# SDD-2000 Duct Smoke Detectors

The SDD-2000 Series Smoke Duct Detector is the latest innovation for early detection of smoke and products of combustion present in air moving through HVAC ducts in Commercial, Industrial, and Residential applications. The unit is designed to prevent the recirculation or spread of smoke by air handling systems, fans, and blowers.

SDD-2000 Duct Smoke Detetors are available with both Ionisation and Photovoltaic smoke detector heads (replaceable).

Complete systems may be shut down in the event of smoke detection. The SDD-2000is designed and built to meet all local code requirements regarding HVAC supply and return duct smoke detectors.

The units can be powered from 24V, 110V or 230V. The smoke detector head can be easily replaced and the cover opened without any special tools.

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**Model Types**

| Model | Description |
|---|---|
| **SDD-2000-N** | Ionisation Duct Smoke Detector |
| **SDD-2000-P** | Photovoltaic Duct Smoke Detector |

**Technical Data**

| | |
|---|---|
| Power supply | 24VAC/DC, 115VAC, 230VAC |
| Power Consumption (Standby) | 230VAC: 8mA<br>115VAC: 14mA<br>24VAC: 55mA<br>24VDC: 14mA |
| Power Consumption (Alarm) | 230VAC: 18mA<br>115VAC: 32mA<br>24VAC: 190mA<br>24VDC: 68mA |
| Relay Contact Rating (Alarm Contacts) | 2 x "C" Rated Relays 10A @ 115VAC<br>1 x "A" Rated Relays 2A |
| Relay Contact Rating (Troubles Contacts) | 1 x "C" Rated Relays 10A @ 115VAC |
| Air Velocity | 0.5...20.0 m/s |
| Humidity | 10..85 %rH (non-condensing / non-freezing) |
| Wiring Terminals | Accepts cable 0.65 to 2mm (12AWG to 22AWG) |
| Approvals | UL Listed (UL268A, UROX, UROX7) File #S2829<br>CSFM Listed (3240-1--4:105)<br>MEA Accepted (73-92-E: VOL. 27) |
| Operating temperature | SDD-3000-N: 0°C...+70°C<br>SDD-3000-P: 0°C...+60°C |
| Enclosure | Grey plastics, white plastic cover (Makrolon 94V-0) |
| Dimensions | 343W x 115H x 58D mm |
| Weight | 1.2kg |

**Features**

- Low-Flow Technology: Both Ionisation and Photoelectric
- Models listed for velocities between 0.5 and 20m/s
- Both models listed for high-temperature applications
- Operating voltages: 230VAC, 115VAC, 24VAC, 24VDC
- Interconnect up to 30 units for common functions
- Patent pending "No-Tools Required" front or rear loading and removing sampling/exhaust tubes
- Patent pending "Test Port Valve" allows for aerosol smoke testing without cover removal
- Clear cover fitted with four captive "No-tools Required" thumbscrews
- Instantaneous cover removal trouble indication
- Staggered terminal blocks for easier wiring
- Flashing LED on detector head indicates normal operation
- Magnet test capability (magnet included)
- More wiring space than competitive models
- Duct wall gaskets on back of the enclosure are pre-installed
- Reset switch is also an alarm test switch - competitive models require a magnet or cover removal to test at unit
- Unit includes green pilot and red alarm visual indicators
- External mounting tabs do not require cover removal to install
- Colored cover gasket indicates proper cover seal
- Compact, lightweight size means easy handling, lower shipping costs
- Two sets of 10A form C alarm contacts
- One set of 2A form A alarm contacts
- One set of 10A form C trouble contacts
- Large terminal connection screws
- Standard interchangeable plug-in photoelectric or ionization head

**Mechanical Installation**

Location Prerequisites

This guideline contains general information on duct smoke detector installation. To determine the correct installation position for an SDD-2000 Series duct smoke detector, the following factors must be considered.

1) A uniform non-turbulent (laminar) airflow between 0.5m/s 20m/s must be present in the HVAC duct. To determine duct velocities, examine the engineering specifications that define the expected velocities or use a velocity meter (or equivalent).

2) To minimize the impact of air turbulence and stratification on performance, a duct smoke detector should be located as far as possible downstream from any obstruction (i.e. deflector plates, elbows, dampers, etc.). In all situations, confirmation of velocity and pressure differential within specifications is required.

The pressure differential between the input sampling (high pressure) tube and exhaust (low pressure) tube for the SDD-2000 Series smoke duct detector should be greater than 25Pa and less than 3000Pa.

3) Identify a code compliant location (supply or return side, or both) for the installation of the duct unit that will permit easy access for viewing and serviceability.

4) When installing on the return side, install duct units prior to the air being exhausted from the building or diluted with outside "fresh" air.

5) When installing duct smoke units downstream of filters, fires occurring in the filters will be detected, but if the filters become blocked, insufficient air flow through the duct unit will prevent the correct operation of the duct detector. Duct units installed in the supply air side may monitor upstream equipment and/or filters.

6) Where possible, install duct detectors upstream of air humidifiers and downstream of dehumidifiers.

