

# Intelligent Detection Devices

## Multi-Criteria Fire Detector Model FDOT421

### ARCHITECT AND ENGINEER SPECIFICATIONS

- Multi-criteria addressable fire detector that incorporates photoelectric and thermal sensors
- Compatible with device programmer / loop tester, Model DPU
- Responds to both flaming and smoldering-fire signatures
- Polarity insensitive utilizing *SureWire™* technology
- Tri-color detector status LED with 360° viewing
- Field-selectable application profiles
- Superior EMI immunity
- Remote sensitivity-measurement capability
- Compatible with DB-11 series mounting bases
- Each detector is self-testing:
  - complete diagnostics performed every 10 seconds
  - self monitored for sensitivity within @UL Listed limits
- Listed and approved as heat detector
  - Rate-of-Rise Detection: 15°F / min. (8.3°C / min); fixed 135°F (57°C)
- Restriction of Hazardous Substances (RoHS) compliant
- Automatic environment compensation
- @UL Listed and @ULC Listed; FM (#3230, 3210), CSFM (#7272-0067:0258) Approved



### Product Overview

The Model FDOT421 photoelectric detector incorporates both optical and thermal sensors, and uses signals in a neural network to create an intelligent multi-criteria detector. The encompassing result is a detector that provides enhanced detection to an array of products of combustion.

Model FDOT421 utilizes advanced, multi-criteria detection technology. The multi-criteria detector also has state-of-the-art microprocessor circuitry (with error check), as well as detector self-diagnostics and supervision programs that is used on Desigo Fire Safety 50-point (Model FC2005), 252-point (Model FC2025 / FV2025) and 504-point (Model FC2050 / FV2050) addressable fire alarm control panels (FACPs).

Additionally, Model FDOT421 is plug-in, addressable two-wire and multi-criteria detector (with both photoelectric and thermal inputs) that is compatible with FireFinder® XLS systems.

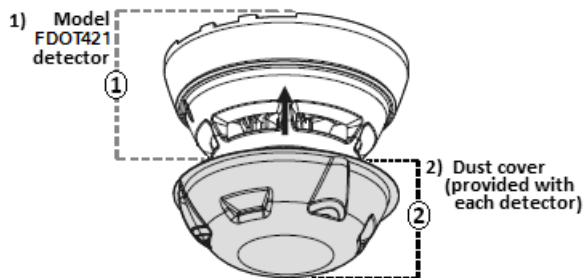
Model FDOT421 is compatible with the Siemens Fire Safety field-device programmer / test unit: Model DPU, which is a compact, portable and menu-driven accessory for electronically programming and testing detectors, easily and reliably.

Model DPU eliminates the need for cumbersome, unreliable mechanical programming methods, such as dials or switches, and reduces installation and service costs by electronically programming and testing the detector prior to installation.

**Multi-Criteria Fire Detector 6150**

## Product Overview – (continued)

Each detector consists of a dust-resistant photoelectric chamber; a solid state, non-mechanical thermal sensor, and microprocessor-based electronics with a low-profile plastic housing. Every Model FDOT421 fire detector is shipped with a protective dust cover:



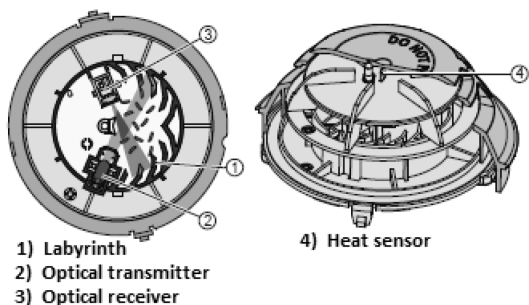
## Operation

Model FDOT421 utilizes an infrared light emitting diode (IRLED), and infrared light-sensing photodiode. Under normal conditions, light transmitted by the LED is directed away from the photodiode and scattered through the smoke chamber in a controlled pattern.

