



# Watertight 4-Wire 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

- NEMA Type 4 UL listed for non-hazardous indoor and outdoor applications
- UV Resistant, UL listed housing and cover material
- Photoelectric, integrated low-flow technology
- Air velocity rating from 100 ft/min to 4,000 ft/min (0.5 m/s to 20.32 m/sec)
- Versatile mounting options: square or rectangular configuration
- Plug-in sensor offers superb false alarm immunity and the latest sensor technology
- Broad ranges for operating temperature (-4°F to 158°F) and humidity (0% to 95% non-condensing)
- Patented sampling tube installs from front or back of the detector with no tools required
- Increased wiring space with a newly added 3/4-inch conduit knockout
- One easy-access Test/Reset button and improved LED status
- Patented interconnect feature for multi-fan shutdown
- New high contrast terminal designations
- Built-in short circuit protection from operator wiring errors
- Field selectable settings for configuring the detector
- Two DPDT Form-C relay contacts
- 24 VAC/DC or 120VAC
- Backward compatibility with existing Innovair products, including remote accessories

## Agency Listings



**Innovairflex™**

**The InnovairFlex D4120W** watertight 4-wire photoelectric duct smoke detector is UL listed as a watertight enclosure providing protection against falling dirt, rain, windblown dust, splashing and hose directed water. D4120W duct smoke detector features a pivoting housing that fits various applications: both square and rectangular footprints mount to round or rectangular ductwork.

This unit senses smoke in the most 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). A plug-in sensor head offers superior false alarm immunity. These features, plus a NEMA 4 rating, allow operators to mount the detector to rooftop HVAC equipment or use the detector in other harsh environments.

The new design provides the same form, fit, and wiring terminations as the standard InnovairFlex unit. Superior test and operational features added to the standard model are also available in this watertight unit. As the only watertight duct smoke detector on the market, D4120W provides unsurpassed environmental protection while simplifying installation, testing, and maintenance.

This InnovairFlex duct smoke detector can be customized to meet local codes and specifications without additional wiring. The new InnovairFlex product line is compatible with all previous Innovair models, including remote test accessories.

**WARNING:** Duct smoke detectors are **NOT** a substitute for open area smoke detectors; **NOT** a substitute for early warning detection; **NOT** a replacement for a building's regular fire detection system. Refer to NFPA 72 and 90A for additional information.

**NOTE:** To maintain the watertight properties of this duct smoke detector, watertight conduit and fittings must be used. Mount the product with the conduit holes facing downwards, if possible

# InnovairFlex Duct Smoke Detector Specifications

## Architectural/Engineering Specifications

The air duct smoke detector shall be a System Sensor InnovairFlex™ D4120W Watertight NEMA4 Photoelectric 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 multiple footprints from square to rectangular. The detector shall operate at air velocities of 100 feet per minute to 4000 feet per minute (0.5 to 20.32 meters/second). The unit shall be capable of controlling up to 50 air handling systems when interconnected with other detectors. The detector shall be capable of providing a trouble signal in the event that the front cover is removed. It shall be capable of local testing via magnetic switch, test button on the cover, or remote testing using the SSK451 Multi-Signaling Accessory or the RTS451KEY Remote Test Station. Terminal connections shall be of the strip and clamp method suitable for 12–18 AWG wiring.

## Physical Specifications

**Size: (Rectangular Dimensions)** 14.38 in (37 cm) Length; 5 in (12.7 cm) Width; 2.5 in (6.36 cm) Depth  
**(Square Dimensions)** 7.75 in (19.7 cm) Length; 9 in (22.9 cm) Width; 2.5 in (6.35 cm) Depth

