



July 27, 2000

DN-1208 • I-120

## 2412 and 2424

### 4-Wire Photoelectric Smoke Detectors with Optional Horn & Thermal Sensors

Section: Conventional Initiating Devices

#### GENERAL

The System Sensor **2400 Series** photoelectric detector is specifically designed to meet the stringent performance requirements of industrial and municipal fire detection and alarm systems. The design of these detectors emphasizes ease of installation and field maintenance.

#### FEATURES

- 12 or 24 VDC operation.
- Unique optical sensing chamber:
  - Superior signal-to-noise ratio.
  - Built-in signal processing.
  - 3.0% nominal sensitivity.
- Removable cover for field cleaning.
- Visible LED “blinks” in standby, latches on in alarm.
- Sealed against dirt, insects, and back pressure.
- Optional built-in 135°F (57°C) thermal.
- Three-year limited warranty.
- Field metering of detector sensitivity.
- Built-in test capability.
- Low standby current.
- Twist-on mounting bracket with tamper option.
- Designed for direct surface or electrical box mounting.
- Models available with built-in 85 dBA piezoelectric horn.
- Insect-resistant screening with 0.020" (0.508 mm) openings.
- Isolated or integrated operation of thermal available (certain models).
- SEMS screws for easy wiring.
- Meets performance criteria designated by UL 268.
- Built to withstand air velocities up to 3,000 feet (914.4 meters) per minute without triggering a false alarm.

#### APPLICATIONS

Use to contribute to life safety, fire protection, and property conservation. Photoelectric detectors are recommended in areas where smoldering fires are likely to ignite. In areas where small combustion particles are usually present from forklift trucks, cooking stoves, etc., they are less likely than ionization detectors to produce false alarms.

For further information, see System Sensor manual I56-407-03, “Applications Manual for System Smoke Detectors,” which provides detailed information on detector spacing, placement, zoning, wiring, and special applications.



California  
State Fire  
Marshal

7272-1209:103

(2412, 2412TH,  
2424, 2424TH)

7272-1209:134

(2412AT, 2424AIT,  
2424AT)

**MEA**

427-91-E Vol. III  
(2412AT, 2424, 2424AIT,  
2424AT, 2424TH)



**BSA**

1329-88-SA

(2424AIT, 2424AT)

1346-88-SA

(2412B, 2412THB,  
2424, 2424TH)



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#### CONSTRUCTION AND OPERATION

All 2400 Series photoelectric smoke detectors contain a unique optical sensing chamber designed to sense the presence of smoke particles produced by a wide range of combustion sources. A custom integrated circuit incorporates signal processing to reduce false alarms and sample/hold circuitry to provide easy field metering of sensitivity.

The optional built-in piezo horn produces an interrupted 85 dBA tone at 10 feet (3.048 m). The horn operates upon polarity reversal of the supply voltage, when the unit senses smoke, or when the thermal reaches its alarm point (integral thermal models only).

This document is not intended to be used for installation purposes. We try to keep our product information up-to-date and accurate. We cannot cover all specific applications or anticipate all requirements. All specifications are subject to change without notice. For more information, contact **NOTIFIER**. Phone: (203) 484-7161 FAX: (203) 484-7118



**NOTIFIER**

One Fire-Lite Place, Northford, Connecticut 06472

**ISO 9001**  
**CERTIFIED**  
ENGINEERING & MANUFACTURING

## INSTALLATION

Easy to install and maintain, these detectors are designed for direct surface mounting (mounting bracket included), or mounting to a 4" (101.6 mm) octagon or smaller box. Easy-to-wire screw terminals allow fast and simple field wiring of in, out, and remote annunciator connections.

Consult control panel specifications for the maximum allowable loop resistance for the particular control panel to be used.

To prevent wiring mistakes, observe polarities and make certain that each conductor is identified. Installation and maintenance instructions are packaged with each detector. For further information, refer to NFPA 72 Standards and the local authority having jurisdiction.

## MAINTENANCE

These detectors are designed to seal the sensing chamber from back pressure air flow, dust, dirt, and insects. The back of each detector is sealed. The chamber is protected by a fine mesh (0.020"/0.508 mm) screen. Installation and Maintenance Instructions are packaged with each detector.

