

## Avtron XR4F SMARTSafe™ Encoders



**Hazardous Duty Shafted Encoder,  
85mm B5 & B10-Flange or Foot Mount**

### Magnetic Durability in a Compact Encoder

10mm, 11mm & 18mm Shaft Sizes

EURO B5 & B10 Flange Mount

Up to 5000 PPR

-40°C to +80°C Operation

3 Year No-Hassle Warranty

Magnetic Sensors: No Glass Disks

Self-Diagnostic LED & Remote Alarm

ATEX Rated: Zones 1 & 2, 21 & 22

IECEX Rated: Zones 1 & 2, 21 & 22

cULus Class I Division 1 Groups A,B,C,D Listed

cULus Class I Zone 0 Group IIC

cULus Class I Division 2 Groups A,B,C,D Listed

### XR4F

XR4F solid shaft encoders are a unique industry first. By combining Avtron durable magnetic encoder technology with SMARTSafe™ systems, Avtron has created a truly durable solid shaft encoder which can be used in hazardous environments and applications. It is ATEX, IECEX & cULus certified. SMARTSafe encoders can be used in gas and ATEX dust hazard environments. Also available: hollow shaft models (XR45, XR685), NEMA style shafted model (XR485), and no-bearing modular encoders (XR56, XR85, XR115, XR125, XR850).

For applications requiring ATEX or IECEX Zone 2 or 22 or UL Class I, Division 2 use the XR4F directly with no barrier, isolator, special connector or cable gland required.

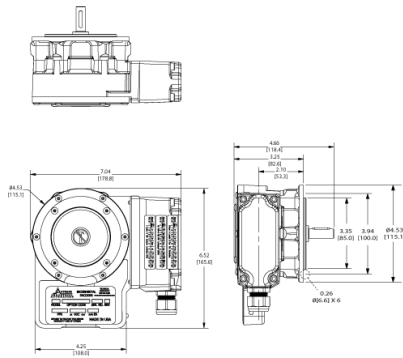
For applications requiring ATEX or IECEX Zone 1 or 21, we offer protection using the XRB3 isolator in your control cabinet to permit intrinsic safety wiring rather than explosion proof conduit or glands. For applications requiring NEC 500 UL Class I, Division 1, or NEC 505 (c)UL Class I, Zone 0, use the XRB3 isolator remotely and intrinsic safety wiring.

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

Instead of relying on a tiny optical encoder with weak bearings, install the most rugged encoders available. Vibration, shock, liquids, dust and dirt won't harm SMARTSafe encoders! Mud pumps, paint booths, hazardous duty IEC motors...XR4F can keep them all working 24/7/365.

Select the Avtron XR4F SMARTSafe encoder to eliminate encoder problems in your hazardous duty application!

## OUTLINE DRAWING



## MORE XR4F ADVANTAGES

- Directly replaces Hubner OG9, FOG9, POG9, POG 9G, POG90, POG10 G, POG 11, POG 11G models
- Bearings up to 4X larger than competitors models
- Foot, B5 or B10 Euro Flange Mount
- Directly replaces Johannes Hubner FG4, FG40 models
- Fully Potted Electronics Withstand Liquids & Dusts
- Protected Against Surges and Wiring Problems

## MORE XR4F SPECIFICATIONS

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

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

Division 2, Zone 2: 5-24VDC In/Out, 150mA

### Output Format: A Quad B with marker (A,/A, B,/B, Z,/Z)

### Frequency Range: 0 to 165 kHz

### Maximum Cable Length:

Division 1, Zone 1: Encoder 500' Isolator 1000'

Division 2, Zone 2 (5 to 12 VDC in): 500'

Division 2, Zone 2 (15 to 24 VDC in): 250'

