

Monitor

Temperature

Synchronize
Speed Switches

Digital Counters

Vibration

Tachometers

Signal Conditioners

Position

Control



www.**ELECTRO-SENSORS**.com

The original machine monitoring experts

Industrial Speed Monitors

Motor Control Solutions

Proud to be ISO 9001:2000 Certified

Thank you for your interest in Electro-Sensors' products. Our products monitor shaft speeds in production lines and control motor speeds in manufacturing and process lines. We've been doing this since 1965, and in that time customers from around the world have installed over 1 million of our speed monitoring products. We pride ourselves on supplying simple-to-install complete systems designed for many years of rugged service.

We know that every unintentional machine shutdown costs money for our customers. That's why we strive to offer product solutions that will provide our customers with vital information about their process so they can make control decisions before a machine shuts down. With this goal in mind, one of our earliest advertising slogans was, "Catch Trouble Before Trouble Catches You!" Our speed switches have caught a lot of problems in process lines and prevented costly shutdowns and equipment damage, not to mention the consequent cleanup of product jams.

Information about our products can be found in this catalog, on our website, or by calling our toll-free phone number. If you need us to adapt one of our standard products to your specifications, just let us know how we can help. Customer service and customization are our strengths.

We look forward to serving you,

Brad Slye
President

Quality Certification

Our quality management system is audited and approved by BVQI, an international registrar for ISO9000 quality programs. We are proud to be certified to the ISO9001:2000 standard.



Our Mission Statement

Electro-Sensors is committed to providing excellence in product and service for total customer satisfaction. To fulfill this commitment, we administer quality management that provides structure for design, consistency in production, customer feedback, and continual improvement of our quality system.

We contribute real value to the marketplace by providing complete, ready-to-install systems. Our products and systems are delivered promptly from stock, and knowledgeable technical personnel provide customers with all the support or service needed to ensure a successful installation and start-up.

Our goal is to provide peace of mind to our customers through the best possible products, support, and ease of use.



See conveyor and elevator failures before they happen.



Predict 3 conveyor and elevator hazard risks with one easy solution.

Integrate our rugged and reliable speed monitoring devices into your processing or handling systems and spot problems in shaft-driven components before they occur!

- Sensor Flexibility** 4
- New Products** 5
- Industrial Applications** 6
- Shaft Speed Sensing** 8
- Shaft Speed Switches** 9
 - SCP-Series, M-Series 9
 - PVC-Series, DR1000 & LRB-Series 10
 - SS110 & UDS1000 11
 - ST420 Shaft Tachometer 11
 - FB420 Shaft Speed Sensor 11
 - EZ-Mount Brackets & Disc Guards 12
 - Speed Switch Selection Chart 12
- Hazard Monitoring System** 13
- Tachometers & Ratemeters** 14
 - Tachometer Selection Chart 15
- Signal Conditioners** 16
- Temperature Transmitters** 16
- Counters** 17
- Conveyor Belt Alignment** 17
- DeviceNet Sensors** 18
- Position Monitors** 19
- Vibration Monitors** 21
- Tilt Switches** 21
- Speed Sensors & Pulse Generators** 22
- Encoders & Control Potentiometers** 24
- Closed Loop Motor Controllers** 25
- Application Drawings**
 - MS332 27
 - MS320 28
 - MicroSpeed 196 29
 - MicroLength 196 30



The Original Machine Monitoring Experts



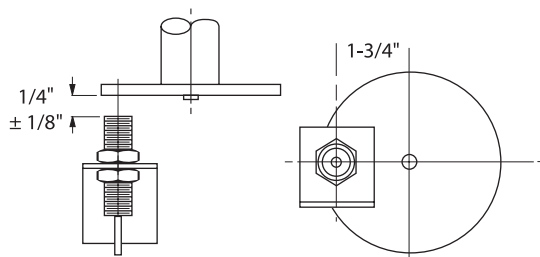
**ISO9001:2000
Certified**

Sensor Flexibility

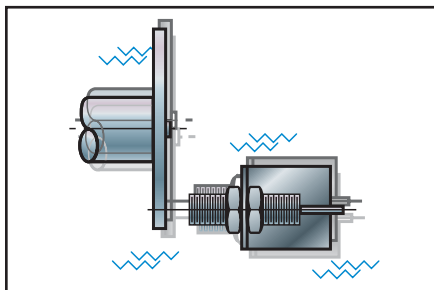
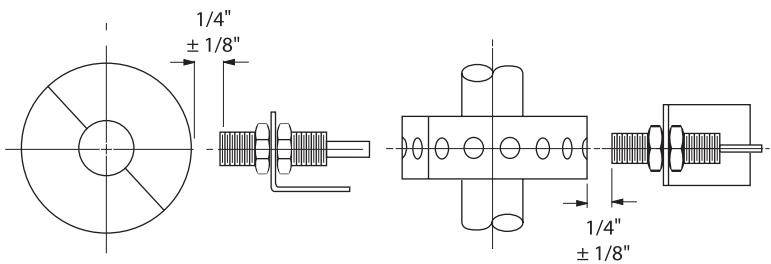
Flexibility – that's why plant maintenance professionals choose Electro-Sensors' Speed Monitoring Systems. For example, you only need a ruler to position our sensing heads (with our competitors you need a feeler gauge). Our designs have many other advantages, see below.

Compare our sensor tolerances to competitors before you purchase and install an inflexible rotational pickup device.

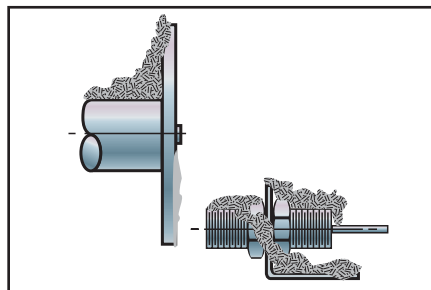
Head-on Position and Tolerance



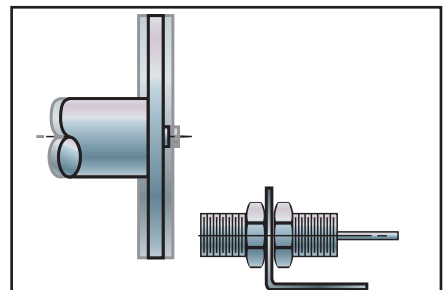
Side-Mount Wrap



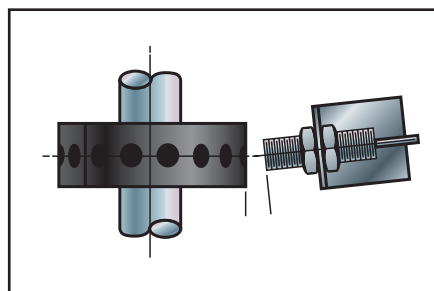
Unaffected by Plant Vibration



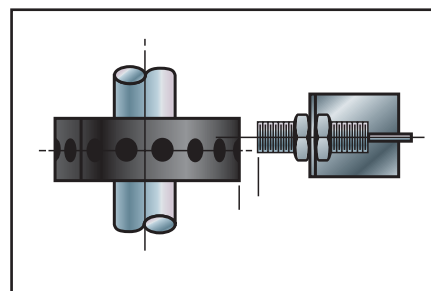
Plows Thru Grease, Dust & Dirt



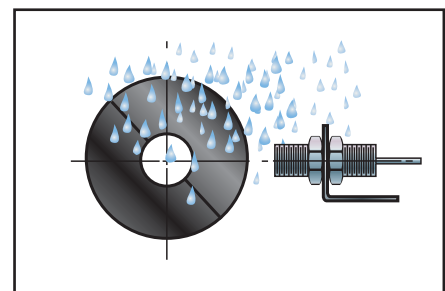
Forgives Up To 1/8 inch End Play



Forgives Misalignment



Senses Up To 1/4 inch Off center

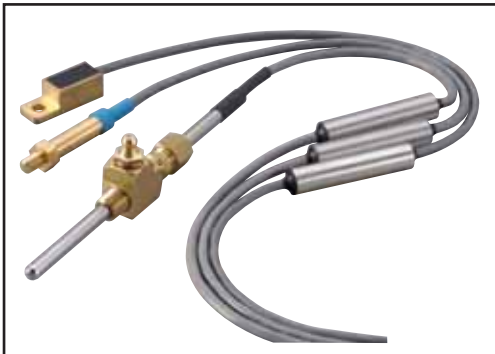


Water Resistant

Electro-Sentry™ Hazard Monitoring System

Combines the key elements of shaft speed, belt alignment, and bearing temperature into a straightforward to install and simple to use system.

See page 13.



TT420 Temperature Transmitters

Combines temperature sensing, signal conditioning and a 2-wire loop-powered 4-20mA transmitter into one compact easy to install package.

See page 16.

FB420 Feedback Sensor

A shaft speed sensor that provides a 4-20 mA signal directly proportional to the rotational speed of a monitored shaft.

See page 11.



ST420 Shaft Tachometer

A 2-wire loop-powered 4-20mA analog shaft speed sensor.

See page 11.

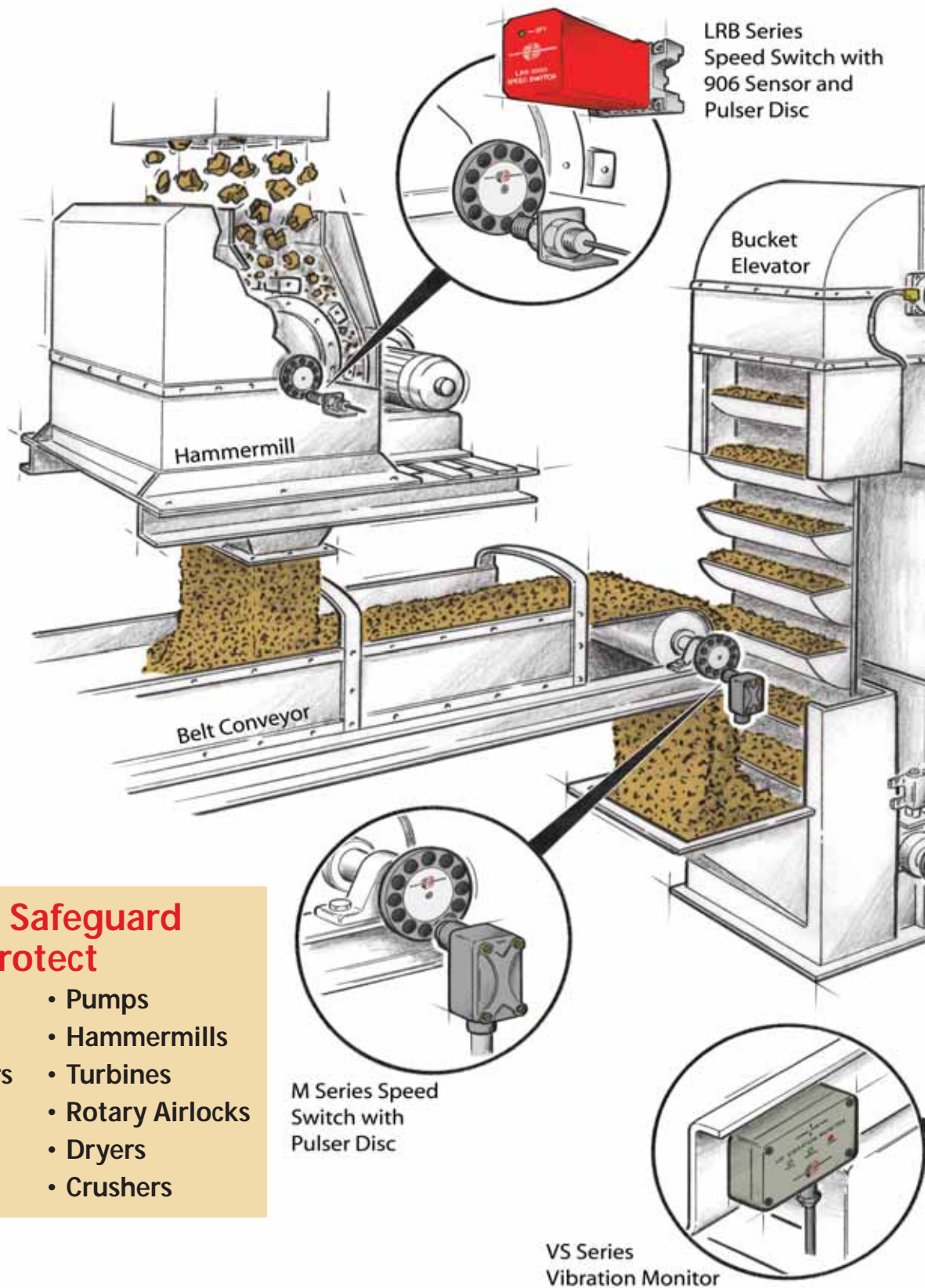
SpeedTalker DN-UI

Converts pulse frequencies from external sensors to RPM units, providing tachometer measurement of up to two rotating shafts and the status of eight alarm functions over DeviceNet.