7) To prevent false alarms, the duct detector should not be mounted in areas of extreme high or low temperatures, in areas where high humidity exists, or in areas where the duct may contain gases or excessive dust.

No-Tools Tube Sampling Installation

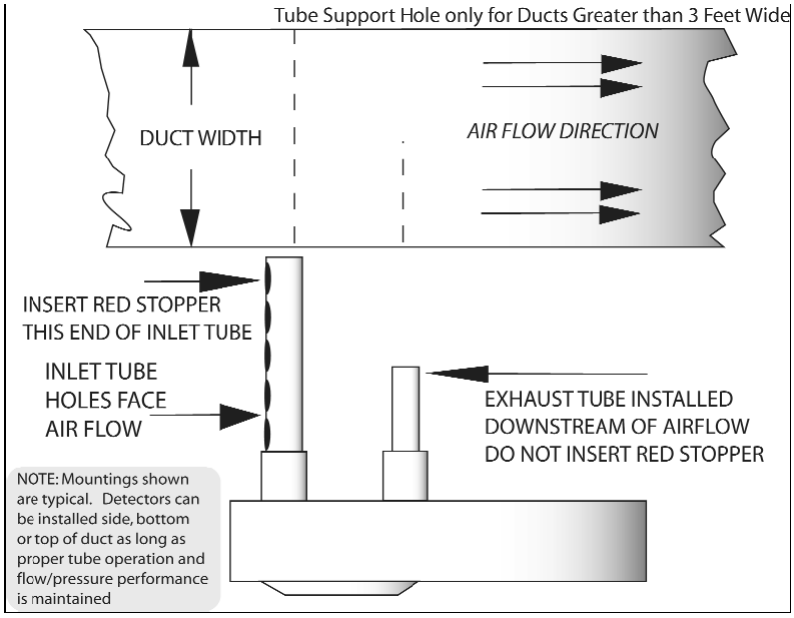
Use universal STN-U sampling tubes.

The SDD-2000 Series duct smoke detector provides a unique, patent-pending mechanism for installation and/or removal of the sampling and exhaust tubes from either the front or rear of the detector housing.

Once the airflow direction has been determined, insert the inlet and exhaust tubes into the duct smoke detector. If the cover is in place, the tubes may be inserted into the back of the detector via the key-slots provided. Simply push the tube into place against the spring loaded retainer, and turn into the correct position, allowing the key to ìlockî the tube in the desired orientation. For front side

installation, simply rotate the tube retainer until the tube may be inserted and oriented properly. Once the tube is installed, rotate the retainer back into place to lock down the tube.

Ensure air intake sampling tube is positioned so that the inlet holes are directly facing the airflow.




Duct Preparation

Remove mounting template from the installation kit. Remove paper backing from the mounting template and affix it to the duct at the desired location. Using the template as a guide, drill (2)

mounting holes, 2.5mm for the #12 X ¾" sheet metal screws packaged in the installation kit. Drill or punch (2) 11/4" (32mm) holes for inlet sampling and exhaust tubes, using the template as a guide. Clean all holes.

Mounting

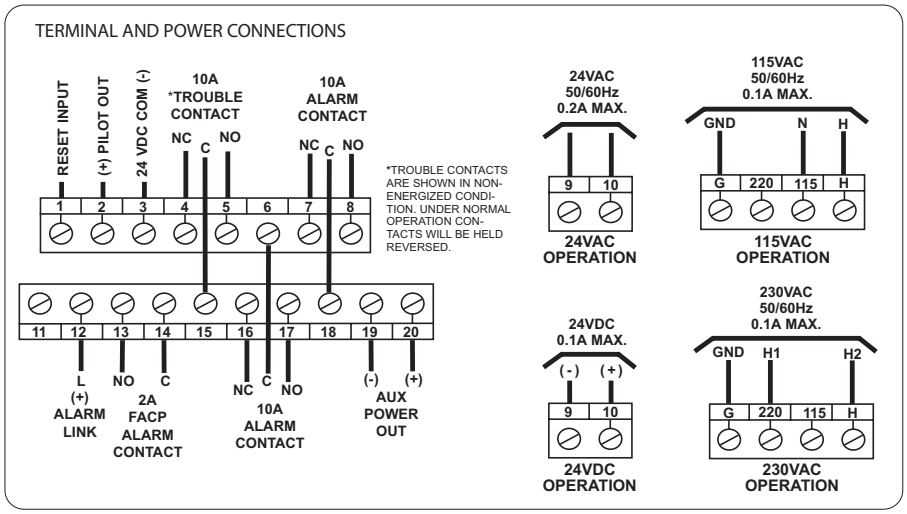
After securing the sampling and exhaust tubes to the duct smoke unit, (or initially placing the tubes through the 11/4" holes drilled or punched in the HVAC duct to accept the inlet sampling and exhaust tubes and then attaching them to the duct unit), hold the duct unit assembly in position and use (2) # 12 X ¾" sheet metal screws (packaged in the installation kit) to secure the duct smoke detector to the HVAC duct sheet metal.

