

NEUTRAL EARTHING RESISTOR

Features and Benefits

- Field proven
- Extensive installed base
- To IEEE 32:1972
- Compact economic designs
- Complete range performance capability
- Extensive range of options
- Replaceable elements
- Low temperature coefficient of resistance

Rating

System Voltage

VOLTX is able to manufacture NERs for any applied voltage. We have built NERs for system voltages of up to 33kV .

Line Voltage

Although NERs are referred to by their system (i.e. phase to phase) voltage, it is the line (i.e phase to neutral) voltage that is used for the calculation of resistance. Enclosure clearances and accessories may also be selected in relation to line rather than system voltage.

Current

VOLTX has NER designs for applied currents from a few amps to many thousand, with ratings that may be for a short time, continuous or some combination of the two. Where continuous currents are applied the enclosure ventilation should be increased to prevent overheating.

Resistance

Unless external impedance needs to be taken into account resistance is calculated from the line (applied) voltage divided by the current. The standard tolerance is +/-10% on the cold resistance value.

Time

Standard time ratings are 5s, 10s, 30s and continuous although any other values are available on request. Most applications can be generously covered with a 10s rating; longer time ratings were historically used in conjunction with now-obsolete liquid resistor technologies and older switchgear. The cost, size and weight of an NER increase with rated time. NERs may be rated continuously at 5 - 10% of their short-time rated current but may need an allowance for increased ventilation.

Temperature rise

Standard temperature rise during a full fault is 760°C, in strict compliance with ANSI/IEEE 32:1972. We also offer more compact and economic designs that take advantage of advances in insulation and resistor alloy materials, which have a temperature rise of 1000°C.

Insulation: Basic Impulse level (BIL)

Internal air clearances and insulators are usually selected with reference to the BIL for the line voltage, using the following classes from IEC60071-1:2006:

Voltage class/kV	3.6	7.2	12	24	36
BIL/kV	40	60	75	125	170

Values may be selected based on system voltage but result in larger and more costly designs.

Frequency

The resistor's performance is itself largely independent of frequency, although accessories such as current transformers may need to be selected for the appropriate system frequency.

Connections

roof mount bushing or through the base of the enclosure to a support insulator.

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Mechanical Data

Service and ingress protection

Resistors may be designated for indoor use or outdoor service.

Indoor resistors may be of open (IP00) or enclosed construction.

Enclosed resistors are either protected to IP23 or IP54.

Higher ratings are available on request, however this may result in a larger and potentially more costly design.

Cable boxes are protected to IP54.

IP ratings are to IEC 60529:1999. Certain resistor designs and configurations have exposed high voltage terminals and/or live enclosures. In such cases, the IP rating partially excludes clause 51, "access to hazardous parts". Certain resistor designs have open bases and are intended for floor or enclosed plinth mounting. In such cases the IP rating assumes that the resistor is installed in such a manner as to maintain the IP rating.

Enclosure Materials

Pre-galvanised mild steel can be used in indoor and moderate outdoor environments.

NERs can be painted if required – our standard finish is electrostatic powder coat.

Elements and construction

All elements systems are designed to avoid points of high voltage and thermal stress.

All elements are flat steel grids or coiled-coil elements.

All connections between elements are bolted to allow easy inter-changeability.

All elements are manufactured from high quality stainless steel resistance alloys.

Safety

NERs are high voltage electrical system components. They may have exposed live parts such as bushing stems, etc.; their enclosures can get hot both during and after operation.

Site layout, NER labeling and operations and maintenance procedures must fully take account of these hazards.