See page 18.



Industrial



Systems to Safeguard and Protect

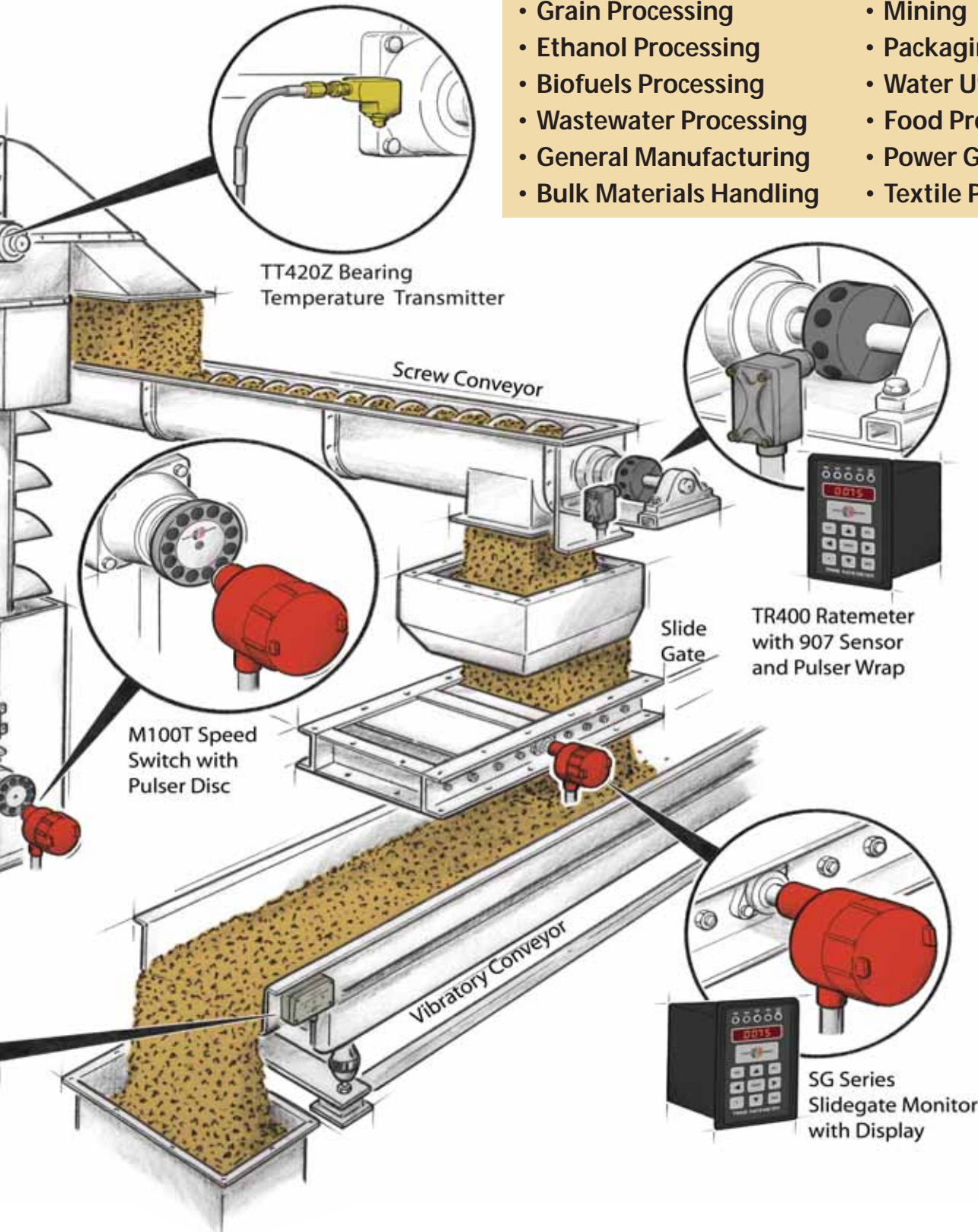
- Belt Conveyors
- Screw Conveyors
- Vibratory Conveyors
- Slide Gates/Valves
- Bucket Elevators
- Fans/Blowers
- Pumps
- Hammermills
- Turbines
- Rotary Airlocks
- Dryers
- Crushers

VS Series
Vibration Monitor

Applications

Industries Served

- Grain Processing
- Ethanol Processing
- Biofuels Processing
- Wastewater Processing
- General Manufacturing
- Bulk Materials Handling
- Mining
- Packaging
- Water Utilities
- Food Processing
- Power Generation
- Textile Production



No other system can accurately monitor shaft speed in the extreme conditions commonplace in industrial environments today. Our complete systems are rugged, reliable, and straightforward to install and maintain. We now offer temperature transmitters, DeviceNet sensors, vibration monitors, and position monitors.

Electro-Sensors - The Original Machine Monitoring Experts.

Common Installations



#255 Disc and #906 Sensor



PVC Pulser Wrap and #906 Sensor

- Non-contact sensing.
- End-of-shaft mounted pulser disc.
- Standard or explosionproof sensors available.
- Wide range of pulses per revolution (PPR) available.

- Optional pulser wrap available when shaft end is not accessible.
- Pulser wraps are custom made (number of pulses per revolution, shaft diameter) and work with either standard or explosionproof sensors.



EZ-100 and Speed Switch



EZ-SCP and Speed Switch



Disc-Guard and Speed Switch

EZ Mount Brackets

- EZ Mount assemblies simplify installation and use.
- No additional mounting brackets or hardware required.
- EZ-100 for use with M-Series switches and 907-Series sensors
- EZ-SCP for use with SCP-Series switches.

Stainless Steel Disc-Guards

- Protect pulser disc and sensing head.
- Simple to retrofit.
- Rugged stainless steel construction.

*Electro-Sensors' Shaft Speed Switches indicate shaft stoppage, slowdown, or critical speed. **5-year limited warranty on all speed switches.***



SCP Series Speed Switch

Presetable Speed Switch System

- Single or dual relay set points adjustable from 1-1,000 RPM.
- Built-in start delay.
- Dial-in calibration does not require power.
- Fail-safe operation in overspeed and underspeed mode.
- Split collar pulser wraps available when end of shaft is inaccessible.
- Explosionproof/waterproof housing contains sensor and electronics.
- Optional EZ-Mount bracket available.



M Series Speed Switch

Miniature Speed Switch System

- Single set point adjustable from 10-100 RPM (M100), or 100-5,000 RPM (M5000).
- Single-turn potentiometer for easy calibration.
- Split collar pulser wraps available when end of shaft is inaccessible.
- Compact explosionproof housing contains sensor and electronics.
- Optional EZ-Mount bracket available.
- Spanish language cutsheet available for this product.



M100T/M5000T

Miniature Speed Switch System

- Terminal block for easy wiring.
- Cast aluminum housing is explosionproof and waterproof.
- Optional voltages available.
- Easy installation and calibration.
- Compact, self-contained system with sensor and switch.
- Rugged system is dust, dirt and greaseproof.
- Optional EZ-Mount bracket available.
- Spanish language cutsheet available for this product.



Our Most Popular Speed Switch!



PVC Series Speed Switch

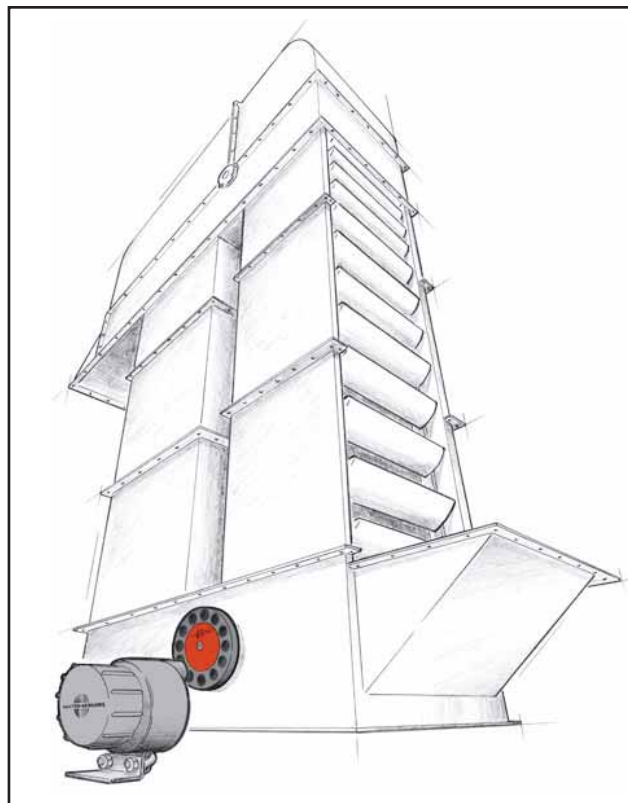
Chemical Resistant Speed Switch System

- Single set point adjustable from 10-100 RPM (PVC100), or 100-5,000 RPM (PVC5000).
- Split collar pulser wraps available when end of shaft is inaccessible.
- NEMA 4X fiberglass enclosure contains sensor and electronics.

DR1000 Speed Switch

Digital Zero Speed Switch System

- Precise set point adjustment from 0.5-5,000 RPM.
- DPDT relay is standard.
- Rugged explosionproof/NEMA 4X switch housing.
- Separate sensor allows remote mounting of switch electronics.
- Split collar pulser wraps available when end of shaft is inaccessible.
- Explosionproof sensors available.



LRB Series Speed Switch

DIN Rail Mount Speed Switch System

- Dial-in calibration does not require power.
- Single or dual relay set points adjustable from 1-1,000 RPM.
- Built-in start delay.
- Fail-safe operation in overspeed and underspeed mode.
- Separate sensor allows remote mounting of switch electronics.
- Split collar pulser wraps available when end of shaft is inaccessible.
- Explosionproof sensors available.





SS110 Speed Switch

Slow-Speed Switch System (0.01 -10 RPM)

Monitors extremely slow speeds — down to 100 minutes per revolution

- Dial-in calibration does not require power.
- DIN rail mounting simplifies installation.
- Built-in start delay.
- Separate sensor allows remote mounting of switch electronics.
- Split collar pulser wraps available when end of shaft is inaccessible.
- Explosionproof sensors available.

UDS1000 Speed Switch

Reverse Rotation Detector

- Shaft reversal de-energizes relay and unit automatically resets when reverse motion stops.
- Rugged explosionproof/NEMA 4X switch housing.
- Separate bidirectional sensor allows remote mounting of switch electronics.
- Split collar pulser wraps available when end of shaft is inaccessible.
- Explosionproof sensors available.
- UDS1000-WP available for water utilities/pump protection.



