

PAF® Power Assisted Fuse

G&W's Power Assisted Fuse (PAF)® 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 introduce 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.

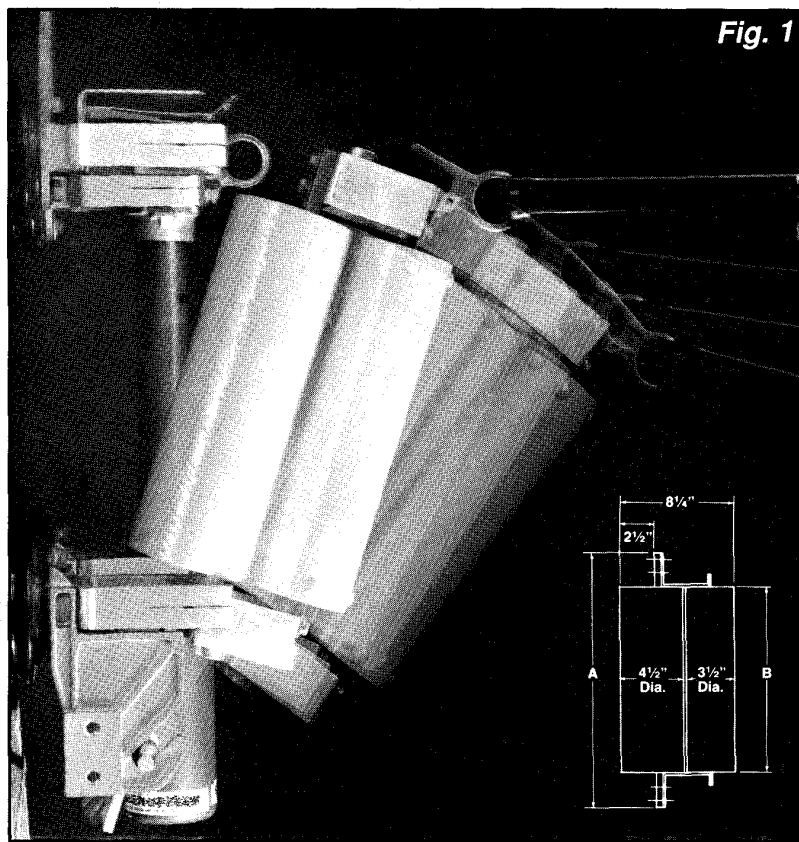
NEED FOR IMPROVED PROTECTION

With the ever increasing demand for electrical energy, distribution systems have been forced to expand and grow. Stiffened transmission systems, increased substation capacity and on-site generation all contribute to subsequent increases in available fault currents imposed on equipment. This short circuit current, if uncontrolled, can exceed the thermal and mechanical capability of electrical devices on the system, severely damaging equipment and thus jeopardizing power supply.

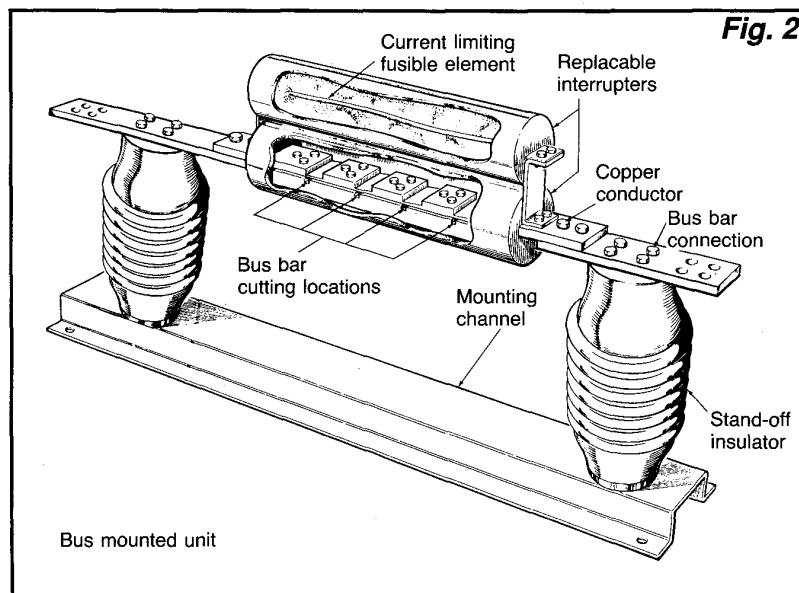
CONVENTIONAL FAULT INTERRUPTING DEVICES

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 damage limitation capabilities of current limiting fuses may prevent the secondary catastrophic failure of oil filled enclosures.

For systems rated above 200A, circuit breakers and expulsion 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



G&W's PAF can be specified to fit within a conventional power fuseholder.



currents to occur. The application of a PAF for protection of underrated circuit breakers can provide significantly improved protection at a substantial cost savings over replacement of those circuit breakers. 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 OPERATION

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.

The arc voltage across the gaps is used to transfer 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.

