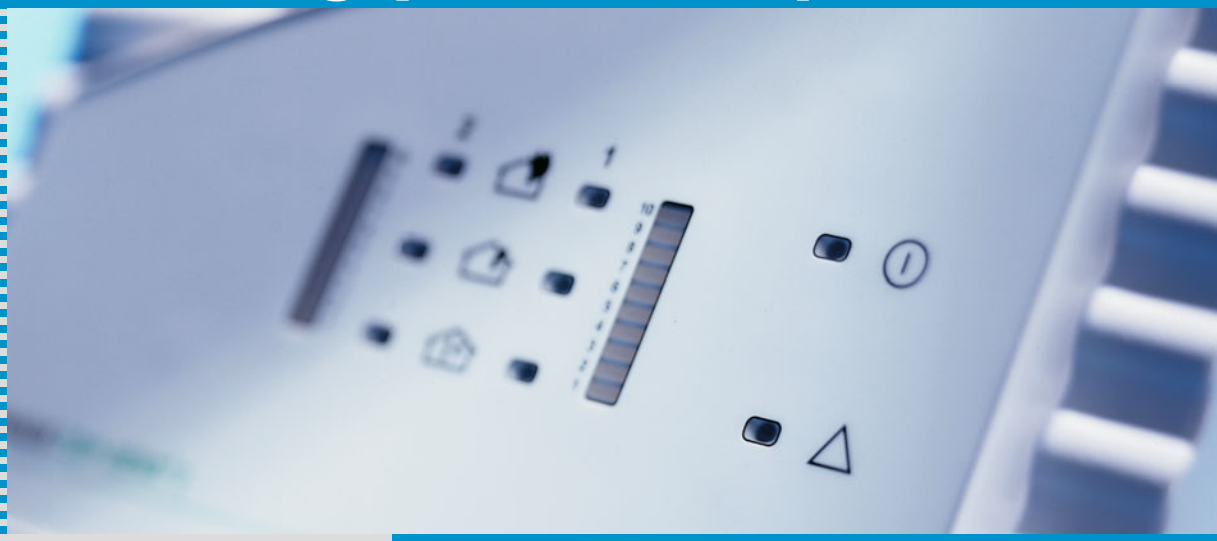
Saving lives, protecting valuables, securing process cycles



Fire detection

TITANUS® air sampling smoke detection systems: Smoke detection with high sensitivity and false alarm immunity

WAGNER®

Why very early smoke detection?

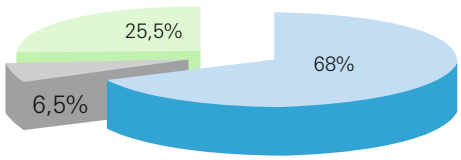
Fire - never underestimate the danger

"Experience shows that a fire can break out at virtually any time. Just because many buildings have not experienced a fire for decades does not mean that there is no risk of fire; rather, those concerned are fortunate - but they could become liable for damages in the future."
[Extract from a statement made by the Higher Administrative Court of Münster, Germany 10 A 363/86 v. 11.12.1987]

