ACCESS MENUS

INSTALLATION AND MAINTENANCE INSTRUCTIONS

5451EIS Plug-in Intrinsically Safe Rate-of-rise Thermal Detector with Fixed Temperature Alarm

SYSTEM SENSOR®
A Division of Pittway
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1-800-SENSOR2, FAX: 630-377-6495

Specifications

Diameter:	10.4 cm
Height:	5.4 cm
Weight:	150 g
Input Voltage:	15 to 28 VDC
Installation Temperatures:	
U.S. –	32°F to 100°F (0°C to 40°C)
Europe (Maximum)–	50°C
Operating Humidity Range:	10% to 93% Relative Humidity (noncondensing)
Latching Alarm:	Reset by momentary power interruption
Intrinsic Safety Rating:	EEx ia IIC T5

This sensor must be installed in compliance with the control panel installation manual and meet the requirements of the authority having jurisdiction.

NOTICE: This manual should be left with the owner/user of this equipment.
IMPORTANT: This detector should be cleaned at least once a year. If cleaning is performed with non-intrinsically safe equipment, it must be conducted outside the hazardous area.

General Description

Model 5451EIS is an intrinsically safe rate-of-rise thermal detector with fixed temperature alarm utilizing a state-of-the-art dual thermistor sensing circuit. These detectors are designed to provide open area protection and are to be used with compatible control panels only. Two LEDs on each detector light to provide 360° visibility of the detector indication. Remote LED annunciator capability is provided as standard.

NOTE: Although the 5451EIS is a UL listed open area heat detector, UL has not evaluated this product for use in hazardous environments. The detector is FMRC and BASEEFA approved for intrinsic safety.

Installation

NOTE: All wiring must conform to applicable installation codes and regulations.

NOTE: Verify that all detector bases are installed, that the initiating-device circuits have been tested, and that the wiring is correct. (Refer to detector base manual for testing procedure.)

⚠WARNING

Disconnect the power from initiating-device circuits before installing detectors.

1. Install Detectors:
   a. Insert the detector into the detector base.
   b. Turn the detector clockwise until the detector drops into place.
   c. Continue turning detector clockwise to lock it in place.

Tamper-resistance Feature

The detector bases include a feature that, when activated, prevents removal of the detector from the base without the use of a tool. Refer to the installation instruction manual of the detector base to make use of this feature.

2. After all detectors have been installed, apply power to the control unit.
3. Test the detector using the magnet as described under TESTING.
4. Reset the detector at the system control panel.
5. Notify the proper authorities the system is in operation.

Testing

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

IMPORTANT: If testing is done with non-intrinsically safe methods, it should be conducted outside the hazardous area.

Detectors must be tested after installation and periodic maintenance. The 5451EIS may be tested as follows:
A. Test Magnet (System Sensor Model No. M02-04)

1. Position the magnet against the cover opposite the test module socket. (See Figure 1.)
2. The LEDs on the detector should light within 10 seconds. If the LEDs fail to light, check the power to the detector and the wiring in the detector base.
3. Reset the detector at the system control panel.

B. Test Module (System Sensor Model No. MOD400R)
The MOD400R is used with a DMM or volt meter to check the detector sensitivity as described in the module's manual.

C. Direct Heat Method (Hair dryer of 1000 - 1500 watts)
From the side of the detector, direct the heat toward the sensor. Hold the heat source about 15 cm away to prevent damage to the cover during testing.

NOTE: If a detector goes into alarm, it will reset only if the detector has cooled and if its power is momentarily interrupted. Check the control panel being used to determine whether the RESET switch (or some other auxiliary device or control) momentarily cuts off power to the detector loop.

