



## Photoelectric Smoke Detectors



System Sensor's i3™ series smoke detectors represent significant advancement in conventional detection. The i3 family is founded on three principles: installation ease, intelligence, and instant inspection.



### Features

- Plug-in detector line, mounting base included
- Large wire entry port
- In-line terminals with SEMS screws
- Mounts to octagonal and single-gang backboxes, 4-square backboxes, or direct to ceiling
- Stop-Drop 'N Lock attachment to base
- Removable detector cover and chamber
- Built-in remote maintenance signaling
- Drift compensation and smoothing algorithms
- Simplified sensitivity measurement
- Wide angle, dual color LED indication
- Loop testing via EZ Walk feature
- Built-in test switch

### Installation ease.

The i3 line redefines installation ease with its plug-in design. This allows an installer to pre-wire the bases included with the heads. The large wire entry port and in-line terminals provide ample room for neatly routing the wiring inside the base.

The base accommodates a variety of back box mounting methods, as well as direct mounting with drywall anchors. To complete the installation, i3 heads plug in to the base with a simple Stop-Drop 'N Lock™ action.

### Intelligence.

i3 detectors offer a number of intelligent features to simplify testing and maintenance. Drift compensation and smoothing algorithms are standard with the i3 line to minimize nuisance alarms. Two-wire i3 detectors needing cleaning can generate a remote maintenance signal, when connected to the C2W-MOD2A loop test/maintenance module, or to a panel equipped with the i3 protocol. This signal is indicated by LEDs located at the module and the panel. The CSENS-RDRA, a wireless device, displays the sensitivity of i3 detectors in terms of percent per-foot-obscuration.

### Instant inspection.

The i3 series provides wide-angle red and green LED indicators for instant inspection of the detector's condition: normal standby, out-of-sensitivity, alarm, or freeze trouble. When connected to the C2W-MOD2A loop test/maintenance module or a panel with the i3 protocol, the EZ Walk loop test feature is available on two-wire i3 detectors. This feature verifies the initiating loop wiring by providing LED status indication at each detector.

### Agency Listings





# Photoelectric Smoke Detectors

## Smoke Detector Specifications

### Architectural/Engineering Specifications

Smoke detector shall be a System Sensor i<sup>3</sup> Series model number \_\_\_\_\_, listed to ULC. The detector shall be a photoelectric type (Model C2W-BA, C4W-BA) or a combination photoelectric/thermal (Model C2WT-BA, C4WT-BA) with thermal sensor rated at 135°F (57.2°C). The detector shall include a mounting base for mounting to 3½-inch and 4-inch octagonal, single gang, and 4-inch square back boxes with a plaster ring, or direct mount to the ceiling using drywall anchors. Wiring connections shall be made by means of SEMS screws. The detector shall allow pre-wiring of the base and the head shall be a plug-in type. The detector shall have a nominal sensitivity of 2.5 percent-per-foot nominal as measured in the ULC smoke box. The detector shall be capable of automatically adjusting its sensitivity by means of drift compensation and smoothing algorithms. The detector shall provide dual color LED indication which blinks to indicate power up, normal standby, out of sensitivity, alarm, and freeze trouble (Model C2WT-BA, C4WT-BA) conditions. When used in conjunction with the C2W-MOD2A module, 2-wire models shall include a maintenance signal to indicate the need for maintenance at the alarm control panel, and shall provide a loop testing capability to verify the circuit without testing each detector individually.

### Electrical Specifications

<b>Operating Voltage</b>	Nominal: 12/24V non-polarized Minimum: 8.5V Maximum: 35V
<b>Maximum Ripple Voltage</b>	30% peak to peak of applied voltage
<b>Standby Current</b>	2-wire: 50 µA maximum average; 4-wire: 50 µA maximum average
<b>Maximum Alarm Current</b>	2-wire: 130 mA limited by control panel; 4-wire: 20 mA @ 12V, 23mA @ 24V
<b>Peak Standby Current</b>	2-wire: 100 µA; 4-wire: n/a
<b>Alarm Contact Ratings</b>	2-wire: n/a; 4-wire: 0.5 A @ 30V AC/DC

