SYSTEM SENSOR®

CE
0832
0832-CPD-0283

INSTALLATION AND MAINTENANCE INSTRUCTIONS FOR MODEL 5451EIS INTRINSICALLY SAFE RATE-OF-RISE THERMAL DETECTOR WITH FIXED TEMPERATURE ALARM

Before installing the sensor, please thoroughly read System Sensor's Guide to Conventional Fire Systems. This manual includes detailed information on sensor spacing, placement, zoning, and special applications. Copies of this manual are available at no charge from System Sensor.

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 for use in hazardous areas where potentially explosive atmospheres are likely to arise. The classification of equipment required must be confirmed with your responsible authority. The detectors are designed to be used with compatible panels only and must be used in conjunction with a compatible zener barrier or galvanic isolator.

Two LEDs on each detector light to provide a local 360° visible alarm indication. Remote LED annunciator capability is available as an optional accessory wired to the standard base terminals. These detectors also have a latching alarm feature. The alarm can be reset only by a momentary power interruption. These detectors may be tested by activating an internal reed switch with a magnet.

SPECIFICATIONS

Size:	Cover Height:	60 mm
	Cover Diameter:	102 mm
Weight:		277 g
Operating Temperature Range:		-10°C to 40°C
Operating Humidity Range:		10% to 93% Relative Humidity, Non-condensing
Intrinsic Safety Rating:		EEx ia IIB T5
Latching Alarm:		Reset by momentary power interruption.

This detector has been independently tested and certified to EN54 part 5 Class A1R and BASEEFA approved for intrinsic safety.

COVERAGE

As a general guide, the detector should provide adequate protection of an area 70-90m², where the ceiling is smooth and there is no significant air movement. Where installation conditions or response requirements vary, different spacing may be necessary. It is essential to consult local codes of practice for the installation of fire alarm systems before installing thermal detectors.

BASE SELECTION AND WIRING GUIDE

Refer to the installation instructions supplied with the plug-in detector bases for wiring details. System Sensor detector bases B401 and B401DG are available for this detector.

All bases are provided with screw terminals for power and remote indicator connections. The electrical ratings for each detector-base combination are also included in the base installation instructions.

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

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

WARNING
Remove power from detector monitoring circuits before installing detectors.

INSTALLATION

1. Place the detector into the detector base.
2. Rotate the detector clockwise with gentle pressure until the detector drops into place.
3. Continue rotating the detector clockwise to lock it in place.
4. After all detectors have been installed, apply power to the detector monitoring circuits.
5. Test the detector as described under **TESTING.**
6. Reset the detector at the system control panel.
7. Notify the proper authorities that the system is in operation.

Tamper-Resistance

The detector bases include a feature that, when activated, prevents removal of the detector without the use of a tool. See the installation instructions for the detector base for details of how to use this feature.

CAUTION
Dust covers are fitted to the detectors to help protect units during shipment and when first installed. They are not intended to provide complete protection against contamination; therefore detectors should be removed before beginning construction, major re-decoration or other dust producing activity. Dust covers must be removed before the system can be made operational.
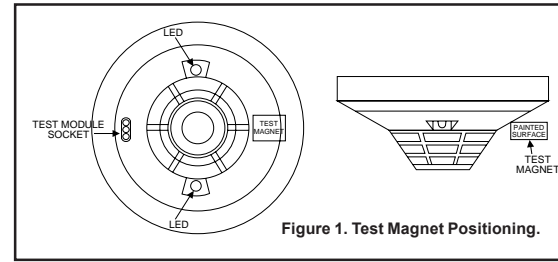

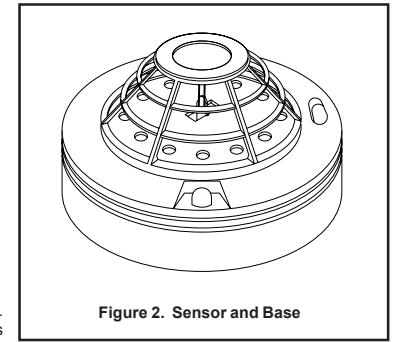**Figure 1. Test Magnet Positioning.**

Figure 2. Sensor and Base

TESTING

Detectors must be tested after installation and following periodic maintenance. However, before testing, notify the proper authorities that the detector system is undergoing maintenance and the system will be temporarily out of service. Disable the zone or system undergoing maintenance to prevent unwanted alarms.

IMPORTANT: If testing is carried out using non-intrinsically safe methods, it must be conducted outside the hazardous area.

Test the detector as follows:

Test Magnet (Model M02-24 - optional)

1. Test the detector by positioning the test magnet against the detector body approximately 2cm from LED1 in the direction of the metering socket (see Figure 1).
2. Both LEDs should latch on within 30 seconds, indicating an alarm and activating the panel.

Calibrated Sensitivity Test (MOD400R)

IMPORTANT: MOD400R is not intrinsically safe - the test must be conducted outside the hazardous area

1. Use the MOD400R Test Module with a digital or analogue voltmeter to check detector sensitivity as described in the test module manual.

