



REQUEST FOR PROPOSAL

Project Title: Cooley Laboratory Renovation
Location: Montana State University

PPA No.: 10-0023
RFP No.: 36
Date: 03/27/12

To: Dick Anderson Construction
4498 Jackrabbit Lane
Bozeman, MT 59718

Attention: Platisha

From: Cecilia Vaniman, Project Manager
Cooley Lab Renovation
Montana State University

Attention:

In order to expedite the Work and avoid or minimize delays in the Work the following proposal is requested. Please return a response by: 04/05/2012 Date Sent: 03/27/2012 Date Received:

Proposal Requested:

Reference Drawings: M2.0.2 through M2.5

Reference Specifications: 16721

Reference Submittals: Division 16721 Fire Alarm Shop Drawings

Provide the following:

- REMOVE (38) Division 15 provided duct smoke detectors located at each smoke/fire damper (including both internal and external type detectors). Maintain heat detector that was provided with each smoke/fire damper.
DELETE (38) Division 16 provided monitoring modules for Division 15 provided smoke detectors.
PROVIDE (38) System Sensor DNR series externally mounted duct smoke detector housings with (38) remote test switches #RTS151KEY and (37) sampling tubes #DST3 and (1) sampling tube #DST5. Install addressable smoke detector, Notifier #FSP-851R in each housing, 38 total. Install test switch on wall, directly under duct detector location, at +60" AFF. Upon detection of smoke, damper shall close and signal shall be sent to fire alarm panel. Provide additional wiring to fire alarm panel as required and provide conduit and wire to remote test switch for each detector.

This RFP is for pricing purposes only. The contractor shall not proceed with the scope of work described within until pricing is approved by the owner in writing.

Distribution: [ ] Owner [ ] Agency [x] Architect [x] Contractor [ ] Engineer [ ] Other

# FSP-851(A) Series

## Intelligent Plug-In Photoelectric Smoke Detectors with FlashScan®



Intelligent/Addressable Devices

### General

Notifier FSP-851(A) Series intelligent plug-in smoke detectors with integral communication provide features that surpass conventional detectors. Detector sensitivity can be programmed in the control panel software. Sensitivity is continuously monitored and reported to the panel. Point ID capability allows each detector's address to be set with rotary, decimal address switches, providing exact detector location for selective maintenance when chamber contamination reaches an unacceptable level. The FSP-851(A) photoelectric detector's unique optical sensing chamber is engineered to sense smoke produced by a wide range of combustion sources. Dual electronic thermistors add 135°F (57°C) fixed-temperature thermal sensing on the FSP-851T(A). The FSP-851R(A) is a remote test capable detector for use with DNR(A)/DNRW duct detector housings. FSP-851(A) series detectors are compatible with Notifier Onyx and CLIP series Fire Alarm Control Panels (FACPs).

**FlashScan®** (U.S. Patent 5,539,389) is a communication protocol developed by Notifier that greatly increases the speed of communication between analog intelligent devices. Intelligent devices communicate in a grouped fashion. If one of the devices in the group has new information, the panel's CPU stops the group poll and concentrates on single points. The net effect is response speed greater than five times that of earlier designs.

### Features

- Sleek, low-profile design.
- Addressable-analog communication.
- Stable communication technique with noise immunity.
- Low standby current.
- Two-wire SLC connection.
- Compatible with FlashScan® and CLIP protocol systems.
- Rotary, decimal addressing (1-99 on CLIP systems, 1-159 on FlashScan systems).
- Optional remote, single-gang LED accessory.
- Dual LED design provides 360° viewing angle.
- Visible bi-color LEDs blink green every time the detector is addressed, and illuminate steady red on alarm (*FlashScan systems only*).
- Remote test feature from the panel.
- Walk test with address display (an address on 121 will blink the detector LED: 12-[pause]-1 (*FlashScan systems only*)).
- Built-in functional test switch activated by external magnet.
- Built-in tamper-resistant feature.
- Sealed against back pressure.
- Constructed of off-white fire-resistant plastic, designed to commercial standards, and offers an attractive appearance.
- 94-5V plastic flammability rating.
- SEMS screws for wiring of the separate base.
- Optional relay, isolator, and sounder bases.

### Specifications

**Sensitivity:** 0.5% to 2.35% per foot obscuration

**Size:** 2.1" (5.3 cm) high; base determines diameter.

- **B210LP(A):** 6.1" (15.5 cm) diameter.
- **B501(A):** 4.1" (10.4 cm) diameter.
- **B200S(A):** 6.875" (17.46 cm) diameter.