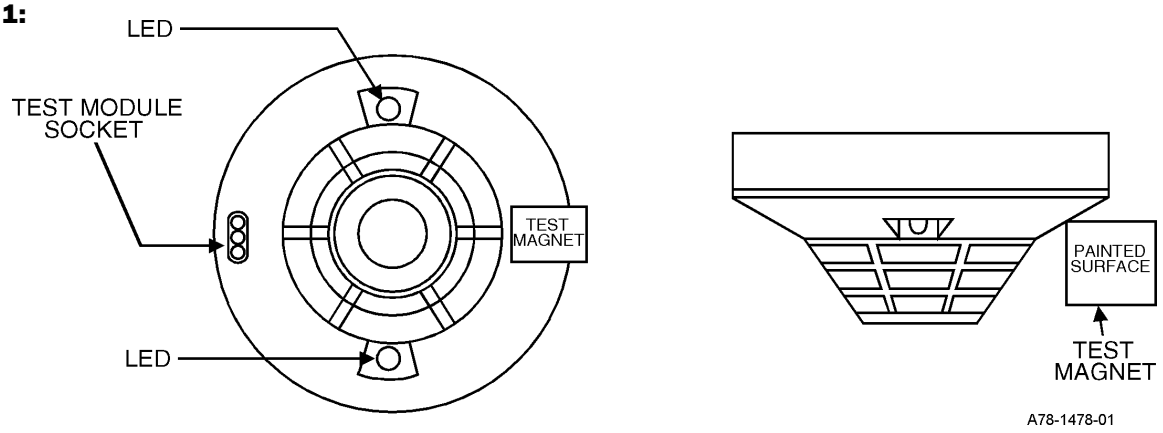
Detectors that fail these tests should be cleaned as described under MAINTENANCE and retested. If the detectors still fail these tests they should be returned for repair.

Maintenance

The 5451EIS detector has been designed to be as maintenance-free as possible. Normal air-borne dust, however, can accumulate on the detector's sensing elements and cause them to become less sensitive. All detectors should be tested and cleaned at least once a year, and those in dustier areas should be tested and cleaned more often. Detectors must also be cleaned and tested immediately after a fire. Before cleaning, notify the proper authorities that the system is undergoing maintenance, and therefore the system will temporarily be out of service. Disable the loop or system undergoing maintenance to prevent unwanted alarms.

1. Remove detector from mounting base.
2. Use a vacuum cleaner to remove dust from the sensing chamber.
3. Reinstall the detector.
4. Test detector as described under TESTING.

Figure 1:



⚠WARNING

The Limitations of Property Protection Heat Detectors

This heat detector 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.

Heat detectors will not work without power. AC or DC powered smoke detectors will not work if the power supply is cut off for any reason.

Heat detectors are designed to protect property, not life. They do not provide early warning of fire and cannot detect smoke, gas, combustion particles, or flame. They alarm when temperatures at the heat detector reach 57°C (135°F). Given the rapid growth of certain types of fires, heat detectors cannot be expected to provide adequate warning of fires resulting from smoking in bed, inadequate fire protection practices, violent explosions, escaping gas, improper storage of flammable liquids like cleaning solvents, other safety hazards, or arson.

Heat detectors do not always detect fires because the fire may be a slow-smoldering, low-heat type (producing smoke), or because they may not be near where the fire occurs, or because the heat of the fire may bypass them. Heat detectors will not detect smoke, gas, flames, or combustion particles.

Heat detectors are components in professionally installed fire alarm systems. **They will not function if they have been improperly wired into the fire alarm system or if power to them is cut off for any reason.**

Heat detectors cannot last forever. They should be tested and maintained following the instructions in this manual. To be safe, they should be replaced after they have been installed for 15 years.

Refer to NFPA 72 for application.