Ideal for Protecting Pumps & Fans!



ST420 Shaft Tachometer

2-Wire Loop Powered 4-20mA Analog Shaft Speed Sensor

- Accurate quartz crystal based digital processing.
- No user calibration – works right out of the box.
- Standard and custom measurement ranges available.
- Intrinsically safe design.
- Works with shaft-mounted pulser targets (disc/wrap).
- Stainless Steel M18 x 1 housing, NEMA 4X/IP67.

FB420 Shaft Speed Sensor

Analog And Relay Output In One System

- 4-20mA output directly proportional to shaft speed.
- Relay can be set for over-speed or under-speed.
- Rugged housing is explosionproof and waterproof.
- Simple installation and calibration.
- Provides real time preventive maintenance feedback.
- Prevents product waste, machinery damage and process downtime.



EZ-100 & EZ-SCP EZ-Mount Brackets

- No need to design and machine additional mounting brackets.
- Heavy-duty sealed bearings, stainless steel shaft, and powder-coated aluminum bracket.
- All necessary installation hardware included.
- Easy to install or retrofit – saves time and money.
- Compensates for typical shaft movement and vibration.
- EZ-100 for M-Series speed switches and 907-Series sensing heads.
- EZ-SCP for SCP-Series speed switches.



EZ-100



EZ-SCP

Stainless Steel Disc-Guards

Protect your switch or sensor against:

- Impact or shock damage
- Excessive dirt, grease & grime

- Rugged stainless steel construction.
- Simple to retrofit.



Speed Switch Selection Chart

Speed Switches	AVAILABLE OPTIONS											
	12 Vdc	24 Vdc	115 Vac	220 Vac	Underspeed Detection	Overspeed Detection	Number of Relays	DPDT Relay	Set Point Range	4-20mA Output	Start Delay	Set Point Delay
SCP1000	O	O	S	O	S	S	1	S	1-1K		S	
SCP2000	O	O	S	O	S	S	2		1-1K		S	
M100			S		S		1		10-100			
M5000			S		S		1		100-5K			
M100T	O	O	S	O	S		1		5-100			
M5000T	O	O	S	O	S		1		100-5K			
PVC100			S		S		1		10-100			
PVC5000			S		S		1		100-5K			
DR1000	O	O	S	O	S		1	S	0.5-5K			
LRB1000	O	O	S	O	S	S	1		1-1K		S	
LRB2000	O	O	S	O	S	S	2		1-1K		S	
SS110	O	O	S	O	S	S	1		0.01-10		S	
UDS1000	O	O	S	O	S		1	S				
FB 420		S			S	S	1			S		S

O = Optional S = Standard

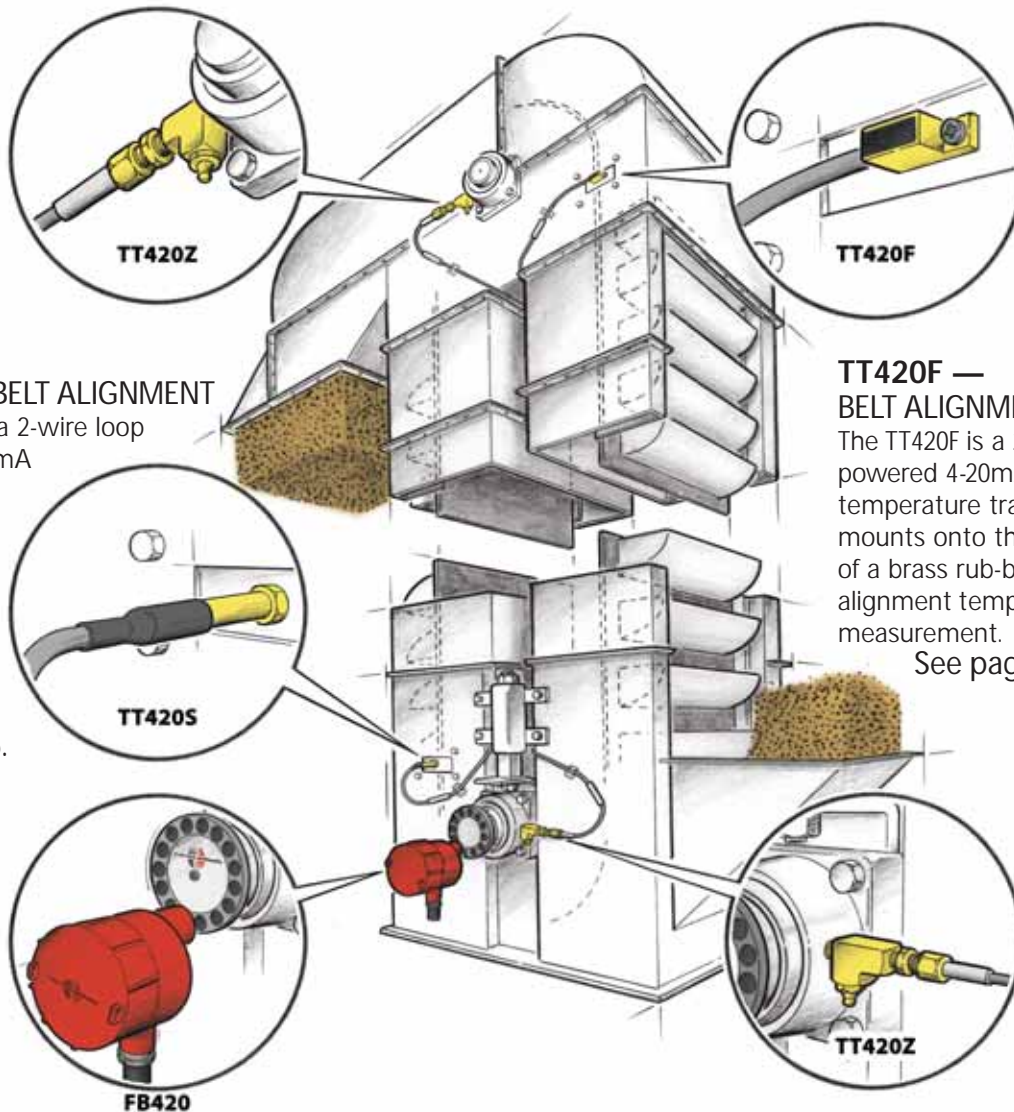


ELECTRO-SENTRY™

Hazard Monitoring System

Combines the key elements of shaft speed, belt alignment, and bearing temperature into a straightforward to install and simple to use system.

- Shaft Speed, Belt Alignment & Bearing Temperature
- No Calibration - Ready to Use Right Out-of-the-Box
- Complete System or Individual Components Available
- Sensors Output Standard 4-20 mA Signal
- No Proprietary Software or "Black Boxes" Required
- Simple & Straightforward to Install
- Easy to Troubleshoot
- Compatible with I.S. Barriers, PLCs, Meters and Data Acquisition Systems



TT420S — BELT ALIGNMENT

The TT420S is a 2-wire loop powered 4-20mA temperature transmitter that screws into the rear of any brass rub-block with a 1/4" - 28 tap. See page 16.

TT420F — BELT ALIGNMENT

The TT420F is a 2-wire loop powered 4-20mA temperature transmitter that mounts onto the rear surface of a brass rub-block for belt alignment temperature measurement. See page 16.

FB420 — SHAFT SPEED

The FB420 is a feedback sensor that mounts onto the elevator tail pulley to measure shaft speed. Housed in a rugged, XP enclosure the FB420 outputs a 4-20mA signal across the RPM range of the shaft, and has 2 programmable relay functions. See page 11.

TT420Z — BEARING TEMPERATURE

The TT420Z is a 2-wire loop-powered 4-20mA temperature transmitter that mounts into standard 1/8" or 1/4" grease fitting (Zerk) taps for bearing temperature measurement. 6" probe length allows for use with a wide range of bearing sizes. See page 16.

Now Available With 6 Relays!

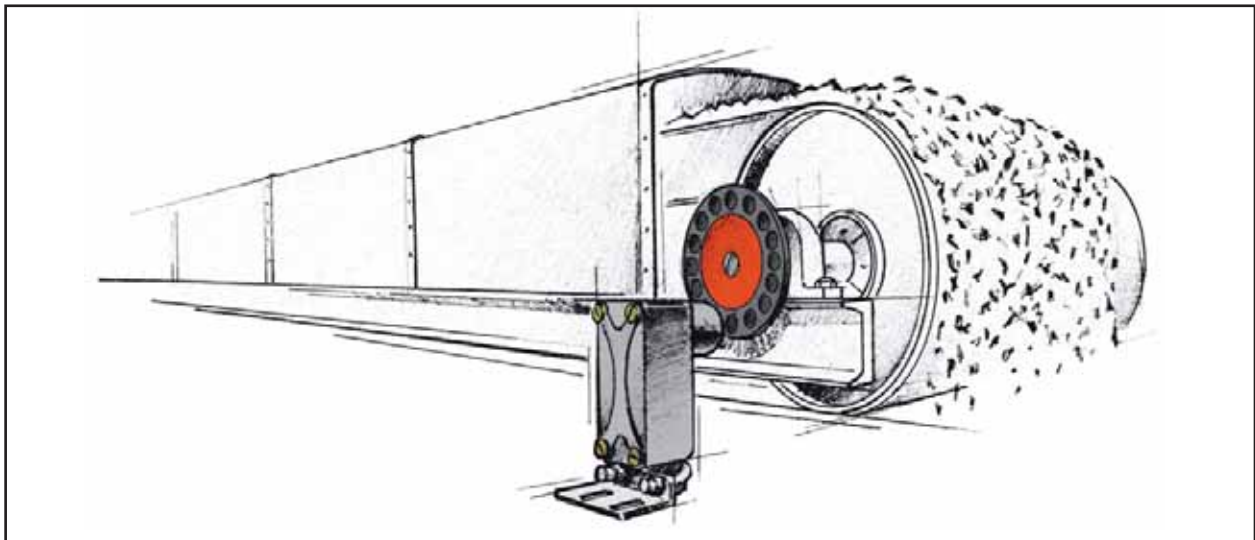


TR400 Ratemeter

Field-Programmable Digital Tach/Ratemeter

Displays speed and direction of rotating equipment.

- Relay and analog outputs optional.
- Completely field programmable.
- Full diagnostic functions.
- Single channel or quadrature mode.
- Compatible with all sensor types.
- Keypad lockout.
- Front panel reverse direction indication.
- Display rate or time in process.
- NEMA 4 meter faceplate standard.
- Split collar pulser wraps available when end of shaft is inaccessible.
- Explosionproof sensors available.
- Built-in relay test function.



TR5000 Ratemeter

Full Logic Control Tach/Ratemeter

Monitors up to two shafts and displays their relationship.

- Relay and analog outputs optional.
- Completely field programmable.
- Full diagnostic functions.
- Setpoint and start delay functions.
- Compatible with all sensor types.
- Three programmable transistor outputs.
- Keypad lockout.
- Display rate, time in process, ratio, sum, difference, or draw.
- NEMA 4 meter faceplate is standard.
- Split collar pulser wraps available when end of shaft is inaccessible.
- Explosionproof sensors available.





AP1000 Ratemeter

Digital Tach/Ratemeter System

Microprocessor-based unit accurate up to two decimal places.

- Field programmable from 0.00-9,999 IPM, GPM, RPM, etc.
- Small panel-mount meter installs easily in control cabinet or optional enclosures.
- Display rate or time in process.
- Split collar pulser wraps available when end of shaft is inaccessible.
- Explosionproof sensors available.

