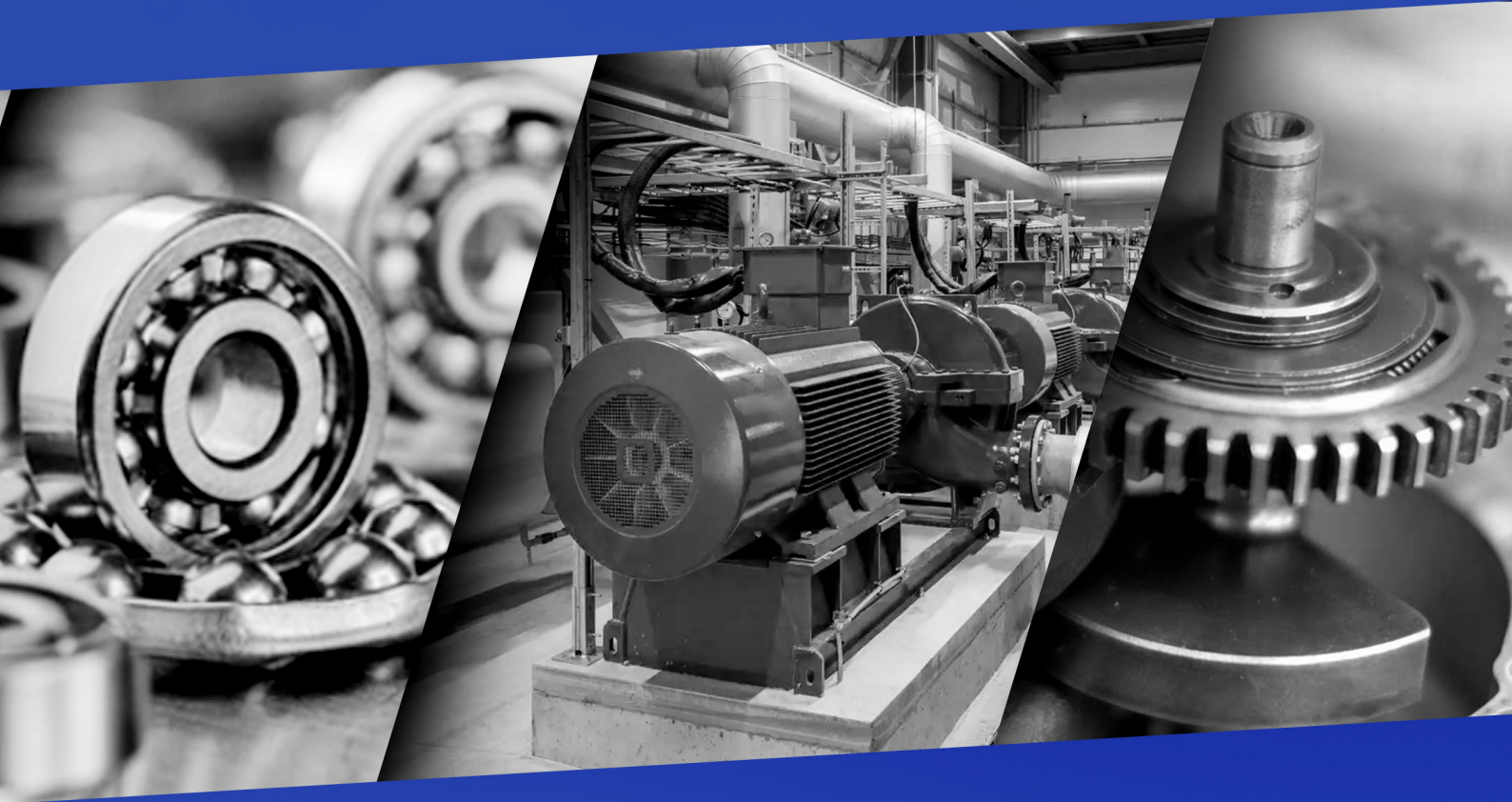# Fizix

Seamless Machine Health Monitoring Solutions

Analytical Sensors & Perceptive Software

What is **Fizix?**

Fizix is a visionary technology company that is heavily involved in extensive research and development efforts in the field of machine health.

WE LET YOUR MACHINES TALK TO YOU

CONTINUOUS MONITORING: Our objective is to continuously monitor the health of machines, ensuring early detection of failures and effective planning, thereby enabling our customers to maintain efficient and sustainable business continuity.

ARTIFICIAL INTELLIGENCY: Leveraging artificial intelligence and state-of-the-art sensor technologies, our solutions not only detect abnormalities but also identify changes in machine health, facilitating accurate diagnostics. Our aim is to develop tailored and comprehensive solutions that address the specific needs of our customers.
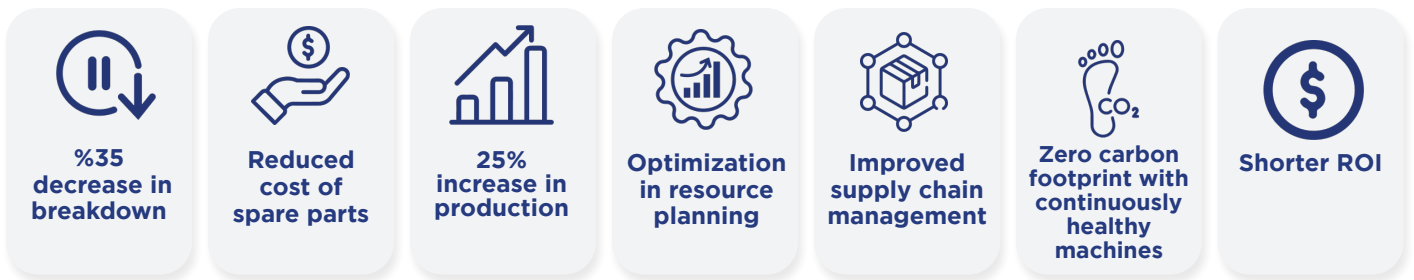
HOLISTIC VIEW: With user-friendly designs and easily integratable systems, we empower users to access data, information, and notifications quickly and effortlessly. As a pioneering and innovative technology company specializing in machine health monitoring, we stand ready to collaborate with you, helping you strengthen your leadership position in your industry.

DIGITAL TWIN: As a trusted partner in digitalization, smart city, and smart factory projects, we prioritize sustainability, quality, and customer satisfaction. Equipped with experienced software, hardware, and administrative teams, we are at the forefront of the industry, delivering innovative projects in digital twin and related fields. Through our future-shaping solutions, we contribute to the success of our customers, providing them with a competitive edge.

PREDICTIVE AND PRESCRIPTIVE: Fizix ensures early fault detection by monitoring the health of all systems, including rotating equipment such as motors, compressors, fans, pumps, and more, at every stage of the production process. This enhances operational safety, safeguards personnel, reduces downtime, improves production efficiency, and enhances the quality of the final product.

Reap the gains of

| %35 decrease in breakdown | Reduced cost of spare parts | 25% increase in production | Optimization in resource planning | Improved supply chain management | Zero carbon footprint with continuously healthy machines | Shorter ROI |

with Comprehensive Benefits of

| Enhanced personnel safety | Customized user interface | Accurate and reliable data | Remote monitoring capabilities | Accumulated data for historical analysis | Fault detection using AI technology |

• Early detection of equipment problems ensures smooth operation, reducing the risk of unexpected major breakdowns.

• Continuous monitoring of machine health extends equipment lifespan and reduces inventory and investment costs.

