Simplex

True*Alarm*®
Fire Alarm Systems

UL, ULC Listed*
FM Approved
NYC MEA Approved**

Communicating Devices
4098 Series TrueAlarm® Bases, and
Photoelectric, Ionization, & Heat Sensors

FEATURES

- **Digital transmission of analog sensor values via MAPNET II®, two-wire communications†**
- **Fire alarm control panel provides:**
  – Automatic environmental compensation
  – Control panel sensitivity selection
  – Multi-stage alarm operation
  – Control panels can display and print detailed sensor information in plain language
  – Sensitivity is displayed in percent per foot (no interpretation is required)
- **For use with Simplex 4100, 4020, and 4120 series control panels and Universal Transponders**
- Automatic once per minute individual sensor alarm simulation test satisfies NFPA 72 annual sensitivity testing requirement
  – Peak value logging allows accurate analysis and sensitivity selection for each sensor
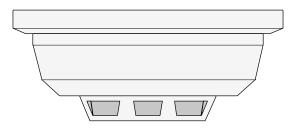- Magnetic test feature

APPLICATION

TrueAlarm smoke sensors can be ceiling or wall mounted. If ceiling mounted, the sensor should be as close as possible to the center of the room or hallway. If this is not possible, the edge of the sensor should be at least 4 inches from any wall. If wall mounted, locate the top of the sensor at least 4 inches and not more than 12 inches from the ceiling.

Sensor locations should be determined only after careful consideration is made of the physical layout and contents of the area to be protected. On smooth ceilings, spacing of 30 ft (9.1 m) may be used as a guide. For additional information, refer to NFPA-72, the *National Fire Alarm Code.*

Up to 127 sensors can be connected on a single pair of wires to a MAPNET II communications channel. Unshielded wire may be used in retrofit applications. TrueAlarm sensors and other Simplex addressable communicating devices can be intermixed on the same MAPNET II circuit.

* ULC listed devices are designated with a "C" suffix (example: 4098-9701C).

** Accepted for use – City of New York Department of Buildings – MEA35-93-E.

4098-9784 Base with 4098-9701 Sensor

OPERATION

Each TrueAlarm sensor's analog output is digitally communicated to the system control panel where the data is analyzed and an average value is maintained. An alarm is determined by comparing the sensor's present value with its average value.

With TrueAlarm analog sensing, the constant monitoring of each sensor's average value as a continuously shifting reference point provides software filtering that compensates for environmental factors (dust, dirt, etc.) and component aging. Without this filtering, there is a significant increase in the probability of false alarms caused by shifts in sensitivity, either up or down.

The alarm set point for each TrueAlarm sensor is determined at the system control panel. It can be selected to be more or less sensitive as the individual application requires. Alarm set points can be individually varied automatically by time of day to be more sensitive at night and less sensitive during daytime hours.

The system will indicate when individual sensors need cleaning. Dirty sensors, or any sensor trouble, will automatically be annunciated at the control panel. In addition, the LED on that sensor's base will light steadily. In an alarm condition, the LED on the alarmed sensor's base will light steadily. (LED operation is controlled by the fire alarm control panel. During alarm conditions, a base indicating a trouble condition that is not in alarm may return to pulsing to conserve communications power.)

† TrueAlarm analog sensing is protected by U.S. Patent Nos. 5,155,468 and 5,173,683. MAPNET addressable communications is protected by U.S. Patent No. 4,796,025.

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True*Alarm* SENSOR BASES AND ACCESSORIES

FEATURES

- Base mounted address selection remains with location and is accessible from front (dipswitch under sensor)
- Automatic identification provides default sensitivity when substituting sensor types
- Integral LED for power-on (pulsing), or alarm or trouble (steady on)
- Locking anti-tamper design
- Magnetically operated functional test
- Mounts on standard outlet boxes

SENSOR BASES

- **4098-9784,** Standard sensor base
- **4098-9785,** Sensor base with wired connections for remote alarm indicator or 4098-9822 relay
- **4098-9786,** Sensor base with piezoelectric sounder:
- Output is 88 dBA @ 10 ft (3 m) per UL268, *Smoke Detectors for Fire Protective Signaling Systems*
- Complimentary listed as audible notification appliance to UL Standard 464, *Audible Signal Appliances*, rated 82 dBA @ 10 ft (3 m)
- Operation is programmable from the control panel
- **Synchronized Coded/Temporal Coded Sounder Operation** is programmable from the control panel. The total quantity of sounder bases and other device types available on the same channel will vary with panel application. Refer to specific panel programming requirements.
- Wired connections for remote alarm indicator or 4098-9822 relay
- **4098-9787,** Sensor base with supervised relay driver output, programmable from control panel:
- Use with remote mount 2098-9737 relay
- Wired connections for remote alarm indicator or 4098-9822 relay

