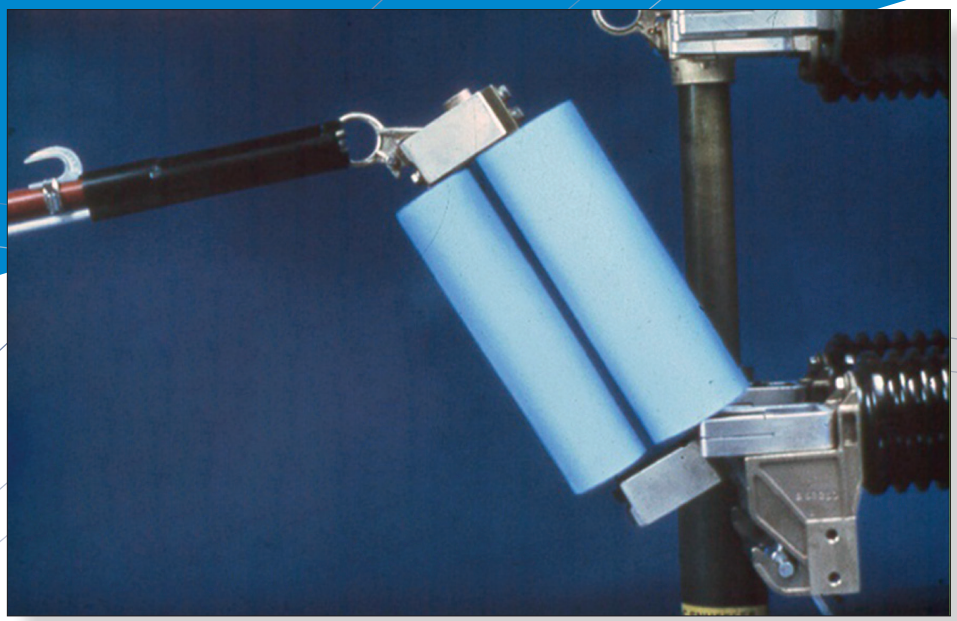


PAF
Power Assisted Fuse

For systems rated 15kV to 38kV and 600A continuous current

G&W Electric

Engineered to order. Built to last.

G&W Electric's PAF (Power Assisted Fuse) offers current limitation to systems with continuous current ratings through 600A and up to 38kV. This makes the PAF ideal for applications beyond the ratings of conventional current limiting fuses and for economical alternatives to conventional expulsion, vacuum and SF6 fuses which are not current limiting.

The PAF is a commutating form of current limiting device where the continuous current is carried by a continuous copper bus bar path. This path is opened under overcurrent conditions to transfer current to a parallel mounted current limiting fuse.

The PAF can be mounted indoors or out. Metal enclosed PAF fuses are available with enclosures, cable terminations, bus connections, supports and enclosures.

FEATURES AND BENEFITS

- **Indoor or outdoor application**
- **Easy to install and maintain**
- **Laboratory and field tested**
- **Current limiting**
- **Arc flash reduction**
- **Cost effective**

Need for Improved Protection

As demand for electrical energy continues to grow, distribution systems have expanded and evolved. Strengthened transmission networks, increased substation capacity, and the addition of on-site generation all contribute to higher available fault currents on the system. If not properly controlled, these short-circuit currents can exceed the thermal and mechanical limits of electrical equipment, potentially causing severe damage and jeopardizing the reliability of the power supply.

Conventional Fault Interrupting Devices

Traditionally, the current limiting fuse has worked well as overcurrent protection on systems with normal continuous currents up to 200A. Their current limitation capability, speed of operation, compact size and low cost make them ideal add-ons to existing installations. Current limitation is a major benefit because it yields a significant reduction in the magnitude of the let-through current. This can lead to substantial savings by reducing damage to the faulted equipment. The energy limiting capabilities of current limiting fuses may prevent the secondary catastrophic failures and effective arc flash/blast reduction.

For systems rated above 200A, circuit breakers and explosion fuses are most commonly used. Though able to withstand higher continuous current, these devices are not current limiting and are relatively slow interrupters, therefore permitting the damage of higher let-through currents to occur. The application of a PAF for protection of underrated switchgear can provide significantly improved protection at a substantial cost savings over replacement of that switchgear. Also, for applications where available fault currents have increased due to expanding power requirements, simply replacing the circuit breakers may not be adequate protection for other underrated equipment on the system.

