

Controller & Detector  
Mounted in Tandem

## SuperDuct™ Duct Smoke Detector

*4-Wire, Photoelectric Type*

### SD Series

#### FEATURES

- > Less than 2" deep for easy installation and applications where space is tight
- > PCB mounted photoelectric sensor with on-board intelligence
- > Environmental compensation with patented differential sensing
- > Standard RJ45 interconnection
- > Status LEDs remain visible even after installation
- > Cover tamper reed switch
- > Sampling tubes install from room-side or air-side
- > Magnet-activated test/dirty switch

#### SPECIFICATIONS

- > -4F to 158F operating range with 100 ft/min to 4,000 ft/min air velocity
- > Operating humidity: 10-93% R.H. non-condensing
- > 0.67 to 2.46% obscuration/ft.
- > 24V DC, 24V AC, 120V AC, 220/240V AC
- > Standby current: 77.9 mA @ 24V DC
- > Alarm current: 124.3 mA @ 24V DC

The SuperDuct SD Series four-wire duct detector offers the convenience of modular design plus the power of advanced sensing technology. With separate controllers able to serve two detectors, installers have the freedom to configure the SuperDuct to suit the tight spaces typical of duct applications - and still have ready access to field connections and maintenance features.

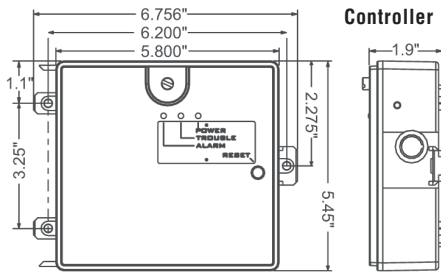
The SuperDuct's advanced circuit board-mounted photoelectric sensor is an integral part of the detector assembly and features environmental compensation that does away with sensitivity drift once and for all, ensuring unparalleled stability and reliability even under harsh environmental conditions. With its innovative remote test station, SuperDuct detectors can be tested for dirt contamination remotely, eliminating the need to physically access the detector with a sensitivity tester. This feature saves countless hours of fumbling with ladders and climbing into awkward spaces.

Snap-in RJ45 connectors reduce time spent on controller/detector interconnection to just a few seconds, while sampling tube spacing - and even field wiring connections - match standard configurations, making SuperDuct a drop-in alternative to bulky, outdated products on the market today. With a wide range of available accessories, SuperDuct provides a simple-to-install, easy-to-maintain, and highly-reliable solution for duct smoke detection needs.

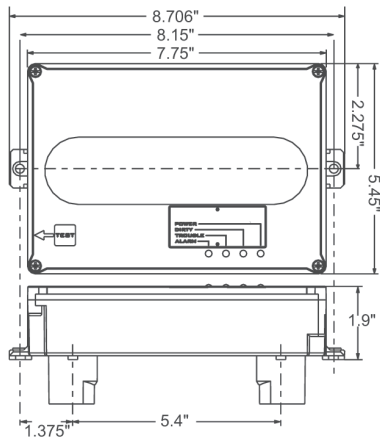
D-04A



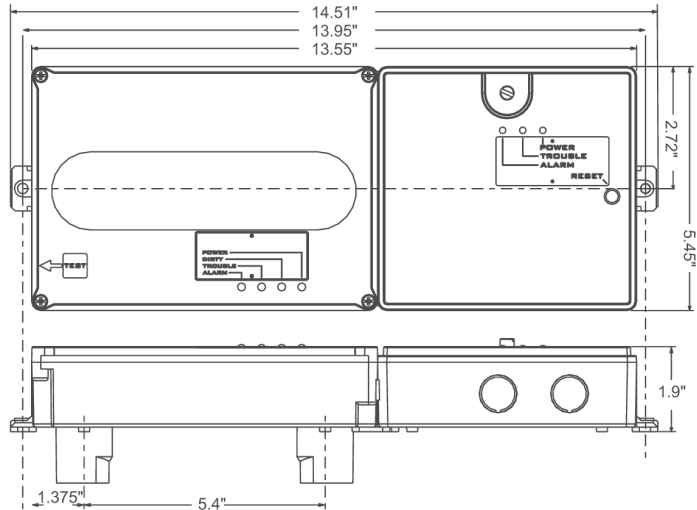
## TECHNICAL INFORMATION



**Controller**

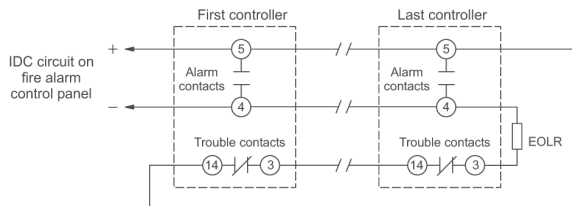


**Detector**



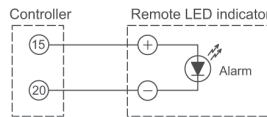
**Controller & Detector Mounted in Tandem**