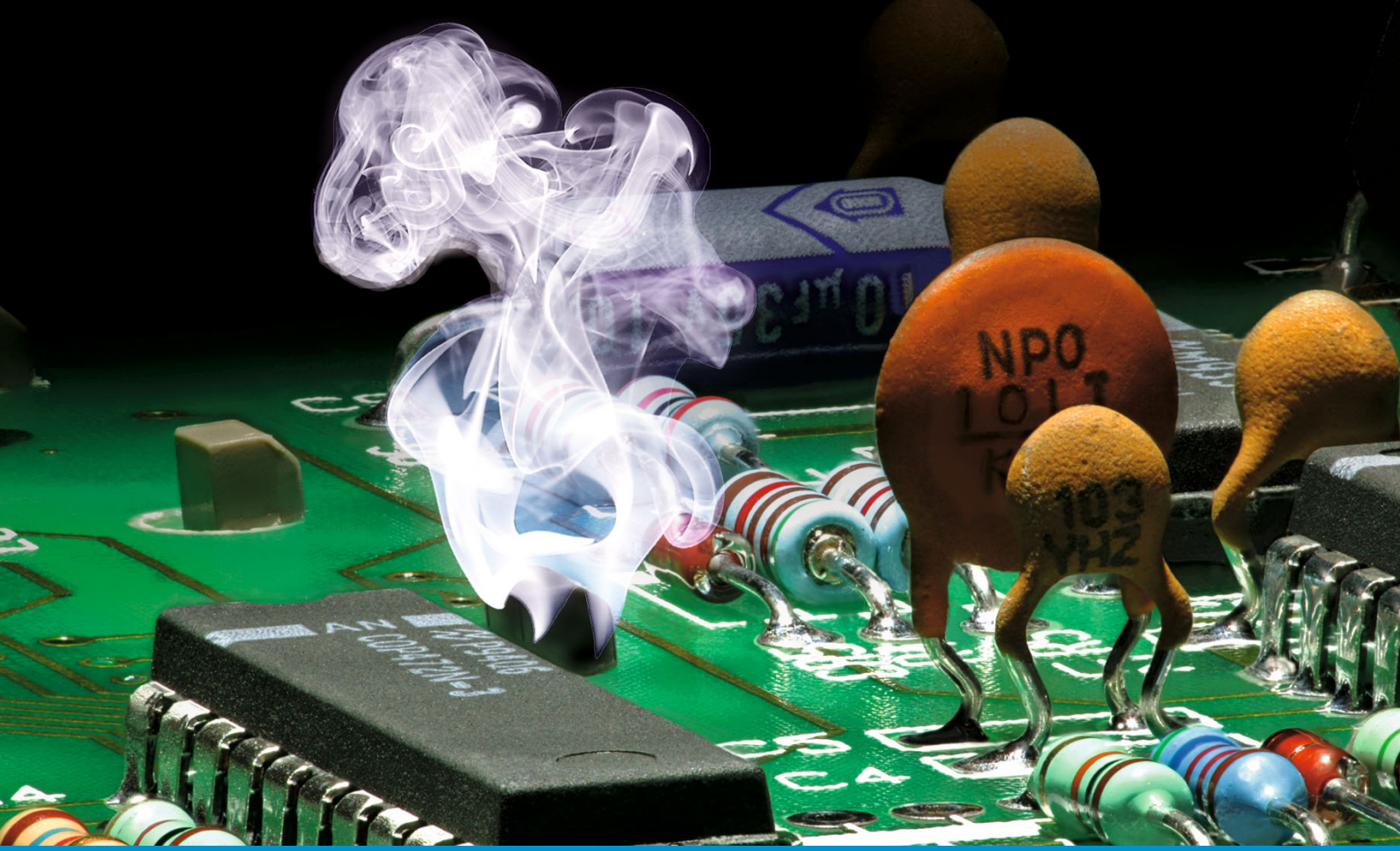
A fire can have many causes

Now more than ever before, a fire can mean the loss of supply availability, a drop in market share and even the collapse of a company. High concentrations of valuables, irreplaceable assets and increasing demand for immediate availability of goods and services therefore require appropriate fire protection solutions. Industrial development has created highly technical fire protection requirements in situations where conventional fire detectors are no longer sufficient. As fire origin statistics show, the majority of damaging fires originate as a result of prolonged smouldering fires. While conventional detectors have to "wait" until the fire has reached a detectable size, more sensitive smoke sensors identify the fire in its initial phase and therefore offer a significant time benefit for damage limitation.

Fire causes	Proportion	
Faulty electric devices and installations	25,5 %	Predominantly smouldering fires
Smoking	20,0 %	
Hot surfaces	8,0 %	
Welding and cutting	5,5 %	
Friction points	4,5 %	
Spontaneous combustion	3,5 %	
Radiant heat	1,0 %	
Sparks and ignition equipment	3,5 %	Smouldering fires, open fires, explosions
Chemical reactions	1,0 %	
Electrostatic discharges	1,0 %	
Mechanical sparks	1,0 %	
Arson	17 %	Predominantly open fires
Open flames	6,5 %	
Molten substances	1,0 %	
Lightning strikes	1,0 %	



Distribution of fire causes according to Bussenius



State-of-the-art fire detection

Time benefits through increased sensitivity

The earliest possible fire detection brings significant time benefits, which enable counter measures to be taken.
Modern air sampling smoke detection systems are able to detect fires with a thousand times more sensitivity than point-type smoke detectors, and also to detect fires in their early phase from just 1 gram of material combustion. Unlike point-type smoke detectors, which are only triggered at a much later stage, they offer a considerable time benefit.

