SYSTEM SENSOR®

B524RB(A) and B224RB(A) Plug-in Relay Detector Bases

For use with the following models:
B524RB: For use with any 500 Series detector
B224RB: For use with any 200 Series detector

Specifications

Base Diameter:	6.2 inches (157 mm)
Base Height	
B224RB:	1.2 inches (31 mm)
B524RB:	1.4 inches (36 mm)
Mounting:	4-inch square box with or without plaster ring, Min Depth - 1.5 inches (13 mm)
	4-inch octagon box, Min. depth - 1.5 inches (13 mm)
	$3^1/_2$-inch octagon box, Min. depth - 1.5 inches (13 mm)
Operating Temperature Range:	0° to 49°C (32° to 120°F)
Operating Humidity Range:	10% to 93% Relative Humidity (Non-condensing)

Electrical Ratings

Operating Voltage:	15 to 28 VDC
Time Averaged Standby Ratings:	< 500 μA @ 24 VDC
Relay Characteristics	
Coil:	2 coil latching
Contact Type:	1 Form C
Contact Relay	
Resistive:	2 A @ 30 VDC
Inductive:	0.3 A @ 110 VDC (with .35 PF or greater)
	0.3 A @ 120 VAC (with .35 PF or greater)
	1.0 A @ 30 VDC (with .6 PF or greater)
Set Time:	4 seconds minimum, 20 seconds maximum
Reset Time:	1 second minimum, 8 seconds maximum

Before Installing

Please thoroughly read the system wiring and installation manuals, and manual I56-407, *Guide for Proper Use of System Smoke Detectors,* which provides detailed information on detector spacing, placement, zoning, and special applications. Copies of these manuals are available at no charge from System Sensor. (For installation in Canada, refer to CAN/ULC-S524, Standard for the Installation for Fire Alarm Systems and CEC Part 1, Sec. 32.)

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

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

General Information

Form C latching relay contacts are included for the control of an auxiliary function. The relay operates 12 seconds (nominally) after activation of the sensor head remote annunciator output.

Mounting

The detector base mounts directly to $3^1/_2$- and 4-inch octagon and 4-inch square boxes, with or without a plaster ring.

To mount, remove the decorative ring by rotating it in either direction to unhook the snaps. Then, separate the ring from the base. Install the base on the box, using the screws supplied with the junction box and the appropriate slots in the base. Replace the decorative ring on the base and rotate it in either direction until the ring snaps in place (see Figure 1).

Installation Guidelines

All wiring must be installed in compliance with all applicable local codes and any special requirements of the local authority having jurisdiction, using the proper wire sizes. 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 (1.0 square mm). However, wire sizes up to 12 gauge (3.3 square mm) can be used with the base. The use of twisted pair wiring or shielded cable for the power (+ and -) loop is recommended to minimize the effects of electrical interference.

If shielded cable is used, the shield connection to and from the detector must be continuous by using wire nuts, crimping, or soldering, as appropriate, for a reliable connection.

Alarm system control panels have specifications for allowable loop resistance. Consult the control panel specifications for the total loop resistance allowed before wiring the detector loops.

Wiring Instructions

⚠WARNING

The base uses a latching relay that can change states if it is subjected to mechanical shocks or jarring. As a result, even though relay contacts are in the open state when the base is shipped from the factory, the contacts may have closed during shipment.

Connecting an auxiliary control circuit to closed relay contacts can cause an unexpected, and possibly dangerous, activation of that circuit. Therefore, do NOT connect an auxiliary control circuit to the relay contacts (terminals 1, 2, and 3) before ensuring that the relay contacts are in their open state. Ensure that the contacts are open by applying power to the bases WITHOUT the sensor heads installed.

Make wiring connections by stripping about $^3/_8$" (10 mm) of insulation from the end of the wire. Then, slide the wire under the clamping plate and tighten the clamping plate screw.

Figure 1. Mounting the base to an electrical box:

SNAP ON DECORATIVE RING

SCREWS (NOT SUPPLIED)
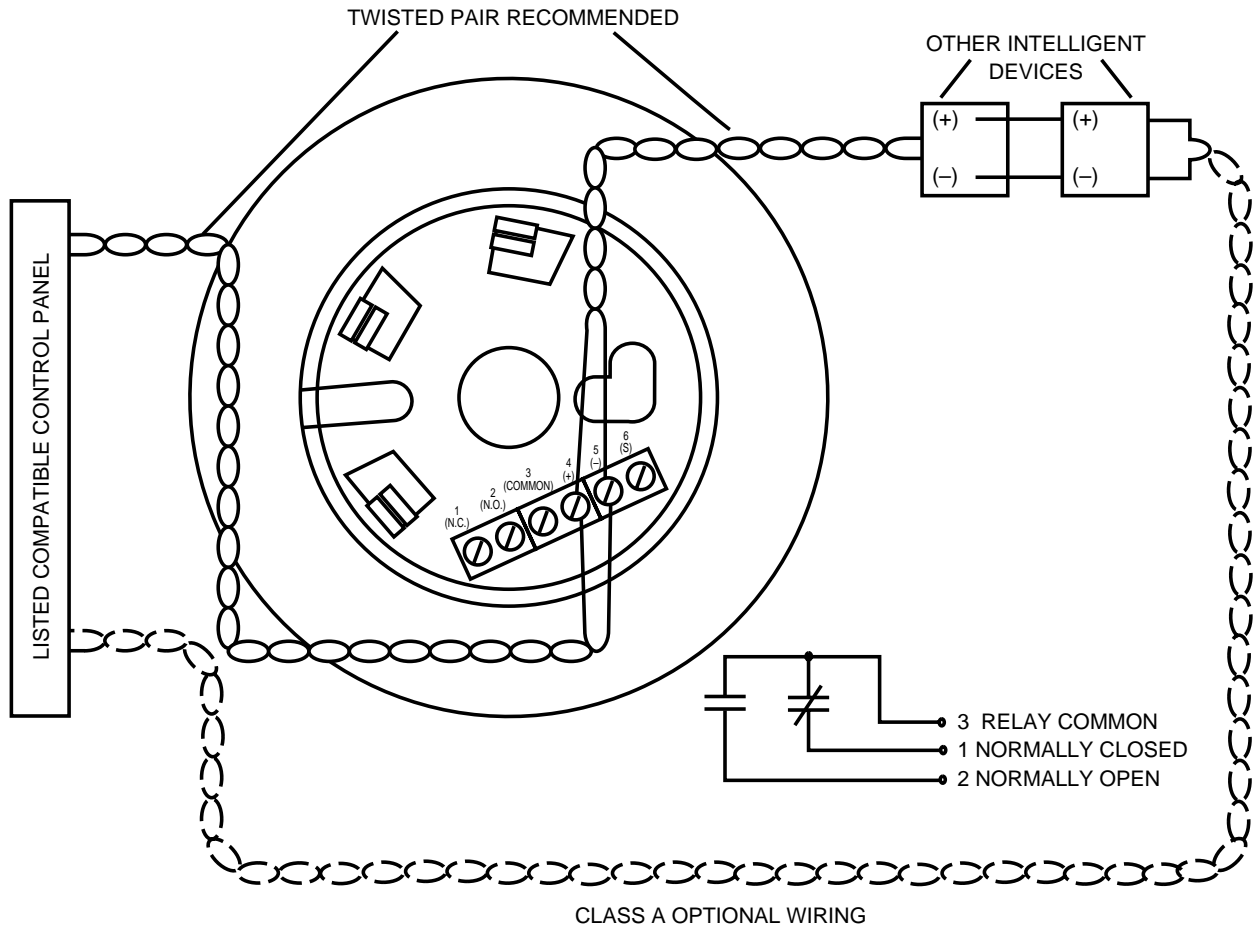
DETECTOR BASE

BOX (NOT SUPPLIED)
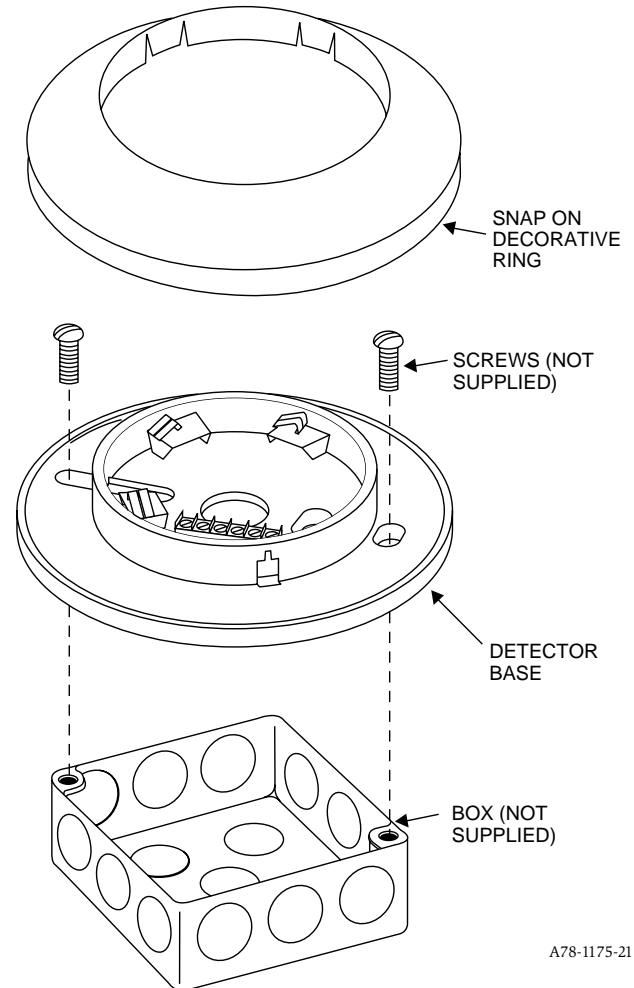
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Wire the normally open (NO) line to terminal 2 (see Figure 2). Insert the normally closed (NC) line of the relay to terminal 1 and the relay common line to terminal 3. Wire the communication lines in (+) and out (+)to terminal 4. Insert the communication line in (–) and out (–) to terminal 5. Terminal 6 is for shielded cable only (see Figure 2). If shielded cable is used, the shield connection to and from the detector must be continuous by using wire nuts, crimping, or soldering to ensure a reliable connection. If shielded cable is not used, leave terminal 6 in the screwed-down position.

Check the zone wiring of all bases in the system before installing detector heads. This includes checking the wiring for continuity, correct polarity, ground fault testing, and performing a dielectric test.

Figure 2. Wiring diagram:

TWISTED PAIR RECOMMENDED

OTHER INTELLIGENT DEVICES

LISTED COMPATIBLE CONTROL PANEL

1 (N.C.)
2 (N.O.)
3 (COMMON)
4 (+)
5 (−)
6 (S)

(+) (−)
(+) (−)

3 RELAY COMMON
1 NORMALLY CLOSED
2 NORMALLY OPEN

CLASS A OPTIONAL WIRING

A78-1577-15

A label is affixed to the base for recording the zone, address, and type of detector being installed at the base location. This information is useful for setting the detector head address and for verification of the sensor type required for that location.