• Equipment protection prevents potential equipment-related accidents, enhancing worker safety.

• Maintenance teams can make more informed decisions regarding performance optimization and maintenance requirements, resulting in increased operational efficiency.

• Smart sensors enable the detection of potential equipment malfunctions.

• Careful monitoring of equipment enables understanding of each component's unique behavior.

• Enhancements in production processes and maintenance procedures lead to improved factory/facility operations.

• Early problem detection allows for prevention of major breakdowns.

• Healthy machines contribute to reduced energy consumption.

• Planned maintenance boosts machine uptime.

Achieve Extraordinary Benefits:

| 20-30% decrease in maintenance costs | 70-75% reduction in downtime | 35-50% decrease in breakdown incidents | 20-25% growth in production | 10 Times return on investment (ROI) | 50% increase in maint. per. efficiency |

Step into the Digital Future
with Fizix

Dashboards, Notifications and Reporting

Comprehensive Summary Screens: Provide historical and real-time data on overall reliability.

Health Score-Based Monitoring: Provides clear and focused insights

Automatic Notifications: Weekly and monthly reports with critical updates.

Notification System: Ensures no important changes are missed. Alarms and notifications can be sent via email, phone apps, or other applications.

Customized Screens: Tailored dashboards for managers, operations personnel, and maintenance staff.

Real-Time Data Monitoring: Specialized screens for monitoring data flow and changes.

Live Data Access: Maintenance personnel can access detailed data without being physically present at the machines.

Next Generation Platform

User-Friendly Interface: Simplifies your workflow.

One-Click Machine Health View: Instant access to machine health status.

Dark Mode & Light Mode: Customize your viewing experience.

Mobile Applications: Available for iOS and Android, access from anywhere, anytime.

# Forecasts, Fault Diagnosis with Algorithms, AI, and Experts

Digital Twin-Based Interfaces: Next-generation interfaces for accurate simulations and visualizations.
Automated Fault Detection: Utilizing multiple levels of algorithms and AI systems.
Planned Maintenance: Early detection of potential failures facilitates planned maintenance activities.
Predictive Insights: Trend and forecast analyses offer guidance on potential future conditions.
Certified Expert Support: Available at your chosen parameters/time intervals (monthly, upon alarm, etc.). Provides detailed reports and insights from certified professionals.
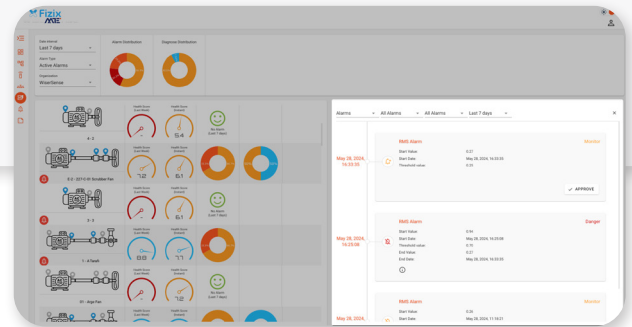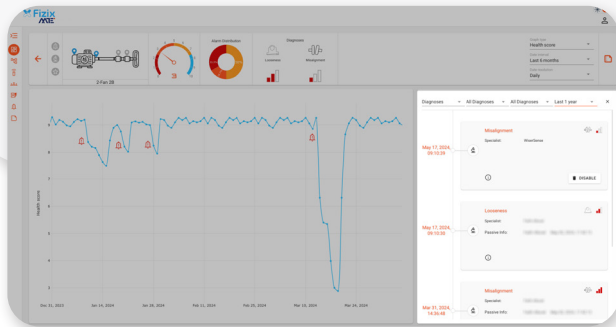

# Advanced Sensor Data Analysis for Predictive Maintenance

Comprehensive and Detailed Analysis: Enables trend analysis and anomaly detection.
Statistical Parameters: Includes Accel. RMS, Velocity RMS, Crest Factor, Kurtosis, Spectrum Energy Bands, Spectrum Peak Diagnosis, etc.
High-Frequency Data Analysis: Utilizes time waveform, spectrum, envelope, circular, and waterfall/cascade plots for in-depth insights
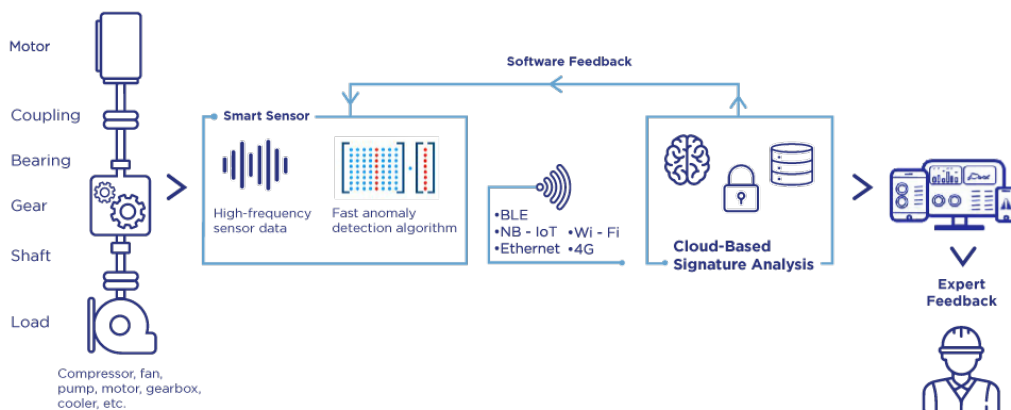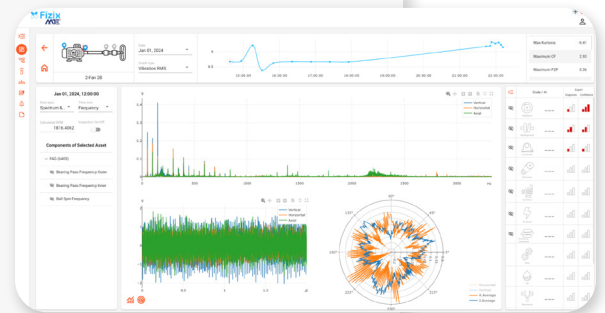
All in One Premium Machine Health Solution: **OMax**
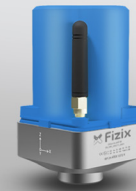
OPro-STD-W

• Continuously monitor the health status of your machines using our reliable wired power solution for monitoring.

• Stream data wirelessly for smooth and uninterrupted operations.

• Achieve more efficient data exchange and communication by easily integrating with Modbus, OPC UA, etc.

OMax-BAT-W

• Save time with a completely wireless system that allows for fast integration!

• Benefit from up to 5 years of extended battery life, providing a solution for locations where cable power is unavailable or unsafe.

• Customize your data transmission intervals according to your specific needs.

• Our user-friendly design allows for easy battery replacement and prolonged usage.

Vibration
Excellent monitoring capability with a 3-axis sensor and data acquisition of up to 26.6 kHz.

Simultaneously detect various faults such as imbalance, looseness, misalignment, bearing/gear failures, cavitation, etc.

Acoustics
Detect potential damage to your bearings, gears, and oil at a very early stage, thanks to a data acquisition rate of up to 80 kHz.

Magnetic Flux
By collecting data at a rate of up to 32 kHz, it is possible to identify motor-specific issues such as rotor bar faults, eccentricity, short circuits, load imbalance, alignment, and winding problems.

Rotation Speed (RPM)
By combining vibration and magnetic flux sensors, machine rotation speeds (RPM) can be accurately estimated.