FSP-851(A) in B210LP(A) Base

B210-2951.jpg

- **B200SR(A):** 6.875" (17.46 cm) diameter.
- **B224RB(A):** 6.2" (15.748 cm) diameter.
- **B224BI(A):** 6.2" (15.748 cm) diameter.

**Shipping Weight:** 5.2oz. (147g).

**Operating Temperature range:** FSP-851(A), 0°C to 49°C (32°F to 120°F). FSP-851T(A), 0°C to 38°C (32°F to 100°F). Low temperature signal for FSP-851T(A) at 45°F +/- 10°F (7.22°C +/- 5.54°C). FSP-851R(A) installed in a DNR(A)/DNRW, -20°C to 70°C (-4°F to 158°F).

**UL/ULC Listed Velocity Range:** 0-4000 ft/min. (1219.2 m/min.), suitable for installation in ducts.

**Relative Humidity:** 10%-93% noncondensing.

**Thermal Ratings:** Fixed-temperature setpoint 135°F (57°C).

### DETECTOR SPACING AND APPLICATIONS

Notifier recommends spacing detectors in compliance with NFPA 72. In low airflow applications with smooth ceiling, space detectors 30 feet (9.144m) for ceiling heights 10 feet (3.148m) and higher. For specific information regarding detector spacing, placement, and special applications refer to NFPA 72. *System Smoke Detector Application Guide*, document A05-1003, is available at [systemsensor.com](http://systemsensor.com)

### ELECTRICAL SPECIFICATIONS

**Voltage Range:** 15-32 volts DC peak.

**Standby Current (max. avg.):** 300µA @ 24VDC (one communication every five seconds with LED enabled).

**LED Current (max.):** 6.5mA @ 24 VDC ("ON").

### Installation

FSP-851(A) plug-in detectors use a separate base to simplify installation, service, and maintenance. A special tool allows maintenance personnel to plug in and remove detectors without using a ladder.

Mount base (all base types) on an electrical backbox which is at least 1.5" (3.81 cm) deep. For a chart of compatible junction boxes, see *DN-60054*.

**NOTE:** 1) Because of inherent supervision provided by the SLC loop, end-of-line resistors are not required. Wiring "T-taps" or branches are permitted for Style 4 (Class "B") wiring. 2) When using relay or sounder bases, consult the ISO-X(A) installation

sheet 156-1380 for device limitations between isolator modules and isolator bases.

## Agency Listings and Approvals

These listings and approvals apply to the modules specified in this document. In some cases, certain modules or applications may not be listed by certain approval agencies, or listing may be in process. *Consult factory for latest listing status.*

- **UL Listed:** S1115.
- **ULC Listed:** S1115 (FSP-851A, FSP-851RA, FSP-851TA).
- **MEA Listed:** 225-02-E .
- **FM Approved.**
- **CSFM:** 7272-0028:0206 .
- **Maryland State Fire Marshal:** Permit # 2122 .
- **BSMI:** CI313066760036.
- **CCCF:** Certif. # 2004081801000017 (FSP-851T)  
Certif. # 2004081801000016 (FSP-851).
- **U.S. Coast Guard:** 161.002/42/1 (NFS-640); 161.002/50/0 (NFS2-640/NFS-320/NFS-320C, excluding B210LP(A)).
- **Lloyd's Register:** 11/600013 (NFS2-640/NFS-320/NFS-320C, excluding B210LP(A)).

## Product Line Information

**NOTE:** "A" suffix indicates ULC Listed model.

**FSP-851:** Low-profile intelligent photoelectric sensor. Must be mounted to one of the bases listed below.

**FSP-851A:** Same as FSP-851 but with ULC listing.

**FSP-851T:** Same as FSP-851 but includes a built-in 135°F (57°C) fixed-temperature thermal device.

**FSP-851TA:** Same as FSP-851T but with ULC listing.

**FSP-851R:** Low-profile intelligent photoelectric sensor, remote test capable. For use with DNRA/DNRW.

**FSP-851RA:** Same as FSP-851R but with ULC listing. For use with DNRA.

## INTELLIGENT BASES

**NOTE:** "A" suffix indicates ULC Listed model.

**NOTE:** For details on intelligent bases, see DN-60054.

**B210LP(A):** Standard U.S. flanged low-profile mounting base.

**B210LPBP:** Bulk pack of B210LP; package contains 10.

**B501(A):** Standard European flangeless mounting base.

**B501BP:** Bulk pack of B501; package contains 10.

**B200S(A):** Intelligent, programmable sounder base capable of producing sound output in high or low volume with ANSI Temporal 3, ANSI Temporal 4, continuous tone, marching tone, and custom tone.

