

Features

TrueAlarm detection with TrueSense operation combines photoelectric detection with heat detection to provide a multi-mode detector with four detection mechanisms:

- Stable and reliable photoelectric smoke detection with built-in **TrueAlarm** sensitivity drift compensation
- Resettable, thermistor-based fixed temperature detection
- Resettable, thermistor-based rate-of-rise temperature detection
- And **TrueSense detection**, a patented correlation of smoke activity and thermal activity providing intelligent fire detection earlier than with either activity alone

Functional chamber enclosure:

- Louvered design enhances smoke capture by directing flow to chamber
- Entrance areas are minimally visible when ceiling mounted
- Operation is for ceiling or wall mounting

Multi-function LED indicator:

- Indicates normal and alarm conditions
- Provides status during magnetic functional test

Magnetically operated functional test:

- Initiates alarm and verifies performance
- Identifies general sensitivity status using detector LED pulses (normal, more sensitive, or less sensitive)
- With detectors categorized as normal or needing cleaning or other service, maintenance priorities can be more easily determined

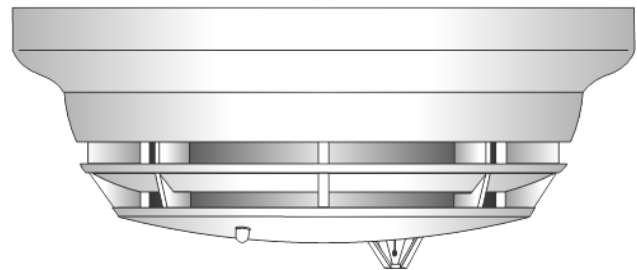
Available options:

- Bases for 2-wire or 4-wire operation
- Auxiliary alarm relay output
- Remote alarm indicating LED

Designed for EMI compatibility

UL listed to Standard 268

* This product has been approved by the California State Fire Marshal (CSFM) pursuant to Section 13144.1 of the California Health and Safety Code. See CSFM Listing 7272-0062:219 for allowable values and/or conditions concerning material presented in this document. It is subject to re-examination, revision, and possible cancellation. Accepted for use – City of New York Department of Buildings – MEA35-93E. Additional listings may be applicable; contact your local Simplex product supplier for the latest status. Listings and approvals under Simplex Time Recorder Co. are the property of Tyco Safety Products Westminster.



4098-9602 TrueSense Detector Mounted in Base

Description

Simplex® 4098-9602 detectors combine photoelectric smoke detection technology and quick response thermistor-based heat detection technology into a sophisticated, intelligent detector that analyzes *each* of these activities *and their combination* to determine whether alarm conditions are present.

Four Detection Modes. An onboard microprocessor provides four independent detection modes: photoelectric detection with TrueAlarm sensitivity drift compensation, fixed temperature heat detection, rate-of-rise temperature heat detection, and TrueSense photoelectric/heat trending analysis and alarm detection. If any of these alarm conditions are experienced, an alarm is initiated.

Specifications

Voltage	15 to 32 VDC, from Control Panel IDC
Standby Current	100 μ A @ 24 VDC
Alarm Current, 2-Wire Operation	Up to 86 mA maximum, exact current is determined by alarm current limiting of connected IDC (initiating device circuit)
Alarm Current, 4-Wire Operation	24 mA typical @ 24 VDC
Auxiliary Relay Ratings	Refer to page 3 under Product Selection
Rate-of-Rise Temperature Alarm**	$\geq 20^\circ$ F/min (11° C/min), <i>only in effect at temperatures above 90° F (32° C)</i>
Fixed Temperature Alarm	135° F (57° C)
UL Listed Temp. Range**	32° F to 100° F (0° C to 38° C)
Operating Temp. Range	15° F to 100° F (-9° C to 38° C)
Storage Temp. Range	0° to 140° F (-18° C to 60° C)
Smoke Obscuration Sensitivity	2.8%/ft Nominal, per UL268
Air Velocity Range	0-2000 ft/min (0-610 m/min)
Humidity Range	10% to 95% RH from 32° F to 122° F (0° C to 50° C)
Color	Frost White
Dimensions	4-7/8" Dia. x 2" H, mounted in base (124 mm x 51 mm), refer to p.3 for detail

