KONČAR
Electrical Engineering
INSTITUTE

tradition. knowledge. responsibility.

ADVANCED CONDITION MONITORING SYSTEMS FOR ROTATING MACHINES

www.koncarmonitoring.com

Importance of predictive maintenance

Condition monitoring brings value in many areas of business

Preserving investment value, reducing costs and increasing production revenue are the goals of every plant operator. With constant pressure on the machines to produce more, failures occur more often and continuous production process is jeopardized. Introducing a proper machine monitoring system is the first step towards operational improvements on a daily basis.

Timely detection of problems prevents serious machine damage and in financial terms brings substantial savings. When predictive maintenance is accepted and used across the entire organization, the results impact many areas including profit and loss figures. The research shows that maintenance represents fully 15% - 40% of the operating cost of a plant and up to 35% of these costs is unnecessary. Whether it is installed on new equipment or during a refurbishment phase, the costs of predictive maintenance program are minor compared to the benefits that such program brings.

SHUTDOWN PLANNING	Maintenance shutdown can be scheduled when it is convenient for the organization.
OPTIMIZED WORKLOAD	Maintenance activities are optimized thanks to the data availability and resource utilization.
DAMAGE AVOIDED	Extensive damage resulting from sudden failure can be avoided.
LOWER REPAIR TIME	Repair time can be minimized, which results with reduced machinery downtime and higher equipment availability.
CLEAR PROBLEM SOLUTION	The system identifies the nature of the problem while expensive approaches are eliminated.
JUST-IN-TIME MAINTENANCE	Maintenance periods can be planned when they are needed and not only for preventive purposes.
INVENTORY AVAILABILITY	Lower inventory levels required for spare parts that may not be always available, or are simply too expensive.
DATA COLLECTION	Quick, efficient and immediately processed data brings time savings and better of flow of information in the organization.
SHORT PAYBACK PERIOD	With capital failures prevented, payback period is achieved in a very short period of time.
ENVIRONMENTAL AND PERSONNEL SAFETY	Having a system that alarms users when big faults occur means protecting the area from accidents and injuries.

Who we are

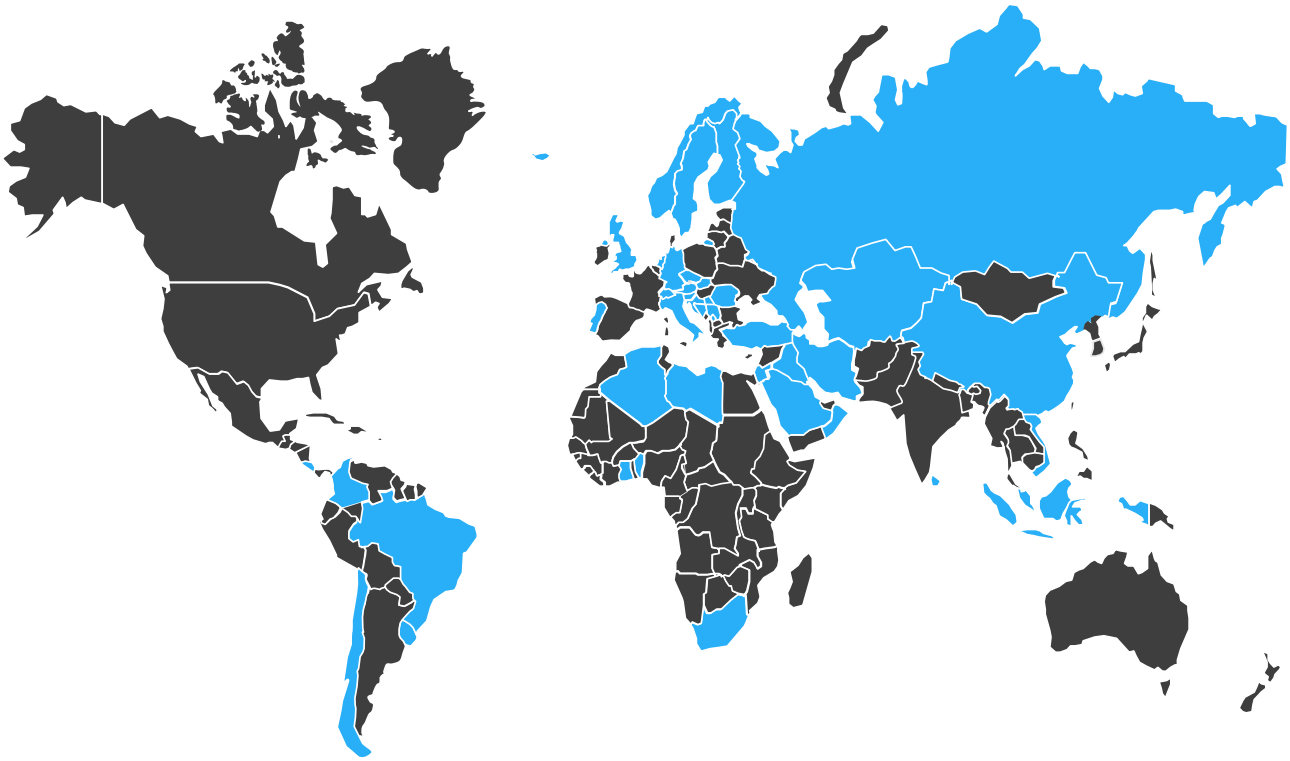
60 years of know-how in rotating machines & energy field

