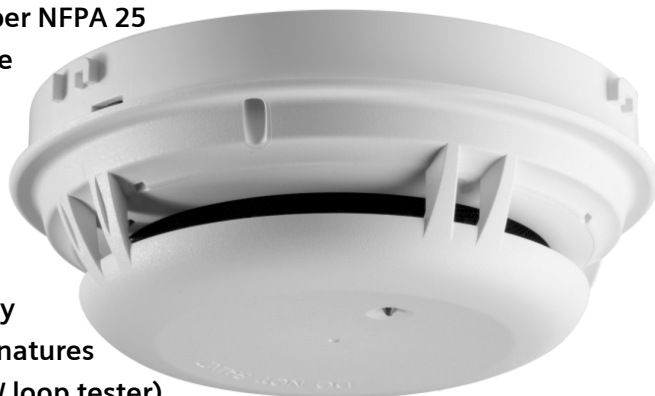


# Intelligent Detection Devices

## Multi-Criteria Fire Detector [with ASAtechnology™] Model FDOOT441

### ARCHITECT AND ENGINEER SPECIFICATIONS

- Advanced multi-criteria fire detector that has dual-optical and thermal sensors
- Differentiates between deceptive phenomena and an actual fire (nuisance-alarm avoidance)
- Provides enhanced detection via forward-and-backward light-scattering technology
- Complies with NFPA 76 (Telco standard) as 'VEWFD' high-sensitivity detector
- ®UL Listed and FM Approved as a multi-criteria and 'VEWFD' fire detector
- Compatible with Siemens Model 'H'-series devices on the same loop (with Desigo fire-alarm control panels [FACPs] or FireFinder® XLS FACPs)
- Low-temperature warning for sprinkler systems, per NFPA 25
- ®UL 268A Listed for direct air-duct (4,000 FPM) use
- Supervisory temperature-monitoring feature
- Remote sensitivity-measurement capability
- Automatic environment compensation
- Up to 22 application profiles
- Tri-color detector status LED with 360° viewing
- Polarity insensitive utilizing SureWire™ technology
- Responds to both flaming and smoldering-fire signatures
- Compatible with Model DPU (device programmer / loop tester)
- Environmentally efficient alternative to ionization detectors
- Meets guidelines (®UL, NFPA 72) for sensitivity self-monitoring
- Compatible with legacy Model DB-11-series mounting bases
- Restriction of Hazardous Substances (RoHS) compliant



- ®UL 268 compliant
- ®UL Listed and ®ULC Listed; FM (#3230, 3210), CSFM (#7272-0067:0258) Approved

### Product Overview

The Model FDOOT441 is an advanced, multi-criteria fire detector that incorporates a redundant, optical / thermal sensor. Model FDOOT441 uses a unique forward / backward light-scattering technology providing state-of-the-art, unparalleled fire detection to the widest range of fire types.

Model FDOOT441 is programmable as a high-sensitivity detector, and meets the requirements of NFPA 76 Standard (*for the Fire Protection of Telecommunications Facilities*) as a Very Early Warning Fire Detector (VEWFD).

The Model FDOOT441 detector is a flexible multi-purpose detector providing all solutions to meet detection needs. The detector can be field programmed for simultaneous and or independent functionality, depending upon the exact customer and application requirements.

For example the detector can utilize the optical and heat sensors together for enhanced fire detection (multi-criteria) and simultaneously provide independent output for heat detection. The detector is extremely versatile and meets the following standards:

## Product Overview — (continued)

- Multi-criteria fire detector (©UL 268)
- Heat detector (©UL 521) with five (5) possible field-selectable temperatures; combined with four (4) rate-of-rise options
- Direct in-duct (plenum) detector (©UL 268A)
- Supervisory monitoring for temperature ranges
- NFPA 76 (Telco Standard) as VEWFD
- Low-temperature warning signal at 40°F (4.4°C)
  - for sprinkler systems, per NFPA 25 / NFPA 72

Model FDOOT441 — which provides extremely accurate and reliable detection with built-in redundancy — utilizes advanced, multi-criteria detection technology known as **ASA** (Advanced Signal Analysis) that allows the detector to distinguish non-threatening deceptive phenomena.

