

Orbis Marine Optical Smoke Detector



ORB-OP 42001-MAR

Orbis Marine Optical Smoke Detector

ORB-OP-42003-MAR

Orbis Marine Optical Smoke Detector with flashing LED



0729

Operating principles

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 Marine 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 Marine 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 Marine Optical Smoke Detector

The sensing technology in the Orbis Marine optical smoke detector is significantly different in design from previous optical detectors. A full description is given in the section 'How do Orbis Marine 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 Marine optical detector work?

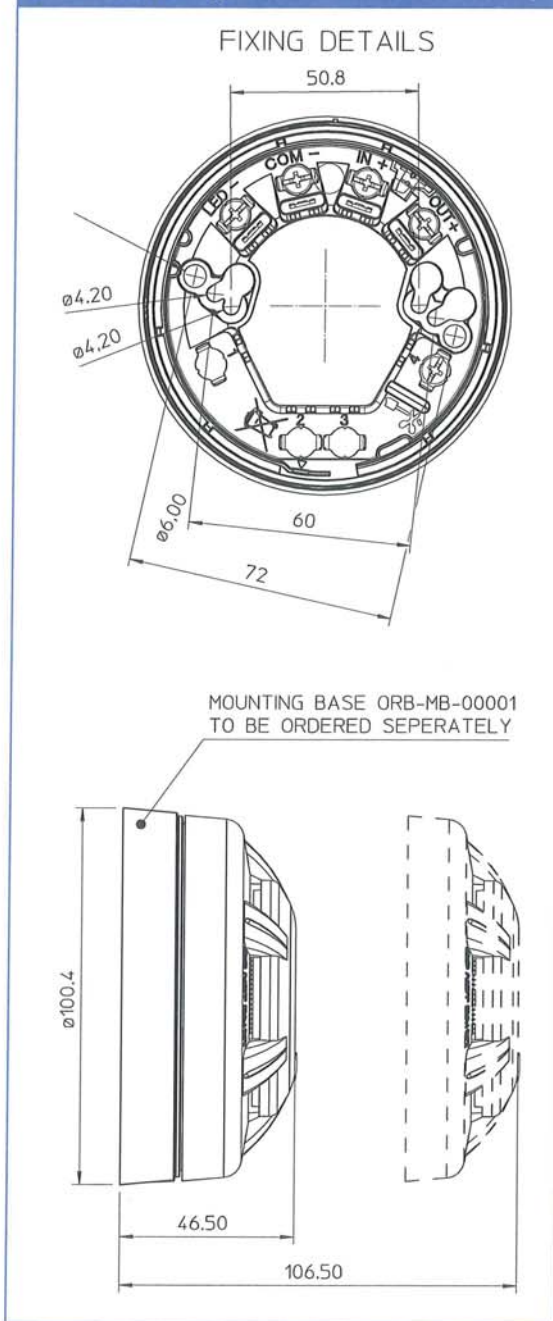
Orbis operates on the well established light scatter principle. The remarkable optical design of the Orbis Marine optical smoke detector allows it to respond to a wide spectrum of fires.

The sensing chamber 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.

Dimensional Drawings



Technical Data

Specifications are typical at 24V, 23°C and 50% relative humidity unless otherwise stated.

Principle of detection:
Photoelectric 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 12V 20mA At 24V 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)
Dimensions and weight of detector:	97mm diameter x 31mm Weight, 75g (in base) 100mm diameter x 46mm Weight, 135g

Environmental

Temperature:	Operating and storage -40°C to +70°C (no 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: 2001 since smoke detectors have to be open in order to function. An IP rating is therefore not as significant as with other electrical products.