Aspirating Smoke Detection in Lift Shafts

FAAST

Fire Alarm Aspiration Sensing Technology®

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FIRE ALARM ASPIRATION SENSING TECHNOLOGY®

Aspirating Smoke Detection in Lift Shafts

Aspirating Smoke Detection (ASD) technology is the ideal solution for lift shaft monitoring, offering wide-reaching benefits that overcome the numerous application challenges.

Lift shafts are considered a critical application for fire detection in any building. By the nature of their design, they can act like a chimney, allowing smoke to be rapidly transported to all levels of a building.

In addition, lifts may also be used during evacuation procedures (country specific), creating the need for early, accurate fire detection to reduce risks and facilitate safe evacuations.

This guide is designed to provide information on using ASDs to effectively monitor lift shafts and outlines how to design a FAAST LT™ system to ensure accurate, reliable smoke detection and the highest level of system stability.

Applications

FAAST LT™ aspirating detectors can be used to monitor all lift applications including:

- General passenger lift (e.g. hotel)
- Specialised passenger lift (e.g. hospital)
- Express lift (e.g high speed ascent / descent)
- Service lift (e.g. heavy loads, vehicles)
- Paternoster (e.g. constantly moving chain of boxes often used in industrial plants)

Key Criteria

FAAST LT™ combines proven aspirating detection technologies together with innovative design features that deliver highly reliable, stable, early warning smoke detection in critical risk applications.

The device includes high performance optical detection, fully independent chambers, ultrasonic airflow monitoring and an IP65 industrial standard housing.

The FAAST LT™ detector unit can also be remotely located in a safe and easy-to-access location, outside the sampling area.

Features & Benefits

- High sensitivity optical detection
- Ultrasonic air flow monitoring for pipe flow measurement
- Fully independent chambers allowing one unit to monitor two lift shafts
- Unique air flow pendulum verifies pipe network functionality
- Air flow stable, dual exhaust outlet design
- Detector mounting outside of the protected area, permitting simplified maintenance and removing lift downtime
- Simple design, installation, configuration and monitoring using purpose designed PipeIQ™ software.

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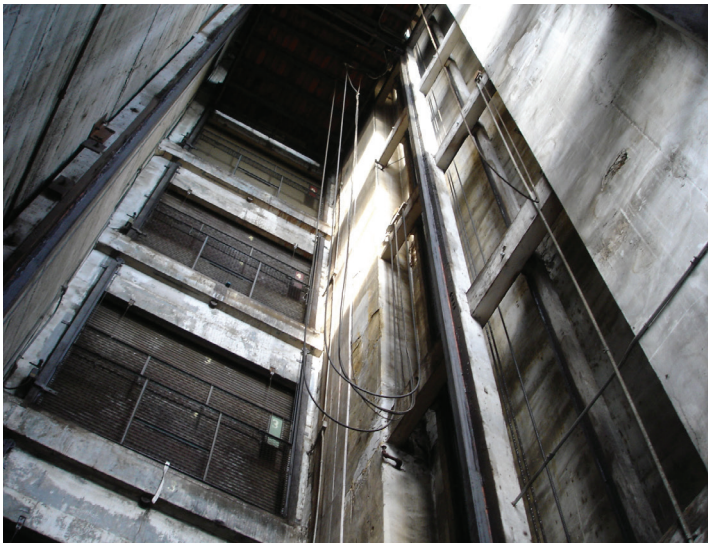
Overcoming Application Challenges

Lift shafts present a number of monitoring challenges that can prove problematic for traditional detection methods. Harsh environmental factors, high particulates and access issues for installation and ongoing maintenance create the need for an advanced ASD solution that can deliver the necessary stability and performance.

FAAST LT™ provides the ideal detection solution, with advanced design features optimised for use in hard-to-access locations, where risks are increased, harsh environmental factors exist and maintenance can be problematic.



Environmental Factors

Lift shafts experience a high volume of air movement; the ascent and decent of cabins create high airflow and during a fire, smoke particulates can be quickly dispersed. This not only increases smoke transportation risks but also creates the need for sensitive, reliable smoke detection.

FAAST LT™ can easily overcome environmental challenges. The device features advanced airflow and filtration capability through two-stage ultrasonic airflow monitoring at the inlets and at the optical chamber to detect and inform of any changes within the pipe network such as clogged sampling holes. This ensures that sufficient airflow enters the device before and after filtration. FAAST LT™ also performs within a wide temperature and humidity range (-10°C to 55°C / 10% to 93% humidity non-condensing). Offering class-leading reliability, FAAST LT™ successfully distinguishes smoke from dust particulates, preventing nuisance alarms.

Maintenance

Lift shafts are a high-risk maintenance application, where regulated safety standards are necessary to reduce the chance of injury to service engineers. Traditional detection methods require the shutdown of the lift during maintenance activities, creating unnecessary costs such as out of hours servicing and the need for both specialised equipment and multiple engineers to carry out the work.

