SIEMENS

Fire Safety & Se

Reviewed for Code Compliance
Inspections Division
Approved with Conditions

Date: 06/03/13

Intelligent Detection Dev

Photoelectric Smoke Detector

Model OP921

ARCHITECT AND ENGINEER SPECIFICATIONS

- Compatible with Siemens Model 'H'-series devices on the same loop (with Model FC9–series fire-alarm control panels)
- Compatible with Model 8720 / DPU (device programmer / loop tester)
- Utilizes advanced microprocessor-based signal processing
- Extended temperature and humidity operating range
- Each detector is self-testing:
  - self monitored for sensitivity within ℗UL Listed limits
  - complete diagnostics performed every 10 seconds
- Polarity insensitive utilizing *SureWire*™ technology
- Compatible with Model DB-11–series mounting bases
- Tri-color detector status LED with 360° viewing
- Field-selectable application sensitivity profiles
- Remote sensitivity-measurement capability
- Utilizes advanced signal processing
- Superior EMI / RFI immunity
- RoHS compliant

- Automatic environment compensation
- ℗UL268A Listed [for direct air-duct use], ℗ULC Pending; CSFM Approved

Product Overview

The Model OP921 Photoelectric Smoke Detector uses state-of-the-art microcontroller circuitry and surface-mount technology for maximum reliability. Model OP921 incorporates an optical sensor using a light-scattering detection principle. The device utilizes advanced software algorithms to analyze the signals, and provides highly stable and accurate smoke detection.

Further, Model OP921 uses state-of-the-art microprocessor circuitry with error check; detector self-diagnostics, and supervision programs.

Field-Device Programmer

Model OP921 is compatible with the Siemens – Fire Safety field-device programmer / test unit (Model 8720 / DPU), which is a compact, portable and menu-driven accessory for electronically programming and testing detectors easily and reliably.

Model 8720 / 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.

For proper operation of Model 8720 / DPU, the technician selects the accessory's program mode, and enters the desired address. In turn, Model 8720 / DPU automatically sets and verifies the address, as well as tests the detector. When in the 'test' mode, Model 8720 / 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.

Model 8720 / DPU operates on AC power or rechargeable batteries, providing flexibility and convenience in programming and testing equipment from practically any location.

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Product Overview — (continued)

Model OP921 is a plug-in, two-wire and addressable photoelectric smoke detector. Model OP921 is ®Underwriters' Laboratories Listed [®UL268A Listed for direct in-air duct usage].

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 OP921 fire detector is shipped with a protective dust cover:

1. Dust cover
2. Thermal detector

Operation

Model OP921 is a wide-spectrum, photoelectric smoke detector incorporating 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:

1. Labyrinth
2. Optical transmitter
3. Optical receiver

Sensitivity Settings

Application Parameter Sets

Model OP921 provides four (4) pre-pr parameter sets that can be selected by expected application or environmenta

- Sensitive
- Standard
- Robust
- Air-duct

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***Sensitive*:** This application 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.)

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

***Robust*:** This application 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.

Air-Duct: This application parameter set is used when the detector is used a ®UL268A (DI) compliant direct in-air duct application without a duct housing.

Model OP921 does not require a field sensitivity test. Model OP921 is ®UL Listed as a self-testing device and complies with NFPA 72 as a self monitoring detector and control panel arrangement. Additionally, this parameter set is also used when Model OP921 is used in air-duct housings (Models FDBZ492 and FDBZ492-HR).

The visible LED flashes green every 10 seconds to indicate communication with the FACP, and to notify Model OP921 has passed its self-test. Should Model OP921 sense a fault or failure within its system, the LED will flash amber, and the detector will transmit the data to the FACP.

A quick visual inspection is sufficient to indicate the condition of Model OP921 at any time. If more detailed information is required, a printed report can be provided from the compatible FACP, indicating the status and settings assigned to each individual detector. When Model OP921 moves to the *alarm* mode, the detector will flash red and continue flashing until the system is reset at the FACP. At that same time, any user-defined, system-alarm functions programmed into the system are activated.

Model OP921 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 sensitivity is within the range indicated on the nameplate label
- Smoke in its sensing chamber
- Internal sensors and electronics are functional

Operation — (continued)

Based on the monitoring results, the LED indicator flashes the following colors based on the following conditions:

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

* LED can be turned OFF.
Please follow the corresponding description of the panel used.

A quick visual inspection is sufficient to indicate the condition of the detector at any time. If more detailed information is required, a printed report can be provided from the Model FC9-series FACPs indicating the status and settings assigned to each individual detector.

Installation

All Model OP921 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 OP921 may be installed on the same initiating circuit with the following Siemens Model 'H'-series detectors [when used with the Model FC9-series of FACPs] —

- Model HFP-11
- Model 'HMS'-series manual stations
- Model 'HTRI'-series interfaces
- Model HCP output-control devices
- Model 'HZM'-series of addressable, conventional zone modules

Application Data

Installation of Model OP921 detectors requires a (2) two-wire circuit. In many retrofit cases, existing wiring may be used. 'T-tapping' is permitted only for Style 4 (Class B) wiring. Model OP921 is polarity insensitive, which allows a substantial reduction in installation and debugging time.

Model OP921 can be applied within the maximum 30-feet 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 dete
NFPA 72 guidelines. Good fire-protect
and common sense dictate how and v
installed and used. Contact your local
Safety distributor or sales office whene
applying Model OP921 in unusual app
follow NFPA guidelines and ®UL Listed / ®ULC Pending
installation instructions — included with every Siemens – Fire Safety detector — and local codes as for all fire protection equipment.

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Technical Data

Operating Temperature Range: +32°F (0°C) to 120°F (49°C)

Relative Humidity: 0 — 95%; non-condensing

Air Pressure: No effect

Air Velocity: 0 — 4,000 ft. / min (0-20m / sec)

Input Voltage Range: 16VDC — 30VDC

***Alarm* Current (max.):** 410µA

Standby Current (max.): 250µA, max. (average)

Maximum Spacing: 30-foot centers (900 sq. ft.), per NFPA 72

Detector Weight:
0.317 Lbs. (0.144 Kg.)

Mechanical Protection Guard:
®UL Listed /®ULC Pending
with STI Guard Model STI-9604

Mounting Diagram
Dimensions

FACP Compatibility Table

Model Number	Description
FC901	50-point panel
FC922	252- point panel (networkable)
FC924	504-point panel (networkable)

Details for Orde

Model Number	Part Number	
OP921	S54320-F4-A2	Photoelectr
DB-11	500-094151	Detector M
DB-11E	500-094151E	Detector Ba
DB2-HR	S54320-F12-A1	Relay Base
RL-HC	500-033230	Remote Alarm Indicator: 4" octagon-box mount, red
RL-HW	500-033310	Remote Alarm Indicator: Single-gang box mount, red
FDBZ492	S54319-B22-A1	Addressable Air-Duct Housing
FDBZ492-HR	S54319-B23-A1	Addressable Air-Duct Detector with Relay
LK-11	500-695350	Base Locking Kit

In Canada, order:

Model Number	Part Number	Description
DB-11C	500-095687	Detector Mounting Base for ULC (pending)

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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.

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