Simplex

*UL, ULC, CSFM Listed, FM Approved**

Datasheet

TrueAlarm Multi-Point Analog Sensing

TrueAlarm Multi-Sensor Model 4098-9764 Providing TrueSense Early Fire Detection

Features

- TrueAlarm photoelectric smoke sensing and heat sensing combined in one housing
- Smoke activity monitored by TrueAlarm photoelectric sensing technology
- Thermal activity monitored by TrueAlarm thermistor sensing technology
- TrueSense smoke activity and thermal activity fire detection

Fire alarm control unit (FACU) compatibility

- For use with 4007ES, 4010ES, 4100ES, and 4100U FACUs
- You can use IDNet two-wire communications to digitally communicate TrueAlarm analog sensor information to the FACUs
- You can use special point types to allow the 4098-9764 multi-sensor to communicate smoke and heat analog sensing data with only one IDNet address
- The host FACU processes individual sensor information to determine sensor status and to determine whether conditions are normal, off-normal, or alarm
- 4100U FACUs require software revision 11 or higher with multi-point compatible IDNet transmission modules

Alarms

You can use one of the following to determine alarms:

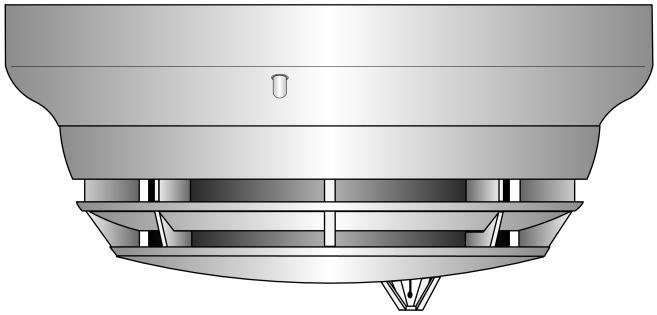
- Smoke detection with sensitivity from 0.2% per foot to 3.1% per foot obscuration. See Photoelectric sensing details for additional information.
- Heat detection selectable as fixed temperature or fixed with selectable rate-of-rise
- TrueSense intelligent analysis of the combination of smoke and heat activity

Additional design features

- Functional and architecturally styled enclosures for ceiling or wall mounting
- A smoke sensor louver design that directs air flow to chamber enhancing smoke capture
- Built-in magnetic test
- Compatible with standard bases including relay control, sounder bases, and isolator bases
- Designed for EMI compatibility

UL listed to Standard 268 7th Edition

Figure 1: TrueAlarm multi-sensor 4098-9764 mounted in standard sensor base



TrueAlarm multi-sensor description

TrueAlarm multi-sensor model 4098-9764 combines the performance of a TrueAlarm photoelectric smoke sensor with a fast-acting and accurate TrueAlarm thermal sensor to provide both features in a single sensor and base assembly.

Digital communication of analog sensing

Analog information from each sensor is digitally communicated to the FACU. The FACU stores and tracks photoelectric sensor input as an average value. It then determines an alarm or abnormal condition by comparing the sensor's present value against its average value. Thermal data is processed to look for absolute or rate-of-rise temperature as required.

Intelligent data evaluation

The software filtering process monitors each photoelectric sensor's average value and compensates for environmental factors, such as dust and dirt, and component aging. The result is a reduction in false or nuisance alarms caused by shifts in sensitivity. Status indications of dirty and excessively dirty prompt maintenance to be performed for each device.

FACU selection

Peak activity for each sensor is stored to assist in evaluating specific locations. You can select the alarm set point for each TrueAlarm sensor at the FACU, as more or less sensitive as the individual application requires.

Multi-point reporting and CO base reference

Reports of 4098-9764 sub-points under its single address vary with the base you use. For multi-point details, refer to data sheet *S4090-0011* .

For details of 4098-9764 usage with CO sensor bases, refer to data sheet *S4098-0052* .

Timed and multi-stage selection

You can program alarm set points for timed automatic sensitivity selection, such as more sensitive at night, less sensitive during day. You can also program the FACU for multi-stage operation for each sensor.

Sensor alarm and trouble LED indication

Each sensor base's LED pulses to indicate communications with the FACU. If the FACU determines that a sensor is in alarm, or that it is dirty or has some other type of trouble, the details are annunciated at the FACU and that sensor base's LED turns on steadily. During a system alarm, the FACU controls the LEDs so that an LED indicating a trouble returns to pulsing to help identify the alarmed sensors.