## ARCHITECTURAL/ ENGINEERING SPECIFICATIONS

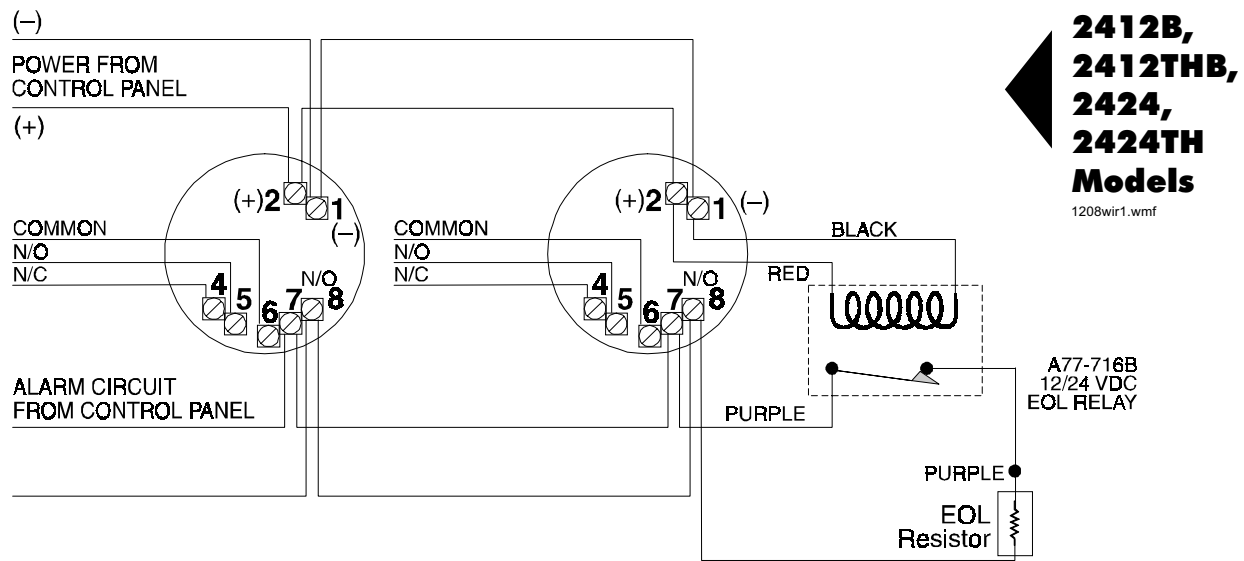
The smoke detector shall be a photoelectric type (models 2412 and 2424) or a combination photoelectric/thermal type (models 2412TH and 2424TH), with thermal sensor rated at 135°F (57°C) as manufactured by System Sensor. Wiring connections shall be made by means of SEMS screws. The detector will have a visible LED which will blink in standby, and latch on in alarm. The sensor shall have a nominal sensitivity of 3.0% per foot as measured in a UL smoke box. The detector screen and cover should be easily removable for cleaning. It shall be possible to perform a sensitivity and functional test on the detector without needing to generate smoke. Detector circuitry shall perform a self-test on the sensing chamber and internal electronics every 40 seconds. If circuitry fails, the detector LED shall stop blinking. The detector LED shall stop blinking. The detector shall have a mounting bracket that allows for direct surface mounting or mounting to a 3-1/2" (88.9 mm) or 4" (101.6 mm) octagonal box.