For instance, the signals from the detector's sensors are monitored and processed via the **ASA** patented-algorithm technology, which combines the signals into a neural network to create an intelligent, multi-criteria detector.

The encompassing result is a detector that provides enhanced detection to a wide range of products of combustion, while offering unsurpassed rejection to nuisance-alarm sources, such as: dust, steam, aerosols and other deceptive phenomena that could cause false alarms.

Since Model FDOOT441 is a (2) two-wire, addressable device, it is able to function as a multi-purpose detector — satisfying smoke and heat detection in a singular, aesthetically pleasing package. Further, Model FDOOT441 serves as an extremely cost-effective, sensible solution that saves product, installation and maintenance costs (compared to other multiple detector alternatives). Each detector fits into one (1) wall-or-ceiling footprint, and only occupies one (1) address on the signal-line circuit (SLC).

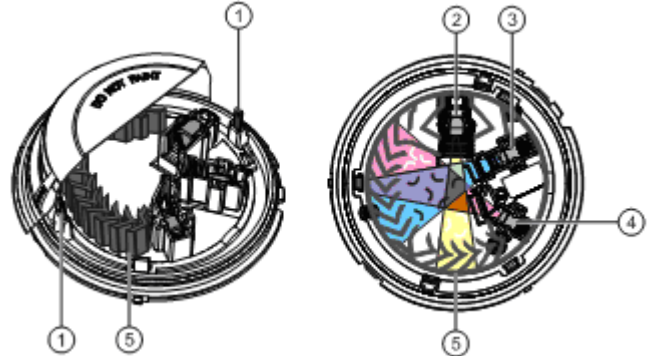
A patented forward / backward, light-scattering technology — which is able to distinguish both small and large products of combustion — operates at the core of each Model FDOOT441 detector.

Additionally, each Model FDOOT441 provides an environmental-friendly solution to ionization detectors, eliminating the need for a radioactive source and eventual disposal requirements. Thus, each detector is capable of detecting both smoldering and flaming fire — all in ecologically efficient manner — and is a valid, RoHS-compliant detection alternative to ionization detectors.

Two (2) thermal sensors make each Model FDOOT441 detector a robust, reliable device suitable for the most challenging applications.

## Operation

### Forward / Backward Light-Scattering Technology



1. **Heat sensors**
2. **Receiver**
3. **Backward scatterer**
4. **Forward scatterer**
5. **Labyrinth**

The high-quality, optical-electronic measuring chamber for each Model FDOOT441 houses the following components:

- ✓ Two (2) optical transmitters
- ✓ One (1) optical receiver
- ✓ Two (2) thermal sensors

The transmitters illuminate the smoke particles from different angles: one sensor acts as forward scatterer, the other sensor as a backward scatterer. The scattered light then hits the receiver (photodiode) and generates a measurable electric signal. The combination of a forward-and-backward scatterer facilitates optimum detection, as well as differentiates between light-and-dark particles / particle size.

This type of detection creates standardized, responsive behavior and optimizes the differentiation between wanted signals and deceptive phenomena.

In addition, the heat sensors make it possible to detect fires without smoke generation:

- ✓ Early detection of all fire types of fire — whether they generate light-or-dark smoke, or no smoke
- ✓ The fire detector can be operated at a lower sensitivity level, thus achieving a higher immunity against false alarms that may otherwise be caused by cold aerosols (e.g. — by smoking, electrical welding, etc.)

In the case of an open fire, the smoke sensitivity, which is heightened by a temperature increase — a detection-reliability level that is comparable to a wide-spectrum smoke detector — can be achieved and maintained.

## Operation — (continued)

### Model DPU

Model FDOOT441 is compatible with the Device Program / Test Unit accessory, which 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 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.

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

When in '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.

### Field-selectable application profiles

Model FDOOT441 provides 22 user-friendly, field-selectable application profiles, identified with universally known names (e.g. — Hotel, Telco, Office, Parking Garage, Dormitory, and Data Center etc.) Refer to installation manual: **P/N — A6V10324655** for a complete list and description of application profiles.

