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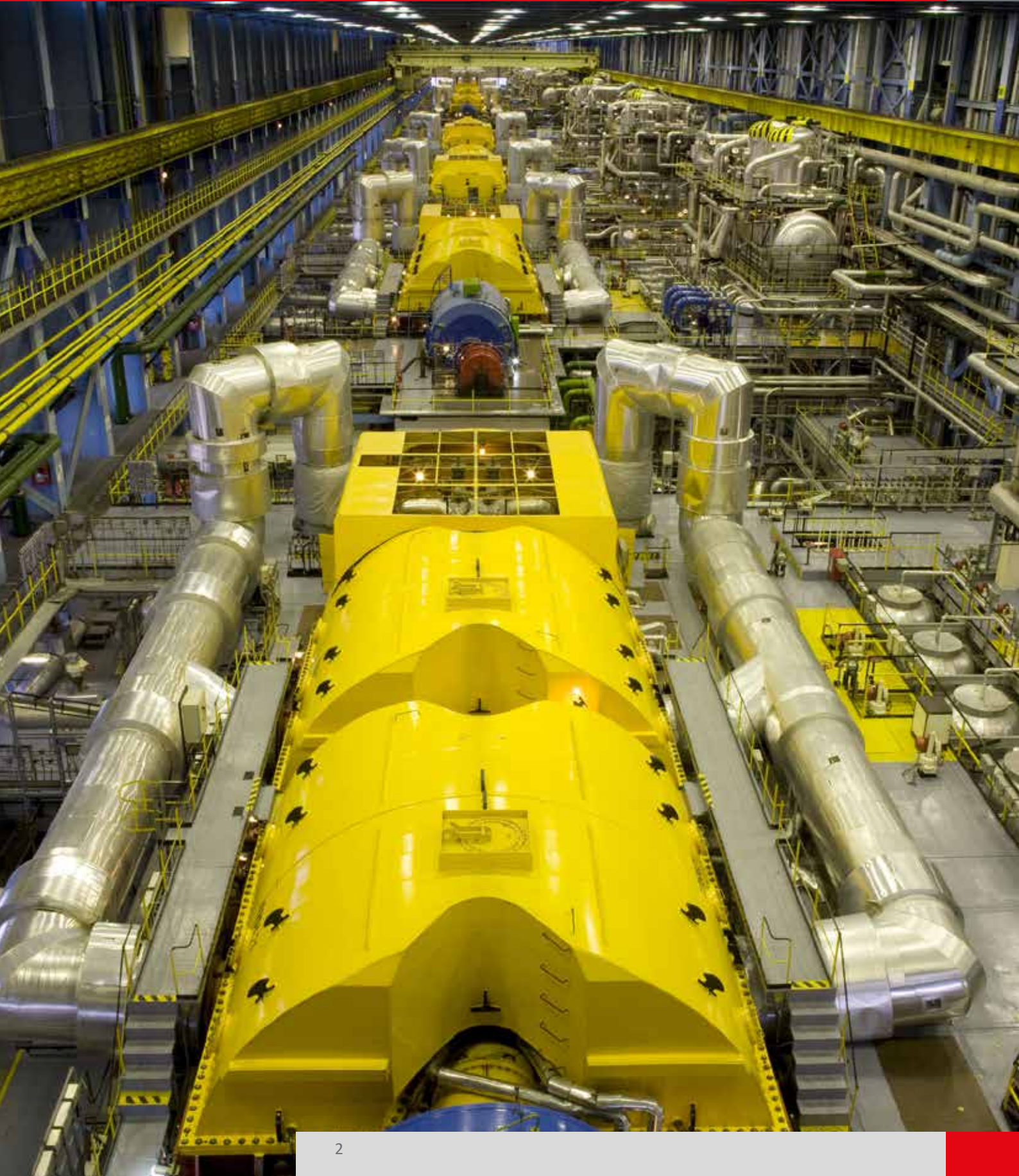


## Condition Monitoring for single machines and complex assets





# Welcome to the World of PRUFTECHNIK Condition Monitoring



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# Condition Monitoring

## All advantages at a glance

Increase profit by:

- ▶ Detecting early damage
- ▶ Optimizing repair work planning
- ▶ Increasing machine availability
- ▶ Reducing spare parts storage costs
- ▶ Avoiding unplanned loss of production

Protection of workers and equipment by:

