

Earth Leakage Module (ELM)

30 mA - 3 A

for PowerPact® H- and J-Frame circuit breakers

ELM ▼



Industry experts indicate that the majority of all electrical circuit faults that occur in industrial and commercial power systems are initially manifested as ground faults (also called earth leakage or residual current). Detecting ground faults before they reach hazardous levels helps avoid damage to critical process equipment. This allows preventive maintenance to be scheduled before costly damage occurs, minimizing costly downtime.

The Square D® earth leakage module (ELM) provides protection against low-level ground fault in 15 A to 250 A circuits. The ELM is a UL 1053-listed module which connects to a PowerPact H- or J-Frame molded case circuit breaker (MCCB) to provide low-level, ground-fault sensing and protection functions with sensitivity ranges between 30 mA and 3 A.

Schneider Electric offers the following earth leakage modules for the PowerPact H- and J-Frame circuit breakers. Each ELM has adjustments for five current sensitivity levels and four time delays. This allows settings to help maximize protection and minimize risk of nuisance tripping, in each application (the time delay defines the length of time during which the leakage will persist, before tripping is initiated).

Benefits of the ELM Module

- Helps protect equipment and reduces downtime from damage due to low-level ground fault
- Opens circuit upon detection of low-level ground faults helping to prevent potential catastrophic events
- Indirectly helps protect personnel from fires and malfunctioning equipment, etc.
- Detects excessive earth leakage currents, which contributes to energy efficiency
- Allows selection of appropriate current sensitivity and time delay



Catalog Number	Amps	Sensitivity	Time Delay (msec)
ELM150HD	150	30 mA, 100 mA, 300 mA, 1 A, 3 A	Instantaneous, 60, 100, 500
ELM250JD	250	30 mA, 100 mA, 300 mA, 1 A, 3 A	Instantaneous, 60, 100, 500



by Schneider Electric

Add-on Earth Leakage Module Features

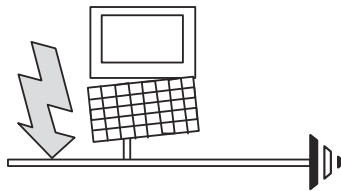
- UL 1053 listed and easily field installable on UL 489-listed PowerPact H- and J-Frame circuit breakers
- Adjustable earth leakage pickup levels from 30 mA to 3 A
- Adjustable earth leakage time delays
- Integral push-to-test feature meets NEC® 230-95(c)
- Earth leakage trip indicator includes local fault indicator button for local status and terminals for remote indication of ground fault trip status
- All ELMs are supplied with required hardware for I-Line® or unit mount applications
- The electronics, shunt trip and integral test feature are line-powered and do not require external control power
- A 48 Vdc shunt trip is required in the circuit breaker; it may be field installed (Cat. No. S29392) or factory installed (circuit breaker suffix -SP in the PowerPact H- and J-Frame circuit breakers)

I-Line mounting
(J-Frame) ▼

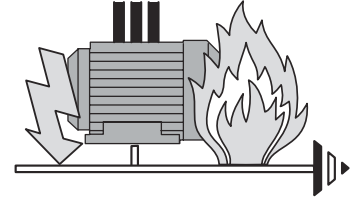
Unit mounting
(H-Frame) ▼



Application Examples



To help protect electronics
from low-level ground faults



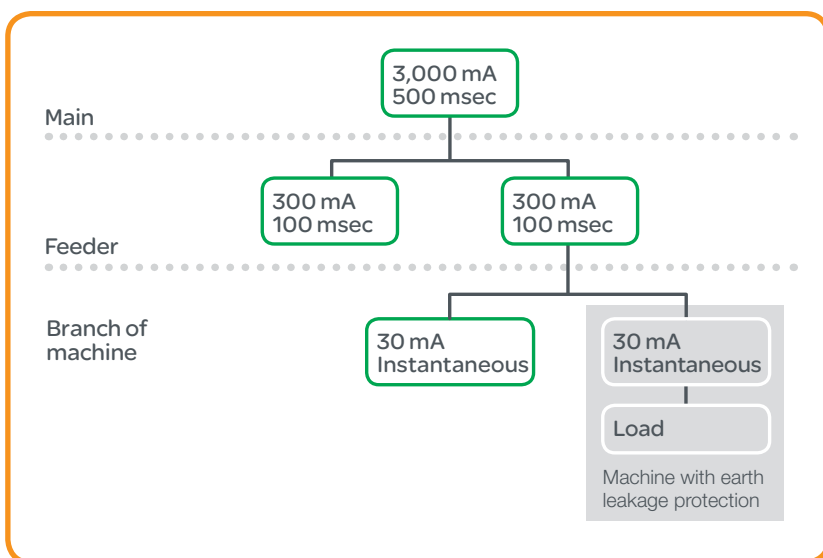
To help protect equipment
(motors etc.) from
insulation degradation