Helping our clients to solve their problems and increase their productivity has been motivating us since the first day. Located in Zagreb, Croatia, as a part of KONCAR Group, we develop products for applications in hydro, wind, process industries and other areas.
Our passion for new and innovative products is motivating us to grow and create value for our clients. With our educated and experienced team, we extend the lifetime of most complex equipment and solve problems that others can't. Because of our expertise and flexibility we are a preferred supplier of many international companies in power generation and energy sector.



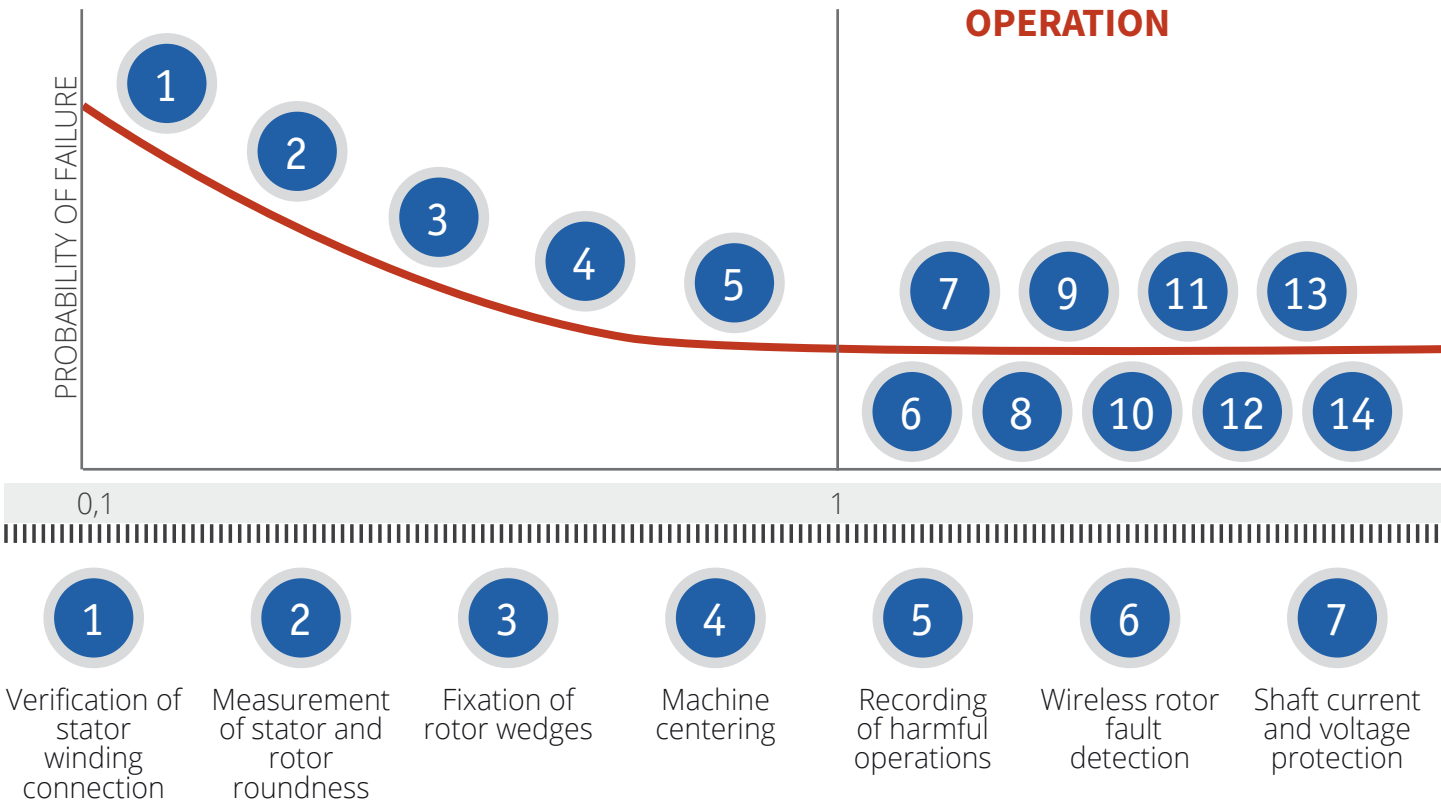

Worldwide recognized and implemented

More than 20 GVA monitored with our solutions!



Solutions that save money and time

Recognizing different needs of your machine during its lifetime is the first step towards fault-free machine operations. From the early stages of production to commissioning, regular usage, and maintenance, our solutions help to identify and prevent most common rotating machine problems. The technology behind them makes sure that all market players perform their tasks efficiently and achieve their goals.



