

# Avtron XR12 SMARTSafe™ Sensor



**Severe Duty Magneto-resistive  
Sensor for XR125 Encoders,  
Fits Shafts up to 7  
7/8" [200mm]**

## Large Bore Hazardous Duty Encoder Sensor XR12

- cULus Class I, Div 1 Listed, Groups A,B,C,D
  - cULus Class I Zone Group IIC
- cULus Class I, Div 2 Listed, Groups A,B,C,D
- ATEX IECEx Rated: Zone 1 & 2, 21 & 22
  - Fits Shafts up to 7 7/8" [200mm]
    - Ideal for Oil and Gas Drilling
    - Fully Potted Electronics
    - Up to 8192 PPR
- Wide Sensor-Rotor Gap: No Shimming or Scraping
  - 3 Year No-Hassle Warranty

XR12 SMARTSafe™ modular incremental quadrature encoder sensors enable the world's first hazardous duty rotary 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 smaller bore applications ([XR5](#)).

For Level 2 applications requiring ATEX/IECEx Zone 2 or 22 or cULus Class I, Division 2, Groups A,B,C,D use the XR12 directly in your application, with no barrier, isolator or cable gland required.

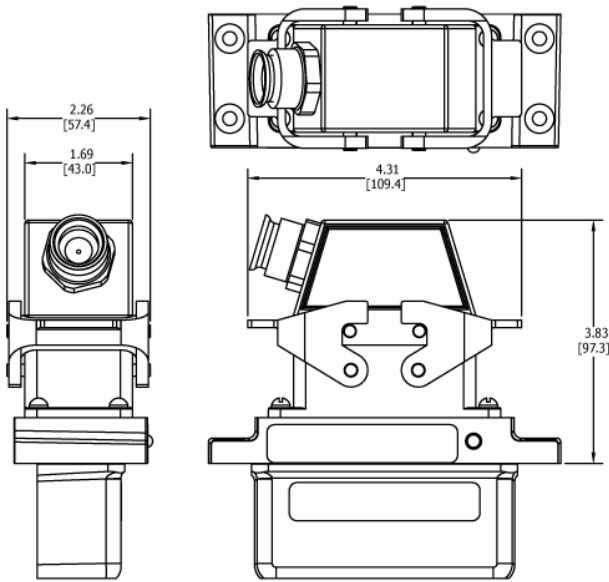
For Level 1 applications requiring ATEX/IECEx Zone 1 or 21 protection use the XRB1 or XRB2 isolator in your control cabinet which permits the use of intrinsically safe wiring instead of explosion-proof conduit or glands. The XR56 can also be used in UL Class I Div 1 & Zone 0 applications using the XRB2 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 XR12 directly on your machine and install the rotor on your main application or motor shaft. Vibration, shock, liquids, dust and dirt won't harm SMARTSafe™ XR12 encoders! Paint booths, draw works, coil tubing rigs...XR12 can keep them all working 24-7-365.

Eliminate the biggest cause of industrial encoder failure--eliminate the bearings with XR12 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 XR12 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
- ▮ Sensor for XR125 encoder
- ▮ Direct machine-mount capability
- ▮ Self-Diagnostic LED and Alarm Output

## XR12 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:** 8-8192

**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:** +/-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-IP67 (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

XR12 Sensor Part Numbers				
Model	Line Driver	PPR	Connector Options	Modifications
XR12-	See chart at right	X- none F- 60 G- 100 H- 120 A- 128 L- 240 N- 256 P- 300 E- 360 B- 480 Q- 500 R- 512 S- 600 V- 900 J- 960 Y- 1024 Z- 1200 3- 2000 4- 2048 5- 2500 D- 4096 8- 4800 9- 5000 0-special	See chart at right	000- none 004- Super Magnetic Shielding 018- w/ Isolator XRB1 or XRB2 for cabinet mount 4xx- Special PPR (see table) 9xx- Special Cable Length (xx=ft/0.3m)

Line Driver Code				Connector Options
Level 1		Level 2		
Class I Div 1	Zone 1 & 21 (a)	Class I Div 2	Zone 2 & 22	
F	H	n/a	7	A- 10 pin MS W/O Plug B- 10 pin MS with Plug
F	H	n/a	7	*- 7 Pin MS
F	H	n/a	7	R- 10 Pin mini twist lock
F	H	n/a	7	W- Flexible cable with Gland
F	H	n/a	7	G- 10 Pin Industrial with Plug
F		G		4- Conduit Box, Terminal Block 1/2" NPT
F		G		5- Conduit Box, Terminal Block 3/4" NPT
F		G		6- Conduit Box, Terminal Block 1" NPT
F		G		7- Conduit Box, Terminal Block 25mm PT
F		G		2- Tall Conduit Box, Terminal Block 3/4" NPT
XRBZ	XRBZ	None	None	Required Isolator: order separately or with option code 018

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

Units with connector options 4, 5, 6, 7 or 2 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.  
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