Aspirating Smoke Detectors 420 Series
Special environments require very early detection
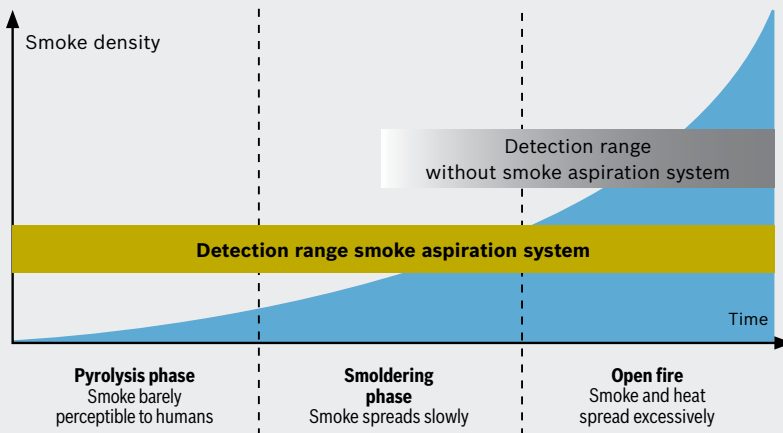
BOSCH
Invented for life

Aspirating Smoke Detectors: A sure-fire investment

Actively protect your investments with a smoke aspiration system from Bosch

Investing in a fire alarm system is the most effective way to safeguard your company. Protect your company, your employees and your assets with technology from Bosch.

The solution to an underestimated problem

Statistics show that in some countries, a fire breaks out every two seconds. The consequences can be devastating - and even being well-insured is of little help. The only solution is to detect fires as early as possible so action can be taken before they spread and cause damage. Conventional alarms aren't triggered until the fire has begun smoldering or even broken out into open flame. At that stage, fighting it can be difficult. This is the big advantage of smoke aspiration systems: they detect incipient fires and provide very early warning.

Smoke density

Detection range
without smoke aspiration system

Detection range smoke aspiration system

Time

Pyrolysis phase
Smoke barely perceptible to humans

Smoldering phase
Smoke spreads slowly

Open fire
Smoke and heat spread excessively

Early warning of fires with smoke aspiration systems

How smoke aspiration systems work

Smoke aspiration systems are modular, which makes it easy to tailor them to individual building conditions and potential fire risks. The two main components are: sampling pipes in the monitored area and a detector unit that can be located elsewhere.

The detector generates a vacuum in the sampling pipes to ensure continuous air intake from the monitored areas. These actively obtained air samples are channeled through a sensitive optical sensor in a detection chamber to check for smoke particles.

An intelligent signal processor then analyzes the measured data and decides whether there are any typical fire patterns. Evirnonmental effects that might cause false alarms are suppressed.