Due to generic-name classification, no cross-reference tables are required as the application name resides in the panel's configuration tool. This user-friendly feature — along with the algorithms provided by **ASAtechnology** — provides a reliable, field-configurable detector suitable for an array of applications.

### Field-selectable temperature settings

Model FDOOT441 provides five (5) field-selectable temperature thresholds, ranging from 135°F to 175°F (57°C to 79°C), with fixed and rate-of-rise options. The aforementioned ranges provide the customer with maximum flexibility to program and easily adjust the temperature settings to suit multiple application needs within a building or changing environmental conditions.

Additionally, Model FDOOT441 can be configured to provide a low temperature warning signal at 40°F (4.4°C). This configuration (along with connection to a compatible FACP) meets NFPA 72 requirements for sprinkler-temperature monitoring, and serves as prevention of water freezing in pipes for water-based suppression systems.

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### Ambient supervisory feature for temperature

Another highlight for Model FDOOT441 is supervision of ambient temperatures, allowing the end user to set a unique, specified warning point at a customized temperature threshold ranging from -4°F to 120°F (-20°C to 49°C). This feature is practical for monitoring of machinery; special processes, or for environments where maintaining a temperature is critical as an early-warning supervisory signal.

### Self-monitoring for smoke-sensor sensitivity

Model FDOOT441 provides an automatic self-monitoring sensitivity check that suits the NFPA 72 sensitivity requirements. When connected with a compatible FACP, Model FDOOT441 detects automatic-and-dynamic sensitivity verification within the agency-listed-and-approved limits. Besides checking for sensor integrity and automatic environmental compensation, Model FDOOT441 provides a display and report of sensitivity in percent-per-foot (or percent-per-meter) at the FACP.

### Profile Overview

The Model FDOOT441 detector 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 FDOOT441 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.

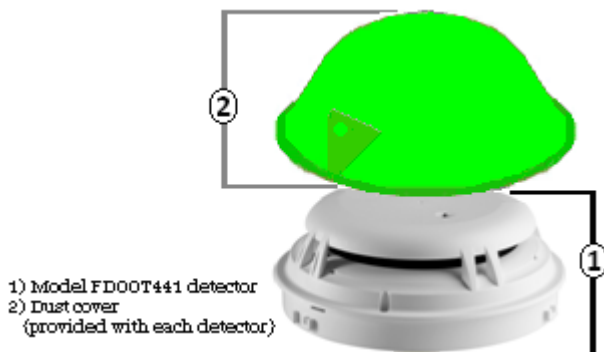
The Model DB-11 base can be used with the optional Model LK-11 detector locking kit, which contains 50 detector locks and an installation tool to prevent unauthorized removal of the detector head. Model DB-11 has decorative plugs to cover the outer mounting screw holes.

Model FDOOT441 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.

Each detector consists of the following:

- Dust-resistant photoelectric chamber
- Solid state, non-mechanical thermal sensor
- Microprocessor-based electronics with a low-profile plastic housing

Each Model FDOOT441 fire detector is shipped with a protective dust cover:



All Model FDOOT441 detectors are approved for operation within the @UL-specified temperature range of 32° to 120°F (0° to 49°C) – depending on heat-detector configuration (see to installation manual: P/N A6V10324655) for details.

## Application Data

Installation of the Model FDOOT441 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 FDOOT441 is polarity insensitive, which can greatly reduce installation and debugging time.

