

# Neutral Grounding Resistors

The purpose of a neutral grounding resistor is to limit the ground fault current to a safe level so that all the electrical equipment in the power system is protected. The resistor should be the only current path between the neutral of power transformers or power generators and ground.

When the neutral of a system is not grounded it is possible for destructive transient overvoltages to appear from line to ground during normal switching of a circuit having a line to-ground fault. Experience has proved that these overvoltages cause aging and failure of insulation at locations on the system other than at the point of fault. In this way, a relatively unimportant line-to ground fault on one circuit may result in considerable damage to equipment and interruption of service on other circuits, not to mention the increased difficulty in finding the original location of the problem.

A neutral grounding resistor is designed to limit the ground fault current to a safe value while at the same time letting enough current to flow to operate the protective relays that will clear the fault. While the disturbance lasts the resistor must be capable of absorbing and dissipating the energy generated without exceeding the temperature limits established by IEEE-32 Standards. In this way the fault is safely limited, isolated, and the power system is protected against overvoltages.



### Advantages of using a neutral grounding resistor:

- /// Reduced operation and maintenance expenses.
- /// Fast isolation of the original fault.
- /// Reduced transient overvoltages.
- /// Reduced physical damage on the equipment at fault.
- /// Simplification of ground fault location.
- /// Increased life and protection of transformers, generators and related equipment.
- /// Reduced frequency of faults.
- /// Improved service reliability.
- /// Increased protection in the use of lightning arresters.
- /// Increased safety for personnel.

## Features:

- Up to 5,000 amperes and up to 115,000 volts line to neutral.
- Galvanized Steel or Satin Coated Steel enclosures.
- Optional stainless steel and anodized aluminum frame and covers for corrosive atmospheres.
- Stainless steel nuts and bolts.
- Silver plated connectors and internal connections for positive contact and reduced oxidation.
- Indoor-outdoor service. Removable covers. Ventilated bottom screen. Protected against the entrance of rodents, birds or accidental contact by personnel.
- Continuous edge wound, stainless steel resistive elements without paralleling up to 1200 amps.
- Double insulation to ground.
- Designed to absorb thermal expansions and contractions.
- High-temperature, ceramic insulators.
- Standard bushings and insulators for easy replacement in case of damage.
- Entrance and exit bushings located according to customer's needs.
- Optional current or voltage transformers and relays for fault detection, mounted inside the enclosure with optional external terminal box.
- Rating, design, manufacturing and testing according to IEEE, NEMA and CSA standards.
- 24 month guarantee.

Our models are named as follows:

**NGR****voltage-current-time** where **voltage** is the line-to-neutral rms voltage, **current** is the limit current and **time** is the rated time, 10s for ten seconds or C for continuous duty, i.e. NGR2400-400-10s or NGR347-5-C.

Our standard models come with NEMA 3R galvanized steel enclosures painted color light gray ANSI 61 for indoor/outdoor use, (manual, test report and aluminum nameplates). Models above 600 Volts come with one external bushing for neutral connection.

The following suffix codes can be added to the model name to denote special features:

- /NB:** No bushings
- /GB:** Add ground bushing
- /SS:** Stainless steel enclosure
- /AL:** Aluminum enclosure
- /N1:** NEMA1 (indoor use) enclosure
- /N4:** NEMA4 completely closed enclosure
- /Am:** where A is the altitude when higher than 2000 meters above sea level (i.e. 3000masl)
- /SZ:** Seismic zone special bracing
- /CT:** Space for current or voltage transformer.