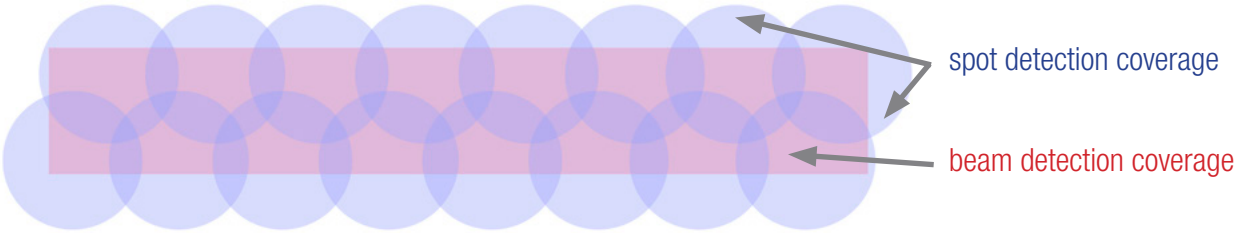
thefirebeamcompany

GUIDE TO USING OPTICAL BEAM SMOKE DETECTION

Optical beam detection provides an economical solution for detecting smoke in large open space areas such as Shopping Malls, Warehouses and Airports.

Firstly lets look at other forms of detection that are typically used and why we would choose beam detection in their place.

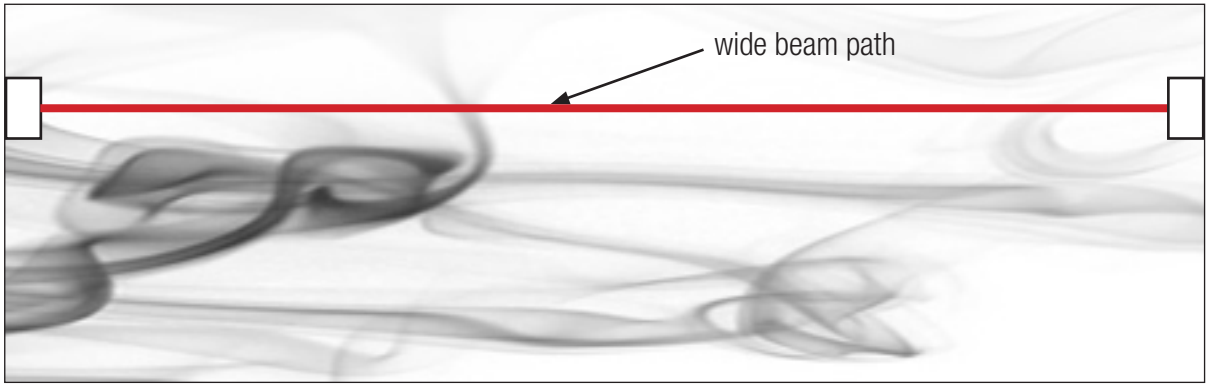
Point detection is often used but can lead to a complex network of many overlapping sensors which will be very time consuming to install, expensive to wire and could be problematical to access when maintaining. One optical beam detector will generally replace as many as 16 single spot detectors covering 1500msq.



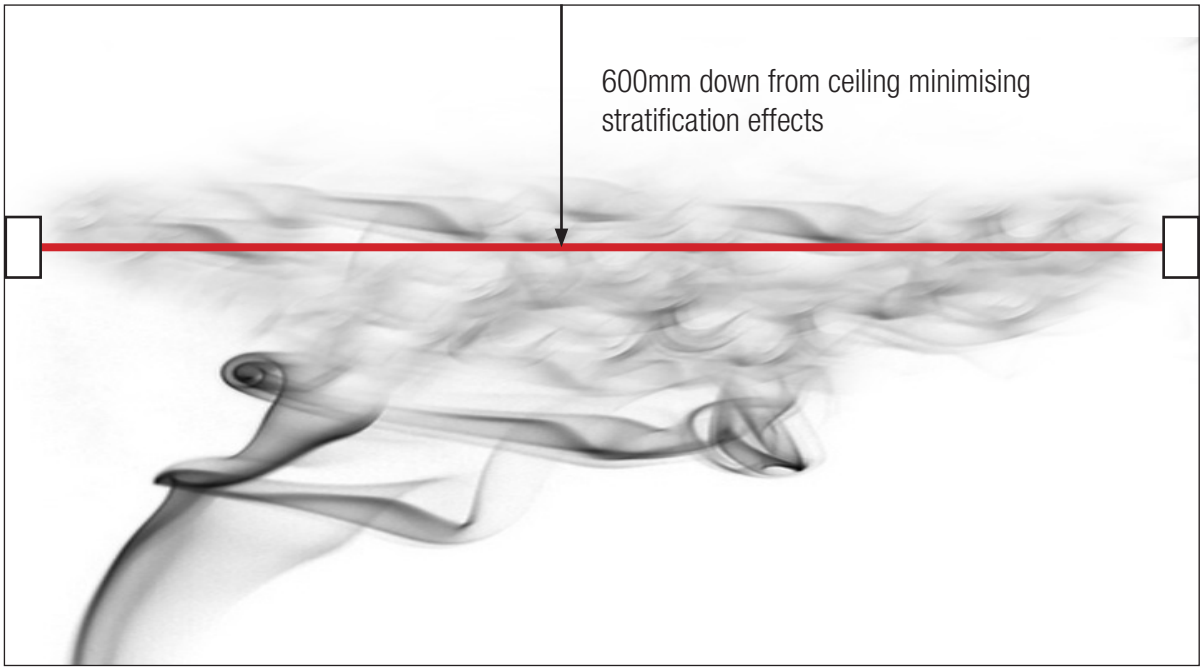
Air sampling aspirating systems are usually ceiling mounted but are complex and time consuming to install. The are made up of a network of sampling pipes, end caps and elbows. This all requires installing and maintaining. The pipework itself can be intrusive and require hiding within the fabric of the building.

