Doepke

Systematic search for frequent errors

DRCA 1 — systematically measures residual and leakage currents
— analyses currents and frequencies
— enables long-term measurement, logging and evaluation
— helps optimise installations

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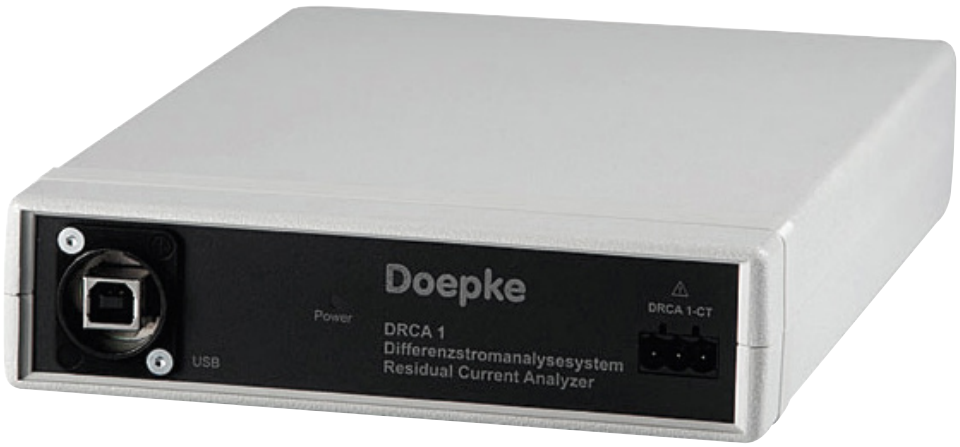
Sporadic tripping of residual current circuit-breakers

Doepke's DRCA 1 analysis system measures, analyses and documents fault-related and operation-related leakage currents with a high level of precision and reliability. In doing so, it provides real-time insights into the installation.
This information serves as a useful basis for selecting the correct residual current circuit-breaker in order to increase the installation's reliability.

Frequency converters and power supplies with combinatorial circuits are an ever more frequent feature of electrical installations. They may give rise to operation-related leakage currents with high frequencies. If a differential current occurs, a residual current circuit-breaker cannot identify whether a residual current is present or whether an operation-related leakage current is flowing to earth, and trips when its rated residual current is exceeded (as per its intended function). A sporadically tripping residual current circuit-breaker can become a costly problem. Operators are therefore keen to avoid unnecessary failures of their installations. However, attempting to do so by foregoing residual current circuit-breakers entirely is not recommended, nor is it permitted in most cases. The solution is to find a residual current circuit-breaker which is optimally tailored to the installation. And achieving this solution requires accurate knowledge of the frequency, severity, duration and ultimately the cause of the differential currents which occur. This data can be supplied by the differential current analysis system DRCA 1 (Doepke Residual Current Analyser).



