Doepke
e.Guard

DETECT AND PREVENT

Intelligent residual current monitoring
with **e.Guard.**
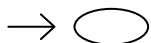
PREVENTATIVE SAFETY

Predictive Maintenance is a central component of Industry 4.0. It refers to proactive maintenance of installations with the goal of avoiding costly failures or damage. It involves the continuous collection of data relating to the condition of the installation.

Doepke e.Guard is a smart, modular system for monitoring the condition of electrical installations. With the help of residual current monitors (RCMs), e.Guard continuously collects residual current data, which provides information about the insulation resistance in the installation. As a result, there is no longer a need for recurring insulation tests in accordance with DIN VDE 0105-100/A1.
This allows for maintenance to be scheduled, for multiple activities to be performed at the same time and for expensive installation failures or serious damage, for example due to fires, to be avoided. This means interruptions can be effectively minimised and downtime costs reduced.

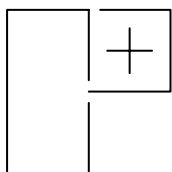e.Guard reduces risks and increases safety for your company.
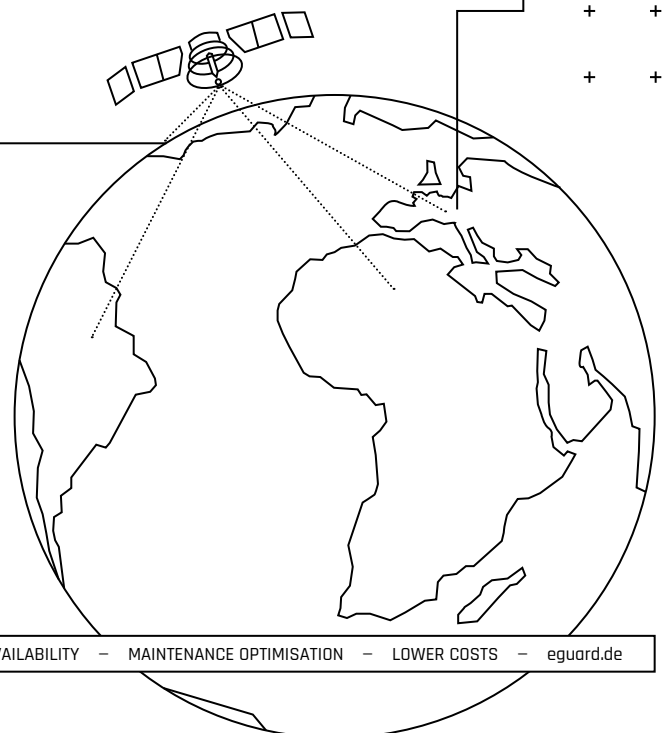
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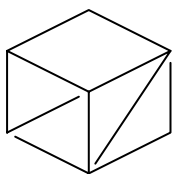
e.Guard IS:

CUSTOMISED

e.Guard is available as either a flexible individual
solution for smaller systems or as a fully
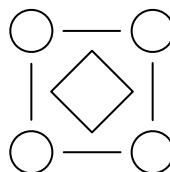integrated element in the system landscape
of more complex systems.

INTELLIGENT

From Level 4 up, e.Guard recognises and
learns individual residual current patterns
of the installation during operation.
This allows maintenance activities to be predicted.

EASY

e.Guard has low requirements
for commissioning.
Usable data are made available quickly.

VISUAL

For analysis and control,
e.Guard offers intuitive dashboards
that are even suitable for mobile devices.
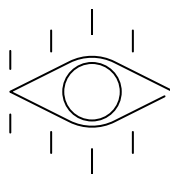
ADAPTS TO
ANY SITUATION

e.Guard gives back the ability to act precisely where it is most needed:
in industrial electrical supply. e.Guard visualises residual currents
and enables targeted intervention in good time.
e.Guard is flexible and protects your installations in accordance with their specific requirements.
A product made by experts.

