

## SD-651

### SD-651 Low-Profile Plug-In Smoke Detectors



#### Conventional Initiating Devices

#### General

The Notifier SD-651 Plug-in Smoke Detectors offer superb performance and reliability in a profile which is just 2" (5.1 cm) deep. Model SD-651 (photoelectric sensor) can be used with a variety of different adapter bases in several wiring configurations and voltages. Other features include: low current draw, stable performance in high air velocities, built-in tamper resistant base design, remote LED option, removable cover, and built-in test switch.

The SD-651 is designed to meet the performance criteria designated by UL. Its sensing chambers are sealed against back pressure air flow, dirt, and insects. This chamber is protected by a fine mesh screen which can be cleaned or replaced. Additional key features include a variety of mounting bases and a full line of accessories.

SD-651 photoelectric smoke detectors contain a unique optical sensing chamber designed to sense smoke particles produced by a wide range of combustion sources. A custom integrated circuit incorporates signal processing to reduce false alarms.

**Model SD-651** photoelectric detector's unique optical sensing chamber is engineered to sense smoke by a wide range of combustion sources.

#### Specifications

**Operating Voltage/Alarm Current:** See Adapter Base Selection Guide following

**Standby Current:** 85µA Standby

**Sensitivity:** 1 - 3.18%/ft.

**Height:** 2.0" in B401

**Diameter:** 4.1" installed in B401; 6.1" installed in B110LP

**Shipping Weight:** 5.2 oz

**Construction:** Flame retardant thermoplastic

**Temperature:** Photo: 32°F to 120°F (0°C to 49°C)

**UL Listed Velocity Range:** Photo: 0–3000 fpm (0–15.2 m/s)

**Humidity Range:** 10%–93% RH non-condensing

**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.



#### Agency Listing and Approval

One listing and approval apply to the module specified in this document. In some cases, certain modules or applications may not be listed by certain approval agencies, or listing may be in process. Consult factory for latest listing status.

- **UL Listed:** S911

#### Product Line Information

**SD-651:** Low-profile photoelectric detector. Must be mounted to one of the B100 Series or B400 Series bases listed in the Adapter Base Selection Guide.

**F110:** Retrofit replacement flange for B400 Series flanged bases.

**RA400Z:** Remote annunciator for 2 or 4 wire systems, 3-32V. Fits standard single gang electrical box.

**B401BH-2:** Sounder base. Requires an external 24 VDC power supply. Mounts to 4" square electrical box (112" minimum depth, 218" recommended).

**SMK400:** Surface mounting kit provides for entry of surface wiring conduit. For use with B401 or B401R mounting bases only.

**EOLR-1:** End of line relay for power supervision, 12/24 VDC systems.

**M02-04-01:** Test magnet.

**M02-09-00:** Test magnet with 32" telescoping handle.

**XR-2B:** Detector removal tool. Allows installation and/or removal of SD-651 detector heads from base in high ceiling installations when used with XP-4.

**XP-4:** Extension pole for XR-2B. Comes in three 5 ft. sections.

**C58-227-01:** Replacement dust cover for SD-651 smoke detectors.

**RMK400:** Recessed mounting kit (B401 sold separately).

## Adapter Base Selection Guide

Base Model Number	Loop Type	Current Limit Resistor	Contact Type	Nominal Voltage	Current Draw on Alarm (mA)
<i>B110LP/B401†</i>	2-wire*	No	—	12/24 VDC	10-130**
<i>B110RLP/B401R†/B401BR†</i>	2-wire*	Yes	—	24 VDC	10-62
<i>B401†</i>	2-wire*	No	—	12/24 VDC	10-100**

\* Functionality contingent on panel compatibility.

\*\* Must be limited by control panel.

† Flangeless base.