The advantages of smoke aspiration systems
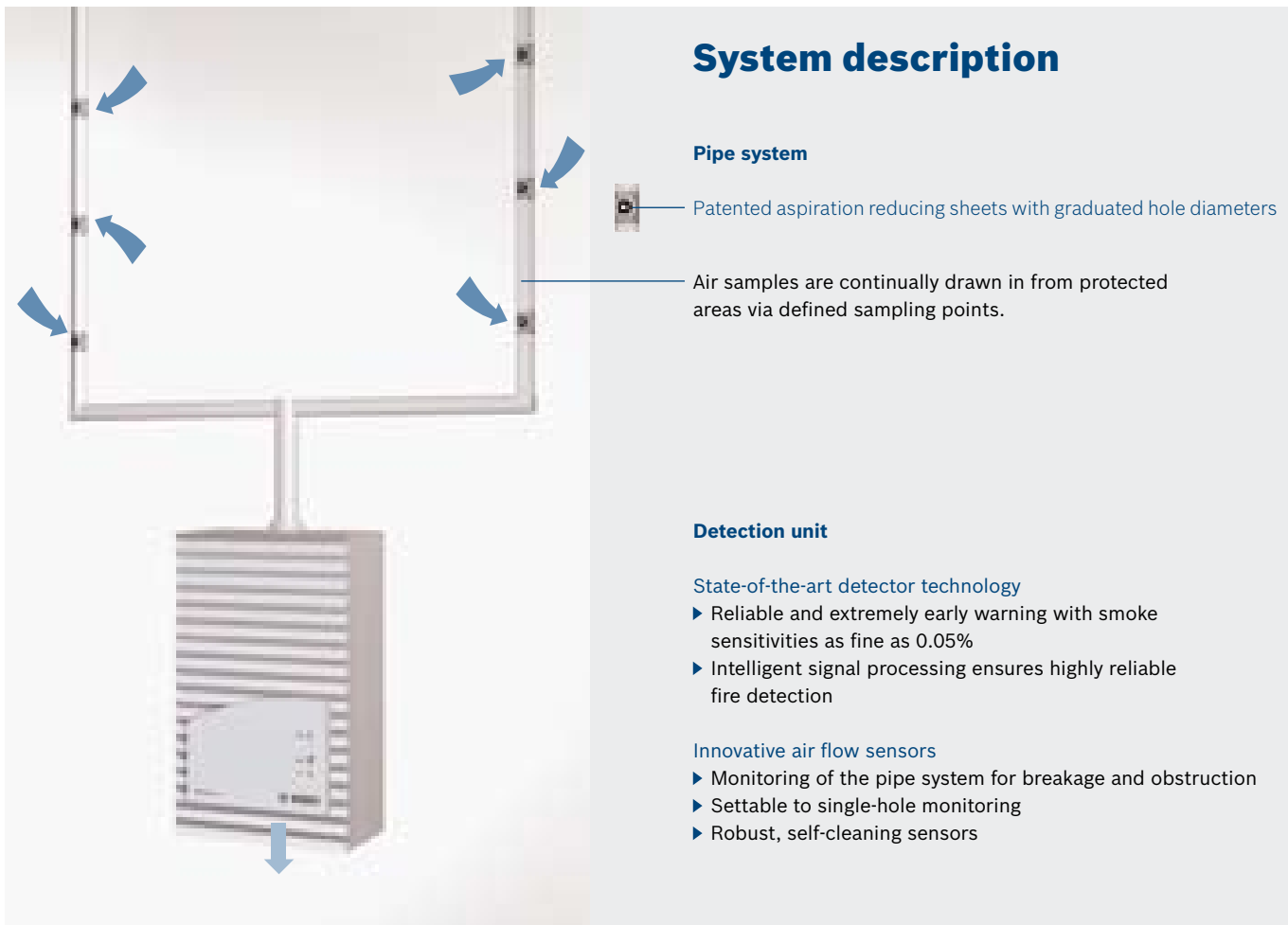
Highly reliable detection for early warning:
Fires are detected when they are just beginning (in the "pyrolysis" phase). Highly sensitive sensors detect the presence of a fire before visible smoke is released, thus reliably preventing major damage in most cases.
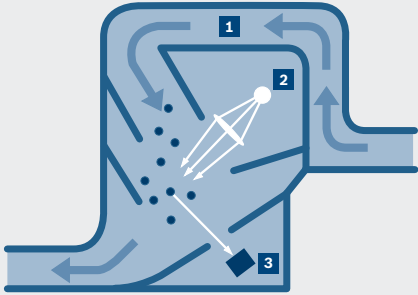
Minimization of false alarms:
In smoke aspiration systems, intelligent signal processing largely suppress environmental factors that typically cause false alarms, such as dust, drafts and electrical interference. This enables higher sensitivity and ensures reliable operation even in challenging situations with high ceilings, extreme temperatures, dirt or moisture.

Flexible placement and maintenance:
The detection units can also be installed externally for monitoring double floors and cable conduits, so maintenance personnel can easily access them. Smoke aspiration systems can be unobtrusively integrated into buildings.

System description

Pipe system

Patented aspiration reducing sheets with graduated hole diameters

Air samples are continually drawn in from protected areas via defined sampling points.