Temperature
In addition to other sensors, you can also detect temperature-related errors by providing an additional verification.
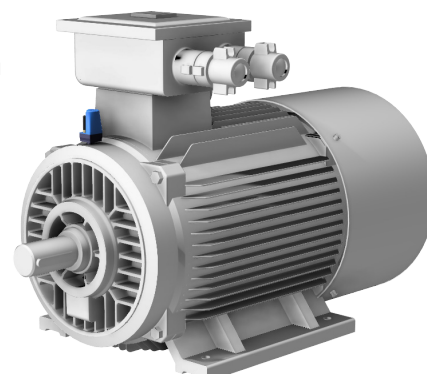
• Monitor and analyze machine health even at very low or high speeds.

• Enjoy seamless wireless connectivity regardless of the environment or distance, thanks to our interchangeable and expandable antenna.

• Our system is designed with IP66 or higher protection, ensuring durability even in the most challenging conditions.

• Easily configure your sensors without the need for a separate mobile or tablet application.

• Make better decisions by receiving error predictions both on the device and online.

• Communicate seamlessly with popular ERP systems to ensure smooth workflow.

OOne
Family

OOne-STD-W

The Fizix OOne system facilitates your focus on predictive maintenance in machine health through its optimized sensors, embedded software, and intelligent interface.

By easily mounting OOne onto your systems or machines, you can instantly start monitoring their health. Additionally, you can conveniently monitor hard-to-reach or hazardous areas online without compromising the safety of your personnel.

OOne tracks changes in your machines and systems at standard alert levels or the limits you set, and sends you notifications via email, SMS, messages, or phone calls.

Thanks to AI-powered software, the data obtained from your machine is automatically processed to detect primary faults such as imbalance, misalignment, looseness, and bearing failures. These faults are then promptly and automatically reported to you.

OOne-IST-W

The IST-OOne-W is another variant from the Fizix OOne Vibration and Temperature Sensor system family, specifically designed for use in extremely humid or underwater environments. This product differs from the standard OOne version. It does not have a connector and features an integrated structure where both power and antenna cables are directly integrated as wiring. However, it utilizes the same sensor and processor as the standard OOne and enables wireless communication.

OOne-EX-W

The OOne-Ex-W, which is part of the Fizix OOne Vibration and Temperature Sensor system family, is specifically designed for monitoring equipment in explosive and flammable environments. It has the necessary certifications for such applications. Unlike the standard OOne product, it features an embedded power cable and antenna. The power cable utilizes a special Polyurethane cable, while the antenna has embedded connector connections, with only a portion exposed outside the sensor. This design ensures safer and more robust utilization of the sensor.

OOne-HT-W

The HT-OOne-W, which is a part of the Fizix OOne Vibration and Temperature Sensor system family, is specifically designed for equipment with high temperature requirements. This product features a different design compared to the standard OOne version, allowing the sensor to operate at higher temperatures. With its two different structures, this sensor offers a highly practical and modern design.
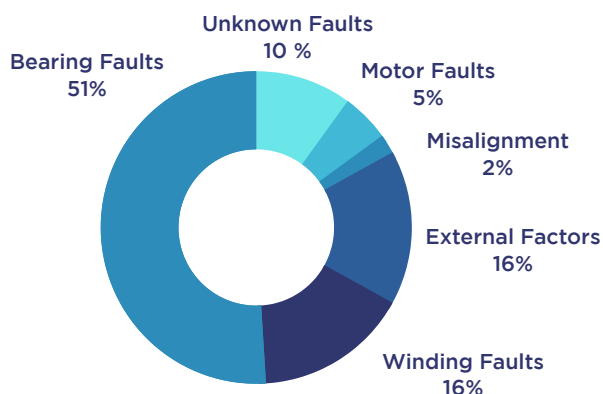
All the
Industries

All the
Machines

Industries and Machines

Electric Motors

The world is rapidly depleting its limited energy resources as each day passes, leading to an ever-increasing consumption. In such circumstances, the key is not to produce more, but rather to prevent unnecessary energy losses. Motor-driven systems account for 47% of global energy consumption, with 67% of these systems being utilized in industrial sectors. Consequently, continuous monitoring of the well-being of these motors, which are extensively employed in the industrial realm, holds tremendous significance.

With Fizix solutions, you can avoid sudden stop and energy losses.

- Bearing Faults 51%
- Unknown Faults 10 %
- Motor Faults 5%
- Misalignment 2%
- External Factors 16%
- Winding Faults 16%

According to the survey conducted by A. Bonnett and C. Yung, motor faults are as shown above. Motor faults not only lead to sudden stops of machines but also cause consume more current from the grid during the faulty operation period.

New Generation Smart Motor Health Monitoring

Thanks to Fizix's new generation smart machine health monitoring systems, various data such as vibration in three axes, ultrasound, temperature, magnetic flux, and energy can be monitored in electric motors. With the OPower energy monitoring and OMax motor health monitoring sensors developed by Fizix, electric motors can be comprehensively monitored. Moreover, potential faults can be predicted months in advance through AI-powered cloud-based software.
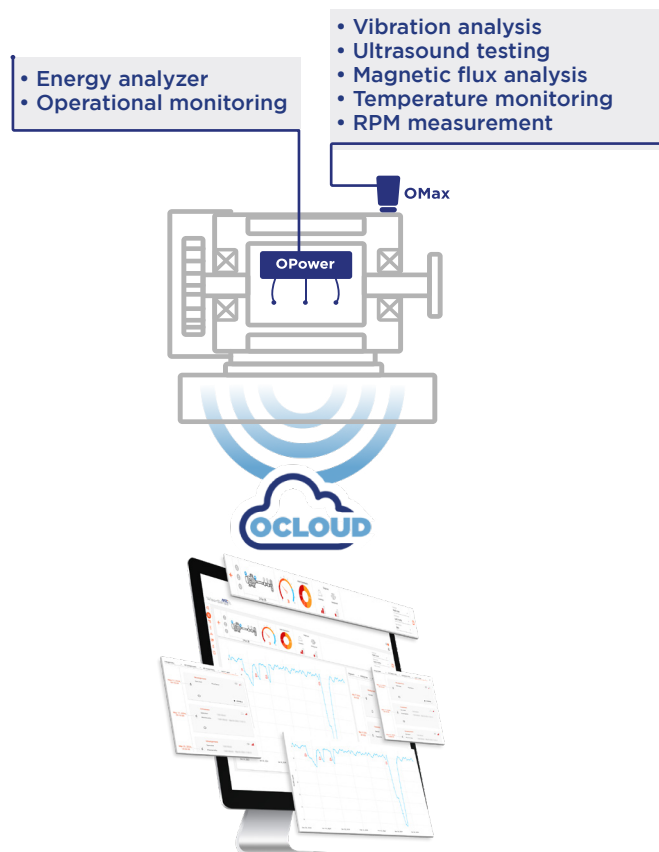
Mechanical Problems
- Imbalance and Eccentricity
- Bearing Mechanical Problems
- Bearing Lubrication Problems
- Looseness in Rotor Bars and Foundation

Electrical Problems
- Disturbances in Supply Voltage
- Voltage and Current Imbalance
- Insulation Faults
- Rotor and Stator Faults
- Rotor Faults

Faults that occur in electric motors not only lead to sudden stops but also result in increased and unnecessary energy consumption.