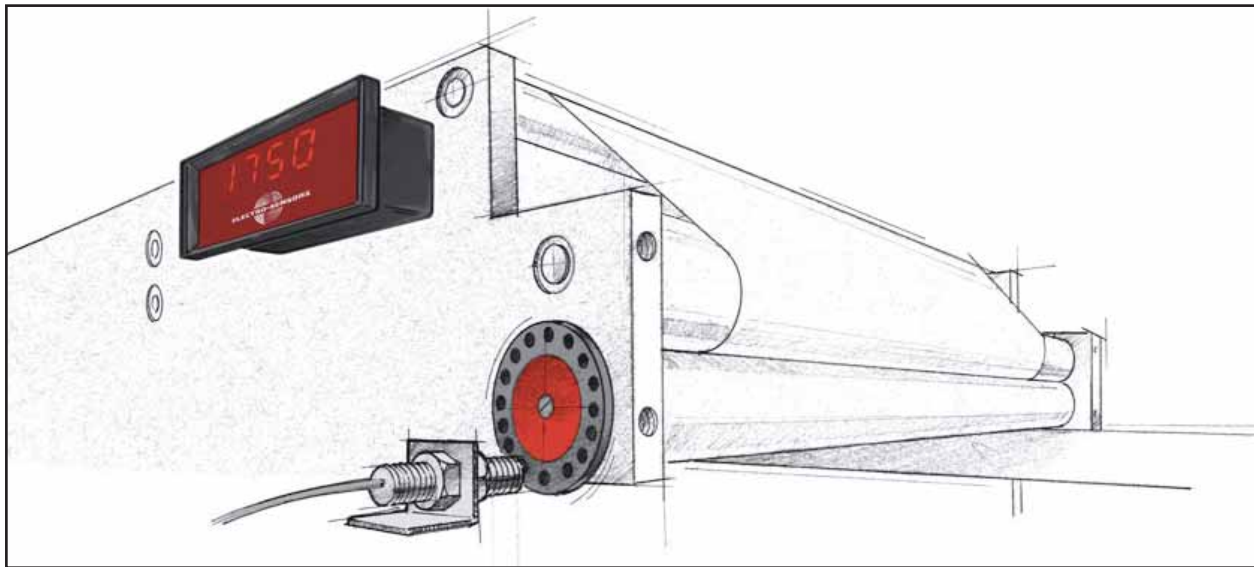


HH-100

Hand-Held Tachometer

Two tachometers in one!

- Allows non-contact and contact operation.
- Displays 1.00-99,999 RPM, FPM, IPM, MPM.
- Also measures length in inches, feet, and meters.
- Contact adapter, cone tip, surface speed wheel, reflective tape, carrying case, and batteries included.
- Two-year warranty.



Tachometer Selection Chart

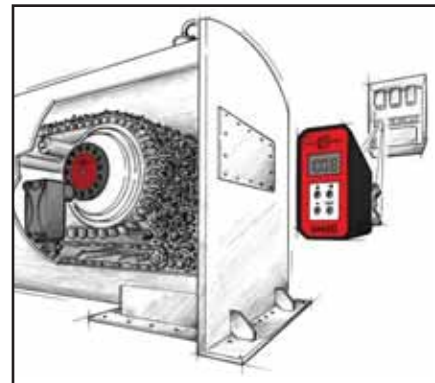
Tachometers	Display Range	POWER REQUIREMENTS				AVAILABLE OPTIONS										
		12 Vdc	24 Vdc	115 Vac	220 Vac	Relay Output	Underspeed Detection	Overspeed Detection	4-20mA Output	Start Delay	Set Point Delay	Analog Display	Digital Display	External Set Point Adj.	RS-422	NEMA 4 Faceplate
AP1000	0-9,999	0	0	S	0								S			
TR400	0-9,999			S	0	0	0	0	S	S		S	S	0	S	
TR5000	0-99,999	0		S	0	0	0	0	S	S		S	S		S	

O = Optional
S = Standard

SA420 Speed to Analog Converter

Converts Shaft Speed to Analog Outputs

- 4-20 mA and 0-10 Vdc output.
- Monitors speed from 0-10,000 RPM.
 - LCD display for easy programming.
 - Field adjustable calibration.
 - Convenient DIN rail mountable socket base.
 - Compatible with all types of sensors.
 - Split collar pulser wrap available when end of shaft is inaccessible.
 - Explosionproof sensors available.
- Spanish language cutsheet available.



4-20 mA
0-10 Vdc
Output

AIFO-200 Analog to Frequency Converter

Provides conversion from an analog input to a frequency output

The AIFO-200 is an interface device used between an analog signal and a frequency-input device. Typically, the AIFO is used in applications where a process is monitored by a transducer, PLC, PC or some other device that provides a 0-10 Vdc or 4-20 mA signal.

- 0-10 Vdc and 4-20 mA inputs.
- 0-20 kHz output switch selectable.
- Inversely proportional output available.
- NPN open collector or driven output.
- 0.05% linearity.
- Offset and gain adjustments.



Temperature Transmitters

TT420 Temperature Transmitters

Monitor temperature on a wide range of machinery

- Sensors output standard 4-20mA signal.
- Compatible with I.S. barriers, PLCs, meters and data acquisition systems.
- Ready to use – no calibration required.
- Simple and straightforward installation.
- Brass rub blocks available – consult factory.
- Pre-calibrated: $-40^{\circ}\text{C} \rightarrow +120^{\circ}\text{C} \leftrightarrow 4\text{mA} \rightarrow 20\text{mA}$.





CT6000 Process Counter

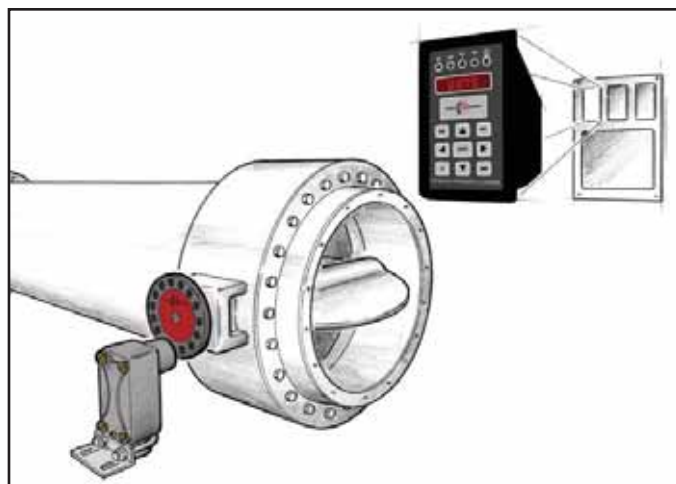
Displays process, batch, total and rate

- Completely field adjustable with full diagnostic functions.
- Three programmable transistor set point outputs and AC inputs.
- Nonvolatile memory.
- Bidirectional counting.
- NEMA 4 faceplate.
- Keypad lockout.
- Compatible with all sensor types.
- Explosionproof sensors available.
- Split collar pulser wrap available when end of shaft is inaccessible.
- Optional 4-20 mA output, programmable for any of the three counts or rate.
- Optional three relay outputs.



AC-D-4M Large Display Counter

- 2.3" Display height.
- Bidirectional counting.
- On-board or remote reset.
- 5,000-hour memory.
- Shelf mountable.
- 12 Vdc sensor supply.
- Sensor or contact closure input.
- 300 Hz sensor input.



Conveyor Belt Alignment



BA100 Conveyor Belt Misalignment System

- Highly visible red epoxy coated roller of 1-1/4" diameter with nylon bushings.
- Simple installation – drill (3) 13/32" diameter holes and mount on conveyor.
- 3/4" NPT conduit opening on all weatherproof and explosionproof units.
- The BA100 comes with limit switches rated for 20A @ 120Vac, 240Vac and 480Vac.
- Roller arm can move up to 90 degrees in either direction and is spring loaded for automatic reset.
- Optional manual reset available.
- Cast aluminum housing and optional cast iron housings available.
- Available in NEMA 4/5 weatherproof, dust-tight housing and explosionproof NEMA 7/9 housing.



DeviceNet Shaft Speed Sensor With Alarms – SpeedTalker DN-XP

- Explosionproof DeviceNet Shaft Speed Sensor.
- Rugged explosionproof, waterproof housing.
- Provides both measured shaft RPM and alarm states.
- State of the art shaft speed measurement and analysis.
- Integrates into any DeviceNet network.
- Predictive maintenance feedback and machine diagnostics.
- ODVA conformance tested (file #10159).



DeviceNet Shaft Speed Sensor With Alarms – SpeedTalker DN-BH

- Stainless Steel DeviceNet Shaft Speed Sensor.
- Corrosion resistant, waterproof stainless steel housing.
- Provides both measured shaft RPM and alarm states.
- State of the art shaft speed measurement and analysis.
- Integrates into any DeviceNet network.
- Predictive maintenance feedback and machine diagnostics.
- ODVA conformance tested (file #10219).



SpeedTalker DN-UI DeviceNet Universal Input Shaft Speed Monitor

- Provides measured shaft RPM and alarm states over DeviceNet.
- Compatible with most pulse output sensors.
- Provides isolated DC sensor power.
- Network powered DIN rail mountable module.
- Integrates into any DeviceNet network.
- ODVA conformance tested (file #10390).





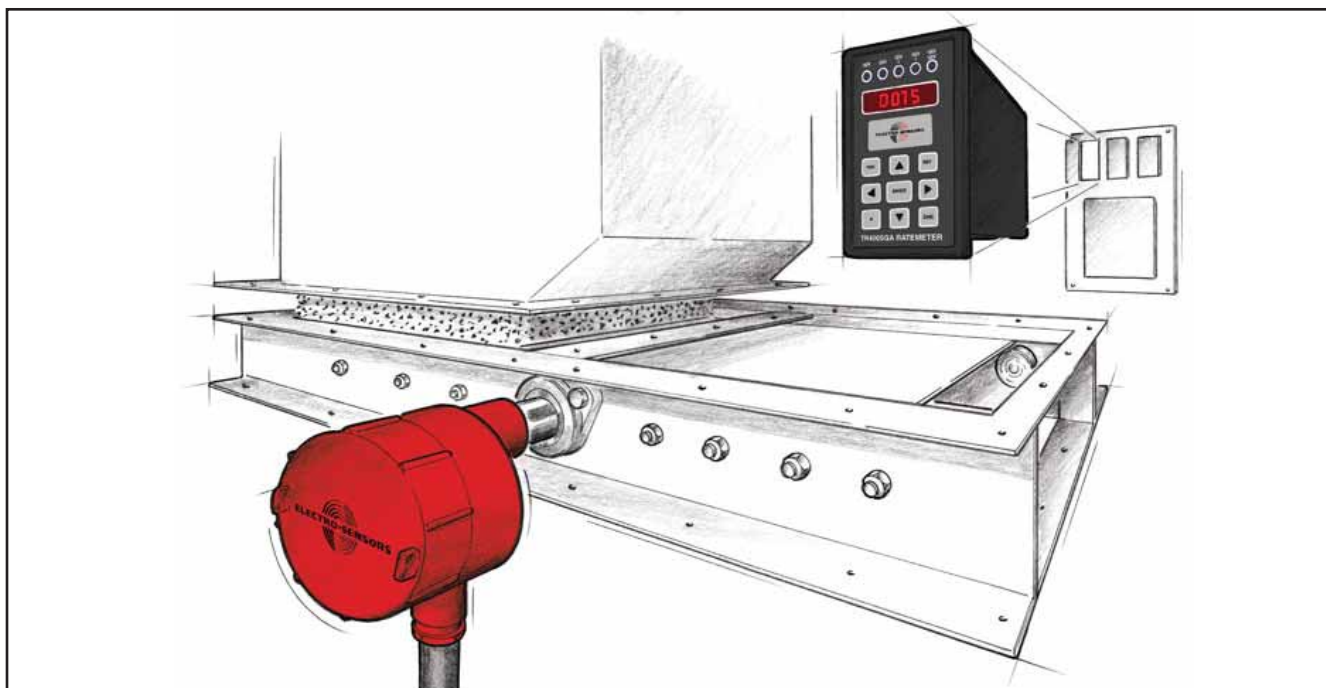
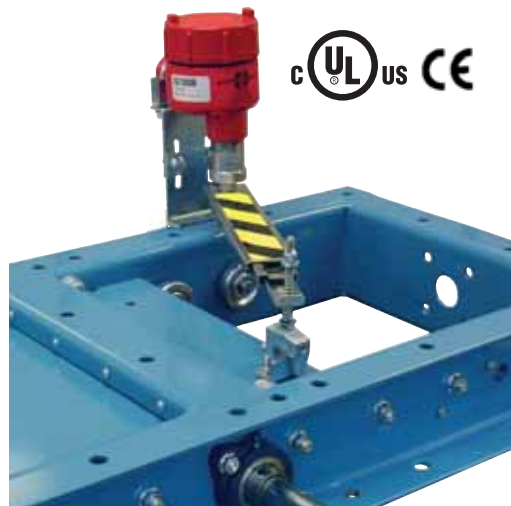
SG1000A Slide Gate Monitor

