



# Avtron XPH1 SMARTSafe™ Encoder



**Severe Duty Encoder for  
TDS9/10/11 Mounting with  
Flameproof and Explosion  
Proof Ratings**

## Explosion Proof Bearingless Encoder

## XPH1

- | Fits NOV TDS 9, 10 & 11 Top Drives  
Directly
  - | No Barrier or Isolator Needed
- | No Intrinsic Safety Ground Required
- |  Class I Div 1 Groups C, D Listed
  - | AEx Zone 1 Certified
  - |  Zone 1 & 2 Certified
  - | Fully Protected Against Shorts and  
Wiring Errors
- | Drives up to 1000 feet [305m] of cable  
without repeaters
  - | 2 Year No-Hassle Warranty
  - | -50°C to +85°C Operation

Dramatically slash encoder-related downtime on top drive applications!

XPH1 SMARTSafe™ encoders are the world's first explosion-proof encoders with removable electronics and no external barrier! They are cULus, ATEX, AEx & IECEx certified and offer incredibly reliable no-bearing construction! SMARTSafe XPH1 encoders can be used in ATEX/IECEx, cUL AEX, and UL gas hazardous environments.

XPH1 comes complete with auto-centering jig, base plate, riser shaft, sensor and rotor to fit NOV TDS9, TDS10, and TDS11. Also available: no-bearing modular sensors (XP5), 8.5" C-face XPH8 as well as intrinsically safe models ([XR5](#), [XR12](#), [XR56](#), [XR125](#), [XR485](#), [XR685](#), [XR850](#)) and hollow shaft models [M6C](#).

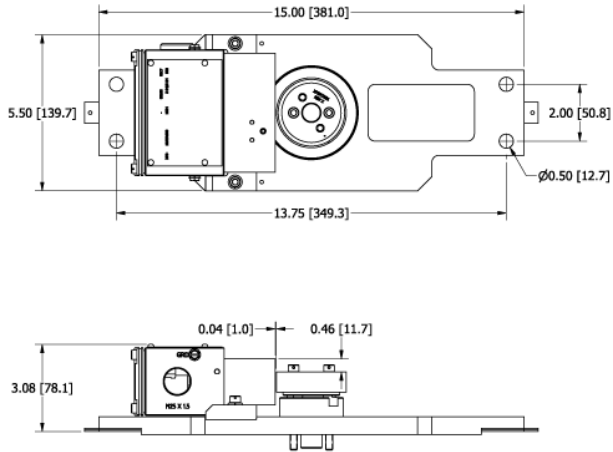
For applications requiring ATEX/IECEx Zone 1 or 2 or cULus Class I, Division 1 or 2, Groups C & D use the XPH1 directly in your application with no barrier or isolator required.

Unlike the competition, Avtron SMARTSafe encoder systems are protected against short circuits, power-to-output wiring, and output-to-ground faults. They feature full diagnostics: it's easy to determine that signal quality is good—just look for the green LED. Worried about wiring short circuits and errors? XPH1 will indicate any short circuit conditions with an orange LED and will survive this condition!

No encoder bearing failures, no more sealing problems. Mount XPH1 directly on your motor, build it right into your machine. So many applications benefit from a more reliable no-bearing encoder. Vibration, shock, liquids, dust and dirt won't harm SMARTSafe XPH1 encoders!

Eliminate the biggest cause of hazardous duty encoder failure--eliminate the bearings with XPH1 hazardous duty encoders!

## OUTLINE DRAWING



## MORE XPH1 ADVANTAGES

- ▮ All-digital design, no trim pots or adjustments for longer life
- ▮ Advanced sensor technology
- ▮ Superior line drivers withstand short circuits and reverse voltage wiring errors
- ▮ Fully Potted Electronics
- ▮ SMARTSafe sensors find problems before they cause failure
- ▮ Allows Gland or Conduit Connections
- ▮ Full protection against motor shaft currents

## XPH1 SPECIFICATIONS

**Operating Power:** 5-24VDC in/out  
 400mA max @ 5V; 200mA max @ 12V; 100mA max @ 24V (plus cable load)

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

**Frequency Range:** 0 to 250 KHz

**PPR:** 8-100000

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

**Maximum Cable Length:** 1000 ft (305m) (contact factory for longer distances)

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

**Sensor-Rotor Gap:** 0.040", +0.015/-0.030" [1mm+0.38/-0.76]

**Temperature:** -50°C to 85°C  
 (rotor -50°C to 100°C continuous, +135°C intermittent)

**Environmental:** IP65 fully potted sensors

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

**Weight:** 15lbs. [6.8kg]

**Certifications:**

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

Class I Div 1, Groups C and D  
 Class I Zone 1, Ex db ia IIB T4 Gb  
 Class I Zone 1, AEx db ia IIB T4 Gb  
 Ex db ia IIB T4 Gb (ATEX/IECEX)



\*See installation drawings for Warnings and Limitation  
 \*\*Consult NOV for installation guidelines and details

## SELECTION GUIDE

XPH1 Encoder Part Numbers						
Model	Rotor Style/Bore	Cover	Output	PPR		Connection Options Terminal Box
XPH1-TDS10/11 with 64mm rotor	XX- No Rotor A1- TDS10/11 w/shaft adapter	X- No Cover	8- Hi Power 5-24V in/ 5-24V out (Hx)	Left PPR XX-None BC-50 AF-60 AK-80 AG-100 AH-120 AA-128 AM-200 AL-240 AN-256 AP-300 AE-360 AC-400 AB-480 AQ-500 AR-512 AS-600 AV-900 AJ-960 AU-720 AY-1024 AW-1000 AY-1024 AZ-1200 CX-1500 A3-2000 A4-2048 A5-2500 A7-3600 AD-4096 A8-4800 A9-5000 00-Special XX-None	Right PPR BC-50 AF-60 AK-80 AG-100 AH-120 AA-128 AM-200 AL-240 AN-256 AP-300 AE-360 AC-400 AB-480 AQ-500 AR-512 AS-600 AV-900 AJ-960 AU-1000 AY-1024 AZ-1200 A3-2000 A4-2048 A5-2500 A7-3600 AD-4096 A8-4800 A9-5000 00-Special XX-None	A- Left Exit M25 thread Right Exit Blanking Plug Phasing A->B CW
						000- none 004- Super Magnetic Shielding



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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