

## INSTALLATION AND MAINTENANCE INSTRUCTIONS

# 3251 Intelligent Ionization, Photoelectric, and Fixed Temperature (135°F) Thermal Smoke Sensor



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1-800-SENSOR2, FAX: 630-377-6495

### Specifications

Operating Voltage Range:	15 to 28 VDC
Max. Standby Current:	350µA @ 24 VDC (no communication)
Heat Sensor:	135° F Fixed Temperature Electronic Thermistor
Operating Humidity Range:	10% to 93% Relative Humidity, noncondensing
Operating Temperature Range:	0° to 38° C (32° to 100° F)
Height:	1.7 inches (43mm) installed in B210LP base
Diameter:	6.1 inches (155mm) installed in B210LP base 4.1 inches (104mm) installed in B501 base
Weight:	3.6 oz. (102 g)



### Before Installing

This sensor must be installed in compliance with the control panel system installation manual. The installation must meet the requirements of the Authority Having Jurisdiction (AHJ). Sensors offer maximum performance when installed in compliance with the National Fire Protection Association (NFPA); see NFPA 72. Please read System Sensor's *Guide for Proper Use of System Smoke Detectors* (156-407), available at no charge from System Sensor. This manual includes detailed information on sensor spacing, placement, zoning, and special applications.

**NOTICE:** This manual should be left with the owner/user of this equipment.

**IMPORTANT:** This detector must be tested and maintained regularly following NFPA 72 requirements. The detector should be cleaned at least once a year.

### General Description

The Model 3251 intelligent smoke detector is a microprocessor-based sensor, which uses a combination of ionization, photoelectric, and fixed temperature (135°F) thermal sensors to detect a wider range of fires than the standard single sensor smoke detector. Rotary decade switches are provided for setting the sensor address (see figure 2). This sensor is designed to provide open area protection and is intended for use with compatible control panels only.

The sensor is provided with two bicolor LED's which indicate sensor status. Flashing green indicates normal operation and steady red indicates alarm. Remote LED annunciator capability is also available as an optional accessory (Model RA400Z).

### Spacing

System Sensor recommends spacing sensors in compliance with NFPA 72. In low air flow applications with smooth ceilings, space sensors 30 feet apart. For specific information regarding sensor spacing, placement, and special applications, refer to NFPA 72 or System Sensor's *Guide For Proper Use of System Smoke Detectors*.

### Wiring Instructions

All wiring must be installed in compliance with the National Electric Code (NEC), applicable local codes, and any special requirements of the Authority Having Jurisdiction (AHJ). Proper wire gauges should be used.

The installation wires should be color-coded to limit wiring mistakes and ease system troubleshooting.

Improper connections will prevent a system from responding properly in the event of a fire.

### Remove power from the communication line before installing sensors.

1. Wire the sensor base (supplied separately) per the wiring diagram (see figure 1).
2. Set the desired address on the sensor address switches (see figure 2).
3. Install the sensor in the sensor base. Push the sensor into the base while turning it clockwise to secure it in place.
4. After all sensors have been installed, apply power to the control unit and activate the communication line.
5. Test the sensor(s) as described in the TESTING section of this manual.

### CAUTION

Dust covers provide limited protection against airborne dust particles during shipment. Dust covers must be removed before the sensors can sense smoke. Remove sensors prior to heavy remodeling or construction.

### Testing

Before testing, notify the proper authorities that the system is undergoing maintenance and will be temporarily out of service. Also, disable the system to prevent unwanted alarms. All sensors must be tested after installation and periodically thereafter. Testing methods must satisfy the Authority Having Jurisdiction (AHJ). Sensors offer maximum performance when tested and maintained in compliance with NFPA 72.

The sensor can be tested in the following ways:

#### A. Functional Magnet Test (Model M02-04-01)

This sensor can be functionally tested using a test magnet. The test magnet electronically simulates smoke in the sensing chamber, testing the sensor electronics and connections to the control panel.

1. Hold the test magnet in the magnet test area as shown (see figure 3).
2. The sensor should alarm the panel.

Two LED's on the sensor are controlled by the panel to indicate sensor status. Refer to the control panel technical documentation for sensor LED status operation and expected delay to alarm.