INTEGRATION OF THE 5451EIS DETECTORS INTO A SYSTEM

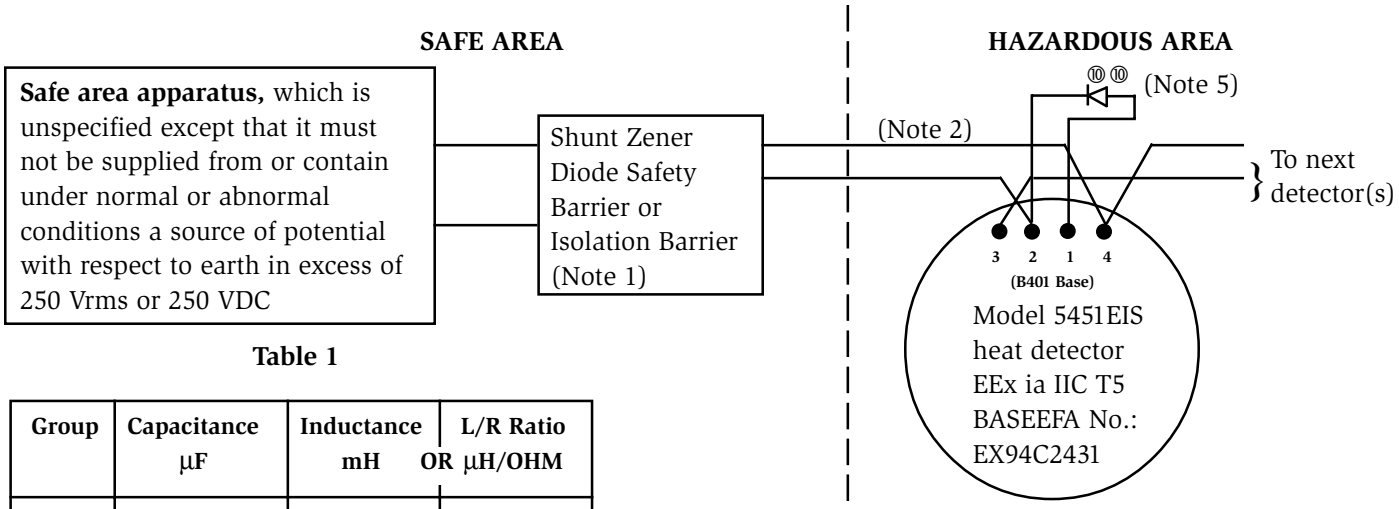


Table 1

Group	Capacitance µF	Inductance mH	L/R Ratio OR µH/OHM
IIC	0.13	4.2	55
IIB	0.39	12.6	165
IIA	1.04	33.6	440

Notes:

1. Any single channel shunt zener diode safety barrier or single channel of a dual channel shunt zener diode safety barrier certified by BASEEFA or any EEC approved certification body to [EEx ia] IIC having the following or lower output parameters:

   Uz = 28V
   Imax: out = 93.3 mA
   Wmax: out = 0.67 W

   In any safety barrier used, the output current **must** be limited by a resistor "R", such that Imax:out = U_z/R. Or any of the following isolation barriers may be used:

   MTL : MTL3043 (Ex86B2285), MTL4061 (Ex94C2040), MTL5061 (Ex96D2426)
   Pepperl + Fuchs : KHDO-ICS/Ex151 (Ex88B2331), KHDO-ICS/Ex251 (Ex88B2331), KFDO-CS-Ex151 (Ex88B2331)
2. The capacitance and inductance or inductance/resistance (L/R) ratio of the hazardous area cables must not exceed the values shown in Table 1.
3. The installation must comply with the appropriate national installation requirements, e.g. in the U.K. BS5345: Part 4:1977.
4. The electrical circuit in the hazardous area must be capable of withstanding an A.C. test voltage of 500 VRMS to earth or frame of the apparatus for one minute. This note does not apply when using an isolation barrier.
5. An external light emitting diode (LED) may be fitted to terminals 2 and 1 (B401 base). The surface area of the LED must lie between 20mm² and 10cm². The LED and its terminations must be afforded a degree of protection of at least IP20, and be segregated from other circuits and conductors as defined in clause 5 of EN50020: 1977.
6. 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. 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. 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 automatically disengages when the detector head is removed from the base. DO NOT remove the shorting spring since it reengages as the detector head is turned in the base, completing the circuit.

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⚠CAUTION

Please refer to control panel installation instructions for specific barrier/control panel compatibility information.