- ▶ Avoiding secondary damage
- ▶ Minimizing failures and accident risks

Environmental protection by:

- ▶ Extending service life
- ▶ Reducing electricity consumption

## More than just simple machine data collection!

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VIBSCANNER® 2  
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VIBXPERT® II  
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SONOCHEK®  
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VIBGUARD® IIoT  
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OMNITREND® Center  
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OMNITREND® Asset View  
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# This is how condition monitoring works

The secret is predictive maintenance

Predictive maintenance continuously monitors the condition of machines and systems with the help of sensors and powerful software. As soon as there are significant changes in the data trend, actions should be taken. In contrast to reactive maintenance, predictive maintenance allows you to pro-actively plan equipment downtime, minimizing interruptions and conserving resources.

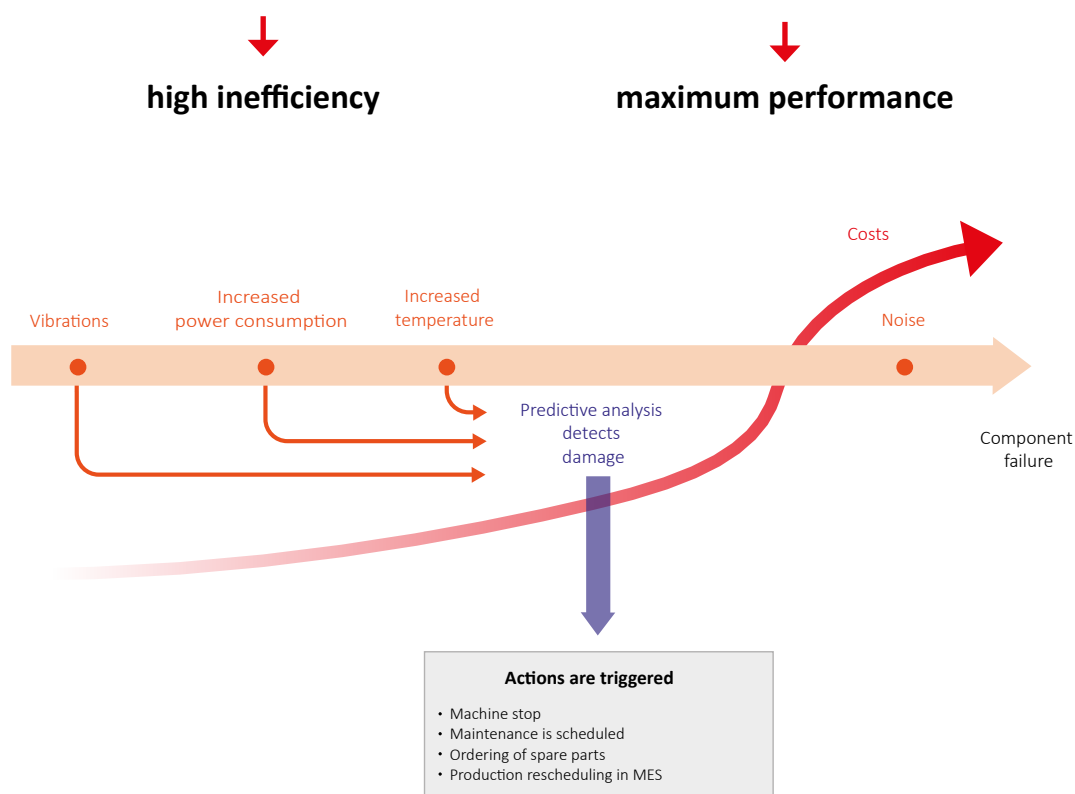
→ **Act, don't react!** ←

Without condition monitoring

- ▶ Strong vibrations, heat, and noise
- ▶ Rotor imbalance
- ▶ Bearing damage and failure
- ▶ Premature wear of components such as gears and bearings
- ▶ Loss of production and unplanned downtime

With condition monitoring

- ▶ Early detection of machine problems
- ▶ Eliminate the causes of failure
- ▶ Reduce vibrations and heat
- ▶ Higher machine availability and system safety
- ▶ Reduce operating and maintenance costs





# Condition Monitoring in Industry 4.0

Do you speak “IIoT”? We do!

The “Industrial Internet of Things”, IIoT for short, massively changes the maintenance of the present and the future. PRUFTECHNIK is ready with the right solutions for the future!

