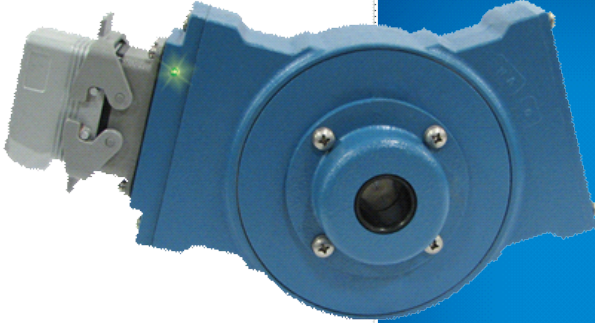


# Avtron XR685 SMARTSafe™ Encoders



**Severe Duty Magnetic Encoder  
for Hazardous Applications, 1  
1/8" Hollow Shaft Mount**

## Severe Duty Hollow Shaft Encoder for Hazardous Applications

- Severe Duty
  - Up to 5000 PPR
- ATEX/IECEx Rated for Zone 1, 2, 21 & 22 Applications
  - IP66 Enclosure
- Replaces Competitive Models Without Rewiring
  - Fully Potted Electronics
- Self-Diagnostic LED and Alarm Output
  - 1 Year No-Hassle Warranty
- cULus Class I Div 1 Groups A, B, C, D
  - cULus Class I Zone 0 Group IIC
- cULus Class I Div 2 Groups A, B, C, D

## XR685

XR685 SMARTSafe hollow shaft incremental quadrature rotary encoders are a breakthrough in hazardous duty encoders. They are ATEX/IECEx and UL approved and offer huge bearings for maximum life. SMARTSafe encoders can be used in ATEX/IECEx gas and dust and UL gas hazardous environments. Also available: hollow shaft models in other bore sizes (XR45, XR47), shafted models (XR4F, XR485), no-bearing modular encoders (XR56, XR67, XR85, XR115, XR125, XR850), and modular sensors (XR5, XR12).

For Level 2 applications requiring ATEX/IECEx Zone 2 or 22 or UL Class I, Division 2, Groups A,B,C,D use the XR685 directly in your application, with no barrier, isolator or cable gland required.

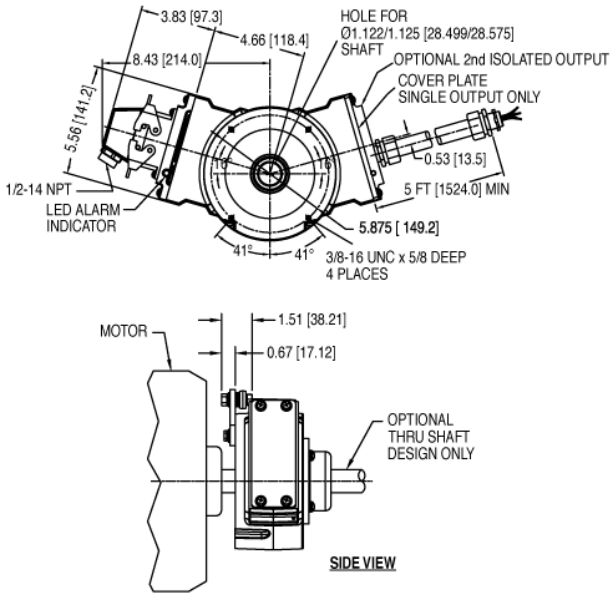
For Level 1 applications requiring ATEX/IECEx Zone 1 or 21 use the XRB1 or XRB2 isolator in your control cabinet which permits the use of intrinsically safe wiring instead of explosion proof conduit or glands. XRB2 Isolator Systems enable use in Class I Div 1 and Class I Zone 0 applications.

Unlike the competition, Avtron SMARTSafe encoder systems are fully protected against short circuits, power-to-output wiring, and output-to-ground faults at every point. Wiring errors won't harm this system!

Instead of depending on a tiny optical encoder with weak bearings use XR685. Vibration, shock, liquids, dust and dirt won't harm SMARTSafe XR685 encoders! Paint booths, draw works, coil tubing rigs...XR685 can keep them all working 24-7-365.

Eliminate encoder failures in your hazardous environment application-select XR685 today!

# OUTLINE DRAWING



# MORE XR685 ADVANTAGES

- Optional K661 signal converter for direct replacement of analog tachs (BC66, etc.)
- Shrugs off dirt, oil, and water contamination
- Huge range of stub shaft adapters available to fit shafts from 1 3/8" to 12" & most major motor brands
- Protected against: power-to-phase, short circuits, and reverse voltage wiring problems
- No glass disks to break or optics to fail
- End of shaft and thru shaft models available

# XR685 SPECIFICATIONS

**Operating Power:** (add cable drive current as req'd)  
 Level 1 Protection: 12-24VDC In, 10.6V Out, 150mA  
 Level 2 Protection: 5-24VDC In/Out, 100mA  
**Output Format:** A Quad B with marker (A,A-, B,B-, Z,Z-)  
**Frequency Range:** 0 to 165 KHz  
**PPR:** 8-5000  
**Speed:** 4000 RPM Max. (contact factory for higher speeds)  
**Maximum Cable Length:**  
 Level 1: 400' [120m]  
 Level 2: 500' [150m] @ 5-12V; 200' [60m] @ 24V  
**Temperature:** -40°C to 80°C (Storage -40°C to 100°C)  
**Environmental:** Electronics-IP67, IP66 overall (see manual for details)  
**Vibration:** 5-2000Hz, 18G; 100G Shock  
**Weight:** 15 lbs. [6.4 kg]; 17lbs [7.7kg] dual output  
**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

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

# SELECTION GUIDE

Model	Temp Rating	Tether	Style	XR685 PART NUMBERS AND AVAILABLE OPTIONS							
				Left Module		Right Module		Connector Options	Modifications		
				Line Driver	PPR	Line Driver	PPR				
XR685	N- -20°C to 80°C C- -40°C to 80°C	X- none 1- B21958 threaded rod	E- Standard (EOS) T- Thru Shaft	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	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	See chart at right	See chart at right	000- none 003- w/ K661 analog converter 004- super magnetic shielding 018- w/ Isolator XR61 or XR62 for cabinet mount 4xx- special PPR (see chart) 9xx- spc1 cable length (xxx=ft)

Line Driver Code		Level 1		Level 2		Connector Options
Class I Div 1	Zone 1 & 21 (Ia)	Class I Div 2		Zone 2 & 22		
		F	H	n/a	7	
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		
XR62	XR62	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, or 7 are dual labeled for for both cULus Class / Div and ATEX / IECEX Zones



Nidec-Avtron Makes the Most Reliable Encoders in the World

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All dimensions are in inches [millimeters].  
 Specifications and features are subject to change without notice.  
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