

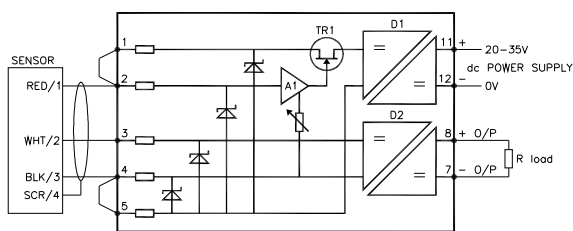
# INTRINSICALLY SAFE BX002 and BX003 Sensor Barrier

Intrinsic safety means limiting the electrical energy in a system to a level incapable of causing ignition in any normal or fault condition. This can only be accomplished by installing an energy-limiting interface in the wiring between hazardous and non-hazardous areas.

Limiting the discharge of energy-stored devices in electrical equipment such as capacitors and inductors virtually eliminates the possibility of generating a spark and thus a source of ignition.

The **BX002** (0.5 to 9.5V) and **BX003** (4 to 20mA) Isolated Galvanic Barriers are the best choice for use with Positek Intrinsically Safe Position Sensors. The hazardous area circuits are certified intrinsically safe [EEx ia] IIC. Connections between hazardous and non-hazardous areas are transformer isolated, eliminating the requirement for a high-integrity intrinsically safe earth.

Choosing either a BX002 or BX003 barrier not only provides signal isolation but allows sensors to be calibrated to a specific barrier type before shipping, ensuring the respective barrier output corresponds to the sensor position over the calibrated range. The isolated power circuit limits the energy supply to the sensor to ensure the maximum safety parameters required for Positek sensors are not exceeded.



How it works; a 20-35V dc external power supply is connected to the dc/dc converter D1 which provides isolation. The output from D1 is regulated by A1 and TR1 to provide a nominal 5V supply for the sensor. The barrier and sensor can be connected by three wires; 5-wire connection capability is available to compensate for volts drop in long cable runs. D2 provides isolation between the sensors output and the barriers 0.5-9.5V or 4-20mA current loop output.

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



## SPECIFICATION

**POWER SUPPLY**  
 Voltage: 20-35V dc  
 Power consumption: ca. 0.7W for voltage output, 1.4W current output

**INPUT CIRCUIT** (terminals 1,2,3,4,5)  
 Transformer isolated  
 Intrinsically Safe [EEx ia] IIC  
 BAS00ATEX7171  
 U<sub>max</sub> out = 10.4V  
 I<sub>max</sub> out = 46mA  
 Voltage across sensor: ca. 4.8 volts  
 Lead resistance for 15mA: 12Ω maximum (all connections)  
 Input resistance terminal 3: 17MΩ min

**OUTPUT CIRCUIT** (terminals 7/8)  
 Output options  
 Voltage: BX002 0.5 to 9.5V  
 Output resistance: < 30Ω  
 Current loop: BX003 4 to 20mA  
 Load resistance: 0 - 1kΩ

**TRANSFER CHARACTERISTICS**  
 Non-linearity: < ± 5mV for voltage outputs  
 < ± 10μ A for current outputs  
 Temperature drift: < 0.5mV/°C for voltage outputs  
 < 1μA/°C for current outputs  
 Settling time to 1% of span: < 25ms for 10-90% step change  
 Rise time: < 8ms 10-90% of step change  
 Bandwidth: dc 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: to EN50081-2  
 Immunity: to EN50082-2  
 Ambient temperature range: -20° to 60°C working, -40°C to +100°C storage  
 Protection class: IP20