



**MGM**  
TRANSFORMERS  
BY FORGENT

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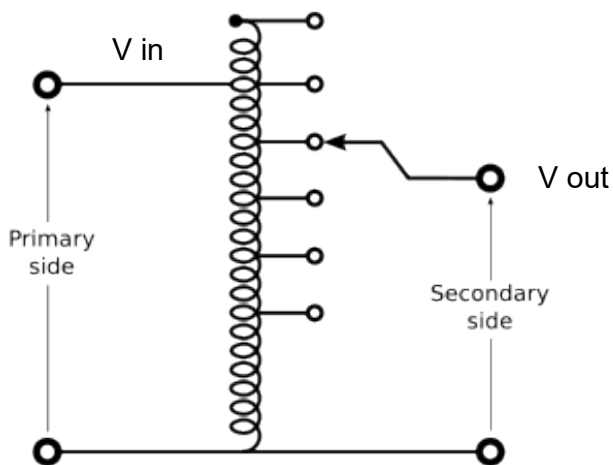
### SPECIALTY PRODUCT BROCHURE

#### MGM Transformers Overview

With over forty years of transformer experience and our long standing commitment to quality and customer service, MGM Transformers will design and build the transformer that is right for your specific application.

MGM provides custom built dry & liquid-filled Auto transformers designed by industry leading, experienced engineers for the unique requirements of Auto transformers. Our people, knowledge, and experience can provide a reliable, cost-effective transformer that will provide years of trouble free service.

#### Application



As explained by the figure, an auto transformer has the capability to supply a varying secondary voltage to the externally connected load. So this is mostly used in applications where various voltage outputs is required. Some of its applications are listed below:

1. It is used in electronics testing centers where continuously varying voltage supplies are required.
2. At places like power stations which initially need to step down/up the voltage, then increase/decrease it to match the voltage required by the device at the receiving end.
3. For motor starting applications.

**AUTO TRANSFORMER**

## Advantages of MGM

A highly experienced and trained engineering staff (ALL IN-HOUSE) for the design and manufacturing of standard and highly specialized products.

- Product offerings in both dry type and liquid filled to meet your specific demands.
- 220°C Nomex insulation for Dry-Type Transformers
- Self-Cooled or Forced Air Cooled
- Low Voltage and Medium Voltage solutions.
- All processes done in-house at our own UL, CUL, CSA and ISO 9001-2015 certified facilities.
- Shortest lead times in the industry.

### Features:

An **autotransformer** is an electrical transformer with only one winding. The "auto" (Greek for "self") prefix refers to the single coil acting alone, not to any kind of automatic mechanism. In an autotransformer, portions of the same winding act as both the primary and secondary sides of the transformer. In contrast, an ordinary transformer has separate primary and secondary windings which are not electrically connected.

Since part of the winding is common to both the primary and secondary, autotransformers have the advantages of often being smaller, lighter, and cheaper than typical dual-winding transformers, but the disadvantage of not providing electrical isolation between primary and secondary circuits. Other advantages of autotransformers include lower leakage reactance, lower losses, lower excitation current, and increased kVA rating for a given size and mass.

Advantages of Auto-transformers:

- Lower weight (lower cost).
- Lower losses (higher efficiency).
- Better regulation as lower impedance.
- Smaller exciting current as lower core weight.
- Smaller overall size.

The KEY to these advantages is kVA transformation. This means that an autotransformer with a rating of  $kVA_{auto}$  only needs components such as amount of wire and core equal to a traditional transformer with a rating of  $kVA_{equiv}$ . These values are related by following equations:

$$kVA_{auto} = kVA_{equiv} / F \text{ and } Impedance_{auto} = Impedance_{equiv} * F$$

Where  $F = (V_{in} - V_{out}) / V_{in}$  for step down and  $F = (V_{out} - V_{in}) / V_{out}$  for Step-up. In other words, High Voltage minus Low Voltage, divided by High Voltage.

As an example, consider a step-down transformer that transforms 480V to 415V. In this case  $F = (480 - 415) / 480 = 0.135$

Therefore, an autotransformer with the same amount of material content as, for example, a 100 kVA traditional transformer could supply and output of  $100 / 0.135 = 738$  kVA or more than 7 times the output for about the same cost. The Standard 5.75 % impedance would become  $5.75 \% * 0.135 = 0.78 \%$

## Testing

MGM Transformer tests every transformer to satisfy the requirements of appropriate governing standard depending on specifications including IEEE C57.12.01, NEMA ST-20 and UL 1561. Our testing equipment ensures the highest quality transformers that meet all IEEE, and NEMA standards. We also offer customer witness testing on individual transformers and we have the capability of providing a range of design tests and optional tests such as impulse, partial discharge, temperature rise, sound level, and others.

The following tests will be conducted on the unit:

1. Winding resistance: Resistance of each Primary and Secondary windings shall be measured with digital micro ohmmeter.
2. Turn Ratio: The transformer shall be tested for turn ratio of each coil's primary to secondary turns on all the taps connections of the transformer.
3. Polarity and phase relation test: The polarity / phase relation shall be checked simultaneously with the turn ratio test.
4. No load losses and Exciting current: This shall be tested at 100% rated voltage and at other specified voltage(s) at rated taps connection using digital or analog meters. The measurements will be made at the Primary or secondary terminals with other winding(s) open circuited.
5. Impedance and Load loss test: The voltage required to circulate the rated current under short-circuit conditions when connected on the rated voltage tap, is the **impedance** voltage. The **impedance** voltage and **load loss** is **measured**.
6. Applied potential test: The test shall be done at 60 Hz. Applicable test voltage shall be applied on each primary and secondary windings in turn with all other windings and parts connected to ground and the return circuit of the test transformer. Duration of the test shall be 1 minute.
7. Induced potential test: The test shall be conducted at 400 Hz for 18 seconds. Twice the rated voltage shall be applied at the lower voltage winding with other winding(s) open circuited.

## THE BETTER CHOICE!

MGM is a leader in the transformer industry and a premiere manufacturer capable of fulfilling the most demanding applications. **No one can provide a wider range of products and solutions than MGM!**