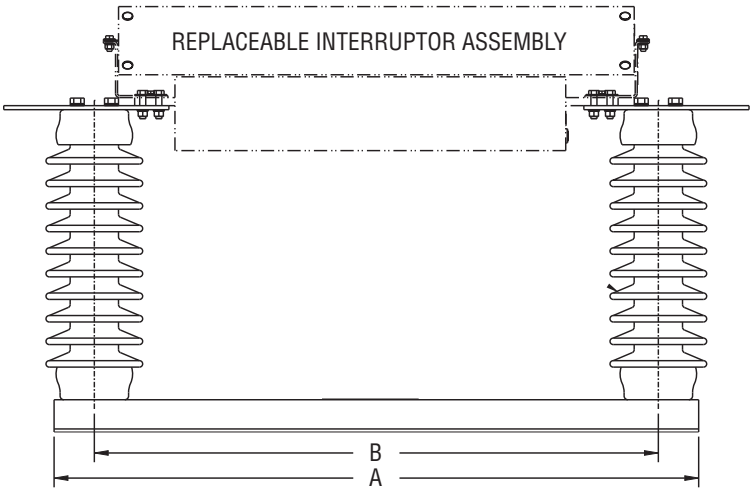
PAF

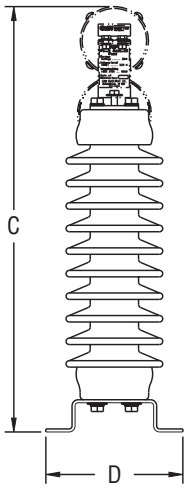
PAF RATINGS

Voltage Class (kV)	Application Range (kV)	Continuous Current (A)	Rated Interrupting (kA)		
			Curve	40	60
15kV	1.0 – 15.5	600	Standard	Y	N
			Desensitized[1]	Y[2]	Y
38kV	15.6–38.0	600	Standard	Y	N
			Desensitized	N	N

[1] Two shunt fuses required per interrupter.

[2] Identical to 60kA desensitized, nameplate change only.





Dimension	Length in. (mm)	
	15kV	38kV
A	18.45 (469)	40 (1016)
B	13.5 (343)	35 (889)
C	17.6 (447)	26.4 (671)*
D	8.5 (216)	8.5 (216)

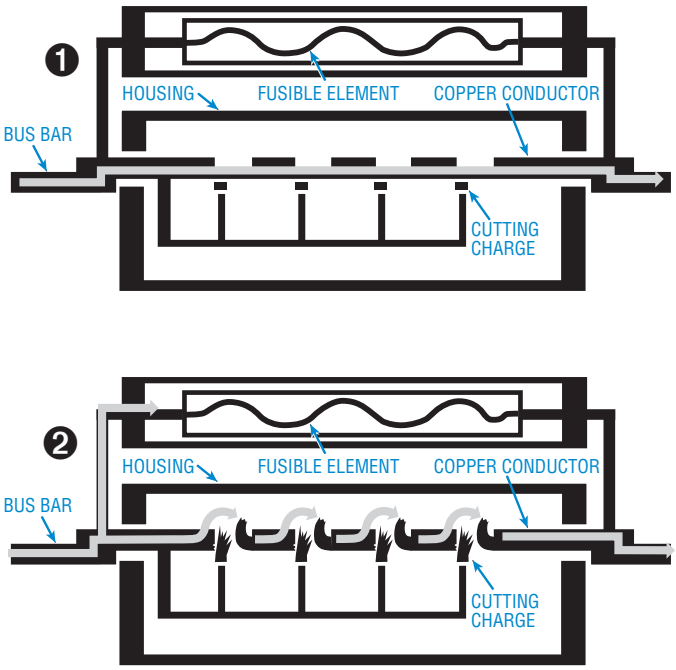
* Approximately

Mechanical

PAF Operation Sequence

1. A large cross-section copper conductor carries the continuous current. Upon occurrence of a short circuit current, a sensing element initiates triggering of a cutting device placed at strategic intervals along the copper bus. This creates multiple gaps in the bus. The cutting devices are similar to those that have been developed for military and space applications in which long shelf life and reliable operation are prime requirements.
2. The arc voltage across the gaps forces the short circuit current to a parallel mounted current limiting fuse. The fuse element melts in the conventional manner, interrupting the current without venting of flames or gases.