- Accurate gate or valve position feedback – ideal for product proportioning.
- Simple calibration allows use with most gate sizes.
- Versatile system – interface with a PLC or optional TR400-SGA display unit.
- Rugged explosionproof NEMA 4 housing – long life & dependability.
- Non-volatile memory – no loss of gate position caused by a power loss.
- No bracket required – easily mounts to gate drive shaft.
- Works on electrically or manually driven rack and pinion gates.

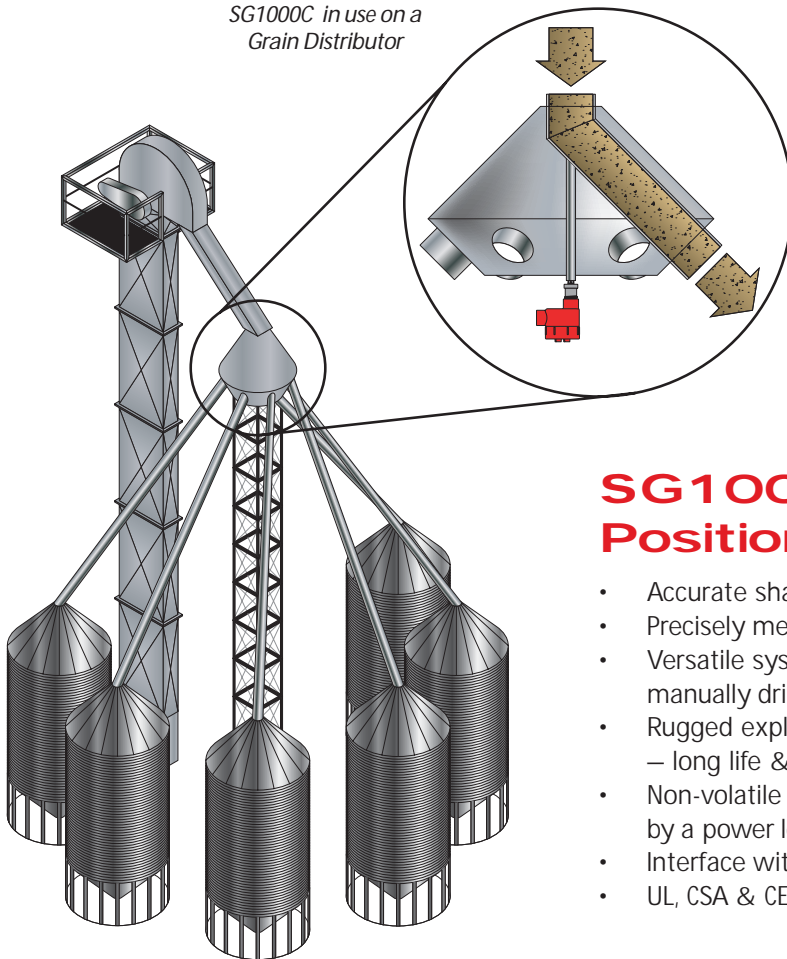


SG1000B Position Monitor

- Accurate gate position feedback – ideal for product proportioning.
- Precisely measures repetitive linear movement.
- Versatile system – interface with a PLC or optional TR400-SGA display unit.
- Rugged explosionproof NEMA 4 housing – long life & dependability.
- Non-volatile memory – no loss of gate or valve position caused by a power loss.
- Works on rack and pinion or linear driven gates.



SG1000C in use on a
Grain Distributor

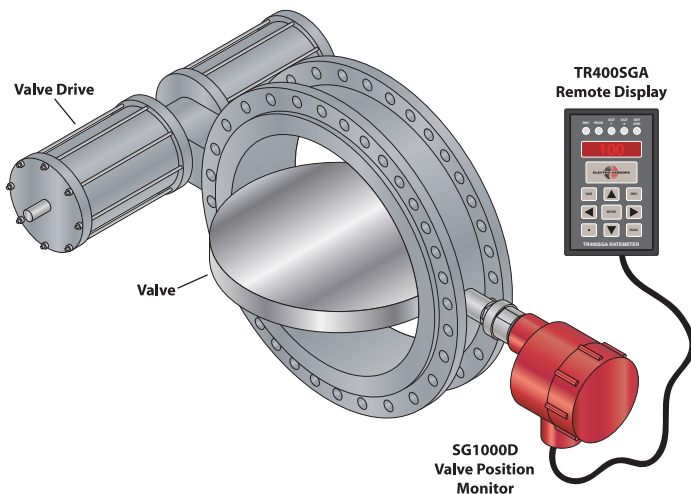


SG1000C Single Turn Position Monitor

- Accurate shaft-position feedback – 0° to 359°.
- Precisely measures repetitive single turn rotary movement.
- Versatile system – works on powered or manually driven shafts.
- Rugged explosionproof NEMA 4 housing – long life & dependability.
- Non-volatile memory – no loss of position caused by a power loss.
- Interface with a PLC or optional TR400-SGA display unit.
- UL, CSA & CE approved to applicable standards.

SG1000D Valve Position Monitor

- Accurate valve-position feedback – 0° to 359°.
- Precisely measures valve shaft rotary movement.
- Versatile system – works on powered or manually driven valve shafts.
- Rugged explosionproof NEMA 4 housing – long life & dependability.
- Non-volatile memory – no loss of valve position caused by a power loss.
- Interface with a PLC or optional TR400-SGA display unit.
- UL, CSA & CE approved to applicable standards.



VS Series Vibration Monitors

Vibration monitors with adjustable over- or under-vibration alarm and start delay

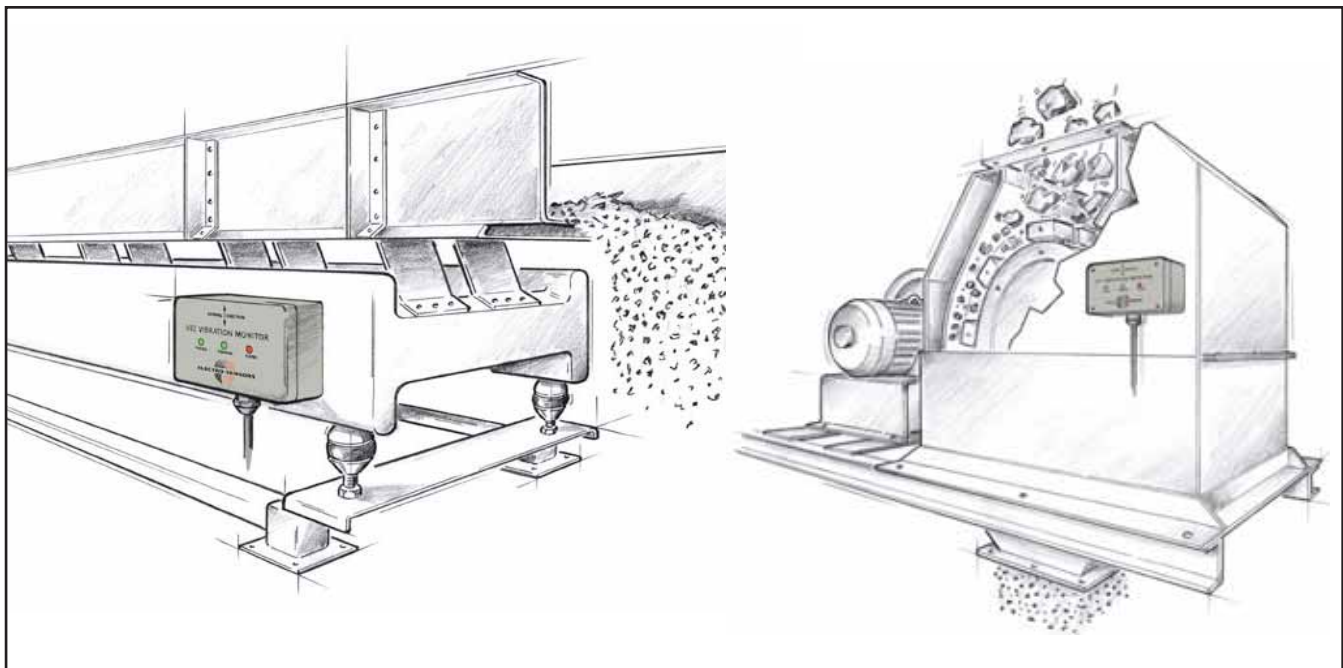
- Adjustable vibration alarm trip-point.
- Adjustable alarm delay prevents false shutdowns.
- Selectable over- or under-vibration alarm.
- LEDs provide at a glance machine status.
- SPDT Relay or NPN output.
- NEMA 4X and XP vibration monitors available.
- Monitors different vibration ranges to meet all applications.



NEMA 4X



Explosionproof



MTS Series Tilt Switches

MTS Series

Tilt Switch Systems and Probes

Detects the presence or absence of bulk material.

- Relay contact for presence or absence of bulk material.
- Standard control unit comes in a steel NEMA 12 enclosure with indicator lights.
- NEMA 4 and intrinsically safe enclosures available.
- Rugged heliarc-welded steel probes.
- Adjustable time delay prevents false indication.
- Probe may be used as stand-alone indicator.





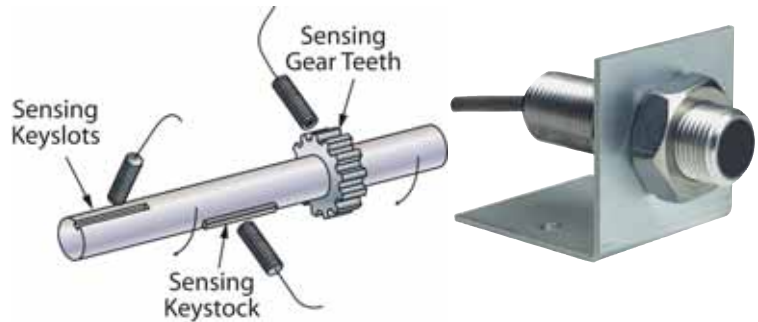
Hall Effect Sensors

Electro-Sensors manufactures a complete line of Hall Effect Sensors. These sensors can be used with any Electro-Sensors' product, or any product that can accept an NPN open collector current sinking pulse output. Our sensors, when used with an Electro-Sensors' magnetic target disc or wrap, provide the user with a large gap distance - up to 3/8". The sensors are manufactured from aluminum, stainless steel, or cast aluminum, and come complete with a mounting bracket and 10' of cable. We have sensor/pulse generator systems for almost any environment.

