Aspirating Smoke Detection for Large Area Coverage Applications
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One of the most common Class B applications for Aspiration Smoke Detection (ASD) is the protection of large open spaces with high ceilings; many of which are used by the public such as atria, in lobbies and shopping centres, warehouses, shopping malls, supermarkets and historical buildings.

In these applications it is often difficult to achieve effective protection using point and beam detectors, due to numerous monitoring challenges that are present such as smoke stratification.

Applications

Advanced next-generation FAAST™ aspirating smoke detection can be used in all large volume applications including:

- Lobbies
- Atria
- Shopping Centres & Superstores
- Warehouses and Distribution Centres
- Churches & Cathedrals
- Historical Buildings
- Libraries
- Museums & Galleries
- Airports
- Stadiums

Key Criteria

FAAST XM™ provides the earliest and most accurate detection down to invisible smoke concentrations, allowing more time to implement counter measures and prevent full scale evacuations.

Using a discreet pipe network of sampling points, that can be installed both horizontally and vertically, FAAST XM™ draws air directly to the detection chamber to address smoke stratification, which prevents smoke from reaching the ceiling.

FAAST XM™ is also highly stable and reliable, delivering up to 67% increased false alarm immunity compared to traditional aspirating detection technologies.*

Features & Benefits

- Increased fire protection and coverage across large areas
- Low-level full system test capability (single operator), with no need for additional equipment or facility downtime
- Reduced maintenance needs resulting in considerable operational cost efficiencies
- Flexible sampling pipe network for warehouse racking, where product storage makes other detection methods impractical
- Remote monitoring with flexible status updates via email/smart phone/mobile
- Optimal detection 24/7 with no downtime
- Discreet and unobtrusive pipe network

* Independent test at the University of Maryland, USA.
FAAST XMTM incorporates advanced technologies and design features that easily overcome the application challenges associated with large area monitoring:

- The ability to monitor high ceilings up to 40m
- Flexible installation testing and maintenance to overcome access issues
- The ability to overcome smoke stratification and solar gain detection challenges via three-dimensional pipe networks that can be installed at different heights
- Flexible installation that compensates for building movement
- The ability to overcome compartmentalisation issues associated with warehouse/supermarket racking and shelves
- Discreet detection via capillary points and unobtrusive pipework that does not compromise aesthetics
- Safe and timely evacuations achieved by the earliest, most accurate warning of an issue

Warehouses, Distribution Centres & Supermarkets

When designing an ASD system for use in these environments, a number of potential issues should be considered.

For open warehousing, the recommendations given by local standards for spacing and height limits should be followed, with special consideration being given to the compartmentalisation that is determined by the racking/shelving.

FAAST XMTM features pipework that can be extended to provide maintenance test points at a low level, as shown in Figure 1 (top right).

Ceiling mounted sampling points should be positioned above the aisles wherever possible; particularly where the rack height is greater than 90% of the ceiling height.

In some cases it may be practical to run pipes across the aisles with spacing greater than 10 m and with sampling holes spacing less than 10 m, positioned above the aisles. See Figure 2 below.

In other cases (particularly retrofit projects), it may be more practical to run pipe along the aisles.
Warehouse & Distribution Centre
In-Rack Detection

For many warehouses, additional detection within the rack is desirable and should be provided when the rack is over 8 m. The following recommendations should be considered:

Where racking is over 8 m, the top level of in-rack sampling should be within the top 25% of the rack height and no less than 10 m from the ceiling.

Additional levels of in-rack sampling should be provided to ensure a maximum vertical spacing of 8 m. A maximum horizontal spacing of 6 m is also recommended. See Figure 3 below.

If the aisles are over 3 m, sampling holes should be provided on both sides.

Each level should be off-set to the one below to minimise the possibility of smoke rising vertically and passing between multiple layers of sampling points.

Unless practical considerations make a vertical pipe solution preferable, the horizontal spacing should be less than 4 m. See Figure 4 above.
Detection Within Atria

The high ceilings within atria create the risk of smoke stratification and solar gain detection issues, making a three-dimensional approach necessary to achieve effective smoke detection.

FAAST XM™ can be engineered to provide a three-dimensional solution; pipework can be run vertically to provide detection at lower levels as well as horizontally near the ceiling. See Figure 5 below.

Pipework can also run horizontally at different levels of the area.

This feature provides three-dimensional detection, negating any issues associated with high ceiling monitoring. See Figure 6 bottom left.

Sampling Point Locations

To achieve comprehensive coverage, it is recommended that sampling points are located at 3 m - 8 m intervals on the vertical plane or at 2 °C increments of ambient temperature.

The FAAST XM™ detector unit can be installed in a service area, allowing easy access with no need for special equipment or facility downtime when undertaking system testing and maintenance activities.
Detection Where Aesthetics Matter

In large public buildings such as libraries, museums, galleries, churches, cathedrals and airports, aesthetics are often a key consideration.

Despite such concerns, standards compliance is of paramount importance; by utilising low profile capillary air sampling tubes coupled with discrete sampling points, FAAST XM™ delivers a virtually invisible, compliant and highly effective means of smoke detection.

Air sampling pipes can be positioned within ceiling voids whilst discrete, low profile sampling points are located at ceiling level and connected via the capillary tubes. See Figure 7 to the right and Figure 8 below.

In addition, sampling points can be run into the plasterwork of ornate buildings in order to provide highly effective, discrete detection solutions. See Figure 9 to the right.

The early stage warning and reliability of FAAST XM™ provides the time necessary to evacuate large buildings safely when required, while maintaining the appearance of aesthetically important buildings for all to enjoy.

Achieving Discreet Sampling

Consider the following guidance to achieve the most discreet and aesthetically pleasing sampling.

- Position aesthetic pipework along ledges / cornices
- Install a capillary emerging from the void above the protected area
- Position a capillary down a chandelier suspension chain
- Position a capillary over the edge of a gallery

Contact Us

For further information and design support, please contact Tim Checketts on Tel: 07972 658622 / Email: tim.checketts@honeywell.com or visit www.faast-detection.com