1551B Plug-in Intelligent Ionization Sensors with Communications

SYSTEM SENSOR®

A Division of Pittway
3825 Ohio Avenue, St. Charles, Illinois 60174
1-800-SENSOR2, FAX: 630-377-6495

Specifications

Diameter:	6.1 inches	(155 mm) installed in B501B
	4.1 inches	(104 mm) installed in B501
Height:	2.3 inches	(58 mm)
Weight:	5 ounces	(150 gm)
Operating Temperature Range:	-10° to 60°C	(14° to 140°F)
	Note: Do not install where normal ambient temperatures extend beyond 0° to 49°C (32° to 120°F)	
Operating Humidity Range:	10% to 93% Relative Humidity	
Mounting:	B501B flanged base	
	B501 flangeless base	
	B501 with RMK400 recessed mounting kit	
	B501BH Base with horn	
Maximum Air Velocity:	1500 Ft./Min. (7.6 m/S)	
Voltage Range:	15 to 32 VDC	
Standby Current:	200 µA maximum @ 24 VDC (with no communication)	
	300 µA average maximum @ 24 VDC (with one communication every five seconds and LED blink enabled)	
LED Current:	6.5 mA @ 24 VDC	

Before Installing

Please thoroughly read *Guide for Proper Use of System Smoke Detectors* (I56-407-XX), which provides detailed information on sensor spacing, placement, zoning, and special applications. Copies of this manual are available from System Sensor.

General Description

Models 1551B dual-chamber ionization intelligent sensors utilize a state-of-the-art, unipolar sensing chamber. These sensors are designed for use with duct housings DH500 and DH500AC/DC only, and to be used with compatible control panels only. Connect sensors only to compatible control units. (For installation in Canada, refer to CAN/ULC-S524-M86, Standard for the Installation of Fire Alarm Systems and CEC Part 1, Sec. 32.)

Two LED's on each sensor light to provide a local 360° visibility of the sensor indication. The LED's can be latched on by code command from the panel for an alarm indication. The LED's can also be unlatched to the normal condition by code command. Remote LED annunciator capability is available as an optional accessory (Part No. RA400).

Wiring Guide

Model 1551B can be used with any one of a variety of plug-in bases. Therefore, connect all wiring following the installation instructions provided with the base that was selected for use with the 1551B. As Figure 1 indicates, bases are equipped with screw terminals for all appropriate connections.

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

NOTE: Verify that all sensor bases are installed and that the wiring polarity is correct at each base.
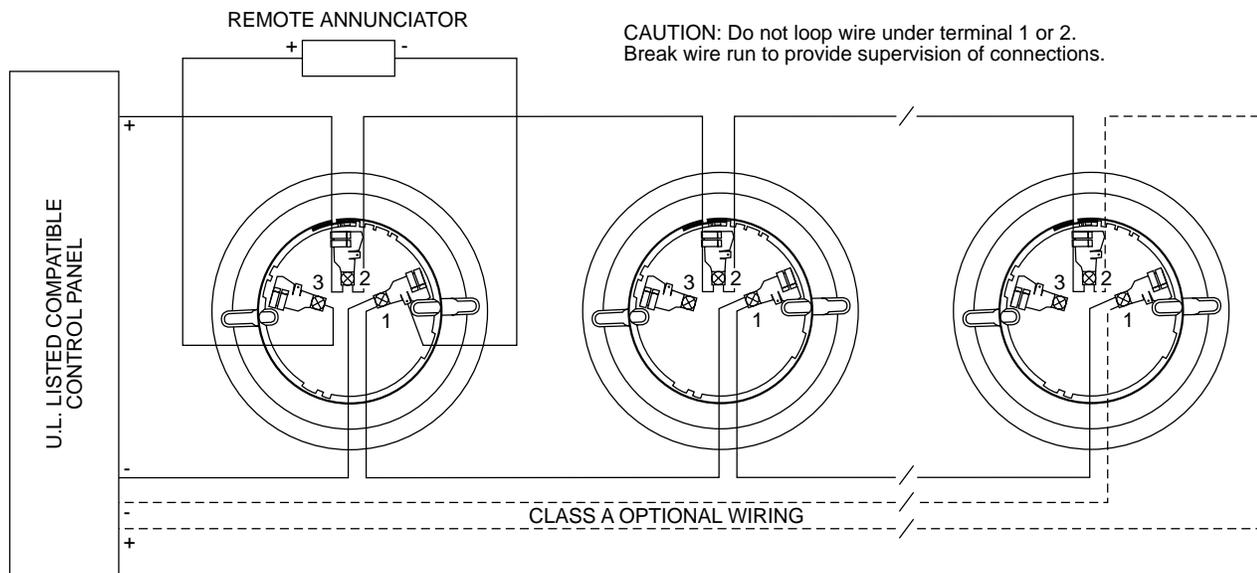