MACHINE PRODUCTION → INSTALLATION AND COMMISSIONING → PLANT AND

INDUSTRIES COVERED

- Hydro
- Water & Wastewater
- Process
- Energy
- Wind
- General industry

TARGET USERS

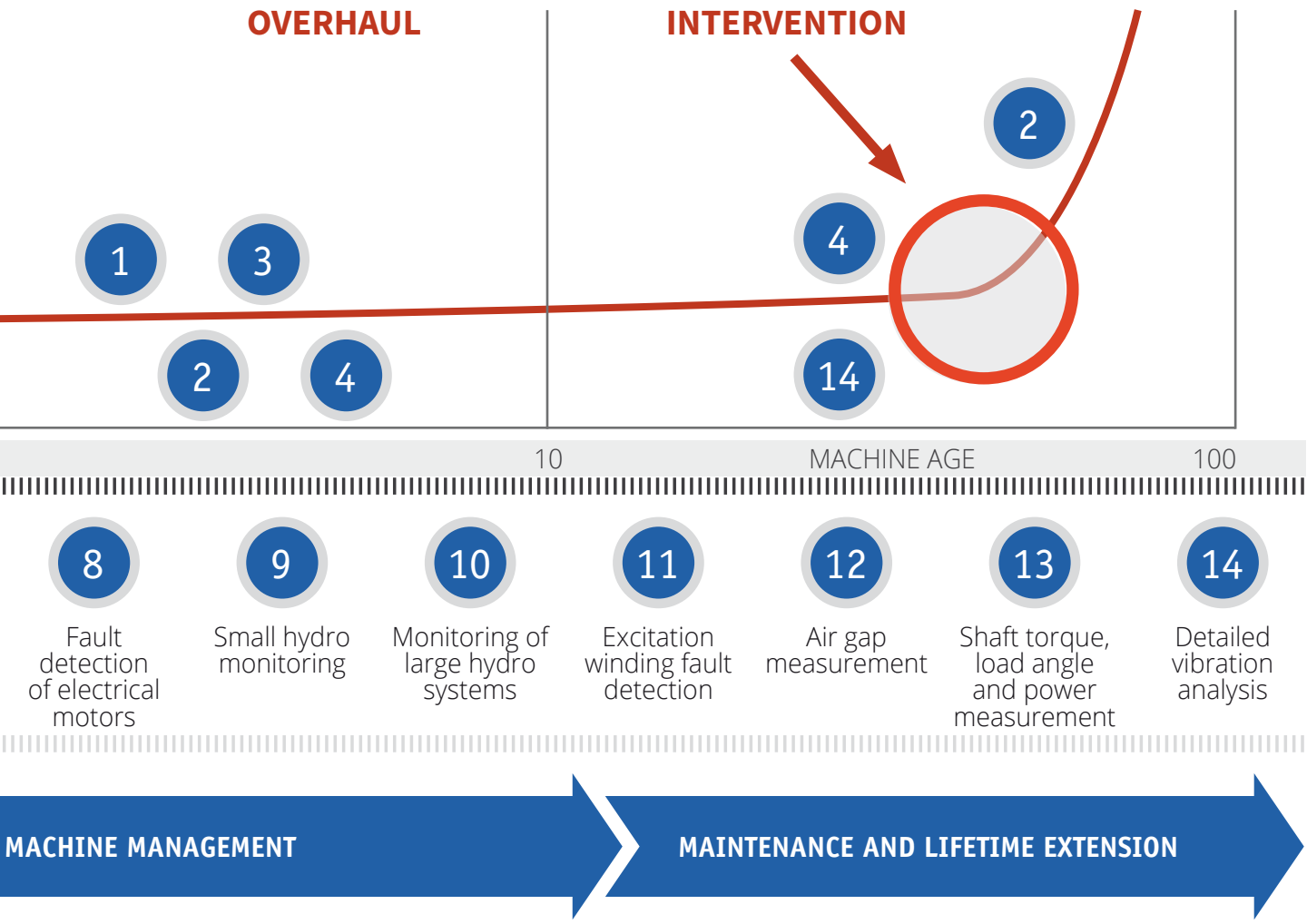
- Producers, OEMs
- System integrators & turn-key companies
- Site operators
- Maintenance experts

APPLICATION

- Synchronous and induction machines
- Hydro and turbo generators
- Medium & high voltage motors

Right products for right customers at the right time

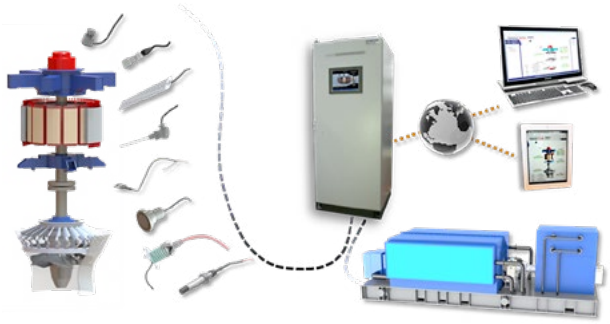
The machine lifetime has a well-known scenario – after the initial critical phase before the machine is commissioned, the probability of failure increases with its age, until faults suddenly start to appear more and more. Identifying problems on time will assure that the machine value is preserved and its lifetime extended.



