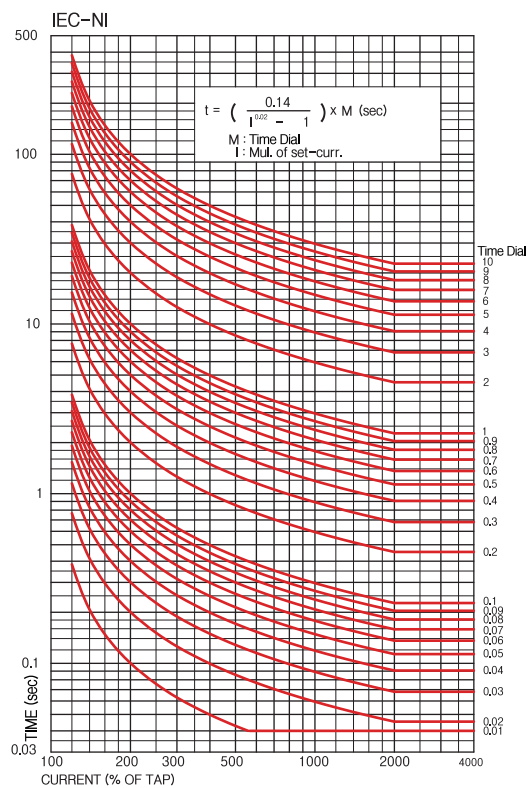
■ Panel 가공치수



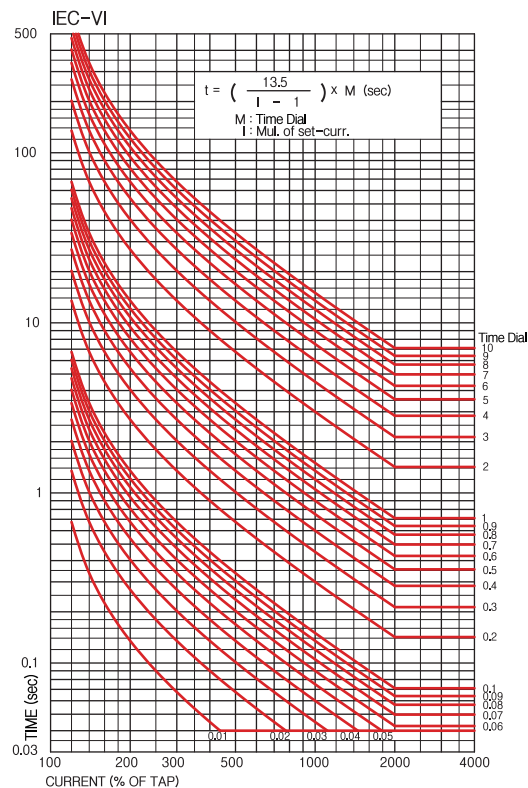
K-PAM 3300 Series 동작특성 곡선 (Operation Characteristic Curves)