## Junction Box Selection Guide\*

Base Model Number	Single Gang	3-1/2" Octagon	4" Octagon	4" Square	50 mm	60 mm	75 mm
<i>B401</i>	No	No	No	No	Yes	Yes	No
<i>B110LP/RLP</i>	Yes	Yes	Yes	Yes	No	No	No

\* Box depth contingent on base and wire size. Refer to National Electrical Code or local applicable codes for appropriate recommendations.

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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.

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## B401 Plug-In Detector Base

For use with the following detectors:

**US Models:** 1151, 1451, 2151, 2451, 2451TH, 5451  
**European Models:** 1151E, 1451E, 2151E, 2451E, 5451E  
**Australian Models:** 1151AUS, 1451AUS, 2151AUS, 2451AUS, 4451AUS  
5451AUS, 51A51, 51B51, 51C51, 51D51

### Specifications

Base Diameter: 10.2 cm (4.0 inches)  
Base Height: 2.0 cm (0.8 inches)  
Weight: 152 g (0.34 lb.)  
Mounting: 50 mm box  
60 mm box  
Operating Temperature Range: -10° to +60°C (14° to 140°F) — European Installation  
0° to 49°C (32° to 120°F) — US/Australian Installation  
Operating Humidity Range: 10% to 93% Relative Humidity

### Electrical Ratings — includes base and detector

	Base And Smoke Detector	Base And Heat Detector
System Voltage:	12/24 VDC	24 VDC
Maximum Ripple Voltage:	4 Volts peak to peak	4 Volts peak to peak
Start-up Capacitance:	0.02 $\mu$ F Maximum	0.02 $\mu$ F Maximum
Standby Ratings:*	8.5 VDC Minimum 35 VDC Maximum 120 $\mu$ A Maximum	15 VDC Minimum 35 VDC Maximum 100 $\mu$ A Maximum
Alarm Ratings:	4.2 VDC Minimum at 10 mA** 6.6 VDC Maximum at 100 mA**	4.2 VDC Minimum at 10 mA** 6.6 VDC Maximum at 100 mA**
Reset Voltage:	2.5 VDC Minimum	2.5 VDC Minimum
Reset Time:	0.3 Seconds Maximum	0.3 Seconds Maximum
Start-up Time:	34 Seconds Maximum	34 Seconds Maximum

\* 1151E: 30  $\mu$ A Maximum.

\*\* Alarm current MUST be limited to 100 mA maximum (130 mA for models 1151 and 2151) by the control panel.

If used, the RA400Z Remote Annunciator operates within the specified detector alarm currents.

### Before Installing

Please thoroughly read System Sensor manual I56-407, *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 System Sensor.

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

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

### General Description

This B401 plug-in detector base is used with System Sensor smoke and heat detector heads. The capability of plugging these detectors into a variety of special bases makes them more versatile than equivalent direct-wired models. Refer to the System Sensor catalog for other available plug-in detector bases.

The B401 base is intended for use in 2-wire systems, with screw terminals provided for power and remote annunciator connections.

## Mounting

Figure 1 shows mechanical mounting details. These detector bases mount to typical junction boxes. Attach the base to the box using the screws supplied with the junction box.

## Installation Guidelines

All wiring must be installed in compliance with applicable codes and the authority having jurisdiction. Proper wire gauges should be used. The conductors used to connect smoke detectors to control panels and accessory devices should be color-coded to reduce the likelihood of wiring errors. Improper connections can prevent a system from responding properly in the event of a fire.

For signal wiring (the wiring between interconnected detectors), it is recommended that the wire be no smaller than 18 gauge. Wire sizes up to 12 gauge may be used with the base. For best system performance, the power (+) and (-) loop wires should be twisted pair and installed in separate grounded conduit to protect the loop from extraneous electrical interference.

Smoke detectors and alarm system control panels have specifications for allowable loop resistance. Consult the control panel manufacturer's specifications for the total loop resistance allowed for the control panel being used before wiring the detector loops.

## Wiring Instructions



Do not loop wire under terminals. Break wire run to ensure supervision of connections.

