



Transformers

Fine-tuned Power for critical equipments



Aluminium Foil Transformers



Description

The Aluminum Foil Wound Transformer is a high-performance solution for modern power distribution, utilizing aluminum foil to achieve a lightweight and compact design—weighing only 42% of a copper equivalent while retaining 60% of copper’s conductivity.

With advanced CNC machine winding, polyester film insulation, and low heat generation, it ensures efficiency and reliability across diverse applications.

We offer a reliable transformer designed to meet evolving design challenges. By leveraging the unique properties of core materials, selecting appropriate insulation, and using customized CNC winding, we've built solutions trusted in 1,000's of installations across India.

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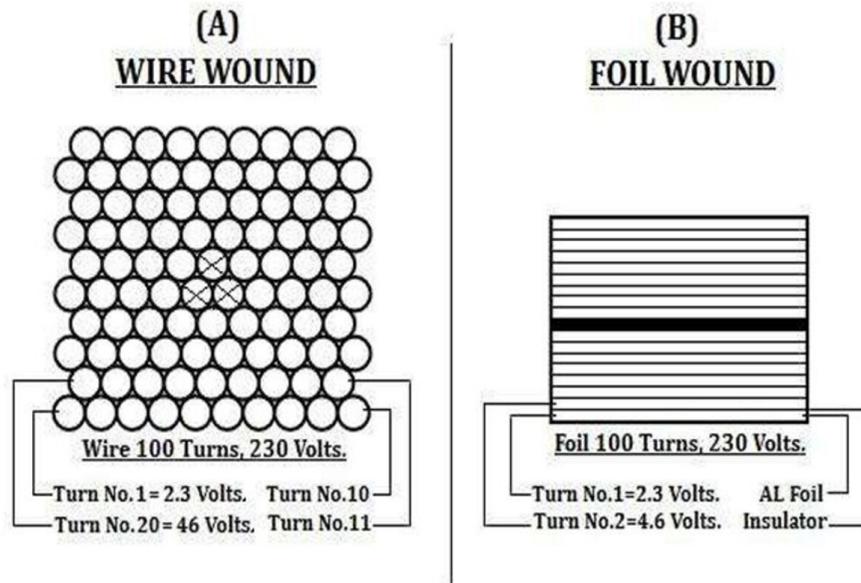
Our Transformers Offer

- Extended lifespan of at least 40 years
- Elimination of insulation damage issues typically caused by oil
- Higher efficiency through reduced eddy currents via bi-directional winding
- Lower thermal stress, thanks to flatter winding materials
- Design free from hot-spots
- Stabilized voltage across winding layers

Benefits Include:

- Naturally higher dielectric strength
- Minimal humming or vibration noise
- Compact size
- Hot-spot resistant winding design
- High heat tolerance without extra costs
- Low to zero maintenance
- Reduced capital expenditure (CAPEX)

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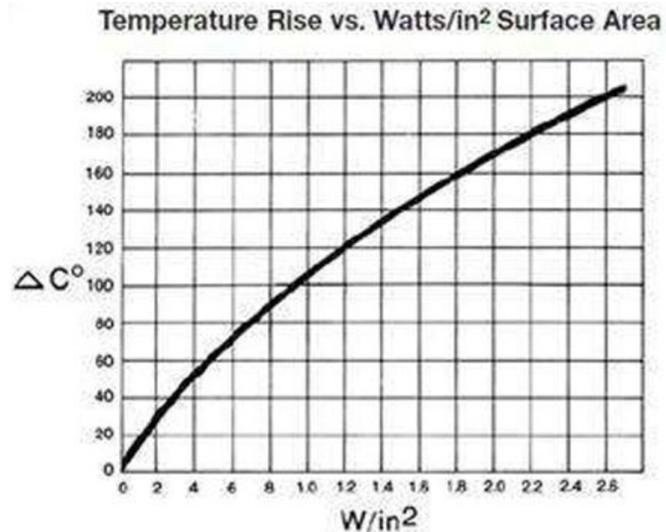


Key Advantage

One of the key advantages of using aluminium foil instead of copper wire in transformers is the significant reduction in weight.

Copper has a density of 8.96 g/cm^3 , while aluminium is much lighter at 2.70 g/cm^3 . For the same winding volume, aluminium weighs roughly one-third as much as copper. Although aluminium provides only 60% of copper's conductivity, increasing the winding volume by 40% compensates for this difference. Even then, the aluminium coil weighs just 42% of an equivalent copper coil—delivering a lighter, more efficient solution.

