

Protective Relay Time Calculator

Apply externally supplied inverse-time relay curve constants to a fault-current multiple and compare the operating time with an entered limit.

Generated October 10, 2026

<https://www.elecatrix.com/testing-protection-grounding/protective-relay-time-calculator/>

Inputs

Input	Value	Unit
Fault current	5000	A
Pickup current	500	A
Time dial	0.5	x
Entered curve constant	0.14	x
Entered curve exponent	0.02	x
Entered operating-time limit	1.5	s

Results

Result	Value	Unit
Current multiple	10	x
Calculated operating time	1.4853	s
Time margin	0.0147	s

Calculation details

Detail	Value	Unit
Calculation basis	Relay time screen applies user-entered curve constants to an entered current multiple.	
Review boundary	Entered relay-curve arithmetic only; no coordination study, device programming, safety, or code result is made.	

Formulas

$$M = \frac{I_{\text{fault}}}{I_{\text{pickup}}}$$

$$t = (TD \times K / M^{n-1})$$

$$\text{Time margin} = t_{\text{limit}} - t$$

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Warnings and limitations

Entered relay-curve arithmetic only; this calculator does not set or approve relay curves, program devices, verify coordination, or produce a safety/code result.