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Statement

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Siemens field proven vacuum circuit-breakers 3AH4 with long service life for reliable switching of arc furnace transformers

The vast majority of medium voltage circuit-breakers operates in utility distribution networks, where switching typically occurs very infrequently.

Electric Arc Furnace (EAF) or electric Ladle Furnace (LF) duty however puts very special demands on the circuit-breaker, that performs the operational switching of such a furnace transformer of any power rating: Up to 100 full load switching operations per day are normal for furnace applications and must be carried out without dangerous switching overvoltage nor excessive wear of the operating mechanism.

Thus, switching of arc furnace transformers calls for special planning, design and selection of circuit-breakers itself, along with the surrounding components e.g. switchgear panels and the mandatory overvoltage protection elements:

Due to the exceptional operational demands circuit-breaker solutions have to be especially designed for being used in this field of application:

- High performance vacuum interrupters are utilized for highest dielectric properties.
- Special material and elements are used in the operating mechanism for high mechanical lifetime.

Based on substantial experience from numerous projects, Siemens vacuum circuit-breakers of type 3AH4 are the only ones approved by Siemens for reliable switching of arc furnace transformers.

All other vacuum circuit-breakers of type 3AH are not designed for switching arc furnace transformers and not approved for such an application, and Siemens will not take over any responsibility for reliable and safe operation in this field of application.

Furthermore our "General Limitation of Liability" (enclosed) is valid when selling and / or using 3AH4 circuit-breakers for switching arc furnace transformers.



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Siemens vacuum circuit-breakers for switching arc furnace transformers

Siemens 3AH vacuum circuit-breakers can be used for all kinds of applications in medium-voltage power supply systems, although it is always essential to ensure that the correct project planning and design procedures are employed. The 3AH4 vacuum circuit-breakers are especially suitable for switching arc furnace transformers because of the large number of make-break operations that are permitted.

Special aspects of arc furnace transformer switching

When planning and designing an arc furnace switchgear installation it is important to remember that the power supply system itself, or because of the way in which certain elements of the system are combined, is an oscillating system that can be excited by switching operations. In order to minimize the negative consequences of this physical effect it is important to employ protective circuitry suitable for specific installations that will give switching surge protection for the arc furnace transformer, the incoming-feeder transformer and the circuit-breakers.

The sizing and selection of the protective elements and the way in which they are used in the switchgear must be such that the breakers and other items are not overloaded. In order to ensure that the circuit-breakers are used in accordance with the appropriate regulations it is essential to adhere to the permitted maxima, standards and parameters laid down in Catalog HG11.04 (2008) with which you are already familiar.

General disclaimer when supplying breakers for this application

The user is responsible for the correct dimensioning of the protective circuitry. Siemens will not accept any liability for likely damages to the circuit-breakers or other items/assets caused by the incorrect dimensioning of the protective circuitry by the user. Furthermore, liability for consequential damages, and in particular possible interruptions during operation or disruption of production, is excluded which may have been caused by incorrect protective circuitry. Only approved or qualified specialized companies are allowed to handle the correct dimensioning of the protective circuitry. On request and within its capacities, Siemens may also be prepared to supply you with corresponding offers.

Siemens is only a supplier of goods and therefore does not assume responsibility for the whole system. Also, when the company is acting solely as a supplier of goods, this means without any supply of engineering or protective elements, warranty and liability are naturally restricted to the goods being supplied. In the event of damage being sustained it is not Siemens' responsibility to prove whether or not the circuit-breaker was defective.

Siemens vacuum circuit-breakers have been tested in accordance with the relevant international standards and specifications. We must also draw your attention to our Catalog HG11.01 (2007), Page 6 where the need for surge suppression is described and explained.