



**An Introduction to Aspirating Smoke Detection Stratos-HSSD  
What, Why and Where**

**What**

Aspirating smoke detection (also known as air sampling) is a method of smoke detection, whereby a sample of air is continuously drawn from the protected area through a network of sampling pipes, and passed through a revolutionary designed laser detection chamber.

The output of this detection chamber is processed by a powerful system of artificial intelligence, which provides the maximum of sensitivity with statistically the minimum risk of false alarms.

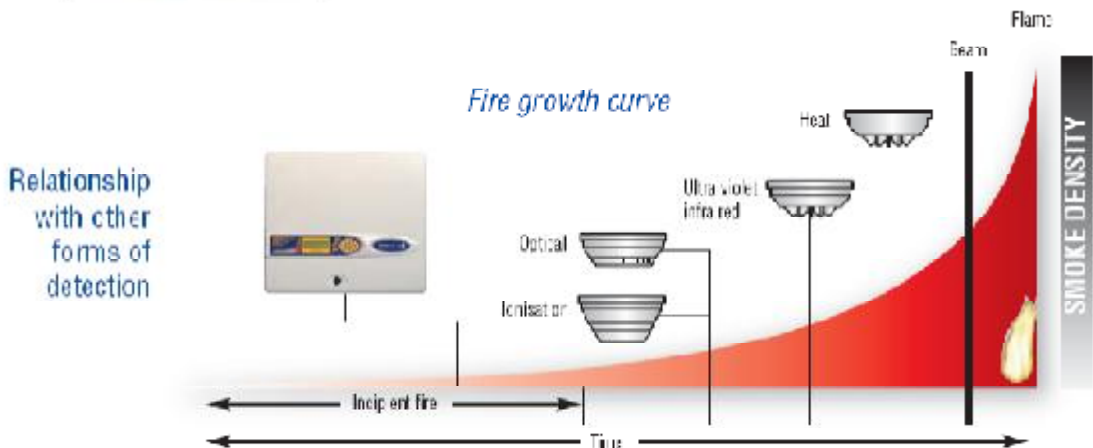
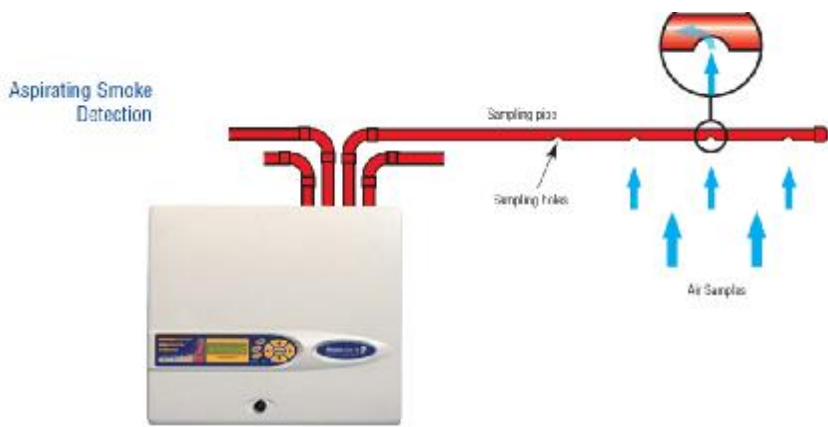
**Why**

Aspirating smoke detection is not intended to compete with standard point detection, which is suitable for most standard applications where cost and basic compliance to regulations are the main drivers.

However, there are many instances where a more effective and reliable form of detection is required or point detection is just not suitable. ASD offers the only solution to these problem applications which are often high risk and high value.

There are seven main drivers or opportunities for ASD:

- 4 very early warning is required;
- 4 high air flow (air conditioning) is present;
- 4 environment is hostile (very cold, very hot, wet or dusty);
- 4 detection is to be covert (unseen);
- 4 building height will cause smoke stratification;
- 4 access for maintenance is impractical;
- 4 coincidence detection is required for extinguishant release.



## *Aspirating Smoke Detectors*

### **Where**

#### **Early warning**

Laser based aspirating smoke detection can be up to a thousand times more sensitive than point detection system, or other aspirating systems which use a 'point' type detector in an aspirating enclosure (also known as PIAB - point in a box). When such a detection system is coupled with ClassiFire® Perceptive Artificial Intelligence (PAI) system, as used in Stratos-HSSD®, it enables the system to provide and maintain the optimum sensitivity without external input, maximizing sensitivity and minimising nuisance alarms.

