ORBIS OPTICAL SMOKE DETECTOR

Part Number ORB-OP-12001-APO

WHERE TO USE OPTICAL SMOKE DETECTORS

Optical smoke detectors have always been recognised as good detectors for general use. They are regarded as particularly suitable for smouldering fires and escape routes.

The performance of Orbis optical detectors is good in black as well as in white smoke. In this respect Orbis is different from traditional optical smoke detectors which perform far better in white smoke than in black.

Orbis optical detectors are also designed to reduce significantly the incidence of false alarms through over-sensitivity to transient phenomena.

Orbis optical detectors are recommended for use as general purpose smoke detectors for early warning of fire in most areas.

ORBIS OPTICAL SMOKE DETECTOR

The sensing technology in the Orbis optical smoke detector is significantly different in design from previous optical detectors. A full description is given in the section 'How do orbis optical smoke detectors work?' but the advantages of this system and its associated algorithms are:

- improved sensitivity to black smoke
- compensation for slow changes in sensitivity
- extra confirmation of smoke before the alarm signal given

The algorithms are used to verify signals from the sensing chamber, to filter out transients and to decide when the detector should change to the alarm state.

All this combines to increase detection reliability and reduce false alarms.

HOW DOES THE ORBIS OPTICAL DETECTOR WORK?

Orbis operates on the well established light scatter principle. The remarkable optical design of the Orbis optical smoke detector allows it to respond to a wide spectrum of fires.

The sensing chamber of the Orbis optical smoke detector contains an optical sensor which measures back-scattered light as well as the more usual forward-scattered light. Sensitivity to black smoke is greatly improved.

The detector is calibrated so that Orbis is highly reliable in detecting fires but is much less likely to generate false alarms than earlier smoke detectors.

The stability of the detector–high reliability, low false alarm rate–is further increased by the use of algorithms to decide when the detector should change to the alarm state. This removes the likelihood of a detector producing an alarm as a result of smoke from smoking materials or from another non-fire source.

ENVIRONMENTAL PERFORMANCE

Orbis optical detectors operate over a broad range of voltages at extremes of temperature. Thus the operating voltage is 8.5V to 33V at –40° to +70°C, a unique achievement for a conventional smoke detector.

TECHNICAL DATA

All data is supplied subject to change without notice.
Specifications are given at 23°C and 50% relative humidity unless otherwise stated.

DETECTOR OPERATING PRINCIPLES		
Principle of detection:	Photo-electric detection of light scattered by smoke particles over a wide range of angles. The optical arrangement comprises an infra-red emitter with a prism and a photo-diode at 90° to the light beam with a wide field of view. The detector's microprocessor uses algorithms to process the sensor readings.	
Sampling frequency:	Once every 4 seconds	
ELECTRICAL		
Supply voltage:	8.5—33V DC	
Supply wiring:	2 wires, polarity sensitive	
Maximum polarity reversal:	200ms	
Power-up time:	<20 seconds	
Minimum 'detector active' voltage:	6V	
Switch-on surge current at 24V:	95µA	
Average quiescent current at 24V:	95µA	
Alarm current:	At 12 volts At 24 volts	20mA 40mA
Alarm load:	600Ω	
Holding voltage:	5–33V	
Minimum holding current:	8mA	
Minimum voltage to light alarm LED:	5V	
Alarm reset voltage:	<1V	
Alarm reset time:	1 second	
Remote output LED (–) characteristic:	1.2kΩ connected to negative supply	
MECHANICAL		
Material:	Detector and base moulded in white polycarbonate.	
Alarm Indicator:	Integral indicator with 360° visibility (See Table 3 on page 13 for details of flash rate)	
Dimensions:	97mm diameter x 31mm height 100mm diameter x 46mm height (in base)	
Weight:	Detector Detector in base	75g 135g
ENVIRONMENTAL		
Temperature:	Operating and storage temperature (no condensation or icing)	–40°C to +70°C
Humidity:	0% to 98% relative humidity (no condensation)	
Wind speed:	Unaffected by wind	
Atmospheric pressure:	Insensitive to pressure	
IP rating to EN 60529: 1992:*	23D	
Electromagnetic Compatibility:	The detector meets the requirements of EN 61 000-6-3 for emissions and BS EN50 130-4 for susceptibility.	

*The IP rating is not a requirement of EN 54 since smoke detectors have to be open in order to function. An IP rating is therefore not as significant as with other electrical products.

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