

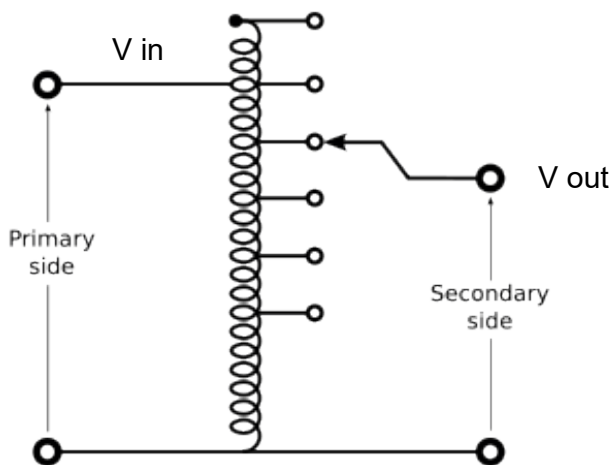
SPECIALTY PRODUCT BROCHURE

MGM Transformer Company Overview

With over forty years of transformer experience and our long standing commitment to quality and customer service, MGM Transformer 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.

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!**

MGM Transformer Company - Product Catalogs

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ISO 9001 CERTIFIED

Special Design Dry Type Transformers
Liquid Filled and Dry Type Substation Transformers
Liquid Filled and Dry Type Drives Isolation Transformers
600V Class General Purpose Transformers
Low Voltage Custom Transformers

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600 V Class, Dry Type, General Purpose Distribution Transformers

BULLETIN 10

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Custom 600 V Class, Dry Type General Purpose Distribution Transformers

BULLETIN 15

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Dry Type Substation Transformers

BULLETIN 30

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Liquid-Filled Secondary Substation Transformers

BULLETIN 40

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MGM provides custom built dry type 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 ability to supply a varying secondary voltage to the externally connected load. So this is mostly used in applications where various voltage outputs are required. Some of its applications are listed below:

- It is used in electronic testing centers where continuously varying voltage supplies are required.
- All power line power stations adjust voltage to step down the voltage, then increase it to match the voltage required by the device at the receiving end.
- For motor starting applications.

AUTO TRANSFORMER

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

MGM provides custom built dry type transformers for the Electric Vehicle (EV) charging industry, designed by industry leading, experienced engineers for the unique requirements of EV charging stations. Our people, knowledge, and experience can provide a reliable, cost-effective transformer that will provide years of trouble free service.

Application

There is no doubt that the trend towards EV's here to stay. Motorists who purchase such a vehicle also need a charging station. The total number of electrically powered cars worldwide reached some 3.2 million in early 2012. That's a 55% increase over the previous year. The figure includes all the vehicles charged with electricity, such as plug-in hybrids.

ELECTRIC VEHICLE CHARGING

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

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

Purpose

Simply put, a grounding transformer is used to provide a ground path to either an ungrounded "Y" or a delta connected system and is used to:

- Provide a relatively low impedance path to ground, thereby maintaining the system neutral at or near ground potential.
- Limit the magnitude of transient over voltages when re-energizing ground faults occur.
- Provide a source of ground fault current during line to ground faults.
- Permit the connection of phase to neutral loads if desired.

If a single line to ground fault occurs on an ungrounded or isolated system, no return path exists for the fault current, thus no current flows. The system will continue to operate but the other two un-faulted lines will rise in voltage by the square root of 3 resulting in overvoltage of the transformer insulation, and other associated components on the system, by 275%.

GROUNDING TRANSFORMER

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

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

Application

Traction used transformers are critical components in the traction chain, affecting both train performance and operator services. MGM supplies traction substation transformers for all applications.

- High speed, commuter and regional trains.
- Transit/Traction - In general, electricity is distributed along tracks as DC current. Converted to AC to drive motors. 500VDC - 1500VDC is typical range.

These transformers are typically located in either indoor or outdoor traction substations.

TRACTION DUTY

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

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

Application

A triplex transformer is composed of three separate single phase transformers which are banked and connected directly together to form a single three phase unit in a common enclosure. While slightly larger than a dedicated three phase unit a triplex design can be broken down into three significantly smaller and lighter components when there are size and/or weight restrictions for transporting the transformer. These are often used in mining or high rise building installations where the unit must be transported in an elevator.

TRIPLEX TRANSFORMER

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

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

HIGH RISE TRANSFORMER

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

MGM provides custom built dry and or liquid filled transformers specifically for the mining industry, designed by industry leading experienced engineers for the unique requirements of mine duty transformers. Our knowledgeable staff, manufacturing standards and experience will provide a reliable, cost-effective transformer that will provide years of trouble free service.

Application

The mining industry requires many different types of Power Transformers, the need for high power in a compact robust transformer make these units unique to the industry. Examples include:

- Above/Ground Ground Application
- Headage Equipment
- Mining Distribution
- Low Profile Power Centers
- Multiple Input and/or Output Voltages
- Power Distribution
- Continuous Miners
- Low Profile Mining Transformers
- Longlead Transformers
- Special Environmental

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