



## DISCOVERY OPTICAL SMOKE DETECTOR

Part Number 58000-600

### OPERATING PRINCIPLES

The Discovery Optical Detector has a white moulded polycarbonate case with wind-resistant smoke inlets. The indicator LEDs are colourless when the detector is in quiescent state and red in alarm. Within the case is a printed circuit board which, on one side, has the light-proof chamber with integral gauze surrounding the optical measuring system and, on the other, the signal processing and communications electronics.

An infra-red light emitting diode within its collimator is arranged at an obtuse angle to the photo-diode. The photo-diode has an integral daylight-blocking filter (Fig.2).

The IR LED emits a burst of collimated light every second. In clear air the photo-diode receives no light directly from the IR LED, because of the angular arrangement and the chamber baffles. When smoke enters the chamber it scatters light from the emitter IR LED onto the photo-diode in an amount related to the smoke characteristics and density. The photo-diode signal is processed to provide an analogue value for transmission when the detector is interrogated. ■

Optical detector operating modes

Mode	Alarm threshold %/m	dB/m	Minimum time to alarm (sec)
1	1.4	0.06	5
2	1.4	0.06	30
3	2.1	0.09	5
4	2.1	0.09	30
5	2.4	0.11	5

Compensation rate complies with EN54-7:2000

Table 1

Top section - Discovery Optical Smoke Detector

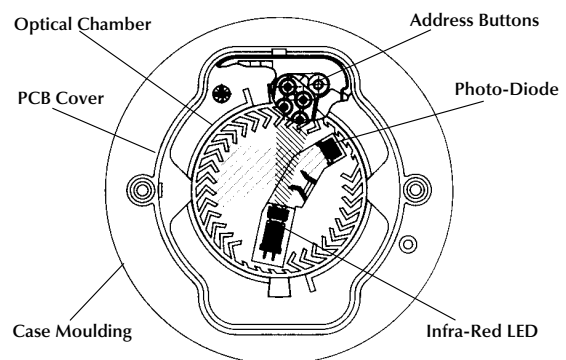


Fig. 2

## TECHNICAL DATA

### Discovery Optical Smoke Detector

Part No: 58000-600

Specifications are typical at 24V, 23°C and 50% relative humidity 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 infra-red emitter and sensor, arranged radially to detect forward scattered light	
<b>Sensor:</b>	Silicon PIN photo-diode	
<b>Emitter:</b>	GaAlAs infra-red light emitting diode	
<b>Sampling frequency:</b>	1 per second	
<b>Supply wiring:</b>	Two-wire supply, polarity insensitive	
<b>Terminal functions:</b>	L1 & L2	supply in and out connections
	+R	remote indicator positive connection (internal 2.2kΩ resistance to positive)
	-R	remote indicator negative connection (internal 2.2kΩ resistance to negative)
<b>Operating voltage:</b>	17–28V DC	
<b>Communication protocol:</b>	Apollo Discovery 5–9V peak to peak	
<b>Quiescent current:</b>	300µA	
<b>Power-up surge current:</b>	1mA	
<b>Maximum power-up time:</b>	10s	
<b>Alarm current, LED illuminated:</b>	3.5mA	
<b>Remote output characteristics:</b>	Connects to positive line through 4.5kΩ (5mA maximum)	
<b>Clean-air analogue value:</b>	23 +4/-0	
<b>Alarm level analogue value:</b>	55	
<b>Alarm indicator:</b>	2 colourless Light Emitting Diodes (LEDs); illuminating red in alarm. Optional remote LED	
<b>Temperature range:</b>	-40°C to +70°C	
<b>Humidity:</b>	0 to 95% relative (no condensation or icing)	
<b>Effect of atmospheric pressure:</b>	None	
<b>Effect of wind:</b>	None	
<b>Vibration, Impact and Shock:</b>	To EN54-7:2000	
<b>IP rating:</b>	44 in accordance with BSEN60529	
<b>Approvals &amp; Standards:</b>	See page 29	
<b>Dimensions:</b>	100mm diameter x 42mm height 50mm (height in base)	
<b>Weight:</b>	Detector	105g
	Detector in base	160g
<b>Materials:</b>	Housing: White polycarbonate V-0 rated to UL94 Terminals: Nickel plated stainless steel	



0832