Motor health deterioration can lead to an approximate 10-14% increase in energy consumption. Specifically, imbalances, misalignments, looseness, and bearing faults contribute significantly to the energy consumption increase. In a 100 horsepower motor, if the current draw increases by 4 A due to alignment and imbalance issues, the consumption will rise by approximately 8 kW. For a continuously operating motor, this increase results in an additional energy consumption cost of 5,376 USD annually (calculated as 8 kW * 8400 h * 0.18 industrial electricity rate - as of July 2022).

- Energy analyzer
- Operational monitoring

- Vibration analysis
- Ultrasound testing
- Magnetic flux analysis
- Temperature monitoring
- RPM measurement

In digitalization processes, solutions focused on machine health are becoming prominent. When AI-supported continuous monitoring systems and proper maintenance methods are implemented, the benefits outlined below can be achieved.

|		
20% Energy Savings with Proper Machine Monitoring	**20-30%** Reductions in Maintenance Costs	**70-75%** Reduction in Downtime
35-40% Breakdown reduction	**20-25%** Production increase	**x10** ROI

Compressors

Compressors are widely used in various industries. Many industrial facilities require compressed air for their process operations, and compressors are used to generate high-pressure air with high motor power. The failure of compressors can lead to significant downtime, extensive maintenance costs, unsafe working conditions, and loss of profitability.

Get rid of sudden stops and energy losses with **Fizix solutions.**
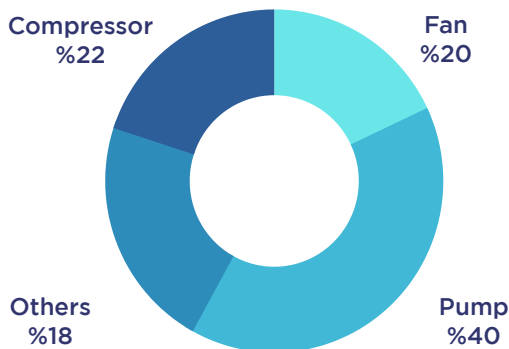
US industrial motor electricity consumption

Compressor %22 — Fan %20 — Pump %40 — Others %18

According to the report by Global Efficiency Intelligence, referencing the International Energy Agency and the U.S. Department of Energy [4]:

• Motor systems account for the highest share of global electricity consumption, with a 47% share.

• Approximately 30% of global electricity is consumed by motor systems used in industries.

• In the United States, pump systems consume around 40% of the total electricity consumption of industrial motor systems, fan systems consume 20%, and air compressor systems consume 22%.

The 5 benefits of real-time monitoring of compressors are:

1. Instant access to data for remote monitoring.
2. Preventive maintenance.
3. Long-term compressor efficiency.
4. Elimination of on-site machine health monitoring.
5. Cost savings.

The solutions we offer for compressor health monitoring

Vibration:
OOne is used for monitoring and detection of all potential faults that can cause vibration. It can detect issues such as shaft misalignment, imbalance, loose mounts, bearing problems, and more.

Shaft Misalignment and Orbit:
OGap is used for detecting and monitoring the axial misalignment in motor shafts or driven shafts. It can easily display the graphical representation of shaft orbit motion, especially in low-speed rotating systems.

All Operational Information of the Compressor:
OGate allows the collection of operational data such as torque, current, energy consumption, etc. from the motor controller and transfer it to the cloud platform.

Motor Rotation Speed:
ORev is used to detect the instantaneous rotation speed of variable speed motors. It provides real-time monitoring and measurement of the motor's rotational speed, allowing for effective control and analysis of the motor's performance.

Acoustic Listening:
OSound is used for the detection and monitoring of early-stage bearing faults and oil film issues. By analyzing the acoustic signals emitted by the equipment, OSound can identify abnormal noise patterns associated with bearing defects or lubrication problems. This enables proactive maintenance and timely intervention to prevent further damage or breakdowns.
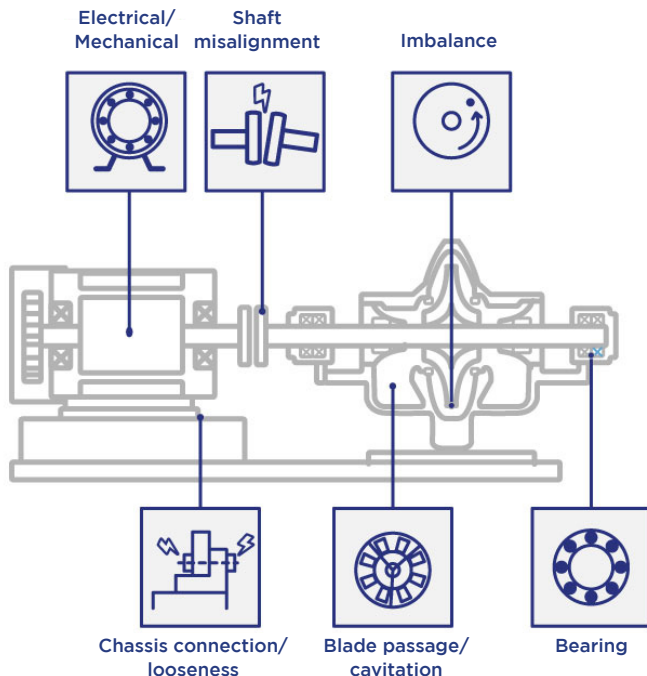
Temperature:
With OThermal, the overall temperature of the motor can be monitored. It enables tracking the temperature profile of the motor, allowing for early detection of overheating or abnormal temperature changes.

Oil/Bearing Temperature:
OTemp is used to monitor the temperature of rotor bearing bearings or the oil in the oil container.

Pumps

Pumps are involved in many areas of industry and our daily lives. They also have a significant share in total energy consumption. Although they have various structures, their general purpose is to transfer solids, liquids, and gases. Typically, pumps often experience the following faults.