**Weight:** 2.5 lbs (1.14 kg)

**Operating Temperature Range:** –4° to 158°F (–20° to 70°C)

**Storage Temperature Range:** –22°F to 158°F (–30°C to 70°C)

**Operating Humidity Range:** 0% to 95% relative humidity non-condensing

**Air Duct Velocity:** 100 to 4000 ft/min (0.5 m/sec to 20.3 m/sec)

**NEMA Enclosure Rating:** Type 4 – Watertight Indoor/Outdoor

## Electrical Ratings

**Power supply voltage:** 20–29 VDC 24 VAC 50–60 Hz 120 VAC 50–60 Hz

**Input capacitance:** 270 μF max 270 μF max N/A

**Reset voltage:** 3.0 VDC min 2.0 VAC min 10 VAC min

**Reset time: (with RTS451)** .03 to 0.3 sec .03 to 0.3 sec .03 to 0.3 sec

**Reset time: (by power down)** 0.6 sec max 0.6 sec max 0.6 sec max

**Power up time:** 35 sec max 35 sec max 35 sec max

**Alarm response time:** 15 sec 15 sec 15 sec

**Sensitivity Test:** See detector label See detector label See detector label

## Current Requirements: (Using No Accessories)

**Max. standby current:** 21 mA @ 24 VDC 65 mA RMS @ 24 VAC 60 Hz 20 mA RMS @ 120 VAC 60 Hz

**Max. alarm current:** 65 mA @ 24 VDC 135 mA RMS @ 24 VAC 60 Hz 35 mA RMS @ 120 VAC 60 Hz

## Contact Ratings

**Alarm initiation contacts: (SPST)** 2.0A @ 30 VDC (resistive)

**Alarm auxiliary contacts: (DPDT)** 10A @ 30 VDC; 10A @ 250 VAC; ½ HP @ 240VAC; ¼ HP @ 120VAC

Note: Alarm auxiliary contacts shall not be connected to initiating circuits of control panels. Use the alarm initiation contact for this purpose.

**Supervisory contacts: (SPDT)** 2.0A @ 30 VDC (resistive); 2.0A @ 125 VAC (resistive)

## Accessory Current Loads at 24 VDC

Device	Standby	Trouble	Alarm
APA451	12.5 mA	N/A	30 mA Max
MHR/MHW	0 mA	N/A	29 mA Max
RA400Z	0 mA	N/A	12 mA Max
RTS451	0 mA	N/A	12 mA Max
RTS451KEY	12 mA	N/A	12 mA Max
SSK451	8 mA Max	16 mA Max	40 mA Max

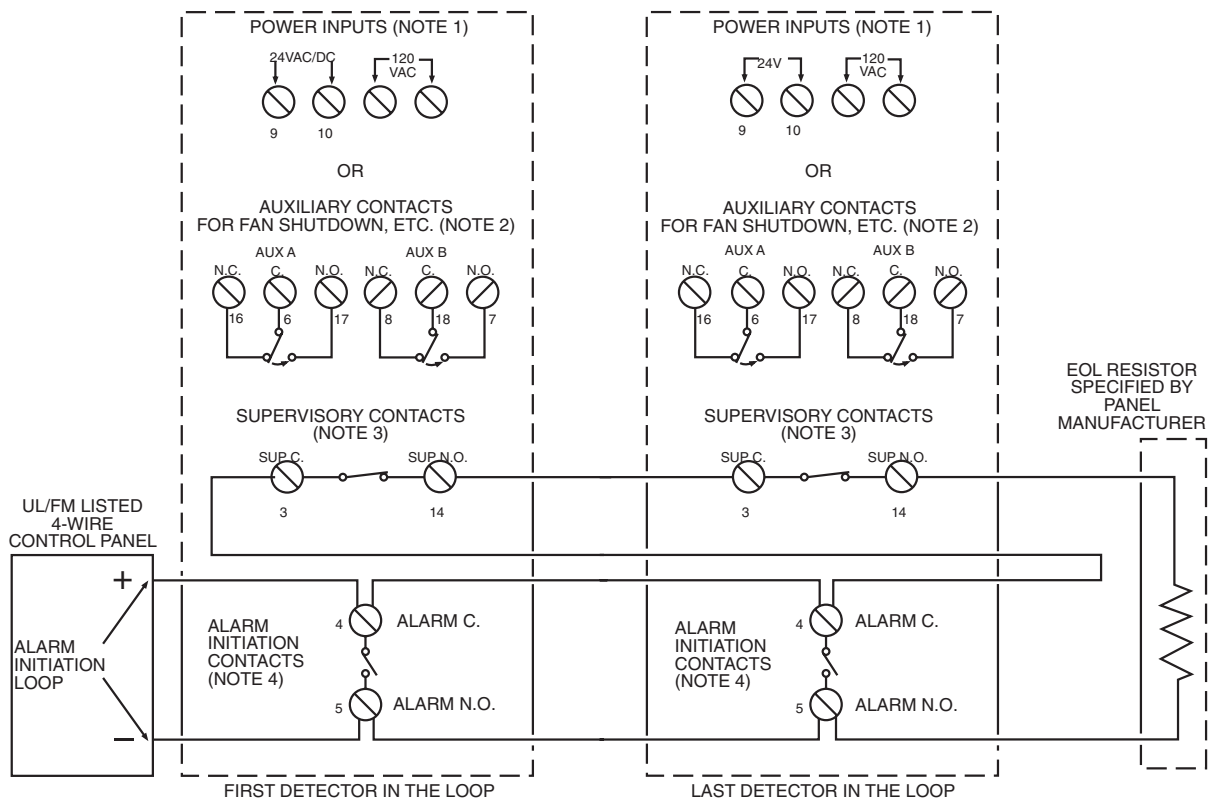
Note: Any combination of accessories may be used such that the given accessory loads are: 110mA or less at the Aux output, and 50mA or less at the Alarm output.

