QPS®

Transformer

POWER TRANSFORMER

Introduction:

A transformer is a device that transfers electrical energy from one circuit to another through inductively coupled electrical conductors without changing its frequency. A changing current in the primary circuit creates a changing magnetic field which induces a changing voltage in the secondary circuit and the changing magnetic field also induces an electromotive force (EMF) across each winding. The primary EMF, acting as it does in opposition to the primary voltage, is sometimes termed the "back EMF". By appropriate selection of the numbers of turns, a transformer thus allows an alternating voltage to be steeped up or steeped down.

The EMF of a transformer at a given flux density increase with frequency. By operating at higher frequencies, transformers can be physically more compact because a given core is able to transfer more power without reaching saturation, and fewer turns are needed to achieve the same impedance. However properties such as core loss and conductor skin effect also increase with frequency. Operation of a transformer at other than its design frequency may require assessment of voltages, losses, and cooling to establish of safe operation is practical.

Energy losses vary with load current, and may be expressed as "no-load" or "full-load" loss. Winding resistance dominates load losses, whereas hysteresis and eddy currents losses contribute to over 99% of the no-load loss.

Losses in the transformer arise from heating of the conductors due to winding resistance, hysteresis losses due to the amount of energy lost caused by the alternating flow of the magnetic field within the core, resistive heating of the core material due to eddy currents circulating within the core in a plane normal to the flux, frictional heating by magnetostriction that causes the magnetic flux in a ferromagnetic material, such as the core, to physically expand and contact slightly with each cycle of the magnetic field resulting a buzzing sound commonly associated with transformers, mechanical losses due to the alternating magnetic field causes fluctuating electromagnetic forces between the primary and secondary windings that incite vibrations within nearby metalwork, adding to the buzzing noise, consuming a small amount of power and stray losses that give rise to eddy currents due to leakage flux that intercepts nearby conductive materials such as the transformer 's support structure and be converted to heat.

General Data:

Transformer Type
- Isolation transformer.

Primary Voltage Range
- Single Phase
  110V – 240V – 380V – 415V – 440V.
- Three Phase
  200V – 220V – 380V – 415V – 440V.

Secondary Voltage Range
- Single Phase
  12V – 24V – 220V – 415V – 440V.
- Three Phase
  100V – 200V – 380V – 415V – 440V.

Capacity
- Single Phase – 3VA ~ 100KVA.
- Three Phase – 50VA ~ 1000KVA.

E-I Silicon Steel Grade
- High quality 0.5mm silicon steel from Japan.

Enameled Wire Grade
- 1PEW – 150^{0}C Class 1 Polyester enameled wire.
- EIW – 180^{0}C Polyesterimide enameled wire.
- 200^{0}C Varnish bonded fibreglass covered rectangular wire.

Termination of Wires
- Polyester or glass reinforced temperature resistance plastic terminal blocks.
- Chrome plated high grade mild steel bolts and nuts.
- Soldering pins.
- Flexible wires.

Insulation Class
- Class A, Class B, Class F & Class H.

Cooling
- Air Cool.

Optional
- Optional designs are catered for upon request.

Ambient Temperature
- Maximum ambient temperature 40°C Max

Specifications are subject to change without prior notice.

Quality Products & Services