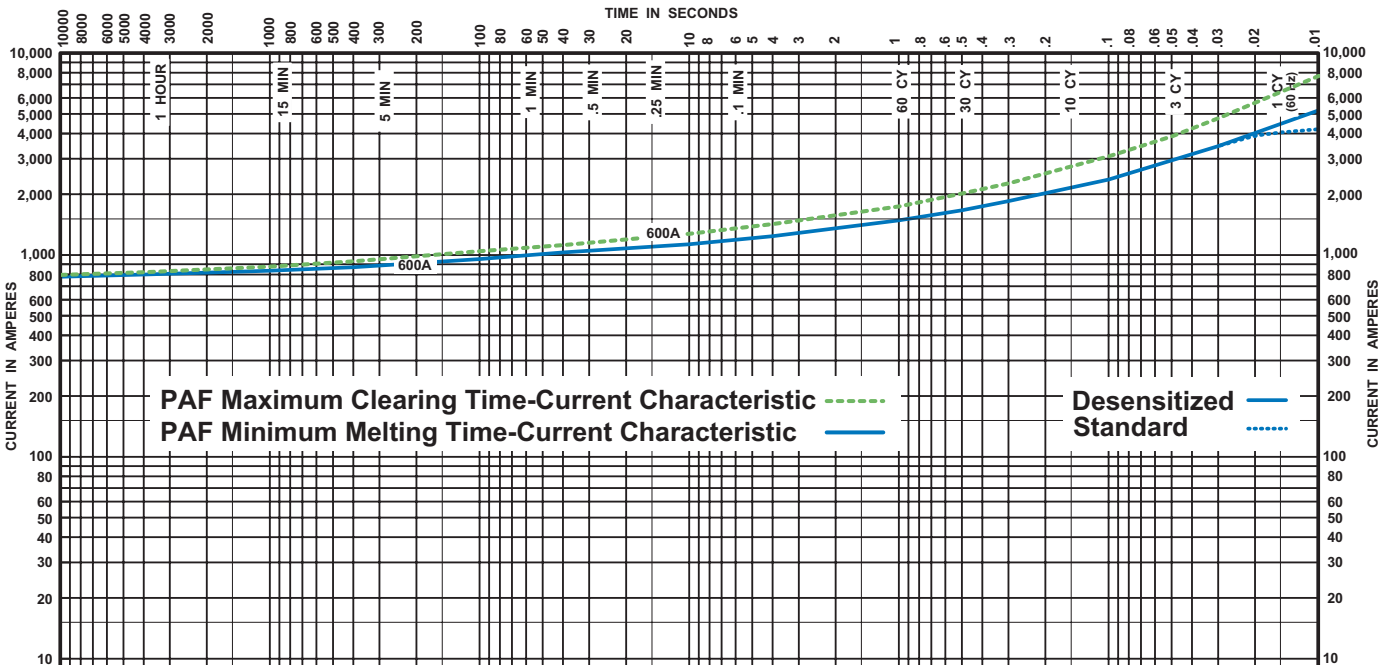
   At short circuit current levels, current limitation is provided within the first half loop of fault current and prior to the first current peak.



PAF applications include market segments impacted by increasing short circuit fault currents.

