GET OFF THE DOWNTIME ROLLER COASTER.

INDUSTRIAL SHAFT SPEED, VIBRATION, TEMPERATURE AND POSITION MONITORING

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A Guide To Proactive Maintenance Using Shaft Speed Monitoring

Install Speed Switch System

Scheduled Maintenance
Predictive Maintenance
Pre-emptive Repair

Electro-Sensors
The Original Machine Monitoring Experts
Why monitor your machinery?

Monitoring critical moving parts on any machine is a wise investment. With the proper devices, it’s relatively simple to recognize changes in shaft speed, vibration and bearing temperatures as indicators of potential failures and maintenance issues. In doing so, failures can be detected before they happen, allowing for proactive maintenance to be scheduled instead of a reactive response that forces machinery shutdown. Downtime is greatly reduced. Operational life is increased. Material waste is controlled. And collateral damage and potential safety problems are minimized.

What is a Shaft Speed Switch and where is it used?

A Shaft Speed Switch is a device that monitors rotating shafts that are critical to the proper operation of many types of machinery. It can be used to alarm an operator of any undesirable or critical speed condition of the monitored shaft such as rotating too fast, too slowly, or a combination of these.

Undesirable speed changes usually indicate that damage can (or will) occur to machinery as a result of failing mechanics or process problems. A Shaft Speed Switch signals a critical condition or speed via a relay output that typically sounds an alarm, triggers an alarm indicator light, and/or shuts down the machine before damage occurs.

Other common uses for Shaft Speed Switch relay outputs are to trigger a secondary process to start or stop when the shaft reaches a certain speed, speed to analog conversion, position monitoring, or rate metering. A number of process monitoring and control enhancements are facilitated by the reliable performance of Shaft Speed Switches.
What are the benefits of using Shaft Speed Switches?

Shaft Speed Switches provide many valuable direct and indirect benefits to any application in which they are applied. First and foremost, using Speed Switches allows equipment to have a longer life with less downtime because maintenance can be performed proactively and ahead of unexpected failures that can cause damage. This will greatly reduce your downtime, maintenance cost, and lower your material waste cost. And operational life is maximized without the risk of unexpected failures.

In addition, Shaft Speed Switches can give you better control and accuracy of your process by keeping your machine speeds within their acceptable tolerances. Finally, by enabling machine monitoring, Shaft Speed Switches will allow you to focus on more important things in your operation.

As a result, your operation will be more productive and efficient, and your process will deliver greater consistency—both major goals for any industrial facility. The benefits of using a Shaft Speed Switch heavily outweigh the cost and provide immediate return on investment.

A Shaft Speed Switch delivers these benefits:

- Increased Efficiency
- Increased Productivity
- Longer Machine Life
- Less Downtime
- Lower Maintenance Costs
- Lower Material Waste
- Increased Process Accuracy
- Increased Process Control
- Safer Work Environment
- Increased Profitability

Machinery & Process Protection = Peace of Mind
How to choose the right Shaft Speed Switch for your application.

Whether you need detection of critical speed, direction of speed, one or multiple relay outputs, or speed to analog conversions, Electro-Sensors has a Shaft Speed Switch that can do it. Also, whether your environment is hazardous, wet, or contains dust, dirt, oil, grease, severe vibration, electrical noise, extreme heat, or freezing cold, we have a rugged, robust system that can handle it. Electro-Sensors has a Shaft Speed Switch to monitor your application in any combination of these requirements and at almost any RPM range. We challenge you to have us meet your toughest specifications. Shown on the next few pages are several typical applications that can benefit significantly from shaft speed monitoring or control—but there are many others. If you have rotating shafts in your process, chances are Electro-Sensors can improve your process.

Typical Applications

M-Series Shaft Speed Switch monitoring critical speed for slowdown or slippage on a belt conveyor.

906 Sensor and Pulser Wrap providing a pulse train on a motor coupler shaft. Pulses can be sent to a PLC or data collection device.
SCP-Series Shaft Speed Switch features a dust-, water- and explosion-proof housing in this screw conveyor application.

A pump application utilizes the UDS 1000 Shaft Speed Switch with a 907XP Sensor and Pulser Wrap to detect reverse rotation of the pump shaft and prevent catastrophic damage to the pump shaft.

SG1000-Series Position Monitor accurately monitoring position on a slide gate.
VS2 monitoring acceptable vibration levels on a vibratory conveyor.

AP1000 Digital Tachometer with 906 Sensor and 255 Pulser Disc displaying rate on a web press.

VS1 and TR400 Ratemeter System monitoring for critical shaft speed and over-vibration on a hammermill.
906 Sensor and 255 Pulser Disc send shaft pulses to a PLC from a rotary air lock.

