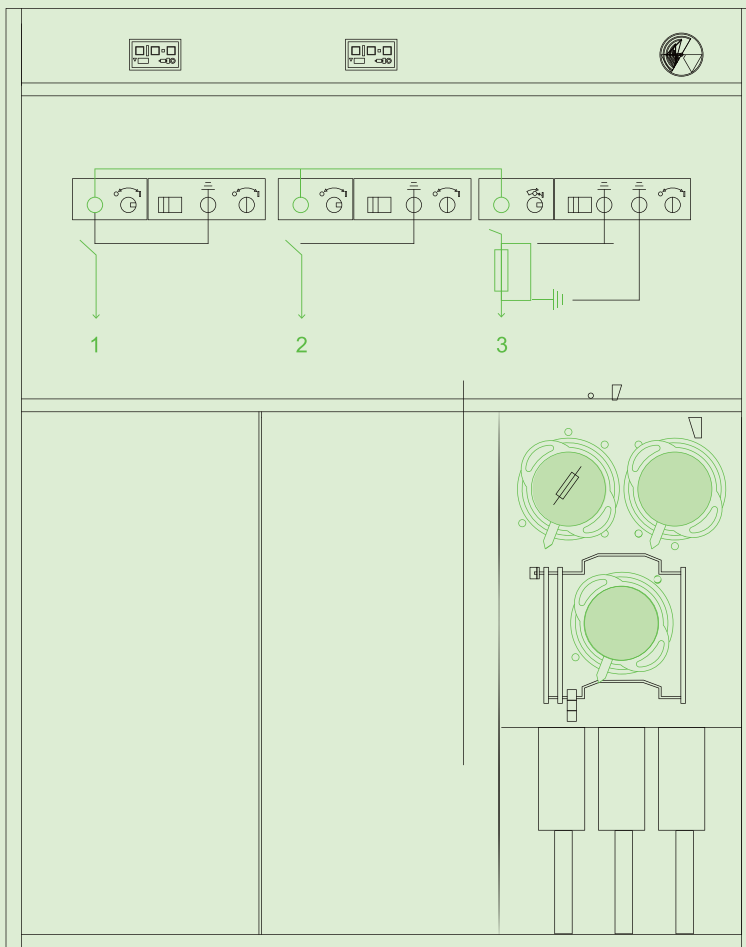


# Our Fuses in Gas Insulated Switchgears



# GAS INSULATED SWITCHGEARS



## Features

- **Non-ageing, high quality fuse links** that will operate for decades
- **Excellent breaking capacity up to 63 kA** to protect the most powerful installations
- **Low power dissipation** values for installation in compact substations
- **Unsurpassed short-circuit protection** by current-limiting interruption
- **Technical assistance** to select proper fuses for the switch-fuse combination selections: Transfer currents
- **Thermal Protection** to suit enhanced safety requirements of GIS and more

## Overview

Gas insulated switchgear (GIS) having hermetically sealed compartments filled with gas of high dielectric strength are usually chosen for their compact dimensions and immunity to hostile climatic conditions. MV current limiting fuses play a key role in the successful operation of GIS. The fuses are fitted with strikers in order to open automatically all three poles of the switch on the operation of one fuse-link. This combination is widely used in transformer substations, as it ensures correct operation. However, there are some specific challenges with this application which requires careful evaluation.

## Challenges of Fuse Selection / Performance

### 1. Selection of the correct fuses for switch fuse combinations

This is already a confusing subject for all switch-fuse combinations due to the partial discrepancy between IEC 60282-1 and IEC 62271-105. However, fast opening time of gas insulated switches make the selection procedure evermore challenging.

### 2. Restricted Power Dissipation Values

Fuse enclosures/canisters do have a limited power acceptance which should be met by the selected fuses.

### 3. Restricted Space for Fuses

Fuses enclosures/canisters usually provide a limited space for fuses. Restricted space should not have an impact on the safe fuse operation.

# Solutions

Inter-Teknik **current limiting fuses** have been operating in **global switchgear manufacturers'** Ring Main Units for many years. This comes down to our technical expertise in this particular field and high quality products. Here we are sharing with you the principles for successful selection and operation.

## 1. How to Choose Your Fuse in Striker-operated Switch-fuse Combinations?

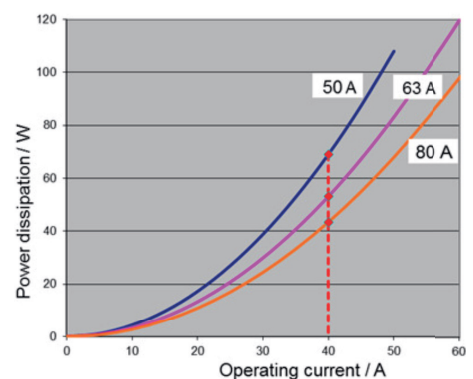
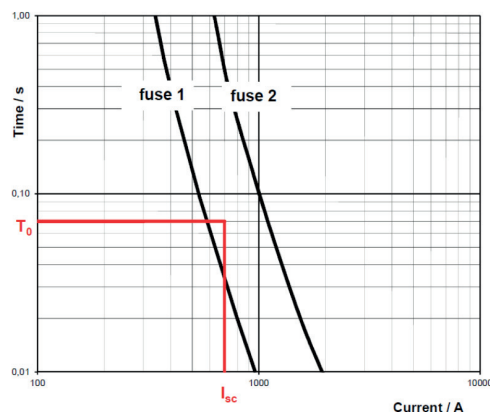
The fuse selection for transformer protection has to take into account both, the transformer bolted secondary short-circuit current and the striker initiated opening time of the switch. For practical uses, below table (fig.1) might be of assistance. Fuses having characteristics that pass below the intersection of the opening time of the switch ( $T_0$ ) and the transformer secondary short-circuit current ( $I_{sc}$ ) basically fulfill the requirements. *This may still be a very confusing task for the users, particularly due to the discrepancy between IEC 60282-1 & IEC 62271-105. We'll be glad to provide you with our expertise in this challenging process*

## 2. Low Power Dissipations

Power dissipation values should remain within the accepted limit of the switchgear manufacturer, as the enclosures/canisters feature a limited power acceptance. Inter-Teknik fuses, due to low power dissipation, easily comply with the given requirements. It'll be useful to keep in mind that the rated power dissipation values, as given in manufacturers' literature, may be misleading as they refer to the rated current of the fuse. Consequently, lowest current rating promises the lowest power dissipation. At a specific operational current on the contrary, the highest applicable fuse rating dissipates the lowest amount of heat. (fig. 2)

## 3. Thermal Protection

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 the combination, before thermal damage can occur to adjacent switchgear components, and also prevent fuse malfunction. Thermal protection feature was particularly developed for compact GIS applications due to restricted power acceptance and risk of overheating. Therefore, nowadays it's the global state of art in all GIS applications to equip the fuses with thermal protection function. Inter-Teknik fuses provide thermal protection over a decade with utmost success in practice.



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