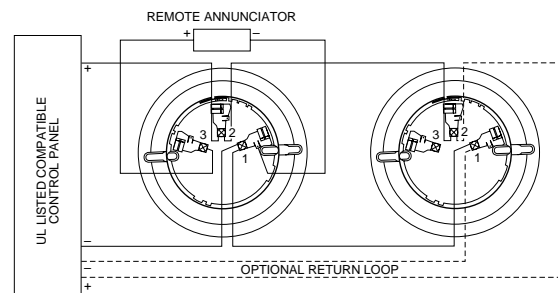
#### B. Sensitivity Test

The sensor contains an internal test which continually checks the sensitivity of the sensor. If the sensor moves out of its intended sensitivity range, the sensor will transmit a trouble signal to the control panel.

#### C. Smoke Entry: Aerosol Generator (Gemini 501)

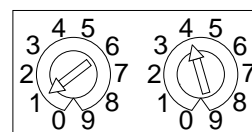
The GEMINI model 501 aerosol generator can be used for smoke entry testing. Set the generator to represent 4%/ft. to 5%/ft. obscuration as described in the GEMINI 501 manual. Using the bowl shaped applicator, apply aerosol until the panel alarms.

Figure 1. Wiring diagram:



A78-2461-00

Figure 2. Rotary decade address switch:



A78-2460-00

#### D. Direct Heat Method (Hair Dryer of 1000-1500 watts).

A hair dryer of 1000-1500 watts should be used to test the thermistors. Direct the heat toward either of the two thermistors (see figure 4), holding the heat source approximately 12 inches from the detector in order to avoid damaging the plastic housing. The detector will reset only after it has had sufficient time to cool. Make sure both thermistors are tested individually.

Both smoke and heat detection testing are recommended for verifying system protection capability.

A sensor that fails any of these tests should be cleaned as described under CLEANING and retested. If the sensor fails after cleaning, it must be replaced and returned for repair. When testing is complete, restore the system to normal operation and notify the proper authorities that the system is back in operation.

#### Cleaning

Before cleaning, notify the proper authorities that the system is undergoing maintenance, and will be temporarily out of service. Disable the system to prevent unwanted alarms.

1. Remove the sensor to be cleaned from the system.
2. Remove the sensor cover using a small standard screwdriver to release each of the four cover removal tabs that hold the cover in place. Use caution to avoid damaging the thermistors.
3. Vacuum the outside of the screen without removing it.
4. Remove the outer chamber assembly being careful not to damage the thermistors. Pull the assembly straight away from the sensing chamber until it snaps out of place. Use a vacuum or clean compressed air to clean the inside of the outer chamber assembly.
5. Use a vacuum or clean compressed air to remove dust and debris from the sensing chamber.
6. Reinstall the outer chamber assembly. Align the arrow on the outer chamber assembly with the arrow on the printed circuit board. Push the outer chamber assembly over the sensing chamber until it snaps into place. Check to make sure that the screen is in the screen contact.
7. Reinstall the sensor cover. Use the thermistors and LED's to align the cover with the sensor. Snap the cover into place. Check to make sure the thermistors are in the upright position.
8. Reinstall the sensor.
9. When all the sensors have been cleaned, restore system operation for testing purposes and test the sensor(s) as described in the TESTING section of this manual.

Figure 3. Test magnet position:

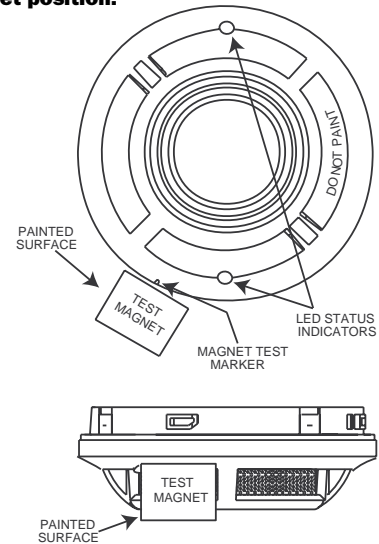
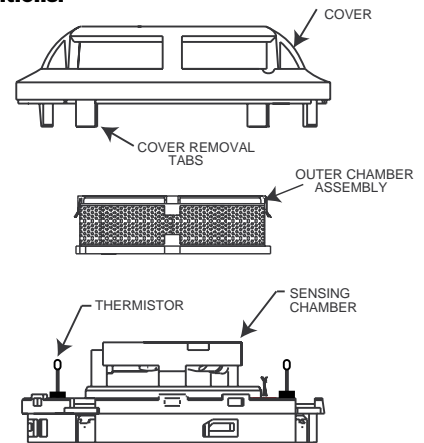


