



A Division of Pittway
System Sensor Europe
Via Caboto 19, 34143, Trieste, Italy

B401R Plug-in Detector Base

For use with the following smoke detectors: 1451E and 2451E

Specifications

Diameter:	10.2 cm (4.0 inches)
Height:	2.0 cm (0.8 inches)
Weight:	152 g (0.34 lb.)
Operating Temperature:	-10° to +60° C (14° to 140° F)
Operating Humidity:	10% to 93% Relative Humidity

Electrical Ratings — includes base and detector

Voltage:	24 VDC
Maximum Ripple Voltage:	4 Volts peak to peak
Start-up Capacitance:	0.02 μ F Maximum
Standby Ratings:	15 VDC Minimum 32 VDC Maximum 120 μ A Maximum
Alarm Ratings:	10 mA Minimum at 10.5 VDC 62mA Maximum at 32 VDC (If used, the RA400Z Remote Annunciator operates within the specified detector alarm currents.)
Reset Voltage:	2.5 VDC Minimum

Before Installing

Please thoroughly read the 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 at no charge 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

The B401R plug-in detector base is used with System Sensor model 2451E photoelectronic detector head and model 1451E ionization detector head. 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 plug-in detector bases.

The B401R base is intended for use in 2-wire systems, with screw terminals provided for power, ground, and remote annunciator connections. The B401R base also contains a resistor to provide current limiting in the alarm state.

Base Terminals

NO.	FUNCTION
1	REMOTE ANNUNCIATOR (+)
2	NEGATIVE (-) V IN, REMOTE ANNUNCIATOR (-)
3	NEGATIVE (-) V OUT
4	NOT USED
5	POSITIVE (+) V IN AND V OUT

NOTE: If remote annunciator is not used, polarity to these terminals may be reversed.

Mounting

These detector bases mount to typical junction boxes. Install the base to the box using the screws supplied with the junction box. Figure 2 shows mechanical mounting details.

Wiring Installation Guidelines

All wiring must be installed in compliance with the National Electrical Code and the local codes 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 prevent wiring mistakes. Improper connections can prevent a system from responding properly in the event of a fire.

For signal wiring, (the wiring between interconnected detectors or from detectors to auxiliary devices), it is recommended that single-conductor wire be no smaller than 1.5mm², and that two- or three-conductor wire be no smaller than 1.0mm². For best system performance, alarm loop conductors should be installed in separate grounded conduit or shielded cable to protect the alarm loop from extraneous electrical interference.

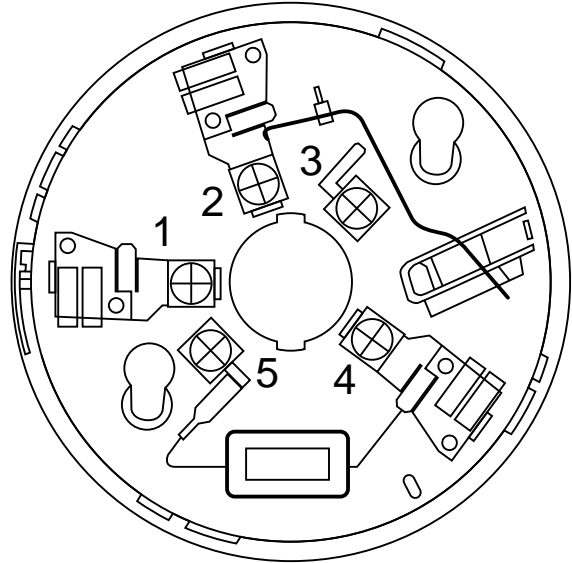
Smoke detectors and alarm system control panels have specifications for allowable loop resistance. Consult the control panel manufacturer's specifications for the total loop resistance allowed for the particular model control panel being used before wiring the detector loops.

Wiring Instructions

Wire connections are made by stripping about 1 cm (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.

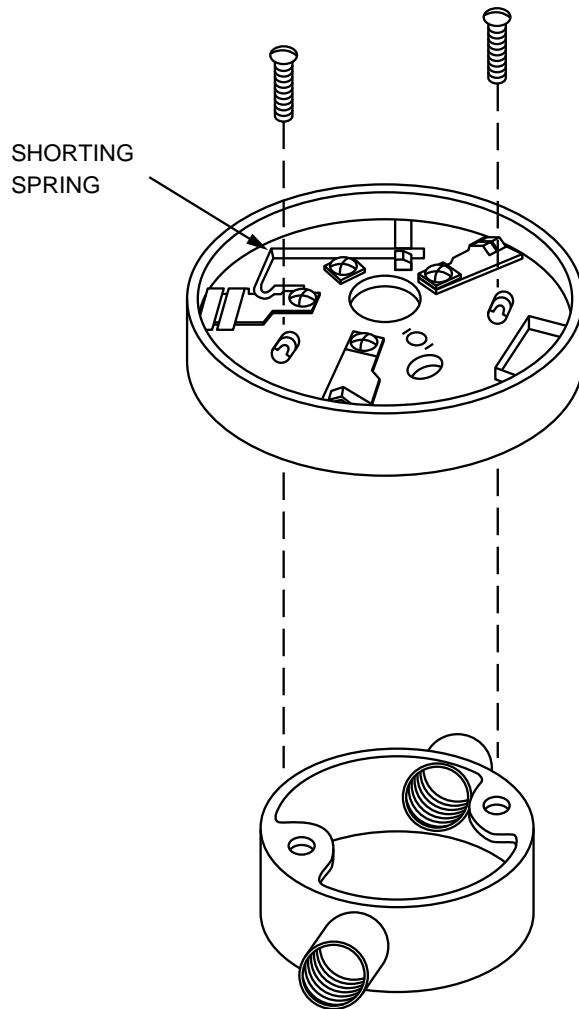
The zone wiring of the detector bases should be checked before the detector heads are installed. To make this possible, this base contains a special spring-type shorting jumper (shown in Figure 2). After a detector base is properly wired and mounted to an electrical box, make sure that the shorting spring is in contact with terminal 3.

