

# Series 65 Optical Smoke Detector



## Product overview

|          |   |
|----------|---|
| Product  | Optical Smoke Detector  |
| Part No. | 55000-317   |
| Product  | Optical Smoke Detector with flashing LED                          |
| Part No. | 55000-316   |
| Product  | Optical Smoke Detector with magnetic test switch and flashing LED |
| Part No. | 55000-315   |

## Product information

The Series 65 Optical Smoke Detector uses the scattered light principle to 'see' smoke entering the chamber located within the detector housing.

- Responds well to slow burning, smouldering fires
- Well suited for bedrooms and escape routes
- Unaffected by wind or atmospheric pressure
- Flashing LED and magnet operated test switch option on selected detectors

## Technical data

All data is supplied subject to change without notice. Specifications are typical at 24 V, 23°C and 50% RH unless otherwise stated.

|                                       |   |
|---------------------------------------|---|
| <b>Detection principle</b>            | Photo-electric detection of light scattered in a forward direction by smoke particles                                 |
| <b>Chamber configuration</b>          | Horizontal optical bench housing an infrared emitter and sensor arranged radially to detect scattered light           |
| <b>Sensor</b>                         | Silicon PIN photo-diode   |
| <b>Emitter</b>                        | GaAs infra-red light emitting diode   |
| <b>Sampling frequency</b>             | Once every three seconds  |
| <b>Confirmation frequency</b>         | Once every two seconds  |
| <b>Supply Wiring</b>                  | Two wire supply, polarity insensitive   |
| <b>Terminal functions</b>             | L1 IN Supply in connections and L2<br>L1 OUT Supply out connections and L2<br>-R Remote indicator negative connection |
| <b>Supply voltage</b>                 | 9 V to 33 V dc  |
| <b>Ripple voltage</b>                 | 2 V peak to peak maximum at 0.1 Hz to 100 kHz   |
| <b>Quiescent current</b>              | 30 - 50 µA at 24 V  |
| <b>Power-up surge current</b>         | 115 µA at 24 V  |
| <b>Alarm voltage</b>                  | 6 V to 28 V   |
| <b>Normal alarm current</b>           | 61 mA at 28 V<br>52 mA at 24 V<br>18 mA at 10 V   |
| <b>Alarm indicator</b>                | Clear light emitting diode (LED) emitting red light   |
| <b>Alarm LED current</b>              | 4 mA  |
| <b>Remote output characteristics</b>  | Remote is a current sink to the negative line limited to 17 mA  |
| <b>Sensitivity</b>                    | Nominal alarm threshold of 0.15 dB/m obscuration, measured in accordance with EN 54-7                                 |
| <b>Operating temperature</b>          | -20°C to +60°C  |
| <b>Humidity</b>                       | 0% to 95% RH (no condensation or icing)   |
| <b>Effect of atmospheric pressure</b> | Unaffected  |
| <b>Effect of wind speed</b>           | Unaffected  |
| <b>Vibration, impact &amp; shock</b>  | EN 54-7   |
| <b>IP Rating</b>                      | IP23D   |
| <b>Standards &amp; approvals</b>      | EN 54-7, LPCB, VdS, DIBt, BOSEC, FG, CPR and SBSC   |
| <b>Dimensions</b>                     | 100 mm diameter x 42 mm height (50 mm high with mounting base)  |
| <b>Weight</b>                         | 99 g<br>150 g with base   |
| <b>Materials</b>                      | Housing: White polycarbonate<br>UL94-V0<br>Terminals: Nickel plated stainless steel                                   |

36 Brookside Road, Havant | Tel: +44 (0)23 9249 2412 | Email: sales@apollo-fire.com  
Hampshire, PO9 1JR, UK. | Fax: +44 (0)23 9249 2754 | Web: www.apollo-fire.co.uk



A HALMA COMPANY

© Apollo Fire Detectors Limited 2017



## Operating principles

The Series 65 Optical Smoke Detector has a moulded self-extinguishing white polycarbonate case with wind resistant smoke inlets. Inside the case a printed circuit board has the optical system mounted on one side and the signal processing electronics on the other. The sensing chamber is a moulding configured as a labyrinth which prevents penetration of ambient light. The labyrinth has a fine gauze insect-resistant cover. The chamber houses an infrared light emitting diode (LED) and a photo-diode which has an integral visible-light filter as an extra precaution against ambient light.

