

# 400 Series™ Direct-Wire Photoelectronic Smoke Detector



A Division of Pittway  
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1-800-SENSOR2 (736-7672), Fax 630-377-6495  
<http://www.systemsensor.com>

## Models Available

**2400/2400A Photoelectronic**

**2400TH Photoelectronic with Thermal**

**2412B/2412BA Photoelectronic**

**2412THB Photoelectronic with Thermal**

**2424 Photoelectronic**

**2424TH Photoelectronic with Thermal**



## Features

- 12 or 24 volt operation
- Unique optical sensing chamber
- Removable cover and insect screen for easy cleaning
- Visible LED blinks in standby, latches on in alarm
- Sealed against dirt, insects, and back pressure
- Field sensitivity metering of detector to meet NFPA 72 requirements
- Twist-on mounting bracket with tamper option
- SEMS screws for easy wiring
- 3-year warranty
- Optional built-in 135°F (57°C) heat sensor

## Specifications

Size: 3.2" (8.1 cm) h, 5.5" (13.9 cm) dia. with mounting bracket; add .5" (1.27 cm) to height for thermal

Shipping Weight: 0.5 lb. (227 g)

Operating Temperature Range:

Thermal Models: 32°F to 100°F (0°C to 38°C)

All Other Models: 32°F to 120°F (0°C to 49°C)

Operating

Humidity Range: 10 – 93% RH noncondensing

Air Velocity Rating: 3000 fpm

Wiring Gauge: 12 – 18 AWG, twisted pair recommended

Mounting: 3½" or 4" octagon box, 4" square box with plaster ring, 50, 60, 75 mm boxes

Smoke Detector Spacing:

On smooth ceilings (as defined in NFPA 72), spacing of 30 feet (900 sq. ft.) may be used as a guide. Other spacing may be used depending on ceiling height, high air movements, and other conditions or response requirements.

Sensitivity: 3.0% ± .7 ft. nominal

Test Features:

1. Test port – Insert 0.1 inch maximum diameter allen wrench or screwdriver into test port on detector housing.
2. Test card – After removing detector cover, insert calibrated test card into test slot on screen.
3. Test module – Using a standard voltmeter interface, insert MOD400R plug into detector's module port. Fulfills calibrated sensitivity test per NFPA 72.

Thermal Sensor Rating

(thermal models only): 135°F fixed temperature restorable



**MEA**  
approved

## General Description

**System Sensor 400 Series** photoelectronic detectors are specifically designed to meet the stringent performance requirements of industrial and commercial fire detection/ alarm systems. The design of these detectors emphasizes ease of installation and field maintenance.

The 400 Series offer 6 different photoelectronic detectors with a variety of voltages, wiring configurations, and thermal options.

