

### Key Features

- 4-20 mA analog speed output
- SPDT relay output
- Internal sensor
- User-configurable operating range within 0-9,999 rpm
- Setpoint can be set for over-speed or under-speed
- Internal LCD for programming and troubleshooting
- 24 VDC powered; terminal blocks for easy wiring
- Works with Electro-Sensors magnetic pulser discs / wraps
- Optional EZ-100 mounting bracket and mounting magnet available
- Cast aluminum explosion proof (XP) housing
- UL Listed Class I, Div I (C, D) Class II, Div I (E, F, G)



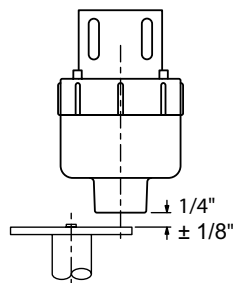
### Description

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 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 failsafe over-speed alarm or failsafe under-speed alarm (the failsafe 'alarm' state is relay de-energized).

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.

### Sensor Gap Flexibility

You only need a ruler to position our sensing heads (with our competitors you need a feeler gauge). Compare our sensor tolerances to competitors before you purchase.



Pulser Disc/Wrap Position and Tolerance

### Principle of Operation

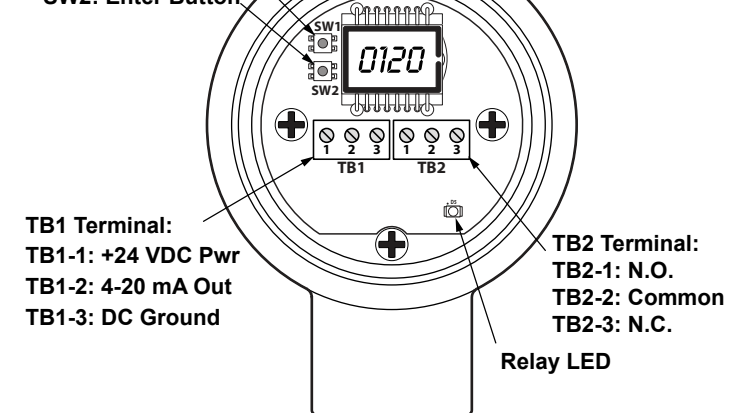
The FB420 is mounted so that the internal sensor is aligned with the magnets that are embedded in either a pulser disc\* or a split collar wrap\*. Pulser discs are mounted to the end of a shaft. Split collar wraps are attached around the circumference of a shaft. As the shaft rotates, the magnets pass 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.

\* Sold separately. See System Options for part numbers.

### Programming Push-buttons:

SW1: Increment Button

SW2: Enter Button



**TB1 Terminal:**  
TB1-1: +24 VDC Pwr  
TB1-2: 4-20 mA Out  
TB1-3: DC Ground

**TB2 Terminal:**  
TB2-1: N.O.  
TB2-2: Common  
TB2-3: N.C.

Rear-View (Cover Removed). Showing the power/signal terminal TB1, the relay terminal TB2, the push-buttons SW1 and SW2, and the relay LED

## FB420 Specifications

Product	
Input Power	Isolated +24 VDC ±10%
Input Current	55 mA (when 20 mA signal and relay energized)
Fuse Type	External fuse 0.100 A slo-blo
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	±0.7%
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	• Unused • Failsafe Over-speed • Failsafe Under-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	800-045000

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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-2.00 Mounting Magnet (must use EZ-100 Bracket Assembly)	810-000050
Standard Disc Guard	725-005300
EZ-Mount Disc Guard	725-005200
EZ-Mount Lower Disc Guard	725-005201



EZ-100 Mounting Option



MM-2.00 Mounting Magnet Option  
(must be used with EZ-100)



Standard Disc Guard



EZ-Mount Disc Guard



Lower EZ-Mount 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.