

# Avtron XR685 SMARTSafe™ Encoders



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

### Magnetic Durability in a Compact Encoder

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), shafted models (XR4F, XR485), no-bearing modular encoders (XR56, XR85, XR115, XR125, XR850), and modular sensors (XR5, XR12).

For 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.

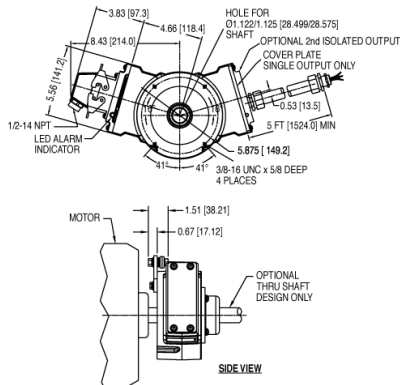
For applications requiring UL Division 1, ATEX/IECEX Zone 1 or 21 use the XRB3 isolator in your control cabinet which permits the use of intrinsically safe wiring instead of explosion proof conduit or glands. XRB3 Isolator Systems enable use in Class I Div 1 and Class I Zone 0 applications.

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

## MORE XR685 SPECIFICATIONS

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

Division 1, Zone 1 (XRB3): 12-24VDC In, 10.6V Out, 150mA

Division 2, Zone 2: 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:

Division 1, Zone 1: 400' [120m]

Division 2, Zone 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:

ATEX/IECEX Zone 1 & Zone 21 Group IIC

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

ATEX/IECEX Zone 2 & 22 Group IIC

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)



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Features and specifications are subject to change without notice. EU-SMART™, SMARTSafe™, SMARTTach™, THIN-LINE™, WIDE-GAP™, SAFETach™, and BULLSEYE32™ are trademarks of Nidec Industrial Solution. All other trademarks and registered trademarks are the property of their respective owners. Nidec Industrial Solutions' standard warranty applies. All dimensions approximate.

# SELECTION GUIDE

MODEL	TEMPERATURE RATING	ANTI-ROTATIONAL TETHER	MOUNTING STYLE	LEFT OUTPUT LINE DRIVER	LEFT OUTPUT PPR	RIGHT OUTPUT LINE DRIVER	RIGHT OUTPUT PPR	CONNECTOR OPTIONS	MODIFICATIONS
XR685	N - -20°C to +80°C (Standard) C - -40°C to +80°C	X - None 1 - Threaded Rod Tether (B32809)	E - Standard (End of Shaft) Mount T - Through Shaft Mount	X - No Left Output F - Level 1 Protection, (UL Class I, Div 1, UL/cUL Class I, Zone 0 Listed) 5-7v, 5V out (NOTE Requires XRB3 Isolator) H - Level 1 Protection (ATEX/IECEX Zone 1 & 21), 5-7v in, 5v out (NOTE Requires XRB3 Isolator) 7 - Level 2 Protection, (ATEX/IECEX Zone 2 & 22) 5-24v, 5-24V out G - Level 2 Protection, (UL Class I, Div 2 Listed) 5-24v, 5-24V out R - US CLASS I, DIV 2, ZONE 2, RECOGNIZED, 5-24v in, 5-24v out	X - No Left Output F - 60 PPR G - 100 PPR H - 120 PPR A - 128 PPR L - 240 PPR N - 256 PPR P - 300 PPR E - 360 PPR B - 480 PPR Q - 500 PPR R - 512 PPR S - 600 PPR V - 900 PPR J - 960 PPR W - 1000 PPR Y - 1024 PPR Z - 1200 PPR 6 - 1800 PPR 3 - 2000 PPR 4 - 2048 PPR 5 - 2500 PPR D - 4096 PPR 8 - 4800 PPR 9 - 5000 PPR 0 - Special PPR	X - No Right Output H - Level 1 Protection (ATEX/IECEX Zone 1 & 21), 5-7v in, 5v out (NOTE Requires XRB3 Isolator) 7 - Level 2 Protection, (ATEX/IECEX Zone 2 & 22) 5-24v, 5-24V out F - Level 1 Protection, (UL Class I, Div 1, UL/cUL Class I, Zone 0 Listed) 5-7v, 5V out (NOTE Requires XRB3 Isolator) G - Level 2 Protection, (UL Class I, Div 2 Listed) 5-24v, 5-24V out R - US CLASS I, DIV 2, ZONE 2, RECOGNIZED, 5-24v in, 5-24v out	X - No Right Output F - 60 PPR G - 100 PPR H - 120 PPR A - 128 PPR L - 240 PPR N - 256 PPR P - 300 PPR E - 360 PPR B - 480 PPR Q - 500 PPR R - 512 PPR S - 600 PPR V - 900 PPR J - 960 PPR W - 1000 PPR Y - 1024 PPR Z - 1200 PPR 6 - 1800 PPR 3 - 2000 PPR 4 - 2048 PPR 5 - 2500 PPR D - 4096 PPR 8 - 4800 PPR 9 - 5000 PPR 0 - Special PPR	A - 10 pin MS style w/o Mating Plug B - 10 pin MS style w/Plug J - 7 pin MS style w/Plug (A, B, Z) (Standard Phasing) K - 7 pin MS style w/Plug (A, A/, B, B/) (Standard Phasing) G - Industrial EPIC Style w/LED alarm P - Industrial EPIC Style w/LED and remote alarm contact (level 2 protection only) R - Baldor Mini MS style w/Plug W - 3' Sealed Cable w/Color Coded Leads 4 - Std conduit box, 1/2" NPT threads (ATEX/IECEX/UL/cUL rating) 5 - Std conduit box, 3/4" NPT threads (ATEX/IECEX/UL/cUL rating) 6 - Std conduit box, 1" NPT threads (ATEX/IECEX/UL/cUL rating) 7 - Std conduit box, 25mm threads (ATEX/IECEX/UL/cUL rating) X - No connector, no sensor (housing only)	000 - No Special Options 004 - Super Magnetic Shielded Sensor(s) 018 - Include XRB3 Remote Level 1 Isolator for Cabinet Mount 032 - Modify Conduit Box to 25mm entry; include remote XRB3 isolator for cabinet mount 401 - 1270 PPR (Special) Left Output (Set Left PPR Code to 0) 402 - 150 PPR (Special) Left Output (Set Left PPR Code to 0) 403 - 50 PPR (Special) Left Output (Set Left PPR Code to 0) 404 - 16 PPR (Special) Right Output (Set Right PPR Code to 0) 405 - 16 PPR (Special) Left Output (Set Left PPR Code to 0) 406 - 6000 PPR (Special) Left Output (Set Left PPR Code to 0) 407 - 2800 PPR (Special) Left Output (Set Left PPR Code to 0) 408 - 1400 (Special) Left Output PPR (Set Left PPR Code to 0) 409 - 30 PPR (Special) Left Output (Set Left PPR Code to 0) 410 - 6000 PPR (Special) Right Output (Set Right PPR Code to 0) 901 - Special 1/0.3m cable length built into sensor 902 - Special 2/0.6m cable length built into sensor 903 - Special 3/0.9m cable length built into sensor 905 - Special 5/1.5m cable length built into sensor 910 - Special 10/3m cable length built into sensor 915 - Special 15/4.5m cable length built into sensor 920 - Special 20/6m cable length built into sensor 925 - Special 25/7.5m cable length built into sensor 930 - Special 30/9m cable length built into sensor 933 - Special 33/10m cable length built into sensor