

**INSTALLATION AND MAINTENANCE INSTRUCTIONS**

**HFS-P and HFS-PT  
Intelligent Photoelectric Smoke Sensors  
with Plug-In Detector Base**



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**SPECIFICATIONS**

Operating Voltage Range:	15 to 32 VDC
Standby Current:	300µA @ 24 VDC (one communication every 5 seconds with LED blink enabled)
Maximum Alarm Current (LED on):	6.5 mA @ 24 VDC
Operating Humidity Range:	10% to 93% Relative Humidity, Non-condensing
Operating Temperature Range:	32°F to 120°F (0°C to 49°C), HFS-P; 32°F to 100°F (0°C to 38°C), HFS-PT
Air Velocity:	0 to 4000 ft/min
Height:	2.0" (51 mm)
Diameter:	6.1" (155 mm)
Weight:	5.7 oz. (162 g)
Mounting:	4" (102 mm) square box with or without plaster ring; Minimum Depth - 1½" (38 mm) 4" Octagon Box; Minimum Depth - 1½" (38 mm) 3½" Octagon Box; Minimum Depth - 1½" (38 mm) Single Gang Box; Minimum Depth - 1½" (38 mm)

This sensor must be installed in compliance with the control panel system installation manual. The installation must meet the requirements of the Authority Having Jurisdiction (AHJ). Sensors offer maximum performance when installed in compliance with the National Fire Protection Association (NFPA); see NFPA 72.

**GENERAL DESCRIPTION**

Models HFS-P and HFS-PT are plug-in type smoke sensors with a plug-in detector base that combine a photoelectric sensing chamber with addressable-analog communications. The sensors transmit an analog representation of smoke density over a communication line to a control panel. Rotary decade switches are provided for setting the sensor's address. The detector is intended for use in a 2-wire intelligent system, with screw terminals provided for power (+ and -).

Two LEDs on the sensor are controlled by the panel to indicate sensor status. Model HFS-PT combines a photoelectric sensing chamber and 135°F (57.2°C) fixed temperature heat detector.

The HFS-P and HFS-PT require compatible addressable communications to function properly. Connect these sensors to listed-compatible control panels only.

Communication takes place over the power (+ and -) lines.

**BASE TERMINALS (SEE FIGURE 1)**

NO.	FUNCTION
1	Power (-)
2	Power (+)

**SPACING**

Space sensors in compliance with NFPA 72. In low air flow applications with smooth ceilings, space sensors 30 feet apart. For specific information regarding sensor spacing, placement, and special applications, refer to NFPA 72 or the System Smoke Detector Application Guide.

NOTE: These products are not listed for use inside duct smoke detectors.

**MOUNTING**

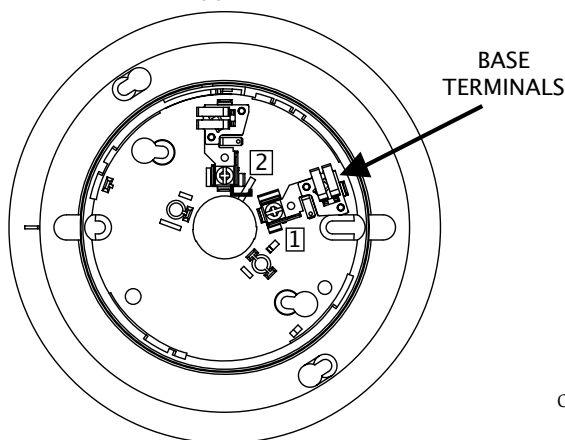
This detector base mounts directly to 3½- and 4-inch octagon boxes, 4-inch square boxes (with or without plaster rings, see Figure 2), and single gang boxes. Install the base on the box using the screws supplied with the junction box and the appropriate mounting slots in the base.

**WIRING GUIDE**

All wiring must be installed in compliance with the National Electrical Code, applicable local codes, and any special requirements of 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 will prevent a system from responding properly in the event of a fire.