The FAAST LT™ unit can be fitted outside of the protected shaft (where the sampling pipe network is located), and draws air in from the pipe network for analysis using a fan. This design feature prevents the need for lift shutdown during maintenance, because the only maintenance required is within the unit itself.

Maintenance is further reduced by the fact that a single unit can monitor twin lifts and a test point can be located at the detector in the safe location (please see overleaf for further information).

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Lift Shaft Monitoring

Sampling Topology

Many international regulations state that lift shafts should be treated as single vertical detection zones.

Sampling pipes should be installed across the top of the lift shaft and pipe work should also be installed down the full length of the shaft. This ensures that smoke can be detected at any level of the building, providing the early warning detection accuracy and reliability demanded by these applications. Please see Figure 1. to the right for guidance on system topology.

The use of a sampling pipe network also provides many more points of detection over traditional point detectors, increasing application safety with maximised cost-efficiency.

Exhausting for Pressure Compensation

The movement of the cabin as it ascends and descends the shaft can create pressure fluctuations. To keep airflow balanced when using an ASD, the unit exhaust must be returned to the lift shaft. This can cause associated flow problems in many ASD systems, which typically feature a single exhaust.

Unlike other ASDs, FAAST LT™ features independent exhausts for each channel, allowing twin lifts to be monitored by a single device. This enables exhausted air to be returned to each shaft. This aspect, combined with advanced flow sensing technology ensure maximised system uptime and increased stability over comparable ASDs.

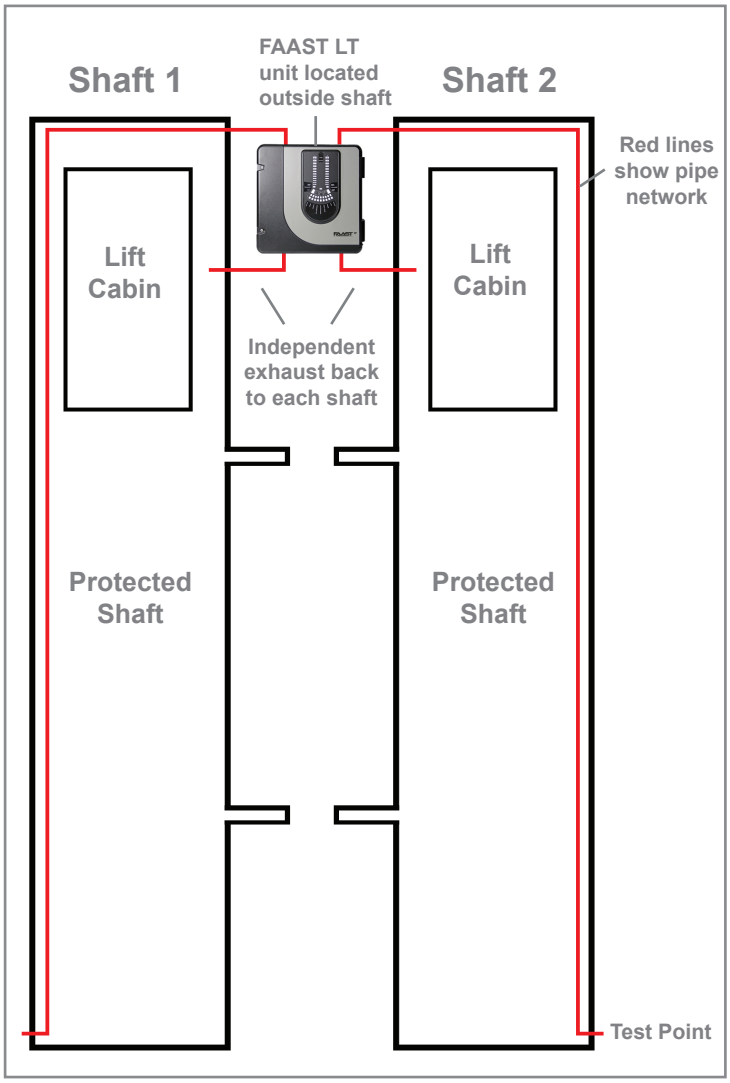

Figure 1.

Simplified Testing

By installing a test point in a safe and easily accessible location (e.g at the detector or a separate location outside the protected area), the need for specialised equipment to carry out routine testing and system monitoring is removed.

A single operator can fully test the system at ground level and check airflow from all sampling points. In the event of particulate / dust build-up, a manual blow through can be used to clear any particulate build-up that is preventing optimal detection in any sampling points within the total system.

Contact Us

For further information and design support, please contact Felix Heck on Tel: +49 151 1896 5125 / Email: felix.heck@systemsensor.com or visit **www.faast-detection.com**

This document is intended as a guide only - please take into consideration regional guidelines and standards.