Detection unit

State-of-the-art detector technology
▸ Reliable and extremely early warning with smoke sensitivities as fine as 0.05%
▸ Intelligent signal processing ensures highly reliable fire detection

Innovative air flow sensors
▸ Monitoring of the pipe system for breakage and obstruction
▸ Settable to single-hole monitoring
▸ Robust, self-cleaning sensors

Technological highlights for reliable detection

High-power light source
1. Guided air stream to prevent deposition of particles
2. Light source (sender)
3. Photodiode (receiver)

Extremely high sensitivity with High-Power Light Source (HPLS)

A high-power light source makes the detection modules much more sensitive than common point type detectors. The air is led through a special measurement chamber that was specially developed for applications of this kind.

In the detection chamber, extremely sensitive sensors provide very early warning to ensure enough time to extinguish a fire or take other action as required. The light source has a favorable spectrum to ensure consistent responses to all types of fires.

Fire localization with ROOM-IDENT

ROOM-IDENT enables both very early detection and localization of fires. A single detection unit can monitor up to five rooms. ROOM-IDENT tracks down the fire source in four phases, displaying the result both on the unit and in the affected room (optional).

Phase 1 (normal mode):
The pipes running accross to various rooms are used to obtain and evaluate air samples.
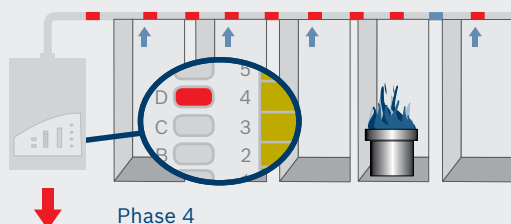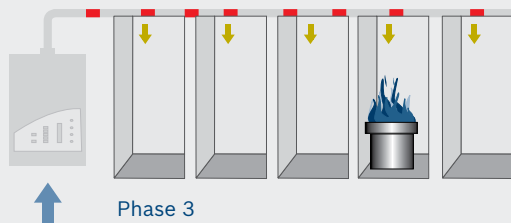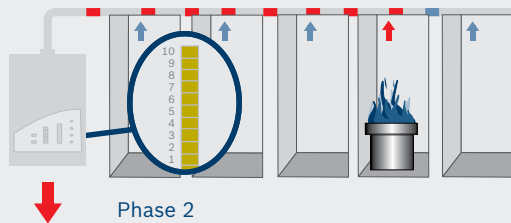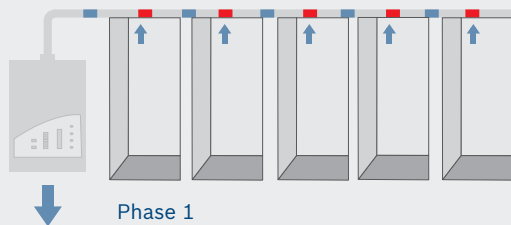
Phase 2 (very early fire detection):
Any smoke is suctioned in and evaluated.
The presence of smoke immediately triggers an alarm to enable an early response.

Phase 3 (back flush):
The intake fan is switched off when an alarm is given, and a second fan switches on to blow all smoke particles out of the pipes in the reverse direction.
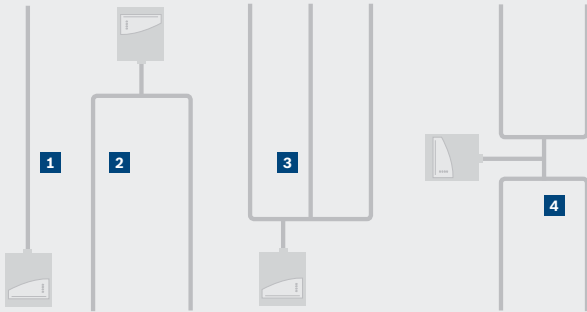
Phase 4 (localization):
After the pipe system is blown free, the direction of air flow is reversed again. Based on the amount of time that aspirated smoke takes to reach the detection module, the system determines which of the monitored rooms contains the fire.

