

Stratos®

High Sensitivity Aspirating Smoke Detectors

APPLICATION NOTE

Large Open Spaces, High Ceilings and Atria



Canterbury Cathedral

Introduction

Many modern buildings are being built around a central atrium to provide a bright airy and controlled atmosphere to occupied areas. Stratos-HSSD aspirating smoke detection system provides the highest detection efficiency in buildings such as; **shopping malls, exhibition halls, gymnasias, superstores, churches, cold stores, hotels, aircraft hangers, atria** etc.

Stratos-HSSD provides effective detection in these applications because, correctly designed, it does not suffer the fundamental disadvantages of methods such as conventional point-type or infra-red beam detection systems. The main limitation for other detection systems in this application is; poor performance because ceilings are too high. Smoke stratification will normally be encountered which effectively stops smoke from reaching detection level until too late (see fig. 1 overleaf). Beam-type smoke detectors are relatively insensitive, therefore providing later warning and rely to some degree on perfect beam alignment. Modern steel frame buildings flex in response to solar heating and wind pressure and this flexing can cause beams to go out of alignment. 'Black heat' radiators at high level are commonly used to heat these areas and these have been known to be a source of problems. Beam detectors can suffer problems if applied in areas where the beam may occasionally be interrupted by movement of goods. Routine maintenance and testing of beam or conventional smoke detectors fitted a high level is often difficult and requires expensive access equipment and disruption, whereas with Stratos-HSSD it is customary to locate the detector in an easy access area.

High buildings and smoke stratification:

Due to the effect of stratification in buildings with a ceiling height in excess of 40ft (12m), 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 detection. By contrast, aspirating smoke detection points can be sited at various positions throughout the area. When placed in a VERTICAL plane, this allows an aspirating system to provide early warning, irrespective of the level of stratification.

Advantages of Stratos® solution:

An intelligent Stratos® aspirating smoke detection system will provide a cost-effective solution to the problem of providing effective smoke detection in a high or large volume building.

Cost saving:

- Once installed the cost of increasing the number of sampling points is minimal - more calibrated holes are drilled in the sampling pipe system.
- The sampling pipe network does not require regular maintenance, and the Stratos-HSSD detector will normally be located in an accessible location. This substantially reduces the whole-life costs of the system.

Flexibility:

- If stratification is anticipated, the sampling points can be extended away from the main sampling pipe runs (down, up or sideways) to place the sampling hole in the most effective position at very little cost.
- Those parts of an aspirating smoke detection system requiring routine maintenance can be installed in an accessible position.
- To minimise aesthetic impact, the sampling pipe network can be installed so that the minimum number of sampling holes is used to meet the recommendations of any code, standard or regulation.
- The detection systems are not adversely affected by building movement or heating systems.