**B200SR(A):** Intelligent sounder base capable of producing sound output with ANSI Temporal 3 or continuous tone. Replaces B501BH series bases in retrofit applications.

**B224RB(A):** Plug-in System Sensor **relay** base. Screw terminals: up to 14 AWG (2.0 mm<sup>2</sup>). Relay type: Form-C. Rating: 2.0 A @ 30 VDC resistive; 0.3 A @ 110 VDC inductive; 1.0 A @ 30 VDC inductive.

**B224BI(A):** Plug-in System Sensor **isolator** detector base. Maximum 25 devices between isolator bases .

## ACCESSORIES

**F110:** Retrofit flange to convert B210LP(A) to match the B710LP(A) profile, or to convert older high-profile bases to low-profile.

**F110BP:** Bulk pack of F110; package contains 15.

**F210:** Replacement flange for B210LP(A) base.

**RA100Z(A):** Remote LED annunciator. 3 – 32 VDC. Mounts to a U.S. single-gang electrical box. For use with B501(A) and B210LP(A) bases only.

**SMB600:** Surface mounting kit

**M02-04-00:** Test magnet.

**M02-09-00:** Test magnet with telescoping handle.

**XR2B:** Detector removal tool. Allows installation and/or removal of detector heads from bases in high ceiling applications.

**XP-4:** Extension pole for XR2B. Comes in three 5-foot (1.524 m) sections.

**T55-127-010:** Detector removal tool without pole.

**BCK-200B:** Black detector covers for use with FSP-851(A) only; box of 10.

**WCK-200B:** White detector covers for use with FSP-851(A) only; box of 10.

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This document is not intended to be used for installation purposes.  
We try to keep our product information up-to-date and accurate.  
We cannot cover all specific applications or anticipate all requirements.  
All specifications are subject to change without notice.



Made in the U.S. A.

For more information, contact Notifier. Phone: (203) 484-7161, FAX: (203) 484-7118.  
[www.notifier.com](http://www.notifier.com)



# Intelligent Non-Relay Photoelectric Duct Smoke Detector

*The InnovairFlex™ Series are the only duct smoke detectors flexible enough to fit configurations from square to rectangular and everything in between.*

## Features

- Photoelectric, integrated low-flow technology (detector head sold separately)
- Air velocity rating from 100 ft/min to 4,000 ft/min
- Adjusts to square and rectangular mounting configurations
- Broad ranges for operating temperature (–4°F to 158°F) and humidity (0% to 95% non-condensing)
- Patented tool-free, plug-in sampling tubes
- New cover tamper signal
- Increased wiring space with a new 3/4-inch conduit knockout
- Housing has space for mounting a relay module
- Easily accessible code wheels on sensor head (sold separately)
- Clear cover for convenient visual inspection
- UL 268A listed
- Remote testing capability
- Requires com line power only
- NEMA Type 4 UL listed for non-hazardous indoor and outdoor applications (**DNRW only**)
- UV-resistant, UL-listed housing and cover material (**DNRW only**)



**Innovairflex™**

The **InnovairFlex Series DNR** and **DNRW** are intelligent (addressable) non-relay photoelectric duct smoke detectors. Like all InnovairFlex detectors, the DNR and DNRW both feature an adjustable housing design that fits square and rectangular installation footprints, mounts to both round and rectangular ductwork, and utilizes tool-free, plug-in sampling tubes for increased application flexibility and installation ease.

These units sense smoke in challenging conditions, operating in airflow speeds of 100 to 4,000 feet per minute, temperatures of –4°F to 158°F, and a humidity range of 0 to 95 percent (non-condensing). For even more extreme environments like rooftops, the DNRW's NEMA 4-rated watertight and UV-resistant housing protects against windblown dirt and dust, rain, and hose directed water, enabling it to be installed without a costly enclosure, saving time and money.

The InnovairFlex housing cover isolates the sensor head from the low-flow feature for simple maintenance, and a cover tamper feature initiates a trouble signal for a removed or improperly installed sensor cover. The housing also provides a 3/4-inch conduit knockout and ample space to facilitate easy wiring and mounting of a relay module to meet specific application requirements. These detectors can be customized to meet local codes and specifications without additional wiring.