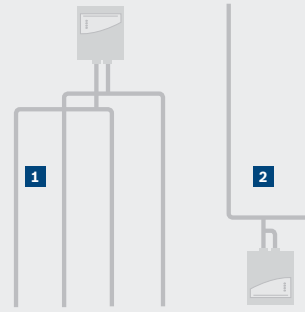Phase 1

Phase 2

Phase 3

Phase 4

The intelligent pipe system

The air flow is constantly and intelligently monitored for breakage and obstruction. The sensitivity can be freely set, all the way to single-hole monitoring. This function is also temperature-compensated and can be programmed to take atmospheric pressure into account.
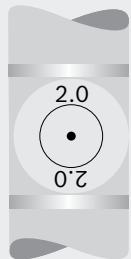
Example pipe layouts for use of one detector module
1 I configuration
2 U configuration
3 M configuration
4 Double-U configuration

Example pipe layouts for a two-detector setup
1 Room protection
2 Protection of facilities or small rooms

Aspiration-reducing film
Graduated aspiration-reducing sheets achieve balanced air samples across all sampling points and prevent annoying whistling (scale of drawing 1:1).

Accessories (selection)
▶ Freezer clips
▶ Manual and automatic blow-out devices to eliminate ice and dust
▶ Detonation fuse for areas with risk of explosions
▶ Filters for extremely dusty areas
▶ Steam trap

Local SecurityNetwork functionality

The aspirating smoke detectors of the 420 series work with Bosch's Local SecurityNetwork (LSN) bus system. LSN is a freely configurable security bus system that offers a wide choice of fire, intrusion and malfunction detectors, operator units and aiming devices from multiple manufacturers.

The bus uses the master-slave principle, with all smoke detectors, remote indicators, fire alarm devices, intrusion detectors, keypads, arming devices and sounders connected to it. The network can be flexibly structured with loop, stub or tee-off configurations; the possibilities are additionally extended by interfaces with inputs and outputs and zone expanders. Power and data are transmitted over two wires.

A wide range of LSN components is available, including over 70 different sensors from six manufacturers and various panel types from eight manufacturers. The system complies with EN 54, EN 50131 Grade 4 and VdS Class C.

"LSN improved" technology and modules accommodate currents up to 1500 mA over up to 3000 meters. The voltage on the LSN bus is 30 V at the bus driver module.

FAS-420-TM Series

This affordable, compact solution is ideal for protecting areas of up to 400 square meters, even under challenging environment conditions.

This affordable, compact solution individually monitors up to five rooms – including small ones – and determines the locations of any detected fires. Featuring innovative air flow sensors, it supports up to eight aspiration openings with a single 40-meter pipe or two 25-meter pipes. It is suitable for areas as large as 400 square meters; the possible applications include hotel rooms, small server rooms, small high-rise warehouses, etc.

FAS-420-TP Series

This universal solution can be configured so that two detectors must confirm a fire before an alarm is triggered (two-detector dependency).
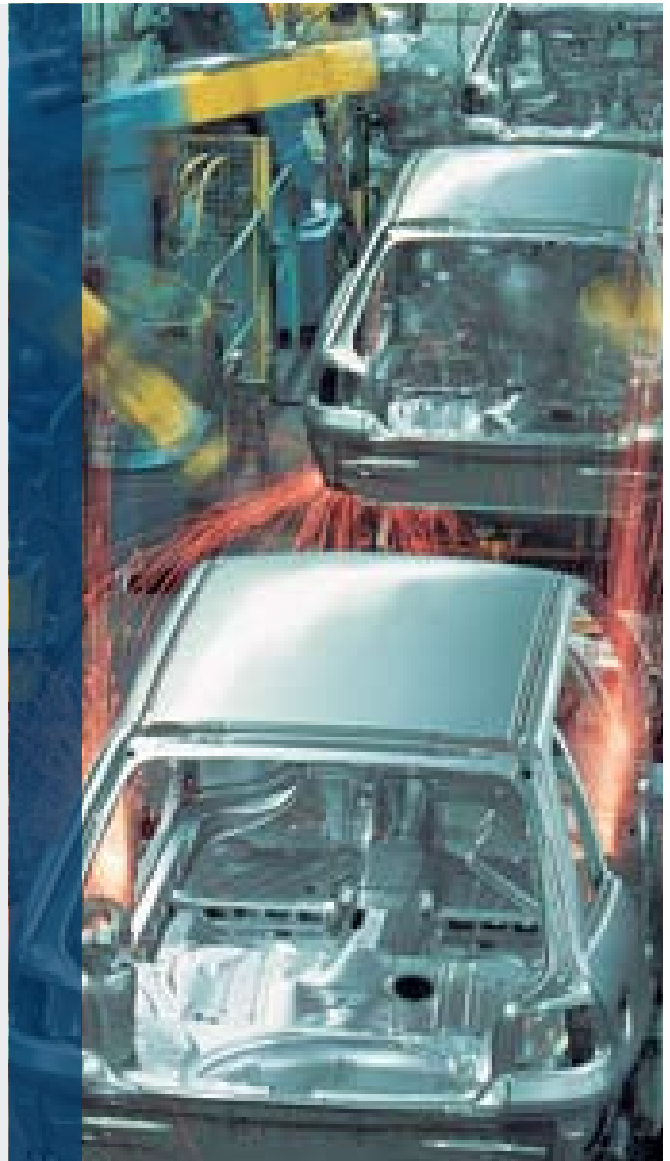
Although, the use of only one detector is also possible. Up to 48 aspiration openings are supported per system, with a maximum pipe length of 360 meters. The system can be optionally networked. The applications include production plants, clean rooms and large server rooms, depending on the size of the area requiring protection.

