

IONIZATION  
SMOKE DETECTORS FOR  
SYSTEMS/RESIDENTIAL  
APPLICATIONS

MODELS

1806/1812/1824



BRK ELECTRONICS *First in Fire Warning*



## 1800 Series 4/6 Wire Systems Detectors

- Compact, Stylish Design
- Stable Unipolar Ionization Sensing Chamber
- Designed For Direct Surface or Electrical Box Mounting
- Unique Unipolar Dual Chamber Sensor
  - Provides Uniform Response to Broad Range of Fires
  - 1.5% Nominal Sensitivity
  - Wind Gusts up to 2500 Feet per Minute will not cause False Alarms
- 6, 12, and 24 Volt Models
- Twist-on Mounting Bracket with Tamper Option for Easy Installation
- Convenient Terminal Strip Wiring
- Built-in Test Switch
- Visual Alarm Indication
- Remote LED Option
- Low Standby Current
- Listed to UL 268
- Ideal for Residential and Commercial Applications

BRK's new 1800 Series detectors have been designed to offer maximum stability, ease of installation and a compact and attractive appearance.

The heart of these 1800 Series detectors is the new unipolar ionization chamber. BRK has created a wide gulf between conventional sensing technologies and this new advanced design. The unipolar chamber is approximately twice as responsive to smoldering fires when compared to conventional ionization detectors (see Figure 1), but is still able to respond quickly to fast flaming fires. This allows the detector to be set less sensitive and further from the threshold of alarm. Because of this new unipolar design, the 1800 Series detectors can be set at a sensitivity level comparable to most competitive photoelectric detectors (1.5% nominal).

The 1800 Series are system type detectors designed for use with four/six wire UL listed control panels. The 1806 operates on 6 VDC, the 1812 on 12 VDC, and the 1824 on 24 VDC. The sensitivity of the detectors is preset at the factory and does not require adjustment in the field. A solid state voltage regulator maintains detector sensitivity over a wide range of input voltages. Testing capability is incorporated in the detector which permits quick and easy testing without sophisticated test equipment. A visual indication of an alarm is given by an LED on the detector cover. This visible alarm signal may be remoted by using

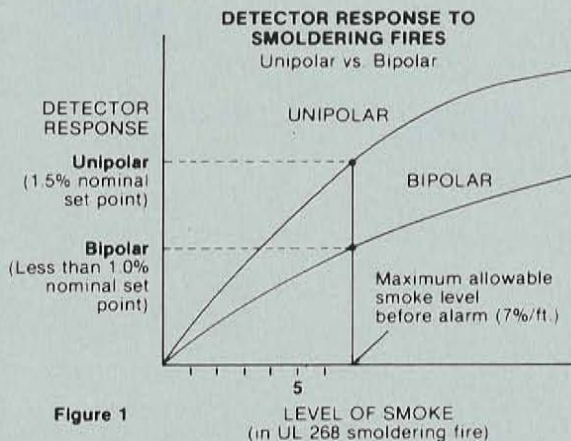
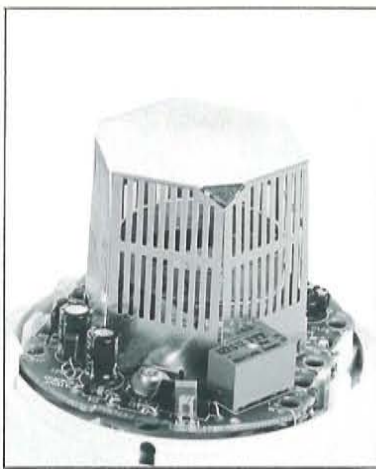


Figure 1

BRK's 669 series Remote Alarm Lamp Assemblies. All the 1800 Series detectors draw less than 100 microamps during normal operation.

Easy to install, clean, and maintain, these detectors are designed for direct surface mounting (twist-on mounting bracket included), or for mounting to most boxes up to 4" octagonal. The units also feature convenient terminal strip wiring. For installation and maintenance instructions, see the I56-126-XX Manual and the I56-210-XX "Applications Manual for System Smoke Detectors" for location and placement of detectors.





## BRK's new unipolar ionization chamber

### Stable response to a broader range of fires!

A unipolar dual chamber, ionization sensor is more responsive to slow smoldering fires than a conventional bipolar sensor.

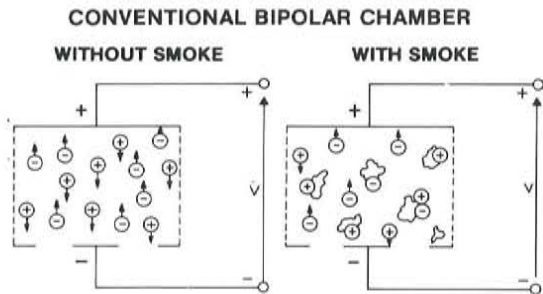
A bipolar sensor is able to detect a change in the chamber's ion current caused by the presence of combustion particles. These particles act as recombination centers, as both positive and negative ions attach themselves to the surface of these combustion particles and recombine, which decreases the current in the chamber. (See figure 2.)