Figure 1. Terminal layout:



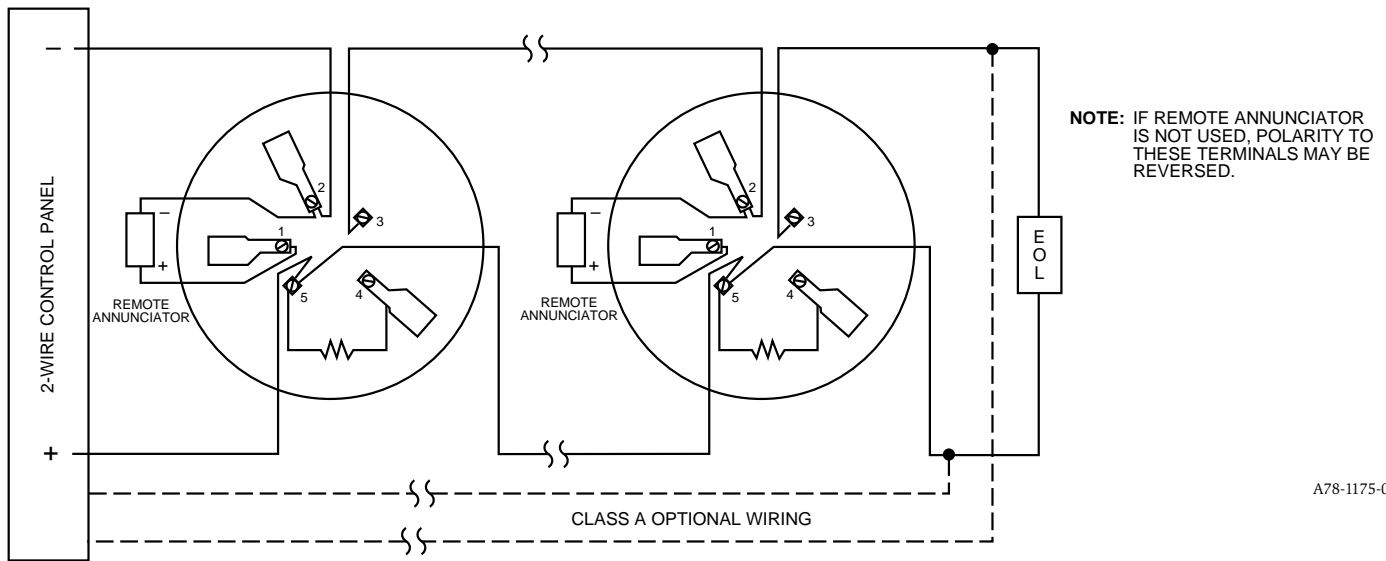
A78-1468-03

Figure 2. Mounting base to box:



A78-1468-01

Figure 3. Typical wiring diagram for 2-wire detector system:



CAUTION

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

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 will automatically disengage when the detector head is removed from the base. DO NOT remove the shorting spring, since it reengages as the detector head is turned into the base, completing the circuit.

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

Tamper-resistance Feature

This detector base also includes an optional tamper-resistance feature that, when activated, prevents removal of the detector without the use of a tool.

To activate this feature, break off the tab on the detector base (see Figure 4), then install the detector. To remove the detector from the base after the tamper-resistance feature has been activated, place a small standard screwdriver into the small hole on the side of the base, and push the plastic lever away from the detector head (see Figure 5). This will allow the detector to be rotated counterclockwise for removal.

The tamper-resistance feature may be defeated by breaking and removing the plastic lever from the base, however this prevents ever using the feature again.

Optional Remote Annunciator Units

The model RA400Z Remote Annunciator LED 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 use less than 5ma at 3.0 V.

Figure 4. Activating tamper-resistance feature:

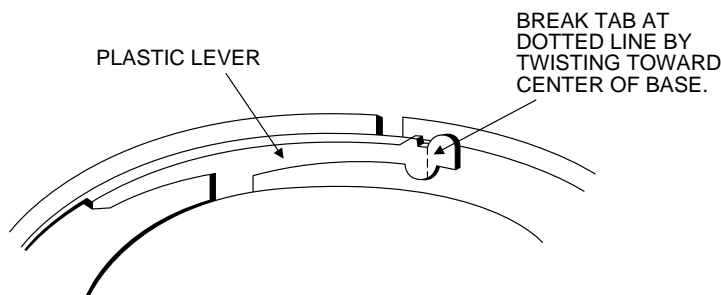
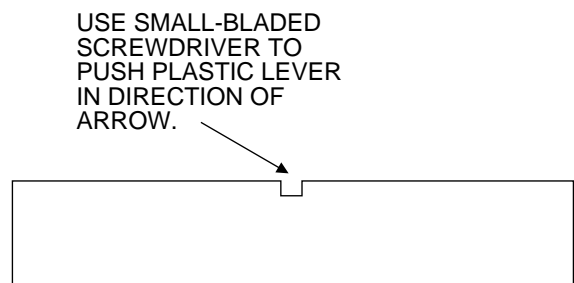


Figure 5. Removing detector head from base:





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.