OPTIONS

- **2098-9737,** Remote mount control relay, DPDT contacts, rated 2 A max. @ 24 VDC, or 120 VAC, for transient suppressed loads (requires external 24 VDC)
- **2098-9808,** Remote alarm indicator
- **4098-9821,** Retrofit adapter plate
- **4098-9822,** Relay (mounts in base electrical box)
- Activates when base LED is steady on
- DPDT Contacts, rated 2 A max. @ 24 VDC, or 0.5 A max. @ 120 VAC, for transient suppressed loads (requires external 24 VDC)
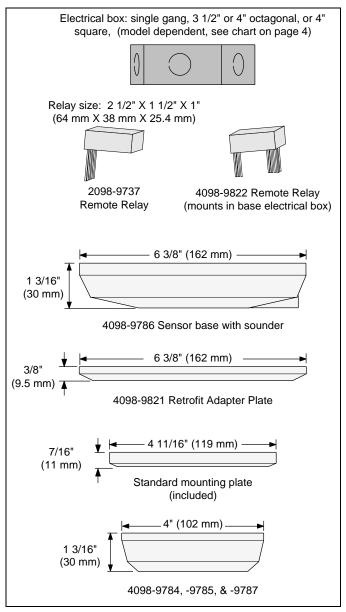
DESCRIPTION

TrueAlarm sensor bases contain integral addressable electronics that constantly monitor the status of the detachable photoelectric, ionization, or heat sensors. Each sensor's output is digitized and transmitted to the system fire alarm control panel every four seconds.

Since TrueAlarm sensors use the same base, different sensor types can be easily interchanged to meet specific location requirements. This feature allows intentional sensor substitution during building construction. When conditions are temporarily dusty, instead of covering the smoke sensors, heat sensors

DESCRIPTION *(Continued)*

may be installed without reprogramming the control panel. Although the control panel will indicate an incorrect sensor type, the heat sensor will operate at a default sensitivity and provide building protection.

MOUNTING AND DIMENSION REFERENCE

Electrical box: single gang, 3 1/2" or 4" octagonal, or 4" square, (model dependent, see chart on page 4)

Relay size: 2 1/2" X 1 1/2" X 1" (64 mm X 38 mm X 25.4 mm)

2098-9737 Remote Relay

4098-9822 Remote Relay (mounts in base electrical box)

6 3/8" (162 mm)
1 3/16" (30 mm)
4098-9786 Sensor base with sounder

6 3/8" (162 mm)
3/8" (9.5 mm)
4098-9821 Retrofit Adapter Plate

4 11/16" (119 mm)
7/16" (11 mm)
Standard mounting plate (included)

4" (102 mm)
1 3/16" (30 mm)
4098-9784, -9785, & -9787

2098-9808 Remote Alarm Indicator (single gang plate)

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True*Alarm* SENSORS

COMMON FEATURES
- Sealed against rear air flow entry
- Interchangeable mounting
- Low profile
- EMI/RFI Shielded Electronics

SMOKE SENSOR FEATURES
- Photoelectric or ionization technology sensing
- 360° Smoke entry for optimum response
- Listed to UL268 testing standards
- UL listed air velocity ranges:
  - 4098-9701, Photoelectric, 0 to 2000 ft/min
  - 4098-9716, Ionization, 0 to 300 ft/min
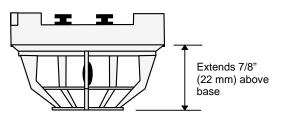
HEAT SENSOR FEATURES
- Combination rate-of-rise and rate compensated fixed temperature operation
- Listed to UL 521 testing standard for 50 ft spacing
- FM approved for 30 ft spacing

4098-9732 HEAT SENSOR

TrueAlarm heat sensors are self-restoring and provide a combination of rate-of-rise and fixed temperature rate compensated sensing. With small thermal mass, the sensor accurately and quickly measures the local temperature for logging at the fire alarm control panel.

Rate-of-rise temperature detection is selectable at the control panel for either 15° F (8.3° C) or 20° F (11.1° C) per minute. Fixed temperature sensing is independent of rate-of-rise sensing and programmable to operate at 135° F (57.2° C) or 155° F (68° C). In a slow developing fire, the temperature may not increase rapidly enough to operate the rate-of-rise feature. However, an alarm will be initiated when the temperature reaches its rated fixed temperature setting.

TrueAlarm heat sensors can be programmed as a utility device to monitor for temperature extremes in the range from 32° F to 158° F (0° C to 70° C). This feature can provide freeze warnings or alert to HVAC system problems.

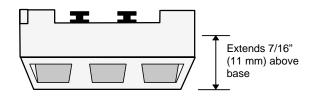Extends 7/8" (22 mm) above base

4098-9732 Heat Sensor

WARNING: **In most fires, hazardous levels of smoke and toxic gas can build up before a heat detection device would initiate an alarm. In cases where Life Safety is a factor, the use of smoke detection is highly recommended.**

4098-9701 PHOTOELECTRIC SENSOR

TrueAlarm photoelectric sensors use a stable, pulsed LED light source and a silicon photodiode receiver to provide consistent and accurate smoke sensing with low power requirements. Seven levels of sensitivity are available for each individual sensor, ranging from 0.2% to 3.7% per foot of smoke obscuration. Sensitivity is monitored and selected at the fire alarm control panel.

