

# Avtron XR5 SMARTSafe™ Sensor



**Severe Duty Magneto-resistive Sensor for XR485, XR685 & XR850 Encoders, Rotor Fits Shafts 5/8"-4 1/2" [16mm-115mm]**

## Hazardous Duty Encoder Sensor XR5

- cULus Class I, Div 1 Listed, Groups A,B,C,D
  - cULus Class I Zone 0 Group II C
- cULus Class I, Div 2 Listed, Groups A,B,C,D
- ATEX IECEx Rated: Zone 1 & 2, 21 & 22
  - Fits Shafts up to 4 1/2" [115mm]
    - Ideal for Oil and Gas Drilling
    - Fully Potted Electronics
    - Up to 5000 PPR
- Wide Sensor-Rotor Gap: No Shimming or Scraping
  - 3 Year No-Hassle Warranty

XR5 SMARTSafe™ modular sensors enable the world's first hazardous duty encoders with removable electronics. They are cULus, ATEX and IECEx certified and offer incredibly reliable no-bearing construction! SMARTSafe sensors can be used in ATEX/IECEx gas and dust and UL gas hazardous environments. Also available: hollow shaft models ([XR685](#)), shafted models ([XR485](#)), no-bearing modular encoders ([XR125](#), [XR850](#)), and modular sensors for larger bore applications ([XR12](#)).

For Level 2 applications requiring ATEX/IECEx Zone 2 or 22 or cULus Class I, Division 2, Groups A,B,C,D use the XR5 directly in your application, with no barrier, isolator or cable gland required.

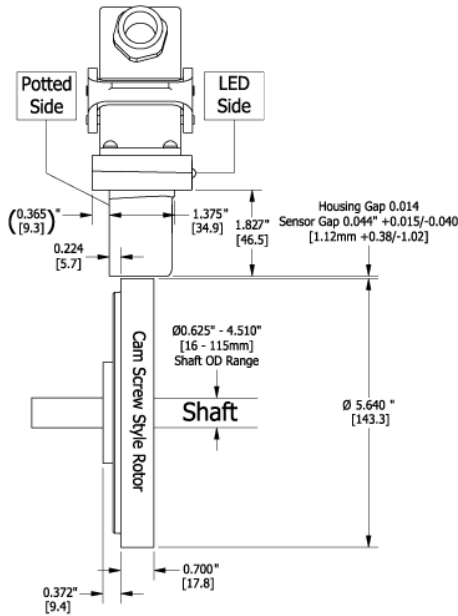
For Level 1 applications requiring ATEX/IECEx Zone 1 or 21 protection use the XRB1 or XRB2 isolator in your control cabinet which permits the use of intrinsically safe wiring instead of explosion proof conduit or glands. The XR56 can also be used in UL Class I Div 1 & Zone 0 applications using the XRB2 Isolator.

Unlike the competition, Avtron SMARTSafe encoder systems are protected against short circuits, power-to-output wiring, and output-to-ground faults.

Instead of mounting a tiny optical encoder with weak bearings on a wobbling stub shaft, mount XR5 directly on your machine and install the rotor on your main application shaft. Vibration, shock, liquids, dust and dirt won't harm SMARTSafe XR5 encoders! Paint booths, draw works, coil tubing rigs...XR5 can keep them all working 24-7-365.

Eliminate the biggest cause of industrial encoder failure--eliminate the bearings with XR5 hazardous duty encoder sensors.

## OUTLINE DRAWING



Check out our website for more detailed specifications, drawings, and installation instructions. [www.avtronencoders.com](http://www.avtronencoders.com)

## MORE XR5 ADVANTAGES

- Sensor PPR can be factory reprogrammed
- Full protection against short circuits, reverse voltage, phase-to-phase shorts
- Shrugs off dirt, oil, and water contamination
- No glass disks to break or optics to fail
- 4,500,000+ hour MTBF design
- Full protection against short circuits, reverse voltage, phase-to-phase shorts
- Mount in XR485, XR685, and XR850 encoders
- Direct Machine-Mount Option
- Self-Diagnostic LED and Alarm Output

## XR5 SPECIFICATIONS

**Operating Power:** (add cable drive current as req'd)

Level 1 (XRB1): 12-24VDC in, 10.6V out, 150 mA

Level 1 (XRB2): 12-24VDC in/out, 150 mA

Level 2 Protection: 5-24VDC in/out, 150 mA

**Output Format:** A Quad B with marker (A,A-, B,B-, Z,Z-)

**Frequency Range:** 0 to 165 KHz

**PPR:** 8-5000

**Speed:** 6000 RPM Max. (contact factory for higher speeds)

**Maximum Cable Length:**

Level 1: Encoder 500' Isolator 1000'

Level 2 (5 to 12 VDC in) 500'

Level 2 (15 to 24 VDC in) 250'

**Rotor Positioning:** Up to +/-0.100" [+/-2.54mm] movement/misalignment

**Sensor-Rotor Gap:** 0.045", +0.015/-0.040" [1.14mm+0.38/-1.0]

**Temperature:** -40°C to 80°C (Storage -40°C to 100°C)

**Environmental:** Electronics-IP54 (see manual for details)

**Vibration:** 5-2000Hz, 18G; 100G Shock

**Weight:** 2.2 lbs. [1kg]

**Certifications:**

Level 1: ATEX/IECEx Zone 1 & Zone 21 Group IIC

Level 1: cULus Class I, Division 1 and Zone 0 Group A,B,C,D\*

Level 2: ATEX/IECEx Zone 2 & 22 Group IIC

Level 2: cULus Class I, Division 2 Group A,B,C,D

\*See installation drawings for Warnings and Limitations

## SELECTION GUIDE

XR5 Sensor Part Numbers					
Model	Line Driver	PPR		Connector Options	Modifications
XR5-	See chart at right	X- none	S- 600	See chart at right	000- none
		F- 60	V- 900		004- Super Magnetic Shielding
		G- 100	J- 960		005- Special 97mm Rotor (see special manual)
		H- 120	Y- 1024		018- w/ Isolator XBR1 or XRB2 for cabinet mount
		A- 128	Z- 1200		4xx- Special PPR (see table)
		L- 240	3- 2000		9xx- Special Cable Length (xx=ft/0.3m)
		N- 256	4- 2048		
		P- 300	5- 2500		
		E- 360	D- 4096		
		B- 480	8- 4800		
		Q- 500	9- 5000		
		R- 512	0-special		

Line Driver Code				Connector Options
Level 1		Level 2		
Class I Div 1	Zone 1 & 21 (Ia)	Class I Div 2	Zone 2 & 22	Connector Options
	F		H	
F	H	n/a	7	
F	H	n/a	7	
F	H	n/a	7	
F	H	n/a	7	
F	H	n/a	7	
F	H	n/a	7	
F	H	n/a	7	
F	H	n/a	7	
XRB2	XRB2	None	None	

\*= E, F, J, K, S, T, U, V,

Units with connector options 4, 5, 6, or 7 are dual labeled for for both cULus Class / Div and ATEX / IECEx Zones



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All dimensions are in inches [millimeters]. Specifications and features are subject to change without notice. EU-SMART™, SMARTSafe™, SMARTach II™, THIN-LINE™, THIN-LINE II™, WIDE-GAP™, and BULLSEYE32™ are trademarks of Nidec Avtron Automation. All other trademarks and registered trademarks are the property of their respective owners.