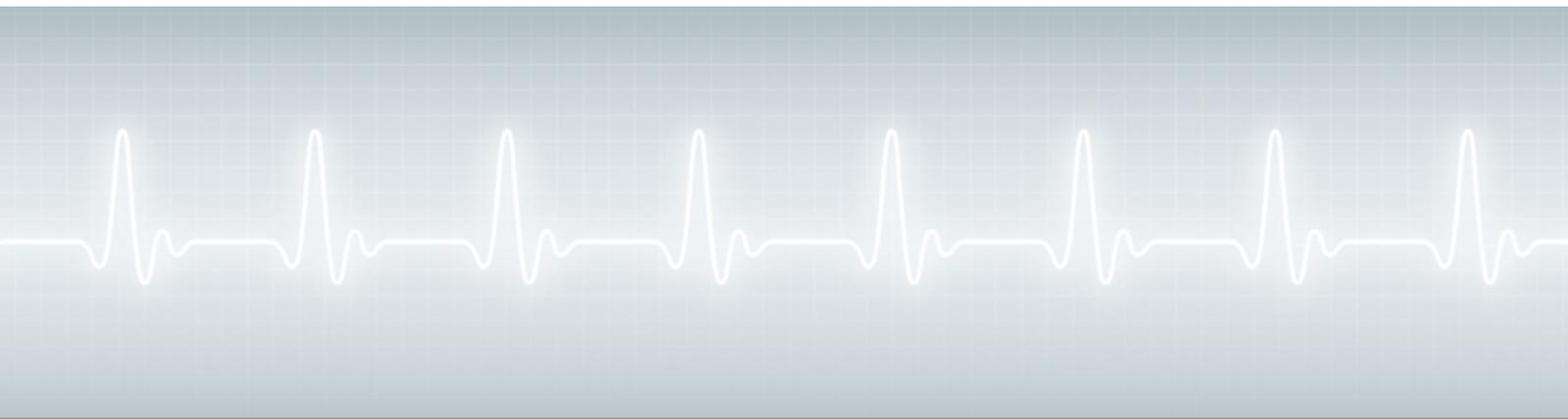


KRIWAN Condition Monitoring



**Extensive protection, efficient regulation, and diagnosis
for machine operators and manufacturers**





Extensive machine protection: Efficiency + safety through condition monitoring

With its expertise, experience, and exceptional product quality, KRIWAN has been the leader in protecting industrial machinery and systems against overload and breakdown for almost 50 years.

Ongoing condition monitoring of machinery and systems pays off – the operator receives continuous information about whether the system is functioning smoothly and if operating conditions or environmental effects may pose a risk to the machine and has the ability to carry out analysis of disturbances. Repair and maintenance work can be coordinated at an early stage and perfectly in line with the production plan.

Accordingly, the condition monitoring system needs to be extremely reliable and must be able to respond quickly. Appropriate measuring points and sensors that specifically monitor the key parameters of processes, machinery, and systems are therefore required. KRIWAN motor-protection relays enable intelligent condition monitoring and increase safety and machine efficiency.

Extensive condition monitoring enables the detection of machine stress and thresholds for reliable operation. This enables condition-based maintenance and helps to prevent the need for spontaneous repairs, as well as reducing maintenance costs and improving system availability.

Machine protection through condition monitoring

- + Preventive maintenance
- + Detection of critical conditions
- + Increased availability
- + Reduction of unplanned downtime
- + Longer lifespan
- + Quick implementation
- + Seamless documentation of machine condition



CONDITION



KRIWAN condition monitoring – tailored solutions

Together with its customers, KRIWAN develops a tailored solution for extensive condition monitoring in three simple steps:

- » Selection of appropriate sensors and measuring points
- » Development of modules that combine protection and regulation
- » Setup of diagnosis software