## WIRING

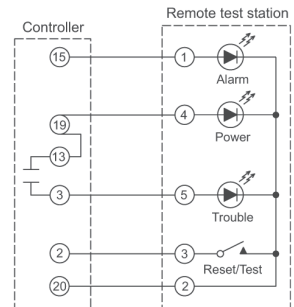


**Fire alarm initiating circuit wiring**

End-of-line resistor required on last device for circuit supervision. Use resistor value specified by the fire alarm panel manufacturer.

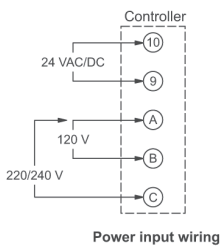


**Remote LED indicator wiring**

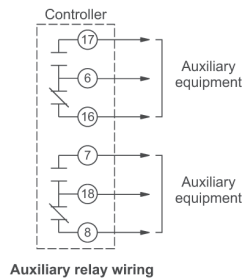


Note: For applications where only the Alarm LED and Reset/Test switch is required, wiring the Power LED and Trouble LED is optional.

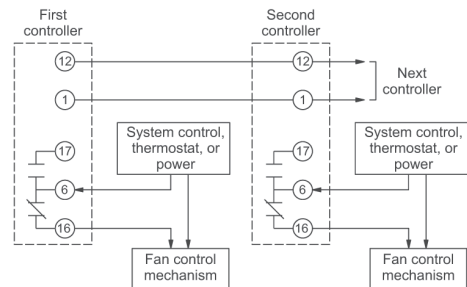
**Remote test station wiring**



**Power input wiring**



**Auxiliary relay wiring**



**Multiple fan shutdown interconnect wiring**



## Application

SuperDuct smoke detection is ideally suited to HVAC applications where early indication of combustion is required within the confined space of ventilation ductwork. Duct detectors are usually installed on the supply duct after the air filters, or in the return air stream prior to being diluted by outside air. To avoid the effects of stratification, install the sensor inlet tube a minimum of six duct widths beyond any bends in the duct.

SuperDuct detectors continually sample air flow in the HVAC duct and initiate an alarm condition whenever smoke is detected. An alarm is activated when the quantity (percent obscuration) of combustion products in that air sample exceeds the detector's sensitivity setting.

Air velocity in the duct as low as 100 ft/min. maintains adequate air flow into the sensor smoke chamber through air-holes in the air sampling tube and discharges through the exhaust tube. SuperDuct air sampling tubes must be installed with the inlet holes facing the airstream. Sampling tubes may be rotated in 45-degree increments so that air-holes can be aligned to allow the unit to be mounted in virtually any angle relative to the airflow.

SuperDuct detectors are engineered to operate optimally under the harsh environmental conditions frequently found in HVAC ductwork. Nonetheless, before installing the detector, test the duct air velocity, temperature, and humidity to verify that it is within the operating range of the SuperDuct detector. Consult the SuperDuct installation sheet for details.

## Typical Configuration

With SuperDuct, smoke detection for two airstreams can be monitored with just one set of field connections for fan shut-down, damper control, etc.

## Installation

Up to two detectors may be connected to a single controller. Typically, the detector comes attached to the

controller, connected by means of an integral cable (provided).

Alternatively, one or both detectors may be installed remotely from the controller and connected by means of either a cable with RJ45 connectors, or terminal blocks (see ordering information for details).

Wiring between detector and controller along with wiring between controller and fire alarm panel (if used) is supervised.

## Assembly

Controllers and detectors come pre-assembled for easy installation for the RJ45 models. They are sold separately for the terminal versions.

## Accessories

### *RJ45 wiring harnesses*

These 8-conductor cables are used to interconnect detectors with controllers. Harnesses are available in 5 ft., 10 ft., and 15 ft. lengths. They include RJ45 connectors with rubber glands to provide a watertight seal at each end.