Electrical/Mechanical   Shaft misalignment   Imbalance

Chassis connection/looseness   Blade passage/cavitation   Bearing

- Energy analyzer
- Operational monitoring

- Vibration
- Ultrasound
- Magnetic flux
- Temperature
- RPM

- Vibration
- Ultrasound
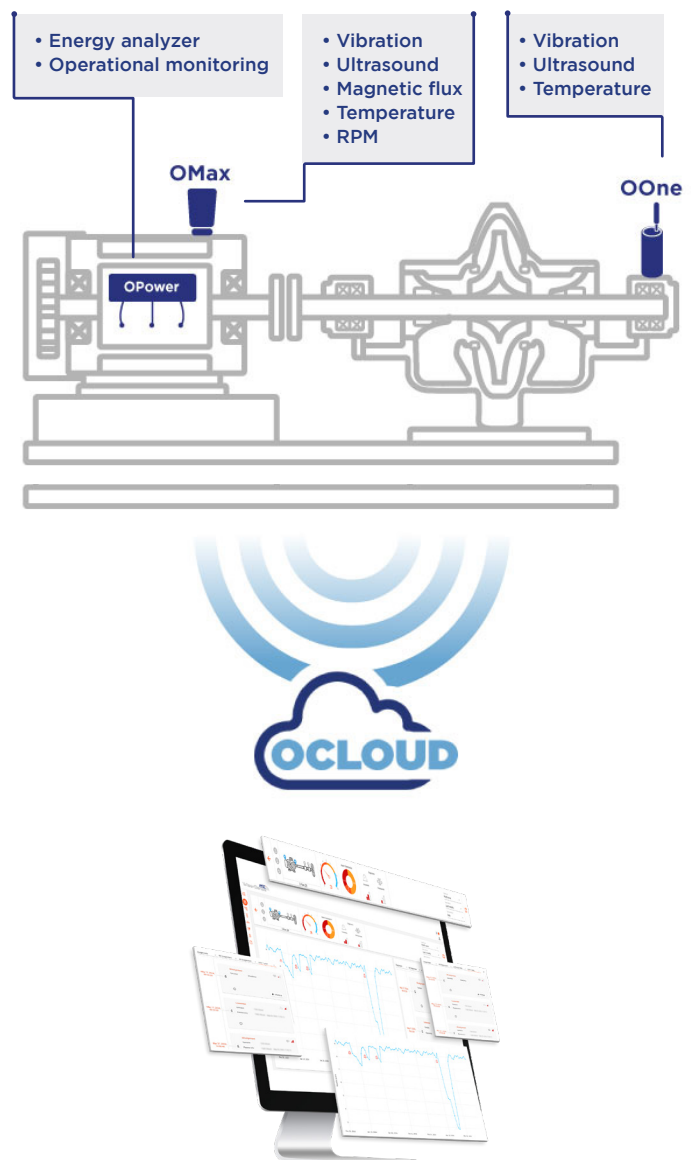- Temperature

OMax

OPower

OOne

OCLOUD

The faults that occur in pumps and motors not only cause sudden shutdowns but also result in excessive/unnecessary energy consumption.

When considering the entire lifespan of pumps, approximately 87% of the expenses are attributed to power consumption, 8% to maintenance, and 5% to subcomponents. In pumps with rotating parts, one of the most important components is the bearings. A fault in the bearings can increase vibration by up to 85%, resulting in a 14% increase in energy consumption and an 18% decrease in pump efficiency.

Approaches to machine health are becoming prominent in digitalization processes. When AI-supported continuous monitoring systems and proper maintenance methods are implemented, it leads to a decrease in maintenance costs, reduced downtime, shorter breakdown durations, increased production, and ultimately, energy cost savings of up to 20%.

Failure is not a one-time event.
It is a continuous process that occurs repeatedly.

With Fizix's next-generation intelligent machine health monitoring system, various data such as vibration, ultrasound, temperature, magnetic, and energy can be monitored in pumps. With the OPower energy monitoring, OMax motor health monitoring, and OOne vibration smart sensors developed by Fizix, pumps can be comprehensively monitored. By using the data from these sensors and leveraging cloud-based artificial intelligence solutions, you can accelerate your processes with pinpoint fault prediction.

| **20%** Energy Savings with Proper Machine Monitoring	**20-30%** Reductions in Maintenance Costs	**70-75%** Reduction in Downtime
35-40% Breakdown reduction	**20-25%** Production increase	**x10** ROI

Fans

Fans are an essential component of your production processes and play critical roles in many industries. For example, ventilation fans consuming MW-level energy in the iron and steel industry, fans supplying clean air to underground galleries in underground mining, and fans feeding clean rooms in the pharmaceutical industry, although they may vary in size, all participate in highly critical processes.

A malfunction in fans can directly impact human or product health and can also expose businesses to penalties due to environmental regulations. Given the broad range of applications, continuous monitoring of the health condition of fans is of utmost importance.
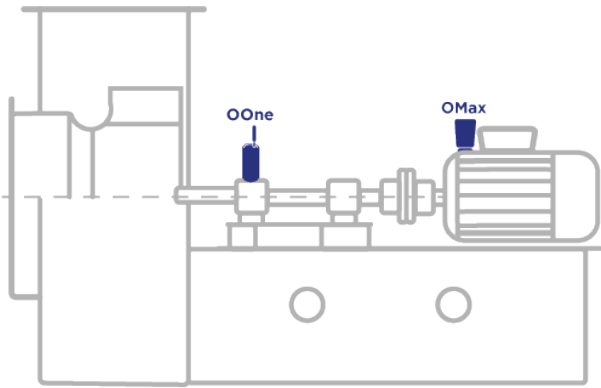
The 5 benefits of real-time monitoring of fans and gearboxes are:
1. Instant access to data for remote monitoring
2. Preventive maintenance
3. Long-term fan efficiency
4. Elimination of periodic machine health checks
5. Cost savings in maintenance and energy expenditures

Our solutions for fan health monitoring include:

Vibration: OOne is used to track and detect any faults that may cause vibration, such as shaft misalignment, imbalance, loose foot, bearing issues, etc.

Shaft Misalignment and Orbit: OGap is utilized to detect and monitor axial misalignment in the motor shaft or the shaft driven by the motor. Additionally, the shaft orbit motion can be graphically displayed, especially in low-speed rotating systems.

Operational Data for Fans: OGate enables the transfer of operational data from the motor controller, such as torque, current, energy consumption, etc., along with flow rate, temperature, and other parameters specific to the fan, to the cloud platform.

Motor Speed: ORev is used for instant detection of motor speed in variable-speed motors.

Acoustic Listening: OSound is employed for early-stage detection and monitoring of bearing failures and oil film issues.

Temperature: OThermal enables tracking of the overall temperature of the motor.

Oil/Bearing Temperature: OTemp is utilized to monitor the temperature of rotor bearing or the oil in the container.

Gearboxes

Gearboxes are widely used in all industries for power transmission, speed reduction, or changing the direction of motion between electrical, mechanical, or hydraulic equipment. They play critical roles in various industries such as the chemical sector, iron and steel industries, mining, oil and gas, energy, petrochemicals, and more.

Given the broad range of applications, continuous monitoring of the health condition of gearboxes is crucial. Online condition monitoring plays a significant role in ensuring the reliability of a gearbox. Gear condition and bearing data can be recorded, and maintenance activities can be planned accordingly. Monitoring vibration, acoustic, and temperature data provides effective insights into the continuous monitoring of the gears within the gearbox, yielding valuable results.

The problems encountered in gearboxes are as follows:
• Misalignment of Gears
• Gear Wear
• Overloading of Gears
• Gear Eccentricity
• Excessive Backlash
• Oil Leakage and Accumulations
• Unnecessary Contact between Gear Teeth

Monitor your non-redundant fan and gearbox systems.
Eliminate unexpected stops and energy losses with Fizix solutions.

The failure of a gearbox can lead to the failure of a rotating machine, resulting in costly repairs and delays in completing the work.

Our solutions for monitoring gear health include:

Vibration: OOne is used to track and detect any faults that may cause vibration. It can identify issues such as misalignment, imbalance, loose mounts, bearing problems, and more.

Acoustic Monitoring: OSound is used for early-stage detection and monitoring of bearing faults and oil film issues through acoustic listening.

Temperature: OThermal allows for monitoring the overall temperature of the motor.

