

Thermal Protection HV Back-Up Fuses



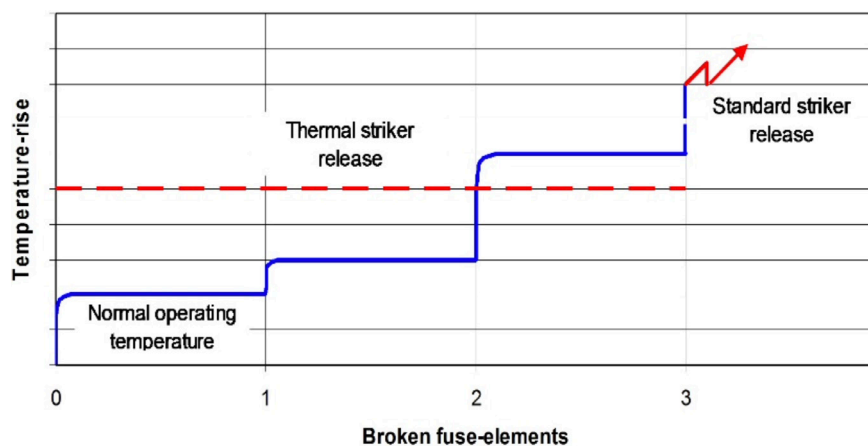
INTER-TEKNIK's thermal protection feature activates the striker pin, in case the fuse body temperature exceeds a certain limit. The striker will trip the switching device in combination, before thermal damage can occur to adjacent switchgear components and prevent fuse malfunction.

Apart from the particular GIS challenges, the primary protection is against the loads in the forbidden range (between the nominal current and the minimum breaking current). If the current limiting fuses are loaded within this chaotic range, this will inevitably result in overheating which may lead to explosions. Experience shows that wrong fuse selection or mistakes at the site by installing the wrong fuse may also cause this.

Although overlooked, thermal damages can again occur even at normal operating currents. Why?

- Mechanical damages: High-voltage fuses usually exhibit several precisely manufactured but fragile fuse-elements connected in parallel to carry the rated current. Under normal service conditions, there is no risk of overheating with properly selected fuses. However, individual fuse-elements may accidentally be damaged either mechanically, when dropped on the floor
- Electrical damages: Inrush currents or lightning strikes may result in damaged fuse-elements
- Overuse of fuses: As well-known, in case of a short-circuit fault, fuses on all three phases should be replaced with new ones, even if they look completely perfect from outside. When this is overlooked, the fuse will likely not possess the original characteristics and has a high chance of overheating.

Figure 4 shows the temperature rise in the fuse body in comparison to damaged fuse elements due to one of above reasons.



For all above reasons, use of thermal protection is highly recommended whenever fuses are used in combination with on-load switching devices.

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