* 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 Listings 7272-0026:218 and 7300-0026:217 for allowable values and/or conditions concerning material presented in this document. 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 Fire Protection Products.

TrueAlarm analog sensor features

General mechanical:

- Housing is sealed against rear air flow entry
- Electronics are EMI/RFI shielded

Smoke sensing:

- Photoelectric light scattering sensing technology
- 360° smoke entry for optimum response
- Chamber screen provides protection from dirt, dust, and insects

Heat sensing:

- Rate compensated, self-resetting operation
- Fast response thermistor design
- The FACU can select for each sensor for both fixed temperature sensing and rate-of-rise temperature sensing

Photoelectric sensing details

TrueAlarm photoelectric sensors use a stable, pulsed LED light source and a silicon photodiode receiver to deliver consistent and accurate low power smoke sensing. Three user selectable sensitivities for special applications are available for each individual sensor, 0.2%, 0.5%, and 1% per foot. Standard sensitivity is 1.25% to 3.1% per foot. The FACU runs an algorithm that can vary the sensitivity for applications between 1.25% and 3.1% per foot.

Note: Fixed sensitivity settings higher than 1.0% per foot are not UL268 7th Edition compliant.

Sensor head design

The sensor head provides 360° smoke entry for optimum smoke response. Because of the photoelectric sensing technology, the 4098-9764 sensor is UL listed for air velocity of up to 4000 ft/min.

Heat sensing details

TrueAlarm heat sensors monitor a fast-reacting thermistor for self-restoring and rate compensated operation. Due to its small thermal mass, the sensor accurately and quickly measures the local temperature for analysis at the fire alarm control unit. At the FACU you can select alarms for each sensor to be fixed temperature, or rate-of-rise temperature, or the combination of both.

Temperature detection

Rate-of-rise temperature detection is selectable at the control unit 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 selectable 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 initiates when the temperature reaches its selected fixed temperature setting.

Utility temperature monitoring

You can program TrueAlarm heat sensors as a utility device to monitor for temperature extremes in the range from 32°F to 122°F (0°C to 50°C). This feature can indicate freeze warnings or HVAC system problems.

TrueSense detection details

Control unit sensor analysis

Each multi-sensor's smoke and heat sensing element provides data for evaluation at the FACU. The FACU evaluates the following four independent detection modes:

- Fixed temperature heat detection
- Rate-of-rise heat detection
- TrueAlarm photoelectric smoke detection
- And TrueSense correlation detection

Comparing photoelectric activity and thermal activity

TrueSense analysis compares thermal activity and smoke activity at a single multi-sensor location. This improves detection of faster-acting, hot-flaming fires.

High integrity detection

TrueSense operation provides early fire detection immunity to false alarms and nuisance alarms.

Application reference

Determine sensor locations after careful consideration of the physical layout and contents of the area. Refer to NFPA 72, ***the National Fire Alarm and Signaling Code***. On smooth ceilings, smoke sensor spacing of 30 ft (9.1 m) may be used as a guide.

For detailed application information, refer to ***4098 Detectors, Sensors, and Bases Application Manual (574-709)***.

Multi-sensor base features

Base mounted address selection

Programmed locations are stored in the base, so you can service sensors without reprogramming.

Integral red LED

The LED pulses on power-on, and lights steady on when there is an alarm or trouble. The FACU annunciates the exact status of the specific sensing element.

FACU features

- Individual smoke sensitivity and temperature operation is selectable for each sensor
- Sensitivity monitoring that satisfies NFPA 72 sensitivity testing requirements
- Peak value logging for accurate sensitivity selection
- The automatic, once-a-minute individual sensor calibration check verifies sensor integrity
- Multi-stage alarm operation
- Selectable alarm verification
- Automatic environmental compensation and determination of dirty and excessively dirty
- TrueSense analysis of smoke and heat activity
- Ability to display and print detailed sensor information in plain English language
- Smoke sensitivity displayed in percent per foot and temperature readings selectable as Fahrenheit or Celsius

