Neutral Grounding Transformers

Resistance grounding systems protect power transformers and generators from damaging fault currents. Low resistance grounding of the neutral limits the ground fault current to a high level (typically 50 amps or more) in order to operate protective fault clearing relays and current transformers. These devices are then able to quickly clear the fault, usually within a few seconds. The limited fault current and fast response time also prevent over-heating and mechanical stress on conductors.

Post Glover 2400kV – 240V GTR with Stainless steel resistor banks and Type 3R powder coat painted enclosure

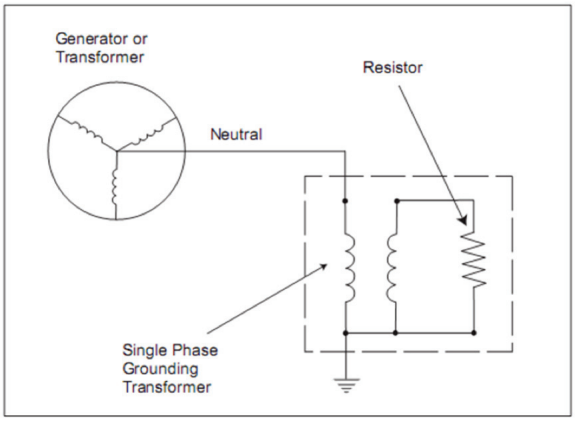
If the system has a neutral which is available, a single phase distribution transformer can be used in conjunction with a loading resistor to provide high resistance grounding. This is particularly well suited for grounding of generators, in that it allows the system to operate like an ungrounded system under normal conditions, while still retaining the ability to limit ground fault current. The primary of the transformer is connected from the system neutral to ground. The loading resistor is connected across the transformer secondary. The resistor is normally sized to allow a primary ground fault current in the range of 2 to 12 amps and is typically rated for either one minute or continuous duty. The transformer should be sized accordingly, with a primary rating equal to the system line to neutral voltage and the secondary normally rated 240 or 120 volts.

When a ground fault occurs downstream of the grounding transformer, ground fault current flows through the fault and back through ground to the grounding transformer. The loading resistor limits the current flow in the secondary winding, which in turn limits the flow of the ground fault current back into the system through the primary of the grounding transformer.

Post Glover's GT product line is designed for applications on systems up to 15kV. Secondary voltage is typically 240 volts, and resistors are designed according to customer specification. Typical construction is a dry type transformer with a secondary resistor mounted in a common enclosure.

Features

- Stainless steel grid or edgewound resistor banks (application dependent)
- Dry Type Transformer
- Mill Galvanized Type 3R enclosure with options for painted and stainless steel
- Extra heavy duty mounting channels for transformer
- Junction box / Terminal block for easy addition of protective relaying equipment



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Post Glover "The Resistor Specialists"

Serving the Electrical Industry Since 1892

Neutral Grounding Transformers

Specification for Grounding Transformers

Scope

This specification covers design, manufacture and testing of medium-voltage Grounding Transformers for use with Neutral Grounding Resistors (NGR) for installation indoors or outdoors onto a concrete pad or power transformer.

Applicable Standards

The transformer shall be designed, manufactured and tested as per the latest revisions of IEEE-32.

Transformer

The transformer shall be a single phase, dry-type, air-cooled transformer. It shall have class “B” insulation up to 2400 volts line to neutral or class “H” insulation above 2400 volts.

The transformer shall be rated for the charging current of the system on which it is being applied; it shall also have the same current and “on” time rating (typically 10 seconds, 60 seconds or continuous) as that of the NGR with which it is being applied. Insulation class maximum temperature rise shall not be exceeded at these currents and “on” times.

The transformer shall be rated at the line to neutral voltage.

Resistor

The neutral grounding resistor will consist of high grade chromium stainless steel or nichrome elements and terminals with high corrosion resistance, double insulated. The assembly shall be durable for long years of service, and having extremely high and stable electrical resistivity.

If more than one resistor frame is required, series connections will be solid copper bus on grid style or edgewound resistors, and Teflon wire on wirewound style resistors.

The resistor frame(s) shall be insulated with a rating equal to or greater the voltage rating of the secondary of the grounding transformer.

The temperature rise shall be in accordance with IEEE-32 for the specified duty cycle.

The resistor shall be connected across the secondary of the transformer, and rated for the same “on” time as the transformer. The current rating of the resistor shall be equal to the rated current of the transformer multiplied by the transformer’s turns ratio.

Enclosures

The Grounding transformer may be combined with the NGR and mounted in one enclosure. The enclosure shall be of heavy gauge galvanized

Steel. All mounting hardware shall be stainless-steel. Indoor enclosure shall have a screened cover with maximum openings of 1/2". Outdoor enclosure shall have a solid heavy gauge top cover, slightly overhung.

The frame of the enclosure shall be made from structural steel angles made from heavy gauge steel, welded together, or bolted together with stainless-steel hardware. The top of the enclosure shall be solid, slightly overhung and sloped. It shall be embossed with stiffening ribs. The enclosure shall have forged eyebolts in each corner for lifting purposes.

The bottom of the enclosure shall be screened with expanded or perforated metal with openings of 1/2" or less. This screening shall be permanently installed. It shall be elevated 4 to 6 inches above the base of the unit.

Bolt-on side covers on all four sides shall be used. Screened covers may be furnished for certain applications. Stainless-steel hardware shall be used. Louvered or screened openings shall not exceed 1/2".

A durable nameplate, permanently attached to one side cover shall show the manufacturer and the complete rating.

Painted enclosures shall be suitably sanded, cleaned, primed and painted. Stainless-steel and galvanized enclosures shall be protected from scratching during manufacture, assembly and shipment.

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