FAS-420-TT Series

This universal solution features a 10-stage alarm display with up to three alarm levels (information, pre-alarm, main alarm).

It also provides a ten-digit bar graph for monitoring smoke pollution (also available in a MicroSens version). Two modules can be deployed to double the surveyed area; they can also be linked to that two detectors must confirm a fire before an alarm is triggered. Up to 48 aspiration openings are supported per system, with a maximum pipe length of 360 meters. The range of applications includes manufacturing facilities, clean rooms and large server rooms.

Product features

	TM	TP	TT
Suitable for use under difficult conditions	●	●	●
Practical installation tools	●	●	●
VdS and EN 54-certified	●	●	●
Suitable for deep-freeze applications	●	●	●
Up to three alarm levels, with pre-alarm and main alarm			●
Intelligent signal processing	●	●	●
Sensitivity settable to 0.05%/m of light obscuration for main alarm		●	●
Display sensitivity down to 0.005%/m of light obscuration			●
10-level alarm display for smoke density	●		●
Two-zone dependency	●	●	●
Two-detector dependency		●	●
Up to 48 aspiration openings per system, max. pipe length 360 meters		●	●
ROOM-IDENT	●		
Extensive range of accessories	●	●	●
Innovative air flow sensor technology	●	●	●
Relay contacts connectable with the fire alarm system via "plug & play"	●	●	●
Infrared diagnosis tool	●	●	●

A wide range of applications

Thanks to their outstanding features, the smoke aspiration systems from Bosch can be used almost anywhere. Their many applications include clean rooms, high-rise warehouses, factories, conveyor belts, paper mills, recycling plants, data centers, false floors, cable conduits, switch cabinets, telecommunications equipment, high-voltage facilities, EMC testing areas, glazed buildings, elevator shafts, escalators, car parks, modern and historic buildings, libraries, saunas, hotel rooms and prison cells.