MONITORING AND INSTRUMENT SCOPE

- Vibrations
- Relative shaft displacement
- Temperature levels
- Process values (current, voltage)
- Magnetic field
- Air gap
- Speed of rotation
- Torsion of mechanical parts
- Partial discharges
- Any other value (e.g. hydraulic values, load angle)
- Stator and rotor roundness
- Operational asymmetries
- Machine centering
- Winding damages
- Stator winding connection

Stationary monitoring solutions



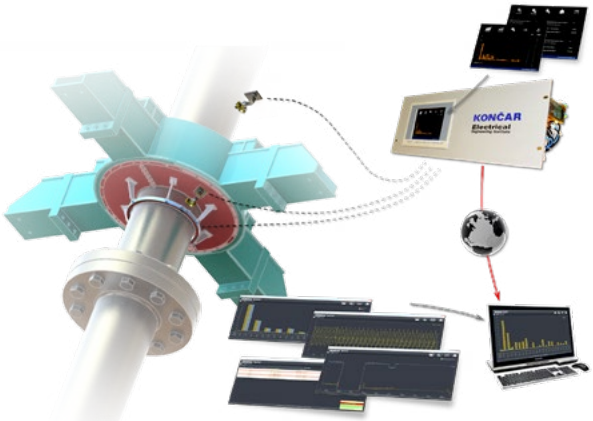
Machine condition monitoring (MCM)

MCM is a modular solution applicable to power plants and machines of all sizes. It allows integration of key values and equipment according to customers' requirements enabling full insight into machine operations.