Air Sampling Verification

To ensure correct operation of the duct unit use a differential pressure gauge to determine the differential pressure between the inlet (high side) and exhaust (low side) tubes. The differential pressure between the two tubes should be greater than 25Pa and less than 3000Pa.

**Electrical Installation**

Prior to connecting input power to the duct unit, determine the correct input voltage/ current availability and ensure it is connected to the correct terminals.



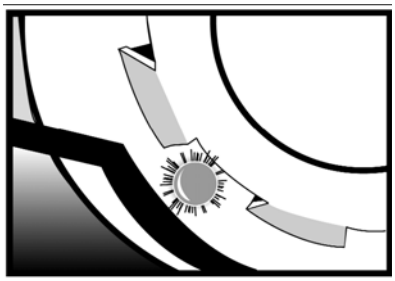

With detector head removed, connect one of the appropriate dedicated power sources to the applicable terminals (see above). Replace detector head and depress the cover removal switch (SW1) and the unit will be energized. The green pilot LED will be illuminated, and when pressing the test/reset button (SW2), the red alarm LED will be illuminated. This test confirms the correct basic operation of the duct smoke unit, excluding the detector head (see functional testing).

**Testing and Maintenance Operation**

Operational Testing

To determine the correct operation of the SDD-2000 Series duct smoke detector, ensure input power is connected and the green pilot LED is illuminated.

The LED on the detector head of both the ionization and photoelectric models will flash while the unit is in standby mode. The LED on the smoke detector head will be permanently illuminated when smoke is detected and the head is in alarm.



With the air handling unit shut down (not connected), and the clear cover removed, press and hold the test/reset button and the cover removal switch on the SDD-2000. The red alarm LED on the circuit board will be illuminated and the alarm relay outputs will change state. Using a multimeter set to OHMS (or continuity buzzer function on the meter) place the meter probes on the following terminals, and ensure the contacts are closed (continuity) (8-18) and (6-17). When releasing the test/reset button these contacts will open.

The trouble contacts (4,15,5) on the SDD-2000 detector will not change state in the event of a fire alarm, operational, or functional testing. The trouble contacts can be tested by either releasing the cover removal switch, or depressing the cover removal switch after rotating the smoke detector head counter-clockwise and removing the detector head. This action will extinguish the green pilot LED and cause the trouble contacts to change state, (4-15) will be closed (continuity) and (5-15) will be open circuit. Replacing the detector head and rotating it clockwise until it locks, will cause the green pilot LED to be illuminated and the unit will be operational, terminals (4-15) will be an open circuit and (5-15) will be closed (continuity).

Functional Testing

Once operational testing is concluded the unit requires functional testing to determine the correct operation of the detector head.

**MAGNET TESTING:** Place the magnet provided with the installation kit on top of the housing between the raised sections above the detector head (as indicated on the unit cover. Allow at least five seconds for alarm initiation. Remove magnet and reset detector.

**SMOKE TESTING:** Using smoke test canister insert the test gas nozzle into the test port on the unit cover. Press can against cover to release gas into the chamber.

**WARNING: DO NOT SPRAY GAS FOR MORE THAN 1/2 SECOND. OVERUSE OF TEST GAS FACILITY MAY RESULT IN DETECTOR CONTAMINATION.**

After 15 to 20 seconds the detector head will go into alarm, illuminating the detector head LED and causing the duct unit functions to operate, alarm relays will change state, and the alarm related remote accessories, if attached, will function.

If no test gas is available to conduct functional testing, remove cover and, while holding down the cover removal switch, blow smoke from a cotton wick or punk directly at the head to cause an alarm. The alarm indicator should illuminate within one minute.

Should additional testing also be required for simulated fire conditions, smoke bombs placed in the duct may not be suited for the particular detector head (photoelectric or ionization) selected and installed. Consult the smoke bomb data for proper use and compatibility with detector type.

The S65A ionization detector head (55000-225APO) utilizes a radioactive source as its means of detection and will detect smoke particles of between .1 and 1 micron in size.

The S65A photoelectric detector head (55000-328APO) operates on the principle of light scatter and will detect smoke particles of between 1 and 10 microns in size.

When purchasing smoke bombs for additional required functional testing, ensure smoke particle sizes comply with the criteria as described above.

**NOTE:** In situations that require a duct smoke detector to be held in an alarm condition for an extended period of time, the magnet test or smoke test methods should be used to ensure the detector is locked into alarm.

Maintenance

Each installation location must be assessed on its own merits. If the protected area is of a very dirty nature then the SDD-2000 Duct unit(s) will have to be checked and cleaned on a quarterly basis or when cleaning is required.

As a guideline the smoke detector head should be cleaned every six months or as required. The best methods of cleaning are to vacuum the detector head thoroughly or to blow the detector head out using clean, dry compressed air.

Do not use chemicals or non-conforming air to clean the detector head housing as this could contaminate the detector head and damage the casing.

Sensing tubes must be inspected and cleaned in accordance with the schedule as determined above, to allow the free flow of air through both inlet and exhaust tubes.