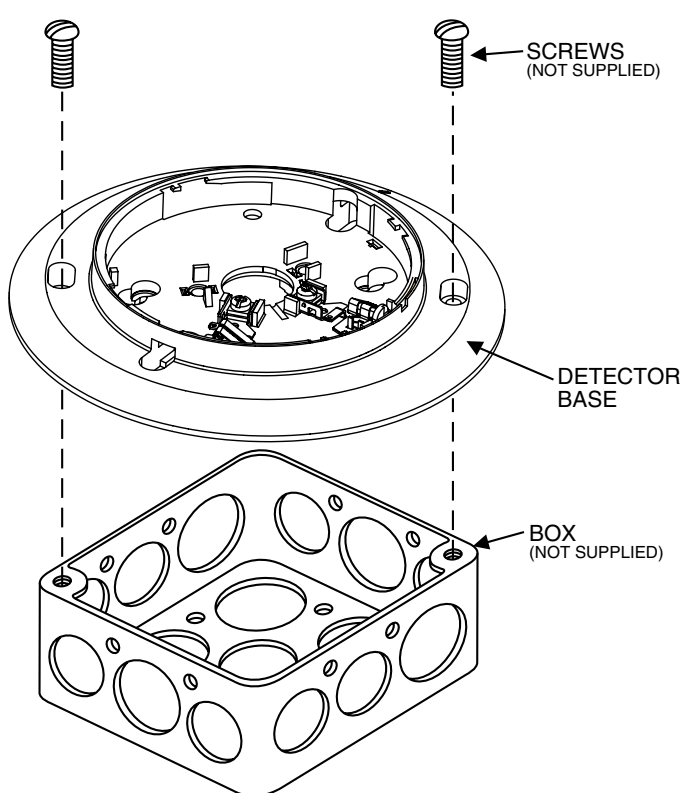
For signal wiring (the wiring between interconnected detectors), it is recommended that the wire be no smaller than AWG 18. However, the screws and clamping plate in the base can accommodate wire sizes up to AWG 12. The use of twisted pair wiring or shielded cable for the power (+ and -) loop is recommended to minimize the effects of electrical interference.

**FIGURE 1. TERMINAL LAYOUT:**



C0127-01

**FIGURE 2. MOUNTING DETECTOR TO BOX:**



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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.

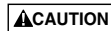
Make electrical connections by stripping about  $\frac{3}{8}$  inch (10 mm) of insulation from the end of the wire (use strip gauge molded in base), sliding the bare end of the wire under the clamping plate, and tightening the clamping plate screw. Do not loop the wire under the clamping plate.

The zone wiring of the detector base should be checked before the detector heads are installed in them. The wiring should be checked for continuity and polarity in the base, and dielectric tests should be performed.

The base includes a label for recording the zone, address, and type of detector being installed. This information is important to set the address of the detector head that will later be plugged into the base and to verify the type required for that location.

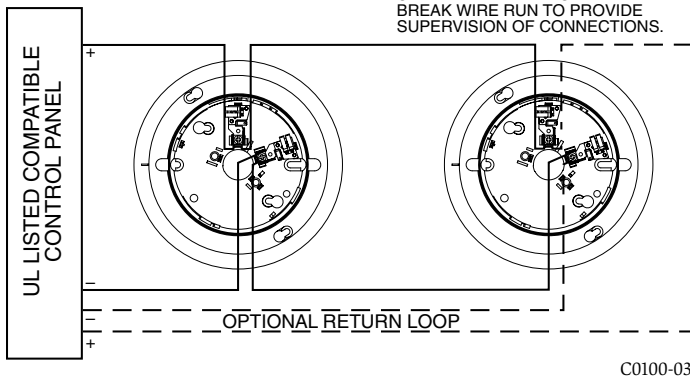
**Remove power from the communication line before installing sensors.**

1. Wire the sensor base per the wiring diagram, Figure 3.
2. Reference the control panel device address map to determine appropriate addressing.
3. Set the desired address on the sensor address switches, see Figure 4.
4. Install the sensor into the sensor base. Push the sensor into the base while turning it clockwise to secure it in place.
5. After all sensors have been installed, apply power to the control unit and activate the communication line.
6. Test the sensor(s) as described in the TESTING section of this manual.



