

GE
Digital Energy

Modular Arc Commutating Triggered Air Gap Solutions for Series Compensation Systems



imagination at work

GE's Modular Arc Commutating Triggered Air Gap Solutions

GE's family of Modular Arc Commutating Triggered Air Gap (MACTAG) solutions represents the industry's leading technology for fast protective devices. The patented technology provides fast, reliable bypass protection, which can reduce the amount of Metal Oxide Varistors (MOV) required on a series capacitor bank resulting in project cost savings.

With the industry's fastest conduction time of 300µs, a bank can quickly and reliably be bypassed and put back in service after a fault. The new design is lighter, has a reduced footprint and a higher protective level. GE's MACTAG has successfully passed extensive type testing according to IEC60143-2 and IEEE824. Tests were conducted at Electric Power Research Institute's Lenox, MA site and at DNV-GL KEMA in Chalfont, PA.

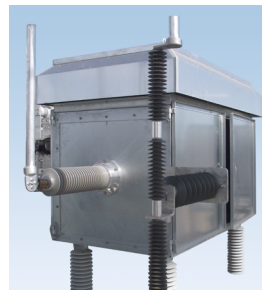
GE's MACTAG is available in two models: MACTAG 240 and MACTAG 360. The MACTAG models are the fastest TAG's in the industry and suitable for fast recovery applications. For applications where fast recovery time is not required, a Pilot Gap only option is available. The models include:



MACTAG 360



MACTAG 240



PG 240



PG 360

Modular Arc Commutating Triggered Air Gap

- MACTAG 240, maximum protective level of 240-250kV*
- MACTAG 360, maximum protective level of 360-400kV*

(* Depends on the application)

Pilot Gap (Suitable where fast recovery is not required)

- PG 240, maximum protective level of 240-250kV*
- PG 360, maximum protective level of 360-400kV*

Key Benefits

Customers can realize the following potential advantages with GE's MACTAG solutions including:

Enhanced Fault Durability and Voltage Withstand Performance

- High resiliency to arcing stress through a pilot gap utilizing highly durable carbon electrodes
- Minimal visible wear during type testing when carbon electrodes were subjected to 30 shots of 40kArms for 100ms
- Improved cold withstand ratings with superior consistency and greater resistance to unintended flashovers than previous designs

Higher Protective Level Ratings with Fast Recovery Time Validated by Independent 3rd Party

- Accommodates higher protective levels allowing for larger, non-segmented banks, providing a more cost-effective solution
- Provides 0.5 second recovery time, meeting both IEEE and IEC type testing standards, the fastest performance in the industry.
- Type tested designs at DNV-GL KEMA, a certified third-party agency, to IEC60134-2 and IEEE824 type testing standards

50% Smaller Footprint with Reduced Installation Time

- Eliminates the TAG "house", with only an enclosure for the pilot gap electrodes, reducing the footprint by 50% compared to previous GE design, resulting in less overall height and space and significantly less weight on the platform.
- Delivers the pilot gap enclosure pre-assembled with simplified construction, reducing site installation time and maximizing construction quality.



Pilot Gap shown with access doors open

TAG Applications

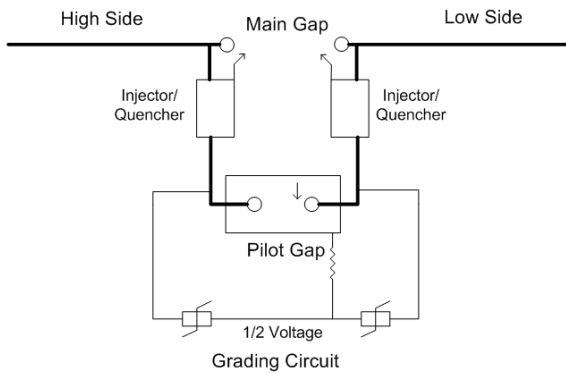
Four product options are available. The standard MACTAG 240 has a nominal protective level rating of 240-250kV, depending on the application, and is capable of 0.5 second recovery. When higher protective levels are required, a module-and-a-half design is available with a maximum protective level rating of 360-400kV, depending on the application, which also has the 0.5 second recovery rating. The principle of the MACTAG is to have a controlled environment to reliably create an arc when desired, but quickly move the arc outside the enclosure so that the dielectric withstand strength of the pilot gap is quickly re-established inside the enclosure.

For applications that do not require fast recovery, the pilot gap can be supplied without the main arc gap which makes for a simpler and even smaller MACTAG. The pilot gap alone has the same protective level ratings of 240-250kV and 360-400kV for the single module and module-and-a-half arrangement respectively.

Modular Arc Commutating Triggered Air Gap

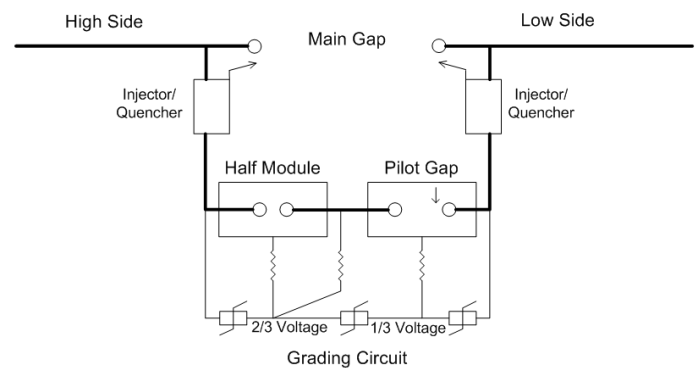
MACTAG 240

- 240-250kV protective level
- 0.5 second recovery



MACTAG 360

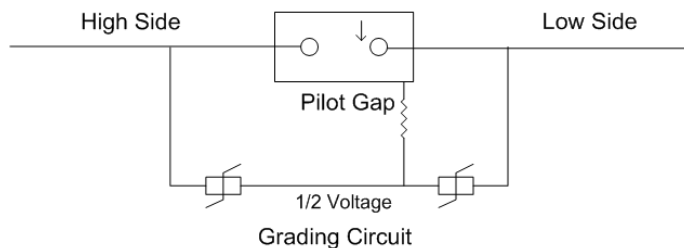
- Module-and-a-half design
- 360-400kV protective level
- 0.5 second recovery



Pilot Gap

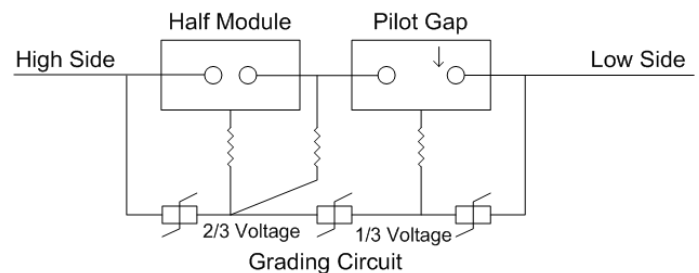
PG 240

- 240-250kV protective level
- Used when fast recovery is not required



PG 360

- 360-400kV protective level
- Used when fast recovery is not required



For more information about
GE's Series Compensation Systems visit
gedigitalenergy.com/facts.htm



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