LRB1000 DIN Rail mounted Shaft Speed Switch with 906 Sensor and Pulser Wrap detects overspeed, underspeed, or stoppage of fans, blowers and more.

Explosion-proof, NEMA 4X FB420 Shaft Speed Sensor and 255 Pulser Disc monitor for shaft slowdown or belt slippage on a bucket elevator.
Make sure there is free application and technical support.

As the acknowledged experts in shaft speed monitoring, Electro-Sensors has a full staff of application experts to help you through every step of your application. From finding the perfect Shaft Speed Switch for your application, through getting it up and running, Electro-Sensors will be there to help. You can count on us to provide you with the appropriate product for your application, and to back it with the kind of service you would expect from a company that takes pride in its reputation for quality products.
What about other risks in shaft-driven equipment?

Comprehensive monitoring solutions for rotating shaft systems components are available and easy to apply. Electro-Sensors offers a complete hazard monitoring system for applications with rotating shafts, belts and bearings, such as bucket elevators and belt-driven conveyors. The Electro-Sentry™ Hazard Monitoring System monitors the key elements of shaft speed, belt alignment and bearing temperature with a turnkey system, plus a Command Center™ touch screen for easy visual monitoring and fast alarm identification.

Electro-Sentry™—complete hazard monitoring:

- Shaft speed, belt alignment and bearing temperature monitoring—all in one system
- No calibration—ready to use
- Complete system or individual components available
- No proprietary software or “black boxes”
- Simple and straightforward installation—no complexity
- Command Center™—easy visual monitoring and fast alarm identification
- Easy to troubleshoot

System components:

- FB420 Shaft Speed Feedback Sensor—Two programmable relay functions and a rugged XP enclosure.
- TT420S-LT Belt Alignment Sensors—2-wire loop powered temperature sensors mount on brass rub block on hinged door assembly. FM approved for CL II & III, D1 & 2, GRPS E, F & G.
- TT420Z-LT Bearing Temperature Sensors—2-wire loop powered sensors mount into 1/8” or 1/4” grease fittings (Zerk). Includes integral 1/2” conduit fitting. FM approved for CL II & III, D1 & 2, GRPS E, F & G.
How to choose the best Speed Switch technology.

The Hall-Effect sensing technology used by Electro-Sensors offers several advantages over other methods. It allows for a large gap between the sensor and target (up to $1/4" \pm 1/8"$), which is necessary for applications where the shaft undergoes significant end play. This system is also very forgiving to vibration, electrical noise, grease, dust, dirt, moisture, and other elements commonly found in industrial facilities. We also offer EZ-Mount Brackets Assemblies and stainless steel discguards to meet almost every application need.

EZ-Mount Bracket Assemblies make shaft speed monitoring easier and more cost-effective, allowing for quick and easy installation on a range of speed switches and sensors. EZ-Mount Brackets save the time and expense of designing, machining, and installing additional mounting brackets. The bracket assemblies are coupled to the shaft and compensate for typical shaft movement and vibration so that sensor/target positioning and performance are not adversely affected. Models are available to accommodate M-Series and SCP-Series Speed Switches, and 907 XP Sensors.

Stainless steel Disc-Guards provide protection for your critical sensor or speed switch and disc. They are simple to retrofit and are constructed of high quality stainless steel to provide many years of trouble free use.

Electro-Sensors systems are also easy to install. In addition to the large gap distance, they are extremely forgiving to off-center or crooked mounting, which makes the alignment of the sensor and target easy and fast.
In the most demanding industrial environments, we can monitor your machinery and be a valuable part of your proactive maintenance program.

A leader in the speed monitoring industry for over 40 years, Electro-Sensors is committed to providing excellence in product and service for total customer satisfaction. With Speed Switches as our main focus, we provide you with products that meet or exceed the specifications of almost any application environment, including extreme conditions. Our complete, ready-to-install systems have been proven reliable by thousands of users worldwide.

Electro-Sensors, Inc. is ISO 9001:2000 certified, and our systems solutions bring safety, efficiency, and reliability to your operations. Products include: Shaft Speed Switches, Tachometers, Speed to Analog Converters, Pulse Generators, Tilt and Vibration Monitors, Closed Loop Motor Controller, and the Electro-Sentry™ Hazard Monitoring System—combining bearing temperature, belt alignment and shaft speed monitoring into one straightforward solution. Systems are delivered promptly and supported by knowledgeable sales and technical support, providing total customer service.

We can’t stop your machines from failing, but we can stop them from stopping you.

For FREE Application Assistance, Call Toll-Free: 1-800-328-6170

The Original Machine Monitoring Experts

Electro-Sensors, Inc.
6111 Blue Circle Drive, Minnetonka, MN 55343.
Toll-free 1-800-328-6170 Phone 952-930-0100 Fax 952-930-0130
www.electro-sensors.com email: sales@electro-sensors.com