MODULAR HARDWARE

e.Guard is a product for intelligent residual current monitoring that combines the strengths of sophisticated hardware and flexible software. The number of hardware components and the range of software can be adjusted on a modular basis.

e.Guard GATEWAY

› DIN rail device as an interface for local and cloud-based data recording and storage

SMART RCMs

FOR THE MOUNTING PLATE

› AC-DC sensitive (Type B)
› Integrated evaluation unit
› Detects and evaluates residual currents of up to 30 A in 8 frequency ranges
› Large frequency range of 0 Hz to 100 kHz
› Easy commissioning and straightforward power supply via Ethernet interface (PoE)
› Two adjustable potential-free contacts, e.g. for triggering alarms and switch-off
› Available with an internal diameter of 35 mm or 70 mm

FOR THE DIN RAIL

› Mixed frequency sensitive (Type F) or AC-DC sensitive (Type B)
› Type B: detects frequencies from 0 to 100 kHz in 8 frequency ranges
› Type F: detects frequencies from 10 to 100 kHz in 7 frequency ranges
› Integrated evaluation unit
› Detects and evaluates residual currents of up to 3 A
› Easy commissioning and straightforward power supply via Ethernet interface (PoE)
› Two adjustable potential-free contacts, e.g. for triggering alarms and switch-off

FLEXIBLE SOFTWARE

The e.Guard software visualises, stores and documents the recorded residual currents.
Depending on which e.Guard level is selected, the possibilities range from a lean piece of software
for continuous installation monitoring through to an intelligent, self-learning complete solution that
is based on machine learning modules and is individually tailored to your needs. The software runs
locally or in the cloud, depending on the level.
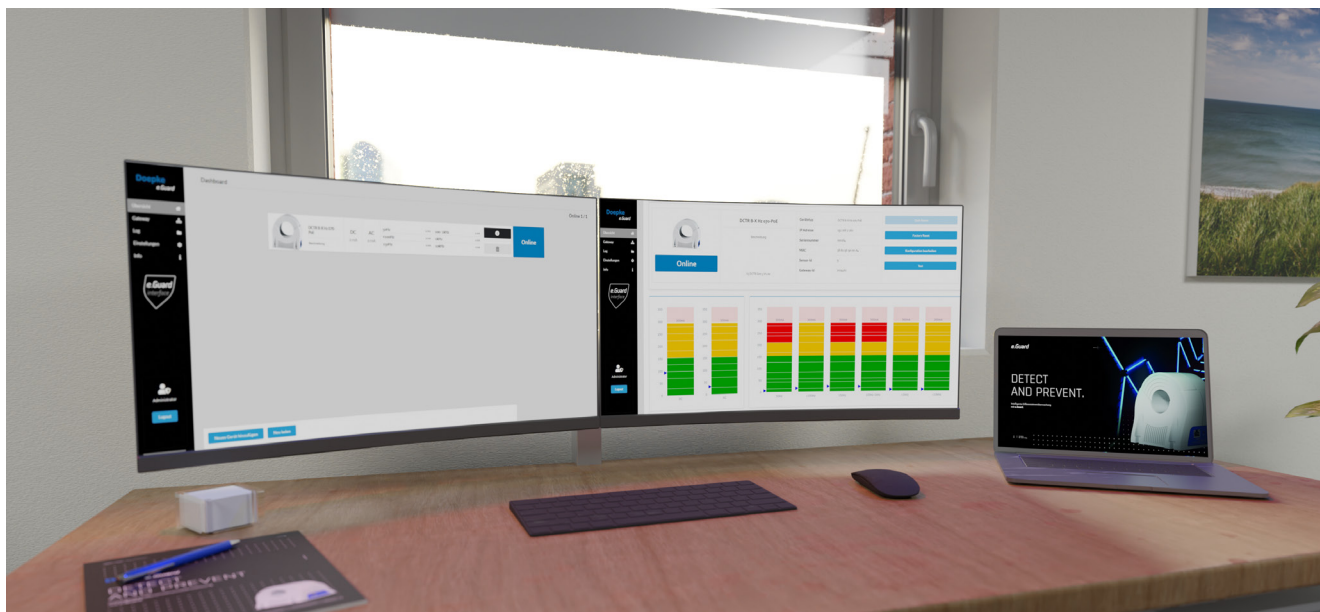
THE FIVE LEVELS WITHIN THE
e.Guard SYSTEM

There are five levels within e.Guard to choose from depending on the desired scope of performance.
This can involve using either tried-and-tested standard components or customised solutions. The spectrum
ranges from proven hardware combined with streamlined software, to continuous monitoring, to intelligent,
self-learning complete solutions based on machine learning modules.