D : Directional

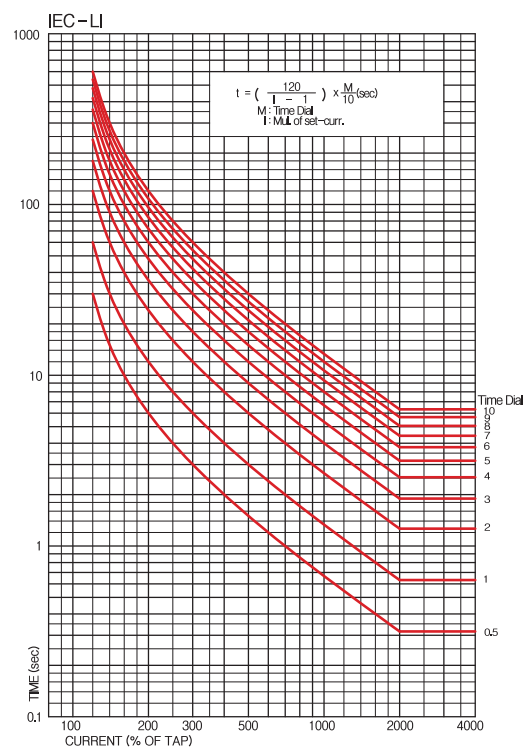
■ (D)OCR, OCGR, NSOCR 요소 IEC_NI



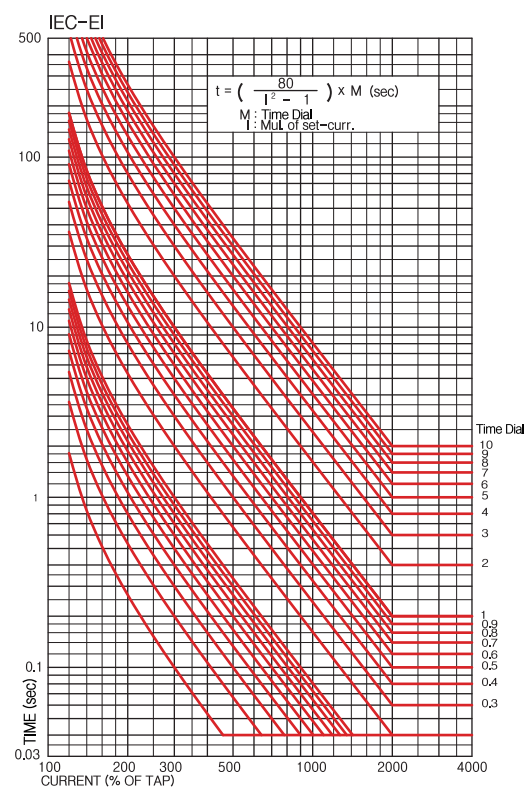
■ (D)OCR, OCGR, NSOCR 요소 IEC_VI



■ (D)OCR, OCGR, NSOCR 요소 IEC_LI



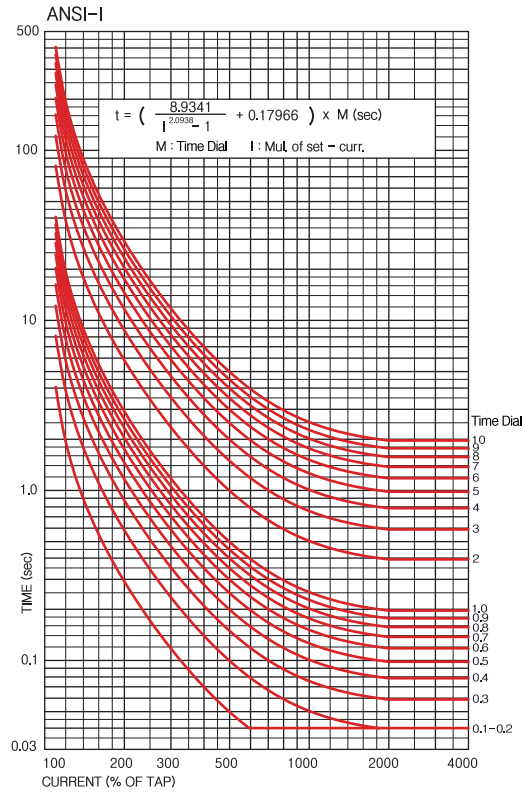
■ (D)OCR, OCGR, NSOCR 요소 IEC_EI



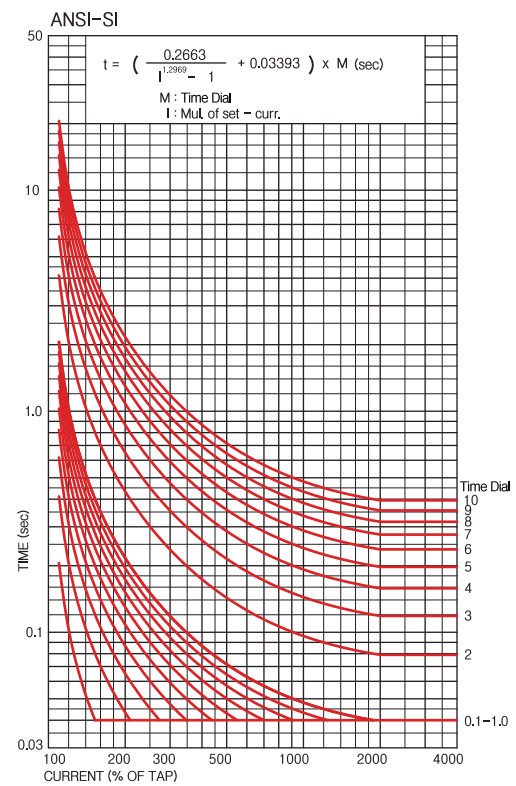
■ K-PAM 3300 Series 동작특성 곡선 (Operation Characteristic Curves)