The InnovairFlex line is compatible with all previous Innovair models, including remote test accessories, for easy retrofits.

**WARNING:** Duct smoke detectors have specific limitations.

## Agency Listings



## InnovairFlex Duct Smoke Detector Specifications

### Architectural/Engineering Specifications

The air duct smoke detector shall be a System Sensor InnovairFlex™ DNR Intelligent Non-Relay Photoelectric Duct Smoke Detector and DNRW Watertight NEMA 4 Duct Smoke Detector. The detector housing shall be UL listed per UL 268A specifically for use in air handling systems. The flexible housing of the duct smoke detector fits both square and rectangular footprints. The detector shall operate at air velocities of 100 ft/min to 4,000 ft/min (0.5 m/sec to 20.32 m/sec). The unit shall be capable of providing a trouble signal in the event that the sensor cover is removed or improperly installed. It shall be capable of local testing via magnetic switch or remote testing using the RTS151KEY remote test station. Terminal connections shall be of the strip and clamp method suitable for 12–18 AWG wiring.

### Physical Specifications

|                                     |   |
|-------------------------------------|---|
| <b>Size: (Rectangular)</b>          | 14.38 in (37 cm) Length; 5 in (12.7 cm) Width; 2.5 in (6.6 cm) Depth    |
| <b>(Square)</b>                     | 7.75 in (19.7 cm) Length; 9 in (22.9 cm) Width ; 2.5 in (6.35 cm) Depth |
| <b>Weight:</b>                      | 1.6 lb (0.73 kg)  |
| <b>Environmental Rating:</b>        | NEMA 4 (DNRW only)  |
| <b>Operating Temperature Range:</b> | –4°F to 158°F (–20°C to 70°C)   |
| <b>Storage Temperature Range:</b>   | –22°F to 158°F (–30°C to 70° C)   |
| <b>Operating Humidity Range:</b>    | 0% to 95% relative humidity (non-condensing)                            |
| <b>Air Duct Velocity:</b>           | 100 to 4,000 ft/min (0.5 to 20.32 m/s)                                  |
| <b>DCOIL (if included):</b>         | 17.5 – 26.4 VDC, 95 mA max  |

### Electrical Ratings

Please see detector head installation manual for electrical specifications

### Accessory Current Loads at 24 VDC

| Device           | Standby | Alarm      |
|------------------|---------|------------|
| RA100Z           | 0 mA    | 12 mA Max. |
| RTS151/RTS151KEY | 0 mA    | 12 mA Max. |

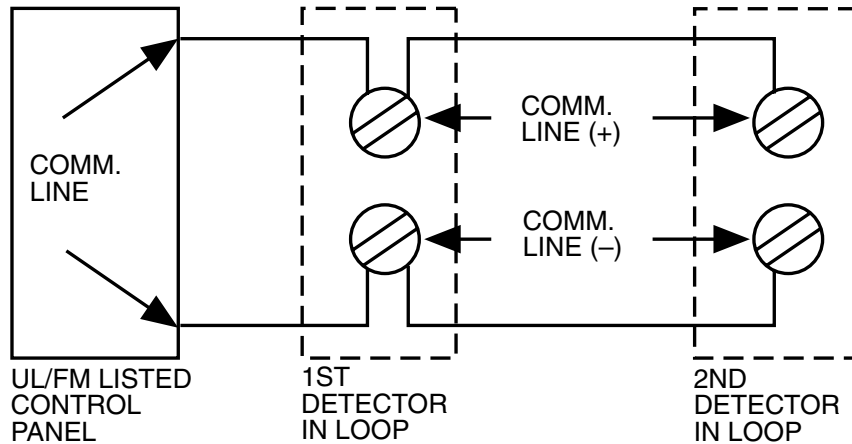
## Installing the InnovairFlex Sampling Tube

The InnovairFlex sampling tube may be installed from the front or back of the detector. The tube locks securely into place and can be removed by releasing the front or rear locking tab (front locking tab shown below right).