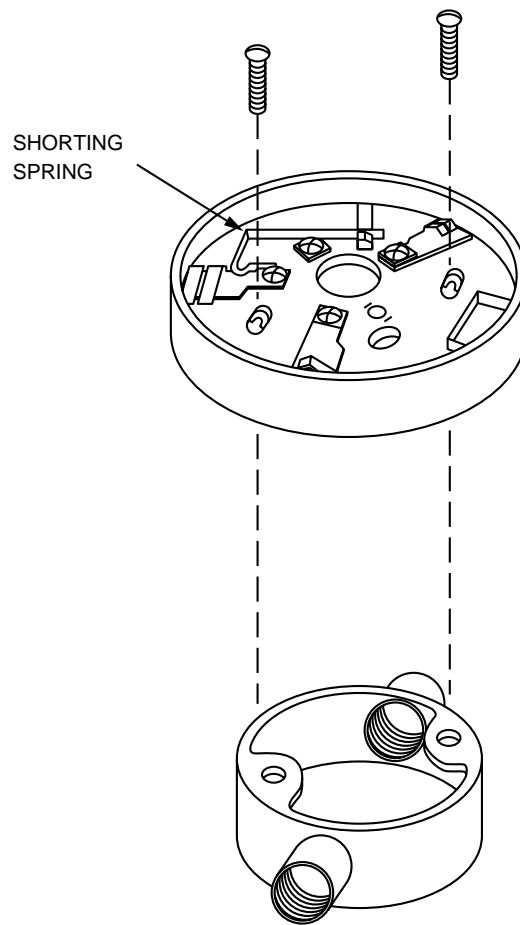
Wire connections are made by stripping about  $\frac{3}{8}$ " of insulation from the end of the wire (use strip gauge molded in base), sliding the bare end of the wire under the clamping plate, and tightening the clamping plate screw.

Two-wire initiating devices receive their power from the initiating circuit of a control panel. Electrical specifications of the control panel and the detector-base combination must be compatible for the system to function properly.

System Sensor maintains a list of two-wire detectors and control panels that are listed as compatible. The *2-Wire Compatibility Chart* is available from System Sensor at no charge.

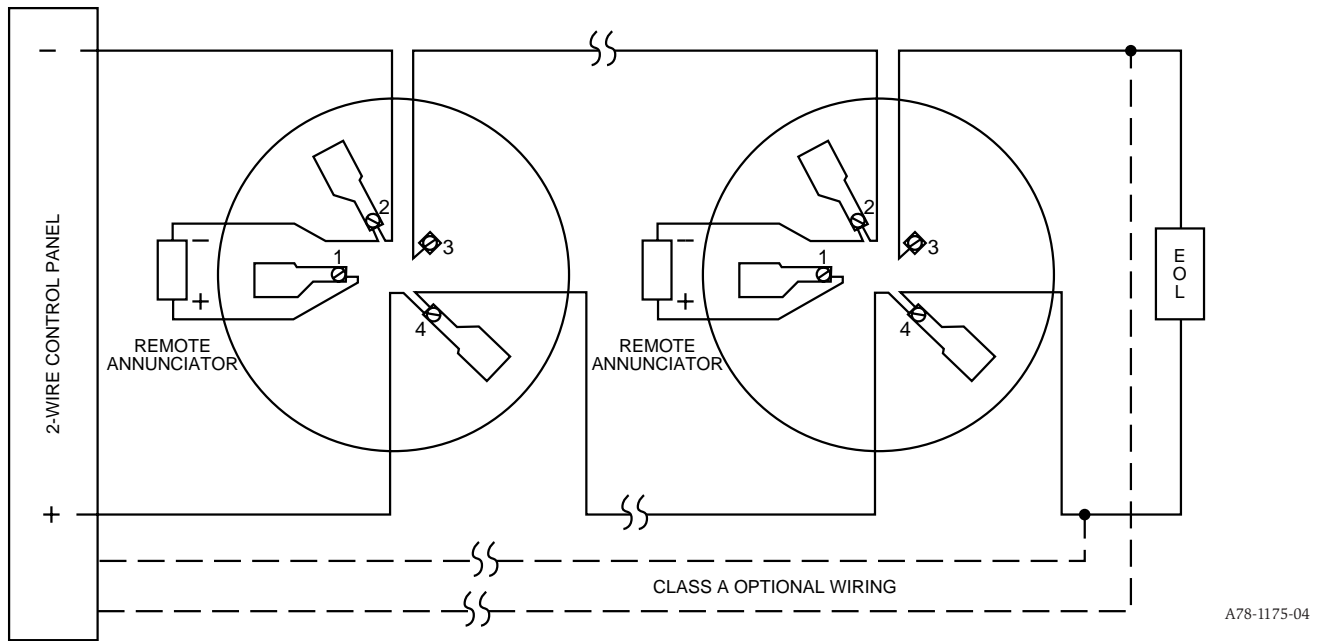
The zone wiring of the detector bases should be checked before the detector heads are installed. To make this possible, this base contains a special spring-type shorting jumper (shown in Figure 1). After a detector base is prop-