HE950 Sensor

Senses wide range of ferrous targets with gap distance flexibility and expanded operating range

- Senses a wide range of ferrous target sizes.
- Senses a wide variety of targets – gear teeth, keyways and more.
- Flexible gap distance set up – up to 3mm.
- Expanded operating range – up to 12kHz.
- Full output down to 0Hz – true zero-speed operation.
- Provides digital pulse output.
- Rugged, NEMA 4 sensor housing.
- Easy installation and set up.



Shaft-End Mount Pulser Discs

Available with alternating magnetic poles or steel slugs.

Pulses per revolution: 1 to 120

End Mount Discs require the installer to center drill and tap the monitored shaft for a 10-32 UNF machine screw. The discs range in size from 2.5" to 8" outside diameter. Most End Mount Discs are 0.25" thick. Custom sizes are also available. These discs are made of PVC, nylon composite, aluminum, or stainless steel, depending on the application. The standard discs, when used with our sensors, give the user up to 3/8" gap distance.

Split Collar Pulser Wraps

Split collar pulser wraps are an ideal solution for monitoring machinery when the end of the shaft is inaccessible. Wraps arrive on site in two halves that clamp together around the monitored shaft, secured by tightening the provided Allen head set screws. Pulser wraps are designed to accommodate any shaft diameter, tight spaces, and even keyways.

We manufacture a variety of pulser wraps available in standard PVC, with optional materials of aluminum, stainless steel and polypropylene. Electro-Sensors will insert either alternating pole ceramic magnets or steel targets around the circumference of the pulser wrap, depending on the sensor type chosen.



199SM/198EM Magnet Wheels

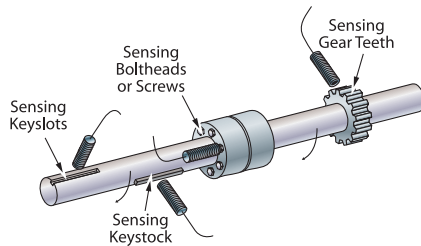
Electro-Sensors' Magnet Wheels contain 120 alternating magnetic poles around the circumference of the wheel, which measures 3.75" in diameter. These magnets can provide either 60 or 120 pulses per revolution for high resolution output.

- The 199SM wheels mount on shafts up to 3" in diameter and are secured with the provided set screws.
- The 198EM wheels mount on the end of a shaft and are secured in place by center-drilling and tapping the shaft for a 10-32 UNF screw (provided).



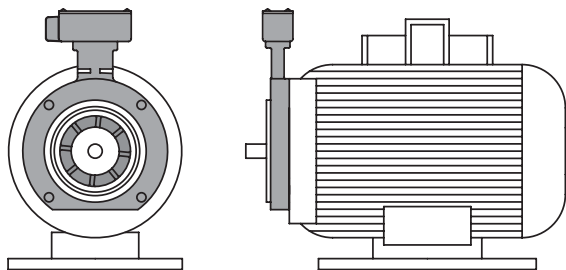
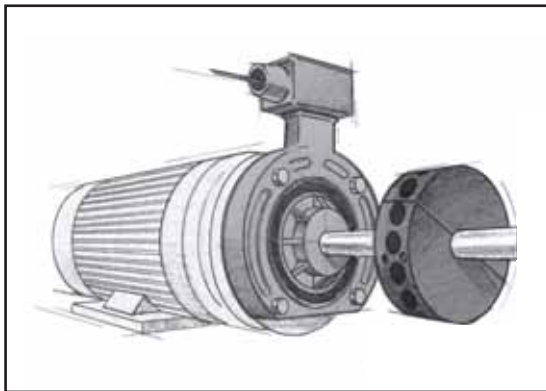
600 Series Proximity Sensors

Electro-Sensors' line of Proximity Sensors can be used to sense the presence of a bolt head, keyway, or other ferrous metallic surface. The sensors have an NPN open collector sinking pulse output. All Proximity Sensors are made from nickel-plated brass and have threaded barrel-type housings. They come complete with a mounting bracket and 6.5' of cable.



NEMA C Frame Ring Kits

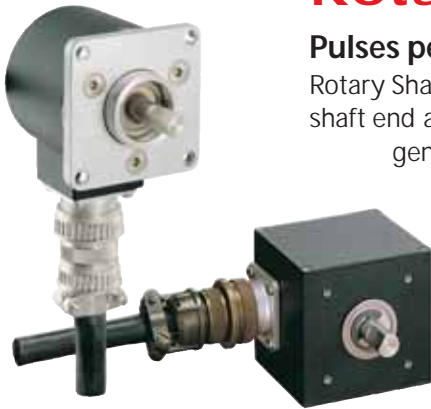
Electro-Sensors' Ring Kits generate accurate digital feedback pulses from motors with NEMA C frames. The DRK Series provides single-channel output and the QDRK Series offers quadrature output. Ring Kits include a Hall Effect sensor and a 199SM Magnet Wheel that can supply either 60 or 120 pulses per revolution depending on the type of sensor used. The mounting ring is machined from cast aluminum and comes with all necessary mounting hardware and the sensor is provided with 10' of cable.



Rotary Shaft Encoders

Pulses per revolution: 1-6,000

Rotary Shaft Encoders attach directly to the monitored shaft. We can also supply a shaft end adapter and flexible coupling to ensure proper installation. These Encoders generate from 1 to 6,000 pulses-per-revolution. An Encoder is normally used on a slow-turning shaft or to provide a high-frequency pulse output. Some options include heavy-duty housing, quadrature output sensing, and an index pulse.

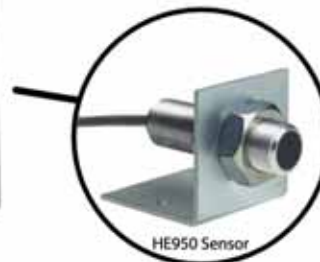


Traction Wheel Encoder Assemblies

The Electro-Sensors' Traction Wheel Encoder is available with three traction wheel materials: black neoprene rubber, smooth polyurethane, and diamond knurled aluminum tread. The complete and ready-to-install system converts linear travel to a digital pulse train proportional to the speed of the monitored material. Pulse counts are available from 1-1,270 pulses per revolution, making it ideal for slow-speed applications. Single-channel or quadrature outputs are available. We also offer an optional double-wheel model.

Accu-Tach

Accu-Dial



Accu-Tach & Accu-Dial Potentiometers

Programmable potentiometers with LCD display and feedback display in user units

Electro-Sensors' control potentiometers provide compact, versatile, and precise process control with a programmable LCD set point display for accurate visual confirmation and feedback. Accu-Dial is a stand-alone product ideal for applications such as AC/DC variable speed motor drives, temperature control, hydraulic and pneumatic systems, or any system currently using a traditional potentiometer. Accu-Tach comes as either a 2- or 3-piece system and provides the same level of control as the Accu-Dial, but with feedback measurement.

- **Replaces traditional potentiometers.**
- Reduce costly downtime and product waste.
- Tough ABS plastic enclosure - NEMA 4 rated.
- Precise process control and feedback.
- Simple to install, easy to calibrate.
- Small footprint - only 1.95" x 3.10".



Application examples on page 27

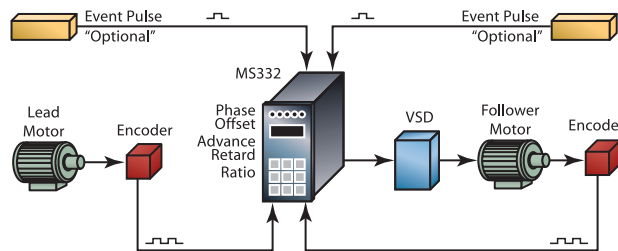
Wicket Oven Synchronization
Load Share Chain Conveyor
Synchronized Feeding
Synchronized Crane System
Rotary Knife

MS332 Synchronizing Controller

Keeps two or more motor-driven processes operating as though they are mechanically linked.

The MS332 is a powerful and versatile tool for building numerous closed loop processes through capabilities such as speed and phase control, electronic line shaft and gearing, event synchronization, and bidirectional control. The MS332 accepts quadrature encoder signals and almost any type of index/event sensor signal. The controller also provides the encoder/sensor power, which makes the MS332 ideal for new or existing systems. An MS332 supplies an isolated 0 to ± 10 Vdc speed reference signal to the drive, making it compatible with virtually any variable speed drive (AC, DC, or servo).

- No programming required - just enter system parameters.
- 3 Modes of operation: Master, electronic gearing/ratio, and event synchronization.
- Accepts similar or dissimilar master/follower encoder PPRs and output types.
- Uses simple, consistent means to access parameters, set-points, and utilities with a configurable keypad-lockout feature.
- A "learn" utility automatically calculates master/follower encoder pulses per index mark for quick setup.
- 8 discrete (switch) inputs and 4 discrete (npn) outputs.
- Optically isolated analog output, encoders/sensors, IO, and serial data port.
- Modbus RTU protocol and isolated RS485 serial data port.
- Monitors machine operation and compensates for system imperfections like parts wear, stretch, and product deviation.



Application examples on page 28

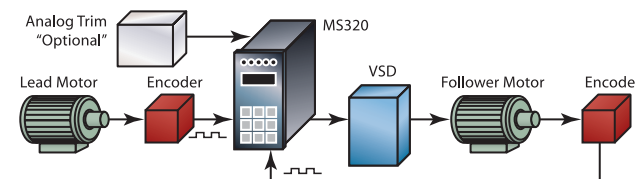
Tension Unwind/Rewind
Ratio Pump Control
Traverse Winding at Constant
Line Speed
Unwind/Rewind Stands
Optimum Feed Rate Control

MS320 Master/Follower Velocity Controller

A cost-effective solution for precise master/follower control of AC and DC variable speed drives.

The MS320 is a cost-effective way to add digital PID velocity control to a master/follower variable speed drive system. This is accomplished by monitoring a signal emanating from a feedback sensor (Digital or Analog) on a machine and fine-tuning the speed reference. The MS320 features three AC inputs: one dedicated for run/stop and two programmable for user-defined functions such as setpoints, jog, setpoint scroll, or stop.

A unique feature of the MS320 is a programmable "reset maximum DAC RPM" variable for core-driven wind and unwind applications that maintain constant line speed as the core builds or unwinds. An optional expansion board provides the user with two additional AC inputs, two relay outputs, RS422, and two analog inputs programmable for feedback signal, lead signal, master setpoint, follower setpoint, setpoint trim, or inverse setpoint trim.



- 0.02% speed regulation in master and follower mode.
- Security lockout of keypad and diagnostics for easy troubleshooting.
- Optional analog feedback and speed or ratio setpoint.
- Complete I/O isolation.
- Two optional relay outputs.

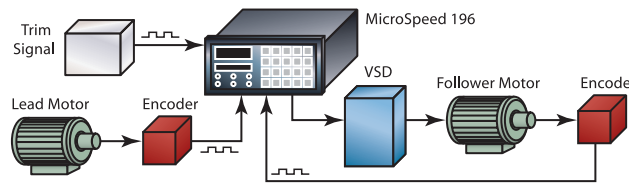
MicroSpeed 196 Master/Follower Velocity Controller

The industry-preferred standard in closed-loop systems for improving the performance of AC and DC drives.

The Microspeed 196 is a closed loop velocity controller designed for use with AC and DC variable speed drives of any horsepower. The Microspeed 196 can be used as a stand-alone controller in regulating a single motor to 0.01%, or as a follower in more complex multi-motor systems. An eight-character alphanumeric display provides the operator with plain English prompts, making operation and programming simple and user-friendly. An auxiliary or trim input is also available for applications that require an input such as a load cell or dancer arm to influence the setpoint or ratio.



