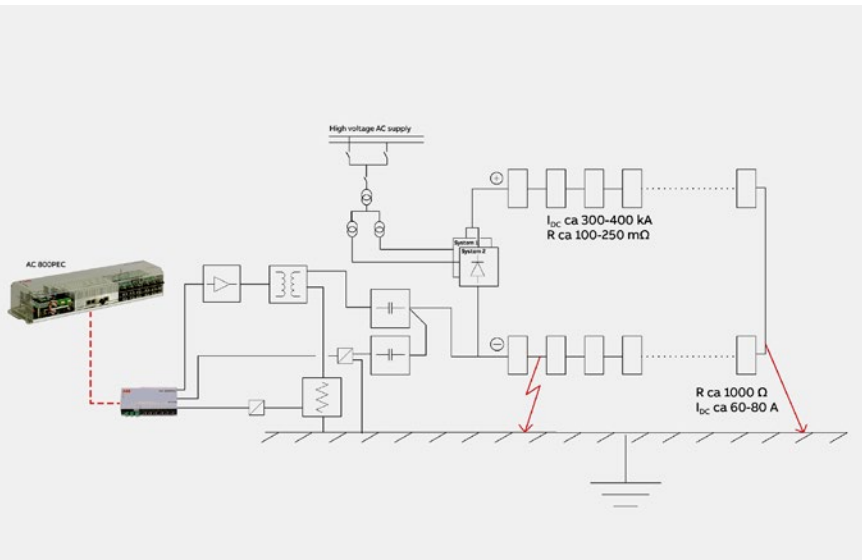


PERMS

Process Earth Resistance Monitoring System



The Process Earth Resistance Monitoring System (PERMS) is a unique monitoring system from ABB to measure the earth impedance of a floating system that can be used for electrolysis processes.

With PERMS it is possible to continuously monitor the resistance between the process and earth. The system will give a warning if the resistance value drops below a defined level. By indicating the earth impedance, PERMS will help you to ensure a safe working area at your plant site and thus protect your personnel and your installed equipment.

Electrolysis plants are typically operated without earthing the process (floating system). To detect earth fault currents, it is necessary to measure the impedance between the DC voltage system and earth. The measurement helps in conducting predictive maintenance of process insulation system.

The resistance to earth depends on the dirt, dust and moisture between the DC process and earth. Leaking of process fluids or hot metal run out can cause low resistance paths to earth. The insulation between high current carrying busbars (“collector busbars”) to earth is critical for the safe operation of the plant. The resistance value may be used to indicate when preventive maintenance is due.

Metering principle

The metering principle of PERMS is based on a modulated AC voltage. This measuring voltage is generated with help of the AC 800PEC controller and applied between the process and plant earth without making an earth connection for the DC process. There is a very low and safe current flowing through the process, to earth and back to the measurement system.

Out of the impedance and the phase shift the real resistance and capacitance is calculated.

The total PERMS equipment is installed in a metal enclosed cubicle (1600x1100x300mm).

1. Main features

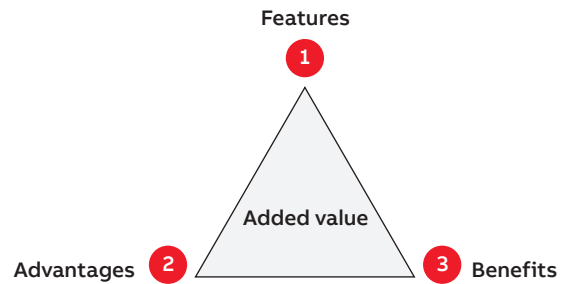
- Monitoring of resistance to earth for floating electrolysis systems
- Monitoring of capacitance to earth for floating electrolysis systems (optional)
- 2 adjustable alarm levels with potential free change over contacts
- Local indication of actual values on process panel mounted in the cubicle
- Test functionalities of process
- Integrated self test (for testing and calibration)

2. Main advantages

- No earth potential applied on process
- Very wide measuring range (20...2500 Ω)
- Very easy installation and commissioning
- Can be used for process voltages up to 2000 V DC
- Possible to detect an earth fault behind the active components (AC part of the rectifier)
- The measuring signal is maximum 50 V AC/25mA which is considered a safe voltage according to relevant standards

3. Main benefits

- Increased human safety without the need for manual work when measuring the impedance
- Equipment is better protected which help ensure longer life time, less shutdowns and greater productivity
- Fast and easy installation without any shutdown requirement



PERMS Cabinet



Technical data

Input power supply	230 V AC for light, space heaters 110...230 V AC/DC for control
System output	max. 50 Vr.m.s., max. 25 mA
Metering range	20...2500Ω
Insulation level	2 kV DC
Test voltage	10 kV/50 Hz/1 min
Controller type	AC 800PEC
Local HMI type	process panel PP836
Mounting	indoor/wall mounting
Standard	IEC 60204-1

For more information please contact:

ABB Switzerland Ltd
Local Business Line Process Industries
Segelhofstrasse 1K
CH-5405 Baden-Dättwil, Switzerland
Phone: +41 (0)58 589 39 39
E-Mail: ch-high-power-rectifiers@abb.com

www.abb.com/rectifiers

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