D : Directional

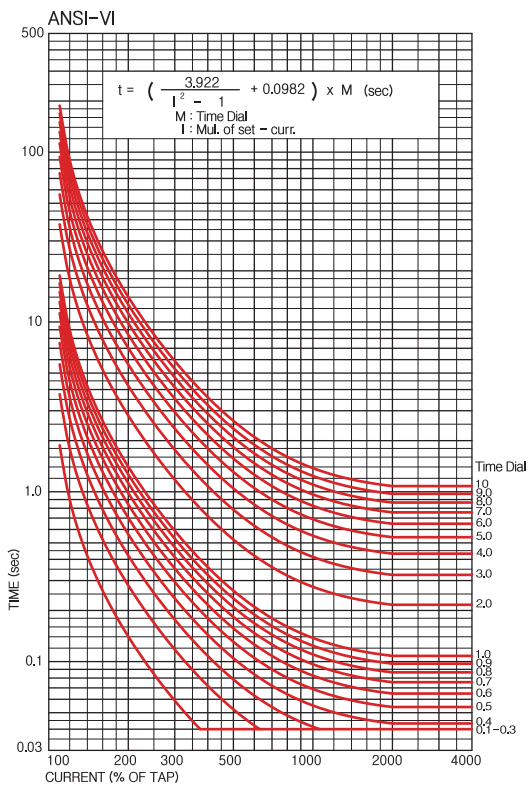
■ (D)OCR, OCGR, NSOCR 요소 ANSI_I



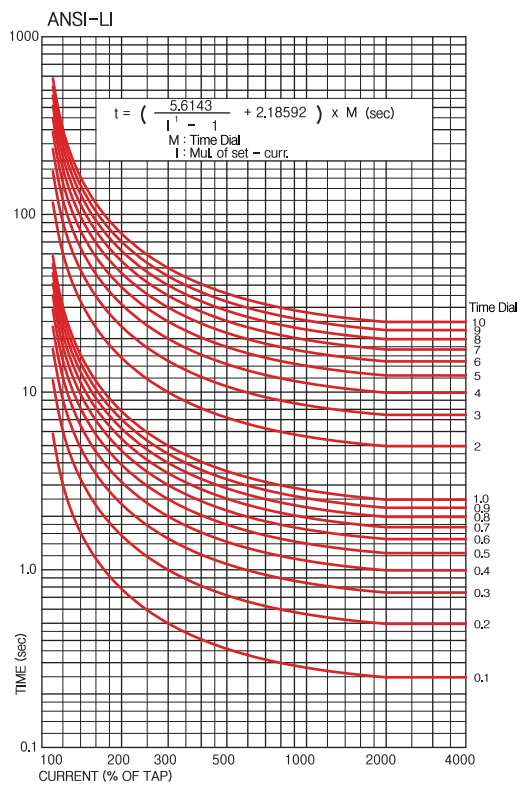
■ (D)OCR, OCGR, NSOCR 요소 ANSI_SI



■ (D)OCR, OCGR, NSOCR 요소 ANSI_VI



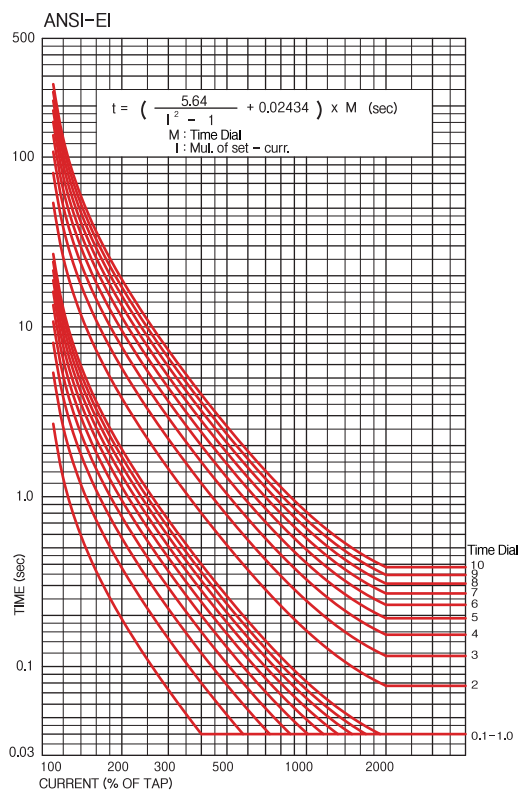
■ (D)OCR, OCGR, NSOCR 요소 ANSI_LI



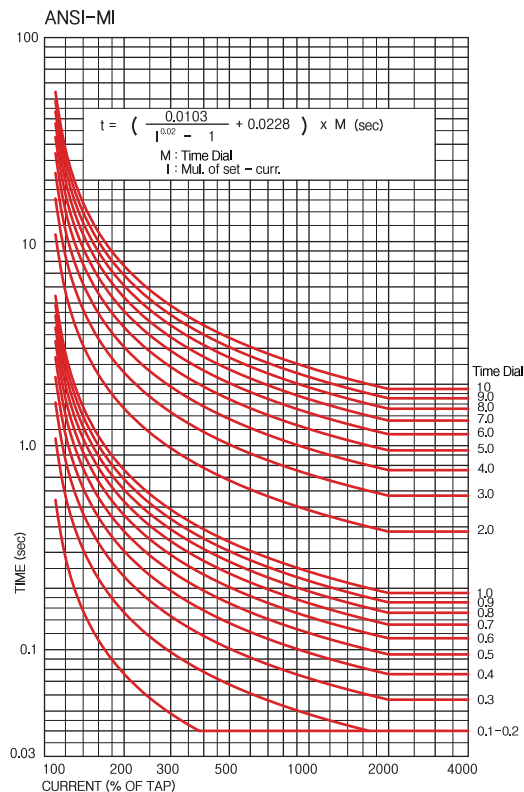
■ K-PAM 3300 Series 동작특성 곡선 (Operation Characteristic Curves)