Direct Heat Method (Hair dryer of 1000-1500 watts)

IMPORTANT: This method is not intrinsically safe - the test must be conducted outside the hazardous area

1. From the side of the detector, direct the heat toward the sensor. Hold the heat source about 15cm away to prevent damage to the cover during testing. Note: If a detector goes into alarm, it will only reset 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.

After completion of all tests notify the proper authorities that the system is operational.

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

MAINTENANCE

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

1. Remove the detector to be cleaned from the system.
2. Use a vacuum cleaner to remove dust from the sensing chamber.
3. Reinstall the detector.
4. When all sensors have been cleaned, restore power to the system and test the sensor(s) as described in the **TESTING** section of this manual.

CAUTION
The Detector has a plastic enclosure that may present an electrostatic risk and must not be installed in a position where it may be subject to a high dust-laden air flow. Clean only with a damp cloth and do not rub.

WARNING
LIMITATIONS OF HEAT SENSORS

Heat sensors are designed to protect property, not life. They do not provide early warning of fire and cannot detect smoke, gas, combustion particles or flame. The 5451E alarms when temperature at the heat sensor reaches 60°C. Given the rapid growth of certain types of fire, heat sensors 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 sensors do not always detect fires because the fire may be a slow smouldering, 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 sensors will not detect smoke, gas, flames or combustion particles.

Heat sensors 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 for any reason.**

Heat sensors 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.
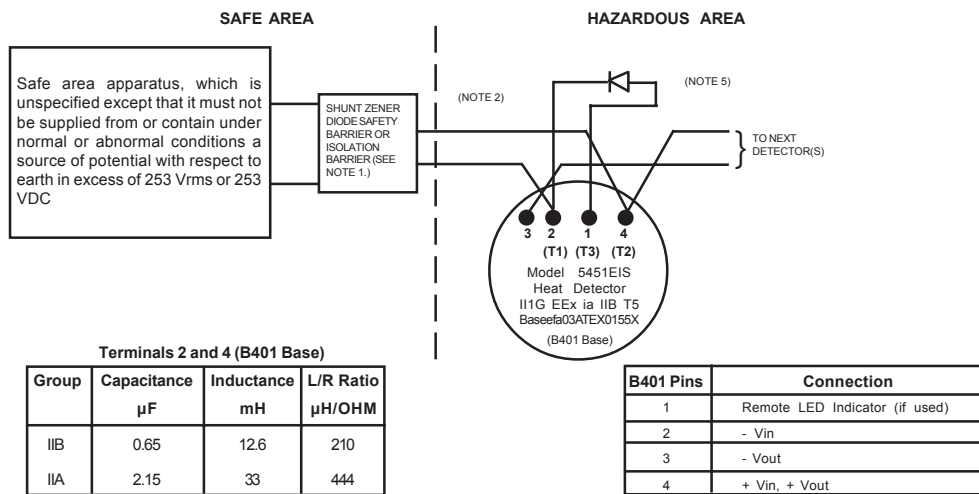

Typical 5451EIS System Diagram

Group	Capacitance μF	Inductance mH	L/R Ratio μH/OHM
IIB	0.65	12.6	210
IIA	2.15	33	444

Table 1

B401 Pins	Connection
1	Remote LED Indicator (if used)
2	- Vin
3	- Vout
4	+ Vin, + Vout

Table 2

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 = Uz/R. Or any of the following isolation barriers may be used:
   MTL : MTL4061 (BAS01ATEX7176), MTL5061 (BAS01ATEX7160)
   Pepperl + Fuchs : KFDO-CS-Ex1.51P (BAS98ATEX7343), KHDO-CS-Ex2.51P (BAS98ATEX7343)
2. The capacitance and inductance or inductance/resistance (L/R) ratio of the hazardous area cables between the power terminals 2 and 4 (B401 base) 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 or BSEN60079-14: 1997.
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 20mm^2 and 10cm^2. 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 6 of EN50020: 2002.
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 terminals 2 and 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.
7. The system must be marked with a durable label. The label should appear on or adjacent to the principle item of electrical equipment in the system or at the interface between intrinsically safe and non intrinsically safe circuits. This should show Baseefa 03Y0180 and SYST or System.

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CAUTION

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

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DECLARATION OF CONFORMITY

Date of Issue: 26/01/06

Manufacturer: Pittway Tecnologica S.r.l.
Via Caboto 19/3
34147 Trieste
Italy

Product: 5451EISE

Mounting Bases: B401

Description: Intrinsically safe conventional rate of rise heat detector

Conforms to: EN54-5 / A1 (E)

Notified Body: BRE-LPCB
Garston
Watford
WD25 9XX

Notified Body Number: 0832

Certificate of Conformity No: 0832-CPD-0283

We hereby declare that the product identified above meets the requirements of the of the EMC Directive 89/336/EEC amended by 92/31/EEC, 93/68/EEC, 93/97/EEC, Directive 94/9/EEC **and the EU Construction products Directive, 89/106/EEC** and therefore qualify for free movement within markets comprising the European Union (EU) and the European Economic Area (EEA).

For and on behalf of
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