The smoke chamber is designed to manage light dissipation and extraneous reflections from dust particles or other non-smoke, airborne contaminants in such a way as to maintain stable, consistent detector operation. When smoke enters the detector chamber, light emitted from the IRLED is scattered by the smoke particles, and is received by the photodiode.

Model FDOT421 also utilizes a modern, accurate and shock-resistant thermistor to sense temperature changes.

The signal processing with detection algorithms allows the detector to first gather smoke and thermal data, and then analyze this information in the detector's 'neural network.' By comparing data received with the common characteristics of fires or fire signatures, Model FDOT421 can compare these signals to those of deceptive phenomena that cause other detectors to false alarm.



Each Model FDOT421 detector provides three (3) pre-programmed parameter sets that can be selected by the fire alarm control panel.

## Profile Overview

Model FDOT421 provides two (2) different alarm sources that can be selected individually (ON or OFF) by the FACP.

Alarm Source 1 (Neural Network) – Combines smoke – heat with the following selectable profiles:

- Sensitive
- Robust
- Standard

**Sensitive:** This parameter set is practically suitable for areas where few misleading sources of false alarm are present, and is appropriate where priority is given to detecting open fires as soon as possible (e.g. – typically a clean application with controlled environmental conditions.)

**Robust:** This parameter set offers improved resistance to false alarms in areas where misleading sources, such as cigarette smoke or exhaust fumes, may cause a nuisance alarm.

**Standard:** This parameter set is practically apt for normal office, hotel lobby type applications and is the default setting.

Alarm source 2 (Thermistor) – Heat only, provides the following:

- Static / fixed at 135°F (57°C), default setting
- Rate-of-Rise Detection: 15°F / min. (8.3°C / min)

If the detector is not programmed, Model FDOT421 will default to a 'standard' profile setting, which allows operation for a normal office-type environment.

Model FDOT421 contains a tri-color LED indicator, capable of flashing any one (1) of three (3) distinct colors: **GREEN**, **YELLOW**, or **RED**. During each flash interval, the microprocessor-based detector monitors the following:

- Smoke in its sensing chamber
- Smoke sensitivity is within the range indicated on the nameplate label
- Internal sensors and electronics

Based on the results of the monitoring, the LED indicator flashes the following:

Flash Color	Condition	Flash Interval (in seconds)
<b>Green*</b>	Normal supervisory operation. Smoke sensitivity is within rated limits.	10
<b>Yellow:</b>	Detector is in trouble and needs replacement.	4
<b>Red:</b>	Alarm condition.	1
<b>No Flash:</b>	Detector is not powered.	—

\* LED can be turned OFF.

Please follow the corresponding description of the panel used.

## Installation

All Model FDOT421 detectors use a surface-mounting base, Model DB-11 or Model DB-11E, which mounts on a 4-inch octagonal, square or single-gang electrical box. The base utilizes screw-clamp contacts for electrical connections and self-wiping contacts for increased reliability.

The Model DB-11 base can be used with the optional Model LK-11 detector locking kit, which contains 50 detector locks and an installation tool to prevent unauthorized removal of the detector head. Model DB-11 has decorative plugs to cover the outer mounting screw holes.

Model FDOT421 may be installed on the same initiating circuit with the Siemens Model 'H'-series detectors (Models HFP-11 and HFPT-11); Model 'HMS'-series manual stations; Model 'HTRI'-series interfaces; Model HCP output-control devices, or Model 'HZM'-series of addressable, conventional zone modules for FireFinder XLS control panels.

All Model FDOT421 detectors are approved for operation within the @UL-specified temperature range of 32° to 100°F (0° to 38°C).

### Model DPU

The Device Program / Test Unit accessory is used to program and verify the address of the detector. The technician selects the accessory's program mode, and enters the desired address. Model DPU automatically sets and verifies the address and tests the detector.

Model DPU operates on AC power or rechargeable batteries, providing flexibility and convenience in programmer and testing equipment from practically any location.

When in the test mode, Model DPU will perform a series of diagnostic tests without altering the address or other stored data, allowing technicians to determine if the detector is operating properly.