- 0.01% Regulation in master mode.
- Zero cumulative error in follower mode.
- Complete I/O isolation.
- Selectable front panel lockout.
- Diagnostics for easy troubleshooting.
- RS422 communications standard.
- 6 Transistor status and control outputs.
- 8-Character alphanumeric display.



Application examples on page 29
 Cable Twisting
 Electronic Gearing for Multi-Pitch Screws
 Traverse Winding
 Backlog Control
 Continuous Web

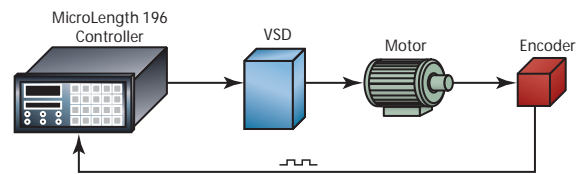
MicroLength 196 Position/Length Controller

The first position/length controller designed to replace preset counter systems with improved accuracy and cycle time.

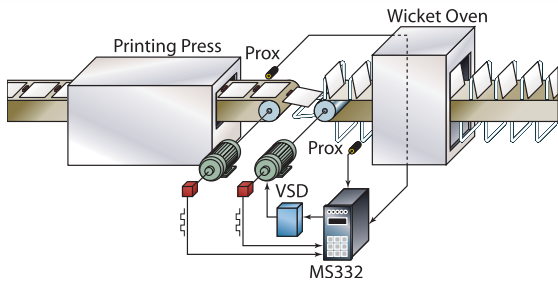
The Microlength 196 is a position length controller most commonly used in cut-to-length and material feed applications. This unit typically interfaces with an AC or DC variable speed drive. Compared to traditional preset counter and PLC systems, the Microlength 196 offers increased accuracy and reduced cycle times. Featuring four programmable setpoints and one programmable batch counter, the Microlength 196 offers complete machine control without a complicated interface system. It features a self-adjusting setup function to calibrate the feedback pulses to a given length, making initial setup much easier than with other position controllers.



- 6-digit resolution.
- Complete I/O isolation.
- ± 1 pulse accuracy.
- Selectable front panel lockout.
- Diagnostics for easy troubleshooting.
- RS422 communications standard.
- 6 transistor status and control outputs.
- 8-character alphanumeric display communicates in English.



Application examples on page 30
 Registered Index
 Batch Cut-To-Length
 Programmable Volume Controller

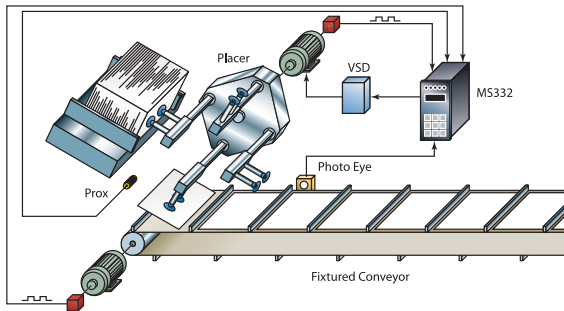
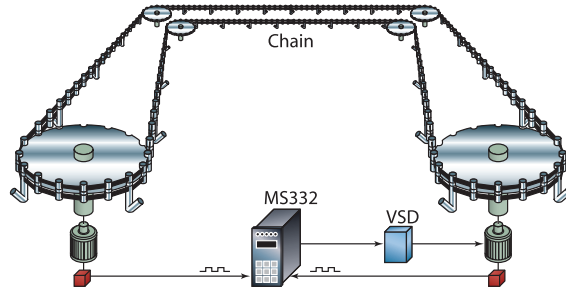


...Wicket Oven Synchronization

The MS332 controls the wicket conveyor to follow the printing press, providing one empty wicket for each sheet off the press. It receives sensor input from each wicket on the oven and each Feed Dog on the press. The unit is easily programmed to handle a wide range of sheet sizes.

Load Share Chain Conveyor...

Systems using long chains or conveyors may need to use more than one drive system to "share" the load over the long distance. The MS332 controls the follower drive in the "pulse locked" mode to ensure that there is no gain or loss between drives, allowing the conveyor to run smoothly without any buckling, regardless of the load.

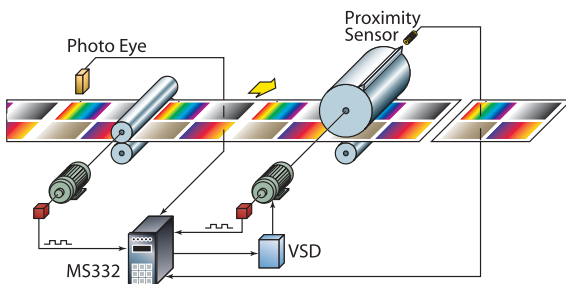
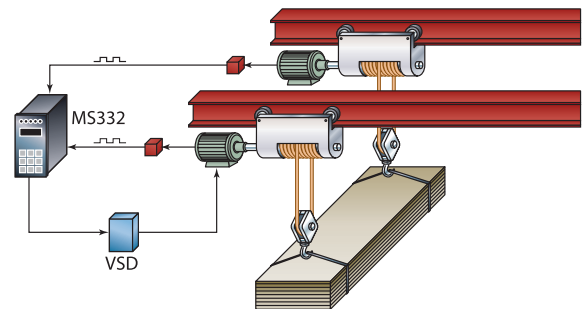


...Synchronized Feeding

The MS332 synchronizes an independently-driven rotary placer and a fixtured conveyor. Event sensors located on the conveyor and placer confirm timing of one machine to the other. It also features auto-phasing that allows quick product pitch changeover.

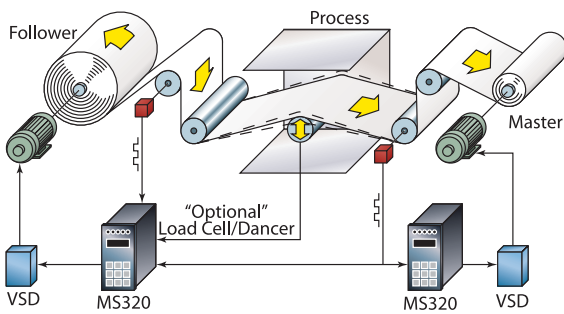
Synchronized Crane System...

Multiple-motor traveling crane systems require absolute synchronization with no gain or loss of shaft revolutions. In many applications, both the vertical and horizontal axes are controlled. The MS332 can control the speed and angular position of the motors in both directions.



...Rotary Knife

In a continuous motion rotary cutting application, an MS332 controls the rotary knife velocity for cutting preset material lengths. Length setpoints may be entered in easily understandable "user units". When it is necessary to make a cut relative to a registration mark, the MS332 compares the registration mark input to the knife position to maintain the preset cut location on the material.

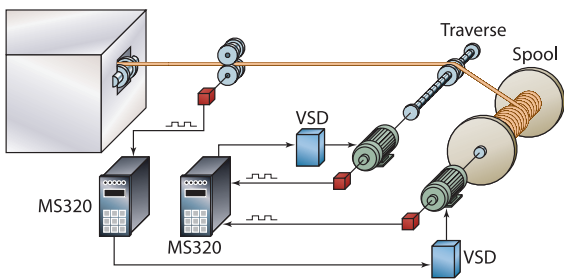
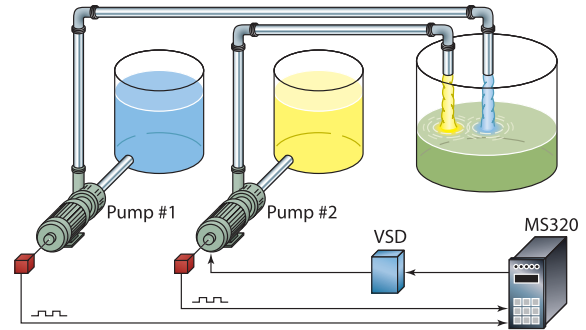


...Tension Unwind/Rewind

The MS320 Closed Loop Motor Speed Controller maintains preset speed and tension at the rewind roll (master) by controlling the unwind roll (follower) and monitoring a Load Cell or Dancer input through the follower. The MS320 is an economical way to precisely control speed and tension.

Ratio Pump Control...

Two positive displacement pumps are used to make a controlled solution mixture. Pump 1 is considered the lead and Pump 2 the follower. The MS320 controls Pump 2 at a ratio of Pump 1. Utilizing the user ratio variable in the MS320, the ratio set point may be entered in user units.

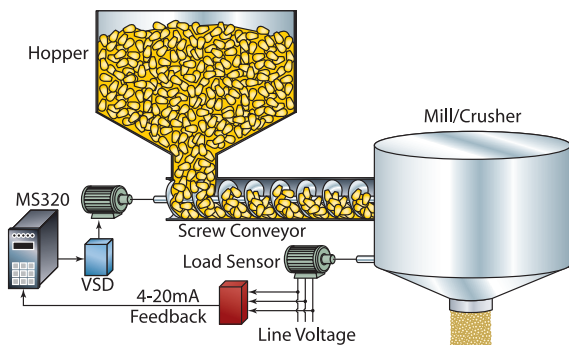
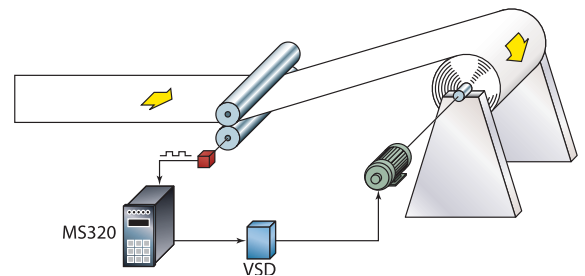


...Traverse Winding at Constant Line Speed

An MS320 controls the master reel to a constant surface speed setpoint by slowing the motor down as the core builds. A second MS320 in the follower mode controls the traverse drive to maintain a consistent product spacing "lay inches". This control scheme provides the operator with a quick and easy method of adjusting line speed and product spacing.

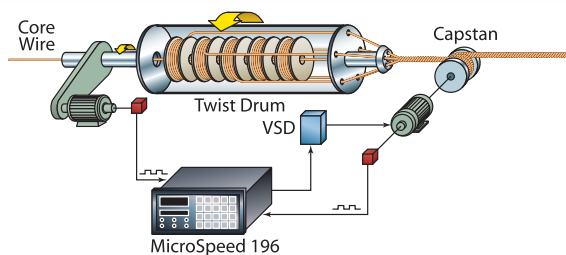
Unwind/Rewind Stands...

Many unwind and rewind stands require a constant surface payoff speed (i.e., FPM). The MS320 operating in master mode and interfaced with a line speed pulse generator, such as our traction wheel encoder assembly or a pulse generator mounted on a nip or idler roller, will provide 0.02% accuracy. During operation, the motor speed is constantly adjusted to maintain the setpoint as the core diameter changes. This ensures a consistent material flow from empty core to full spool "rewind" and from full spool to empty core "unwind". A load cell or dancer input can be used if tension should influence the process.



...Optimum Feed Rate Control

The MS320 programmed for master mode with analog feedback is also extremely useful for load monitoring and control. As the load of the machine increases, the feed rate is reduced and when the load decreases the infeed is increased to maintain a constant load on the mill motor. A load monitoring sensor with an analog output is used for feedback. The setpoint on the MS320 can be set in your customized units (i.e., amps, weight, etc.). Typical applications include feed and grain mills, saws, augers, and crushers.