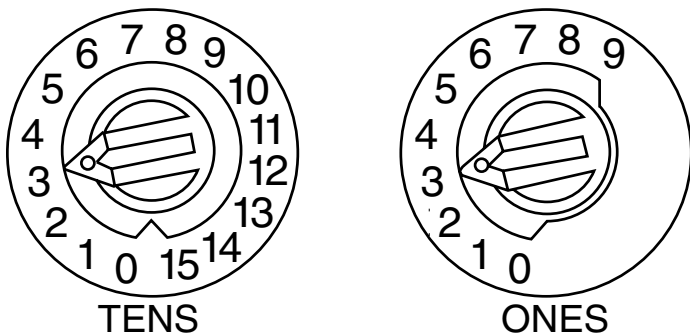
Dust covers provide limited protection against airborne dust particles during shipping. Dust covers must be removed before the sensors can sense smoke. Remove sensors prior to heavy remodeling or construction.

**FIGURE 3. WIRING DIAGRAM:**



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**FIGURE 4. ROTARY ADDRESS SWITCHES:**



C0162-00

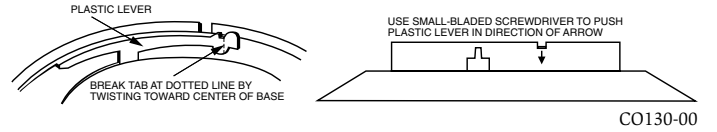
**TAMPER-RESISTANCE**

The Tamper Resistant Tab, in the Detector Mounting Base, can make the detector tamper-resistant by making it necessary to use a small screwdriver or similar tool to detach the detector from the base.

To make the detector tamper-resistant, use needle-nose pliers to break the smaller tab at the scribed line on the tamper resistant tab. Figures 5 and 6 show the location of this tab on the detector mounting bracket.

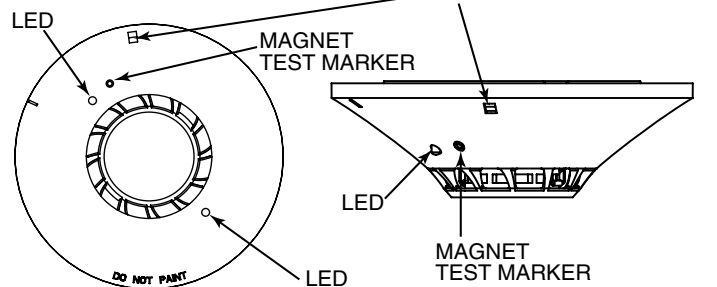
To remove the detector from the base after it has been made tamper resistant, insert a small screwdriver into the notch, as indicated in Figure 1, and press the plastic lever toward the mounting surface before rotating the detector counterclockwise for removal.

**FIGURE 5: ENABLING THE TAMPER-RESISTANT CAPABILITY**



C0130-00

**FIGURE 6:**



C0196-02

**TESTING**

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

All sensors must be tested after installation and periodically thereafter. Testing methods must satisfy the Authority Having Jurisdiction (AHJ). Sensors offer maximum performance when tested and maintained in compliance with NFPA 72.

The sensor can be tested in the following ways:

**A. Functional: Magnet Test (P/N M02-04-01 or M02-09-00)**

This sensor can be functionally tested with a test magnet. The test magnet electronically simulates smoke in the sensing chamber, testing the sensor electronics and connections to the control panel.