| *basic*	*expertise*	*cloud*	*advance*	*excellence*
Level **1** of 5	Level **2** of 5	Level **3** of 5	Level **4** of 5	Level **5** of 5

e.Guard

basic – Level ONE of 5

SAVE TIME WHILE MAKING THE BEST POSSIBLE USE OF IT: RESIDUAL CURRENT VISUALISATION WITH LOCAL SOFTWARE (WINDOWS) AND DATA RECORDING

e.Guard basic combines smart RCMs with local monitoring software. With level ONE, residual currents are signalled and visualised, and the data is saved on a locally available hard drive, thereby implementing constant residual current monitoring as a substitute for periodic insulation tests.

e.Guard basic offers the following key functions:
› Integration of up to 20 RCMs
› Configuration of the RCMs
› Adjustable threshold values for triggering an alarm and/or switch-off
› Pre-warnings and alarms sent via email
› Reports and logbook
› Data stored and history kept for one year
› Automatic backups and easy data export
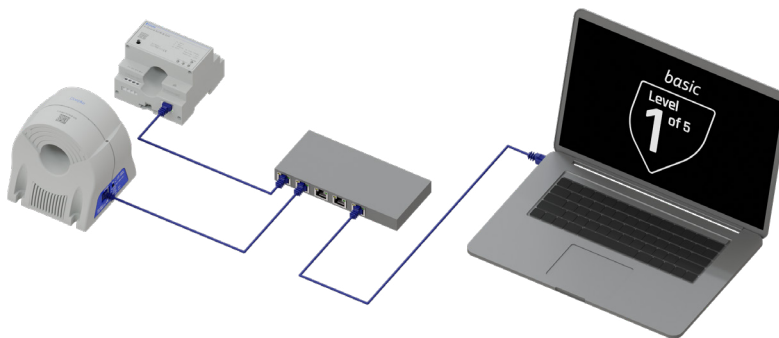
e.Guard

expertise – Level TWO of 5

REPORTING BEFORE SWITCHING: CONTINUOUS MONITORING, ALERTING AND LOCAL DATA RECORDING ON THE e.Guard GATEWAY

e.Guard expertise combines smart RCMs with the e.Guard gateway for data management and software use. With level TWO, you therefore no longer need a PC to store data.

e.Guard expertise offers the following key functions:
› Integration of up to 20 RCMs per e.Guard gateway
› Configuration of the RCMs
› Dashboard can be accessed via any standard internet browser
› Custom thresholds for triggering an alarm and/or switch-off
› Pre-warnings and alarms sent via email
› Configurable reports and logbook
› Data stored and history kept for one year
› Backups and easy data export

Access via browser
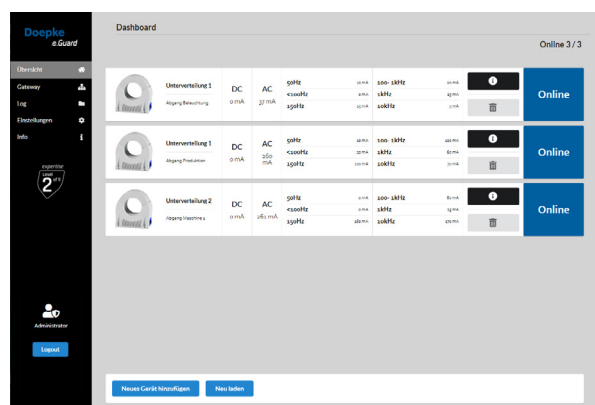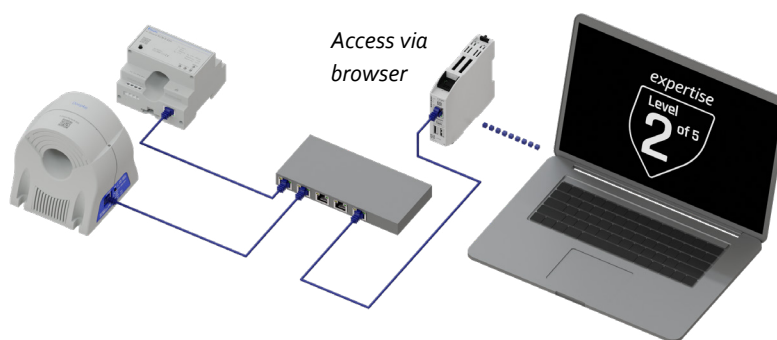
Software e.Guard Interface for Level TWO: Status display of the connected RCMs.