Mounting reference

Figure 2: Mounting reference

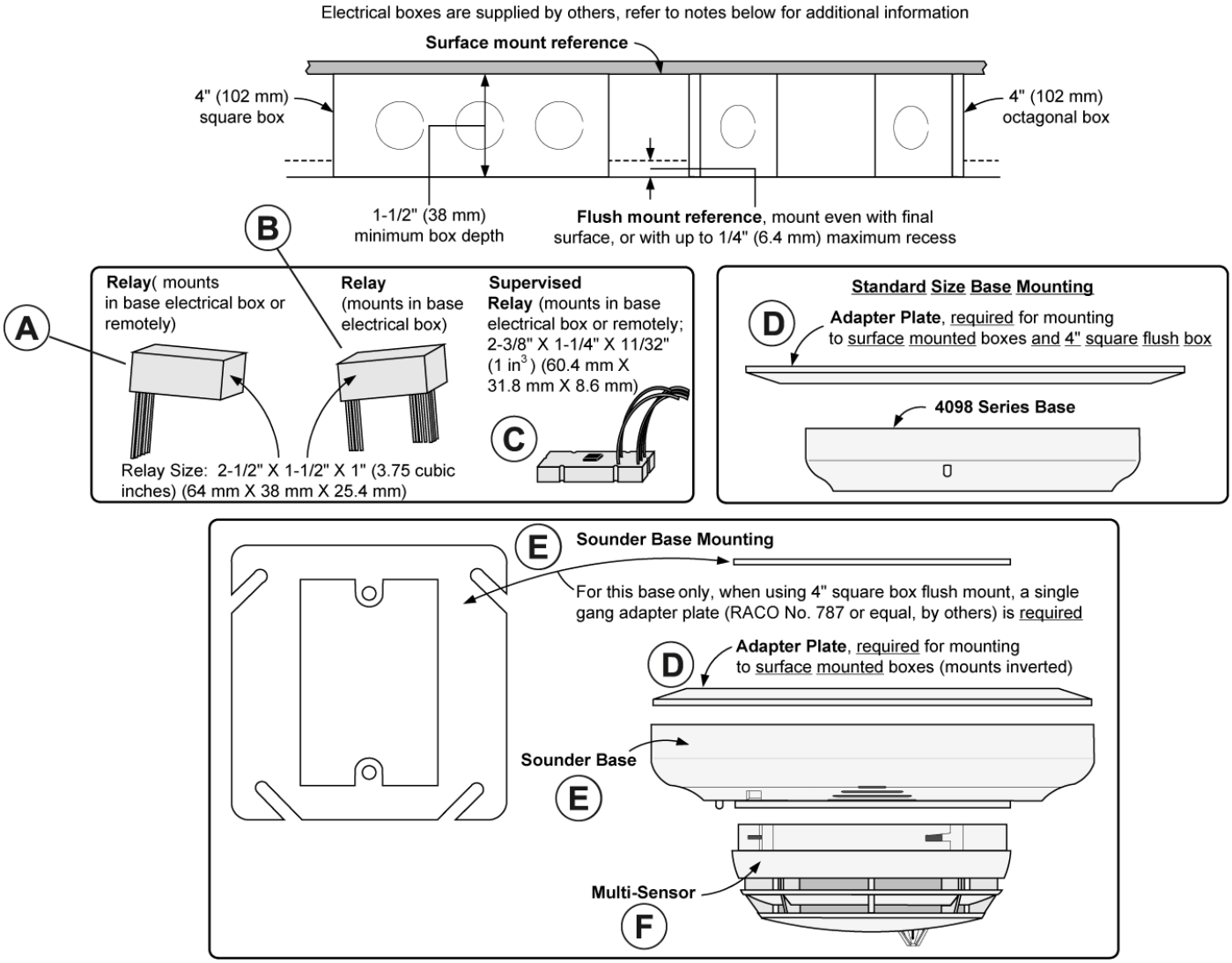


Table 1: Image reference

Callout	SKU
A	2098-9737 relay
B	4098-9822 relay
C	4098-9860 supervised relay
D	4098-9832 adapter plate
E	4098-9794 sounder base
F	4098-9764 multi-sensor

Mounting notes:

- Review wire size, wire count, box type, and whether a locally mounted relay is used before you determine the box size.
- When you use a locally mounted relay, mount the relay in the electrical box and use a 1 1/2 in. extension ring, not included.
- Use a 4 in. square or octagonal box of 1 1/2 in. or 2 1/8 in. depth as required.
- With flush mounting, you can also fit a single gang box, 2 1/8 in. (51 mm) deep if it is compatible with wiring requirements. It is not applicable if a locally mounted relay is used.
- Refer to ***4098 Detectors, Sensors, and Bases Application Manual (574-709)*** for additional information.

Product selection

Table 2: TrueAlarm multi-sensor

Model	Color	Description
4098-9764	White	Multi-sensor, photoelectric sensor with integral thermal sensor. Select base from Table 3
4098-9764BA 4098-9764IND		
4098-9764BK	Black	

Note:
- Order the TrueAlarm multi-sensor separately. See Mounting reference for mounting requirements.
- Model numbers ending in BA are assembled in America.