A unipolar chamber is larger than the bipolar chamber and consists of a unipolar

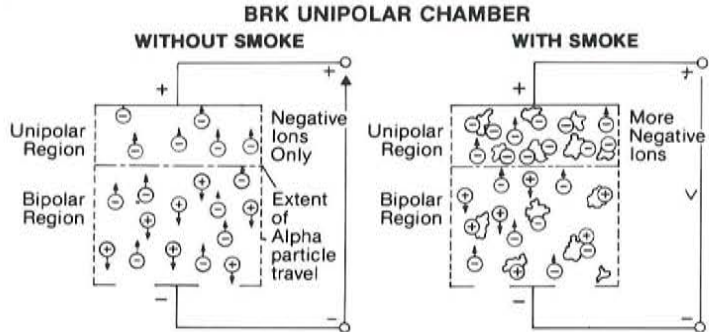
region on top of the bipolar region found in the bipolar chamber. (See figure 3.)

In the presence of combustion particles, a unipolar chamber reduces the current in the bipolar region exactly as in the bipolar chamber but in addition, the combustion particles increase the negative field in the unipolar region which reduces the strength of the field across the bipolar region. This results in an additional reduction of current.

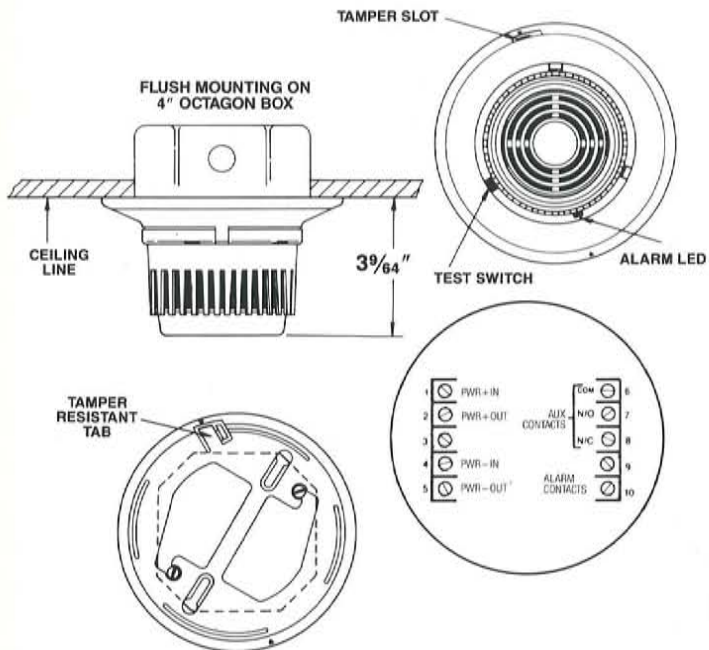
Tests have shown that unipolar sensors are approximately twice as responsive as bipolar sensors in their signal change versus increasing levels of smoke. (See figure 1.)



**Fig. 2.** This illustrates the influence of smoke particles on the current in a bipolar ionization chamber. There are an equal number of + and - ions. With smoke, the ions recombine on the smoke particles and reduce current flow.



**Fig. 3.** This illustrates the design of the unipolar ionization chamber. The smoke particles increase the negative field in the unipolar region, reducing the field in the bipolar region. This results in an additional reduction of current.



Specifications	1806	1812	1824
Operating Voltage . . . . .	6VDC (+10%, -15%)	12VDC	24VDC
Current Consumption			
Standby (typ.) . . . . .	100 $\mu$ A	100 $\mu$ A	100 $\mu$ A
Alarm (Max.) . . . . .	160mA	100mA	85mA
Sensitivity . . . . .	1.5% nominal.		
Sensor . . . . .	Unipolar, Dual Chamber		
Alarm Contacts . . . . .	SPST—N.O., 30W/50VA, 1.25 Amps (Res.) 30VAC/VDC		
Auxiliary Contacts . . . . .	SPDT—30W/50VA, 1.25 Amps (Res.) 125VAC/100VDC		
Temperature . . . . .	32°F to 120°F (0°C to 49°C)		
Humidity . . . . .	10% to 85% Relative Humidity, Excluding Condensation		
Visual Alarm Indicator . . . . .	Solid State Light-Emitting Diode		

#### How to order

Model	Description
<b>1806</b>	Ionization Detector, 6VDC, for control panels.
<b>A77-716-00</b>	End of Line Relay Module, 6VDC.
<b>A77-669-01</b>	Remote Alarm Lamp (LED) Assembly with rectangular mounting plate; 6VDC.
<b>1812</b>	Ionization Detector, 12VDC, for control panels.
<b>A77-716-01</b>	End of Line Relay Module, 12VDC.
<b>A77-669-02</b>	Remote Alarm Lamp (LED) Assembly with rectangular mounting plate; 12VDC.
<b>1824</b>	Ionization Detector, 24VDC, for control panels.
<b>A77-716-06</b>	End of Line Relay Module, 24VDC.
<b>A77-669-03</b>	Remote Alarm Lamp (LED) Assembly with rectangular mounting plate; 24VDC.
<b>156-126-XX</b>	Installation Instructions for 1800 series detectors.
<b>156-210-XX</b>	Application Manual for System Smoke Detectors.

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