

Key Features

- 4-20 mA analog speed output
- LED indicators for operation status
- User-configurable operating range within 0-9,999 rpm
- Internal LCD for programming, testing, and troubleshooting
- 24 VDC powered; terminal blocks for easy wiring
- Works with Electro-Sensors magnetic pulser discs / wraps
- Cast aluminum explosion proof (XP) housing
- UL Listed Class I, Div I (C, D) Class II Div I (E, F, G)
- Optional EZ-100 mounting bracket and mounting magnet available
- Optional Disc Guards for added protection



Description

Electro-Sensors FB420 is a shaft speed sensor that provides a 4-20 mA output signal directly proportional to the rotational speed of a monitored shaft. Since both the 4 mA and 20 mA calibration points are programmable, the user can also operate the FB420 with the 4 mA point offset from 0 rpm if necessary. The FB420 has a 4-digit LCD display used for calibration, testing, and troubleshooting. The LCD is capable of displaying from 0.000 to 9,999 rpm or from 04.00 mA to 20.00 mA. The FB420 has one relay that can be programmed for under-speed alarm or over-speed alarm.

Housed in a rugged, explosion proof NEMA 4X housing, the FB420 is ideal for detecting shaft under-speed or over-speed on a wide variety of industrial machinery. Typical applications include belt conveyors, drag conveyors, bucket elevators, fans, blowers, crushers, and pumps.

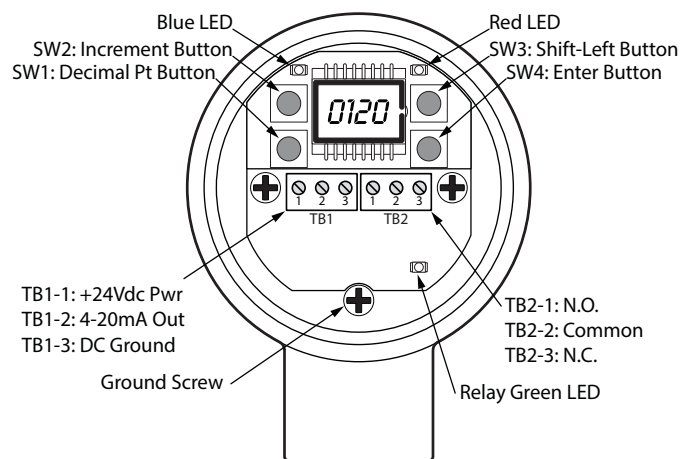
Built-In Sensor Testing

The 2024 update of the FB420 Speed Sensor introduced built-in sensor testing. The test can be activated by holding down the SW1 button for more than 2 seconds. The speed signal then begins to depreciate as the button is held down. If test speed drops below the user defined RPM setpoint it will cause the relay to de-energize and any warning or shutdown used for that machine will be triggered.

* Sold separately. See System Options for part numbers.

Principle of Operation

The FB420 is mounted so that the internal sensor is aligned with the magnets that are embedded in either a pulser disc* or a split collar wrap*. Pulser discs are mounted to the end of a shaft. Split collar wraps are attached around the circumference of a shaft. As the shaft rotates, the magnets pass in front of the internal sensor and generate speed pulses. These speed pulses are converted to a 4-20 mA output as programmed by the user. The output relay is energized or de-energized based on the rotational speed of the shaft and the programming of the FB420.



Rear-View (Cover Removed)

- Blue LED: Loss of Feedback Alert
- Red LED: Open Circuit
- Blue & Red LEDs: Unit not in Normal run mode
- Green LED: Relay Energized

FB420 Specifications

Product	
Input Power	+24 VDC ±10%
Input Current	55 mA (when 20 mA signal and relay energized)
Fuse Type	Any slo-blo External fuse 0.1A to 4A
Input Signal	
Type	Magnetic alternating
Range of Operation	Overall = 0.1 Hz to 9,999 Hz (with 8 PPR = 0.75 to 9,999 rpm)
Gap Distance	1/16" to 1/4"
Analog Output Signal	
Type	4-20 mA, with programmable end-points: (4 mA @ user min. rpm) (20 mA @ user max. rpm)
Accuracy	±0.3% FSR
4-20 mA Resolution	Depends on calibration, but can be a best of 0.001 mA per increment
Required Impedance	4-20 mA output needs 250 to 500Ω load
Max Signal Distance	Using a 3-conductor cable with 17.5Ω /1,000 ft. per conductor, the max. length of cable usable with the FB420 is: • 3,800 ft. when not using the relay • 2,300 ft. when using the relay
Relay Output Data	
Number Available	1 SPDT Form C
Relay Contact Rating	5 Amp @ 30 VDC 5 Amp @ 250 VAC
Relay Functions	<ul style="list-style-type: none"> • Unused • Under speed • Over speed
Physical Environment	
Rating	NEMA 4X, gasket provided
Operating Temp	-40 °C → +65 °C (-40 °F → +149 °F)
Storage Temp	-40 °C → +80 °C (-40 °F → +176 °F)
Humidity	0% to 90% non-condensing

Specifications subject to change without notice.

Ordering

All models come with a standard bracket for mounting

Model Description	Part Number
FB420, 24 VDC	800-046001

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FB420 Standard System

- Shaft Speed Pulse Generator

These are the most popular system components. Many other options are available.

System Options	Part Number
Standard 255 Nylon Pulser Disc, 4" Diameter, 16 Magnets	700-000200
Split Collar Pulser Wrap (PVC, Aluminum, Stainless Steel)	Custom (See Website)

Other Options	Part Number
EZ-100 Bracket Assembly	810-000001
MM-1.50 Mounting Magnet (must use EZ-100 Bracket Assembly)	810-000070
Standard Disc Guard	725-005300
EZ-Mount Disc Guard	725-005200
EZ-Mount Lower Disc Guard	725-005201



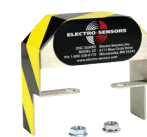
EZ-100 Mounting Option



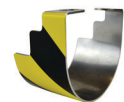
MM-1.50 Mounting Magnet Option
(must be used with EZ-100)



Standard Disc Guard



EZ-Mount Disc Guard



EZ-Mount Lower Disc Guard

Customization

If one of our standard products does not meet your specifications, please call one of our applications specialists. Many of our products can be customized to fit specific needs.

Additional Information

See FB420 Installation and Operating Manual for complete details, specifications, and programming instructions.