

TOYO

長時過電流繼電器

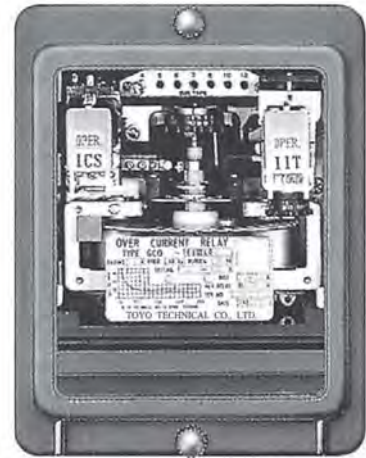
Long Time Over Current Relay

馬達用

■ TYPE TCO-CI□L(常時開路型 : Normal Open Contact)

This relay operates with time delay on current exceeding a given value. Time delay varies inversely as current value, and there are two kinds of time characteristics - inverse and very inverse.

It is possible to improve the time coordination between adjacent relay system by incorporating its instantaneous unit. This relay is specially designed for motor protection.



■ SPECIFICATION

Type		TCO Unit		*IIT Unit	ICS Unit	Figure	Weight					
	*Tap Range	Time Characteristic	Rating		Time Characteristic							
TCO-CINL4	4-12A	inverse	5A	20-80A	1.0A	Fixed	3.6kg					
TCO-CINL3	3-8A											
TCO-CINL2	2-6A											
TCO-CIVL4	4-12A	very inverse						0.5-2.0A	Drawout	4.6kg		
TCO-CIVL3	3-8A											
TCO-CIVL2	2-6A											
TCO-CINLD4	4-12A	inverse			5A	20-80A	1.0A				Fixed	3.6kg
TCO-CINLD3	3-8A											
TCO-CINLD2	2-6A											
TCO-CIVLD4	4-12A	very inverse						0.5-2.0A	Drawout	4.6kg		
TCO-CIVLD3	3-8A											
TCO-CIVLD2	2-6A											

★TAP: 3-8A: 3, 4, 5, 6, 8A 4-12A: 4, 5, 6, 7, 8, 10, 12A ★IIT: 20-80A: 20, 30, 40, 60, 80A
2-6A: 2, 3, 4, 5, 6A

■ OPTION (ICS unit)

Type of ICS coil	Rating
DC current coil	0.2/2.0A, 0.5/2.0A, 1.0A
DC voltage coil	24V, 110V, 125V
AC current coil	0.5A, 1.0A, 2.0A
AC voltage coil	110V, 220V

