

# Neutral Grounding Solutions



## GR Series

NGR | HRG | SME GG | SME GV

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# Neutral Grounding Solutions

## GR Series

### Neutral Grounding Resistors

The purpose of the neutral grounding resistors is detecting and limiting of the earth fault current to prevent any damage to generator and ensure operation continuity and safety of personal and equipment in electrical systems. To ensure this safety, neutral points of power transformers and generators are grounded through neutral grounding resistor, at LV & HV power distribution.

The fault currents which may occur high current values to damage the generator, motor, cable or other critical equipment will be prevented with this application.

### Application Areas

- In power generators used in Power Generation Plants such as Thermal, Nuclear, Gas, Hydroelectric and Wind Power Plants
- Step-up transformers used in Power Generation Plants such as Thermal, Nuclear, Gas, Hydroelectric and Wind Power Plants
- In step-down transformers terminating energy transmission lines
- Transformers and generators used in cogeneration and trigeneration systems in large facilities such as factories, hospitals, shopping centers

### Standards

- IEEE-C57.32
- IEC 60076-25

### Technical Characteristics

- Nominal voltage up to  $110/\sqrt{3}$  kV
- Fault current up to 5000 A
- Fault duration for 5 s, 10 s, continuous or other customer requirements
- Stainless steel resistor materials
- Spring wound, edge wound, grid type resistor materials
- Special ATEX design for explosive environments
- Custom made lifting eyes to ensure safe lifting

### Advantages

- Easy access and maintenance
- High insulation and mechanical resistance against shocks



### Options

- Standard IP23 protection degree of enclosure, available from IP00 to IP55,
- Standard hot dip galvanized enclosure, Optional stainless steel, aluminium and painting
- Entry from bottom is standard, top and side with bushings are options
- Accessories; current & voltage transformers, disconnect switch, surge arrester, relays, anti-condensation heater, etc.

### High Resistance Grounding Systems

High resistance grounding systems (HRG) are used to limit phase-ground short circuit fault current and locate fault where energy continuity is important. HRG system automatically reduces the fault current to 5 A and then start triggering the fault current of the network between 5 / 10 A continuously to allow the detection of fault by the operator.

### Application Areas

- Electrical network
- Hospitals
- Data centers
- Petro Refineries
- Petrochemical Facilities
- Mining and Mineral Processing
- Any area where energy continuity is priority, such as Textile factories, Cement factories, Aluminum or Plastic Injection Factories..

### Standards

- IEEE-C57.32
- IEC 60076-25

## Technical Characteristics

- Nominal voltage up to 7,2 kV
- Suitable for continuous current up to 10 A and impulse current up to 20 A
- Adjustable fault current, impulse time
- Smart fault detection system
- Smart auto control system to check system operation
- Stainless steel resistance materials

## Options

- Hot dip galvanized, stainless steel or aluminium enclosure
- Entry from top or bottom with bushings
- Special design for high altitude

## Advantages

- Limiting the short circuit failure current
- Detecting the location of the fault
- Monitoring the system operation and continuity
- Visual and audio failure notification
- Stable fault and pulse current with 3% resistance variation against temperature rise
- Modular and rigid enclosure design with resistor blocks mounted to the frame for safety lifting

## Generator Neutral & Leads Cubicle

3 phases from the LV and HV generator are combined inside the generator neutral cubicles to provide a neutral point. This neutral point is connected to the ground through a resistor.

Generator neutral cubicle provides the sensing of fault current with the relays and current transformer mounted inside the neutral grounding resistor and limiting the fault current.

Generator leads cubicles are measuring switchgears that control of secondary side of generator, voltage regulation via excitation transformer. They also enables the generator to quickly adapt to load changes and provide a stable output voltage. In this way, efficient and stable operation of power generators in energy generation plants is ensured.



## Application Areas

- Thermal, Nuclear, Gas, Hydroelectric, Biomass, Wind, etc Energy Generation Facilities

## Standards

- IEC 62271-200
- IEEE-C57.32
- IEC 60076-25

## Technical Characteristics

- Suitable up to 17,5 kV gensets
- Applicable up to 5000 A
- Stainless steel resistor materials
- Special mechanical and electrical design to withstand high temperature and extreme current values
- Voltage and current transformers for each phases.

## Advantages

- High personal and equipment safety by using fully type tested SME enclosure as per IEC 62271-200
- Easy access and maintenance
- High insulation and mechanical resistance
- Special production option against corrosion for tropical environment conditions
- Proven reliability with unique design
- Additional equipment can be included



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