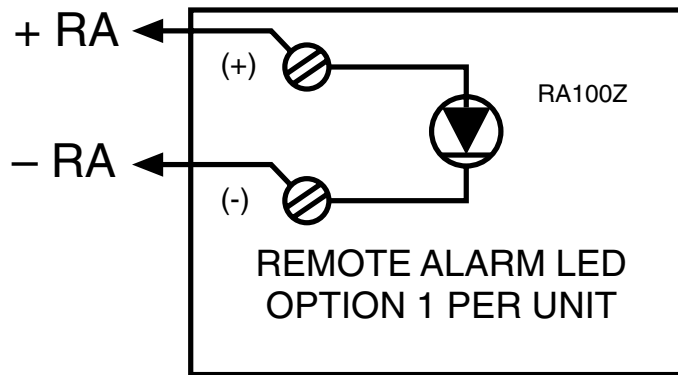


# Wiring for Intelligent Non-Relay Duct Smoke Detector

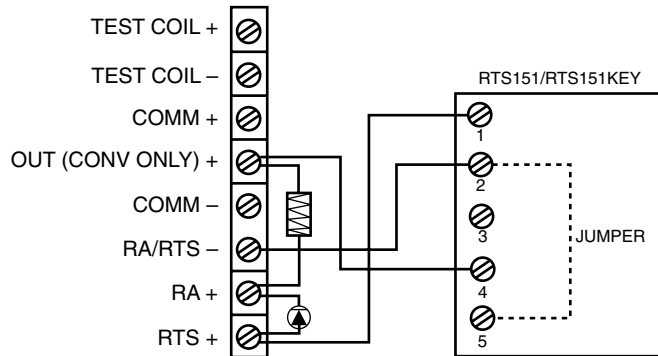
System wiring diagram for DNR:



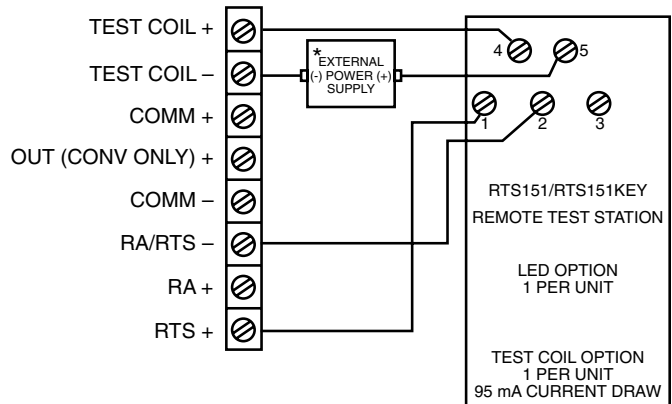
DNR to RA100Z:



DNR to RTS151/RTS151KEY with "R" Remote Test Capable Detector Head Option:



DNR to RTS151/RTS151KEY with DCOIL Option\*:



### \*Important Notes

- The use of either the RTS151 or RTS151KEY requires the installation of an accessory coil, DCOIL, sold separately. Please refer to the DNR or DNRW installation manual for more information.
- The RTS151/RTS151KEY test coil circuit requires an external 24 VDC power supply which must be UL listed.

## Accessories

System Sensor provides system flexibility with a variety of accessories, including two remote test stations and different means of visible and audible system annunciation. As with our duct smoke detectors, all duct smoke detector accessories are UL listed.



RTS151 UL S2522



RTS151KEY UL S2522



RA100Z UL S2522

## Ordering Information

| Part No.           | Description   |
|--------------------|---|
| DNR                | Intelligent non-relay photoelectric low-flow duct smoke detector            |
| DNRW               | Watertight intelligent non-relay photoelectric low-flow duct smoke detector |
| <b>Accessories</b> |   |
| DCOIL              | Remote test coil required with RTS451/RTS451KEY/RTS151/RTS151KEY            |
| DST1               | Metal sampling tube duct width up to 1ft (0.3m)                             |
| DST1.5             | Metal sampling tube duct widths 1 ft to 2 ft (0.3 to 0.6 m)                 |
| DST3               | Metal sampling tube duct widths 2 ft to 4 ft (0.6 to 1.2 m)                 |
| DST5               | Metal sampling tube duct widths 4 ft to 8 ft (1.2 to 2.4 m)                 |
| DST10              | Metal sampling tube duct widths 8 ft to 12 ft (2.4 to 3.7 m)                |
| P48-21-00          | End cap for metal sampling tubes  |
| ETX                | Metal exhaust tube duct width 1ft (0.3 m)                                   |
| M02-04-00          | Test magnet   |
| RA100Z             | Remote annunciator alarm LED  |
| RTS151             | Remote test station   |
| RTS151KEY          | Remote test station with key lock   |
| DH4000E-1          | Weatherproof enclosure  |



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