Model FDOOT441 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 – Fire Safety distributor or sales office whenever you need assistance applying Model FDOOT441 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

### Operating

**Temperatures:** +32°F (0°C) to 120°F (49°C)  
*depending upon heat-detector configurations*  
*(see to installation manual: P/N A6V10324655) for details*

### Heat-Detector

**Range:** +135°F (57°C) to 175°F (79°C)

### Thermal Ratings:

#### FDOOT441 Field-Selectable Temperature Profiles

|  |
|--|
| Fixed Temperature, 135°F                             |
| Fixed Temperature, 145°F                             |
| Fixed Temperature, 155°F                             |
| Fixed Temperature, 165°F                             |
| Fixed Temperature, 175°F                             |
| Fixed Temperature, 135°F + Rate-of-Rise (R-o-R) 15°F |
| Fixed Temperature, 175°F + Rate-of-Rise (R-o-R) 15°F |
| Fixed Temperature, 135°F + Rate-of-Rise (R-o-R) 20°F |
| Fixed Temperature, 175°F + Rate-of-Rise (R-o-R) 20°F |

#### Field-Selectable, Alarm-Threshold Setting Profiles

|                                  |
|----------------------------------|
| 2.5 % / ft. threshold            |
| 3.0 % / ft. threshold            |
| 2.5 % / ft. threshold (verified) |
| 3.0 % / ft. threshold (verified) |

**Detector Sensitivity Range:** @UL: 0.77% to 3.82% / ft.  
 NFPA 76 (Telco) VEWFD:  
 0.2% / ft. *Pre-alarm*,  
 1.0% / ft. *Alarm*

**Application Profiles:** 22 (field configurable)

### Programmable Supervisory Temperature Warning

*available with compatible FACPs:*

-4°F (-20°C) to 120°F (49°C)

**Relative Humidity:** 0-95%; non-condensing

### Air Velocity –

**(Open Area):** 0–4,000 feet-per-minute (fpm)

**Direct-in-Duct:** 0–4,000 (fpm)

**Air Pressure:** No effect

**Maximum Spacing:** 30-foot centers (900 sq. ft.),  
 per NFPA 72 and @ULC-S524  
 Listed

**Input Voltage Range:** 13VDC – 32VDC

**Alarm Current:** 650 µA, max.

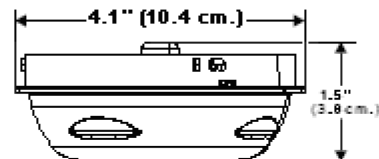
**Quiescent (Standby) Current:** 280 – 360 µA

**Detector Weight:** 0.281 lbs. (0.128 kg.)

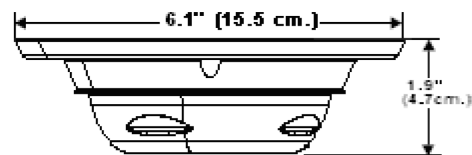
### Approvals / Standards:

FM 3210, 3230  
 CSFM 7272-0067:0260  
 @UL 268 NFPA 25  
 @UL 268A NFPA 72  
 @UL 521 NFPA 76  
 @ULC-S524 Listed

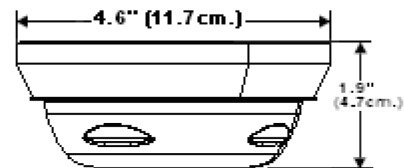
### Mounting Diagram Dimensions



Model FDOOT441



Model FDOOT441  
 [with Model DB-11 base]



Model FDOOT441  
 [with Model DB-11E base]

## Compatible FACP's

| Model  | Data Sheet Number | Description  |
|--------|-------------------|--|
| —      | 6300              | FireFinder® XLS (system overview)                                  |
| FC2005 | 6813              | 50-point addressable panel   |
| FC2025 | 6815              | 252-point system (networkable)                                     |
| FC2050 | 6815              | 504-point system (networkable)                                     |
| FV2025 | 6821              | 252-point addressable intelligent voice-communication system (IVC) |
| FV2050 | 6821              | 504-point addressable intelligent voice-communication system (IVC) |

## Details for Ordering

| Model    | Part Number   | Description   |
|----------|---------------|---|
| FDOOT441 | S54320-F7-A1  | Multi-Criteria Fire Detector with <b>ASA</b> technology™  |
| DB-11    | 500-094151    | Detector Mounting Base for Series 11                      |
| DB-11E   | 500-094151E   | Detector Base {small}                                     |
| DB2-HR   | S54370-F12-A1 | Detector Mounting Base with Relay                         |
| 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 |
|----------|---|---------------------------------|

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.