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ALWAYS AVAILABLE: USE SOFTWARE AND DOCUMENTATION ANY TIME, ANYWHERE – WITH THE AUDIT-COMPLIANT e.Guard CLOUD

e.Guard cloud combines smart RCMs with the e.Guard gateway.
You can store data and use the software regardless of your location via the cloud.

e.Guard cloud offers the following key functions:
› Integration of up to 40 RCMs per e.Guard gateway
› Configuration of the RCMs
› Custom alarm thresholds for triggering switch-off and/or an alarm
› Audit-compliant, uneditable, date-stamped data storage in the e.Guard cloud
› Data can be accessed at any time and from anywhere using any standard internet browser
› Pre-warnings and alarms sent via email
› Status map: Visualisation of alarm history
› Data is stored in the maximum possible resolution (one value per second) for a year
  and the history is kept for seven years in a lower resolution
› Configurable reports
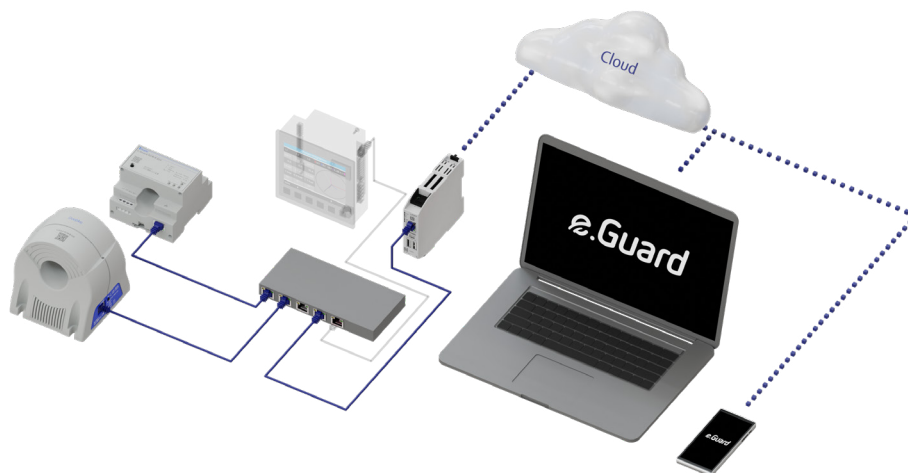
Identification of anomalies in residual current patterns from Level FOUR.
Power Quality Monitoring (PQM) incorporated from Level FIVE.

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advance – Level FOUR of 5

LEARNING AND ADVANCE WARNINGS: CLOUD-BASED, MACHINE LEARNING ASSISTED ANALYSIS OF RESIDUAL CURRENTS WITH A WARNING SYSTEM FOR ANOMALIES

e.Guard advance uses the recorded residual current data together with machine learning methods to predict the future condition/status of the installation.

In addition to the functions of level THREE, e.Guard advance also offers the following key features:
› Machine learning of individual residual current patterns during operation
› Detection and notification of anomalies across all frequency components up to 100 kHz
› Triggers an alarm if the threshold value is exceeded and if anomalies are detected
  in the residual current, e.g. creeping insulation faults, deterioration of EMC filters

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excellence – Level FIVE of 5

THE RESPONSE TO DYNAMIC RISKS: A TAILORED SOLUTION FOR EVERY INSTALLATION WITH ADDITIONAL MEASURED PARAMETERS

e.Guard excellence is the individually tailored solution for predictive maintenance in relation to complex industrial installations.

In addition to the functions of levels THREE and FOUR, e.Guard excellence also offers the following key features:
› A solution geared specifically towards the customer's requirements
› Tailored machine learning meta data matched precisely to your needs
› Customisation of the hyperparameters (which are required to control the
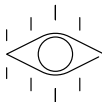 machine learning training algorithm)
› Customised interfaces with insurance providers and ERP systems, cloud-to-cloud interfaces

Screenshot from the e.Guard interface for Level FIVE.

