

Application note

Neutral Grounding Monitoring for 800 V DC AI Factory Power Architectures

Background

Many 800 V DC architectures rely on resistance grounding to create a stable reference point to earth, limit the maximum fault current and maintain safe operation. The grounding resistance must be monitored to detect ageing, thermal overload or mechanical damage. Otherwise, the grounding concept is ineffective.

Objective

The aim is to enable a highly available, scalable and OCP-compliant 800 V DC power distribution system that:

- ensures uninterrupted operation,
- continuously monitors the condition of the grounding resistance,
- detects electrical risks at an early stage,
- and supports operators in the safe upscaling of AI factories.

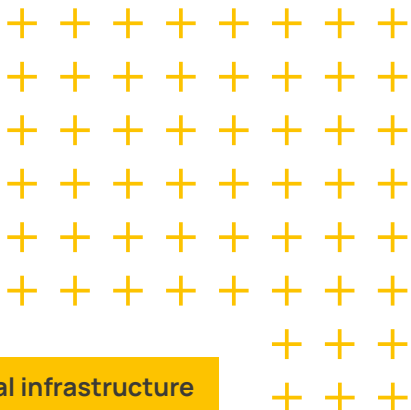


Solution

Bender addresses these requirements with a neutral grounding resistor monitoring solution specially designed for 800 V DC or +/- 400 V DC NGR systems.

Neutral grounding resistance monitoring devices from Bender

- continuously monitor the resistance value and fault current,
- immediately detect deviations from the setpoint,
- ensure the correct functioning of the NGR concept throughout its entire life cycle.



Critical infrastructure

Outcomes

The use of Bender neutral grounding resistance monitoring in 800 V DC AI factories enables:

- **Early detection of grounding problems** before they become critical
- Stable operation even with **megawatt racks** and high load dynamics
- Reduction of **fire, personal injury and equipment protection risks**
- **Uniform safety concepts across multiple AI factory modules**

Key Advantages

- **Enhanced Safety**
Continuous ground resistance monitoring ensures that faults of the ground resistance in 800 V DC (+/- 400 V DC) power supply systems are detected at an early stage. Ground resistance monitoring offers comprehensive protection against overheating, equipment damage and fires – even in large-scale, high-capacity AI data centres.
- **Reduced Downtime**
By detecting electrical anomalies long before a shutdown occurs, Bender solutions enable predictive maintenance. This ensures high availability for mission-critical AI workloads and prevents cascading failures in highly coupled GPU clusters.
- **Less Effort**
Automated monitoring significantly reduces the burden of manual inspections, documentation and audits.



NGRM500/550

Conclusion

An 800 V DC power supply is the backbone of future AI infrastructures. With monitoring technology from Bender, data centres can exploit their full potential. Continuous monitoring of earth resistance is therefore not optional, but a fundamental safety requirement.

Data centre solutions

Bender offers a wide range of solutions for data centres. As an expert in developing smart, safer, and more sustainable energy solutions that protect critical industries worldwide, Bender delivers pioneering solutions that optimise productivity, reliability, and efficiency.



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