The sensor head design provides 360° smoke entry for optimum response to gray or black smoke from any direction. A built-in screen keeps insects from entering the smoke chamber. Due to its photoelectric operation, air velocity is not a factor, except as it affects area smoke flow.
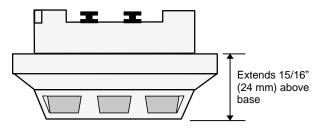

Extends 7/16" (11 mm) above base

4098-9701 Photoelectric Sensor

4098-9716 IONIZATION SENSOR

TrueAlarm Ionization sensors use a single radioactive source with an outer sampling ionization chamber and an inner reference ionization chamber to provide stable operation under fluctuations in environmental conditions such as temperature and humidity. Smoke and invisible combustion gases can freely penetrate the outer chamber. With both chambers ionized by a radioactive source (Am 241), a very small current flows in the circuit. The presence of particles of combustion will cause a change in the voltage ratio between chambers. This difference is measured by the electronics in the sensor's base and digitally transmitted back to the control panel for processing.

Four levels of sensitivity are available for each sensor, ranging from 0.5% to 1.7% per foot of smoke obscuration.

Extends 15/16" (24 mm) above base

4098-9716 Ionization Sensor

True*Alarm* BASE AND SENSOR SELECTION

PRODUCT	DESCRIPTION	COMPATIBILITY
Bases		
4098-9784	Standard sensor base	All sensors
4098-9785	Sensor base with connections for remote alarm indicator or 4098-9822 relay	All sensors, 2098-9808 remote alarm indicator or 4098-9822 relay
4098-9786	Piezo sounder base with connections for remote alarm indicator or 4098-9822 relay	All sensors, 2098-9808 remote alarm indicator or 4098-9822 relay
4098-9787	Sensor base with supervised remote relay connections and connections for remote alarm indicator or 4098-9822 relay	All sensors, 2098-9737 remote relay, 2098-9808 remote alarm indicator or 4098-9822 relay
Sensors		
4098-9701	Photoelectric	
4098-9716	Ionization	All bases
4098-9732	Heat	
Accessories		
2098-9737	Supervised remote relay	4098-9787
2098-9808	Remote LED alarm indicator	4098-9785, 4098-9786, and 4098-9787
4098-9821	Retrofit adapter plate	4098-9784, 4098-9785, and 4098-9787
4098-9822	Relay (mounts in base box)	4098-9785, 4098-9786, and 4098-9787

MOUNTING REQUIREMENTS

OPTIONS	ELECTRICAL BOX REQUIREMENTS
No Options, Any Base	Single Gang Box, or 3 1/2" (89 mm) or 4" (102 mm) Octagonal Box, 1 1/2" (38 mm) Minimum Depth
4098-9821 Retrofit Adapter Plate (Use with 4098-9784, -9785, or -9787)	Recommended When Retrofitting 6 3/8" Diameter Bases, Will Fit a Single Gang Box, 3 1/2" or 4" Octagonal Box, or 4" Square Box, 1 1/2" Minimum Depth
4098-9822 Relay (When Used with 4098-9785 or -9787)	4" Octagonal Box 2 1/8" (54 mm) Deep with 1 1/2" Extension Ring
4098-9822 Relay (When Used with 4098-9786)	4" Octagonal Box, 2 1/8" (54 mm) Deep with 1 1/2" Extension Ring or 4" Square Box, 1 1/2" Deep with 1 1/2" Extension Ring

BASE AND RELAY SPECIFICATIONS:

Bases 4098-9784 & 4098-9785*:

Operating Power ....MAPNET II, 1 address per base

Bases 4098-9786** & 4098-9787:

Communications ....MAPNET II, 1 address per base
Operating Voltage .... Separate 24 VDC
Supervisory Current ....280 µA
Alarm Current....................................4098-9786 = 15 mA
4098-9787 (w/2098-9737) = 28 mA

Relay 4098-9822*:

Operating Voltage .... Separate 24 VDC
Alarm Current...13 mA

* **NOTE:** 4098-9785 base with 4098-9822 relay requires separate 24 VDC.

GENERAL SPECIFICATIONS:

UL Listed Temperature Range.................. 32° F to 100° F
(0° C to 38° C)
Operating Temperature Range .... 32° F to 120° F
(0° C to 49° C)
Humidity Range .... 10 to 90 % RH
Housing Color ....Off-White
MAPNET II Connections ....Terminals
Remote Alarm Indicator/Relay
Connections................................. Wire Leads, AWG # 18

** Synchronized coded/temporal coded sounder operation is programmable from the control panel. Refer to specific panel programming for requirements

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All specifications and other information shown were current as of printing and are subject to change without notice.