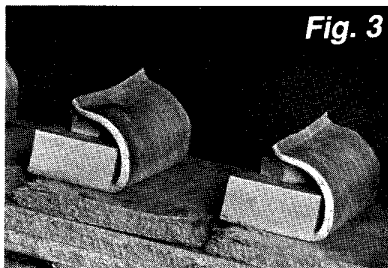


Fig. 3

PAF after interruption.

ELECTRICAL RATINGS

Voltage, kV max.	2.8kV - 38kV
Continuous current, A rms sym.	200A - 600A
Interrupting rating, A rms sym.	40,000 60,000*
Current peak let-through, @ 40kA rms sym.	20,000

*Optional—Consult Factory.

MECHANICAL RATINGS

For typical 15.5kV units (see Fig. 1)	
Length 'A' inches (mm)	18.5 (470)
Length 'B' inches (mm)	13.5 (343)
Minimum phase-to-phase spacing (C/L - C/L), inches (mm)	15 (381)
Total installed weight per phase, for fuse holder mounting, lbs. (kg)	28 (12.7)
Weight per interrupter fuse combination, lbs. (kg)	22 (10)

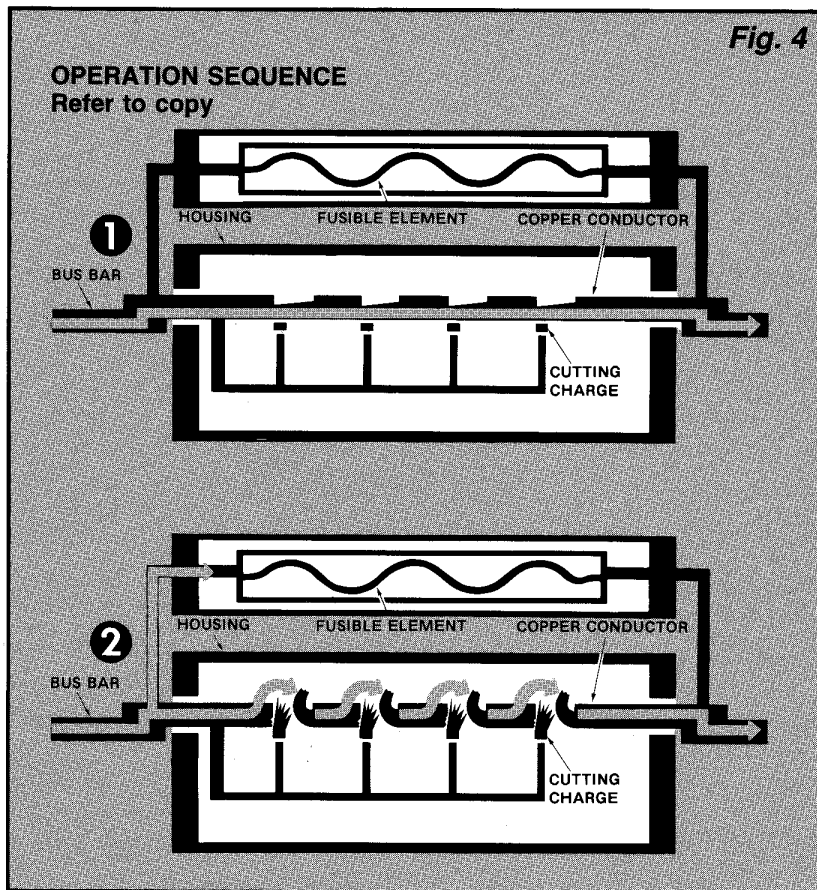


Fig. 4

ORDERING INFORMATION

The following information must be specified when ordering:

- 1) System voltage and configuration (delta or grounded wye).
- 2) Continuous current rating.
- 3) Prospective fault current.
- 4) Mounting configuration.

Standard - bus mounted includes galvanized steel base and porcelain station post insulators.
Disconnect - PAF may be supplied for mounting in S&C SM-5 live parts. Consult factory for details.

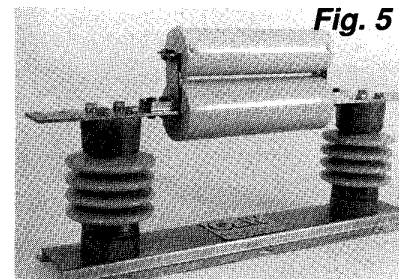
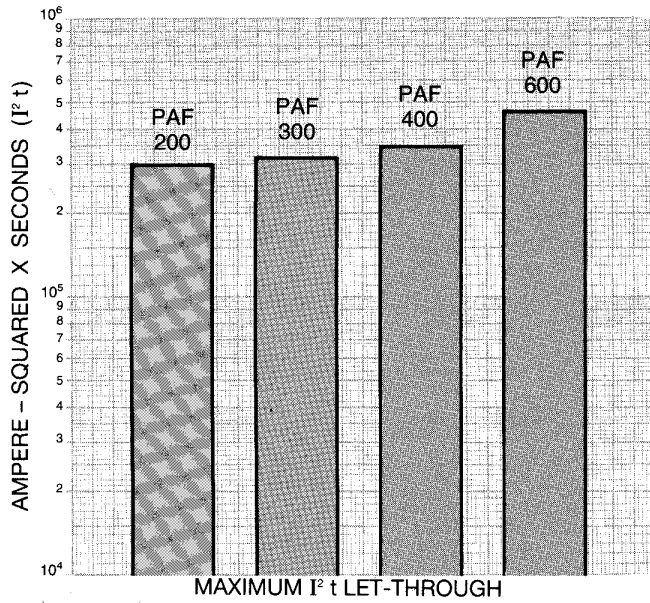


