



June 19, 1998

**2451**

DN-1217 • I-125

## 2-Wire and 4-Wire Photoelectric Smoke Detector with optional thermal sensor

Section: Conventional Initiating Devices

### GENERAL

The System Sensor 400 Series plug-in photoelectric smoke detectors are specifically designed to meet the stringent performance requirements of industrial and municipal fire detection/alarm systems. The design of these detectors emphasizes ease of installation and field maintenance.

### FEATURES

- 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.
- Sealed against dirt, insects, and back pressure.
- Three-year limited warranty.
- Field metering of detector sensitivity.
- Built-in magnetic test switch.
- Low standby current.
- Built-in tamper-resistant feature.
- Designed for direct surface or electrical box mounting.
- 360° field viewing angle of the visual alarm LEDs
- Insect-resistant screening (0.020"/0.508 mm openings).
- Easy plug-in of the head to base.
- SEMS screws for easy wiring.
- Optional recess mounting.
- Air velocity up to 3,000 feet (914.4 m) per minute.

### APPLICATIONS

Use to contribute to life safety, fire protection, and property conservation. Photoelectric detectors are recommended in areas where slow 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.

### CONSTRUCTION AND OPERATION

All 400 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 and meet the performance criteria designated by UL 268. A new custom integrated circuit incorporates signal processing to reduce false alarms and sample/hold circuitry to provide easy field metering of sensitivity.

An additional key feature is the range of mounting bases, to meet a variety of applications.

### INSTALLATION

Model 2451 detectors are designed for systems use with NOTIFIER UL-listed control panels. For two-wire applications, refer to the Device Compatibility Document. Easy to install and maintain, this detector is designed for direct surface mounting (mounting bracket included), or mounting to a 4" (101.6



S911



CS308



California State Fire Marshal  
7272-1209:131



0Q1A0.AY

**BSA**

1232-88-SA



mm) octagonal or smaller box. Easy-to-wire screw terminals allow fast and simple field wiring of in, out, and remote annunciator connections.

Consult NOTIFIER 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. A copy of Installation and Maintenance Instructions is packaged with each detector. For further information, refer to NFPA 72 "Standard on Automatic Fire Detectors," and to local Authority Having Jurisdiction.

A **MOUNTING BASE SELECTION GUIDE** is included on page 2 of this document.

**JUNCTION BOX SELECTION GUIDE:** Box depth is contingent on base and wire size. Refer to National Electrical Code or local applicable codes for appropriate recommendations. **Bases B401 and B401B** can utilize a single-gang, 3-1/2" (88.9 mm) octagonal, 4" (101.6 mm) octagonal, or 4" square junction box. **Bases B402B and B406B** can utilize a single-gang, 3-1/2" octagonal, 4" octagonal, 4" square, 50 mm, 60 mm, or 75 mm junction box. **Base B404B** can utilize a 4" octagonal or 4" square junction box.

### GENERAL SPECIFICATIONS

**Operating voltage:** mounting base dependent (see chart).

**Standby current:** 120 µA max.; 100 µA max. for thermal.

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**

12 Clintonville Road, Northford, Connecticut 06472

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

**Sensitivity:** 3.0%/ft. nominal.

**Weight:** 0.6 pounds (272 g.).

**Size:** model 2451 is 2.4" (60.96 mm) high, 2451TH is 2.9" (73.66 mm) high; 4.0" (101.6 mm) diameter with unflanged bases, 6.2" (157.48 mm) diameter with flanged bases.

**Construction:** flame-retardant white Noryl® plastic.

**Temperature:** for 2451, 32°F to 120°F (0°C to 49°C); for thermal model 2451TH, 32°F to 100°F (0°C to 38°C).

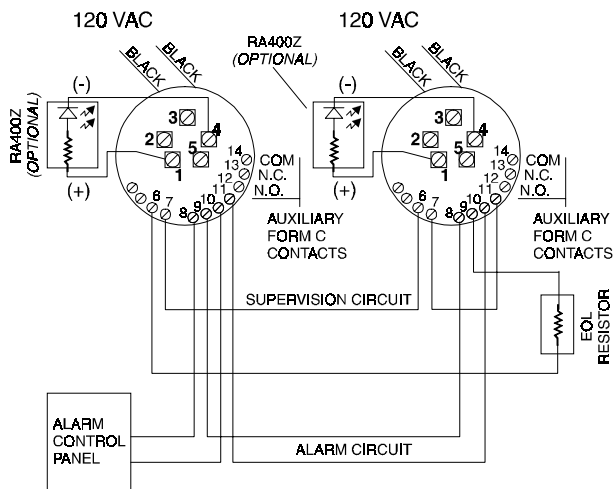
**Alarm point, thermal:** 135°F (57°C), or 15°F/min. rate-of-rise.