Once all detector bases have been wired and mounted, and the loop wiring has been checked, the detector heads may be installed in the bases.

Tamper-resist Feature

NOTE: Do not use the tamper-resist feature if the removal tool is to be used.

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

To activate this feature, break the tab from the detector base as shown in Figure 3A (see page 4). Then, install the detector.

To remove the detector from the base once the tamper-resist feature has been activated, insert a small-bladed screwdriver into the slot in the side of the base and push the plastic lever away from the detector head (see Figure 3B, page 4). This allows the detector to be rotated counterclockwise for removal.

NOTE: Head removal after the tamper-resist feature has been activated first requires removal of the decorative ring.

The tamper-resist feature can be defeated by breaking and removing the plastic lever from the base. However, this prevents the feature from being used again.
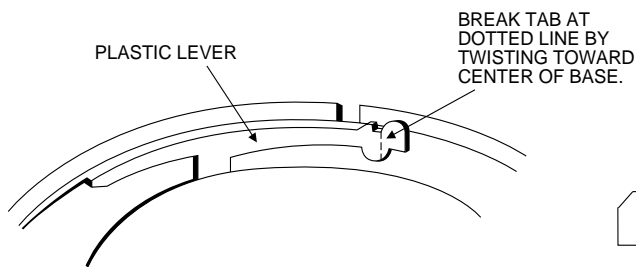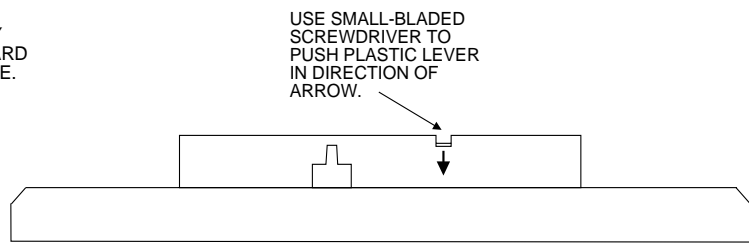
Figure 3A. Activating the tamper-resist feature:

PLASTIC LEVER

BREAK TAB AT DOTTED LINE BY TWISTING TOWARD CENTER OF BASE.

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

USE SMALL-BLADED SCREWDRIVER TO PUSH PLASTIC LEVER IN DIRECTION OF ARROW.

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⚠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.

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.

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.

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