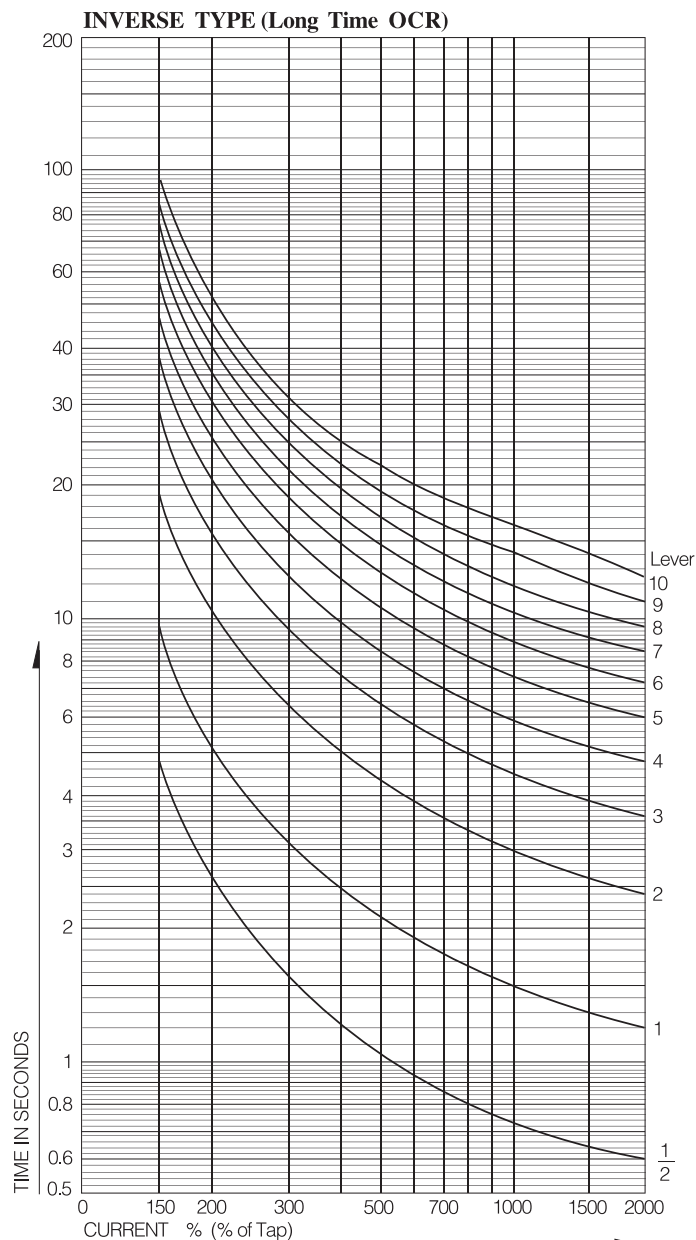
■ OPERATING VALUE SETTING

When setting the operating current of the relay, you can change the value by first inserting the spare screw (beside the ICS unit) into the expected current value, and then remove the original screw after setting is done. In the case of draw-out type relay, set the current value while the relay is being drawn out.

■ TIME LEVER SETTING

The operating time of the relay must firstly be decided before setting the time lever above the rotary disk. The time lever has been initialized at lever 10 as default setting.

■ TIME & CURRENT CHARACTERISTIC (Normal Inverse)