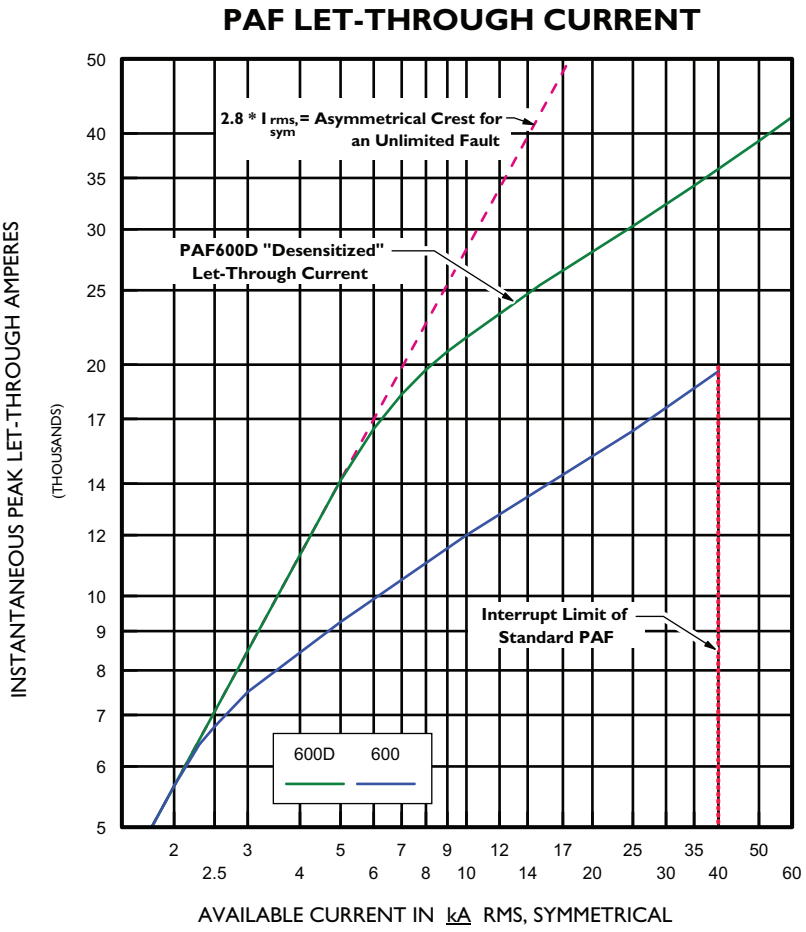
Refineries	Pulp and Paper Mills
Generating Stations	Universities
Distribution Networks	Hospitals
Chemical Plants	Oil Platforms and FPSOs
Cement Plants	Mining

600A Time Current Characteristic Curves

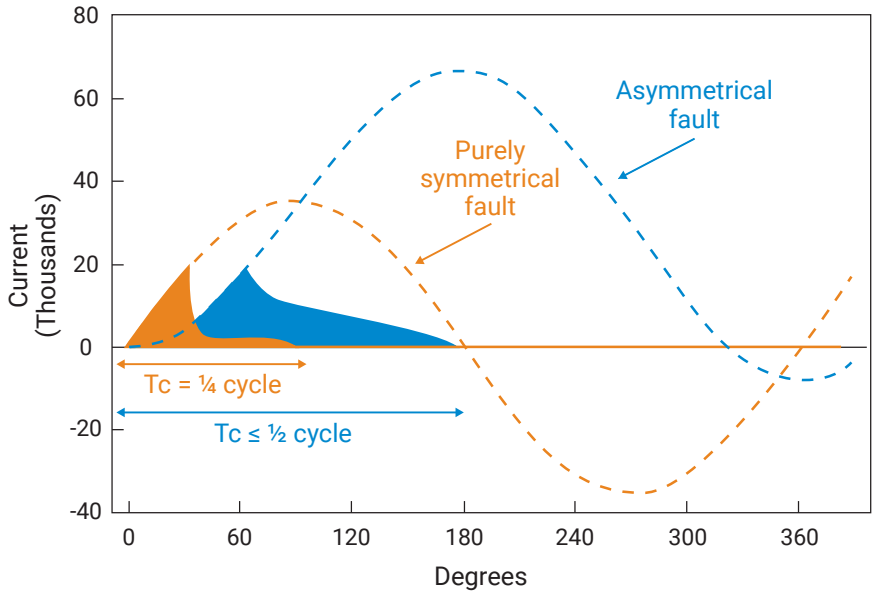


PAF Let-Through Current

Let-Through Current vs. Prospective Fault Current



PAF Symmetrical and Asymmetrical Typical Fault Current Interrupts



Tc = Time it takes for PAF to clear the fault

Ths graph displays an example of symmetrical and asymmetrical faults with their corresponding let-through currents.

Contact us today

1+708.388.5010 or info@gwelec.com

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Since 1905, G&W Electric has been a leading provider of innovative power grid solutions including the latest in load and fault interrupting switches; reclosers; sensors; system protection equipment; power grid automation; and cable accessories. G&W Electric is headquartered in Bolingbrook, Illinois, with manufacturing facilities in the United States, Canada, Italy, China, and Mexico. We help our customers meet their challenges and gain a competitive edge through a suite of advanced solutions and technical services.

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