### Physical Specifications

<b>Dimensions (including base)</b>	5.3 inches (127 mm) diameter; 2.0 inches (51 mm) height
<b>Weight</b>	6.3 oz. (178 grams)
<b>Operating Temperature Range</b>	C2W-BA and C4W-BA: 32°F–120°F (0°C–49°C); C2WT-BA and C4WT-BA: 32°F–100°F (0°C–37.8°C)
<b>Operating Humidity Range</b>	0 to 95% RH non-condensing
<b>Thermal Sensor</b>	135°F (57.2°C) fixed
<b>Freeze Trouble</b>	C2WT-BA and C4WT-BA only: 41°F (5°C)
<b>Sensitivity</b>	2.5%/ft. nominal
<b>Input Terminals</b>	14–22 AWG
<b>Mounting</b>	3½-inch octagonal back box 4-inch octagonal back box Single gang back box 4-inch square back box with a plaster ring Direct mount to ceiling

LED Modes			Power Up Sequence for LED Indication	
LED Mode	Green LED	Red LED	Condition	Duration
Power up	Blink every 10 seconds	Blink every 10 seconds	Initial LED status indication	80 seconds
Normal (standby)	Blink every 5 seconds	off		
Out of sensitivity	off	Blink every 5 seconds		
Freeze trouble	off	Blink every 10 seconds		
Alarm	off	Solid		

## Ordering Information

Model	Thermal	Wiring	Alarm Current
C2W-BA	No	2-wire	130 mA max. limited by control panel
C2WT-BA	Yes	2-wire	130 mA max. limited by control panel
C4W-BA	No	4-wire	20 mA @ 12V, 23mA @ 24V
C4WT-BA	Yes	4-wire	20 mA @ 12V, 23mA @ 24V

### Accessories

C2W-MOD2A	2-wire loop test / maintenance module	RT	Removal / replacement tool
CSENS-RDRA	Sensitivity reader	A77-AB2	Retrofit adapter bracket, 6.6 in. (16.76cm) diameter





## 5600 Series Heat Detectors

### Models Available

#### Single-circuit Models

- 5601A 135°F Fixed Temperature / Rate-of-Rise
- 5602A 194°F Fixed Temperature / Rate-of-Rise
- 5603A 135°F Fixed Temperature
- 5604A 194°F Fixed Temperature

#### Dual-circuit Models

- 5621A 135°F Fixed Temperature / Rate-of-Rise
- 5622A 194°F Fixed Temperature / Rate-of-Rise
- 5623A 135°F Fixed Temperature
- 5624A 194°F Fixed Temperature



### Product Overview

Multiple configurations available to satisfy a broad range of installations:

- Single- and dual-circuit models
- Fixed temp and combination fixed- temp/rate-of-rise
- 135° F or 194° F ratings.

Easy to use terminal screws that provide a more positive wiring connection

A broader range of back box mounting options:

- Single gang
- 3.5" and 4" Octagonal
- 4" square with square to round plaster ring

Reversible mounting bracket for flush and surface mount installations

System Sensor's 5600 series heat detectors offer a low-cost means for property protection against fire, and for non-life-safety installations where smoke detectors are inappropriate.

**Multiple configurations.** The 5600 series offers a full-line of configurations to accommodate a broad range of applications. Both single- and dual-circuit models are offered, each available for low- and high-temperature ratings with either fixed temperature or combination fixed temperature/rate-of-rise (ROR) activation. The ROR element of the fixed/ROR models is restorable, to accommodate field-testing the unit.

**Installation flexibility.** To satisfy a variety of installations, the 5600 series easily mounts to single-gang and octagonal back boxes. These models also accommodate four-square back boxes, when used with a square to round plaster ring. The mounting bracket is reversible to allow for flush- and surface-mount back box installations.

**Visual identification.** The 5600 series provides clear markings on the exterior of the unit to ensure that the proper detector is being used. The 5600 series also provides a post-activation indicator in the form of a collector. Once the detector has been activated, the collector drops from the unit, to easily identify the specific unit in alarm.





## 5600 Series Heat Detectors

### Engineering Specification

Heat detector shall be a System Sensor 5600 series model number \_\_\_\_\_, listed to ULC for Heat Detectors for Fire Protective Signaling Systems. The detector shall be either a single-circuit or a dual-circuit type, normally open. The detector shall be rated for activation at either 135°F (57°C) or 194°F (90°C), and shall activate by means of a fixed temperature thermal sensor, or a combination fixed temperature/rate-of-rise thermal sensor. The rate-of-rise element shall be activated by a rapid rise in temperature, approximately 15°F (8.3°C) per minute. The detector shall include a reversible mounting bracket for mounting to 3½-inch and 4-inch octagonal, single gang, and 4-inch square back boxes with a square to round plaster ring. Wiring connections shall be made by means of SEMS screws that shall accommodate 14-22AWG wire. The detector shall contain markings on the exterior of the housing to identify its temperature rating and activation method. The rate-of-rise element of combination fixed temperature/rate-of-rise models shall be restorable, to allow for field-testing. The detectors shall include an external collector that shall drop upon activation to identify the unit in alarm.