With IIoT, sensors control and influence machine behavior in such a way that human interventions are often no longer necessary. Asset controls are stored on external servers, so-called clouds, and connected to the sensor measurement data. Intelligent software enables asset optimization for maximum productivity based on the sensor data. At the same time, the machine data can be called up at anytime from anywhere in the world via the Internet.

- ▶ Global data availability
- ▶ Reduced data transfer volume
- ▶ Optimized machine efficiency



# PRUFTECHNIK IIoT solutions

## Measurement data now available anytime and anywhere in the world

Thanks to the new MQTT interface in our proven condition monitoring systems, all machine data can now be called up via the OMNITREND® Asset View Software - virtually in real time!

The data is transferred using the MQTT protocol via the Internet to the cloud or an online server, making the current data accessible from anywhere in the world. The advantage: No enormous data pools need to be sent. Handy, small data packets are enough.

- ▶ Available in all VIBGUARD® online condition monitoring systems
- ▶ Available for the mobile high-speed data collector VIBSCANNER® 2
- ▶ MQTT Kernel update possible for all VIBGUARD® systems already in use
- ▶ Intuitive traffic light color system in OMNITREND® Asset View
- ▶ Real-time data and trends can be accessed globally

Global machine networking

24/7 availability of machine data

Measurement data transfer via MQTT to IIoT server

Real-time display of measurement data in  
OMNITREND® Asset View

# Vibration analyzer for professionals

## VIBXPERT® II

Unmatched power and performance

- ▶ Versatile
- ▶ Route-based data acquisition, vibration diagnosis, one-level and two-level field balancing, acceptance measurements with machine templates, troubleshooting
- ▶ Powerful vibration analysis e.g., resonance investigations, run-up and coast-down curves, and impact tests
- ▶ High measuring precision and rugged industrial design

The VIBXPERT® II from PRUFTECHNIK is the mobile power package for fast and reliable recording and analysis of machine condition data. After a very short measuring time, the current machine status data is shown. The maintenance expert can analyze the data on site. From the recorded machine condition data, all values can be read that are important for an exact machine condition analysis.

The VIBXPERT® II is used directly on site at the machine, from the machine hall with standard machines to the diesel generator of an oil tanker, or from a bucket excavator to a hydroelectric turbine. There are limitless applications!

- ▶ The standard in mobile industrial machine and asset monitoring
- ▶ On-site data analysis
- ▶ Compatible with OMNITREND® Center software
- ▶ Can be used in all industrial sectors and branches
- ▶ Robust industrial design for the toughest conditions
- ▶ Automatic measurement point detection thanks to the patented VIBCODE® system





# The high-speed data collector

## VIBSCANNER® 2

Complete measurement in just a few seconds

- ▶ Quick – Measurement times up to 4x shorter than the industry standard
- ▶ Easy – Intuitive operation thanks to the graphical user interface
- ▶ All-in-one – Comprehensive data collection at one push of a button

A unique measuring device that even untrained personnel can use to easily and effectively measure machine vibrations on rotating systems. Thanks to its forward-looking measuring principle and data acquisition across three axes with the triaxial sensor, all relevant condition information is recorded with the touch of a single button at a speed that opens up new possibilities. Not only is the VIBSCANNER® 2 a breakthrough in terms of measurement speed and precision, but also through its robustness and its intuitive operating concept.



- ▶ Fastest vibration data collector with triaxial measurement
- ▶ Intuitive user interface and convenient route guidance
- ▶ Uncomplicated data communication
- ▶ Maximum time savings with highest data quality



# MOBILE DEVICES

## VIBXPERT® II Balancer

Professional field balancing

Imbalances on rotating components such as rotors can be detected and eliminated with the VIBXPERT® II Balancer.

- ▶ One- or two-level balancing possible
- ▶ Diverse operating modes for optimum results
- ▶ Upgrade for vibration analysis sold separately



## VIBSCANNER® Ex

Safe data collection in potentially explosive areas

VIBSCANNER® Ex makes data acquisition and vibration analysis safe in potentially explosive environments.

- ▶ Approved for ATEX zone 1
- ▶ Intuitive one-hand operation via joystick
- ▶ Integrated sensors with explosion protection for vibration, rotational speed, and temperature measurements
- ▶ Vibration analysis: FFT spectrum, time signal analysis and recording
- ▶ Shockproof, water resistant housing (IP65)
- ▶ Compatible with VIBCODE transducers with automatic measuring point recognition



## VIBXPERT® Ex

Most powerful vibration analyzer in potentially explosive areas

VIBXPERT® Ex is a powerful signal analyzer with explosion protection for use in a potentially explosive environment.

