

Features

- ▶ 2 Flashing LEDs
- ▶ Rejection of Transient Signals
- ▶ 360° Visibility in Alarm



F1000-550 Discovery Ionization Smoke Detector

Description

The F1000-550 Discovery Ionization Smoke Detector has a molded self-extinguishing white polycarbonate case with wind resistant smoke inlets. Stainless steel wiper contacts connect the detector to the terminals in the mounting base. Inside the detector case is a printed circuit board which has the ionization chamber system mounted on one side and the address capture, signal processing and communications electronics on the other.

The ionization chamber system comprises an inner reference chamber inside an outer sensing chamber. The outer sensing chamber has smoke inlet apertures which are fitted with an insect resistant mesh.

The radioactive source holder and the outer smoke chamber are the positive and negative electrodes respectively. A single Americium 241 radioactive source mounted within the inner reference chamber irradiates air in both chambers to produce positive and negative ions. On applying a voltage across the electrodes an electric field is formed. The ions are attracted to the electrode of the opposite sign, some ions collide and recombine, but the net result is that a small electric current flows between the electrodes. At the junction between the reference and smoke chambers is the sensing electrode which is used to convert variations in the chamber currents into a voltage.

When smoke particles enter the ionization chamber, ions become attached to them with the result that the current flowing through the ionization chamber decreases. This effect is greater in the sensing chamber than in the reference chamber and the imbalance causes the voltage on the sensing electrode to go more positive.

The voltage on the sensing electrode is monitored by the sensor electronics and is processed to produce a signal that is translated by the A/D converter in the communications ASIC ready for transmission when the device is interrogated.

Approvals and Listings

Underwriters Laboratories (File No. S6349)
Fire Department - City of NY COA #6051



Electrical Description

The F1000-550 Discovery Ionization Smoke Detector is designed to be connected to a two wire loop circuit carrying both data and a 17 to 28 VDC supply. The detector is connected to the incoming and outgoing supply via terminals L1 and L2 in the mounting base. A remote LED indicator may be connected between the R+ and R- terminals.

When the device is energized the communications and processing ASIC regulates the flow of power and controls the data processing. The ionization chambers are energized and the ultra low leakage sensor ASIC provides a conditioned analog signal to the analog to digital (A/D) converter within the communications and processing ASIC. When smoke enters the ionization chambers through the integral gauze, the voltage at the sensing electrode increases to produce an analog signal. An A/D conversion of the signal from the ionization chambers is carried out once per second or when either the monitor or the preceding address is being interrogated. Whenever the device is interrogated this data is sent to the control equipment.

Electrical Specifications

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

Detector Type:	F1000-550 Discovery Ionization Smoke Detector
Detection Principle:	Ionization chamber
Chamber Configuration:	Twin compensating chambers using one single sided ionising radiation source
Supply Wiring:	Two wire supply
Terminal Functions:	L1 and L2; supply in and out connections +R; remote indicator positive connection (internal 2.2K Ω resistance to positive) -R; remote indicator negative connection (internal 2.2K Ω resistance to negative)
Operating Voltage:	17 to 28 VDC
Quiescent Current:	300 μ A
Power-up Surge Current:	1mA
Maximum Power-up Time:	10 seconds
Operating Temperature:	0°C to 49°C
Alarm Indicator:	2 red Light Emitting Diodes (LEDs)
Alarm Current, LED illuminated:	3.5mA
Remote Output Characteristics:	Connects to positive line through 4.5K Ω (5mA maximum)
Humidity:	0% to 95% relative humidity (no condensation)
Effects of Wind Speed:	Less than 20% change in sensitivity at speed up to 10m/s
Atmospheric Pressure:	Suitable for installation up to 2000m above sea level
Dimensions:	4 in x 1.65 in (diameter x height)
Weight:	3.0 oz.
Materials:	Housing: White polycarbonate V-O rated to UL 94 Terminals: Stainless Steel, nickel plated

Ordering Information

Model No.	Part No.	Description
F1000-550	75160	Discovery Ionization Smoke Detector

It is our intention to keep the product information up to date and accurate. We cannot cover all specific applications or anticipate all requirements. All specifications are subject to change without notice. For more information contact: FIRECOM, INC.