complex pipework used in aspirating systems

Some installation codes of practice also limit the height that spot detection and aspiration can be used because the higher the ceiling the lower the particle density will become and could fall below the alarm threshold required for these types of detectors. Beam detectors are more effective at height because as smoke rises it spreads effecting a larger area and in doing so affects more of the beam path. This wide detection path is more effective than the tiny sensor chamber of a point detector.



Spot and aspiration detection systems rely on smoke raising to ceiling height. Problems can also arise by what is know as a stratification layer. Smoke particles are heavier than air and are carried upward by the warm air around them through cooler air. This cool surrounding air will cool the plume and warm air trapped by the ceiling forms a thermal cushion preventing the smoke reaching the ceiling. Spot and aspiration detection could fail to see the smoke because of this. However beam detection is typically placed 600mm down from the ceiling (BS5839) which means they are less likely to be above the stratification line.

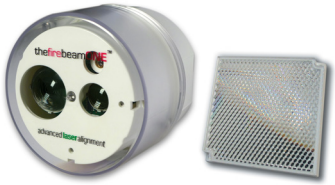


Flame and Video detection. A very specialised and expensive form of detection often used as a secondary form of highly sensitive fast detection in high value environments such as aircraft manufacture.

The choice of detector type will ultimately be decided by accessing the situation, building characteristics, environment, speed of detection, evaluation of potential risk and the materials present.

Beam detection provides a versatile and cost effective solution to large area protection especially with a high ceiling hight.

Types of Optical beam detection. There are three main types of beam to consider.



Non motorised beam detection 'reflective', this simply works by transmitting an invisible beam of infrared light that hits a reflector at the far end and then monitors the line of sight for obscuration. Both the transmitter and receiver are housed in one unit. This is commonly used but should only be used in the correct environment. It should only be used in spaces that are of a solid construction that are free from any movement. Buildings can move for a number of reasons, new builds can settle, large metal warehouses can twist in hot and cold conditions and adverse weather such as snow can distort buildings. It should be noted that 1 degree of building movement can cause a beam to miss align by approximately 1.4m at 100m which will cause a false alarm in a fixed beam. Commissioning, adjusting and maintaining the beam can only be done at height and will require high access equipment.

End to end beam detection. This tends to be a specialised and expensive application that requires firing the beam through small voids that are likely to be problematical to reflector style beams as there could be a risk of unwanted returned signals from nearby structures. They work with a transmitter at one end and a receiver at the far end which checks for obscuration. This type of detection requires cabling to both ends which could mean expensive runs of 100m or more and access at hight to commission and adjust and maintain.

Motorised beam detection. A development brought about by the limitations of fixed and end to end beam detection. Motorisation and intelligence of the beam mean that you can self align and commission these beams at ground level via a simple to use multi language remote controller. Adjustments to beam parameters such as time to fire can also be carried out from this controller. Once the intelligent motorised beam is aligned it will continually keep itself aligned in service meaning building movement is no longer a problem and will mean, saving time, cost, reputation and importantly less false alarms.

What should one consider when using beam detection?

Beam detectors work by measuring the obscuration of its own received signal. Buildings with open sides our areas open the the outside can be susceptible to cloud and mist. Extreme building temperature change can cause condensation on the reflector or beam head causing false readings. Take care to take into account different atmospheric scenarios usually around the winter months. Some beams have anti condensation solutions. Environments that create smoke and steam such as welding bays and bus depots can be problematical.

Motorised beams have now become the industry beam of choice selling throughout the world saving time and money with the safety of working from ground level.

thefirebeam™

the worlds finest beam detectors