




## IS optical smoke detector

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

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

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

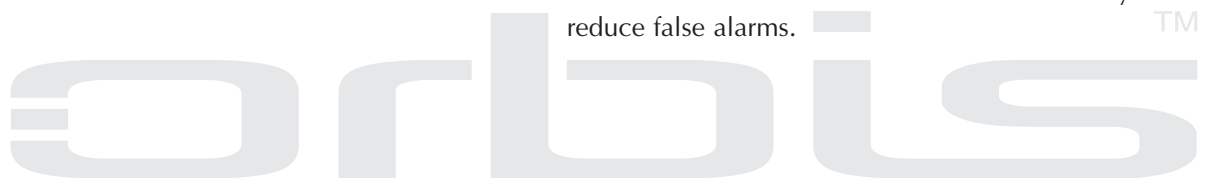
### orbis optical smoke detector

The sensing technology in the Orbis IS 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 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.




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## 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:** 14—28V DC

**Supply wiring:** 2 wires, polarity sensitive

**Polarity reversal:** Not allowed

**Power-up time:** <20 seconds

**Minimum 'detector active' voltage:** 12V

**Switch-on surge current at 24V:** 105µA

**Average quiescent current at 24V:** 85µA

**Alarm load:** 325Ω in series with a 1.0V drop

**Minimum holding voltage:** 5V

**Minimum voltage to light alarm LED:** 6V

**Alarm reset voltage:** <1V

**Alarm reset time:** 1 second

**Remote output LED (-) characteristic:** 4.7kΩ connected to negative supply

### MECHANICAL

**Material:** Detector and base moulded in white polycarbonate.

**Alarm Indicator:** Integral indicator with 360° visibility (See Table 1 on page 14 for details of flash rate)

**Dimensions and weight of detector:** 100mm diameter x 42mm Weight, 75g

**Dimensions and weight of detector in base:** 100mm diameter x 50mm Weight, 135g

### ENVIRONMENTAL

**Operating and storage temperature** -40°C to +70°C  
Operating temperature is restricted by the intrinsic safety gas classification.  
Class T5: -40°C to +40°C  
Class T4: -40°C to +60°C  
The detector must be protected from conditions of condensation or icing.

**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 BS EN 61000-6-3 for emissions and BS EN50 130-4 for susceptibility.

*\*The IP rating is not a requirement of EN 54-7: 2000 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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### How does the orbis IS optical detector work?

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

The sensing chamber of the Orbis IS 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 it is highly reliable in detecting fires but is much less likely to generate false alarms than ionisation 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.

The sensing chamber has been designed to keep out dust and other airborne contaminants.

### Environmental performance

The operating temperature for intrinsically safe detectors is restricted by the gas temperature class. See adjacent column for full details

### Classification

II 1G Ex ia IIC -40°C<Ta<+40°C(T5)  
-40°C<Ta<+60°C(T4)

### BASEEFA Certificate number

ATEX—Baseefa 06 ATEX 0007X  
IECEX—IECEX BAS 06.0002X

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