Every three seconds the LED emits a burst of collimated light, modulated at 4 kHz. In clear air light from the LED does not fall directly on the diode because the LED is positioned at an obtuse angle to the diode.

When smoke enters the chamber a fraction of the collimated light is scattered onto the photo-diode. If the resulting signal from the photo-diode is above a pre-set threshold the LED emits two bursts of light, this time at two-second intervals. If light is scattered onto the photo-diode by both these pulses - due to the presence of smoke - the detector signals an alarm state by switching the alarm latch on increasing the current drawn from the supply from about 40  $\mu$ A to a maximum of 75 mA. This fall in the impedance of the detector is recognised by the control panel as an alarm signal.

The alarm current also illuminates the detectors integral LED. A remote indicator connected between the L1 IN terminal and the -R terminal will have a voltage equal to the supply voltage less one volt across it and so will illuminate.

To ensure correct operation of the detector the control panel must be arranged to supply a maximum of 33 V dc and a minimum of 9 V dc in normal operation. The supply may fall to 6 V dc in alarm conditions if a supply current of at least 10 mA is available at this voltage. To ensure effective illumination of the integral LED and any remote indicator the supply to the detector should exceed 12 V.

To restore the detector to quiescent condition it is necessary to expel any smoke and interrupt the electrical supply to the detector for a minimum of one second.

## Environmental characteristics

The Optical Smoke Detector is unaffected by wind or atmospheric pressure and operates over the temperature range -20°C to +60°C.

## EMC Directive 2014/30/EU

The Series 65 Optical Smoke Detector complies with the essential requirements of the EMC Directive 2014/30/EU, provided that it is used as described in this datasheet.

A copy of the Declaration of Conformity is available from Apollo upon request.

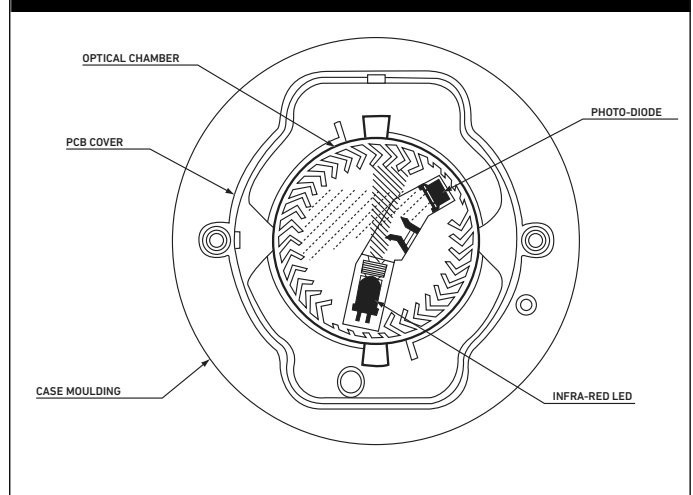
Conformity of the Series 65 Optical Smoke detector with the EMC Directive does not confer compliance with the directive on any apparatus or systems connected to it.

## Construction Products Regulation 305/2011/EU

The Series 65 Optical Smoke Detector complies with the essential requirements of the Construction Products Regulation 305/2011/EU.

A copy of the Declaration of Performance is available from Apollo upon request.

Series 65 Optical Smoke Detector diagram



Response characteristics of Series 65 Optical Smoke Detector

| Type of fire                   | Optical Smoke Detector |
|--------------------------------|------------------------|
| Overheating/thermal combustion | Very Good              |
| Smouldering/glowing combustion | Moderate/Good          |
| Flaming combustion             | Very Good              |
| Flaming with high heat output  | Very Good              |
| Flaming - clean burning        | Poor                   |