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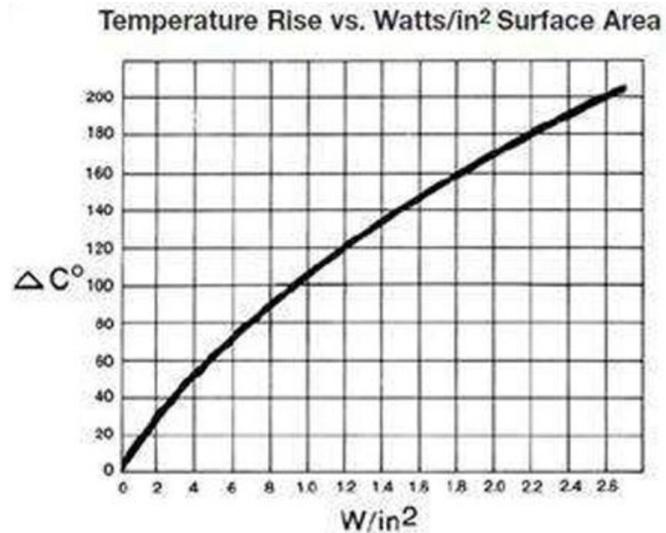
Performance Factors

Operating temperature plays a key role in a transformer's performance, directly affecting its efficiency, rating, and voltage regulation. It is one of the primary factors influencing the transformer's size, weight, and overall capability.

Like all electrical devices, transformers generate heat as current flows through the coil's resistance. This, combined with magnetic losses, leads to a temperature rise. The extent of this rise depends on how much heat is produced and how effectively it is dissipated.

This figure illustrates how surface temperature increases relative to power dissipation (*in watts per square inch*) into still air. It assumes all internal losses are radiated from the surface into the surrounding air.

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Performance Factors

When heat transfer from the transformer core is restricted, the internal temperature rises beyond the exterior, negatively impacting efficiency, regulation, and power rating of the transformer.

Effective transformer design that reduces heat generation or improves heat dissipation can result in:

- A smaller, lighter unit with the same performance
- A unit with the same size and rating, but a lower operating temperature
- A unit of the same size and temperature, but with a higher power rating
- Or a combination of the above benefits

Technical Advantages of Aluminium Foil Transformers



Advantages

- Compact design with lower weight
- Greater insulation reliability
- Enhanced thermal stability and higher short-term overload capacity
- Higher surge withstanding capability
- Increased resilience to withstand short circuit currents
- Reduced sensitivity to harmonics and high-frequency effects on transformer design

We Offer Both—Understanding the **Key Differences**

Features	Copper Wound Transformer 	Aluminium Foil Transformer 
Heating in the Winding	Higher	Very Low
Insulation Material	Paper Based	Polyester Film Based
Size	20-30% Bigger	Very Compact
Winding Direction	Bi-directional winding, the coil direction alternates layer by layer, can lead to increased vibration and reduced efficiency.	Uni-directional winding, where it supports uniform current flow, reducing mechanical stress and improving overall efficiency.
Cost	Higher initial cost	More cost-effective; lower upfront investment
Sustainability	Less abundant; recyclable	Abundant and highly recyclable