1. Hold the test magnet in the magnet test area as shown in Figure 6.
2. The sensor should alarm the panel.

Two LEDs on the sensor are controlled by the panel to indicate sensor status. Coded signals, transmitted from the panel, can cause the LEDs to blink, latch on, or latch off. Refer to the control panel technical documentation for sensor LED status operation and expected delay to alarm.

**B. Smoke Entry**

The GEMINI model 501 aerosol generator can be used for smoke entry testing. 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 the panel alarms.

Additionally, canned aerosol simulated smoke (canned smoke agent) may be used for smoke entry testing of the smoke detector. Tested and approved aerosol smoke products are:

MANUFACTURER	MODEL
Home Safeguard Industries	25S
SDi	CHEK02 and CHEK06
SDi	SOLOA4
SDi	SMOKESABRE-01

When used properly, the canned smoke agent will cause the smoke detector to go into alarm. Refer to the manufacturer's published instructions for proper use of the canned smoke agent.

**CAUTION**

Canned aerosol simulated smoke (canned smoke agent) formulas will vary by manufacturer. Misuse or overuse of these products may have long term adverse effects on the smoke detector. Consult the canned smoke agent manufacturer's published instructions for any further warnings or caution statements.

**C. Direct Heat Method (Hair dryer of 1000-1500 watts). HFS-PT only.**

A hair dryer of 1000-1500 watts should be used to test the thermistors. Direct the heat toward either of the two thermistors, holding the heat source approximately 12 inches from the detector in order to avoid damaging the plastic housing. The detector will reset only after it has had sufficient time to cool. Make sure both thermistors are tested individually.

A sensor that fails any of these tests should be cleaned as described under CLEANING, and retested. If the sensor fails after cleaning, it must be replaced and returned for repair.

When testing is complete, restore the system to normal operation and notify the proper authorities that the system is back in operation.

**CLEANING: (SEE FIGURE 7)**

Before removing the detector, notify the proper authorities that the smoke detector system is undergoing maintenance and will be temporarily out of service.

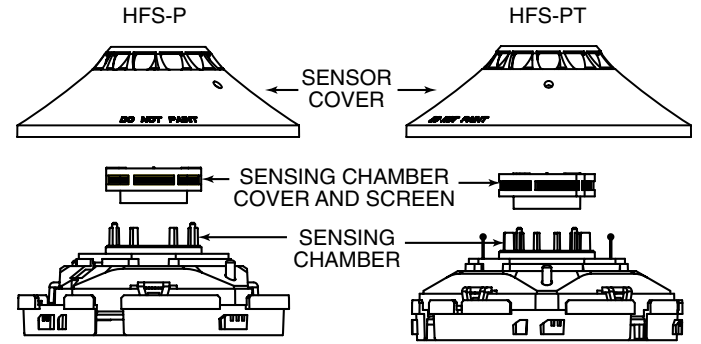
Disable the zone or system undergoing maintenance to prevent unwanted alarms.

1. Remove the sensor to be cleaned from the system.
2. Remove the sensor cover by pressing firmly on each of the four removal tabs that hold the cover in place.
3. Vacuum the screen carefully without removing it. If further cleaning is required continue with Step 4, otherwise skip to Step 7.
4. Remove the chamber cover/screen assembly by pulling it straight out.
5. Use a vacuum cleaner or compressed air to remove dust and debris from the sensing chamber.
6. Reinstall the chamber cover/screen assembly by sliding the edge over the sensing chamber. Turn until it is firmly in place.
7. Replace the cover using the LEDs to align the cover and then gently pushing it until it locks into place. Make sure that the thermistors do not become bent under the cover on the HFS-PT models.
8. Reinstall the detector.
9. Test the detector as described in TESTING.
10. Reconnect disabled circuits.
11. Notify the proper authorities that the system is back on line.

**SPECIAL NOTE REGARDING SMOKE DETECTOR GUARDS**

Smoke detectors are not to be used with detector guards unless the combination has been evaluated and found suitable for that purpose.

**FIGURE 7:**



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

### FCC STATEMENT

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

**NOTE:** This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.