High false alarm immunity

The physical separation of the detection unit from the monitoring area reduces the risk of transient faults such as those caused by condensation and electromagnetic radiation. The use of filters and the appropriate algorithms also guarantee reliable detection in dusty conditions.

Simple accessibility versus business interruption

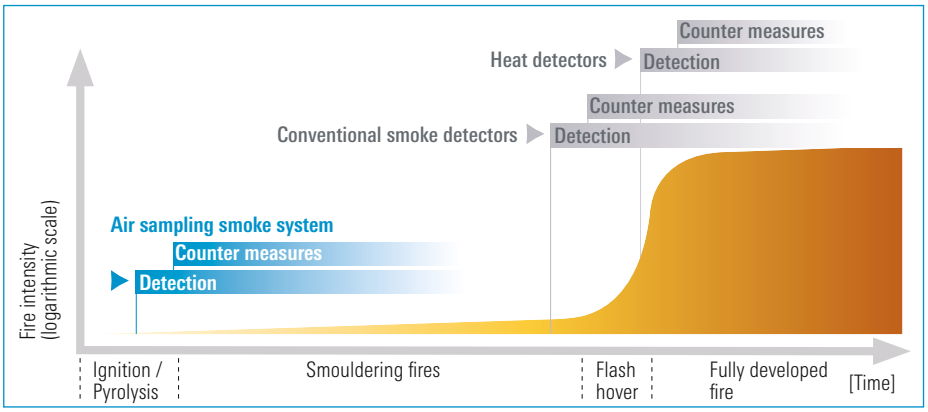
Inspections and service tasks are carried out in central, easily accessible places. This means that the monitored area does not have to be accessed. There is no longer any need to inspect individual detection points under the ceiling, as is the case with conventional fire detectors.

No limit on aesthetics

The smoke sampling holes in the ceiling can be installed so inconspicuously that they do not interfere with the aesthetics. This reduces the limitations on architects and planners when implementing their ideas and gives them greater freedom of design.

High security against vandalism

You can't destroy what you can't see. The virtually invisible integration of the smoke sampling holes in the ceiling offers almost no target for vandals.



Highly sensitive air sampling smoke detection systems compared to other technologies

Classified sensitivity

The new EN 54-20 standard

In July 2009 the new product standard EN 54-20 became compulsory for every manufacturer and installer of air sampling smoke detection systems. The standard introduced sensitivity Classes A, B and C for the first time. The classes classify the early fire detection properties of the systems, taking into account the number of sampling holes, the sensitivity of the detectors and the pipe accessories used, such as the filters.

Greater transparency in fire detection

The standardised classification was based on test fires, whose fire development was reduced by up to a factor of 40 compared to the test fires used for conventional smoke detectors.

The lack of standards and regulations meant that sensitivity information about smoke detectors had very little validity in the past. It is only with the introduction of Classes A to C that information about how sensitive a smoke detector really is has become available. Now, for the first time, the classes have introduced a high degree of transparency into the market, making it possible for designers and end users alike to use clear criteria to fulfil a specific security requirement.

The maximum coverage of an air sampling smoke detector can now be deduced from the number of point-type smoke detectors that have to be replaced by an air sampling smoke detection system in order to satisfy the specific sensitivity class. The coverage is therefore dependent on the sensitivity of the detector as well as the maximum approved number of sampling holes and the admissible length of the sampling pipe.

	Sensitivity	**Application**
Class A	Very high	Earliest possible fire detection, designed primarily for areas with high levels of air conditioning and air dilution.
Class B	High	Very early fire detection for most areas in which valuable goods and/or processes need to be protected.
Class C	Normal	Applications for general fire protection requirements.