** Always locate this and all rate-of-rise heat detection devices away from extremes of temperature fluctuation.

TrueAlarm Smoke Detection Features

Intelligent Data Evaluation. Conventional smoke detectors will typically drift toward being too sensitive due to the accumulation of dust and dirt. With TrueAlarm analog detection, data from the photoelectric chamber is monitored and analyzed at the detector to provide a continuously shifting reference point.

Drift Compensation. The data evaluation and its shifting reference point provide a software filtering process that compensates for environmental factors (dust, dirt, etc.) and component aging, establishing an accurate reference for evaluating new activity. With this filtering, the resulting drift compensation provides a significant reduction in the probability of false or nuisance alarms caused by shifts in sensitivity – either up or down.

Maintained Sensitivity and Dirty Status Indications. With its onboard software compensation, the 4098-9602 maintains its sensitivity much longer in the presence of dust and dirt accumulation. Additionally, it will determine when the dirt accumulation is approaching the limit of compensation, and will indicate that condition via its status indicator LED (see diagnostic information).

Magnetic Test Information. Status information is available by performing the magnetic test and observing the detector LED pulses. The LED will normally go directly into alarm with the magnetic test. If there is an off-normal condition, the LED pulses first to indicate the condition and then goes into alarm (see page 3).

Electronic Heat Detection

Fixed Temperature Heat Detection is provided with the addition of a fast response thermistor that causes an alarm at a fixed temperature of 135° F (57° C).

Electronic Heat Detection (Continued)

Rate-of-Rise Heat Detection occurs at $\geq 20^{\circ}$ F/min (11° C/min). To minimize the possibility of false alarms, rate-of-rise detection is correlated to the ambient temperature and is only in effect above 90° F (32° C).

TrueSense Detection

Comparing Photoelectric Activity and Thermal Activity. TrueSense analysis correlates both thermal activity *and* smoke activity at a single multi-sensor location using an extensively tested covariance relationship. As a result, TrueSense detection improves response to conditions indicative of faster acting, hot flaming fires when compared to the response of either photoelectric smoke activity or thermal activity alone.

High Integrity Detection. TrueSense operation provides early fire detection and maintains the established high level of immunity to false alarms and nuisance alarms that is inherent with TrueAlarm sensor operation.

Application Notes

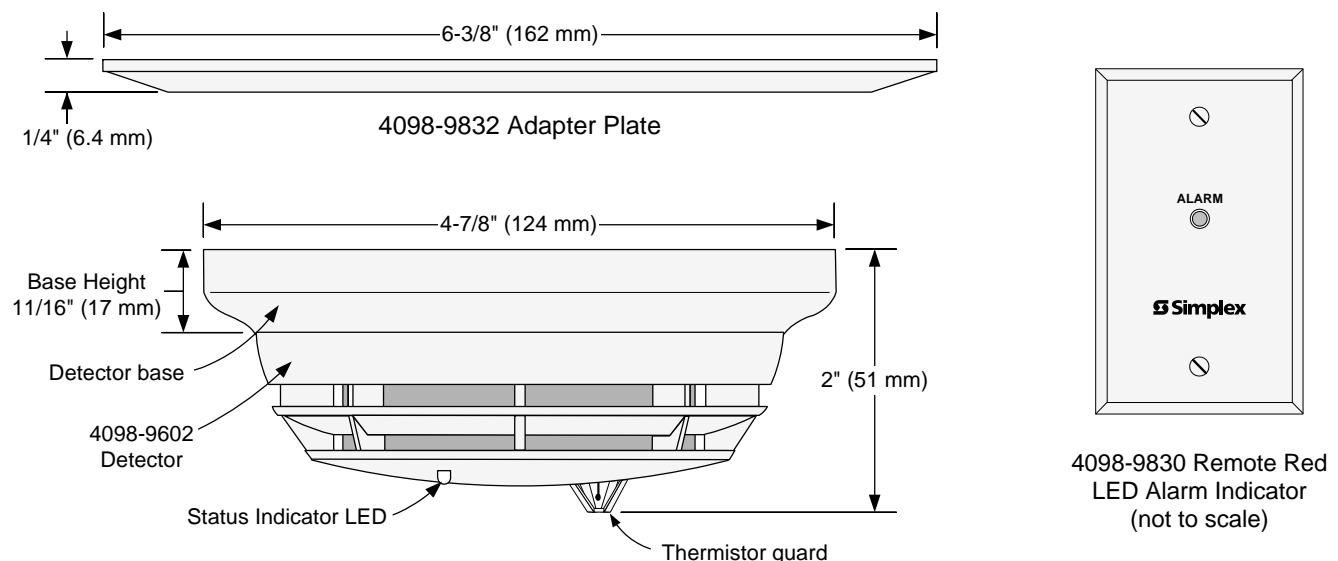
Observe heat detector location guidelines.