D : Directional

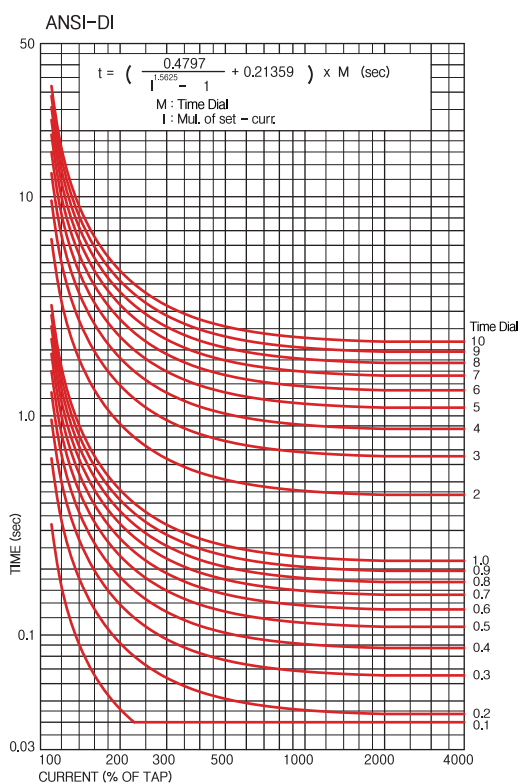
■ (D)OCR, OCGR, NSOCR 요소 ANSI_EI



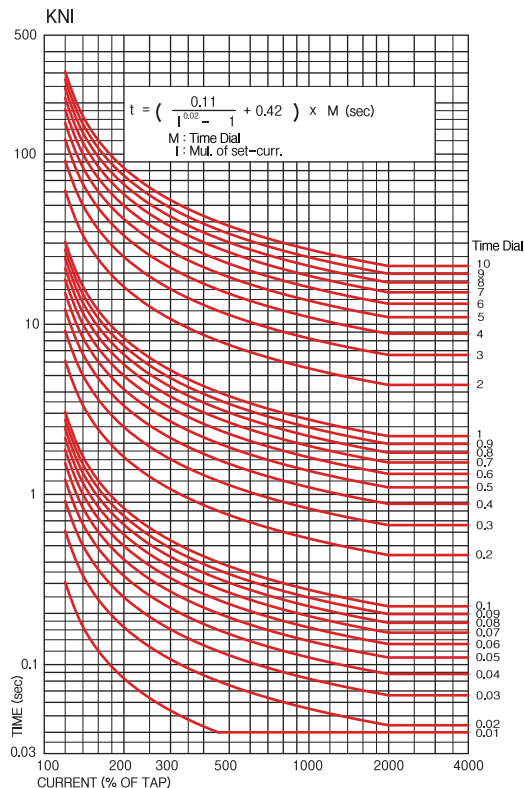
■ (D)OCR, OCGR, NSOCR 요소 ANSI_MI



■ (D)OCR, OCGR, NSOCR 요소 ANSI_DI



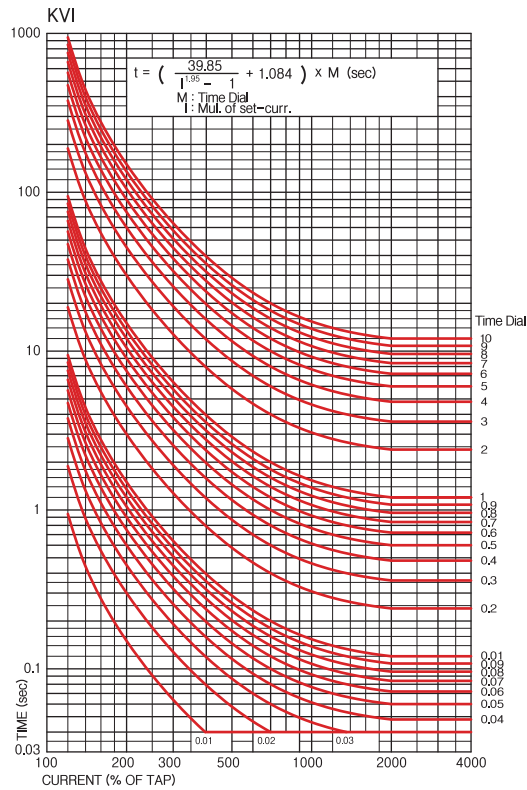
■ (D)OCR, OCGR, NSOCR 요소 KEPCO-NI



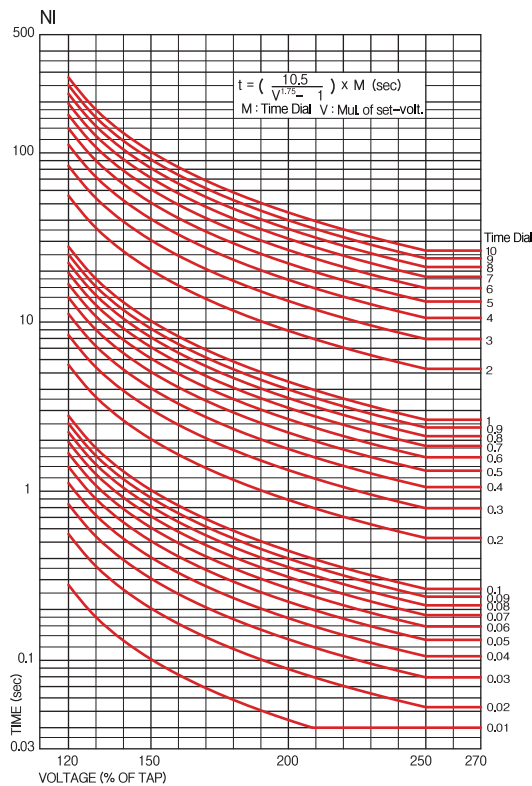
■ K-PAM 3300 Series 동작특성 곡선 (Operation Characteristic Curves)

