

MAINTENANCE OF HIGH VOLTAGE DETECTORS

1. GENERAL

- 1.01 This practice outlines the basic maintenance requirements for high voltage Pyr-A-Larm fire detectors.
- 1.02 This practice replaces BSP Section 770-330-200, Issue 2, November 1980, Appendix 1. Whenever this practice is reissued, the reason(s) for reissue will be stated in this paragraph.
- 1.03 Detailed information on Pyr-A-Larm equipment associated with these systems and specific routine maintenance work operations may be obtained from the Pyr-A-Larm Inspection Test and Maintenance Manual, which may be ordered from:

Pyrotronics, Inc.
8 Ridgedale Avenue
Cedar Knolls, New Jersey 07927

- 1.04 Although this information is related only to Pyrotronics, Inc., fire detection systems, this practice is not intended to constitute an endorsement or recommendation of these systems.

2. MAINTENANCE PROCEDURES

- 2.01 F3/5A Ionization Detectors (Cleaning): The procedure outlined below shall be followed:
 - (a) Rotate the locking shell counterclockwise and withdraw it from the base.
 - (b) Unplug the detector head from the base.
 - (c) Hold the detector so that the Pins point upward. Unscrew bayonet locking ring, remove the ring, and separate the upper and lower chambers. If an insulator disk is found when the chambers are separated, dispose of it. Do not disassemble beyond this point.
 - (d) Wipe the upper chamber portion of the detector with a lint-free cloth moistened with a solution of "Alconox" or "Radicwax." Care should be taken to assure that lint or other foreign matter does not enter or partially

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span the gap between the chamber and the other shell. When washing the chamber, do not touch the radioactive foil which is mounted on the center post.

- (e) Immerse the lower chamber in a solution of "Alconox" or "Radiacwash" and scrub it with a soft camel-hair brush.
- (f) Allow the parts to dry on a clean surface and reassemble the detector. The detector parts are not interchangeable; therefore, care should be exercised to assure that when a detector is disassembled the same parts are reassembled on that detector. Specific detectors need not be reinstalled in the same bases from which they were removed.

2.02 F5B Ionization Detectors (Cleaning): The procedure outlined below shall be followed:

- (a) Rotate the locking shell counterclockwise and withdraw it from the base.
- (b) Unplug the detector head from the base.
- (c) Hold the detector so that the pins point upward. Unscrew bayonet locking ring and remove outer housing and foil disk.
- (d) Wipe center pin with a clean lint-free cloth moistened with a solution of "Radiacwash" or "Alconox". Care should be taken to assure that no lint is brought into the air gap between the chambers.
- (e) Immerse the outer chamber in a solution of "Alconox" or "Radiacwash" and scrub it with a soft camel-hair brush. When washing the chamber, do not touch the radioactive foil which is mounted on the center post emitter disc.
- (f) Allow the parts to dry on a clean surface and reassemble the detector. Care must be exercised to assure that when a detector is disassembled the same parts are reassembled on that detector. Check to see if the center pin is tight. Insert the foil disks into the outer housing with the inscription "Radioactive" facing downward (in the direction of wire mesh). Make certain that the disk is laying flat and does not shift during assembly.

2.03 Ionization Detectors (Checking Sensitivity): Sensitivity is referred to in volts and is inversely proportional to the voltage rating. The higher the voltage rating the less sensitive a detector is; therefore, it will not react as rapidly to a fire. Sensitivity shall be verified as indicated in Table A.

TABLE A

F3/5A	F5B SENSITIVITY	F5B SENSITIVITY
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DETECTOR LOCATION	SENSITIVITY	(WITH 4mm PIN)	(WITH 6mm PIN)
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Ceilings in telephone equipment rooms and on or above ceilings in computer rooms	19 volts (17 volts minimum and 22 volts maximum permissible)	Between 20 volts minimum and 55 volts maximum (4 mm pin)	
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Beneath raised floors	23 + 2 volts	Same as above	
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All other locations	23 to 27 volts with the preference to the 23-volt setting if environmental conditions permit	Same as above	
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Air ventilator ducts	Static (no air) 35 volts minimum 65 volts maximum dynamic (air movement) 20 volts or more		
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The procedures outlined below, based on use of a Pyr-A-Larm Sensitivity Test Set, shall be followed to periodically check the sensitivity of ionization detectors. After the detector has been cleaned, sensitivity checks shall be made with detectors in their exact operating location under maximum air flow conditions.

- (a) With detector removed, insert sensitivity test set adapter into detector base.
- (b) Insert detector into adapter.
- (c) Check to assure that line voltage is between 205 and 225 volts using the high voltage scale.
- (d) Set the meter to the 50-volt scale. Starting from the extreme counterclockwise position, slowly rotate the potentiometer control knob until the detector operates.
- (e) The voltage noted at the exact moment of detector operation is its sensitivity.
- (f) Repeat step (d) above two additional times to assure that a correct reading is obtained.

2.04 Flame Detectors (Cleaning): No disassembly of flame detectors is required for cleaning. Lenses should be cleaned with a cloth and a mild detergent solution.

2.05 Flame Detectors (Electrical Test): A sensitivity test set may be used to assure that flame detectors are capable of proper electrical function. The procedures for this test are as follows:

- (a) Perform the procedures in paragraph 2.03, (a) through (d).

(b) The detector should operate between 30 and 50 volts.

(c) Although recording of specific sensitivity readings on flame detectors is not required, the electrical test should be recorded.

2.06 Thermal Detectors: No specific routine maintenance work operations are required for thermal detectors; however, a periodic check is recommended to assure that no physical damage has occurred.

2.07 Detector Bases: NE51 neon lamps in the detector bases should be observed when detector sensitivity tests are performed to assure that they are not burned out or broken. Bases should also be periodically checked to assure that they have not been physically damaged.

3. TOOLS AND MAINTENANCE EQUIPMENT

3.01 A tool for remote removal of detector heads has been developed and may be obtained through Pyrotronics, Inc. The remote removal tool may be used in the performance of all routine maintenance operations associated with detector heads when they are accessible from directly below or a maximum of approximately 20 degrees off the vertical. When making sensitivity readings using the remote removal tool, an auxiliary shell and an extension cord for the sensitivity meter are required.

3.02 Use of the remote removal tool requires that existing detector locking rings, which are fastened with an allen setscrew, be replaced with a modifier ring having a ramped slot to provide a cam locking arrangement. A rubber washer is used with the modified locking ring to provide necessary pressure to securely hold the ring in place. These items are also available with the remote removal tool.

4. TRAINING SERVICE PERSONNEL

4.01 Pyrotronics, Inc., provides periodic training sessions for maintenance personnel. Arrangements for attendance at the sessions may be completed by contacting them.