

WHITE PAPER

Aspirating smoke detectors - important components of professional fire detection technology

The early detection of fire is a decisive factor in saving human lives and contributes significantly to minimizing material damage. The concept of a professional fire alarm system considers the protection objective as well as all relevant standards and regulations. In addition to the usual point-type fire detectors, these can also be so-called aspirating smoke detectors. Since July 2009, aspirating smoke detectors have been tested according to the European product standard EN 54-20.

Functionality and application

Aspirating smoke detectors are part of a professional fire alarm system and basically consist of an aspiration pipe system and an evaluation unit. The pipes of the aspirating pipe system have fine holes. The number and the size of holes depends on the respective monitoring specification. An aspiration fan or vacuum pump continuously aspirates air samples from the respective monitoring area and forwards the samples to the evaluation unit. There, a detector for the fire parameter 'smoke' examines the sample for smoke particles. As soon as the measured smoke concentration exceeds a defined value, the system triggers a fire alarm. The effectiveness can even be increased by using approved accessories such as filters, condensate separators, and air blowers. Depending on the manufacturer, either differently sensitive detectors are used or an application-related sensitivity is set by means of software or switches.

In the simplest case, the fire detection element in the detector is an optical smoke detector. High-quality systems work with laser technology or spectral analyses. While point smoke detectors have a lower response threshold, highly sensitive aspirating smoke detectors react to even the smallest particle contamination in the room air. Several evaluation levels as well as an early warning option with adjustable pre-alarm thresholds enable optimum use in different application areas. The sensitivity can be individually adapted to the respective requirements. Data centers, for example, require much more sensitive settings than, for example, recycling areas.

A special advantage of aspirating smoke detectors is that the aspirated air can be filtered or - if necessary - dehumidified. On the one hand, this enables use in difficult environmental conditions; on the other hand, it increases the service life of the aspirating smoke detector. The pipe system itself can also be cleaned of dry dust using compressed air or vacuuming.

Preferred areas of application

The areas of application for aspirating smoke detectors are very diverse. They range from areas with high requirements towards early fire detection, to areas that are difficult to access, and also to buildings in which the interior and the aesthetics of the building have to be considered. In production areas of the food industry, for example, aspirating smoke detectors are often the only way to withstand the adverse environmental conditions for fire detectors. They resist complex cleaning and disinfection measures for the production equipment much better than point-type fire detectors. Aspirating smoke detectors with a robust IP66 housing are most suitable for these applications, as they offer complete protection against dust

ingress and against strong water jets. Especially in very harsh environments, this makes expensive external IP enclosures redundant, thus reducing installation costs.

Due to their properties, aspirating smoke detectors are the preferred choice in airports and recycling plants, as well as in deep-freeze warehouses, high-bay warehouses, exhibition halls and in clean rooms such as laboratories or chip production. They monitor not only suspended ceilings very reliably, but also elevator shafts and buildings that are protected as historical monuments.

In Germany, the project planning of the intake points is carried out according to the regulations VdS 2095 or DIN VDE 0833-2, which also define the values for the monitoring area per aspiration point. An aspirating smoke detector can thus monitor up to 1,600 m². The EN54-20 regulation defines the sensitivity classes A (very high sensitivity), B (increased sensitivity) and C (normal sensitivity). They need to be considered in the project planning of the overall system - consisting of aspirating smoke detector, aspiration pipe and accessories.

One company – several brands

Often it is unavoidable to use different systems because application-specific, technical and economic requirements can be comprehensive. In this case, companies with a broad portfolio and tailor-made systems offer advantages. Honeywell for example provides aspirating smoke detectors of different brands, optimally matching all sensitivity classes defined in the standard using different technologies. The FFAST LT-200 system mainly covers applications with class C sensitivity requirements and noise-sensitive environments. The VESDA-E aspiration smoke detectors from XTRALIS are preferred in sensitivity classes A, B and C as well as in areas with strong air flows. VESDA laser systems are specially developed for industrial environments. The VESDA LASER INDUSTRIAL (VLI), for example, has a very robust design and, due to its fail-safe filters, its advantages are particularly effective under difficult ambient conditions.

XTRALIS already presented the latest generation of its aspirating smoke detectors VESDA-E in February 2019 at the FeuerTrutz trade show in Nuremberg. The high sensitivity, flexibility, reliability, programmability and expandability of the VESDA-E devices offer



customers maximum performance and protection while reducing overall investment costs. Simpler maintenance and on-site exchangeable components make it possible to reduce operating costs. VESDA-E is fully compatible with previous VESDA systems.

FFAST LT-200 offers added value especially when smoke develops extensively, as it can occur in office areas and rooms with up to six meters installation height. It combines proven aspiration technologies with a patented and sensitive infrared LED detection chamber and bidirectional ultrasonic flow sensors. Advanced algorithms reliably reduce false alarms. In the FFAST LT-200 EB version, the detector has a preconfigured esserbus® coupler to be connected to the esserbus® ring bus cable.



Both FFAST and XTRALIS belong to the globally operating Honeywell Group.

Summary

A holistic and future-oriented fire protection concept must be planned based on standards, guidelines, building regulations and acceptance issues. Depending on the application, suitable aspirating smoke systems complete a safe and professional concept. The selection of a device type can depend on the technological advantages and the investment specifications, amongst others.

You can find more information on the manufacturers' websites. The manufacturers' on-site trainings offer an overview of the product-specific features and benefits to installers and planners. Both, VESDA and FFAST aspirating smoke detectors are offered in the new product group catalogues of the traditional ESSER and NOTIFIER brands.

In addition, technical consultants answer your product-specific and application-related questions. You can download an overview of the region-related contact persons from the manufacturers' pages.

More information:

www.esser-systems.com

www.notifier.de

www.xtralis.com/vesda-e

www.honeywell.com