Ambient temperature operating range is 32° F to 100° F (0° C to 38° C). Temperature fluctuations should be below 6° F/min (3.3° C/min).

Detector locations should be determined only after careful consideration of the physical layout and contents of the area to be protected. Refer to NFPA 72, the National Fire Alarm Code. On smooth ceilings, spacing of 30 ft. (9.1 m) may be used as a guide.

For additional installation information, refer to Simplex publication 574-709, *4098 Detectors, Sensors, and Bases Application Manual*.

Dimensions and Reference Information



4098-9602 Dimensions Mounted on Base

4098-9602 Product Selection

Smoke Detector

Model	Description	Compatibility
4098-9602	TrueAlarm photoelectric detector with TrueSense photoelectric/thermal detection	Compatible with bases: 4098-9788, 4098-9682, and 4098-9683

Compatible Bases

Model	Description	Details*
4098-9788	2-Wire Base with connections for Remote Alarm LED Indicator	IDC and LED connections are screw terminals for in/out wiring, 18 to 14 AWG
4098-9682	4-Wire Base with Auxiliary Alarm Relay Contacts and connections for Remote LED Alarm Indicator NOTE: Requires external 24 VDC for operation	Relay Ratings, Single Form "C", For Suppressed Loads: Power limited, 3 A @ 28 VDC; Non-power limited, 3 A @ 120 VAC Wiring Connections (In/Out where required): Relay contacts and IDC wiring, color coded 18 AWG leads; LED wiring, screw terminals for 18 to 14 AWG
4098-9683	2-Wire Base with Auxiliary Alarm Relay & connections for Remote LED Indicator NOTE: Must be connected as the only device on the IDC to ensure relay operation.	Relay Ratings, Dual Form "C", For Suppressed Loads: Power limited, 1 A @ 28 VDC; Non-power limited, 1/2 A @ 120 VAC Wiring Connections (In/Out where required): Relay contacts and IDC (-), color coded 18 AWG leads; IDC (+) and LED wiring, screw terminals for 18 to 14 AWG

Detector Accessories

Model	Description	Details*
4098-9832	Adapter Plate	Required for mounting to surface mounted 4" (102 mm) square or 4" octagonal boxes, and to 4" square flush mounted boxes May be used when retrofitting existing bases Compatible with detector bases 4098-9788, -9682, & -9683
4098-9830	Remote LED Indicator	Mounted on single gang stainless steel plate
2098-9739	Encapsulated	24 VDC End-of-Line Relay Dimensions: 2-1/2" x 1-1/2" x 1" (64 mm x 38 mm x 25.4 mm) Mounted on single gang stainless steel plate
2098-9735	Plate Mounted	
		Required for 4-wire circuits using 4098-9682 base, one per circuit; select mounting type as required; wiring is color coded 18 AWG wire leads