INDUSTRIES	TARGET USERS	APPLICATION	MONITORING SCOPE

Shaft current and voltage protection (SCVP)

SCVP detects shaft currents and voltages that may damage the generator bearings and thus prevent greater economic damages. The know-how built in the system protects expensive machines from one of the major generator damages.



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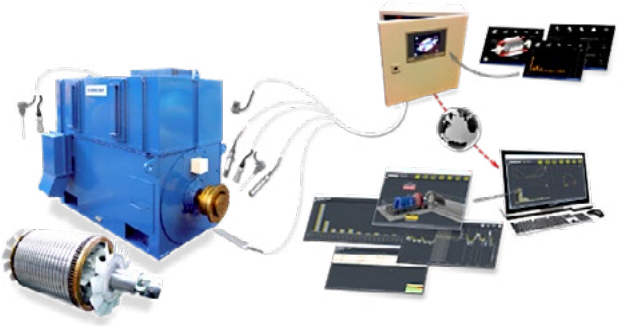


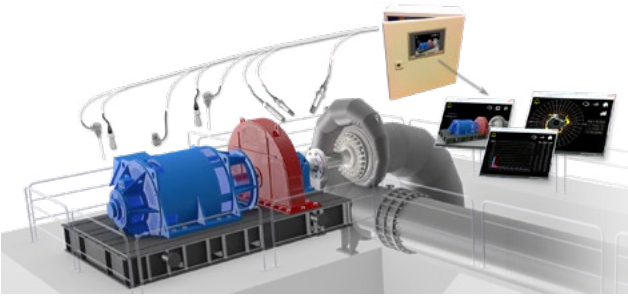
Expert motor condition monitoring (EMCM)

EMCM provides users with crucial information for integrated and smart motor management. The solution uses advanced methods for early fault detection of key motor parts, minimizes maintenance costs and saves a lot of resources especially in process-intensive industries.

INDUSTRIES	TARGET USERS	APPLICATION	MONITORING SCOPE

*The meaning of the symbol is stated on pages 4-5

Installed for the permanent period, these solutions allow users to have continuous access to key elements of their equipment and optimize their maintenance periods.



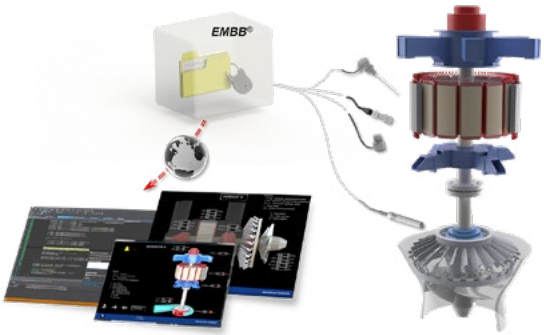
Small hydro condition monitoring (SHCM)

SHCM is a compact solution designed for small hydro plants of all types and age. It targets the most important elements of the operation and allows efficient and cost-effective monitoring of plants located in rural areas.

INDUSTRIES	TARGET USERS	APPLICATION	MONITORING SCOPE

Electrical machine black box (EMBB)

EMBB records machine issues that allow manufacturers to get insight into conditions caused by user mishandling (asynchronous operations, number of machine starts and stops, run-out, extensive vibrations, etc.). This important information helps producers to protect themselves from penalty fees which are not caused by their product.



