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## SD-651 and SD-651A Low Profile Photoelectronic Plug-in Smoke Detectors Installation and Maintenance Instructions

Before installing detectors, please thoroughly read Manual I56-407-XX, *Guide for Proper Use of System Smoke Detectors*, which provides detailed information on detector spacing, placement, zoning, wiring, and special applications. Copies of this manual are available from Notifier (For installations in Canada, refer to CAN/ULC-S524-M91, *Standard for the Installation of Fire Alarm Systems*, and CEC Part 1, Sec. 32).

### **GENERAL DESCRIPTION**

Models SD-651 AND SD-651A low profile photoelectronic detectors use a state-of-the-art optical sensing chamber. These detectors are designed to provide open area protection and to be used with compatible UL-listed control panels only. The capability of plugging these detectors into a variety of special bases makes them more versatile than equivalent direct-wired models.

Two LEDs on each detector light to provide a local 360° visible alarm indication. They flash every ten seconds indicating that power is applied and the detector is working properly. The LEDs latch on in alarm. Remote LED annunciator capability is standard and may be implemented through an optional accessory RA400Z. The alarm can be reset only by a momentary power interruption. These detectors may be tested by activating the internal reed switch with a magnet.

### **SPECIFICATIONS**

Size:	Height	1.7 inches (43 mm)
	Diameter	4.0 inches (101 mm)
Weight:		3.6 oz. (102 gm)
Operating Temperature Range		-10° to 60°C (14° to 140°F)
		Note: Do not install in locations where normal ambient temperature range extends beyond 0° to 49°C (32° to 120°F)
Operating Humidity Range		10% to 93% Relative Humidity noncondensing
Latching Alarm		Reset by momentary power interruption.

### **BASE SELECTION AND WIRING GUIDE**

Refer to the installation instructions for the Plug-in Detector Bases for base selection and wiring instructions. Notifier has a variety of detector bases available for this smoke detector, including 2-wire applications with and without relays, 4-wire and 120VAC applications. (Note: the 120VAC detector base is not available in Canada.)

All bases are provided with screw terminals for power, ground, remote annunciator connections and relay contact connections, if applicable. The electrical ratings for each detector-base combination are also included in the base installation instructions.

### **INSTALLATION**

**NOTE:** All wiring must conform to applicable local codes, ordinances, and regulations.

**NOTE:** Verify that all detector bases are installed, that the initiating-device circuits have been tested, and that the wiring is correct. (Refer to detector base manual for testing procedure.)

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### **WARNING**

Remove power from initiating-device circuits before installing detectors.

1. Install detectors:
  - a. Place the detector into the detector base
  - b. Turn the detector clockwise until the detector drops into place.
  - c. Continue turning detector clockwise to lock it in place.
2. Tamper Resistance: The detector bases can be made tamper resistant. When capability is enabled, detectors cannot be removed from the base without the use of a tool. See the detector base installation manual of the detector base for details in using this capability.
3. After all detectors have been installed, apply power to the control unit.
4. Test the detector using the magnet as described under **TESTING**.
5. Reset the detector at the system control panel.
6. Notify the proper authorities that the system is back on line.

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### **CAUTION**

Dust covers can be used to help limit dust entry into the smoke detector, but they are not a substitute for removing the detector during building construction. Remove any dust covers before placing the system in service.

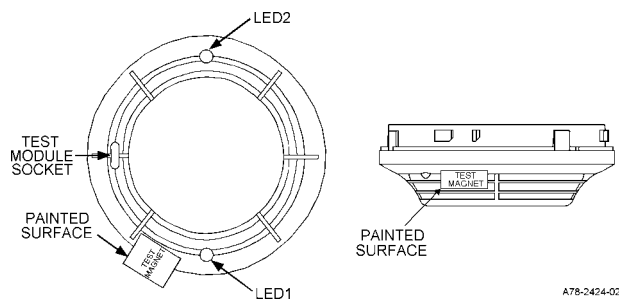


Figure 1. Bottom and side views showing position of test magnet

## TESTING

Before testing notify the proper authorities that the smoke detector system is undergoing maintenance and will temporarily be out of service. Disable the zone or system undergoing maintenance to prevent unwanted alarms. Detectors must be tested after installation and as part of periodic maintenance. Test the SD651 or SD-651A as follows:

**NOTE:** Before testing the detector, check to ensure the LEDs blink. If they do not, the detector has lost power (check the wiring) or it is defective (return it for repair).

### A. Test Magnet (Model no. M02-04-01)

1. Place the magnet against the cover in the location designated by the raised mark to activate the test feature (see Figure 1).
2. The LEDs should latch ON within 5 seconds indicating alarm and annunciating the panel.

### B. Test Module (MOD400R).

Use the MOD400R with a DMM or voltmeter to check the detector sensitivity as described in the MOD400R manual.

### C. Aerosol Generator (Gemini 501).

Set the generator to represent 4% to 5%/Ft. obscuration as described in the Gemini 501 Manual. Using the bowl shaped applicator, apply aerosol until unit alarms.

Notify the proper authorities that the system is back on line.

Detectors that fail these tests should be cleaned as described under **MAINTENANCE** and retested. If the detectors still fail these tests they should be returned for repair.

## MAINTENANCE

It is recommended that the detector be removed from its mounting base to facilitate cleaning. The detector is cleaned as follows:

**NOTE:** Before removing the detector, notify the proper authorities that the smoke detector system is undergoing maintenance and will be temporarily out of service. Disable the zone or system undergoing maintenance to prevent unwanted alarms.

1. Remove the detector cover by prying away the four side tabs with a small-bladed screwdriver, and then pulling the cover from the base.
2. Vacuum the screen carefully without removing it. If further cleaning is required continue with Step 3, otherwise skip to Step 6.
3. Remove the screen assembly by pulling it straight out (see Figure 2). Vacuum the inside.
4. Clean the vaned chamber piece by vacuuming or blowing out dust and particles.
5. To replace the screen, orient it so that the arrow on top aligns with the arrow on the printed circuit board. Carefully push the screen assembly onto the vaned chamber making sure it fits tightly.
6. Replace the cover by gently pushing it until it locks in place.
7. Reinstall the detector.
8. Notify the proper authorities that the system is back on line.

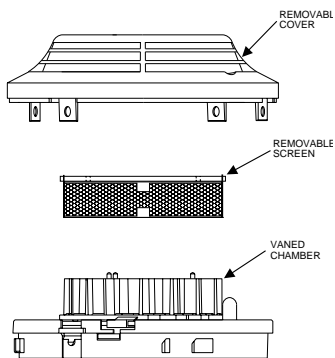


Figure 2. A78-2456-01

## WARNING

### Limitations of Smoke Detectors:

This smoke detector 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.

**Smoke detectors cannot last forever.** Smoke detectors contain electronic parts. Even though smoke detectors are made to last over 10 years, any part can fail at any time. Therefore, smoke detectors shall be replaced after being in service for 10 years. The smoke detector system that this detector is used in must be tested regularly per NFPA 72. This smoke detector should be cleaned regularly per NFPA 72 or at least once a year.