- ▶ Approved for ATEX zone 1
- ▶ Intuitive joystick operation (left- or right-handed)
- ▶ Fast data acquisition with "trending spectra"
- ▶ Robust aluminum housing
- ▶ Compatible with VIBCODE® sensor
- ▶ Interface to machine protection systems for further analyses

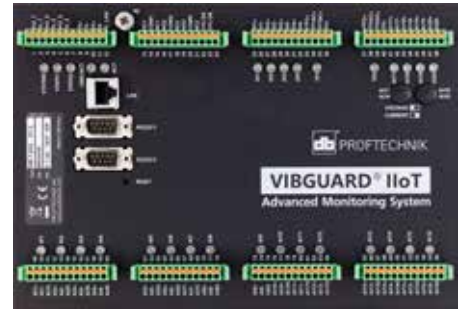




## VIBGUARD® IIoT

Online monitoring on 6, 16, and 20 channels

VIBGUARD® has either 6, 16, or 20 measuring channels which are sampled in parallel and synchronously. This allows even the most complex systems to be continuously monitored and protected against unplanned downtimes. VIBGUARD® IIoT works autonomously and performs the measurement tasks automatically.



- ▶ MQTT interface seamlessly integrates into Industry 4.0 environments
- ▶ Suitable for monitoring standard machines to complex, dynamically operated systems
- ▶ Measures time waveform, characteristic overall values, FFT spectrum, kinetic shaft orbit, and torque
- ▶ Targeted monitoring of imbalance, alignment errors, gear tooth errors, and bearing damage
- ▶ Available with 6, 16, and 20 analog measuring channels

## VIBRONET® Signalmaster

Monitoring of large machinery

Up to 162 measuring points can be installed and entire production areas can be included in the monitoring. The distance between the basic unit and the sensor does not play a decisive role. VIBRONET® Signalmaster is one of the most efficient and cost-effective monitoring systems for large machinery and extensive systems.



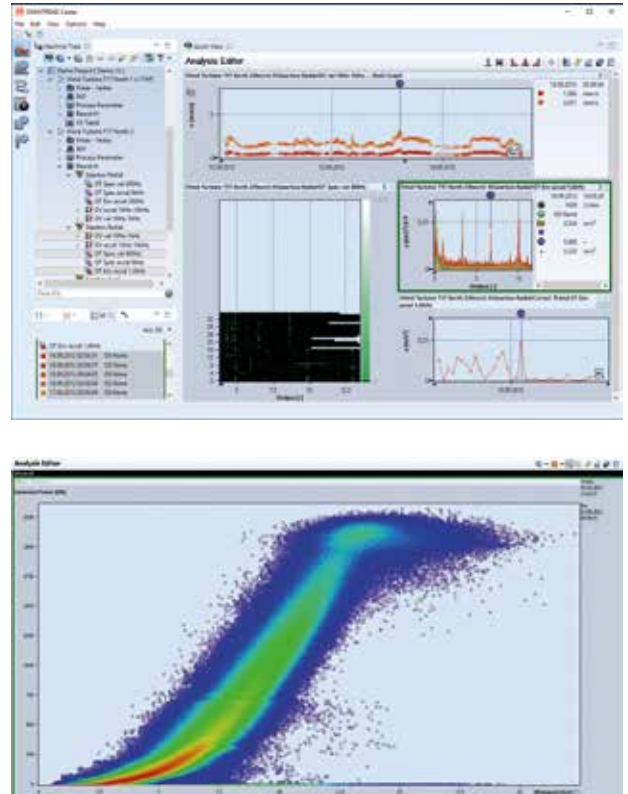
- ▶ Up to 120 vibration sensors with EX protection are possible in ATEX zones
- ▶ Signals are merged via field multiplexer into one line

## OMNITREND® Center

Analysis and reporting of all monitoring data

OMNITREND® Center is the central software for the PRUFTECHNIK mobile measuring devices and online condition monitoring systems. Straight-forward measurement configuration, central data management, structured archiving, powerful analysis, and reporting. OMNITREND® Center gives you all the features you expect from an intuitive software platform that is also easy to use, greatly reducing training time.