- 4 Protection of high value assets
- 4 Computer cabinet protection
- 4 Computer room protection
- 4 Museums.

#### **Areas of high airflow**

'Close Control' air-conditioning systems as used in many modern environments apply relatively high velocity air currents, which effectively prevent smoke from being able to enter conventional 'point' type detectors (particularly cool smoke from an 'incipient' fire, which has insufficient thermal buoyancy to rise to the ceiling where conventional detectors are located).

Installation is usually very simple, as the system is installed with sampling pipe and holes directly in the airflow in front of the air-conditioning intake grille or duct. This not only provides for simple installation, it also makes use of the airflow to transport the cool smoke from an incipient fire directly to the detection system to provide the most certain and quickest of responses. This method of application is known as Primary Detection:

Common applications include:

- 4 Computer suites (IT rooms)
- 4 Telephone exchanges
- 4 Clean rooms.

#### **Hostile environments**

By nature of the system, an aspirating smoke detection system such as Stratos-HSSD has no need to be located within the area to be protected, as the air is transported to the detector(s) via sampling pipes. This means ASD can often be used in areas of extreme heat, cold and humidity, such as:

- 4 Cold stores
- 4 Food preparation areas (wash down areas subject to condensation)
- 4 Areas of High Humidity (textile dying areas)
- 4 Tobacco plants - subject to corrosion.

The Stratos-HSSD range of detectors incorporate Dust Compensation and Laser Dust Discrimination (LDD™). This means that it is possible to provide highly effective smoke detection in most dust hostile of environments with minimum risk of false alarms:

- 4 Textile areas
- 4 Paper mills/tissue production
- 4 Flour mills
- 4 Wood recycling
- 4 Refuse recycling
- 4 Metro tunnels
- 4 Cable tunnels
- 4 Coal conveyers.

## Aspirating Smoke Detectors

### Covert detection

Where detection is required but for reasons of aesthetic consideration or potential vandalism, it must not be visible. A continuous air sample can be discreetly drawn via capillary tubes which are either flush terminated or otherwise concealed in ceiling features such as light fittings:

- 4 Heritage buildings (cathedrals, palaces etc.)
- 4 Prison cells/correction centres
- 4 Architectural and design considerations.

**High buildings and smoke stratification:** Due to the effect of 'stratification', in buildings with a ceiling height in excess of 12 metres, unless a fire has reached conflagration stage, it is unlikely that smoke will rise high enough or quickly enough to enable roof mounted point detectors to provide effective performance. Maintenance of ceiling mounted point detectors can also be a problem, requiring special access methods. Beam detectors are commonly used in this application, but these are of inherently low sensitivity, and do not provide early warning. They are also inherently liable to false alarms, due to building movement and possible airborne activity (cranes, fork-lifts etc).

By contrast, aspirating smoke detection points can be sited at various positions throughout the area and in particular in a VERTICAL plane. This allows an aspirating system to provide early warning, irrespective of the level of stratification, in such places as:

- 4 High warehouse or distribution centres
- 4 Atrium areas
- 4 Hotel lobbies
- 4 Stairwells/lift shafts
- 4 Aircraft hangars.

**Where access for detector maintenance is a problem:** Smoke detectors generally need maintaining and testing every six months. This can be impractical for point detectors in a large number of applications, as access equipment might be required or areas closed or denied for access. Aspirating detectors can be sited outside the protected area where maintenance is easy:

- 4 High buildings
- 4 Retail sheds
- 4 Hospitals
- 4 Ceiling and under-floor voids
- 4 Escalators
- 4 Supermarkets.

**Fire extinguishing system release:** Codes of Practice relating to the release of gaseous fire extinguishing systems call for two levels or forms of detection, before extinguishing gas may be released. This is known as 'coincidence' or 'double-knock' detection. Because of the inherently high performance of Stratos-HSSD, it is generally used to provide the first level of detection. The second level of detection in such an arrangement is normally point detection. These are used to will provide the second level of detection to confirm release of gas, in areas such as:

- 4 Electrical control rooms
- 4 Substations
- 4 Computer areas
- 4 Server rooms
- 4 Telecoms areas.

It is important to appreciate that in many cases, the application of High Sensitivity aspirating Smoke Detection, providing true incipient fire detection means that they are able to summon intervention as such an early stage of fire that a fire is PREVENTED, rather than merely being detected. This minimises damage, reduces downtime and prevents harm to personnel or the environment.

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