

JIGNASA STUDENT STUDY PROJECT
TITLE: TRANSFORMERS AND APPLICATIONS
SUBMITTED TO THE COMMISSIONER OF
COLLEGIATE EDUCATION, HYD
UNDER THE
JIGNASA-2022-23

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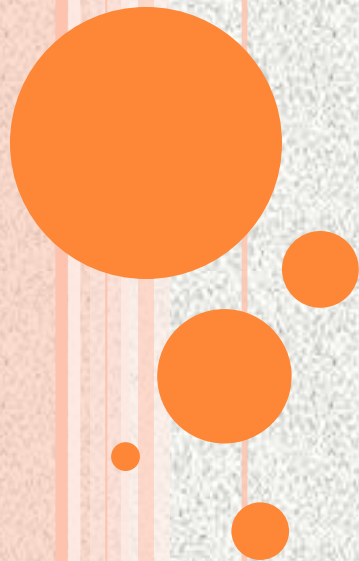
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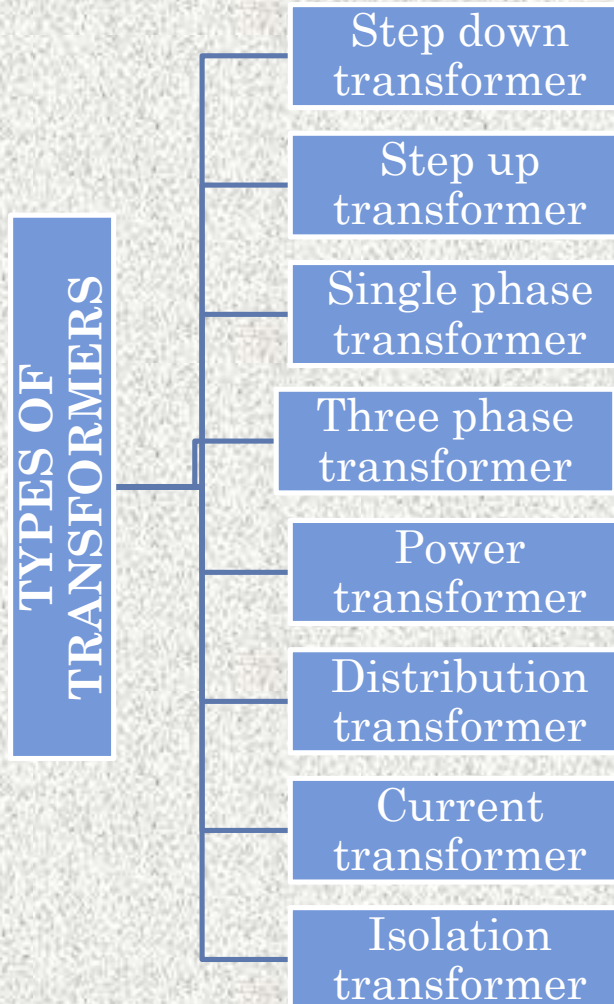


WHAT IS A TRANSFORMER

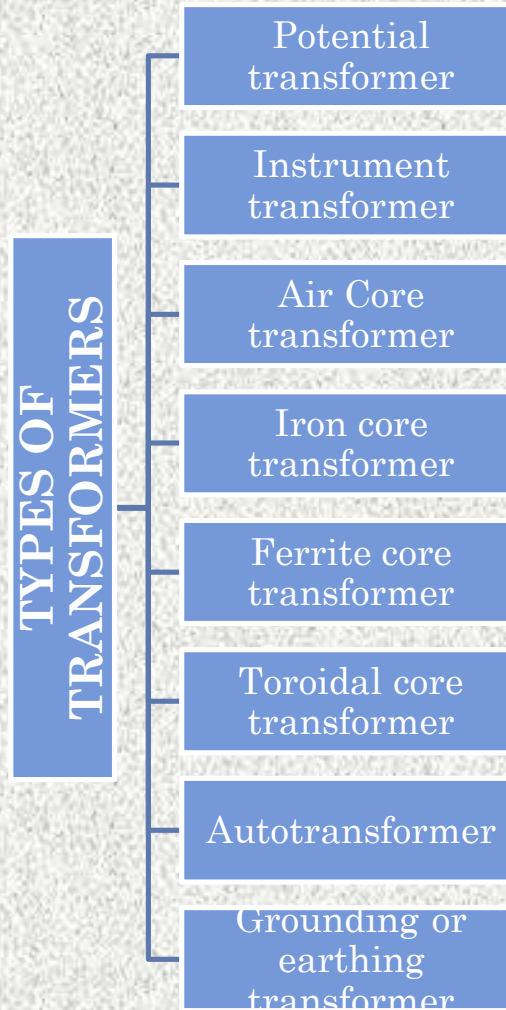
A transformer is a device used in power transmission to transfer electrical energy from one electrical circuit to another, or in multiple circuits at a time.



TYPES OF TRANSFORMERS



TYPES OF TRANSFORMERS



STEP DOWN TRANSFORMER



A step down transformer converts high voltage from the primary side to low voltage on the secondary coil resulting in a decrease in the output voltage.

Applications

Used in the main adapters and chargers for cell phones, CD players and stereos



STEP UP TRANSFORMER



A step up transformer can convert low voltage from the primary side of the transformer to high voltage on the secondary side of the transformer.

Applications

These transformers are used in electronic equipment such as Inverters & Voltage Stabilizers for low to high voltage stability.



SINGLE PHASE TRANSFORMER



- A single-phase transformer is a type of power transformer that uses single-phase alternating current.
- **Applications**
- Decrease voltage in localized power distribution
- Regulation of voltage in television sets



THREE PHASE TRANSFORMER



- These transformers are used to convert the voltage of electronic systems with three-phase.
- **Applications:**
These are widely used in mining, printing, textile working, elevator, industrial automation, and petrochemical fields, among several others.