⚠ WARNING

Remove power from the loop before installing sensors.

---

1. Install sensors:
   a. Verify that the sensor type matches the type written on the label on the base.
   b. Set the sensor to the desired address and record it on the label on the base.
   c. Place the sensor into the sensor base.
   d. Rotate the sensor clockwise until it drops into place.
   e. Continue rotating the sensor clockwise until it locks in place.

Figure 1. Wiring diagram:

REMOTE ANNUNCIATOR

CAUTION: Do not loop wire under terminal 1 or 2.
Break wire run to provide supervision of connections.

U.L. LISTED COMPATIBLE CONTROL PANEL

CLASS A OPTIONAL WIRING

A78-1253-01

⚠ WARNING

The sensor cannot detect smoke if the dust cover is installed.

2. Tamper-Resist Feature

The sensor bases include a tamper-resist feature that, when it is enabled, prevents removal of the sensor without the use of a tool. See the sensor base installation instruction manual for details on the use of this feature.

3. After all sensors have been installed, apply power to the control unit.

4. Test the sensor by positioning a test magnet against the sensor plastic directly opposite the test meter socket (Figure 2). The alarm level should be recognized by the panel and the LED controlled by communication command from the panel.

5. The reset of the sensor LED is controlled by communication command from the panel.

Testing

Before testing, notify the proper authorities that the smoke sensor system is undergoing maintenance, and therefore the system will be temporarily out of service. Disable the zone or system undergoing maintenance to prevent unwanted alarms.

Sensors must be tested after installation and periodic maintenance. Test the sensor as follows:

A. Test Magnet (Model No. M02-04-00)
1. Place the magnet against the cover opposite the test module socket to activate the test feature (see Figure 2).
2. The LED's should latch on within 10 seconds, indicating alarm and annunciating the panel.

B. Test Tool (Model No. MOD400R)
Use the MOD400R with a DMM or Voltmeter to check the sensor sensitivity as described in the MOD400R manual.

NOTE: The MOD400R can be used to test the sensitivity of only those sensors connected to control panels that do NOT use drift compensation.

C. Aerosol Generator (Gemini 501) per NFPA 72
The field test tool is the GEMINI Model 501 aerosol generator. 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 unit alarms.

NOTE: This test only verifies smoke's ability to enter the sensing chamber and initiate an alarm. It does NOT test sensitivity.

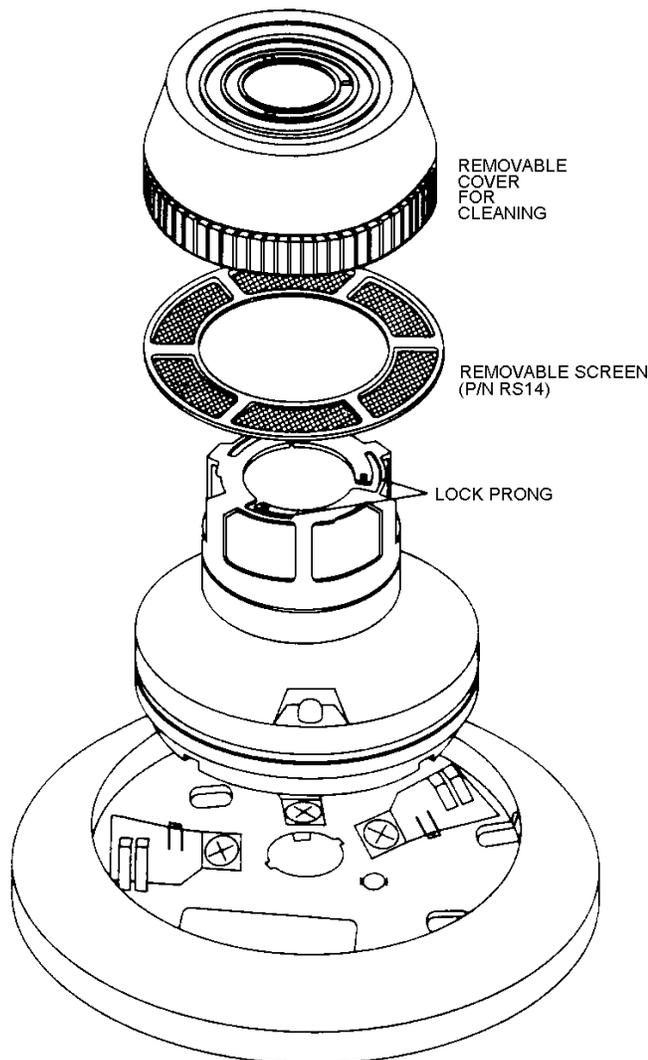Notify the proper authorities that the system is back on line.