* Refer to pages 2 and 4 for dimensions and additional mounting details; 18 AWG = 0.82 mm²; 14 AWG = 2.08 mm²

Detector Status LED Indications

LED Indication	Status
Pulses approximately every 4 seconds	Normal
Steady On	Alarm

LED Response to Magnetic Test[†]

LED Indication	Followed By	Status	Action
LED turns ON	Alarm is initiated	Normal , sensitivity is within compensation range	None
LED pulses <i>quickly</i> , 6 times in 3 seconds, then turns ON	Alarm is initiated	More sensitive , out of normal compensation range	Cleaning or other service is required
LED pulses <i>slowly</i> , 4 times in 8 seconds, then turns ON	Alarm is initiated	Less sensitive , out of normal compensation range	
	Does not initiate Alarm	Detector is malfunctioning	Service is required

[†] Testing requires placing a magnet at the designated location on the detector cover for 4 seconds. Refer to application manual 574-709 for further test and maintenance information.

Mounting Information

(Electrical boxes are supplied by others.)

Electrical Box Requirements:

Without relay (base 4098-9788):

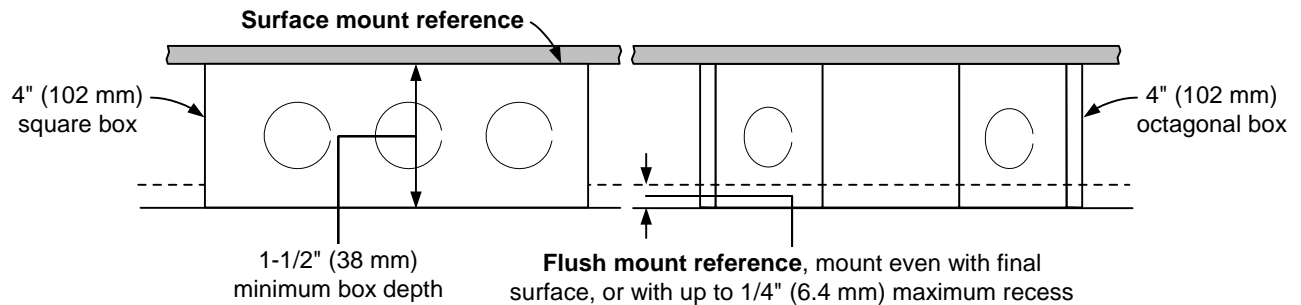
4" octagonal or 4" square, 1-1/2" deep

Single gang, 2" deep

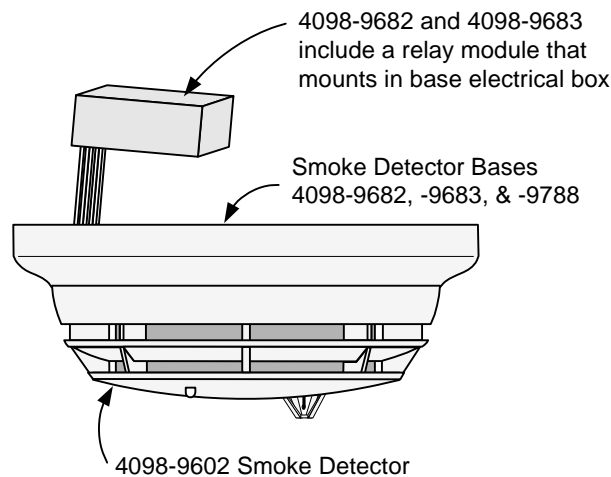
With relay (bases 4098-9682 and 4098-9683):

4" octagonal, 1-1/2" deep, with 1-1/2" extension ring

4" square, 1-1/2" deep, with 1-1/2" extension ring



4098-9832 Adapter Plate, required for mounting to surface mounted boxes and to 4" square flush mount boxes



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