FMRC Approved System Diagram

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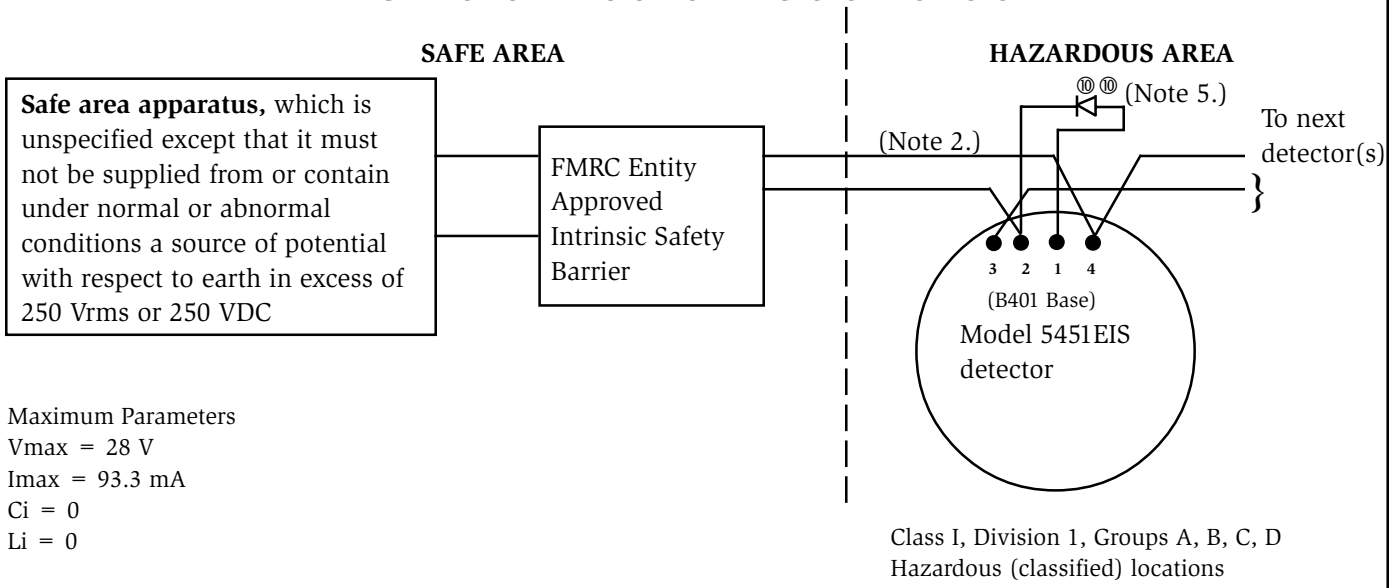

Maximum Parameters
Vmax = 28 V
Imax = 93.3 mA
Ci = 0
Li = 0

Class I, Division 1, Groups A, B, C, D
Hazardous (classified) locations

Notes:

1. Any single channel shunt zener diode safety barrier or single channel of a dual channel shunt zener diode safety barrier certified by FMRC.
2. The entity concept allows interconnection of intrinsically safe apparatus to associated apparatus not specifically examined in such combination. The criteria for interconnection is the voltage (Vmax) and current (Imax) that an intrinsically safe apparatus can receive and remain intrinsically safe, considering faults, must be equal to or greater than the voltage (Voc or Vz) and current (Isc or Iz) levels which can be delivered by the associated apparatus, considering faults and applicable factors. In addition, the maximum unprotected capacitance (Ci) and inductance (Li) of the intrinsically safe apparatus, including interconnecting wiring, must be equal to or less than the capacitance and inductance that can be safely connected to associated apparatus.
3. The installation shall be in accordance with NEC NASI/NFPA 70 and ANSI/ISA RP126.
4. Associated apparatus must be installed in accordance with manufacturers' instructions.
5. An external light emitting diode (LED) should be mounted in an enclosure conforming to the requirements set forth in ANSI/ISA Standard S82.01, S82.02 and S82.03.
6. No revisions without prior FMRC authorization.
7. 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. 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. 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 automatically disengages when the detector head is removed from the base. DO NOT remove the shorting spring since it reengages as the detector head is turned in the base, completing the circuit.

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Three-Year Limited Warranty

System Sensor warrants its enclosed heat detector 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 heat detector. 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 heat detector 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.