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Choke transformer - compact and ergonomic combination of a transformer and a choke

Power and electronic devices are developing very rapidly. There appear modern solutions which find many applications. Transformers as the elements of power supply systems, evolve as well. Changes occur not only in material engineering or production technology of transformers but also, and maybe above all, with regard to the structural solutions. Special transformers, apart from the primary function of adapting voltage, may perform additional functions thanks to structural modifications. The article presents the structure, the application and the parameters of integrated choke transformers produced in ELHAND Transformatory Sp. z o.o. intended for applications in industry and power electronics.

Construction of a choke transformer

A choke transformer is, in terms of material and technology, similar to a traditional transformer. It is a structural combination of a transformer (which increases or reduces the voltage), with a choke (smoothing choke or a choke working in the filter system). Such a solution enables implementing the adapting and insulating function of a transformer, and it gives us a possibility of modifications in a wide range of many electrical and mechanical parameters. The magnetic circuit of a choke transformer, visible in the picture, is divided into two parts: the main transformer part and the supplementing choke part. On the core transformer part, primary and secondary windings are placed. A separated part of the primary winding covers also an additional choke core package. Placement of appropriate air gaps in the choke part of the core and adjustment of the number of coils of the primary winding enables obtaining very large short-circuit voltage values of a choke transformer.

Fig. 1 Choke transformer

Advantages and characteristics of a choke transformer

- In applications with high-power converters, very often an adapting transformer is used along with a smoothing choke or a filter choke transformer; a choke transformer replaces these two elements;
- ELHAND Transformatory Sp. z o.o. uses, during the production of choke transformers, reserved technological solutions that enable achieving a compact structure of a choke transformer.
- A choke transformer has only three input and three output terminals, which simplifies cabling and enables reduction in time and cost of installation;
- Combination of the largest magnetic elements in one compact structure makes it possible to significantly reduce the volume and the total weight of the device as compared to the traditional solution;
- Less material used, lower transport costs, less magnetic elements for maintenance and shorter time of installation are the factors that affect the substantial reduction of a total maintenance cost of a choke transformer.

Applications of a choke transformer

- Power engineering of wind turbines;
- Inverters of photovoltaic sources;
- UPS guaranteed power supply systems;
- High-power converters;
- Industrial applications

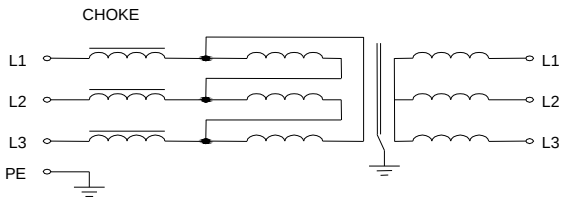

Fig. 1 Typical diagram of a choke transformer

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