POWER TRANSFORMER



A power transformer is used to convert power from one circuit to another without changing its frequency.

Applications:

Power transformers used in electric power generation and distribution

Used for reducing power losses during electric power transmission

DISTRIBUTION TRANSFORMER



- Distribution transformers are convert high grid voltage into the voltage required by the end customer.
- **Applications:**
This transformer distributes the power to remote areas which are generated from the power plants



MEASUREMENT OR INSTRUMENT TRANSFORMER



- These are high accuracy class devices used to change the voltage or current levels.
- **Applications:**
These transformers are used to measure electrical quantities like current, voltage, power, frequency, and power factor.



CURRENT TRANSFORMER

Current transformers are commonly used to reduce or multiply alternating current (AC).

Applications:

Used to measure electric power in powerhouses, industries, grid stations, control rooms in industries for metering & analyzing the flow of current in the circuit and also for protection purposes.



ISOLATION TRANSFORMER



This type of transformer is used to transfer electrical power from an alternating current while isolating the powered device for safety reasons.

Applications:

Isolation transformers are preferable used in radios as they help in radio frequency isolation from the antenna to how much radio transmitter is required to separate the substantial components.



POTENTIAL TRANSFORMER

- Potential transformers or voltage transformers are commonly used to reduce voltage levels.
- **Applications:**
Potential transformers are deployed in metering devices for measuring energy billing and other calculation purposes.



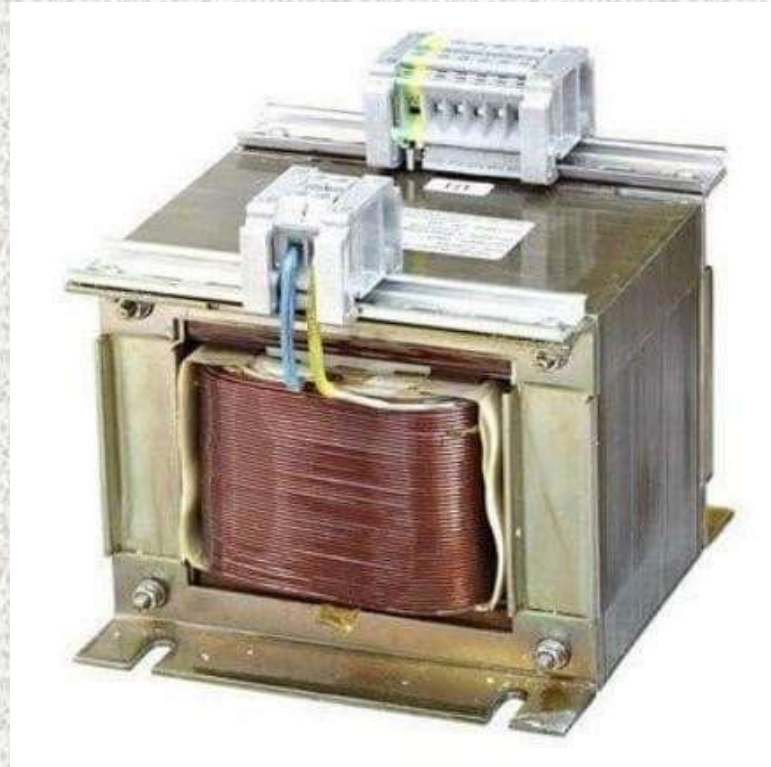
AIR CORE TRANSFORMER

- In this transformer, both the primary and secondary windings are set on a non-magnetic stripe. It has flux linkage in both the windings through the air.
- **Applications:**
- Used in portable communication devices.
- Used in radio transmission systems.



IRON CORE TRANSFORMER

- In this type, both the primary and secondary windings are set on multiple soft iron plates providing an ideal connection to the flux.



IRON CORE TRANSFORMER



In this type, both the primary and secondary windings are set on multiple soft iron plates providing an ideal connection to the flux.

Applications

For transmitting low voltage of electricity from the primary to the secondary core

For supplying accurate voltage.



FERRITE CORE TRANSFORMER

- This type of transformer uses a magnetic core made of ferrite on which the windings of power transformers and other parts are made.
- **Applications:**
- Ferrite cores have high magnetic permeability, so they are used in high-frequency applications such as switch-mode power supplies.



TOROIDAL CORE TRANSFORMER



- The toroidal core transformer uses a magnetic core which almost looks like a ring or donut called a toroidal. They are passive electronic components, consisting of a circular ring-shaped magnetic core of ferromagnetic material around which the wire is wound.
- **Applications:**
- To reduce the acoustic noise significantly
- To Obtain low power consumptions and power losses



AUTO TRANSFORMER

- These types of transformers use a common winding for both primary and secondary windings. The autotransformer winding has three taps where the electrical connections are made. Autotransformers have the advantage of being smaller, lighter, and cheaper than typical transformers.
- **Applications:**
- Used in both Synchronous motors and induction motors.
- Used in electrical apparatus testing labs since the voltage can be smoothly and continuously varied.



GROUNDING OR EARTHING TRANSFORMER

- It is an underground WYE or delta-connected system used to provide a ground path or neutral in a three-phase electric power system. This can help reduce the voltage transients when a ground fault happens.
- **Applications:**
- To provide low-impedance path to ground.
- To limit transient over voltages.



CONCLUSION

- This project has given scope to learn the variety of transformers available.
- The knowledge of technical know-how and their applications have enriched the knowledge of students.
- This project facilitated the students to know the uses of transformers from house-hold to industry.



THANK YOU