Figure 2. Views showing position of test magnet:
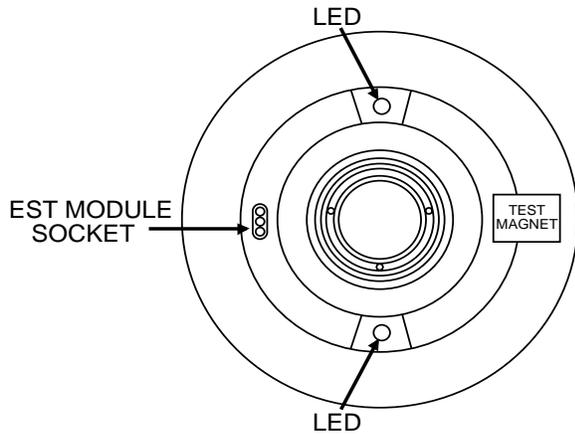
A78-1978-00

Sensors that fail these tests should be cleaned as described under **CLEANING** and retested. If the sensors still fail these tests they should be returned for repair.

⚠CAUTION

Dust covers are an effective way to limit the entry of dust into smoke detector sensing chambers. However, they may not completely prevent airborne dust particles from entering the detector. Therefore, System Sensor recommends the removal of detectors before beginning construction or other dust producing activity.

Be sure to remove the dust covers from any sensors that were left in place during construction as part of returning the system to service.

Figure 3:

A78-1938-00

Cleaning the Sensor

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

It is recommended that the sensor be removed from its mounting base for easier cleaning and that sensors be cleaned at least once a year.

To remove the cover, depress the three lock prongs on the top of the cover and rotate it counterclockwise to remove the cover and screen assembly. Remove the screen and clean the cover and screen assembly. Remove the screen and clean it (Figure 3). Use a vacuum cleaner to remove dust from the sensing chamber. Cover removal tools (CRT400) and replacement screens (RS14) are available upon request.

After cleaning, snap the screen into the cover. Then place the cover and screen assembly on the sensor and rotate it clockwise until it is locked in place. Test the sensor.

⚠WARNING

The Limitations of Property Protection Smoke Sensors

This smoke sensor 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 sensor must be installed in accordance with NFPA standard 72.

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

Smoke sensors will not sense fires which start where smoke does not reach the sensors. Smoldering fires typically do not generate a lot of heat which is needed to drive the smoke up to the ceiling where the smoke sensor is usually located. For this reason, there may be large delays in detecting a smoldering fire with either an ionization type sensor or a photoelectric type sensor. 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 sensor and alarm it. A sensor cannot detect a fire developing on another level of a building quickly or at all. For these reasons, sensors **shall be located on every level and in every bedroom within a building.**

Smoke sensors have sensing limitations, too. Ionization sensors and photoelectric sensors 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 sensors offer a broad range of fire sensing capability but they are somewhat better at detecting fast flaming fires than slow smoldering fires. Photoelectric sensors 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 sensor is always best, and a given sensor may not always provide early warning of a specific type of fire.

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

Three-Year Limited Warranty