- ▶ Status display of the monitored machinery and equipment
- ▶ Interactive reporting function in HTML format with links to findings, work and measurement results
- ▶ Tools for dependency comparison of different measured values (XY plot, 3D waterfall chart)
- ▶ Intuitive, graphical interface for manual setup and configuration of machine trains
- ▶ Easily navigate large machinery using intelligent search filters
- ▶ Server client architecture: Ideal for distributed networks and cloud-based solutions



## OMNITREND® Asset View

The smart IIoT solution for visualizing machine data

OMNITREND® Asset View is a server-based software for displaying the current machine condition data. The design is intuitive and clearly structured – ideal for all managers and system operators.

- ▶ Real-time query of machine status queries via the Internet
- ▶ Traffic light colors immediately signal the current machine status
- ▶ Worldwide data access via MQTT data interface
- ▶ Exceeded alarm values are displayed
- ▶ Trend data visualization
- ▶ Runs on all PCs, smartphones, and tablets with Internet connection
- ▶ Compatible with VIBGUARD® IIoT, VIBGUARD® compact, VIBGUARD® portable, VIBRONET® Signalmaster, and VIBSCANNER®2





## VIBREX®

Variable vibration and bearing monitoring

VIBREX® is a cost-effective, easy-to-install machine protection module. Due to the modular design of VIBREX, the machine vibrations and the bearing condition of your machines can be monitored either on 1 or 2 channels. The vibration monitoring is carried out according to DIN ISO 10816.

- ▶ Switch-off function via relay outputs
- ▶ Display of exceeded alarm values by colored LEDs
- ▶ Alarm value output is possible directly in the machine control
- ▶ Machine protection system including machine switch-off function
- ▶ Analog signal output in 4-20 mA for machine control or process control system



## VIBROTECTOR®

Vibration measurement according to ISO as an analog signal

VIBROTECTOR® is probably the simplest and most cost-effective solution to protect your constantly running machines from irregular vibrations. The vibration transmitter transmits the broadband characteristic values (as 4-20mA current level) directly to the connected process controller.

- ▶ Alarm exceeded according to DIN ISO 10816-3 or 7 and data transmission to the control system
- ▶ Intervention in process control in the case of excessive vibration values
- ▶ Automatic shutdown of the machine by the control system to avoid overloading



# ULTRASOUND

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## SONOCHEK®

Leak detection and structure-borne sound testing via ultrasound

Thanks to the new SONOCHECK® ultrasonic testing device, it is possible to localize specific leaks on high pressure lines (primarily compressed air) and, at the same time, to evaluate the total loss volume. Its extremely broad bandwidth between 20 and 100 kHz allows almost every leak on all industrial compressed gas lines to be tracked over large distances and then be evaluated.

### Search, find, and assess leaks!

- ▶ Leak localization
- ▶ Partial discharge test
- ▶ Condensate separator test
- ▶ Bearing lubrication condition through structure-borne sound

Three high-performance airborne and structure-borne sound sensors and other accessories support leakage location finding and record the ultrasonic frequencies of rotating machine parts.

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## Vibration sensors and accessories

Sensors made in Germany

PRUFTECHNIK supplies the most suitable sensors for all devices and applications. With the tandem piezo design, our sensors are ideally suited for turbomachinery, gearboxes, roller bearings, and pump cavitation.

- ▶ Accelerometers: Standard sensors, miniature sensors for confined spaces, combination sensors, triaxial sensors, and sensors for low-frequency measurements
- ▶ Proximity sensors
- ▶ VIBCODE® sensor for automatic measurement point detection
- ▶ RPM sensors, keyphaser
- ▶ Temperature sensors
- ▶ Available for potentially explosive areas
- ▶ Sensor accessories: Adapters, tools, cables, interfaces, and more



## WEARSCANNER®

Powerful online oil particle counter

WEARSCANNER® identifies ferritic and non-ferritic particles and is ideal for the early detection of progressive damage to gear mesh or roller bearings.

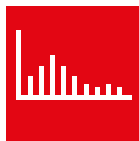
- ▶ Size-dependent particle classification
- ▶ Patented eddy current principle
- ▶ Independent of oil temperature, flow rate, viscosity, air and water content or oil color (darkening)



# PRUFTECHNIK stands for perfect solutions in maintenance. World-wide!



Machine and shaft alignment



Machine and system monitoring



Non-destructive material testing

## [www.pruftechnik.com](http://www.pruftechnik.com)

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