

# HARRINGTON

## MODEL 30-3003 Explosion Proof Smoke Detector

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ISO 9001  
Certified  
Management  
System

### APPLICATION

The Harrington Model 30-3003 Explosion Proof Smoke Detector is a sensitive yet rugged, state-of-the-art protection device that is designed for use in hazardous industrial and commercial locations. The detector is designed to operate effectively with both slow smoldering and fast burning fires. Typical applications that use the Model 30-3003 include:

- Combustible storage facilities
- Munitions manufacturing
- Volatile chemical storage
- Chemical processing plants
- Petroleum refineries
- Turbine enclosures

### DESCRIPTION

The photoelectric smoke detector uses a solid state infrared emitting diode (IRED) and a light sensing photovoltaic cell arranged in a labyrinth assembly. The labyrinth permits free access to smoke but restricts external light. Because of its critical function to the operation of the detector, each IRED is selected with extreme care and is subjected to rigorous pre-production testing to ensure long-term reliability and performance.

During normal operation (no smoke), the detector samples the air approximately every four seconds for a period of less than one millisecond. The photovoltaic smoke cell, which is placed at an angle to the pulsed invisible light source, is sensitive to the infrared light in the specified frequency emitted by the IRED light source and is designed to receive a signal only when the pulsed IRED source is activated.

When smoke enters the chamber, the light from the IRED reflects off the smoke particles and reaches the photovoltaic smoke cell. When the amount of light reflected by smoke reaches the factory set threshold level, the smoke alarm circuit is actuated.

The detector will respond to a slow smoldering fire when smoke in the chamber reaches the pre-set sensitivity setting, typically 2.3%.

If a fast burning fire should occur, including fires in flammable liquids and other materials such as plas-



tics that generate black smoke, the abnormally rapid movement of smoke into the detection chamber is sensed by a special rate compensating circuit. An increase in smoke within the detection chamber that exceeds a pre-set rate causes the rate compensation circuit to increase the intensity of the light source, which increases detector sensitivity. If the smoke continues to build at this rate, an amplifier circuit is triggered and the unit generates an alarm. If not, the detector reverts to normal sensitivity.

In normally smoky atmospheres the detector will not go into alarm as long as the concentration is less than the fixed sensitivity of the detector. This results in a sensitive and positive response with the lowest potential for unwanted alarms.

### SPECIFICATIONS

OPERATING VOLTAGE —  
20 to 28 volts dc.

OPERATING CURRENT —  
Standby: 10 milliamperes  
Alarm: 35 milliamperes.

MAXIMUM AIR VELOCITY —  
3960 feet per minute.

RELAY CONTACT RATING —  
2 amperes at 30 vdc, 0.5 ampere at 125 vac.

**ENGINEERING SPECIFICATIONS**

The detector shall be a 2.3% fixed sensitivity photoelectric smoke detector, providing minimum response time to all fire types.

The detection chamber shall extend beyond the main housing into the area to be protected, to provide maximum smoke entry capability into the chamber from any direction.

The detector light source shall be an IRED (Infrared Emitting Diode). Typical detector current consumption in the standby condition shall be 10 milliamperes.

The detector shall lock in on alarm control panel and also power supervision contacts.

The detector enclosure shall be an explosion-proof flanged housing designed to meet NEC classifica-