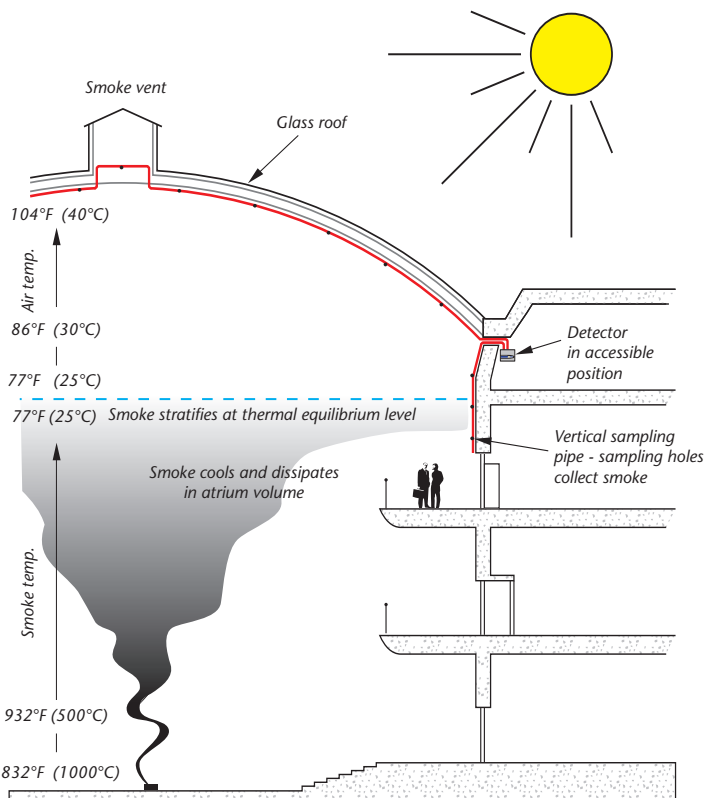


Fig 1. Using Stratos to protect an atrium

Perceptive Artificial Intelligence:

All Stratos® detectors employ the patented ClassiFire® (Perceptive Artificial Intelligence) system that continually records the standing level of air pollution, and will set the alarm thresholds to give the highest possible sensitivity with the minimum risk of unwanted alarms. It is a simple operation to either increase or decrease the potential system sensitivity if the application requires it.

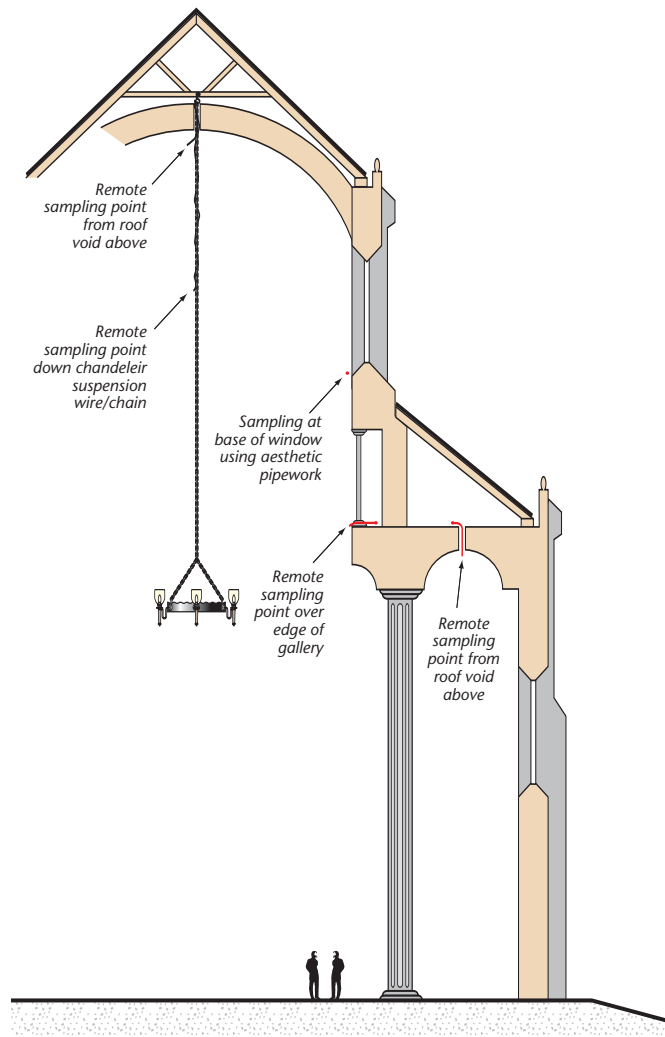


Fig 2. Cross section through a church showing various options for the position of smoke sampling points

Some successful worldwide installations for high ceiling protection:

- Yunnan Kunming Exhibition Center**
- Radcliff Camera, Oxford**
- Amazon Bookstore warehouse**
- Project Amona, Cannock**
- Hangzhou Opera House, Zhejiang**
- Major supermarket distribution centres**
- Canterbury Cathedral**
- Beijing Aviation University Gym Hall**