### Electrical Specifications

#### Operating Voltage / Contact Ratings

6 - 125 VAC / 3A  
 6 - 28 VDC / 1A  
 125 VDC / 0.3A  
 250 VDC / 0.1A

### Physical Specifications

#### Maximum Installation Temperature

5601A, 5603A, 5621A, and 5623A: 100°F (38°C)  
 5602A, 5604A, 5622A, and 5624A: 150°F (65.6°C)

#### Operating Humidity Range

5 to 95% RH non-condensing

#### Dimensions with mounting bracket

Diameter: 4.57 inches (11.6cm)  
 Height: 1.69 inches (4.3cm)

#### Alarm Temperature

5601A, 5603A, 5621A, and 5623A: 135°F (57°C)  
 5602A, 5604A, 5622A, and 5624A: 194°F (90°C)

#### Input Terminals

14–22 AWG

#### Weight

6 oz. (170 grams)

#### Rate-of-Rise Threshold

15°F (8.3°C) rise per minute  
 (models 5601A, 5602A, 5621A, and 5622A only)

#### Mounting

3½-inch octagonal back box  
 4-inch octagonal back box  
 Single gang back box  
 4-inch square back box with a square to round plaster ring

### Ordering Information

Model	Circuit	Temperature Rating	Activation	Protected Spacing – 10 Foot Ceiling *
5601A	Single	135°F (57°C)	Fixed Temperature / Rate-of-Rise	50 feet x 50 feet (15.24m x 15.2m)
5602A	Single	194°F (90°C)	Fixed Temperature / Rate-of-Rise	50 feet x 50 feet (15.24m x 15.2m)
5603A	Single	135°F (57°C)	Fixed Temperature	25 feet x 25 feet (7.62m x 7.62m)
5604A	Single	194°F (90°C)	Fixed Temperature	25 feet x 25 feet (7.62m x 7.62m)
5621A	Dual	135°F (57°C)	Fixed Temperature / Rate-of-Rise	50 feet x 50 feet (15.24m x 15.2m)
5622A	Dual	194°F (90°C)	Fixed Temperature / Rate-of-Rise	50 feet x 50 feet (15.24m x 15.2m)
5623A	Dual	135°F (57°C)	Fixed Temperature	25 feet x 25 feet (7.62m x 7.62m)
5624A	Dual	194°F (90°C)	Fixed Temperature	25 feet x 25 feet (7.62m x 7.62m)

\*NOTE: Refer to ULC guidelines for spacing reductions when ceiling heights exceed 10 feet.





# National Fire Equipment Ltd.

## 100 Series™ Low-Profile Plug-in Smoke Detectors



System Sensor 100 Series Plug-in Smoke Detectors offer superb performance and reliability in a profile which is just 2" (5.1 cm) deep.

Model 2151A (photoelectric sensor) and model 2151TA (photoelectric sensor with thermal) can be used with a variety of adapter bases in several wiring configurations and voltages. Features include: low current draw, stable performance in high air velocities, built-in tamper resistant base design, remote LED option, removable cover, built-in test switch and the ability to obtain sensitivity readings using the CSENS-RDRA infrared reader.

The 100 Series is designed to meet the performance criteria designated by ULC. Its sensing chambers are sealed against back pressure air flow, dirt and insects. This chamber is protected by a fine mesh screen, which can be cleaned or replaced. Additional key features include a variety of mounting bases and a full line of accessories.

All 100 Series photoelectric smoke detectors contain a unique optical sensing chamber designed to sense smoke particles produced by a wide range of combustion sources. A custom integrated circuit incorporates signal processing to reduce false alarms.

Model 2151A photoelectric detector's unique optical sensing chamber is engineered to sense smoke by a wide range of combustion sources. Dual electronic thermistors add 135°F fixed temperature thermal sensing on model 2151TA.