### *Air Sampling Tubes*

Rigid metal sampling tubes are available in several lengths. They can be installed without the need to open the detector.

### *Remote Test/Reset Station*

The Remote Test/Reset Station provides alarm test or dirty test capability from a remote location. It includes a one-gang plate, momentary SPST switch, red alarm LED, and terminal block. Magnetically-operated or key-operated models are available.

### *Air Velocity Test Kit*

With this kit, and a suitable manometer, testing can be carried out with the duct detector fully installed and wired.

### *Test Magnet*

Used to activate test routine from either a SD-TRM4 Remote Test/Reset Station, or the detector

D-04A



## Specifications

Dimensions	Controller: 6.75 x 5.45 x 1.90 inches (17.15 cm x 13.84 cm x 4.83 cm) Sensor: 8.70 x 5.45 x 1.90 inches (22.10 cm x 13.84 cm x 4.83 cm) Controller w/sensor: 14.51 x 5.45 x 1.90 inches (36.86 cm x 13.84 cm x 4.83 cm)
Wire Size	High voltage power input terminals (L & N): #12 to #22 AWG All others: #14 to #22 AWG
Wiring distance:	Detector to Controller: 100 ft max for each detector Test Station to Controller: 10 ohms max. per wire (i.e., 621 feet with 22 AWG, 3,952 feet with 14 AWG)  Controller Interconnect: 5 ohms max between first and last controller (i.e., 310 feet with 22 AWG, 1,976 feet with 14 AWG)
RJ45 wiring harness:	Cable type: CMP
Smoke detection method:	Photoelectric
Air velocity rating:	100 to 4,000 ft/min
Air pressure differential:	0.005 to 1.00 inches of water
Sensitivity:	0.67 to 2.46% obscuration/ft
Reset time:	2 seconds max.
Power up time:	8 seconds max.
Alarm test response time:	5 to 7 seconds
Controller LED indicators:	Alarm (red), Trouble (yellow), Power (green)
Sensor LED indicators:	Alarm (red), Trouble (yellow), Dirty (yellow), Power (green)
Alarm initiation relay	Quantity: 1 Style: normally open Ratings: 2.0A at 30V DC (resistive)
Auxiliary relay	Quantity: 2 Style: Form C Ratings: 10A at 30V DC, 10A at 250V AC (contacts must switch a minimum of 100 mA at 5V DC)
Supervision (trouble) relay:	Quantity: 1 Style: Form C Ratings: 2.0A at 30V DC (resistive)
Auxiliary output:	18V DC, nominal, 30 mA max.
Operating Environment:	Temperature: -20 to 70C (-4 to 158F) Relative humidity: 10 to 93% noncondensing
Operating Voltages:	24V DC, 24V AC 50/60 Hz, 120V AC 50/60 Hz 220/240V AC 50/60 Hz

## Ordering Information

Cat. No.	Description	Standby Current*	Alarm Current*
<b>Controllers and Detectors</b>			
SD-CJ	Controller (RJ45)	71.9 mA	108.3 mA
SD-SJ	Sensor (RJ45)	1 mA	1 mA
SD-4WJ	Controller w/Sensor	72.9 mA	109.3 mA
SD-CT	Controller (terminals)	71.9 mA	108.3 mA
SD-ST	Sensor (terminals)	1 mA	1 mA
<b>Accessories</b>			
SD-TRM4	Remote test/reset station magnetic	5 mA	15 mA
SD-TRK4	Remote test/reset station keyed	5 mA	15 mA
SD-T8	Air sample tube, 8 inch		
SD-T18	Air sample tube, 18 inch		
SD-T24	Air sample tube, 24 inch		
SD-T36	Air sample tube, 36 inch		
SD-T42	Air sample tube, 42 inch		
SD-T60	Air sample tube, 60 inch		
SD-T78	Air sample tube, 72 inch		
SD-T120	Air sample tube, 120 inch		
SD-RJ15	RJ45 wiring harness kit - 15 feet		
SD-RJ10	RJ45 wiring harness kit - 10 feet		
SD-RJ5	RJ45 wiring harness kit - 5 feet		
SD-VTK	Air velocity test kit (stoppers, etc)		
SD-GSK	Cover gasket kit		
SD-MAG	Test magnet kit		

\*Current ratings shown are for operation at 24V DC. For additional voltages, refer to the installation instructions for the SuperDuct.