VF5690-00

Series 65A Ionization Detector

Standard Features

- Responds well to fast burning, flaming fires
- Designed to operate in a variety of environments
- Wide operating voltage
- Flashing LED option
- Flashing LED and magnet operated test switch option
- Requires base

Operation

The detector has a moulded self-extinguishing white polycarbonate case with wind resistant smoke inlets. Nickel plated stainless steel wiper contacts connect the detector to the base.

Inside the detector case a printed circuit board has the ionization chamber mounted on one side and the signal processing electronics on the other.

The ionization chamber consists of a reference chamber contained inside a smoke chamber (Fig. 1). The outer smoke chamber has inlet apertures fitted with insect resistant mesh. The radioactive source holder and smoke chamber form positive and negative electrodes respectively.

An Americium 241 radioactive source mounted within the reference chamber irradiates the air in both chambers, producing positive and negative ions. A voltage across the electrodes produces an electric field.

Ions are attracted to the electrode of the opposite sign to their own charge. Many recombine but a small electric current flows between the electrodes. At the junction between reference and smoke chambers the sensing electrode converts variations in chamber current into voltage changes.

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

The voltage at the sensing electrode is fed to a comparator where it is compared with a factory-set clean air reference voltage. If the monitored voltage exceeds the reference voltage, the comparator switches the alarm latch on, increasing the current drawn from the supply from about 40µA to a maximum of 75mA. This fall in the impedance of the detector is recognised by the control panel as an alarm signal.

The alarm latch current also illuminates the detector 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 1 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 volts DC and a minimum of 9 volts DC in normal operation.

The supply may fall to 6 volts DC in alarm conditions if a supply current of at least 10mA 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 volts.

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.

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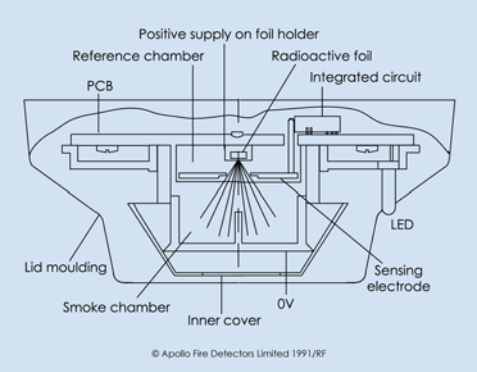

Options

1. Flashing LED: The alarm indicating LED flashes when the detector is in a quiescent state.

2. Magnetic test switch and Flashing LED: A magnetic test switch in the circuit of the detector can be magnetically activated from outside the case to initiate an alarm condition for test and commissioning purposes. A flashing LED, as outlined above, is also included.

Ordering Codes

Part number	Description
VF5690-01	Ionization Smoke Detector with flashing LED
VF5695-00	4" Standard Base
VF5696-00	6" Standard Base
VF5698-00	4" Standard Relay Base

Technical Specifications

Specifications are typical and given at 73°F and 50% relative humidity unless otherwise stated.

Supply Wiring: Two wire monitored supply, polarity insensitive

Terminal Functions:

L1 IN and L2	supply in connections (polarity insensitive)
L1 OUT and L2	supply out connections (polarity insensitive)
-R	remote indicator negative connection

Supply voltage: 9-33V DC

Ripple voltage: 2V peak to peak maximum at 0.1Hz to 100kHz

Quiescent current: 20–45µA at 24V

Switch on surge current: 110µA

Alarm voltage: 6 to 33V

Alarm indicator: Red light emmiting diode

Design Alarm load: 420Ω in series with a 2V drop

Holding voltage: 6V (min)

Holding current: 100mA (min)

Temperature range:
Maximum continuous operating temperature: 140°F
Minimum continuous operating temperature: 32°F
Minimum operating temperature: –4°F (no condensation or icing)
Storage: –22°C to +176°F

Humidity: 0 to 95% relative humidity

IP rating: 23D

Detector weight: 3.59 oz

Detector with base weight: 5.39 oz

Dimensions: Diameter: 3.93", Height: 1.65", Height in base: 1.96"

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