**Figure 1. Mounting base to box:**



A78-1468-01

**Figure 2. Typical 2-wire detector wiring configuration:**



erly wired and mounted to an electrical box, make sure that the shorting spring is in contact with terminal 3. This temporary connection permits the wiring of the loop to be checked for continuity before installation of the detector heads. The shorting spring in the base automatically disengages when the detector head is removed from the base. **DO NOT** remove the shorting spring since it reengages as the detector head is turned in the base, completing the circuit.

### **Tamper-resistance Feature**

This detector includes an optional tamper-resistance feature that prevents its removal from the base without the use of a tool.

**NOTE:** **DO NOT** use the tamper-resistant feature if the XR-5 or XR-2 removal tool is to be used.

To make the detector tamper-resistant, remove the smaller tab by breaking it at the scribed line on the tamper-resist-

ant tab before installing the detector (see Figure 3A). The tamper-resistant tab is on the detector mounting base.

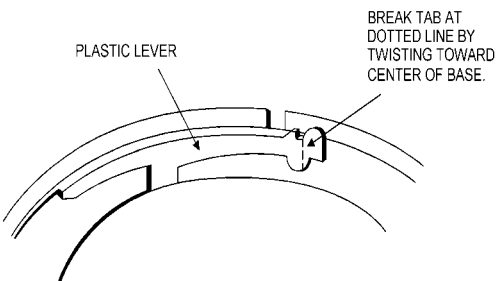
To remove a tamper-resistant detector from the base, use a pocket screwdriver, or similar tool, to depress the tamper-resistant tab and turn the detector counterclockwise. The tab is accessible through the slot on the mounting base (see Figure 3B).

The tamper-resistance feature can be defeated by breaking and removing the plastic lever from the base. However, this permanently disables the tamper-resistance feature.

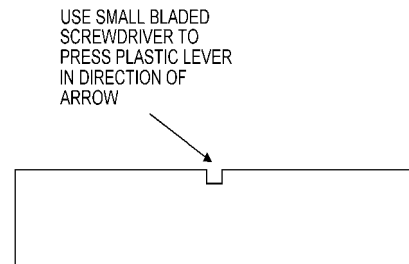
### **Optional Remote Annunciator Units**

The model RA400Z remote LED annunciator is available as an optional accessory. This unit has a rectangular plate that fits U.S. single-gang light switch boxes. If a different type of remote annunciator is used, it must be rated for the appropriate voltage, which is 2.75 to 3.0V.

**Figure 3A. Activating tamper-resistance feature:**



**Figure 3B. Removing detector head from base:**



## Please refer to insert for the Limitations of Fire Alarm Systems

### Three-Year Limited Warranty

System Sensor warrants its enclosed smoke detector base 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 base. 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 base 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.