### Temperature: -40°C to 80°C (storage -40°C to 100°C)

### Environmental: IP54 (see manual for details)

### Vibration: 5-2000Hz, 20G, 100G Shock

### Weight: 10-12lbs [4.5-5.5kg]

### Certifications:

ATEX/IECEX Zone 1 & 21 Group IIC

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

ATEX/IECEX Zone 2 & 22 Group IIC

cULus Class I Div. 2 Groups 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 | SHAFT SIZE  | LEFT OUTPUT PPR  | RIGHT OUTPUT PPR   | LINE DRIVER   | CONNECTOR OPTIONS  | FOOT MOUNTING   | CHANNELS  | MODIFICATIONS  |
|-------|---|--|--|---|--|---|---|--|
| XR4F  | H - 11mm diameter Standard Shaft<br>N - 10mm diameter Shaft<br>T - 18mm diameter Shaft<br>S - 16mm diameter Shaft | XX - No Left Output<br>AF - 60 PPR<br>AK - 80 PPR<br>AG - 100 PPR<br>AH - 120 PPR<br>AA - 128 PPR<br>AM - 200 PPR<br>AL - 240 PPR<br>AN - 256 PPR<br>AP - 300 PPR<br>AE - 360 PPR<br>AC - 400 PPR<br>AB - 480 PPR<br>AQ - 500 PPR<br>AR - 512 PPR<br>AS - 600 PPR<br>AV - 900 PPR<br>AJ - 960 PPR<br>AW - 1000 PPR<br>AY - 1024 PPR<br>AZ - 1200 PPR<br>A4 - 2048 PPR<br>CX - 1500 PPR<br>A5 - 2500 PPR<br>AT - 3072 PPR<br>A7 - 3600 PPR<br>AD - 4096 PPR<br>A8 - 4800 PPR<br>A9 - 5000 PPR | XX - No Right Output<br>BC - 50 PPR<br>BF - 60 PPR<br>AK - 80 PPR<br>AG - 100 PPR<br>AH - 120 PPR<br>AA - 128 PPR<br>AM - 200 PPR<br>AL - 240 PPR<br>AN - 256 PPR<br>AP - 300 PPR<br>AE - 360 PPR<br>AC - 400 PPR<br>AB - 480 PPR<br>AQ - 500 PPR<br>AR - 512 PPR<br>AS - 600 PPR<br>AV - 900 PPR<br>AJ - 960 PPR<br>AW - 1000 PPR<br>AY - 1024 PPR<br>AZ - 1200 PPR<br>A4 - 2048 PPR<br>CX - 1500 PPR<br>A5 - 2500 PPR<br>AT - 3072 PPR<br>A7 - 3600 PPR<br>AD - 4096 PPR<br>A8 - 4800 PPR<br>A9 - 5000 PPR | 7 - Level 2 Protection, (ATEX/IECEx Zone 2 & 22) 5-24v in, 5-24V out<br>F - Level 1 Protection, (UL Class I, Div 1, UL/cUL Class I, Zone 0 Listed) 5-7v in, 5V out (NOTE Requires XRB3 Isolator)<br>G - Level 2 Protection, (UL Class I, Div 2 Listed) 5-24v in, 5-24V out<br>H - Level 1 Protection (ATEX/IECEx Zone 1 & 21), 5-7v in, 5v out (NOTE requires XRB3 Isolator)<br>R - US CLASS I, DIV 2, ZONE 2, RECOGNIZED 5-24v in, 5-24v out | A - 10 pin MS style w/o Plug, Avtron/BEI Pinout, LED Diagnostics<br>B - 10 pin MS style w/o Plug, (Dynapar Phasing)<br>C - 10 pin MS style w/ Plug, Avtron/BEI Pinout, LED Diagnostics<br>D - 10 pin MS style w/ Plug, (Dynapar Phasing)<br>4 - 10 pin MS style w/o Plug, M3/M4 Pinout<br>E - 6 pin MS style w/o Plug, BEI/Avtron HS35 pinout, LED Diagnostics<br>F - 6 pin MS style w/o Plug (Dynapar Phasing)<br>G - 10 pin Industrial (EPIC Style) w/ Plug, w/LED Alarm<br>H - Terminal box w/ USA 1/2" conduit entry (UL/ATEX/IECEx)<br>J - 7 pin MS style w/o Plug, Avtron/BEI HS35 Pinout, LED Diagnostics<br>K - 7 pin MS style w/o Plug, (Dynapar Phasing)<br>L - Terminal box w/ USA 1/2" + cord grip, (cUL/UL/ATEX/IECEx)<br>M - Terminal box w/ USA 3/4" conduit entry (cUL/UL/ATEX/IECEx)<br>N - Terminal box w/ USA 1" conduit entry (cUL/UL/ATEX/IECEx)<br>8 - Terminal box w/ 25mm conduit entry (cUL/UL/ATEX/IECEx)<br>P - 10 pin Industrial (Small EPIC Style) w/ Plug, LED & Remote Alarm Diagnostics (Level 2 Only)<br>R - Baldor Mini MS style Twist-Lock w/plug, LED & Remote Alarm Diagnostics<br>T - M12 w/o plug, Global Pinout, LED Diagnostics<br>U - M12 w/o plug, USA Pinout, LED Diagnostics<br>W - Cable (18" or special length), LED Diagnostics & remote alarm contact<br>2 - M23 w/o plug, Leine and Linde & Hubner pinout, LED Diagnostics<br>3 - M23 w/o plug, Inverted Hubner Signals, LED Diagnostics | X - Standard B10 Flange Mount, No Foot Mount<br>1 - Foot Mount, Toshiba TS2113N Bolt Pattern (may require 18mm shaft)<br>2 - Foot Mount, Baumer Hubner POGxx/OGxx Bolt Pattern<br>3 - Foot Mount, Johannes Hubner FG4 Bolt Pattern<br>4 - Foot Mount, Toshiba Type MSP Bolt Pattern | A - Standard, All Channels<br>A,A,B,B,Z,Z,<br>B - 2 Channels<br>A,A,B,B,<br>D - Single Channel<br>A,A\ (N/A w/ Reverse Phasing)<br>E - 2 Channels A,B,Z<br>F - 2 Channels A,B | 000 - No Special Options<br>001 - Ceramic (Isolated) Bearings<br>004 - Super Magnetic Shielding<br>018 - Include XRB3 Remote Level 1 Isolator for Cabinet Mount<br>901 - 0.3m/1' Special Cable Length, No Connector<br>902 - 0.6m/2' Special Cable Length, No Connector<br>903 - 0.9m/3' Special Cable Length, No Connector<br>905 - 1.5m/5' Special Cable Length, No Connector<br>910 - 3m/10' Special Cable Length, No Connector<br>915 - 4.5m/15' Special Cable Length, No Connector<br>920 - 6m/20' Special Cable Length, No Connector<br>925 - 7.5m/25' Special Cable Length, No Connector<br>930 - 9m/30' Special Cable Length, No Connector<br>933 - 10m/33' Special Cable Length, No Connector |



Nidec Industrial Solutions  
243 Tuxedo Avenue - Cleveland, Ohio 44131  
encoderhelpdesk@nidec-industrial.com  
+1 216-642-1230 - www.avtronencoders.com



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