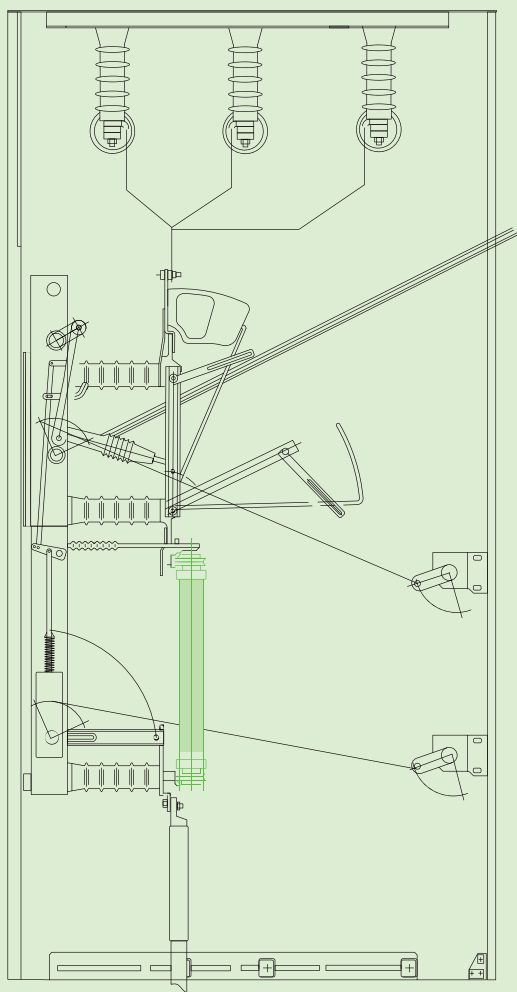


Our Fuses in Air Insulated Switchgears



AIR INSULATED SWITCHGEARS



Features

- **Non-ageing, high quality fuse links**
- **Excellent breaking capacity** up to 63 kA
- Unsurpassed short-circuit protection by **current-limiting interruption** of the faults much before they reach their prospective peak values
- **Technical assistance** to select proper fuses for the switch-fuse combination selections:
 - Transfer & take-over currents
- Great variety of switching and protective devices' combinations

Technical Challenges

Due to vast application area of air insulated switchgears, Inter-Teknik provides its expertise for fuse selection in the fuse-switch and fuse-contactor combinations.

1. The air insulated switchgears, adopted in the **MV distribution networks**, are widely equipped with switch-fuse combinations for transformer protection. In these **striker operated switch fuse combinations**, proper selection is vital and challenging. Particularly, **transfer currents** require technical expertise for adequate selection.
2. Meanwhile, in **the industrial applications**, mostly **full range protection** with the **switch-fuse combination/contactors** is aimed, and **takeover current** carries a major importance. Also, industrial applications in itself, either **motor** or **capacitor protection**, will require an in-depth evaluation.

Solutions

1. Non-ageing, high quality, robust design with high breaking capability is required for all applications in the secondary switchgears.
2. Apart from a high quality product, technical expertise in selection and

coordination plays a huge role in secondary switchgear applications. For an in-depth explanation of **switch-fuse combinations** both for distribution network & industrial applications.

3. Thermal protection plays an important role, as we highly recommend use of this feature whenever fuses operate in combination with an on-load switch or contactor. In some applications, it plays a vital role in air insulated switchgears. *We encourage you to visit our website to learn more about the high quality, reliable fuses and their features. Here, we'll take a closer look at switch-fuse combination principles and thermal protection function.*

Switch-Fuse Combination

Combination of medium voltage fuses with on-load switches have proved to be a very successful device both for short-circuit protection and disconnection of the power transformers for many years. Fuse-switch combinations are full-range switching devices which are capable of breaking both overcurrents and short-circuit currents up to the rated breaking current of the fuses (Fig 1) or switch-fuse combinations used in air insulated switchgears, three parameters shall be deeply considered