## GENERAL SPECIFICATIONS

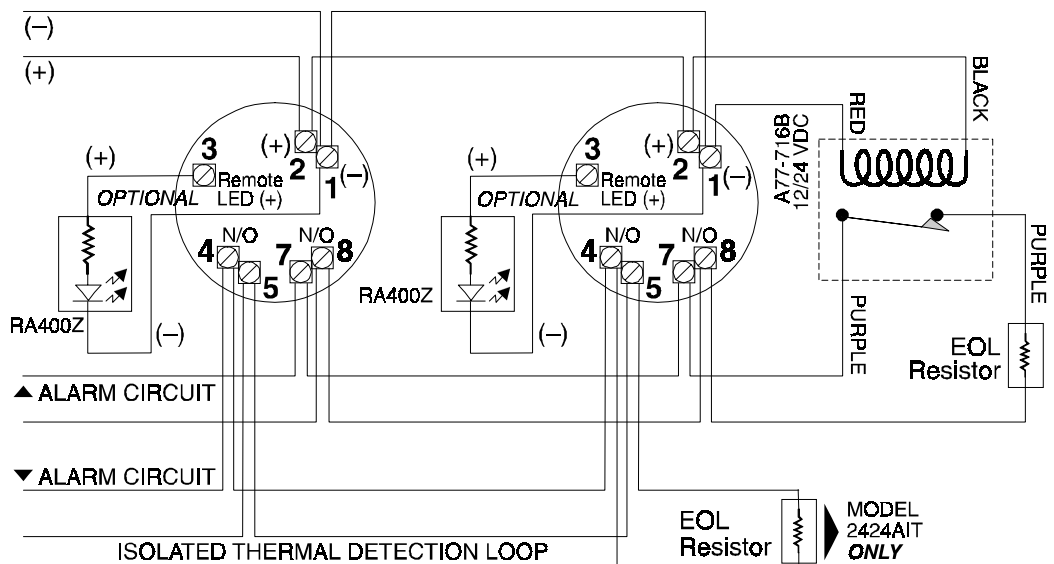
MODEL:	2412AT	2412B	2412THB	2424	2424AIT	2424AT	2424TH
Control Panel Applications:	4-wire	4-wire	4-wire	4-wire	4-wire	4-wire	4-wire
Built-in Thermal:	Yes	No	Yes	No	Yes	Yes	Yes
Visual LED Local Alarm:	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Remote LED Annunciator Capability:	Yes	No	No	No	Yes	Yes	No
Operating Voltage, Nominal:	12 VDC	12 VDC	12 VDC	24 VDC	24 VDC	24 VDC	24 VDC
Operating Voltage, Minimum:	11.3 VDC	11.3 VDC	11.3 VDC	20 VDC	20 VDC	20 VDC	20 VDC
Operating Voltage, Maximum:	17.3 VDC	17.3 VDC	17.3 VDC	29 VDC	29 VDC	29 VDC	29 VDC
Current Consumption, Standby (max.):	120 µA	120 µA	120 µA	120 µA	120 µA	120 µA	120 µA
Current Consumption, Alarm (max.):	51 mA	77 mA	77 mA	41 mA	43 mA	43 mA	41 mA
Current Consumption, Alarm (min.):	35 mA	35 mA	35 mA	21.3 mA	21.3 mA	21.3 mA	21.3 mA
Reversed Voltage (non-alarm):	—	—	—	—	15 mA	15 mA	—
Sensitivity, Photo (nominal):	3.0%/foot	3.0%/foot	3.0%/foot	3.0%/foot	3.0%/foot	3.0%/foot	3.0%/foot
Sensitivity, Thermal:	135°F	—	135°F	—	135°F	135°F	135°F
Contacts:	Form A only	Form A & C	Form A & C	Form A & C	Form A only	Form A only	Form A & C
Relay Contact Ratings:	Resistive or inductive load @ 60% power factor: <b>ALARM CONTACTS</b> are Form A: 2.0 A @ 30 VAC/DC. <b>AUXILIARY CONTACTS</b> are Form C: 0.6 @ 110 VDC, 2.0 A @ 30 VDC (not available on models with "A" (horn) feature). 1.0 A @ 125 VDC, 2.0 A @ 30 VAC (not available on models with "A" (horn) feature).						
Weight:	0.5 pounds (227 grams).						
Size:	3.2" (81.28 mm) high, 5.5" (139.70 mm) dia.; add 0.5" (12.70 mm) to height for thermal models.						
Ambient Temperature:	Thermal models: 32°F to 100°F (0°C to 38°C). All other models: 32°F to 120°F (0°C to 49°).						
Maximum Air Velocity:	3,000 feet (914.4 m) per minute.						
Relative Humidity:	10% to 93%, non-condensing.						
Visual Alarm Indicator:	Solid state light-emitting diode (LED).						

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## WIRING DIAGRAMS



**2412AT, 2424AT, 2424AIT Models**  
1208wir2.wmf



## PRODUCT LINE INFORMATION

<b>2412AT</b>	Four-wire photoelectric detector, direct-wire, 12 VDC, with horn and integral 135°F (57°C) fixed thermal.	<b>2424AIT</b>	Four-wire photoelectric detector, direct-wire, 24 VDC, with horn and isolated thermal (built-in 135°F/57°C and 85 dBA horn).
<b>2412B</b>	Four-wire photoelectric detector, direct-wire, 12 VDC.	<b>2424AT</b>	Four-wire photoelectric detector, direct-wire, 24 VDC, with horn and integral 135°F (57°C) fixed thermal.
<b>2412THB</b>	Four-wire photoelectric detector, direct-wire, 12 VDC, with integral 135°F (57°C) fixed thermal.	<b>2424TH</b>	Four-wire photoelectric detector, direct-wire, 24 VDC, integral 135°F (57°C) fixed thermal.
<b>2424</b>	Four-wire photoelectric detector, direct-wire, 24 VDC.	<b>RA400Z</b>	Remote Annunciator (LED).
		<b>MOD400R</b>	Field Test Module.