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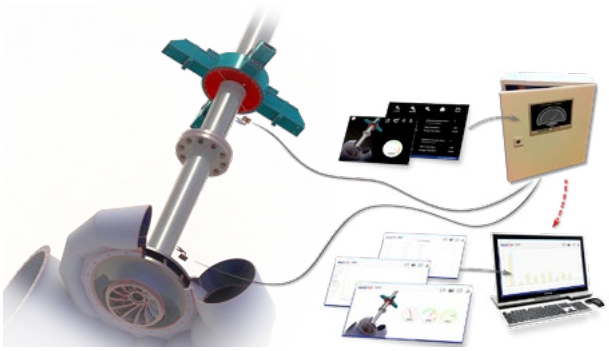
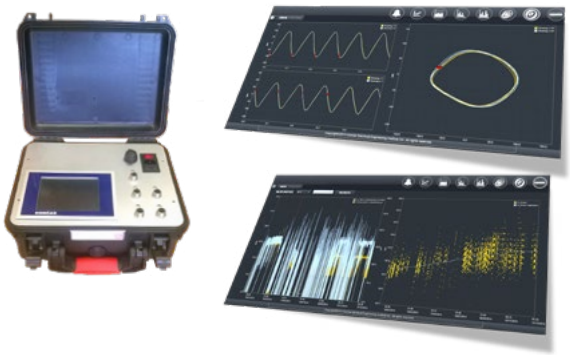


Shaft torque and power monitoring (ST&P)

STP gives the complete picture to users by monitoring torsional vibrations which lead to major machine damage and thus cause financial losses. The system can also be expanded with advanced measurements of machine efficiency and load angle, which is especially important in hydropower and ship industry.

INDUSTRIES	TARGET USERS	APPLICATION	MONITORING SCOPE

Portable monitoring and diagnostic instruments



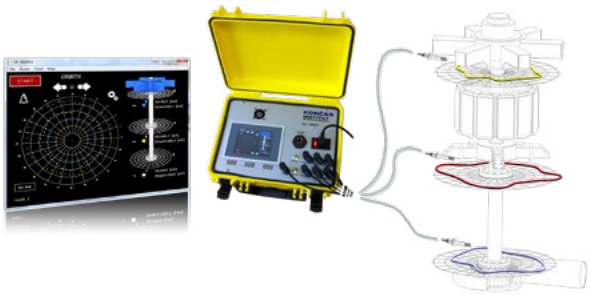
Vibration measurement instrument (VMI)

VMI is a user-friendly instrument made for rugged field applications with the focus on radial and axial bearing vibration measurements according to norms and standards. Equipped with a fast and reliable processing unit, the system integrates various advanced options for quick and effective data management.

INDUSTRIES	TARGET USERS	APPLICATION	MONITORING SCOPE

Slow-roll runout instrument (SRI)

SRI instrument measures mechanical imperfections such as out-of-roundness and non-concentricity of the shaft. It gives insights into runout imperfections values that have to be regulated according to standards in order to assure stable generator operations.



INDUSTRIES	TARGET USERS	APPLICATION	MONITORING SCOPE

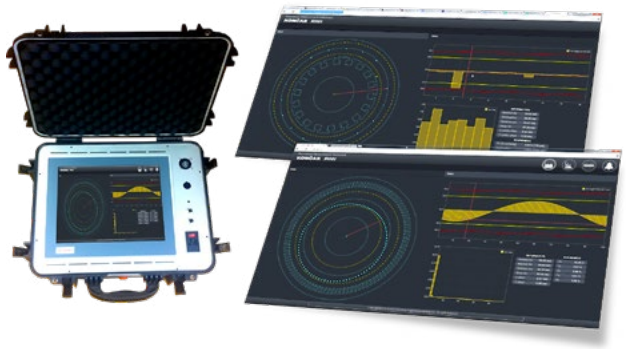
Instrument for winding fault detection (WFD)

WFD provides real-time information on excitation winding failure, which is one of the biggest problems of hydro generators. Using advanced technology for fault detection of the severe problem, the instrument is a crucial equipment for all professionals trying to avoid production shutdowns.

INDUSTRIES	TARGET USERS	APPLICATION	MONITORING SCOPE

*The meaning of the symbol is stated on pages 4-5

Portable instruments can be used with multiple machines when needed during the production, commissioning, and maintenance – perfect when time and money are limited factors.