D : Directional

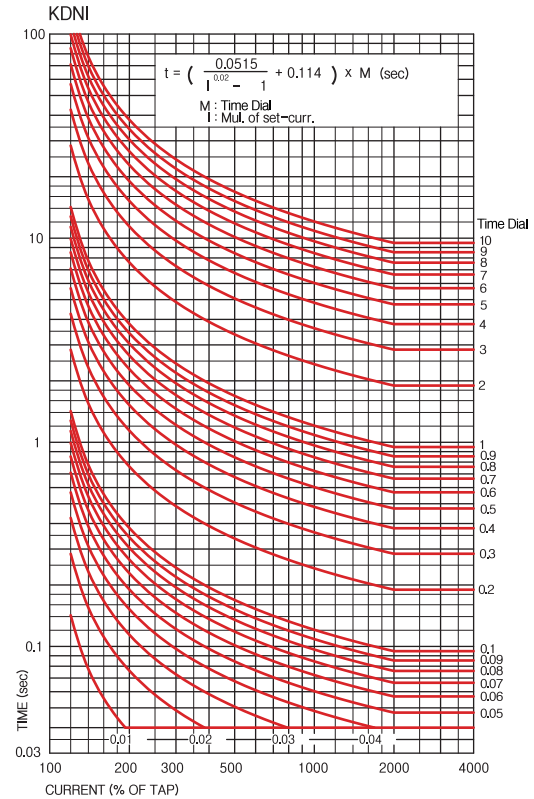
■ (D)OCR, OCGR, NSOCR 요소 KEPCO-VI



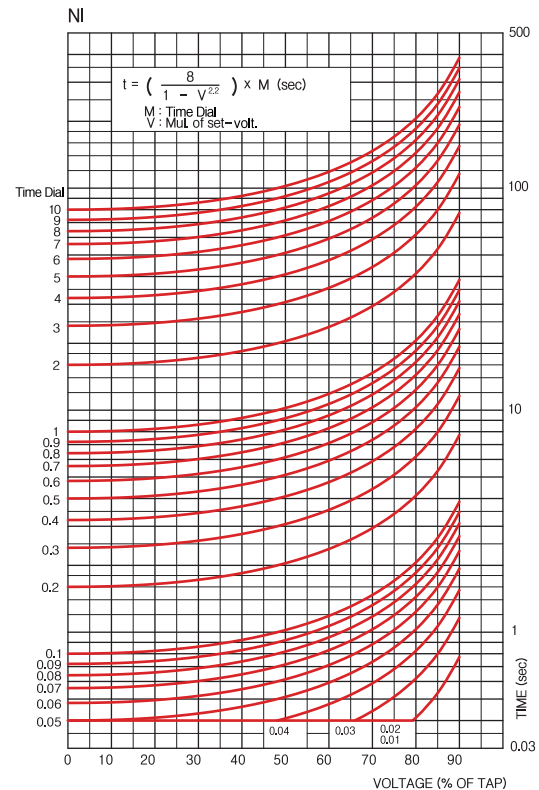
■ OVR 요소 NI



■ (D)OCR, OCGR, NSOCR 요소 KEPCO-DNI

