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Transformer Types

Types of Transformers

Different types of transformers on the basis of applications are:

1. Power transformers
 1. Unit transformer
 2. Substation transformer
 3. Distribution transformer
2. Instrumentation transformers
 1. Potential transformer
 2. Current transformer

On the basis of voltage stepping:

1. Step up
2. Step down

On the basis of core design:

1. Shell form
2. Core form



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Power Transformers



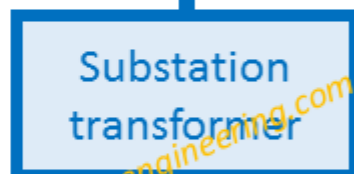
Unit Transformer

A transformer which connects to alternator (synchronous generator) and steps up the electrical power for transmission purposes is known as unit transformer



Substation transformer

A transformer which receives voltage at other end of transmission lines is termed as substation transformer



Distribution transformer

A transformer which steps down the voltage to final distribution voltage level is known as distribution transformer



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Instrument transformers

Potential transformer

Our electrical power grid operates on high voltage ranges. The voltmeter, relay or other measurement/control devices can't directly deal with such high voltage levels, for these measurements a potential transformer is used which steps down the voltage levels to safe limits for measurement/control devices



Current transformer

Just like potential transformer, a current transformer steps down the current to safe limits that can be measured by ammeter and detected by measurement devices



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On the basis of voltage stepping

Step-up Transformer

A transformer which steps up the ac voltage from lower to a higher level. The primary side a step-up-transformer has smaller number of turns than secondary

$$\frac{N_p}{N_s} = \frac{V_p}{V_s}$$

In step-up transformer $N_p > N_s$

Step-down transformer

A step-down transformer is the one which steps down ac voltage level from some higher to lower level. The primary side of step-down transformer has larger number of turns than secondary

$$\frac{N_p}{N_s} = \frac{V_p}{V_s}$$

In step-down transformer $N_p < N_s$



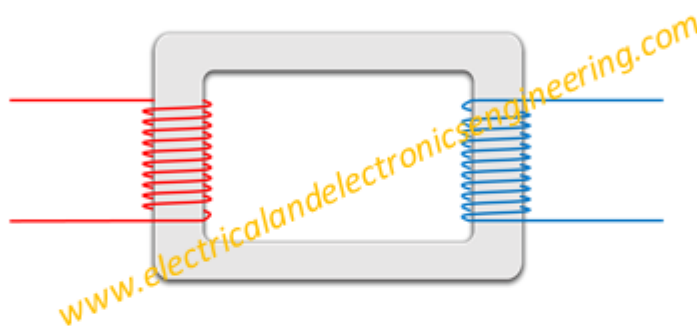
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On the basis of construction

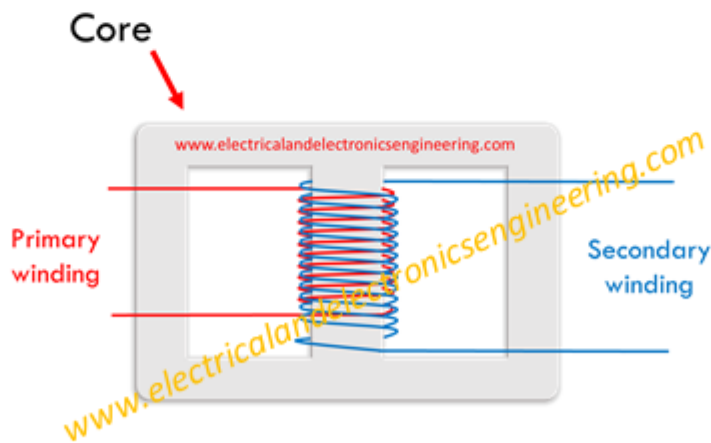
Rectangular core form transformer

This type of transformer has a rectangular core which has primary and secondary winding wound on the any two opposite faces of rectangular core



Shell form transformer

The core of this type of transformer has three legs. Both primary and secondary windings are wrapped on the central core. The low voltage winding is directly wrapped over the central leg, while the high voltage winding wraps over it



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Other types

1. Booster transformer
2. Power supply transformer
3. Auto-transformer
4. Reactors
5. Phase shifting transformers
6. HVDC Transformers
7. Traction transformers



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