

# Discovery

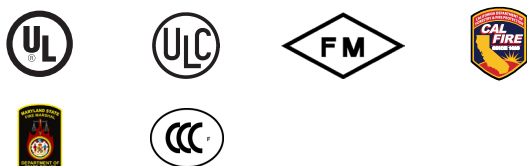
## Photoelectric Smoke Detector



### Product overview

Product	Photoelectric Smoke Detector
Part No.	58000-650
Digital Communication	XP95, Discovery and CoreProtocol® compatible

### Compliance



### Product information

The Discovery Photoelectric Smoke Detector works on the light scatter principle and is ideal for applications where slow burning or smouldering fires are likely.

- Responds well to slow burning, smouldering fires
- Well suited for accommodation areas, passages and escape routes
- Unaffected by wind or atmospheric pressure
- Rejection of transient signals
- Remote test feature
- Five UL approved response modes

### Technical data

All data is supplied subject to change without notice. Specifications are typical at 24V, 73°F and 50% RH unless otherwise stated.

Detection principle	Photoelectric detection of light scattered in a forward direction by smoke particles
Sampling frequency	Once per second
Sensitivity	3.0 + 1.0 - 1.84 %/ft
Digital communication	XP95, Discovery and CoreProtocol compatible
Operating voltage	17 V - 28 V dc
Modulation voltage	5 - 9 V peak to peak
Supervisory current	500 µA
Surge current	1 mA
Alarm current, LED illuminated	3.5 mA
Maximum ambient installation temperature	100 °F
Operating temperature range	32 °F to 100 °F
Humidity	0% to 95% RH (no condensation or icing)
Standards and approvals	UL, ULC, FM, CSFM, MSFM, CCCf
Dimensions	3.93 in. diameter x 1.65 in. height
Weight	3.70 ozs
Materials	Housing: White flame-retardant polycarbonate Terminals: Nickel plated stainless steel
Test method	Home safeguard Sensitivity test No climb Gemini 501

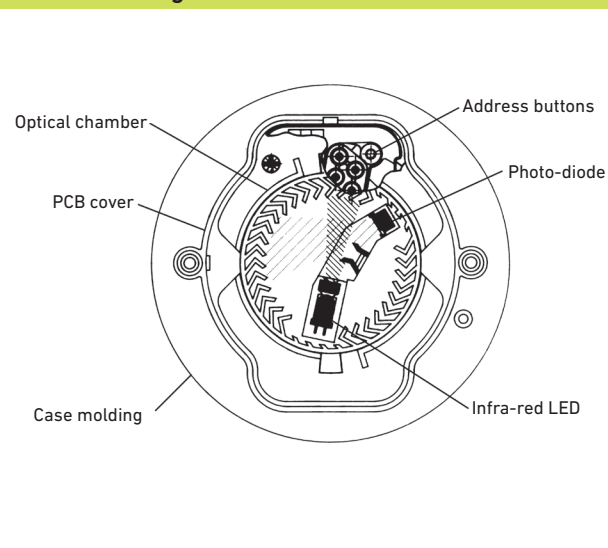
## Operation

The Discovery Photoelectric Smoke 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 labyrinth chamber with integral gauze surrounding the optical measuring system and on the other the address capture, signal processing and communications electronics.

An infrared 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.

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.

### Discovery Photoelectric Smoke Detector schematic diagram



## Electrical description

The Discovery Photoelectric Smoke Detector is designed to be connected to a two wire loop circuit carrying both data and a 17 V to 28 V dc supply. The detector is connected to the incoming and outgoing supply via terminals L1 and L2 in the mounting base. A remote LED indicator requiring not more than 4 mA at 5 V may be connected between the +R and -R terminals. An earth connection terminal is also provided. The detector is calibrated to give an analogue value of 23  $\pm$  4-0 counts in clean air. This value increases with smoke density. A count of 55 corresponds to the alarm level analogue value.

## Features

### Response modes

Discovery Photoelectric Smoke Detectors can be operated in any one of five UL approved response modes, which can be selected through the fire control panel. Each mode corresponds to a unique response behaviour, which is related to sensitivity to fire. Mode 1 gives a higher sensitivity to fire than Mode 5.

### Discovery Photoelectric Smoke Detector Response Times

Mode	Alarm threshold (%/ft)	30 second alarm delay
1	1.7	No
2	1.7	Yes
3	2.3	No
4	2.3	Yes
5	3.0	No

### Flashing LEDs

Discovery Photoelectric Smoke Detectors have two integral LED indicators, which can be illuminated at any time by the fire control panel to indicate detectors in alarm. A flashing LED mode can also be programmed to activate each time a detector is polled.

### Remote test feature

The remote test feature is enabled from the fire control panel. On receipt of the command signal from the fire control panel, the detector is forced electrically into alarm. An analogue value of 85 is returned to the fire control panel to indicate that the detector is working correctly.

### Rejection of transient signals

Discovery detectors are designed to give low sensitivity to very rapid changes in the sensor output, since these are unlikely to be caused by real fire conditions, resulting in fewer false alarms.

### Drift compensation

Discovery Photoelectric Smoke Detectors include compensation for signal drift to compensate for changes in the sensor output caused, for example by dust in the chamber, and will therefore hold the sensitivity at a constant level even with severe chamber contamination. This increased stability is achieved without significantly affecting the detectors sensitivity to fire whilst still meeting the requirements of the UL standard.

### Response characteristics of Discovery Photoelectric Smoke Detectors

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