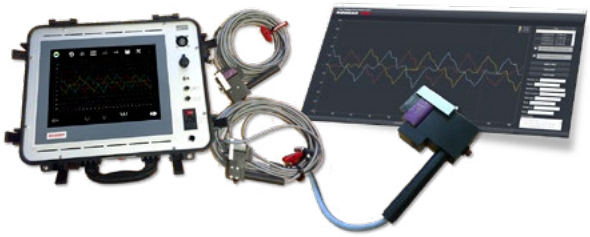
Roundness measurement instrument (RMI)

RMI instrument significantly saves time during the machine production. The system measures important stator and rotor values regulated by norms, using methods that eliminate time-consuming process.

INDUSTRIES	TARGET USERS	APPLICATION	MONITORING SCOPE

Field measurement instrument (FMI)

FMI helps during the machine production by detecting issues related to the incorrect connection of stator windings and by making easier on-site modifications and repair. With simple installation and clear and actionable readings, machine production is quicker and testing time shorter.



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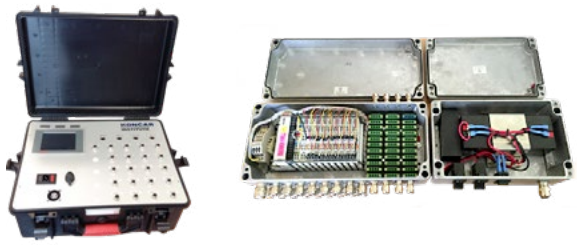

Custom specific instruments

Custom specific instruments are designed to focus on values most relevant to the users. The solution platform integrates most important functions for the field usage and can be adapted to almost any kind of application. Up to 50 output channels can be configured to monitor special machine elements such as rotor faults, partial discharges, air gap, shrink fit, machine efficiency, etc.

INDUSTRIES	TARGET USERS	APPLICATION	MONITORING SCOPE

Actionable monitoring with smart tools

With our set of tools we make sure that results obtained from the machines are used to effectively plan maintenance periods, increase revenue and reduce maximally the number of machine faults.

CLOUD INTERFACE SOFTWARE

Access to web application from any computer in the world. No special installation software, free of charge for additional users, no expensive investment.

INTEGRATION OF MULTIPLE MACHINES AND KEY VALUES

Our modular platform allows multiple machine integration to a single interface. All critical applications and their values can be monitored from one place.

SMART TRENDING

The unique feature uses advanced algorithms that predict point when a failure will occur, which makes it ideal for optimized maintenance planning.

ADVANCED FAULT DETECTION

Using our in-house method we detect failures at early stage and focus on critical machine part with no special diagnostic equipment required.

CALCULATION OF MACHINE EFFICIENCY WITH CONTROL FUNCTION

State-of-the-art knowledge built in our system allows calculation of machine efficiency and usage of real time information to set machine inputs resulting in maximized production output.

AUTOMATICALLY GENERATED REPORTS

With automated reports key stakeholders get tailor-made insight into machine status, which significantly saves their time.

Full range services for your machine

Our premium services cover all of your needs. From training to diagnostic of all types of rotating machines, our experts are dedicated to help you fulfill your objectives and save resources.

TRAINING

We organize on-site and remote training on rotating machines and on how to save resources with condition monitoring.

EXPERT SUPPORT

Our team is available to support you in all phases of machine life cycle – from solution design to implementation and interpretation of results.

DIAGNOSTIC SERVICES

The scope of our work covers visual inspection, tests and diagnostics and condition prediction. This includes on- and offline tests, as well as testing before, during and after the overhaul.

EQUIPMENT LIFETIME ESTIMATION

Thanks to our knowledge and experience we use advanced methods to estimate machine lifetime with respect to its design, operations and condition.

R&D

During the past 20 years we have been involved in more than 700 generator and 7000 motor projects. FEM and CFD calculations, dynamic effects, motion and real material properties are some of the skills we implement in rotating machines.

PROCESS OPTIMIZATION

No matter what your goal is – equipment protection, cost reduction or process improvement, we help you to achieve more and increase your productivity.

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Contact us for more information!

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