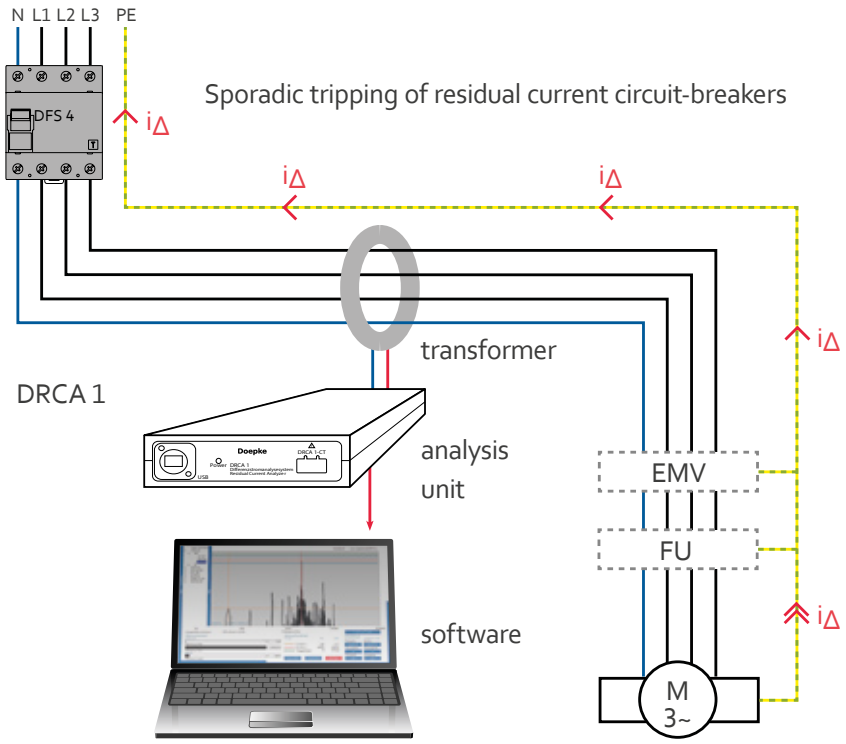
Analytical principles

The differential current analysis system DRCA 1 consists of three parts: a differential current transformer, an analysis device and the analysis software. The wiring diagram on the following page shows the schematic structure. The lines which are monitored by the sporadically tripping residual current circuit-breaker are routed through the DRCA transformer. The residual current circuit-breaker is bridged and the measurement can start. The measuring unit detects differential currents within a frequency range of 10 Hz to 100 kHz. The analysis software is easy to install in Windows and provides a range of signal analysis functions:

- signal progression
- frequency analysis
- trigger mode
- RMS value diagram
- assessed results for the product group selected

Both signal analysis and long-term measurement options are available.

DRCA 1 wiring diagram:



Differential current analysis: reliable, intelligent and convenient

The analysis system DRCA 1 is easy to install and intuitive to operate. Differential currents are identified, documented and analysed with a high level of accuracy. The software reveals the impact of the momentary differential current on the residual current circuit-breaker used. The root-mean-square value diagram shows loads from differential currents, broken down into individual frequency ranges. The assessed signal analysis uses a traffic light system to indicate which of the residual current circuit-breaker types is suitable for the installation, and a selection of potential alternative residual current circuit-breakers. The DRCA 1 system therefore helps optimise the availability of the electrical installation and improves safety by ensuring that a residual current circuit-breaker can be used without being permanently tripped.

The DRCA is available in a case as a complete set:

- Measuring unit DRCA 1
- Instrument transformer CT 070
- Measuring cable 3 m in length DRCA 1 MC
- Analysis software DRCA 1 SW in storage case

If you'd like to see the benefits of our analysis system DRCA 1 close up, we also offer fee-based measurements. Contact your local Doepke representative or our product support team on 04931/1806-821 or -888.

Insight into the software

This screenshot of the analysis software shows a real-time measurement of differential currents in the frequency band from 10 Hz to 100 kHz.
The various residual current circuit-breakers are shown in the left-hand column. Their respective tripping characteristic curves can also be displayed. The software shows the intersections between the momentary differential current and the tripping frequency band of the various residual current circuit-breakers, revealing any potential risk of tripping.