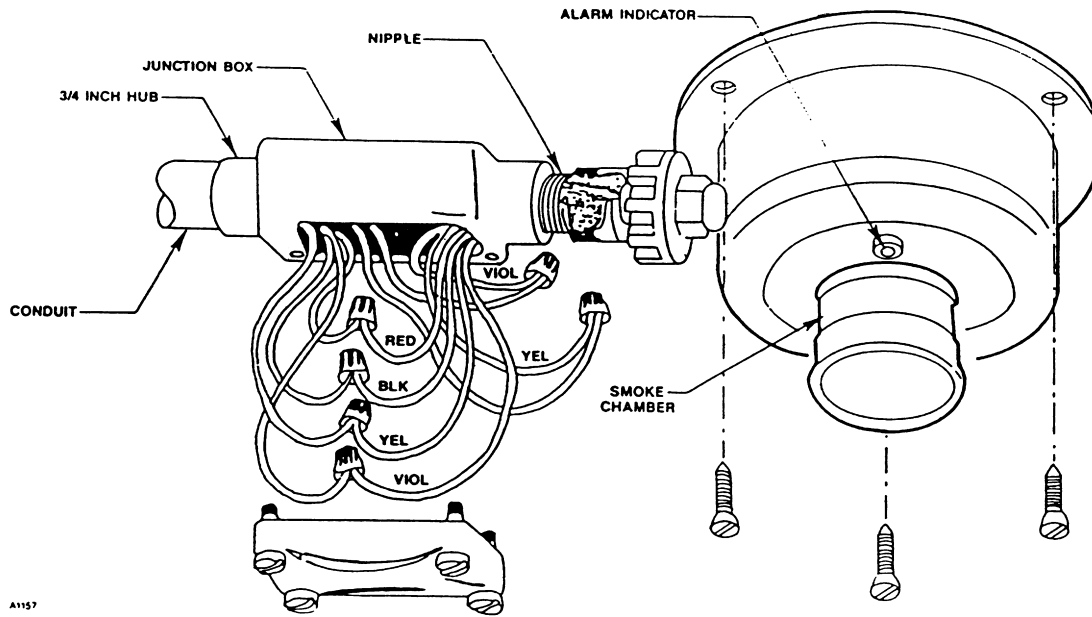
tions of Class I, Groups C and D; Class II, Groups E, F, and G; and Class III hazardous areas. The detector shall be intended for surface mounting and connection to the system wiring shall be by means of pig-tails in a rated enclosure (furnished).

**EXPLOSION-PROOF CERTIFICATION**

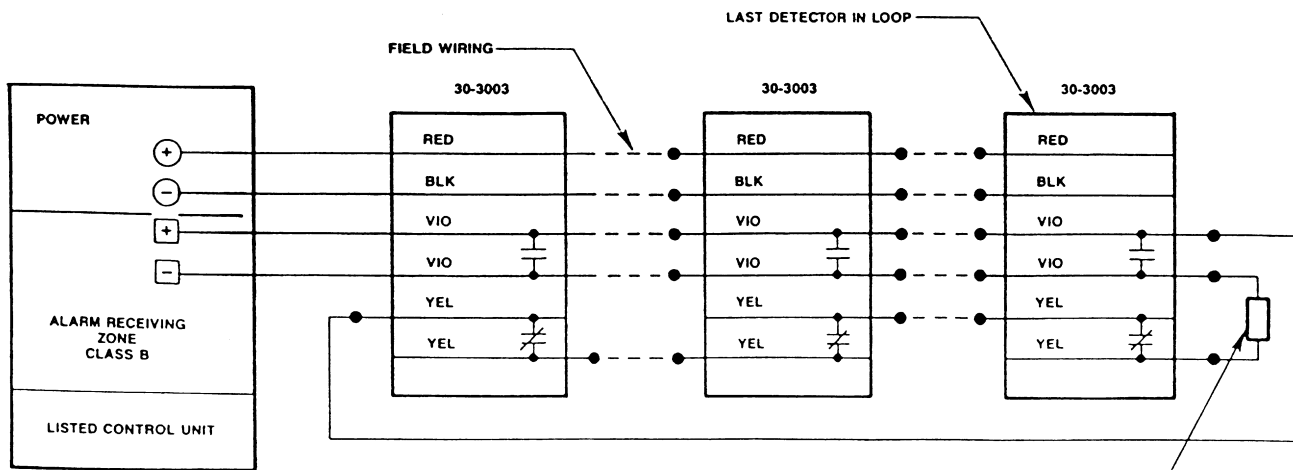
The Model 30-3003 is certified by the German Electric Industry Association, VDE, to meet Standards 0171/"Special Protection" (Ex)<sub>s</sub>G5 (sand encapsulated), for ignition groups EEx e II T5.

**NOTE**

*The Model 30-3003 is not designed to be serviced or repaired in the field. Disassembly of the detector in the field will void both the explosion-proof rating and the warranty. If service or repairs are required, return the entire unit to the factory.*



—Detector Installation



NOTE: CIRCUIT IS SHOWN ENERGIZED IN STANDBY MODE

E.O.L. DEVICE SUPPLIED BY PANEL

—Wiring Diagram for Single Loop Panel