



GROUNDING TRANSFORMERS

Grounding transformers are a critical component in electrical installations, especially where power generation through solar, wind or traditional generators occurs. A magnetic grounding device is a cost competitive method to provide “effective” grounding (Article 100 of NEC Code) in three-phase three-wire systems.

In systems where a delta or ungrounded wye connection is used, often a neutral ground path is required via a grounding transformer, also often called a neutral grounding transformer or ground isolation. Hammond Power Solutions has been a valued supplier of these custom magnetics, typically in a zig-zag or autotransformer configuration.

By providing a ground path in ungrounded wye or delta connected power systems, grounding transformers perform several critical functions:

- Provide the connection of phase-to-neutral loads.
- Provide a relatively low-impedance path to ground, thereby maintaining the system neutral at or near ground potential.
- Provide a source of ground fault current during line-to-ground faults.
- Limit the magnitude of transient over-voltages when re-striking ground faults occur.
- The most common design is the zig-zag autotransformer which offers the best combination of flexibility, size and cost.

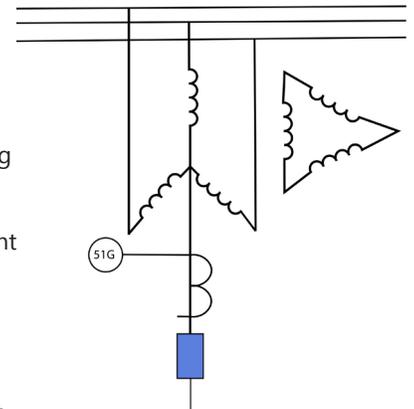
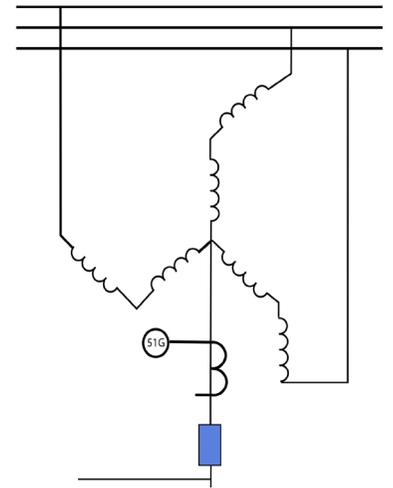
Grounding transformers are not sized by kVA since during normal operation little to no current will flow through the windings. During a fault, the current will increase substantially but only for a few cycles to a few seconds depending on the monitoring and interrupting methods used.

In most cases, the grounding transformer will also be asked to service a small amount of current continuously. In a perfectly balanced system, the neutral current will be zero but systems will be designed to trip at a higher limit.

This trip limit would be considered to be the continuous rating and is needed to verify the transformer’s design won’t overheat during normal operation. As a rule of thumb, if the continuous rating is not known, a minimum value of 3% of the short duration fault current should be considered.

To properly specify a grounding transformer, the following parameters must be known:

1. Winding configuration: Zig-Zag Autotransformer or Wye-Delta
2. Voltage: System Voltage
3. Basic Impulse Level (BIL)
4. Continuous neutral current
5. System available fault current and duration in seconds
6. Zero Sequence impedance in Ohms per phase.
7. Winding material: Copper or Aluminum
8. Enclosure Type: Type 3R, 3R-Enhanced or Non-Ventilated
9. Ambient Temperature
10. Other Environmental Concerns



		THREE PHASE ZIG-ZAG GROUNDING TRANSFORMER			
<small>GUELPH, ONT. BARABOO, WI COMPTON, CA MONTERREY, MX</small>		<small>SP®</small>			
NEUTRAL CURRENT	242 A	INPUT	480 V	PART NO.	227512
TEMP. RISE	150 °C	K TYPE	ANN	SERIAL NO.	
TEMP. CLASS	220 °C	ZERO SEQ. IMPEDANCE	.144+/-10%	ENCL. TYPE	3R
Hz	60	BIL	10 kV	WEIGHT	1100 LBS
<small>SPACINGS BETWEEN ANY VENTILATED ENCLOSURE PANEL AND ANY ADJACENT WALL SHALL BE A MINIMUM OF 3 INCHES X0 = 0.1398 OHMS/PHASE/-10% STD.TOL.) X/R RATIO: X0/R0 >= 4 5-SEC FAULT WITHSTAND CURRENT: 2732A ALTITUDE: 1000M</small>					