**Humidity range:** 10% to 93% RH (non-condensing).

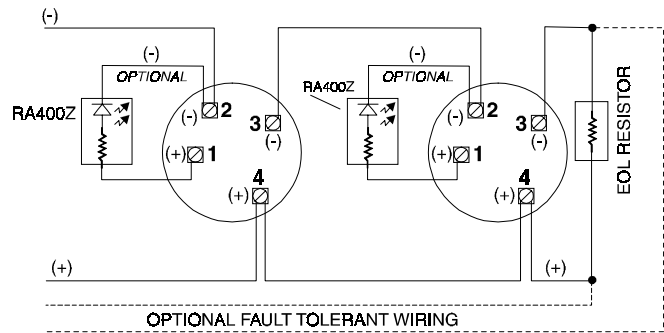
**Air velocity rating:** 3,000 feet per minute (15 meters/sec.).

## PRODUCE LINE INFORMATION

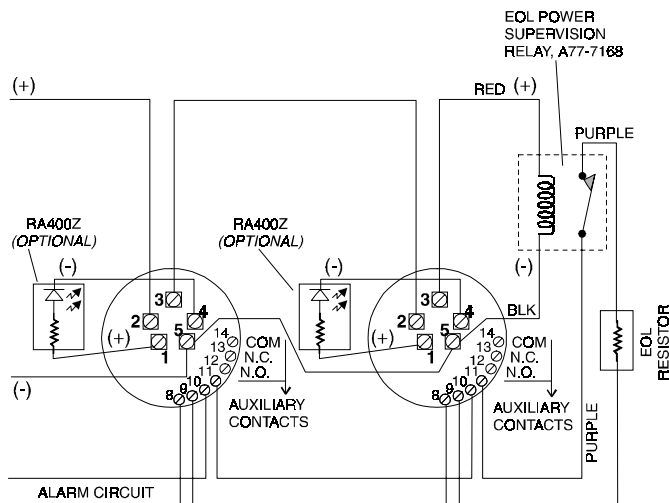
Model	Description
2451	Photoelectric Detector. Must be mounted to one of the B40_B Series Bases listed above.
2451TH	Same as model 2451 above, but with a 135°F (57°C) fixed-temperature heat sensor.
RA400Z	Remote Annunciator for 2- or 4-wire applications. Use with any 400 Series plug-in detector. Fits standard U.S. single-gang electrical box.
MOD400R	Field Test Module for all of the System Sensor 400 Series Smoke Detectors.



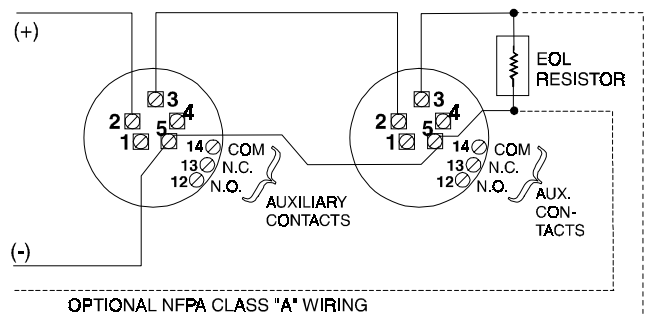
▲ B404B Wiring Diagram



▲ B401B/B401 Wiring Diagram



▲ B402B Wiring Diagram



▲ B406B Wiring Diagram

## MOUNTING BASE SELECTION GUIDE

Base Model Number	Version	Loop Type	Current Limit Resistor	Alarm Contact Type	Nominal Voltage	Standby Voltage	Current Draw on Alarm
B401 & B401B	UL/ULC/EN-54	2-wire*	No	—	12/24 VDC	8.5 to 35 VDC	10 to 100 mA**
B402B	UL & ULC	4-wire	Yes	Form-A & -C	24 VDC	17 to 32 VDC	14 to 39 mA
B404B	UL & ULC	4-wire	Yes	Form-A & -C/A Supervisory	120 VAC	120 VAC	75 mA AC maximum
B406B	UL/ULC/EN-54	2-wire*	No	Form-C	24 VDC	15 to 32 VDC	12 to 100 mA**

\*Functionality contingent on panel compatibility. \*\*Must be limited by control panel.

**RELAY CONTACT RATINGS:** resistive or Inductive (60% power factor) load. **Form-A:** 2.0 A at 30 VAC/DC. **Form-C:** 0.6 A at 110 VDC; 2.0 A at 30 VDC; 1.0 A at 125 VAC; 2.0 A at 30 VAC.