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A COMPARATIVE LOOK AT
e.Guard LEVELS

	LOCAL		CLOUD		
	basic Level **1** of 5	*expertise* Level **2** of 5	*cloud* Level **3** of 5	*advance* Level **4** of 5	*excellence* Level **5** of 5
Maximum number of RCMs per software/gateway	20	20	40	40	40
Configuration of the RCMs	+	+	+	+	+
Alarms in the software	+	+	+	+	+
Alarms sent via email	+	+	+	+	+
Alarms	when threshold values are exceeded			when threshold values are exceeded or anomalies are detected	
Machine learning of individual residual current patterns, anomaly detection				+	+
Machine learning based maintenance forecasts				+	+
Custom, customer-specific solution					+
PDF reports	+	+	+	+	+
Data storage and history	1 year*	1 year**	1 or 7 years***		
e.Guard gateway		+	+	+	+
Test run of RCMs via software	Manual	Automatic	Automatic	Automatic	Automatic
Data storage	Local (Windows PC)	Local (gateway)	Cloud	Cloud	Cloud
Data access	Local (Windows PC)	Local (browser)	Online	Online	Online
Incorporation of power quality components					+
User	Up to 3 users	Up to 5 users	Up to 10 users	Up to 20 users	Up to 50 users

* last month resolution 1 s = one measurement per second | thereafter resolution 15 minutes
** last month resolution 1 s = one measurement per second | thereafter resolution 1 minute
*** 1 year resolution 1 s = one measurement per second | 7 years lower resolution

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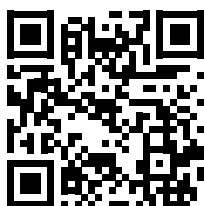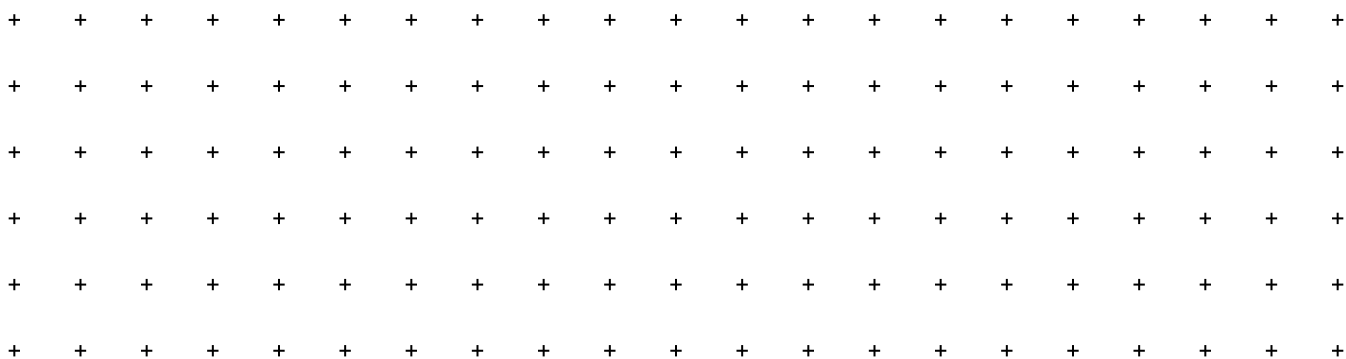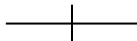
FIND OUT MORE ABOUT e.Guard

*You can find further information, videos and much more
relating to the e.Guard system on our platform.*
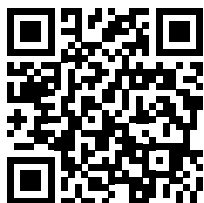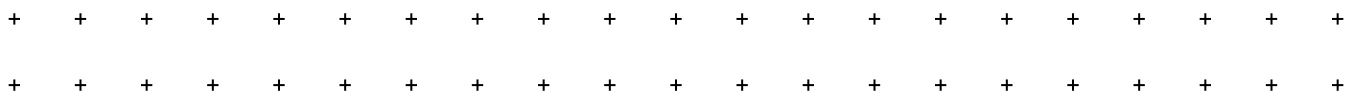
YOUR CONTACTS

*We work with you to develop
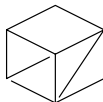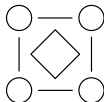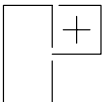the right e.Guard for your installation.*

Doepke
e.Guard

PRODUCT SELECTION

› e.Guard RCM B 070: 09344947

› e.Guard RCM B 035: 09344937

› e.Guard RCM B 025: 09344367

› e.Guard RCM F 025: 09346367

› e.Guard gateway: 09344989

› Software: selfadmin.eguard.systems

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