Operational Data for Gearbox: OGate enables the collection of operational data such as torque, current, energy consumption from the motor's controller, as well as flow rate, temperature, and other parameters related to the fan. This data can be transferred to the cloud platform for further analysis and monitoring.
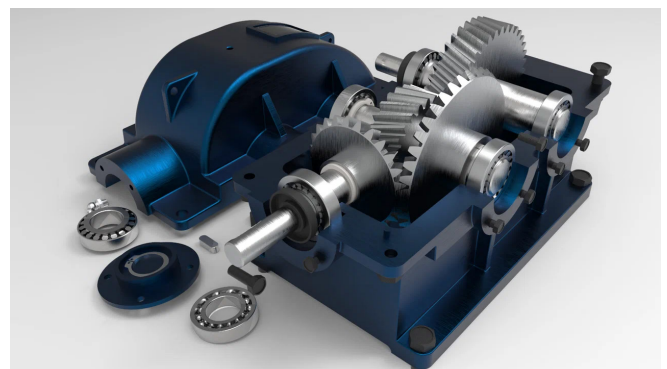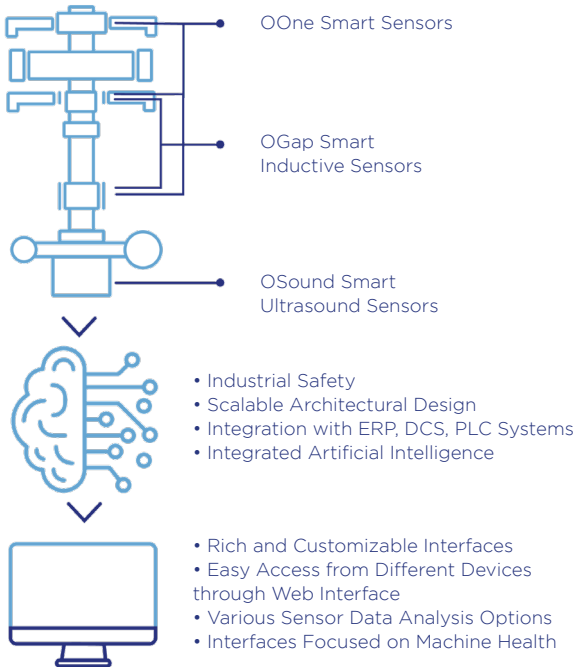
Hydroelectric Power Plants

Fizix can accurately perform pre-failure diagnosis and predictive maintenance processes that cannot be accomplished by SCADA and DCS systems in hydroelectric power plants.

In this scope, data is collected at regular intervals (typically every 3-6 months) using various sensors, primarily vibration, and detailed analysis and fault diagnosis are carried out by experts focusing on the turbine's health. There has been a transition towards smart solutions that provide online monitoring and analysis capabilities in recent years.

Fizix offers an end-to-end solution that is actively and successfully used in hydroelectric power plants. Next-generation intelligent systems provide several advantages alongside remote monitoring and analysis capabilities.

Some of these advantages are listed below:
• 50-80% reduction in maintenance costs
• 50-80% reduction in equipment failures and downtime
• 20-40% increase in machine lifespan
• Approximately 25-30% increase in overall financial gains

OOne Smart Sensors

OGap Smart Inductive Sensors

OSound Smart Ultrasound Sensors

• Industrial Safety
• Scalable Architectural Design
• Integration with ERP, DCS, PLC Systems
• Integrated Artificial Intelligence

• Rich and Customizable Interfaces
• Easy Access from Different Devices through Web Interface
• Various Sensor Data Analysis Options
• Interfaces Focused on Machine Health

For the turbine health monitoring solution, it is recommended to use the Fizix OCloud server software system to securely store, monitor, perform detailed analysis, create alarm thresholds, and enable communication with different platforms using data collected from smart sensors. Various tasks can be efficiently performed remotely and in a computer environment through user-friendly interfaces.

Systems in different locations can be monitored remotely using wired/wireless standard network infrastructures. Additionally, the scalable and big data-compatible server architecture of Fizix OCloud accommodates multiple modules for future artificial intelligence applications and integration with different systems.


What does reliability mean?

It is the measure of how well a machine or equipment maintains its original quality level over time under various conditions. The Fizix server architecture is developed with a focus on machine and equipment management and reliability. It encompasses detailed analyses and offers multiple interfaces at the managerial level. In this regard, it can provide a combination of various solutions for the digitalization needs of your facilities

Don't just monitor the data
Diagnose potential faults remotely and in advance!
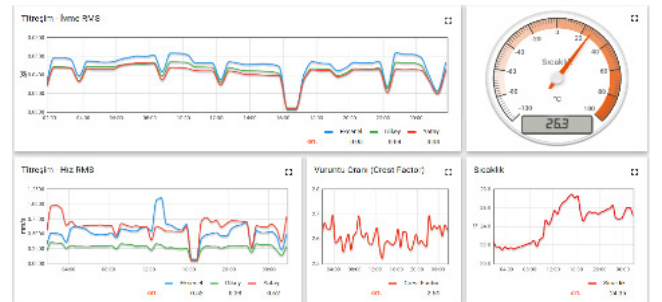
Within the scope of the Fizix solution, three-axis vibration measurements are taken through the three main bearings of the turbine to assess the health condition of the bearing areas, both in real-time and for diagnosing potential faults. An ultrasound sensor is placed particularly in the turbine's water outlet area to monitor the water regime in that region. Relative sensors based on the Eddy-Current principle are used to continuously monitor shaft misalignment, and fault diagnosis can be performed through orbit analysis.
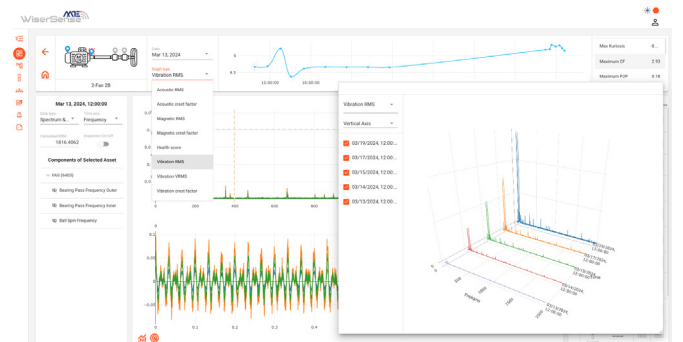
Wind Energy Power Plants

Renewable energy has become increasingly important globally due to the proliferation of electric vehicles and machine-intensive businesses. Significant investments are being made to meet this growing demand, and many countries provide incentives in this regard. Wind energy stands as one of the crucial elements of renewable technology. Wind turbines can be found on both land and at sea. As with any rotating system, it is vital to ensure the proper maintenance of the turbines.

To monitor turbine health, various methods are used, including operational data and total vibration sensors. However, these methods often lack the necessary depth to identify the source of failures and enable predictive maintenance. Instead, they are designed primarily for shutting down systems in emergencies.

You can increase your energy production by
having continuously healthy turbines.

There is a significant demand for remote monitoring to prevent issues such as delayed fault detection, decreased efficiency, and equipment damages in wind turbines. Traditional data collection and analysis methods, like handheld devices, are often insufficient. Fizix offers a solution specifically designed for wind turbines, providing intelligent sensors for remote, online monitoring, and early detection of potential faults.
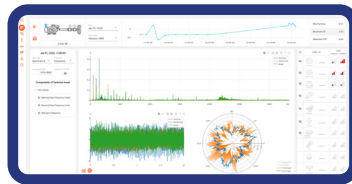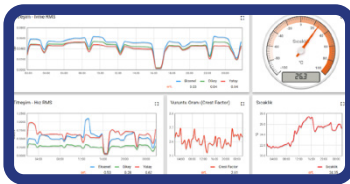
Fizix's server-based platform system provides an effective turbine health monitoring solution, offering secure data storage, detailed analysis, and customizable alarm points. It also supports communication with different platforms and enables remote monitoring of systems in various locations through wired or wireless networks. The system has an expandable architecture with artificial intelligence and integration modules for various system integrations.