### Application Data

Installation of the Model FDOT421 series of fire detectors requires a two-wire circuit. In many retrofit cases, existing wiring may be used. 'T-tapping' is permitted only for 'Style 4' (Class B) wiring. Model FDOT421 is polarity insensitive, which can greatly reduce installation and debugging time.

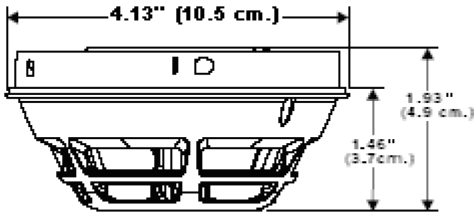
Model FDOT421 fire detectors can be applied within the maximum 30-foot center spacing (900 sq. ft. areas,) as referenced in NFPA 72. This application guideline is based on ideal conditions, specifically, smooth ceiling surfaces, minimal air movement, and no physical obstructions between potential fire sources and the actual detector. Do not mount detectors in close proximity to ventilation or heating and air-conditioning outlets. Exposed joints or beamed ceilings may also affect safe spacing limitations for detectors.

Should questions arise regarding detector placement, observe NFPA 72 guidelines. Good fire-protection system engineering and common sense dictate how and when fire detectors are installed and used. Contact your local Siemens Industry – Fire Safety distributor or sales office whenever you need assistance applying Model FDOT421 in unusual applications. Be sure to follow NFPA guidelines and @UL Listed / @ULC Listed installation instructions – included with every Siemens – Fire Safety detector – and local codes as for all fire protection equipment.

### Technical Data

<b>Operating Temperatures:</b>	+32°F (0°C) to 100°F (38°C)
<b>Relative Humidity:</b>	0-95%; non-condensing
<b>Air Velocity:</b>	0 – 4,000 ft. / min (0 - 20m / sec)
<b>Air Pressure:</b>	No effect
<b>Maximum Spacing:</b>	30-foot centers (900 sq. ft.), per NFPA 72 and @ULC-S524 Listed
<b>Input Voltage Range:</b>	16VDC – 30VDC
<b>Alarm Current:</b>	280µA, max.
<b>Standby Current:</b>	280µA, max. (average)
<b>Thermal Rating:</b>	<ul style="list-style-type: none"><li>Fixed-temperature set point: 135°F (57°C)</li><li>Rate-of-Rise Detection: 15°F / min. (8.3°C / min)</li></ul>
<b>Detector Weight:</b>	0.317 lbs. (0.144 kg.)
<b>Mechanical Protection Guard:</b>	@UL Listed / @ULC Listed with STI Guard Model STI-9604

## Mounting Diagram Dimensions



## Compatible Panels

Model	Data Sheet Number	Description
—	6300	FireFinder XLS
FC2005	6813	50-point addressable FACP
FC2025	6815	252-point addressable FACP
FC2050	6815	504-point addressable FACP
FV2025	6821	252-point addressable intelligent voice communication system
FV2050	6821	504-point addressable intelligent voice communication system

## Details for Ordering

Model	Part Number	Description
FDOT421	S54320-F6-A1	Addressable Multi-Criteria Fire Detector
DB-11	500-094151	Detector Mounting Base for Series 11
DB-11E	500-094151E	Detector Base {small}
RL-HC	500-033230	Remote Alarm Indicator: 4" octagon-box mount, <b>red</b>
RL-HW	500-033310	Remote Alarm Indicator: single-gang box mount, <b>red</b>
LK-11	500-695350	Base Locking Kit for Series 11 Detectors

STI-9604	—	STI Mechanical Protection Guard
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See: [www.STI-USA.com](http://www.STI-USA.com) for further details on ordering Model STI-9604.

## In Canada, order:

Model	Part Number	Description
DB-11C	500-095687	Detector Mounting Base for Series 11 Detectors (®ULC Listed)

**Notice:** This marketing data sheet is not intended to be used for system design or installation purposes. For the most up-to-date information, refer to each product's installation instructions.