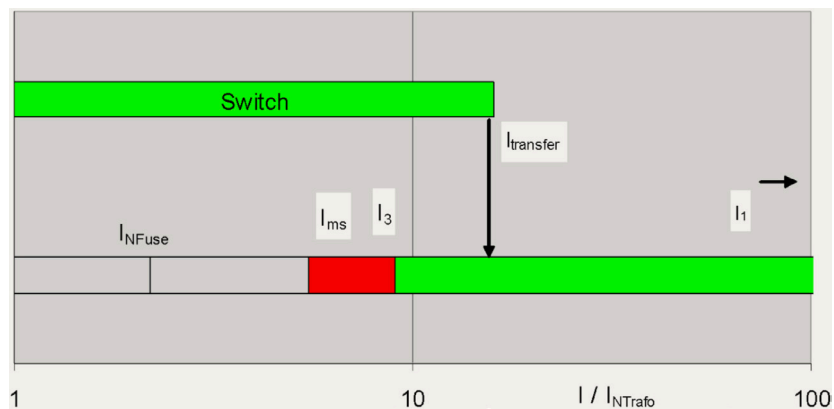


Fig. 1

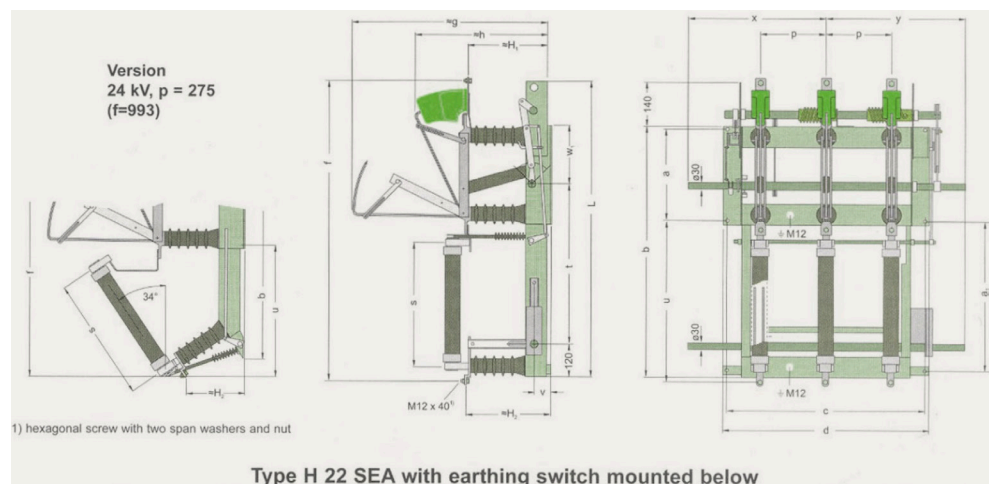


Fig. 2

1. Take Over Current

Where switches are equipped with overcurrent release, our fuses are supposed to provide backup protection for the switch. The breaking function is exchanged from the switch to the fuse at the take-over current I_{to} , which can be read from the intersection point of the two curves (Fig 4)

2. Transfer Current

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. 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 3) 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 fulfils the requirements. *Note: The selection might be very confusing for many users/ manufacturers both due to complexity of the challenge and the partial discrepancy between IEC 60282-1 and IEC 62271-105. You are more than welcome to contact us for technical assistance in this regard.*

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 combination, before thermal damage can occur to adjacent switchgear components and prevent fuse malfunction.

In air insulated switchgear applications, thermal protection feature is essential for the cases where fuses go through cyclic loads. Moreover, as a general precaution, thermal protection is highly recommended whenever fuses are used in combination with an on-load switch or contactor. *For detailed information on fuse-switch combinations, thermal protection or any related subject to fuse use in AIS, please visit our website.*

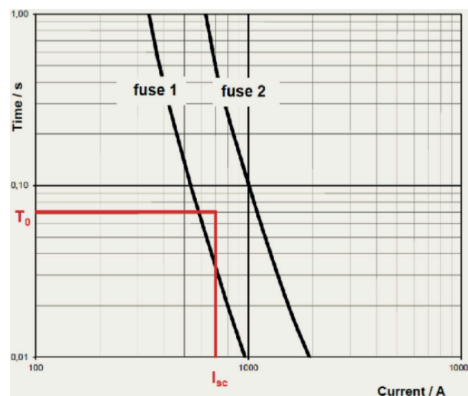


Fig. 3

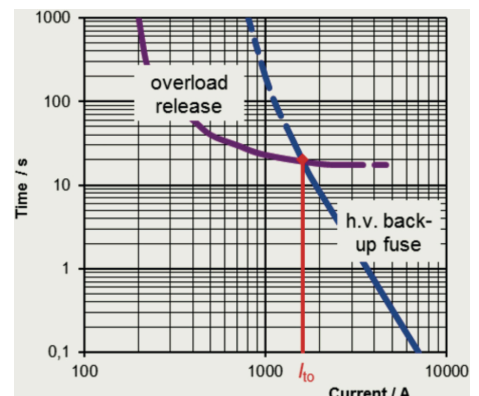


Fig. 4

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