

Oil Type

Distribution Transformers

(50-400 kVA)



Construction features

Description

ABB Distribution transformers from 50 to 400 kVA can be manufactured to the Peoples Republic of China specifications GB1094, GB6451. The transformers feature a gas free hermetically sealed system.

The transformer tank is completely filled with oil and hermetically sealed. Hot oil is not exposed to air therefore oil oxidation which causes sludge formation is reduced to a minimum. Deleterious effects caused through water ingress are minimised. With normal operation oil maintenance is not required.

The transformer is filled with oil at ambient temperature (typically 15°C) and sealed at atmospheric pressure.

The oil temperature will change with ambient temperature and transformer loading. The oil volume and the tank's internal pressure will change according to the mean oil temperature.

An increase in oil temperature above the sealing temperature will increase internal tank pressure. Similarly a reduction in temperature will cause a slight tank vacuum.

Internal operating pressures are limited by careful design of flexible cooling fins. The design accommodates pressures caused by transformer overloads in accordance with GB/T 15164. Tank pressures are designed to operate within the range of 50 to 115 kPa absolute. Tanks are pressurised and leak tested at the manufacturer's works.

Core Coil Assembly

The transformer is of core form configuration with concentric layer windings. The core coil assembly is attached to the cover that is later bolted to the tank. Windings terminate to cover mounted bushings and a tap switch. The coils are assembled to the core with radial packing, axial supports are added when required. The transformer internals have been heated and vacuum processed to remove moisture, gas and to impregnate cellulose with oil.

Coils

Coils are layer wound in an oval shape. Interlayer insulation is pre-compressed paper with thermosetting epoxy glue applied in a diamond pattern. Vertical ducts provide for oil circulation and cooling. Conductors are copper foil or enamel covered copper wire.

The core coil assembly is placed in an oven and raised to an elevated temperature under controlled conditions for dry out and cure of the epoxy glue. The epoxy glue bonds the layer insulation and conductors together to form a single homogeneous mass, which, enhances strength to withstand stresses generated under short circuit conditions.

Core

The core has inverted yokes and two steps. It is stacked with laminations cut from cold rolled grain oriented electrical steel. The core stack is bonded with flexible glue.

The core frame consists of pre-formed steel core clamps and feet. Vertical and horizontal tie rods assure rigidity of the core assembly during transport and short circuit conditions.

Tanks

The tank is of welded steel construction with flexible cooling fins designed to withstand negative 50 to positive 20kPa absolute. Tanks are leak tested in the course of manufacture.

Bushings

Bushings are brown porcelain to P.R. China specification GB3969.

Painting and surface treatment

The tank surfaces are thoroughly cleaned and epoxy powder coated to a thickness of approximately 65 microns. Lake green colour BG02 to GSB G51001.

Standard Fittings

- *Pressure relief vent.*
- *Earth stud*
- *Thermometer pocket and cap.*
- *Stainless steel cover bolts*
- *Filler pipe and cap*

Testing

The transformers are manufactured in accordance with ISO 9001 and 14001. At the end of the manufacturing process the transformers are individually tested in accordance with the IEC Standards.

Upon request, witnessed type/special tests can be carried out.

