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Thesis Title : Design and Construction of A 100 kV 5 kVA
SF₆ Gas Insulated Testing Transformer
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Abstract

Testing transformer is an important equipment for supply high alternating low frequency voltage. This voltage is used for testing power transformer and high voltage equipment in factory or in field prior to installation and operation in the power system.

The thesis reports the design and construction of single phase, 5 kVA, 100 kV 50 Hz testing transformer. The transformer consists of three windings, namely low voltage winding which is wound around the steel core, high voltage winding and coupling winding are wound as a concentric cylinder on top of the low voltage winding. A copper shield of the same width as winding is wound around the beginning layer of the high voltage winding and the end layer of the high voltage winding in order to reduce the gradient of surge voltage. High dielectric strength polyester film is used as insulation between layers and as cover of the three windings. The transformer core is made of grain oriented laminated steel with 0.27 mm thickness. The top corners are cut to reduce the electric field strength. Polyvinyl chloride (pvc) cylinder is used as insulating shell with inner diameter 386 mm. This structure is lighter than metal tank and the high voltage bushing is not needed. Sulphur Hexafluoride Gas (SF₆) which is compressed at 2.4

bars abs at 20°c, which has good dielectric strength and heat transfer properties, is used as insulation and coolant. Gas insulation is lighter than insulating transformer oil. The testing transformer is tested according to IEC and ANSI standard and the test results are compared with the design. It shows that the constructed testing transformer conformed to the standard. It is light weight and hence it is convenient to move when testing is made in the field.