Application note

Permanent Residual Current Monitoring to ensure high availability in data centres

Background
The electrical infrastructure in data centres is complex and must remain highly available at all times. However, modern IT loads inevitably generate leakage and fault currents, which often go undetected and gradually develop into malfunctions or thermal damage. Since data centres cannot be easily shut down for testing, the risk of unexpected failures increases further.

Objective
We are looking for a solution that minimises the risk of unwanted shutdowns while enabling the safe continuous operation of the data centre.

Solution
Continuous residual current monitoring – as implemented by Bender in many data centres – permanently detects fault currents during operation without shutdowns. Early notifications enable targeted troubleshooting before critical conditions arise. The system can be integrated into existing TN-S system infrastructures, connected to the building management system via gateways and enables trend analysis, alarms and logging as the basis for a condition-based maintenance approach.

Critical infrastructure

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Project aim
Safe operation of data centres in accordance with normative requirements and increased availability through real-time detection of electrical faults – without interfering with operations.

Outcomes

- **Increased operational safety**
  Fault currents and insulation problems are detected before they lead to malfunctions and failures.
- **Continuous system availability**
  No shutdowns for periodic inspections.
- **Efficient maintenance:**
  Clear error messages and trend data reduce search times and enable targeted maintenance.
- **System transparency**
  Visualisation of all measuring points via standard browser, including history and trend curves.

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 deliverers pioneering solutions that optimise productivity, reliability, and efficiency.

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