## Installing the InnovairFlex Sampling Tube

The InnovairFlex sampling tube may be inserted 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 Watertight 4-wire Duct Smoke Detector



**NOTE 1:** 24V Power Inputs accept a non-polarized 24VDC or 24VAC 50-60Hz. 120VAC Power Inputs accept only 120VAC 50-60Hz. Connect power source to appropriate terminals of each detector. See specifications for additional power supply information.

**NOTE 2:** Auxiliary contacts shown in standby position. Contacts switch during alarm as indicated by arrows. Auxiliary contacts are not to be used for connection to the control panel. See specifications for contact ratings.

**NOTE 3:** Supervisory contacts shown in standby position. Open contacts indicate a trouble condition to the panel. See specifications for contact ratings.

**NOTE 4:** Alarm Initiation contacts shown in standby position. Closed contacts indicate an alarm condition to the panel. See specifications for contact ratings.

\*Please refer to the corresponding installation manual for accessory wiring diagrams.

## Important Interconnect Notes

- When using the interconnect feature, all interconnected units must be powered using the same independent supply.
- Polarity must be maintained throughout the interconnect wiring. Connect the INT+ terminal on unit 1 to the INT+ terminal on unit 2 and so on. Similarly, connect the INT/AUX- terminal on unit 1 to the INT/AUX- terminal on unit 2 and so on.
- Up to 50 D4120W units may be interconnected.
- Up to 10 DH100ACDC units may be interconnected. Please note that each of the 9 DH100ACDC units interconnected may be replaced by three D4120W units. Therefore, when using the interconnect feature a single DH100ACDC can drive either 9 DH100ACDCs or 27 D4120W units.

\* NOTE: Alarm can be reset only at the initiating device and not at the devices interconnected.

## Accessories

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



RTS451 UL S2522



RTS451KEY UL S2522



APA151 UL S4011



SSK451 UL S2522



RA400Z UL S2522



MHW UL S4011



MHR UL S4011



SSK451 with PS24LOW strobe and PS12/24 LENS lens

## Ordering Information

Part No.	Description		
D4120W	Watertight 4-wire photoelectric low-flow duct smoke detector		
<b>Accessories</b>			
2D51	4-wire conventional photoelectric sensor head	MHR	Mini Horn, Red
DST1	Metal sampling tube duct width up to 1ft (0.3m)	MHW	Mini Horn, White
DST1.5	Metal sampling tube duct widths 1 ft to 2 ft (0.3 to 0.6 m)	P48-21-00	End cap for metal sampling tubes
DST3	Metal sampling tube duct widths 2 ft to 4 ft (0.6 to 1.2 m)	PS12/24LENSC	Ceiling-mount "SMOKE" lens
DST5	Metal sampling tube duct widths 4 ft to 8 ft (1.2 to 2.4 m)	PS12/24LENSW	Wall-mount "SMOKE" lens
DST10	Metal sampling tube duct widths 8 ft to 12 ft (2.4 to 3.7 m)	PS24LO	Mini-Alert add-on strobe (red)
APA151	Remote annunciator with piezo alarm	PS24LOW	Mini-Alert add-on strobe (white)
DH400 OE-1	Weatherproof enclosure	RA400Z	Remote annunciator alarm LED
ETX	Metal exhaust tube duct width 1ft (0.3m)	RTS451	Remote test station
M02-04-00	Test magnet	RTS451KEY	Remote test station with key lock
		SSK451	Multi-signaling accessory



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