Technical Specifications

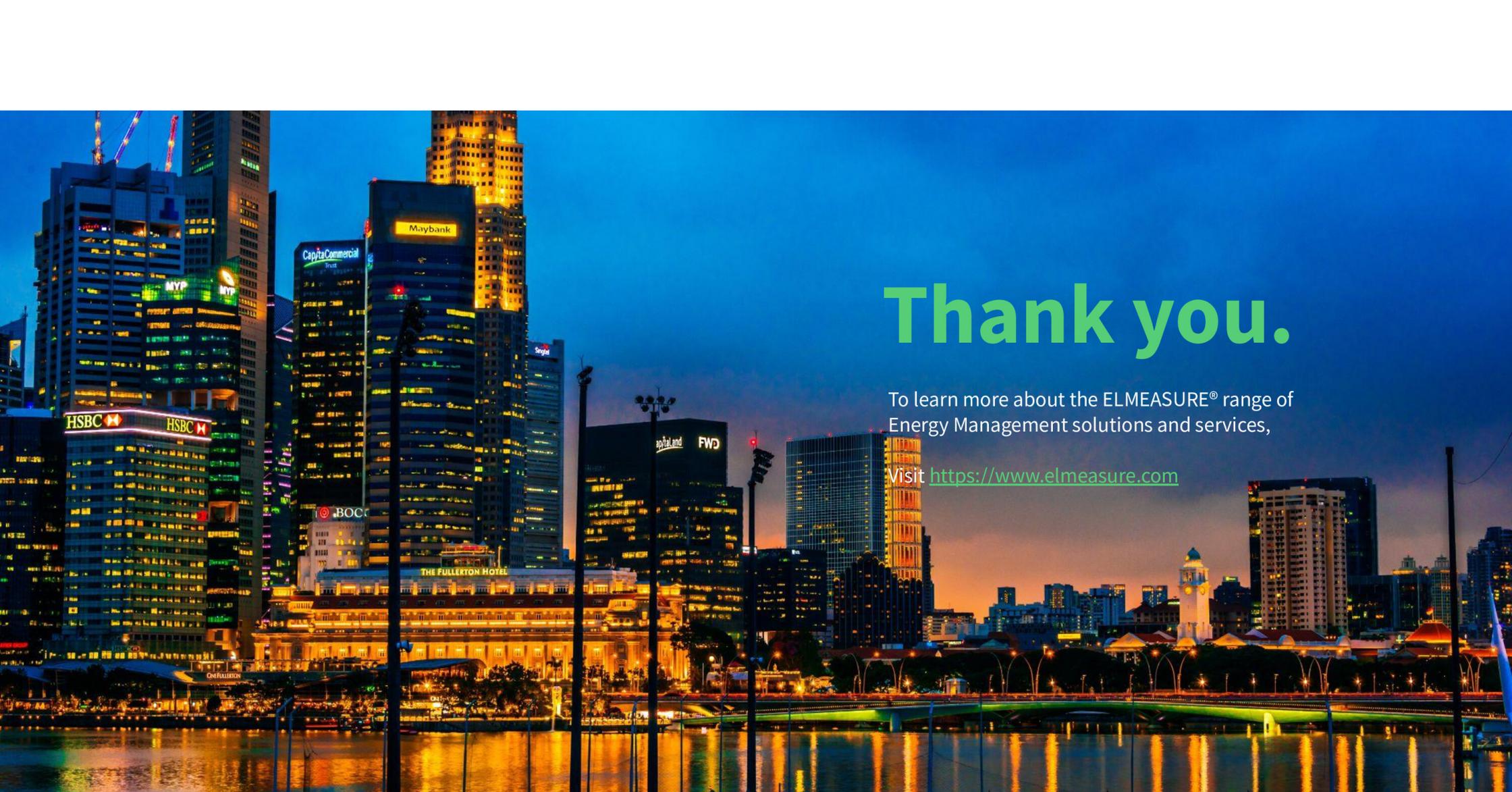


Product: ELM-3KVA to ELM-2MVA (as per customer requirement)

Features

- Medical grade purity of 99.8% conductor (Aluminium Foil)
- Super-insulated Enameled copper wire conductors (UL Approved)
- Class F & H Insulations
- VPI Based
- Best primary-grade laminations (CRNO & CRGO)

General Characteristics	1 Phase ELM -S	3 Phase ELM-T
Input voltage regulation range	1KVA – 80KVA	3KVA–2000KVA
Output voltage	Customized, Up to 900V-PH-PH (Multi-tapping also available)	
Frequency	43–60 Hz	
Protection	I/p Breaker & O/p Breaker All IP Classes Enclosures available Temperature cutoff Sensor Soft-starter	
Load Regulation	< 2%	
Impedance	Less than 5%	
Duty cycle	Continuous	
Metering	2*16 LCD Display	
Display	Input Voltage - Phase & Line Output Voltage - Phase & Line Output Current (Optional)	
Reading Accuracy	± 1%	
Standards	Meets IS 1171-1985 Dry Type Transformers Standards	
Maximum Ambient Temperature	45–50°C at full load	
Humidity	Up to 95% non-condensing	
Waveform Distortion	NIL	
Laminations	CRNO, CRGO, M4 Grades (Special Laminations also available)	
Conductor	Aluminium Foil & Copper Wire	
Efficiency	> 98%	



Thank you.

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