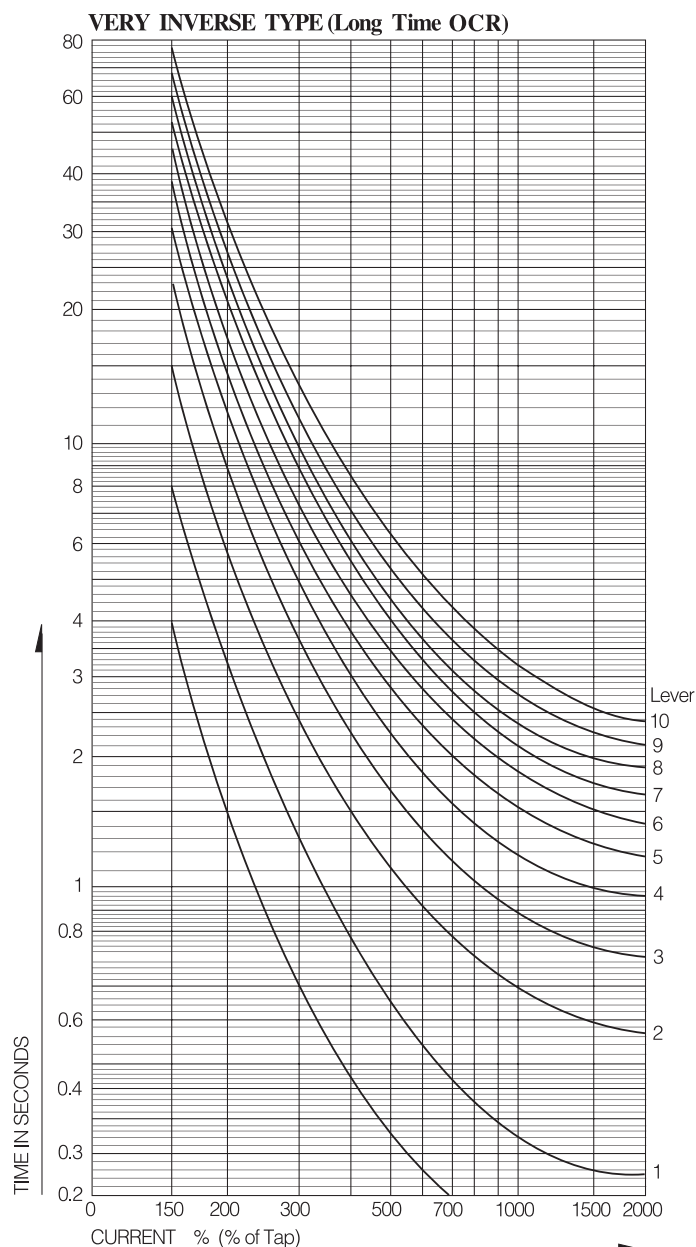
Time Lever = 10

Input	Time (sec.)	Error
300%	30.0	±12%
500%	22.5	±7%
1000%	16.0	±7%

■ PERFORMANCE

試驗項目	反時限性能
適用形式	TCO-CINL TCO-CINLD
最大動作電流	限時要素: 時限Lever 1 Tap值±5%以內 瞬時要素: 電流設定值±10%以內
Floating特性	最小電流設定值±10%以內
動作時間特性	(限時)時限設定Lever 10, 動作電流設定值 2000%入力時: 11秒±2秒 T_2/T_{20} : 3 ~ 4.5倍以內 T_3/T_5 : 1.2 ~ 1.8倍以內 (瞬時)瞬時要素動作電流設定值 200%入力時: 50ms以內
復歸時間	動作電流設定值80%入力時: 66秒以內
補助接觸器動作值	補助接觸器定格70% ~ 90%以內
溫度影響	動作電流值(限時, 瞬時): 20°C±40°C變化時 ±20%以內
週波數影響	動作電流值(限時, 瞬時): 定格周波數±5% 變化時, 動作時間(限時): ±5%以內
傾斜影響	動作電流值(限時, 瞬時): 前/後/左/右 5° 傾斜時, 動作時間(限時): 實測動作電流值 ±10%以內
絕緣抵抗	電氣迴路—外殼間: 10MΩ以上 接點—接點間: 5MΩ以上
常用週波耐電壓	電氣迴路—外殼間: AC 2000V / 1min. 接點—接點間: AC 1000V / 1min.
振動	振動數: 16.7Hz 複振幅: 0.4mm 振動時間: 10分間 誤動作
衝擊	衝擊加速度: 30g(300m/s ²) 衝擊方向: 前/後/上/下 衝擊回數: 2回
過負荷耐量	瞬時, 限時要素最小電流設定Tap定格電流 40倍/1秒間, 1分間2回印加

TIME & CURRENT CHARACTERISTIC (Very Inverse)



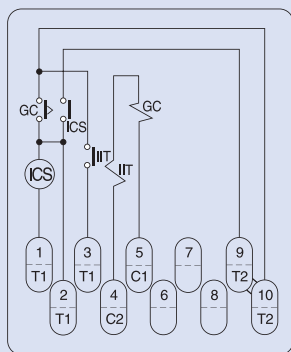
Time Lever = 10

Input	Time (sec.)	Error
300%	13.33	±12%
500%	6.16	±7%
1000%	3.20	±7%

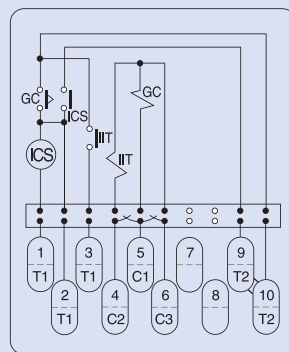
PERFORMANCE

試驗項目	反時限性能
適用形式	TCO-CIVL TCO-CIVLD
最大動作電流	限時要素: 時限Lever 1 Tap值±5%以內 瞬時要素: 電流設定值±10%以內
Floating特性	最小電流設定值±10%以內
動作時間特性	(限時)時限設定Lever 10, 動作電流設定值 2000%入力時: 2.4秒±0.4秒 T_2/T_{20} : 10 ~ 15倍以內 T_3/T_5 : 1.8 ~ 2.6倍以內 (瞬時)瞬時要素動作電流設定值 200%入力時: 50ms以內
復歸時間	動作電流設定值80%入力時: 165秒以內
補助接觸器動作值	補助接觸器定格70% ~ 90%以內
溫度影響	動作電流值(限時, 瞬時): 20°C±40°C變化時 ±20%以內
週波數影響	動作電流值(限時, 瞬時): 定格周波數±5% 變化時, 動作時間(限時): ±5%以內
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過負荷耐量	瞬時, 限時要素最小電流設定Tap定格電流 40倍/1秒間, 1分間2回印加