Don't just monitor the data, **diagnose potential faults remotely and in advance.**
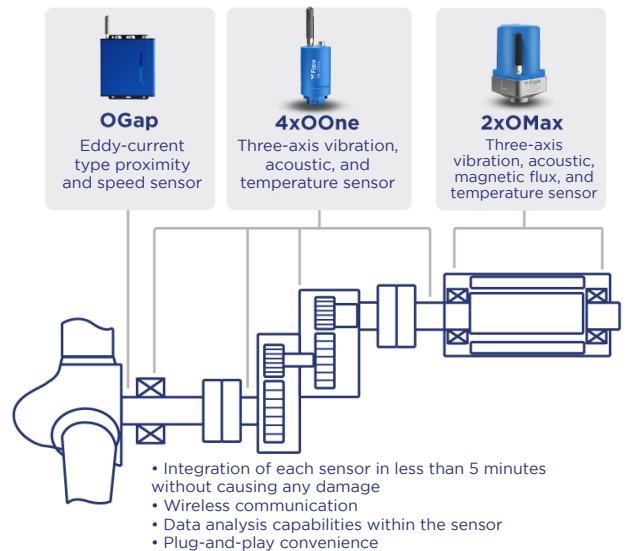
Fizix's server architecture offers detailed analysis and management interfaces with a focus on asset management and reliability. It provides comprehensive digital solutions for the needs of facility digitization.

You can easily monitor your turbines through the Fizix software platform using your internet-connected mobile phone, tablet, or computer.

You can view your current or historical (daily, weekly, monthly, etc.) data on simplified graphs. These graphs display both sensor data and alarm levels, allowing you to plan maintenance in advance.

Receive alarms through email, SMS, and other channels. Additionally, you can forward notifications to external systems. Integration with ERP systems through standard APIs enables automatic conversion of any diagnosis into work orders. It facilitates monitoring of factory and facility health at the management level, allowing you to have a holistic view of the big picture.

OGap
Eddy-current type proximity and speed sensor

4xOOne
Three-axis vibration, acoustic, and temperature sensor

2xOMax
Three-axis vibration, acoustic, magnetic flux, and temperature sensor

• Integration of each sensor in less than 5 minutes without causing any damage
• Wireless communication
• Data analysis capabilities within the sensor
• Plug-and-play convenience

OCLOUD

•Secure data communication and storage
• Scalable architectural design
• Easy integration with external systems such as ERP and PLC
• Integrated artificial intelligence module

• Rich and dynamic interfaces
• Accessible via web for easy access
• Extensive sensor data analysis options
• Interface focused on machine health
• Ability to receive notifications through various applications

• **OOne**, primarily collects three-axis vibration, acoustic, and temperature data at key points such as the main bearing and gearbox. Approximately 3 (+1 optional) sensors are recommended. The high-frequency acoustic sensor enables early diagnosis of lubrication and bearing/gear problems.

• **OMax**, complements OOne's sensor capabilities by collecting magnetic flux data. This enables monitoring and diagnosis of generator magnetic and electrical issues in conjunction with OOne's existing capabilities.

• **OGap**, continuously measures the radial movement of the main shaft using the Eddy-Current principle. This allows for orbit analysis to detect yaw problems in the main shaft. Additionally, OGap can continuously measure the rotational speed of the main shaft, providing an important parameter for accurate diagnosis of vibration faults.

Main Benefits:

• Remote and secure monitoring of difficult or hazardous/risky systems, ensuring a safe working environment.
• Plug-and-play installation, automatic data collection and analysis, ease of use at every stage with remote monitoring.
• Increased reliability and extended operating time due to healthier turbines.
• Improved maintenance planning through the ability to predict failures months in advance.
• Data ownership through Fizix's open architecture and database.

Mining Industry

The presence of mining in human life dates back thousands of years. The development of civilizations has been possible through mining and has greatly contributed to the advancement of today's technologies.

In the present day, minerals are used in various products ranging from toothbrushes to salt, from the development of electronic devices to the production of many chemical products. Coal mining still serves as the primary source of fuel for meeting the electricity needs of many countries.

Indeed, human dependence on minerals has existed since ancient times, and it will continue into our future. Mining is an industry characterized by capital-intensive operations, and therefore, the extraction of minerals and the subsequent profit generation are of utmost importance after successful operations.

Digitalization is of paramount importance in the mining sector for minimizing operational costs. The key to cost reduction lies in uncovering untapped potentials and effectively managing the maintenance departments where these potentials are most abundant.

Reducing unplanned downtime and ensuring efficient utilization of machinery and equipment throughout their lifespan are critical factors for the mining industry.

According to
The Globe and Mail,
" Cost challenges affect all miners, regardless of the type of metal they produce or the size of their operations."

70%: Currently, mining operations are functioning at 70% operational efficiency due to equipment failures, production stoppages, and other operational issues.

3-5X Cost: Failures and losses resulting from unplanned maintenance lead to 3-5 times higher costs compared to planned maintenance.

30-60%: Maintenance of facilities, fleets, and equipment accounts for 30-50% of mining operation costs.