Fig. 5

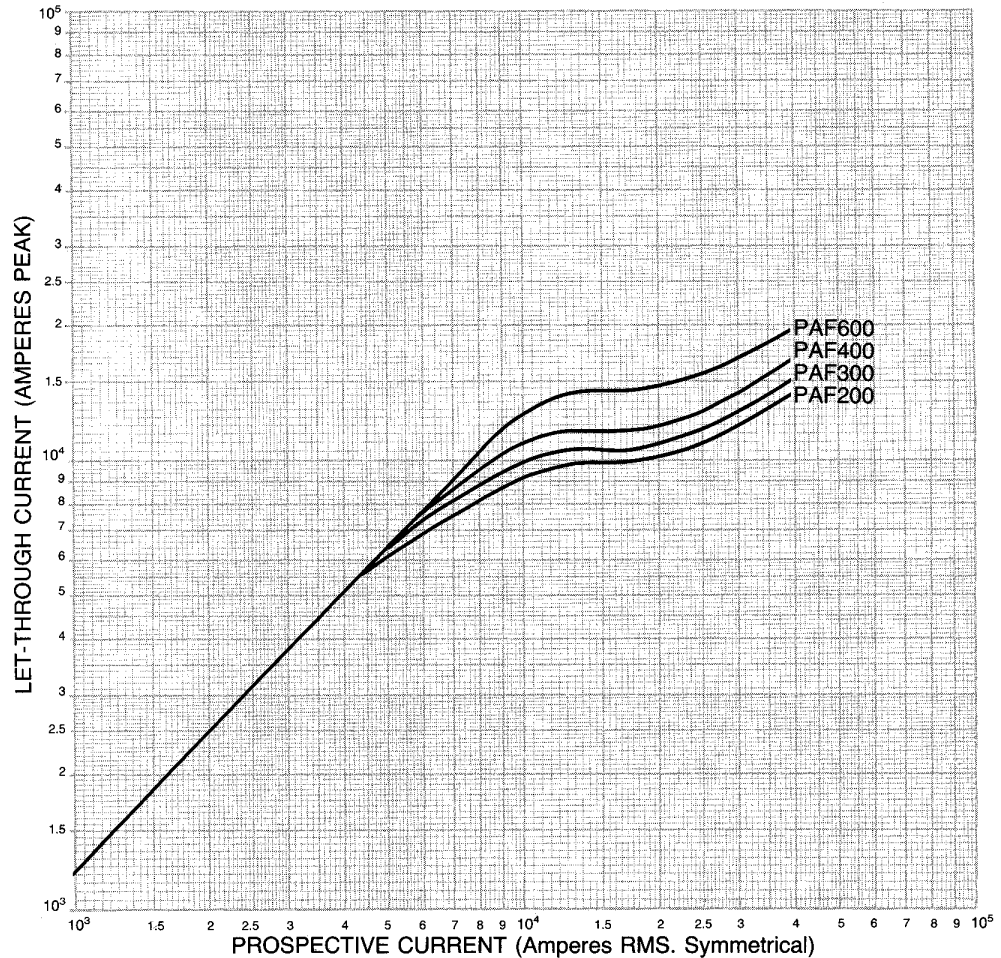
Voltage Class Max.	Catalog No. Continuous Current (Max.)			
	200A	300A	400A	600A
2.8kV (60kV BIL)	2PAF200	2PAF300	2PAF400	2PAF600
5.5kV (60kV BIL)	5PAF200	5PAF300	5PAF400	5PAF600
8.3kV (110kV BIL)	8PAF200	8PAF300	8PAF400	8PAF600
15.5kV (110kV BIL)	15PAF200	15PAF300	15PAF400	15PAF600
27kV (150kV BIL)	27PAF200	27PAF300	27PAF400	27PAF600
38kV (200kV BIL)	38PAF200	38PAF300	38PAF400	38PAF600

PAF® Power Assisted Fuse



◀ Fig. 6:
Maximum I² t
let-through.
Applicable for
2.8kV through 38kV,
40kA rated PAF fuses

Fig. 7: ▶
Let-through current
characteristic curve.
Applicable for 2.8kV
through 38kV, 40kA
rated PAF fuses.



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