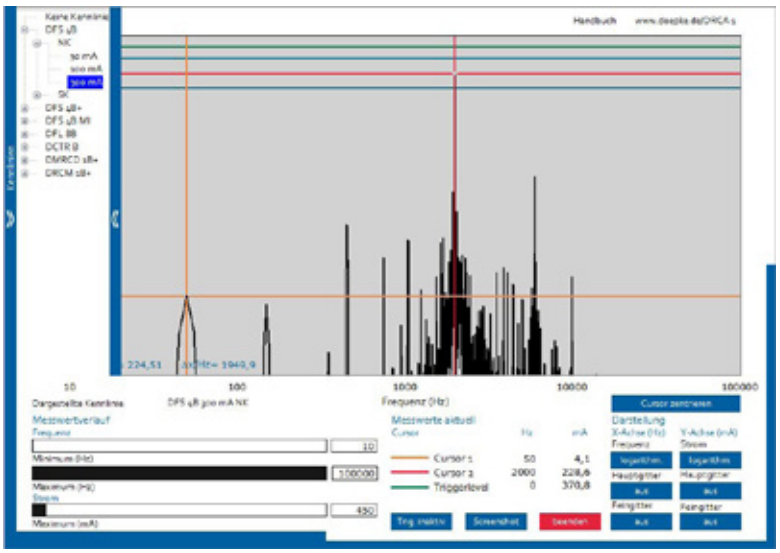


Figure shows frequency analysis

Overview of RCCB series DFS 4 B – the figures refer to the conventional tripping current reached in %

DFS 4 B NK 30 mA 79	DFS 4 B+ 30 mA 79	DFS 4 B SK 30 mA 79
DFS 4 B NK 100 mA 69	DFS 4 B+ 100 mA 65	DFS 4 B SK 100 mA 23
DFS 4 B NK 300 mA 69	DFS 4 B+ 300 mA 65	DFS 4 B SK 300 mA 10
		DFS 4 B SK 500 mA 10

not suitable for use | critical | suitable for use

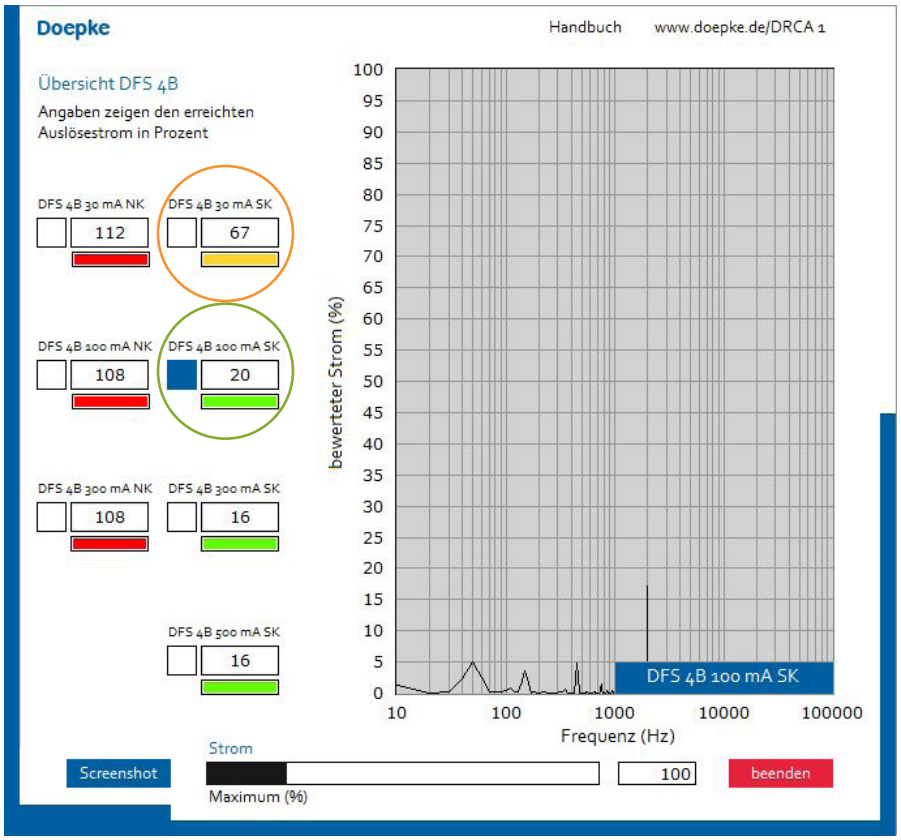


Figure shows the assessed signal analysis with traffic light symbols

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