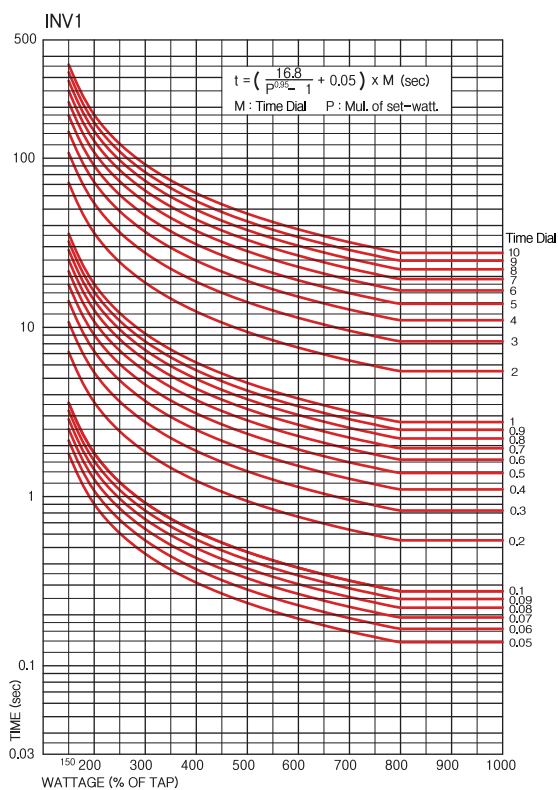


■ UVR 요소 NI

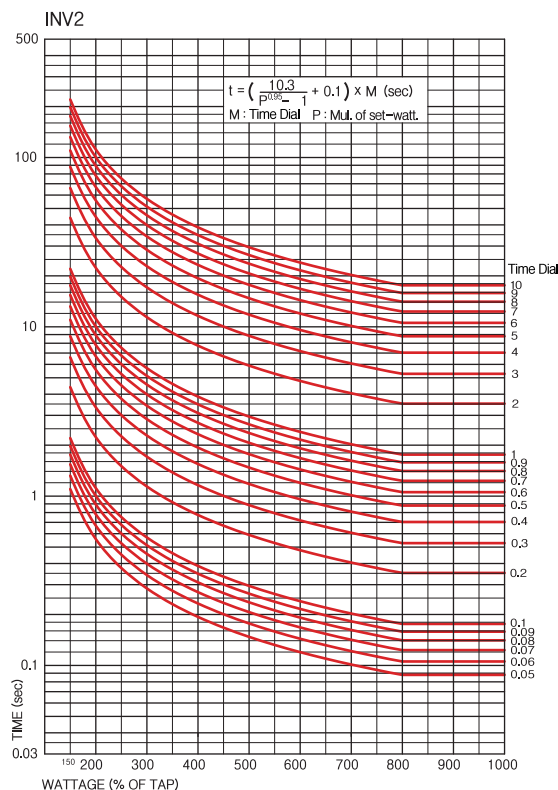


■ K-PAM 3300 Series 동작특성 곡선 (Operation Characteristic Curves)

