



Model 121 Smoke Detector

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In confined public areas where the risk of fire is ever-present, the need for adequate smoke detection is becoming increasingly important if unnecessary loss of life is to be avoided. Early warning of the presence of smoke allows the maximum possible time to instigate fire-fighting and evacuation procedures.

The CODEL Model 121 measures the absorption of light transmitted across a fixed measurement distance, a principle used in CODEL's well-proven industrial opacity monitors. The Model 121 has been extensively tested to withstand the unique conditions associated with rolling stock and the high levels of vibration and shock likely to be encountered particularly when carriages are being shunted.

These ceiling-mounted smoke detectors are easily installed and maintenance is limited to periodic cleaning of the lenses - as little as once per year depending on the application.

CODEL smoke detectors, together with UV flame detectors (Models 602 and 611), have been in successful operation in the 'roll-on-roll-off' trains operated by Eurotunnel for over 15 years.

- high accuracy & stability maintained over long periods
- designed to withstand the harshest environments
- modular construction ensures simple installation & low cable requirements
- rugged units, fully sealed to IP68, designed for very high availability with minimal maintenance requirements



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Operating Principle

The Model 121 smoke detector measures the absorption of light transmitted across a fixed measurement distance. A beam of light with a controlled intensity is emitted from a transmitter and detected by a receiver and the ratio of energy absorbed to energy emitted (the opacity), is determined. Clean air is expressed as 0% opacity and a totally black air condition is 100% opacity.

It is important that only light from the transmitter and not from other extraneous sources such as sunlight, is measured by the detector.

To ensure this, the transmitter is equipped with a high intensity LED modulated at a frequency of 600Hz and the detector and detection circuitry is sensitive only to light of this frequency and phase characteristics.

Similarly, a detector within the transmitter controls the light intensity from the LED to ensure a constant light level and subsequently a constant output from the detector.

Specification

Range : 0 to 100% opacity

Response Time : 5 seconds for 90% response to step change

Construction : fully sealed to IP68

Operating Temperature : -20°C to + 70°C

Power Supply : 24V DC

Output : 4-20mA current loop output proportional to 0-100% opacity

: 500Ω load maximum

Fault Alarm : incorporated in current loop output, alarm condition 0mA : power failure, instrument failure or dirty windows

Certification Tests : shock to IEC571 first issue

: vibration to IEC571 first issue

: EMI induced electric fields to IEC801-3 Class 3 at 10V/m

: EMI conducted electric fields to IEC801-4 Level 4 and BRB RIA No.12 to Fig.1 line H, J, K & L (indirect transient)

: magnetic fields MIL STD461 and 462 to tests in RS01 Part 4, Class A3

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