An explanation of Classes A, B and C within harmonised standard EN 54-20

Systematic fire detection

Design and function of air sampling smoke detection systems

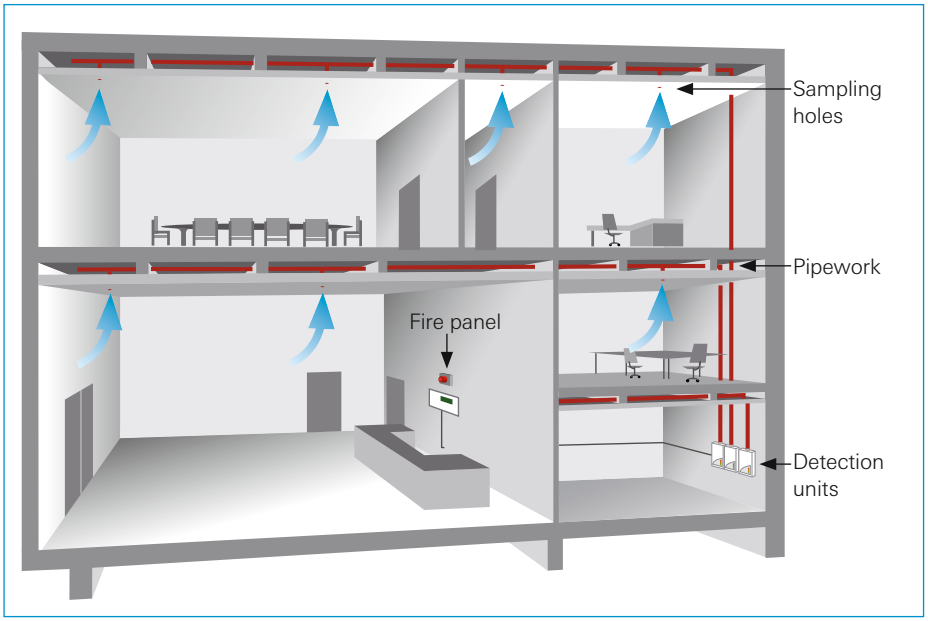
Air sampling smoke detection systems are smoke detectors that actively take air samples from the monitored area and analyse them for the presence of smoke particles.
They basically consist of a detection unit and the associated pipe system. The low pressure needed for air sampling is produced by a fan. Airflow sensor technology ensures functionality by constantly monitoring the pipe system for breakages and obstructions.