Figure 4. Thermistor positions:



### WARNING

#### The Limitations of Property Protection Smoke Detectors

The smoke detector used with this base is designed to **activate and initiate** emergency action, but will do so only when it is used in conjunction with an authorized fire alarm system. This detector must be installed in accordance with NFPA standard 72.

**Smoke detectors will not work without power.** AC or DC powered smoke detectors will not work if the power supply is cut off.

**Smoke detectors will not sense fires which start where smoke does not reach the detectors.** Smoldering fires typically do not generate a lot of heat which is needed to drive the smoke up to the ceiling where the smoke detector is usually located. For this reason, there may be large delays in detecting a smoldering fire with either an ionization type detector or a photoelectric type detector. Either one of them may alarm only after flaming has initiated which will generate the heat needed to drive the smoke to the ceiling.

Smoke from fires in chimneys, in walls, on roofs or on the other side of a closed door(s) may not reach the smoke detector and alarm it. A detector cannot detect a fire developing on another level of a building quickly or at all. For these reasons, detectors **shall be located on every level and in every bedroom within a building.**

**Smoke detectors have sensing limitations, too.** Ionization detectors and photoelectric detectors are required to pass fire tests of the flaming and smoldering type. This is to ensure that both can detect a wide range of types of fires. Ionization detectors

offer a broad range of fire sensing capability but they are somewhat better at detecting fast flaming fires than slow smoldering fires. Photoelectric detectors sense smoldering fires better than flaming fires which have little, if any, visible smoke. Because fires develop in different ways and are often unpredictable in their growth, neither type of detector is always best, and a given detector may not always provide early warning of a specific type of fire.

In general, detectors cannot be expected to provide warnings for fires resulting from inadequate fire protection practices, violent explosions, escaping gases which ignite, improper storage of flammable liquids like cleaning solvents which ignite, other similar safety hazards, arson, smoking in bed, children playing with matches or lighters, etc. Smoke detectors used in high air velocity conditions may have a delay in alarm due to dilution of smoke densities created by frequent and rapid air exchanges. Additionally, high air velocity environments may create increased dust contamination, demanding more frequent maintenance.

To keep your equipment in excellent working order, ongoing maintenance is required per the manufacturer's recommendations and UL and NFPA standards. At a minimum, the requirements of Chapter 7 of NFPA 72, the National Fire Alarm Code, shall be followed. A preventative maintenance agreement should be arranged through the local manufacturer's representative. Though smoke detectors are designed for long life, they may fail at any time. Any smoke detector, fire alarm equipment, or any component of that system which fails shall be repaired or replaced as soon as possible.

#### Three-Year Limited Warranty

System Sensor warrants its enclosed smoke detector to be free from defects in materials and workmanship under normal use and service for a period of three years from date of manufacture. System Sensor makes no other express warranty for this smoke detector. No agent, representative, dealer, or employee of the Company has the authority to increase or alter the obligations or limitations of this Warranty. The Company's obligation of this Warranty shall be limited to the repair or replacement of any part of the smoke detector which is found to be defective in materials or workmanship under normal use and service during the three year period commencing with the date of manufacture. After phoning System Sensor's toll free number 800-SENSOR2 (736-7672) for a Return Authorization number, send defective units postage prepaid to: System Sensor, Repair Department, RA # \_\_\_\_\_, 3825 Ohio

Avenue, St. Charles, IL 60174. Please include a note describing the malfunction and suspected cause of failure. The Company shall not be obligated to repair or replace units which are found to be defective because of damage, unreasonable use, modifications, or alterations occurring after the date of manufacture. In no case shall the Company be liable for any consequential or incidental damages for breach of this or any other Warranty, expressed or implied whatsoever, even if the loss or damage is caused by the Company's negligence or fault. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This Warranty gives you specific legal rights, and you may also have other rights which vary from state to state.