Table 3: TrueAlarm multi-sensor bases

Model	Color	Description		Data sheet
4098-9792	White	Standard sensor base, no options		*S4098-0019*
4098-9776	Black			
4098-9789 4098-9789IND	White	Sensor base with connections for remote LED alarm indicator or unsupervised relay.		
4098-9775	Black			
4098-9791	White	Four-wire sensor relay base	Includes connections for supervised remote relay and for remote LED alarm indicator or unsupervised relay. See Table 4 for details	
4098-9780	White	Two-wire sensor relay base		
4098-9793	White	Isolator base with built-in IDNet communications isolator, no options		*S4098-0025*
4098-9766	Black	Isolator2 base with built-in IDNet2 communications		*S4098-0026*
4098-9767	White			
4098-9794	White	Sounder base with connections for remote LED alarm indicator or unsupervised relay		*S4098-0028*

Note: Order the TrueAlarm multi-sensor bases separately. See Mounting reference for mounting requirements.

Table 4: Accessories reference

Model	Description		
4098-9832	Adapter Plate, 6 3/8 in. (162 mm) diameter, 1/4 in. (6.4 mm) deep, matches bases, see Mounting reference for required applications		
2098-9808	Choose one if applicable	**Red LED alarm indicator** on single gang stainless steel plate, mounts on single gang box, 1 1/2 in. (38 mm) minimum depth	
4098-9822		**Relay with operation that tracks base led status**, mounts in base electrical box, 4 in. square or octagonal box with 1 1/2 in. (38 mm) extension ring, select box depth per actual wiring requirements; DPDT contacts for resistive/suppressed loads, power limited rating of 2 A at 28 VDC; non-power limited rating of 1/2 A at 120 VAC, requires external 24 VDC coil power.	
2098-9737	**Supervised relay for use with 4098-9791 only;** DPDT contacts for resistive/ suppressed loads, power limited rating of 3 A at 28 VDC; non-power limited rating of 3 A at 120 VAC, requires external 24 VDC coil power.		Mount remotely or in base electrical box; remote mounting requires 4 in. octagonal or 4 in. square box, 1 1/2 in. minimum depth; base mounting requires 4 in. octagonal box, 2 1/8 in. deep with 1 1/2 in. extension ring
4098-9860	**Supervised relay for use with 4098-9780 only;** SPDT dry contacts, power limited rating of 2 A at 30 VDC, resistive; non-power limited rating of 0.5 A at 125 VAC, resistive.		

Note:
- Model numbers ending in IND are assembled in India.
- Order accessories seperately. See Mounting reference for mounting requirements.

Specifications

Table 5: General operating specifications

Specification	Rating
Communications and Sensor Supervisory Power	IDNet communications, 1 address per base
UL Listed Operating Temperature Range	32°F to 100°F (0°C to 38°C)
Operating Temperature Range	15°F to 122°F (-9°C to 50°C)
Storage Temperature Range	0°F to 140°F (-18°C to 60°C)
Humidity Range	10 to 95% RH
Smoke Sensor Sensitivity Range	0.2 to 3.1% per foot obscuration. See Photoelectric sensing details for additional information.
Smoke Sensor Air Velocity Range	0 to 4000 ft/min (0 to 1220 m/min)
Thermal Sensor Operation (selected at control unit)	Fixed alarm temperature setting of 135°F (57.2°C), and/or rate-of-rise temperature alarm at 15°F (8.3°C) or 20° F (11.1°C), also selectable as utility monitoring operation from 32°F to 122° F (0°C to 50°C)
Housing Color	Frost White or Black

4098-9764 Sensor and base dimensions

Figure 3: Standard size base mounting sounder base mounting

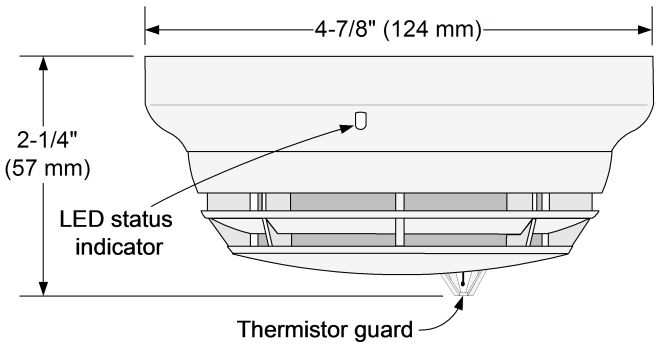


Figure 4: Sounder base mounting