INTERNAL CIRCUIT DIAGRAM

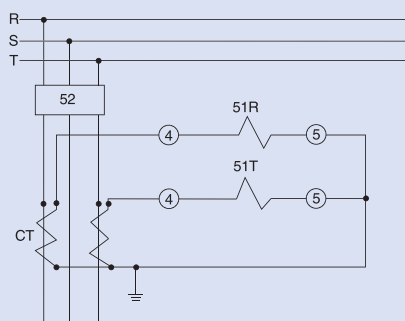


Non-Drawout Type

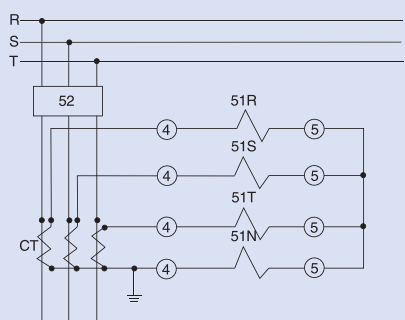
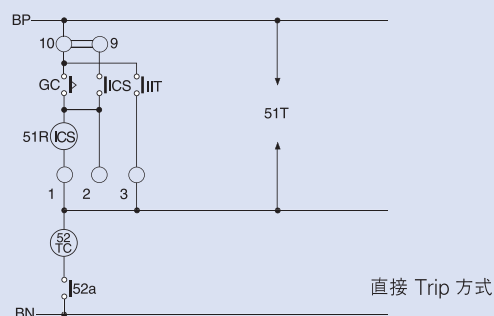


Drawout Type

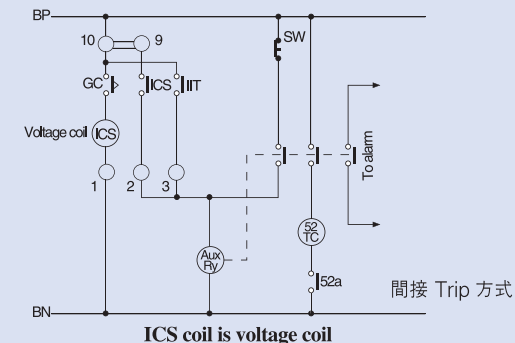
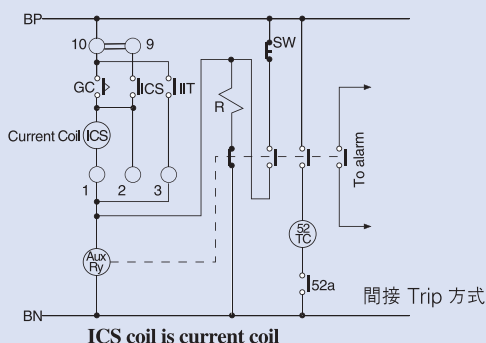
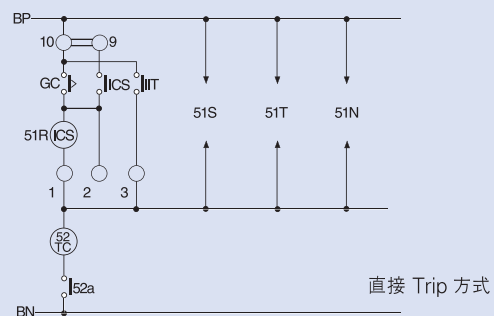
EXTERNAL WIRING DIAGRAM



3PHASE 3WIRE



3PHASE 4WIRE



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