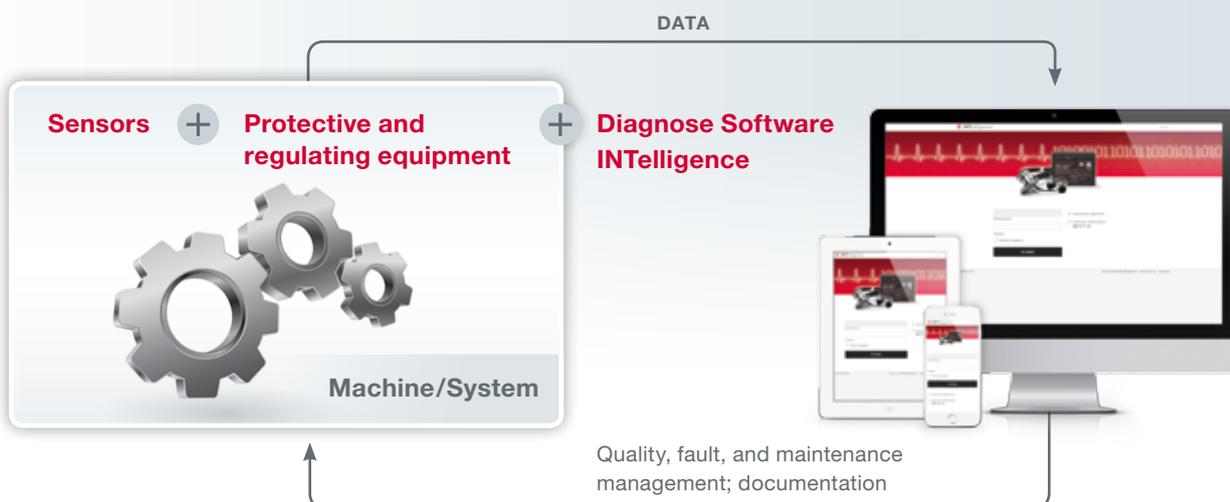
The machine and system data is saved on the device and can be accessed at any time, both locally and throughout the world. The INTelligence software enables detailed analysis and diagnosis of the system data.

The KRIWAN system is a modular solution. It monitors and protects selected parameters, secures processes, and regulates components or the entire system.

Our protection concepts for your applications

- Pumps
- Transformers
- Compressors
- Lifts
- Cranes
- Conveyor belts
- Ventilators
- Shearing machines
- Presses
- Drills
- Mills
- ...

The KRIWAN condition monitoring concept



MONITORING_10110110110110



Tailored sensors, protection, and regulating equipment

Precise measuring data is necessary to provide comprehensive protection. The modules monitor a large number of parameters on an ongoing basis. In order to respond more quickly and more comprehensively, intelligent algorithms also take current trends into account as part of the evaluation.

KRIWAN devices are designed for decentralized operation directly at or in the machine. Consequently, they are very compact and robust and can reliably withstand stresses such as extreme temperatures and vibration. The design of sensors and devices can be adapted to the requirements of specific applications.

The electronics are configured according to customer specifications and are supplied already configured. This means that the system can be put into operation immediately by the end customer and it is also secured against incorrect configuration or manipulation.

Approvals granted

KRIWAN components can be provided with the following approvals:

- ATEX
- VDE
- UL/CSA
- Sil1 or Sil2

Monitoring of physical parameters

The definition of appropriate measuring points and the correct configuration of sensors and protective and regulating equipment are critical for successful condition monitoring. KRIWAN sensors monitor a wide range of physical variables:

Temperature

- Engine, bearings, surfaces, media
- PTC, Pt100, Pt1000, NTC, KTY, PTC+

Fluid

- Differential pressure
- Pressure
- Foreign fluids
- Dry running
- Conductivity

Network

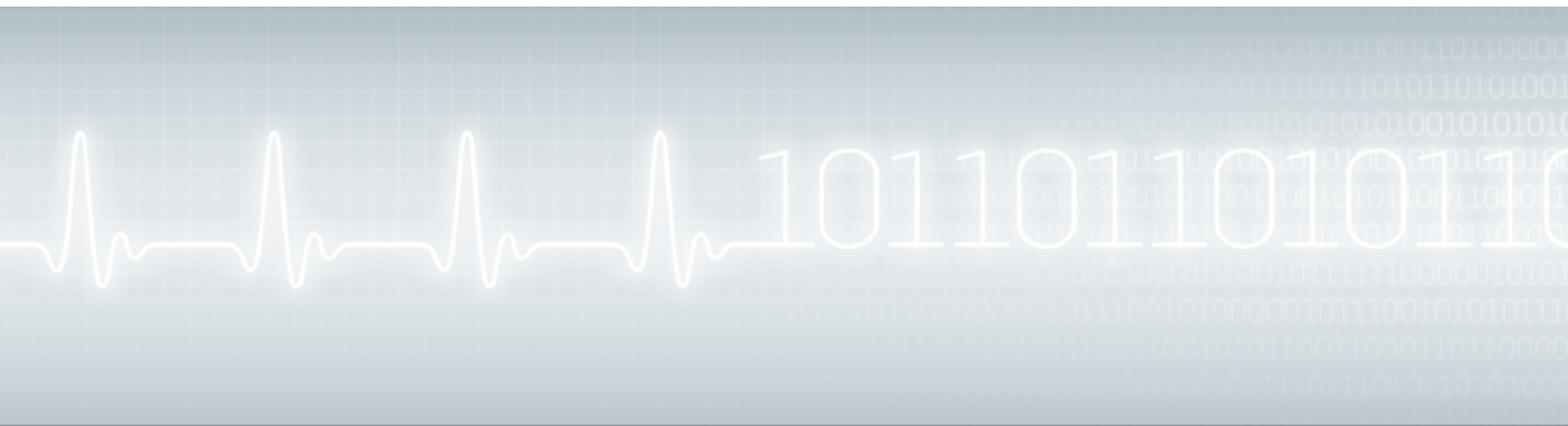
- Power
- Voltage
- Frequency
- Rotary field
- Rotational direction
- Phase imbalance

Operating data

- Runtime and duration
- Frequency of operation
- Error shutoffs
- Sensor monitoring



Examples of KRIWAN sensors and protective and regulating equipment



For clear analysis: Clear visualization with INTelligence software.

Diagnosis technology enables direct access to system data as well as detailed analysis. The compiled data can be accessed locally at any time via USB cable with the INTspector app or anywhere in the world using any Web-enabled device.

The INTelligence Diagnose Software clearly visualizes the parameters and enables simple and quick interpretation of switching cycles, runtimes, temperatures, and other parameters. The error messages collected help to acquire further information about the condition of the system. With the aid of documented long-term data, significant changes as a result of wear or other causes can be detected at an early stage based on trend progressions.

Through specific diagnosis, problems can be addressed at a very early stage, thus preventing shutdowns, damage, and even total failures.

Benefits at a glance

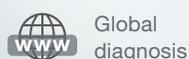
- Web-based software – can be used on any end device without the need for installation
- Visually presented data
- Simple, intuitive operation
- Simple diagnosis for rapid problem solving
- Information about errors and their frequency
- Access to operating data and long-term trend curves
- Access to data sheets
- Can be adapted to specific user requirements

KRIWAN Diagnose Software

Machine/
System



➤ **Diagnose Software
INTelligence**

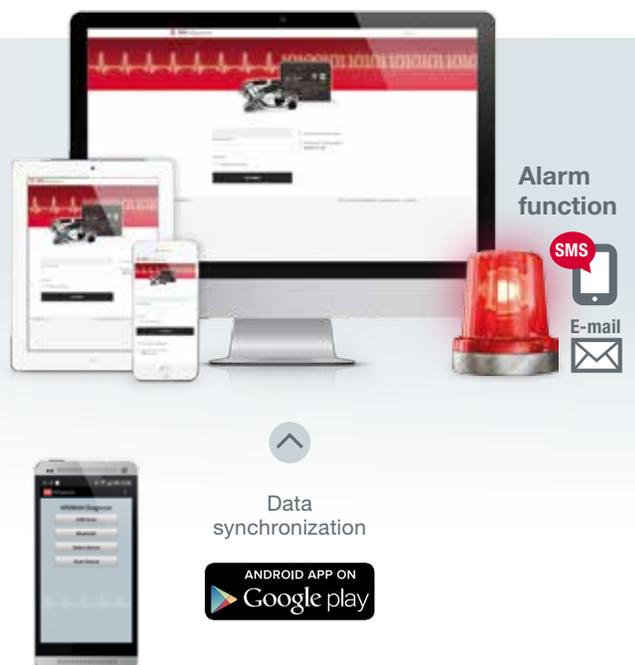


Global
diagnosis

➤ **Diagnose App
INTspector**



On-site
diagnosis



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