

Our resistance units are regularly supplied for in the following industries and applications:

### INDUSTRIES

Generation  
Oil, Gas and Petrochemical  
Distribution Substation  
Gas Compressor Station  
Rollings Mills  
Electric Traction  
Testing Station

### APPLICATIONS

#### Dynamic Braking Resistors (DBR,S)

DBR,S are used to absorb the energy generated when stopping electric motors. They must be able to absorb this energy and cool down quickly between stops.

#### Motor starting and speed control Resistors

Resistors are used where simplicity, reliability and robust construction are Key consideration for example: in mining locomotive

#### Testing

BORNA makes Resistor for testing;

- \_ Batteries
- \_ Power supplies
- \_ Stand by power systems

#### Dummy Load

#### Load Banks

#### Capacitor charge / discharge Resistors

#### Cranes and other load equipments

#### Bow Thrusters

## INDUSTRIAL POWER RESISTORS CESI Laboratory Type Test Certificate



ISO 9001: 2008  
ISO 14001: 2009  
BS OHSAS 18001: 2007  
HSE Management Systems

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# BORNA

ELECTRONICS

Neutral Grounding  
**RESISTORS**



**CESI Laboratory**  
 Temperature-Rise Test  
 11KV-2500KW  
 6KV-1400KW  
 11KV-200KW

Neutral Earthing Resistors are used for resistance grounding of industrial power systems. They are usually connected between earth ground and the neutral power transformer, power generator or artificial neutral transformer.

The rating of NER is chosen to meet the requirements of the system protection scheme.



This will include consideration of maximum acceptable fault current, earth potential levels, and minimizing damage caused by the fault.

BORNA NER,S are designed to provide added safety to industrial distribution systems by limiting ground fault current to reasonable levels.



## Neutral Earthing Resistor

### STANDARDS

At present the only standard for NER,S is American National Standard specification standard requirements, terminology and test procedure for Neutral Grounding devices ANSI / IEEE - 32.

### RESISTOR TYPES

Different types of resistors that are used in the NER all as followings:

- Wirewound
- Spring type
- Edgewound
- Grid type (Plate type)
- Ribbon type
- Casting alloy

Quality design features include all stainless steel (or Ni-cr) grids and terminals, high temperature insulation and welded construction.

BORNA RESISTORS can be supplied with standard open frames or outdoor enclosures. The change in resistance with temperature during operation is small and predictable.

### TEMPERATURE COEFFICIENT OF RESISTANCE

Resistance increase of less than 10% per maximum temperature rise over the operating temperature range.

### ENCLOSURE MATERIALS

The enclosure is made of stainless steel (2mm thickness) or hot dip galvanized steel or painted Mild steel coated with 80 micron RAL 7302.

### ENCLOSURE PROTECTION RATING

- Degree of protection for frame: IP23
  - Degree of protection for termination Box: IP54
- Note: This rating is suitable for indoor and outdoor service.

### STANDARD TESTS

According to the IEEE 32 standard, Routine tests on all units include:

- Resistance measurement at ambient temperature
- Applied potential test (Dielectric test)
- Impulse test only for Bushing

### TECHNICAL SPECIFICATION

- Operating Voltage: Up to 72.5 kV
- Rated current: Up to 4000A
- Time: From a few seconds to continuous operation