## Electrical Specifications

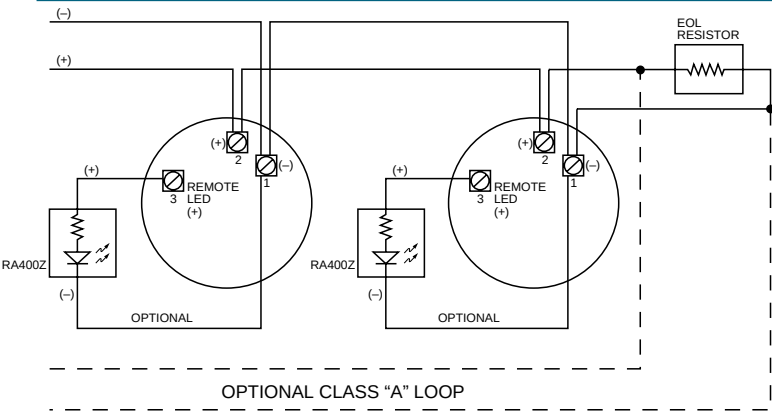
|                                    |                                    | Control                                           | Operating      | Auxiliary       | Remote LED    | Current Consumption   |                     |
|------------------------------------|------------------------------------|---------------------------------------------------|----------------|-----------------|---------------|-----------------------|---------------------|
| <u>Model</u>                       | <u>Product</u>                     | <u>Panel</u>                                      | <u>Voltage</u> | <u>Contacts</u> | <u>Option</u> | <u>Standby (max.)</u> | <u>Alarm (max.)</u> |
| 2400                               | Photo Detector                     | 2-wire                                            | 12/24 VDC      | No              | Yes           | 120 $\mu$ A           | *                   |
| 2400TH                             | Photo Detector w/Fixed Heat Sensor | 2-wire                                            | 12/24VDC       | No              | Yes           | 120 $\mu$ A           | *                   |
| 2412B                              | Photo Detector                     | 4-wire                                            | 12 VDC         | Yes             | No            | 120 $\mu$ A           | 77mA                |
| 2412THB                            | Photo Detector w/Fixed Heat Sensor | 4-wire                                            | 12 VDC         | Yes             | No            | 120 $\mu$ A           | 77mA                |
| 2424                               | Photo Detector                     | 4-wire                                            | 24 VDC         | Yes             | No            | 120 $\mu$ A           | 41mA                |
| 2424TH                             | Photo Detector w/Fixed Heat Sensor | 4-wire                                            | 24 VDC         | Yes             | No            | 120 $\mu$ A           | 41mA                |
| * Must be limited by control panel |                                    |                                                   |                |                 |               |                       |                     |
| Relay Contact Ratings:             |                                    | Resistive or inductive<br>(60% power factor) load |                |                 |               |                       |                     |
| Alarm Contacts                     |                                    |                                                   |                |                 |               |                       |                     |
| Form A:                            |                                    | 2.0A @ 30 VAC/DC                                  |                |                 |               |                       |                     |
| Form C:                            |                                    | 2.0A @ 30 VAC/DC                                  |                |                 |               |                       |                     |
|                                    |                                    | 0.6A @ 110 VDC, 1.0A @ 125 VAC                    |                |                 |               |                       |                     |
| Reset Time:                        |                                    | .3 sec. (max.)                                    |                |                 |               |                       |                     |
| Startup Time:                      |                                    | 34 sec. (max.)                                    |                |                 |               |                       |                     |

## Engineering Specifications

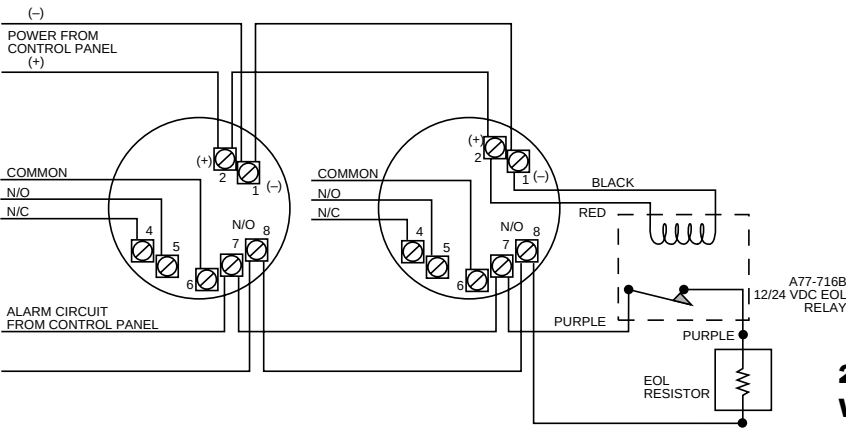
Smoke Detector shall be a photoelectronic type (model 2400, 2412, 2424) or a combination photoelectronic/ thermal (model 2400TH, 2412TH, 2424TH) with thermal sensor rated at 135°F as manufactured by System Sensor. Wiring connections shall be made by means of SEMS screws. The detector will have a visible LED which will blink in standby and latch on in alarm. The detector shall have a nominal sensitivity of 3 % per foot as measured in the 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 without the need of generating 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 shall have a mounting bracket that allows for mounting to a 3<sup>1</sup>/<sub>2</sub>" or 4" octagon box or 4" square electrical box.