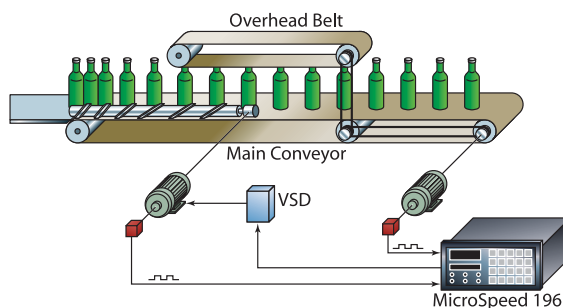


...Cable Twisting

To make multiconductor communication cables, two or more insulated conductors are grouped together and then twisted. The operator adjusts the master "twisting drum" speed and enters the desired setpoint in lay inches into the MicroSpeed 196 which has been programmed with the parameters to establish the speed of the capstan. In some applications, an additional MicroSpeed 196 is used on the rewind stand to maintain constant line speed.

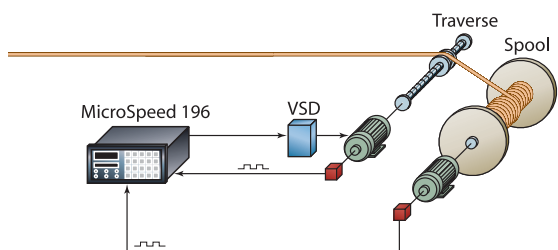
Electronic Gearing for Multi-Pitch Screws...

The MicroSpeed 196 is used to control the speed of the feed screw relative to the main conveyor speed and overhead belt. It is important that the product velocity exiting the screw precisely matches that of the conveyor. With the MicroSpeed 196, machines may be designed to handle a wider range of product sizes and production rates. When a product changeover requires a spacing change, simply change the timing screw for the new product and select the new ratio setpoint.



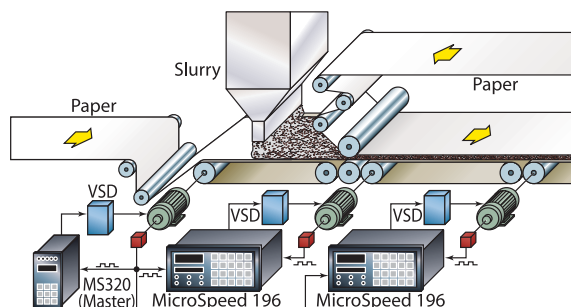
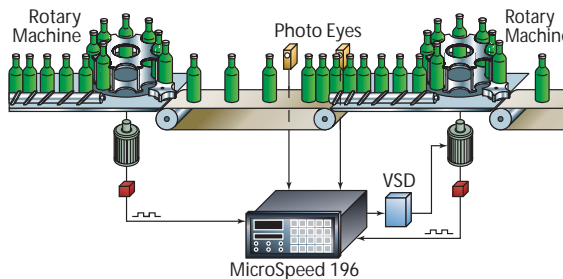
...Traverse Winding

The MicroSpeed 196 traverse controller directs the movement of the product guide across the spool and electronically modifies the end limits on the spool to ensure a level wind, regardless of product deviations or spool deformities. Setpoint selection in ratio, diameter, or product spacing in "lay inches" is easily entered through the keypad or the RS422 link.



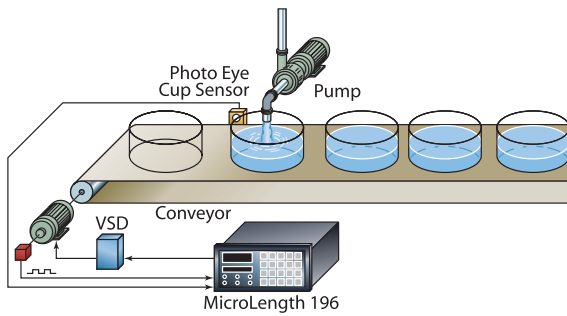
Backlog Control...

The MicroSpeed 196 precisely controls a machine's velocity relative to upstream conditions so that the critical infeed backlog level is maintained. With information from photo-eyes monitoring the infeed backlog level and product spacing, the MicroSpeed 196 makes short speed adjustments which seek and maintain the desired backlog level. This method prevents the oscillation typically associated with high speed/low speed systems.



...Continuous Web

An MS320 is used as a master controller to establish and maintain the product velocity. Several MicroSpeed 196 controllers connected in parallel are used as followers. It is important in this application that the string of conveyors maintain a matched speed. This insures that the wet web of material is smoothly transferred from one conveyor to the next without tearing or buckling the material.

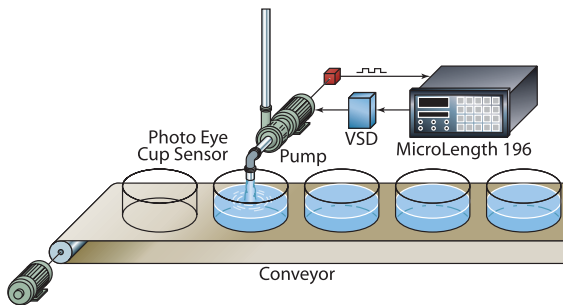
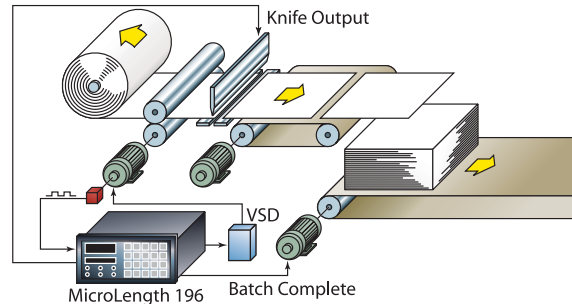


...Registered Index

Applications requiring a registered index can be controlled by a MicroLength 196 coupled with an I-mark or event sensor. In this application, the randomly-spaced product containers must be indexed into position beneath the pump nozzle. Utilizing the event sensor signal, the MicroLength 196 completes each index by accurately positioning the container a programmed distance from the sensor. With this system there is no accumulated error and the accuracy of each move stays within one pulse.

Batch Cut-to-Length...

The MicroLength 196 controls variable speed AC and DC drives with \pm one pulse accuracy for indexed cut-to-length applications. It features self-adjusting setup, that quickly calibrates the feedback pulses to a given length. This motion controller is an excellent choice to replace inaccurate preset counter systems.



...Programmable Volume Controller

The MicroLength 196 controls a positive displacement pump to accurately dispense a preset product volume. Calibrating the MicroLength 196 for this function is quick and easy. A short run of product is dispensed and measured and the MicroLength 196 counts the number of motor rotation pulses. The pulse and volume values are logged into the controller and the calibration is complete and ready for the next run. With \pm one pulse indexing, the MicroLength 196 controls the pump for an accurate dispense each cycle.

In the previous application examples Electro-Sensors, Inc. provides only the motor controllers and feedback devices (ring kits or rotary shaft encoders) and is not responsible for the selection of motors and drive equipment. Electro-Sensors, Inc. does not provide systems design, integration, or installation services. Contact your local systems integrator or electrical contractor for these services.

Proper installation of Electro-Sensors, Inc. equipment is the sole responsibility of the purchaser and is in no way guaranteed by Electro-Sensors, Inc.

Good Reasons To Consider Electro-Sensors For Your Next Project

- Rugged, Reliable Industrial Duty Systems
- Over 40 Years of Industry Experience
- Straightforward System Installation & Calibration
- Top Notch Customer Service & Tech Support
- Most Standard Products Ship Within 1-2 Days
- 5 Year Limited Warranty on Most Products
- ISO 9001:2000 Quality Certified
- Improve Processes — Safeguard Systems — Reduce Downtime

For More Information, Contact:



Jamieson Equipment Company
5314 Palmero Court
Buford, GA 30518
800-875-0280
Jamiesonequipment.com



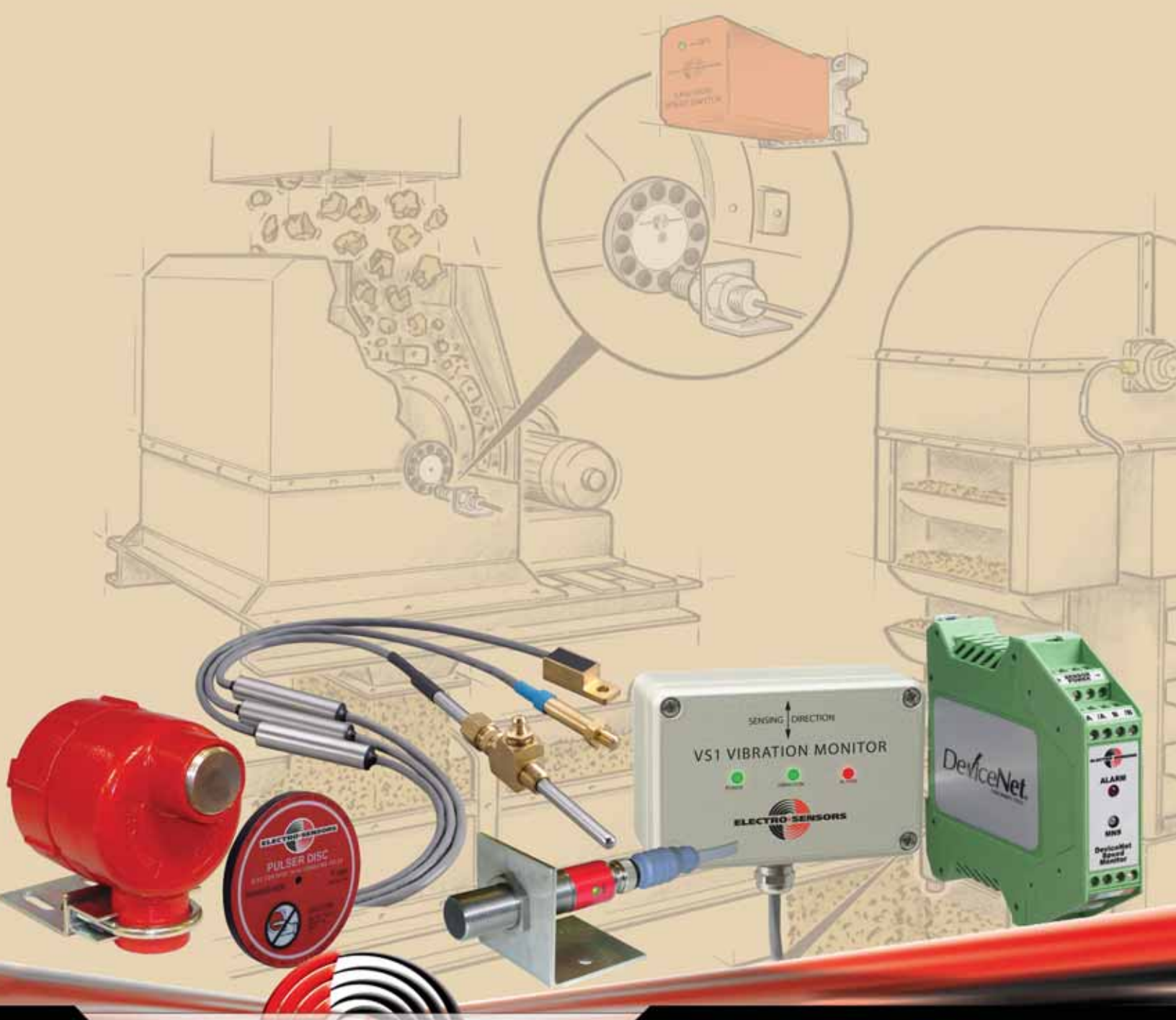
The Original Machine Monitoring Experts

North American Distributor



Electro-Sensors is the North American distributor of Motrona products of Germany. We supply their complete line of automation and drive modules from monitors and converters to encoder interfaces and motion controllers.

Contact Electro-Sensors for more information
and a free Motrona catalog.



www.ELECTRO-SENSORS.com

The Original Machine Monitoring Experts