The 420 Series smoke aspiration systems can also be customized. Just talk to us!
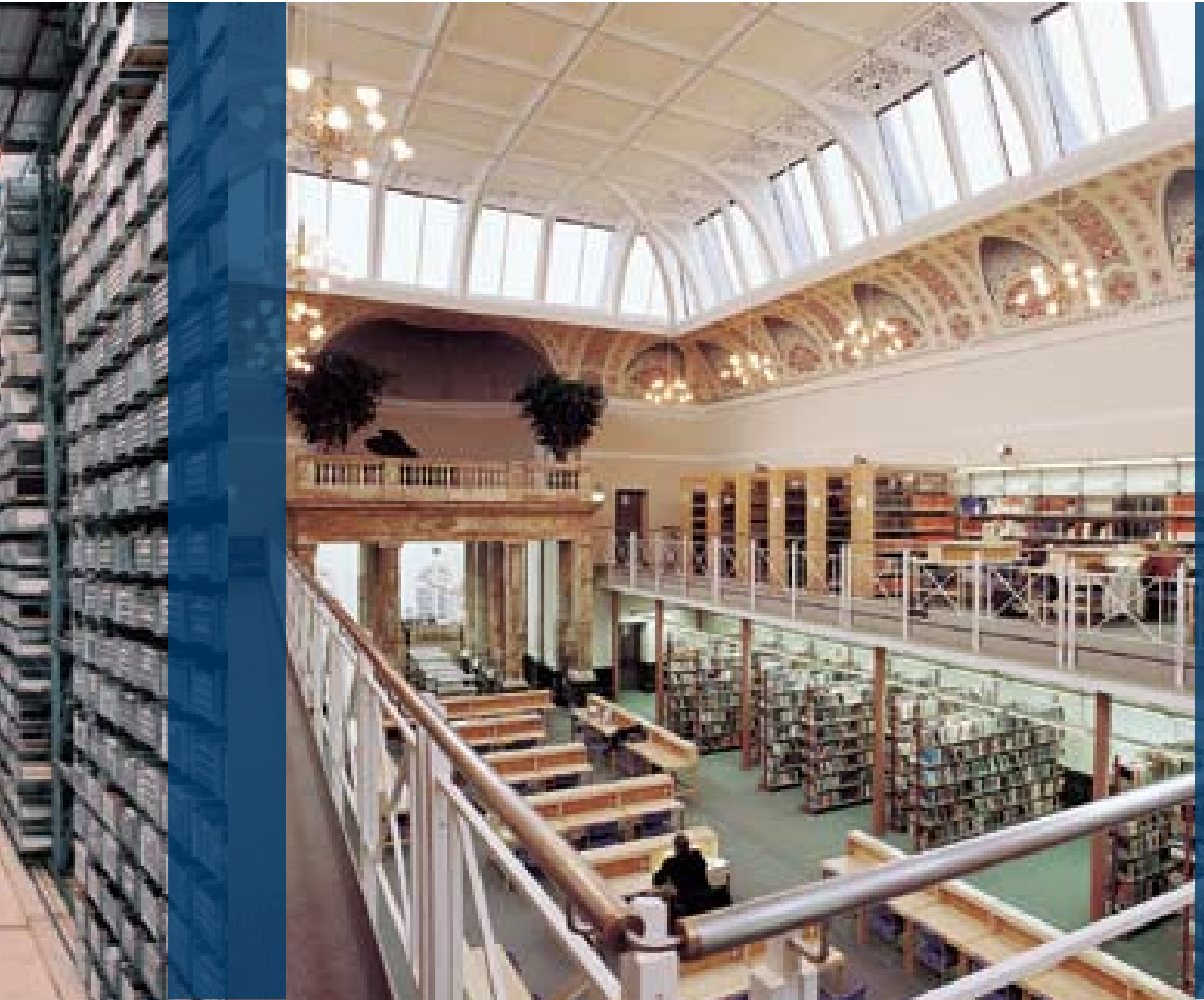
Example 1:
High-rise warehouse
The pipe system is easy to integrate into the warehouse design. Active air sampling over the entire height ensures early detection. The system's parts are easy to access, which reduces maintenance and servicing costs.
Regular operations can continue while maintenance is being done.

Example 2:
Factory
The pipe system is easy to install in a production building's supporting elements. This ensures reliable detection in areas with high levels of dust and contamination. The detector unit is installed at eye level. Maintenance and servicing are straightforward, also in high buildings and when there are complex ceiling conveyors.

Example 3:
Library
The system's highly sensitive detection technology with a high-power light source (HPLS) ensures extremely early warning of fire to protect archived books and documents. The pipes can be installed right on the shelves. A multistage alarm approach can be implemented to protect irreplaceable items.

Anything is possible
420 Series aspirating smoke detectors from Bosch meet the highest standards in terms of safety, reliability and flexibility. Their highly sensitive sensors detect fire at the earliest possible stage.

Intelligent signal processing efficiently eliminates extraneous factors that could otherwise trigger a false alarm. These systems also save you time and money for maintenance and servicing.

A Tradition of Quality and Innovation

For over 100 years, the Bosch name
has stood for quality and reliability.
Bosch is the global supplier of choice
for innovative technology, backed by
the highest standards for service
and support.

Bosch Security Systems proudly
offers a wide range of security, safety,
communications and sound solutions
that are relied upon every day in
applications around the world, from
government facilities and public venues
to businesses, schools and homes.