### Features

- Sleek, low-profile design
- Compatible with 400 Series product
- Two LEDs blink in standby, providing 360° visibility
- Broad range of adapter bases available with built-in shorting spring
- Hand-held sensitivity reader available (Model CSENS-RDRA)



CSENS-RDRA Infrared Sensitivity Reader for use with 2151A/2151TA





## 100 Series™ Low-Profile Plug-in Smoke Detectors

### 100 Series Plug-in Smoke Detector Specifications

<b>Operating Voltage/Alarm Current</b>	See Adapter Base Selection Guide following
<b>Standby Current</b>	85µA Standby
<b>Sensitivity</b>	1 – 3.18%/ft.
<b>Height</b>	2.0" in B401A
<b>Diameter</b>	4.1" installed in B401A; 6.2" installed in B110LPA
<b>Shipping Weight</b>	5.2 oz
<b>Construction</b>	Flame retardant thermoplastic
<b>Temperature</b>	Photo: 32°F to 120°F (0° to 49°C); Photo/thermal: 32°F to 100°F (0° to 38°C)
<b>UL Listed Velocity Range</b>	Photo: 0 – 3000 fpm (0 – 15.2 m/s)
<b>Humidity Range</b>	10% – 93% RH non-condensing
<b>Smoke Detector Spacing</b>	On smooth ceilings spacing of 30 feet (900 sq. ft.) may be used as a guide. Other spacing may be used depending on ceiling height, high air movements, and other conditions or response requirements.

#### Adapter Base Selection Guide

Note: The 400 series 6 inch bases, B401BA, B401BRA, B402BA, B404BA and B406BA, have been made compatible with the new 100 series for retrofit applications only. In addition, make sure to use the F110 flange for these bases.

Base Model Number	Loop Type	Current Limit Resistor	Contact Type	Nominal Voltage	Current Draw on Alarm (mA)
B110LPA/B401BA	2-wire*	No	—	12/24VDC	10–130**
B110RLPA/B401RA/ B401BRA	2-wire*	Yes	—	24VDC	10–62
B112LPA/B402BA	4-wire	Yes	Form A&C	24VDC	17–36
B114LPA/B404BA	4-wire	Yes	Form A&C + A Supervisory	120VAC	75 mA AC Max
B116LPA/B406BA	2-wire*	No	Form C	24VDC	20–100**
B401A	2-wire*	No	—	12/24VDC	10–130**

\*Functionality contingent on panel compatibility    \*\*Must be limited by control panel    †Flangeless base

Relay Contact Ratings: Resistive or Inductive (60% power factor) load.

Form A: 2.0A at 30 VAC/DC

Form C: 0.6A at 110VDC, 2.0A at 30VDC  
1.0A at 125VAC, 2.0A at 30VAC

#### Junction Box Selection Guide\*

Base Model Number	Single Gang	3½" Octagon	4" Octagon	4" Square	50 mm	60 mm	75 mm
B401A	No	No	No	No	Yes	Yes	No
B110LPA/RLPA	Yes	Yes	Yes	Yes	No	No	No
B112LPA/B116LPA	Yes	Yes	Yes	Yes	Yes	Yes	Yes
B114LPA	No	No	Yes	Yes	No	No	No

\*Box depth contingent on base and wire size. Refer to Canadian Electrical Code or local applicable codes for appropriate recommendations.

### Ordering Information

Part No.	Description
2151A	Low-profile photoelectric detector. Must be mounted to one of the B100 Series or B400 Series bases listed in the Adapter Base Selection Guide.
2151TA	Low-profile photoelectric detector with thermal. Must be mounted to one of the B100 Series or B400 Series bases listed in the Adapter Base Selection Guide.

#### Accessories

RA400ZA	Remote annunciator for 2 or 4 wire systems, 3–32V. Fits standard single gang electrical box.
CESENS-RDRA	Hand-held sensitivity reader.
SMK400	Surface mounting kit provides for entry of surface wiring conduit. For use with B401 or B401R mounting bases only.
EOLR-1A	End of line relay for power supervision, 12/24 VDC systems.
M02-04-01	Test magnet.
M02-09-00	Test magnet with 32" telescoping handle.
XR-2B	Detector removal tool. Allows installation and/or removal of 100 Series detector heads from base in high ceiling installations when used with XP-4.
XP-4	Extension pole for XR-2B. Comes in three 5 ft. sections.
C58-227-01	Replacement dust cover for 100 Series smoke detectors.
RMK400	Recessed mounting kit (B401 sold separately).