What is ground-fault protection of equipment (GFPE)?

“ A system intended to provide protection of equipment from damaging line-to-ground-fault currents by operating to cause a disconnecting means to open all ungrounded conductors of the faulted circuit. This protection is provided at current levels less than those required to protect conductors from damage through the operation of a supply circuit overcurrent device. ”

— NEC Article 100

A GFPE is designed to protect equipment, not people.



Coordination with the Power Distribution System

When installing the ELM in a machine, consideration should be given to coordination with the plant distribution system. Doing this will localize a ground fault condition and restrict power outages to the equipment affected. As indicated in the drawing below, each level up from the protected machine should have a higher ground-fault trip setting and a longer time delay. The wide range of GC-200, Vigirex and other Square D products, helps ensure a model for every level of the plant distribution system.

For a user or an operator, an ideal electrical power supply is:

- ✓ Risk free (safety of persons and goods)
- 🔄 Always available (continuity of supply)

The ELM helps prevent electrical hazards and achieves both power supply requirements.

Specifications

Compatibility	May be used with I-Line or unit-mounted PowerPact H- and J-Frame MCCBs	
Current	H-Frame (ELM150HD)	Up to 150 A
	J-Frame (ELM250JD)	Up to 250 A*
Voltage	240 Vac to 600 Vac maximum; 50 Hz/60 Hz (for use on solidly-grounded systems only)	
Sensitivity	Five settings: 30 mA, 100 mA, 300 mA, 1 A and 3 A	
Time delay	Four settings: instantaneous, 60, 100 and 500 msec	
Poles	3-poles; 3-wire applications only (no neutral CT available)	
	1-phase; 2-wire applications	
Control power	External power source is not required; ELM electronics and shunt trip are line powered	
Shunt trip output	A 48 Vdc shunt trip (S29392) is required in the circuit breaker; it may be field installed or factory installed (circuit breaker suffix -SP). 14–18 AWG wiring	
External fault indicator	One (1a) normally open contact; external “wetting voltage” of 125 Vdc, 120 Vac nominal; 25 mA maximum; terminals for 14–18 AWG	
ZSI output	The ELM does not provide a ZSI output. The lower sensitivity of ELM will inherently coordinate with upstream protection	
Mounting	Unit mount or I-Line (mounts on the wide side of the I-Line mounting tracks)	
Standards	UL 1053 Ground-Fault Sensing and Relaying Equipment, CSA 22.2 No. 144, NOM-ANCE	
Dimensions	Adds 3.8 in. to the length of circuit breaker, width is 4.5 in., same as I-Line shrouds of H- or J-Frame circuit breaker	

* Can be used on 100% rated breakers through 225 A

Enclosure Dimensions

Enclosure Type	Height in. (cm)	Width in. (cm)	Depth in. (cm)
H-Frame	32.4 (82.3)	14.4 (36.6)	6.0 (15.2)
J-Frame	32.4 (82.3)	14.4 (36.6)	6.0 (15.2)
100% rated H- and J-Frame	62 (157.4)	22 (55.9)	14.0 (35.6)

Lug Options for Field Wiring

ELM Model	Ampere Rating	Wire Size
ELM150HD*	100 A	14–1/0 AWG Cu or 12–1/0 AWG Al
Lug kit for large wiring	150 A	1–4/0 AWG Al/Cu
ELM250JD	250 A	4 AWG–350 kcmil Al/Cu

* The ELM150HD will be shipped with the small lugs installed; the large wiring lugs are included with the ELM as a kit for field installation



To learn more, visit www.schneider-electric.us/go/circuitbreakers

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