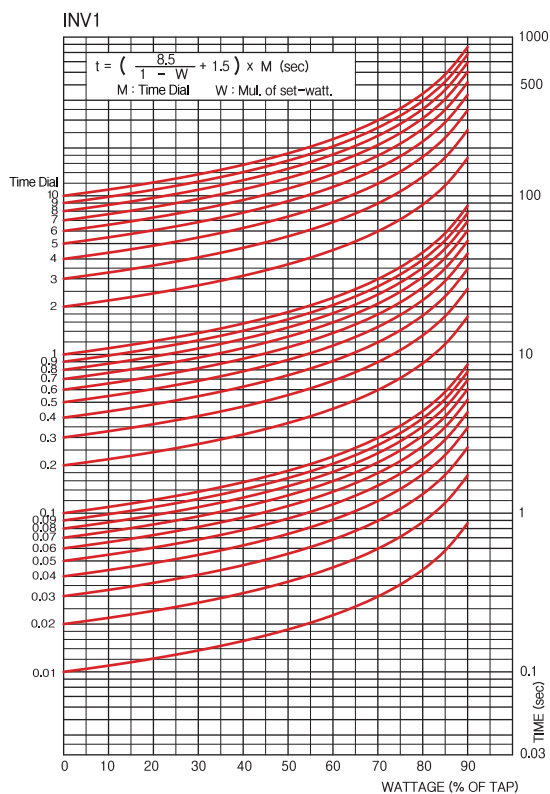
■ OPR 요소 INV1



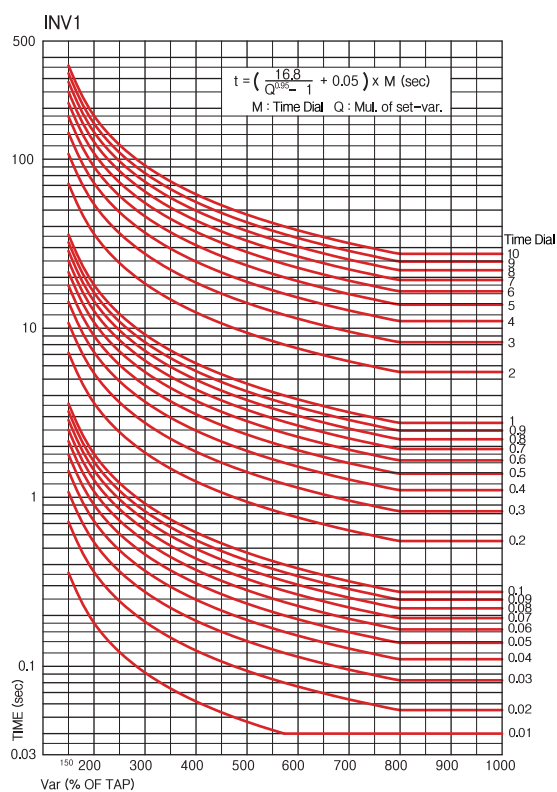
■ OPR 요소 INV2



■ UPR 요소 INV1

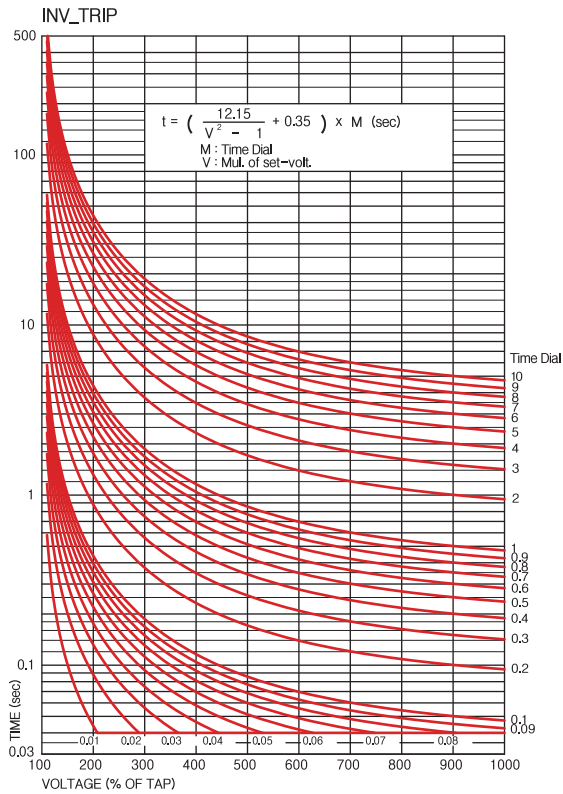


■ Re.PR 요소 INV1

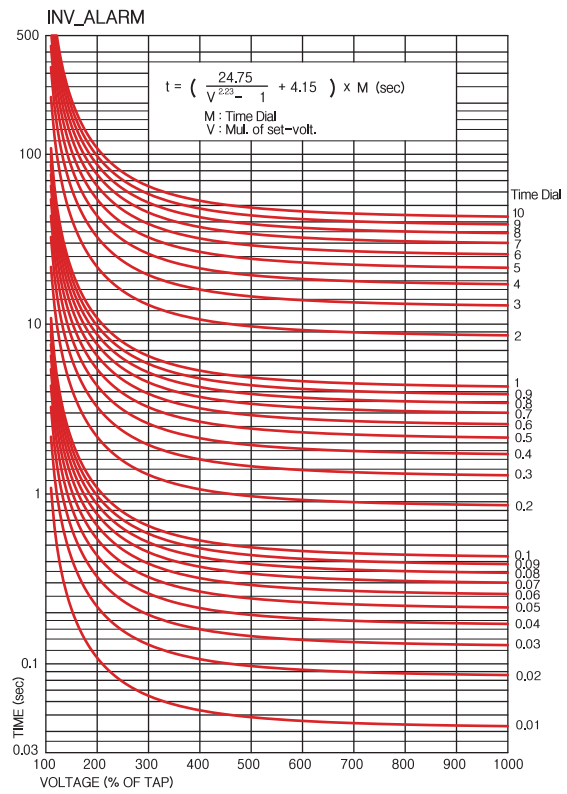


