



# INTRINSICALLY SAFE TIPS® 603 LARGE ANGLE TILT SENSOR



- Intrinsically Safe to EEX ia IIC T4 (Ta = -40 to 80°C)
- Tilt Feedback for Industrial and Scientific Applications
- Non-Contacting Inductive Technology
- Robust, Durable and Reliable
- Up to 160° Tilt
- DC Supply - DC Analogue Output - Voltage or Current Options Available
- Excellent Accuracy and Stability
- IP67 Sealing

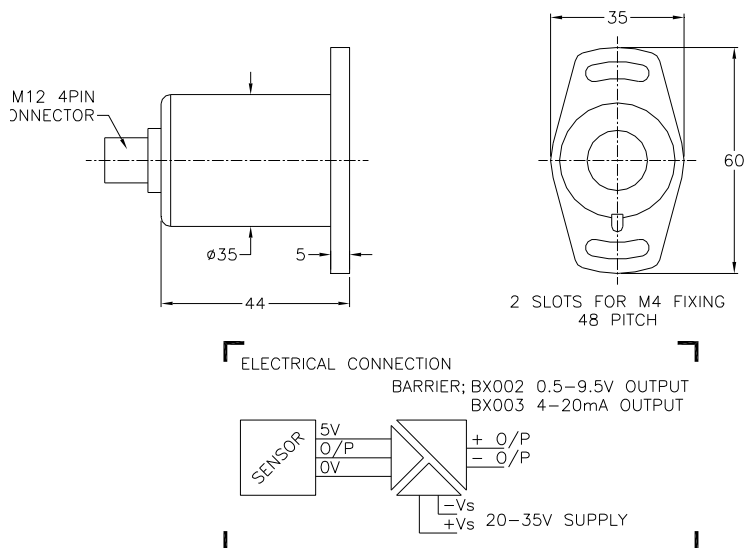
## SPECIFICATION

Travel	
Electrical	±10° to ±80°
Mechanical	unlimited
Factory set range with adjustable zero and span.	
Independent Linearity	< ± 0.5% for ±50° @ 20°C
Hysteresis	< 0.5°
Temperature Coefficients	< ± 0.01%/°C Gain & < ± 0.01%FS/°C Offset
Typical Overall Accuracy	< ± 0.5% / FSO
Response Time	250 mS @ 20°C typically
Resolution	Infinite
Noise	< 0.02% FSO
Damping Ratio	0.2 to 1 (0.6 Nom @ 25°C)
Power Supply and Output Options	
Input	Output
+ 5 V dc ± 0.5 V	0.5 – 4.5 V dc ratiometric
Supply Current	10 mA Typical, 20 mA max.

Intrinsic Safety	II 1G
EEX ia IIC T4 (Ta = -40°C to +80°C)	
Ui	11.4V
Ii	0.46A
Pi	0.51W
Cable length	150m, 550 nF & 99 µH maximum
Environmental	
Temperature Limits	
Operating	-20 to +85°C
Storage	-20 to +125°C
Sealing	IP67
EMC Performance	EN 61000-6-2 EN 61000-6-3
Vibration	IEC 68-2-6: 10g
Shock	IEC 68-2-29: 40 g
MTBF	450,000 hrs 40°C Gf



The X603 TIPS® is a cost effective, durable, accurate Intrinsically Safe, ATEX approved to II 1G EEX ia IIC T4 (Ta = -40°C to +80°C), inductive tilt sensor for industrial and scientific feedback applications in Hazardous Areas. X603 sensors are; available with calibrated travel from 30° up to 160°, easy to install and set up and provide a linear output characteristic with angle of tilt. Using Positek's PIPS® technology, inductive printed circuit board coil with advanced ASIC electronic technology and oil damped pendulum, the sensors DC analogue output signal represents absolute position and is available immediately on power up. The sensor must be used with a galvanically isolated barrier; 0-10V or 4-20mA transmission options are available, and the sensor can be installed up to 150m from the barrier. Overall performance, repeatability and stability are outstanding over a wide temperature range; excellent frequency response and no wearing contacts they have major advantages over RVDT or potentiometer based devices. This robust stainless steel and aluminium sensor is flange mounted, with a connector, sealed to IP67 and has full EMC protection built in. Enquires regarding modifications for custom applications are welcome, please contact us with your requirements.



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# INTRINSICALLY SAFE

## BX002 and BX003 SENSOR BARRIER



- ATEX approved
- Tri-port isolated
- DIN rail mounted
- Voltage and current output versions

### SPECIFICATION

Power supply - Power rail terminals 11 and 12  
 Voltage 20 - 35V d.c.  
 Power consumption ca. 0.7W for voltage output  
 ca. 1.4W for current output

Input Circuit - terminals 1, 2, 3, 4 and 5  
 Transformer isolated  
 Intrinsically Safe [EEx ia]IIC  
 BAS00ATEX7171  
 $U_{max\ out} = 10.4V$   
 $I_{max\ out} = 46mA$   
 Voltage across sensor ca. 4.8 volts  
 Lead resistance for 15mA (all connections) 12 $\Omega$  maximum  
 Input resistance terminal 3 17M $\Omega$  min.

Output Circuit - terminals 7 and 8  
 Output options  
 Voltage BX002 0.5 to 9.5V  
 < 30 $\Omega$   
 Output resistance  
 Current Loop BX003 4 to 20mA  
 Load resistance 0 - 1k $\Omega$

Transfer characteristics  
 Non - linearity <  $\pm 5mV$  for voltage outputs  
 <  $\pm 10\mu A$  for current outputs  
 Temperature drift < 0.5mV/ $^{\circ}C$  for voltage outputs  
 < 1 $\mu A$ / $^{\circ}C$  for current outputs  
 Settling time to 1% of span < 25ms for 10 to 90% step change  
 Rise time < 8ms  
 10 to 90% of step change  
 Bandwidth d.c. to 100Hz (-3dB)  
 Isolation 2500V between safe area terminals and hazardous area terminals.  
 50V between power rail terminals and output terminals (7 and 8)

Electromagnetic Compatibility  
 Emissions Meet EN50081-2  
 Immunity Meet EN50082-2

Ambient temperature range -20 $^{\circ}$  to 60 $^{\circ}C$  working  
 -40 $^{\circ}C$  to +100 $^{\circ}C$  storage

Protection class IP 20



The BX002 (0.5 to 9.5V) and BX003 (4 to 20mA) galvanic barriers are designed to operate with Positek Intrinsically Safe Position Sensors. They are designed to give the respective output corresponding to the sensor position over the calibrated range. The galvanic barrier supplies power to an intrinsically safe sensor located in a potentially explosive atmosphere and transfers the sensor output, which is used for position indication or control purposes. The power supply and voltage input circuits are certified intrinsically safe [EE ia] IIC. The hazardous area connections are transformer isolated from the safe area connections so a high integrity intrinsically safe earth is not required. An external power supply of 20-35V d.c. is connected to the power d.c. to d.c. converter D1, the output from D1 is regulated by A1 and TR1 to provide a power supply for the sensor. The barriers have 3, 4 or 5-wire connection capability to the sensor.