# 400 Series Wiring Guide



**2400/2400TH  
Wiring Diagram**



**2412B/THB, 2424/TH  
Wiring Diagram**

## Ordering Information

### Part No. Description

#### Two-Wire Models

|        |                                                                                   |
|--------|-----------------------------------------------------------------------------------|
| 2400   | Photoelectronic detector, 2-wire, 12/24 VDC                                       |
| 2400A  | Same as above, Canadian model                                                     |
| 2400TH | Photoelectronic detector, 2-wire, 12/24 VDC with built-in 135°F fixed heat sensor |

#### Four-Wire Models

|         |                                                                                                        |
|---------|--------------------------------------------------------------------------------------------------------|
| 2412B   | Photoelectronic detector, 4-wire, 12 VDC, with auxiliary contacts                                      |
| 2412BA  | Same as above, Canadian model                                                                          |
| 2412THB | Photoelectronic detector, 4-wire, 12 VDC, with auxiliary contacts and integral 135°F fixed heat sensor |
| 2424    | Photoelectronic detector, 4-wire, 24 VDC, with auxiliary contacts                                      |
| 2424TH  | Photoelectronic detector, 4-wire, 24 VDC, with auxiliary contacts and integral 135°F fixed heat sensor |

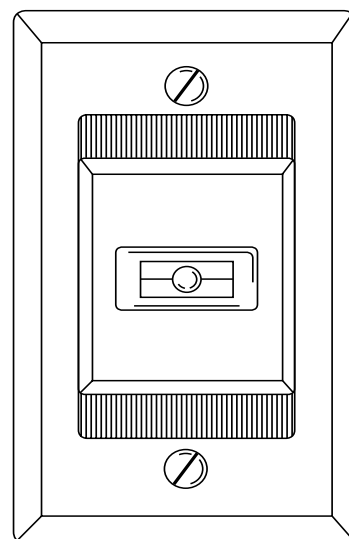
### Accessories

|          |                                                                                                                                                        |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| A77-716B | End of line relay for power supervision, 12/24 VDC                                                                                                     |
| RA400Z   | Remote annunciator for 2 or 4 wire systems, 3-32V – Use with ion and photo detectors. Fits standard U.S. single gang electrical box. (See below.)      |
| MOD400R  | Detector sensitivity test module – Use with most analog or digital multimeters. Satisfies requirement of NFPA 72 for sensitivity testing. (See below.) |
| RS24     | Replacement insect screen for 2400, 2412B, 2424                                                                                                        |
| RS24T    | Replacement insect screen for 2400TH, 2412THB and 2424TH                                                                                               |
| DUST45   | Replacement protective dust cover for 400 Series                                                                                                       |



*The MOD400R Field Sensitivity Test Module can be used with any standard DC voltmeter or multimeter to check the sensitivity range of System Sensor's detectors (satisfies NFPA 72 requirement for sensitivity testing).*

*RA400Z Remote  
Annunciator, 3 – 32V  
Use with ion and photo  
detectors that have remote  
annunciator output*



## System Sensor Worldwide Manufacturing & Distribution

### **In Canada:**

Telephone: 905-812-0767  
Fax: 905-812-0771

### **In the Far East:**

Telephone: 852-2191-9003  
Fax: 852-2736-6580

### **In Italy:**

Telephone: 39-40-949011  
Fax: 39-40-382137

### **In China:**

Telephone: 86-29-524-6253  
Fax: 86-29-524-6259

### **In India:**

Telefax: 91-11-5676815

### **In the United Kingdom:**

Telephone: 44-1403-276500  
Fax: 44-1403-276501