■ K-PAM 3300 Series 동작특성 곡선 (Operation Characteristic Curves)

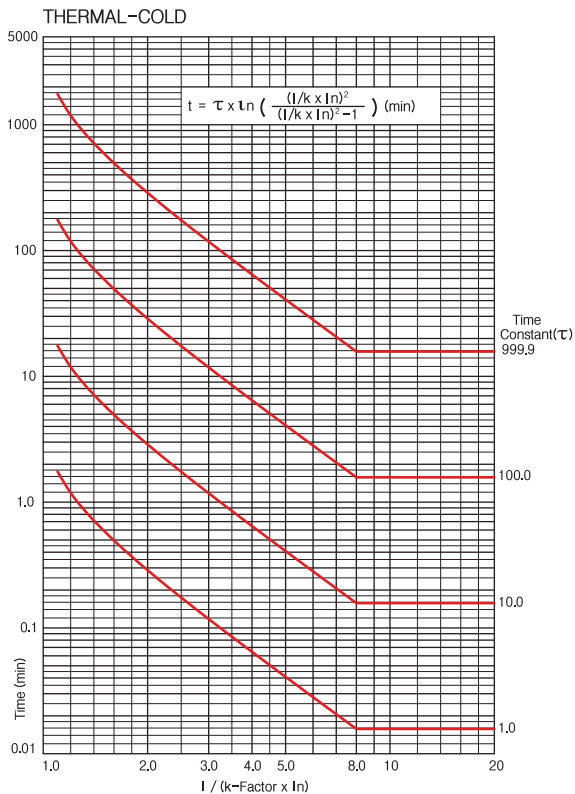
■ OVGR 요소 INV(Trip 용)



■ OVGR 요소 INV(Alarm 용)



■ THERMAL 요소 COLD



■ THERMAL 요소 HOT