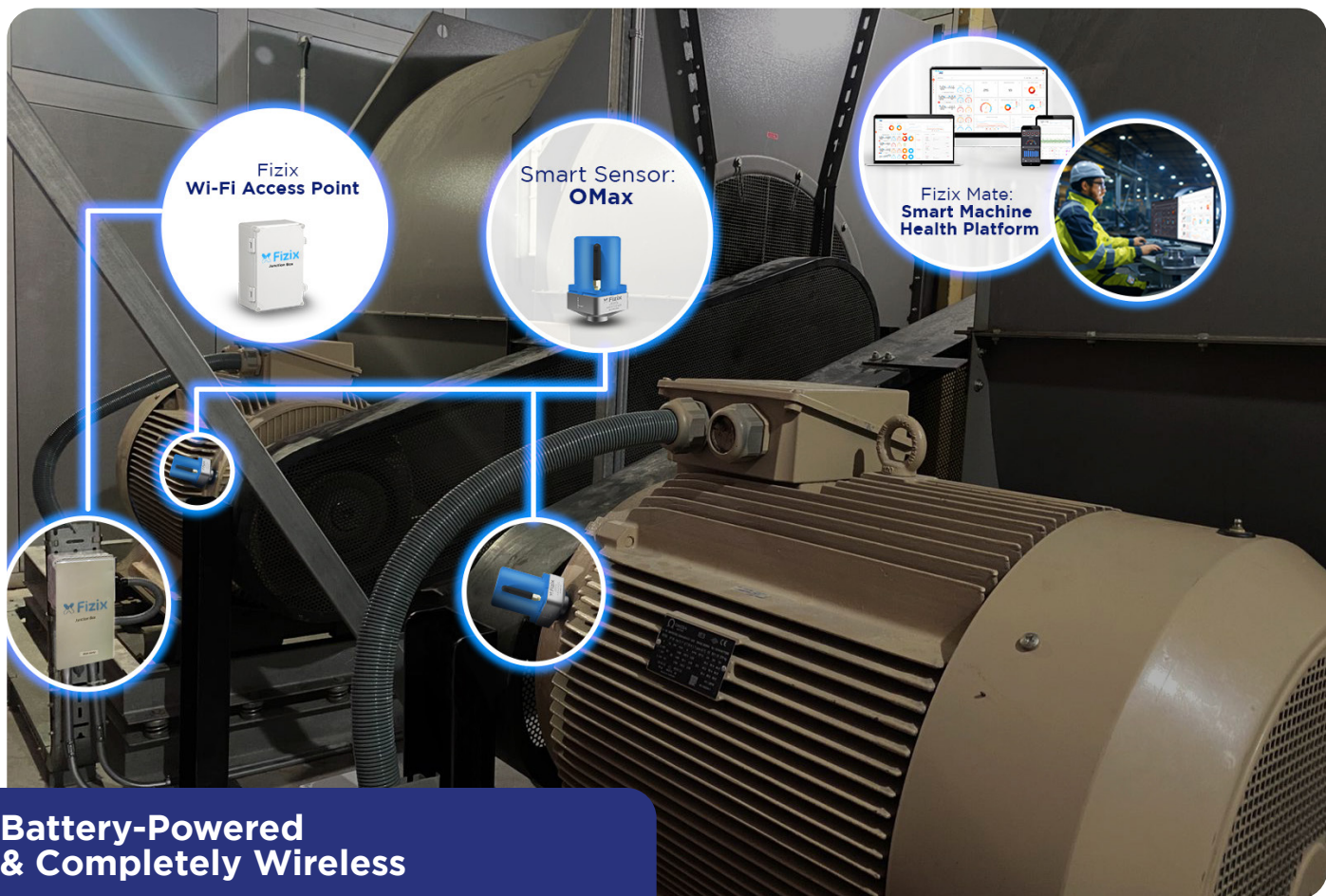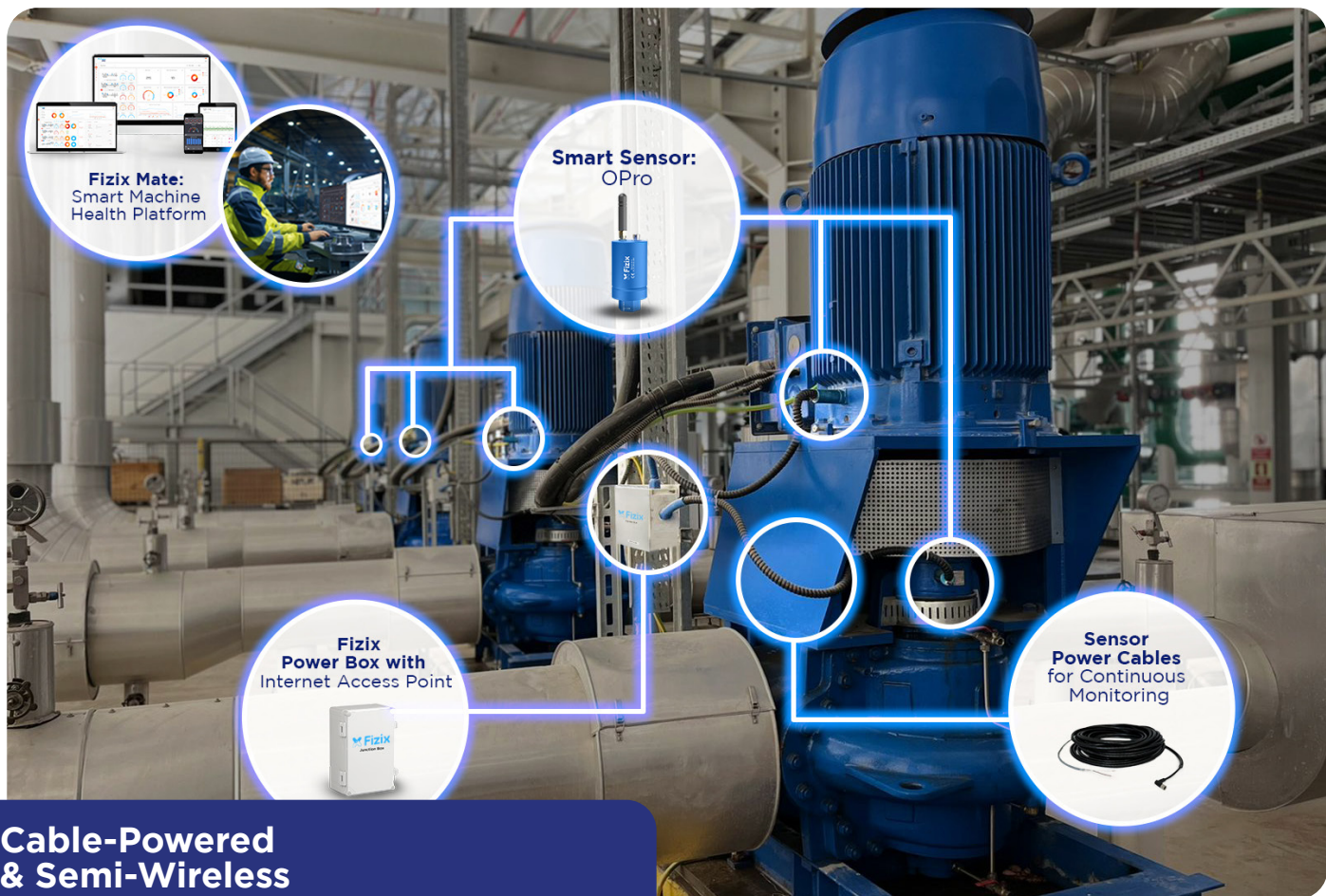**5% Spare part Cost:** On average, mining facilities spend 5% of their annual maintenance budget on spare parts.

Machine Health Monitoring Solutions

•Vibration: OOne is used for monitoring and detecting any defects that may cause vibration. It can detect issues such as shaft misalignment, imbalance, loose feet, bearing problems, etc.

• Shaft Misalignment and Orbit: OGap is used to detect and monitor axial misalignment in the motor shaft or the driven shaft. It can also graphically display the shaft orbit motion, especially in low-speed rotating systems.

• Comprehensive Operational Information of the Motor: OGate enables the collection and transfer of torque, current, energy consumption, and other motor-related data from the motor controller to the cloud platform.

• Motor Rotation Speed: ORev is used for instant detection of motor rotation speed, especially in variable speed motors.

• Acoustic Listening: OSound is used for early-stage detection and monitoring of bearing faults and oil film issues.

• Temperature: OThermal allows monitoring of the overall temperature of the motor.

• Oil/Bearing Temperature: OTemp is used for monitoring the temperature of rotor bearing or the oil in the oil container.

Fields in Which Fizix Product are Utilized in the Mining Industry Include:

Underground Mining:
• Blowers
• Fanls
• Pumps
• Cranes

Conveyors:
• Motors
• Gearboxes
• Drum bearings

Sieve:
• Motors
• Gearboxes
• Steel framework

Electrolysis:
• Pumps

Acid Plants:
• Pumps
• Blowers
• Compressors

Mills:
• Ball mills
• Rod mills
• SAG mills
• Screens
• Pumps
• Motors
• Reducers

Enrichment Facilities:
• Blowers
• Pumps
• Screw conveyors
• Belt conveyors
• Compressors
• Fans

Drying Plants:
• Screw conveyors
• Belt conveyors
• Rotary dryers
• Fluidized bed dryers
• Compressors
• Fans
• Screens

Power Generation Plants:
• Turbines
• Generators
• Pumps

• Decreased total cost
• Reduced downtime
• Early detection of issues
• Avoidance of cascading and destructive failures affecting other equipment

• Increased equipment lifespan
• Operational improvement
• Enhanced equipment protection
• Improved personnel safety and so on.

Fizix Mate:
Smart Machine
Health Platform

Smart Sensor:
OPro

**Fizix
Power Box with**
Internet Access Point

**Sensor
Power Cables**
for Continuous
Monitoring

Cable-Powered
& Semi-Wireless

Fizix
Wi-Fi Access Point

Smart Sensor:
OMax

Fizix Mate:
**Smart Machine
Health Platform**

Battery-Powered
& Completely Wireless

Unleash the Power of AI

Boost Efficiency, Ensure Success,
and Optimize Machine Health
with Our Intelligent Sensors and
Cloud Monitoring Systems!

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