Monitored area

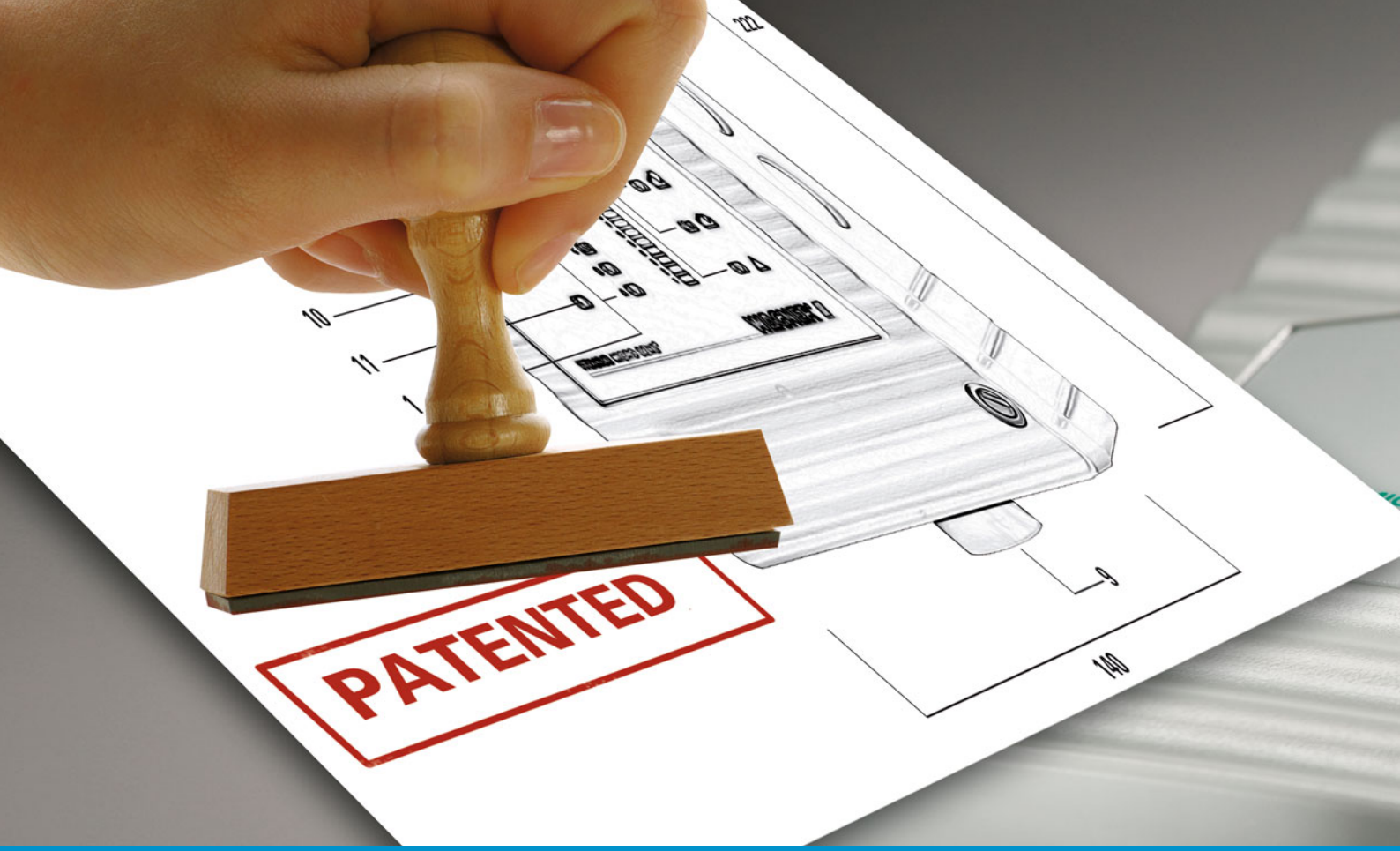
The sampling holes in the monitored area are arranged so that the same amount of air is drawn through each hole. Each sampling hole is therefore allocated the same monitored coverage as a point-type smoke detector.

Cumulative effect

A cumulative effect is achieved by having multiple sampling holes in a room that extract any smoke that arises simultaneously. In these conditions the sensitivity of an air sampling smoke detection system offers a huge advantage. In spaces with high-ceilings, the cumulative effect can often contribute up to 50 %; an amount that can increase still further depending on the space and height of the room.



Operating principle (simplified)



TITANUS® – the patented advantage

For a wide variety of applications

Thanks to their outstanding reliability, sensitivity and false alarm immunity, TITANUS® air sampling smoke detection systems have been the tried and tested system of choice for many years in a wide variety of applications. Especially in areas with particular detection requirements and difficult environmental conditions, these systems, approved under EN 54-20, have shown impressive technological leadership. WAGNER has demonstrated this through a comprehensive range of project design options for all the new standard classes and set a whole new standard within the industry.

A high concentration of valuables and strict requirements in terms of availability mean that today an adequate fire protection concept is essential.

TITANUS® air sampling smoke detection systems offer significant advantages in the implementation of the appropriate concepts designed to suit every individual requirement.

Maximum reaction time benefits through high sensitivity

With the introduction of the High Power Light Source (HPLS), WAGNER has made a decisive step forwards in light source technology: it is more robust and reactions more sensitively to smoke particles than the previously used laser technology. It also allows Wagner air sampling smoke detection systems to operate at temperatures as low as -40 °C. With sensitivity levels a thousand times higher than conventional smoke detectors, **TITANUS**® air sampling smoke detection systems provide significant reaction time benefits to enable counter measures to be taken.

High degree of false alarm immunity, even in problem areas

With the intelligent LOGIC·*SENS* signal processing system, air samples are checked against known fire parameter patterns. Based on many years of experience, WAGNER has managed to perfect its patented signal processing system to such a level that false alarm scenarios can be eliminated with a high degree of reliability, even in very difficult applications. LOGIC·*SENS* satisfies very effectively the requirements laid down in the German VDE 0833-2 to avoid false alarms.

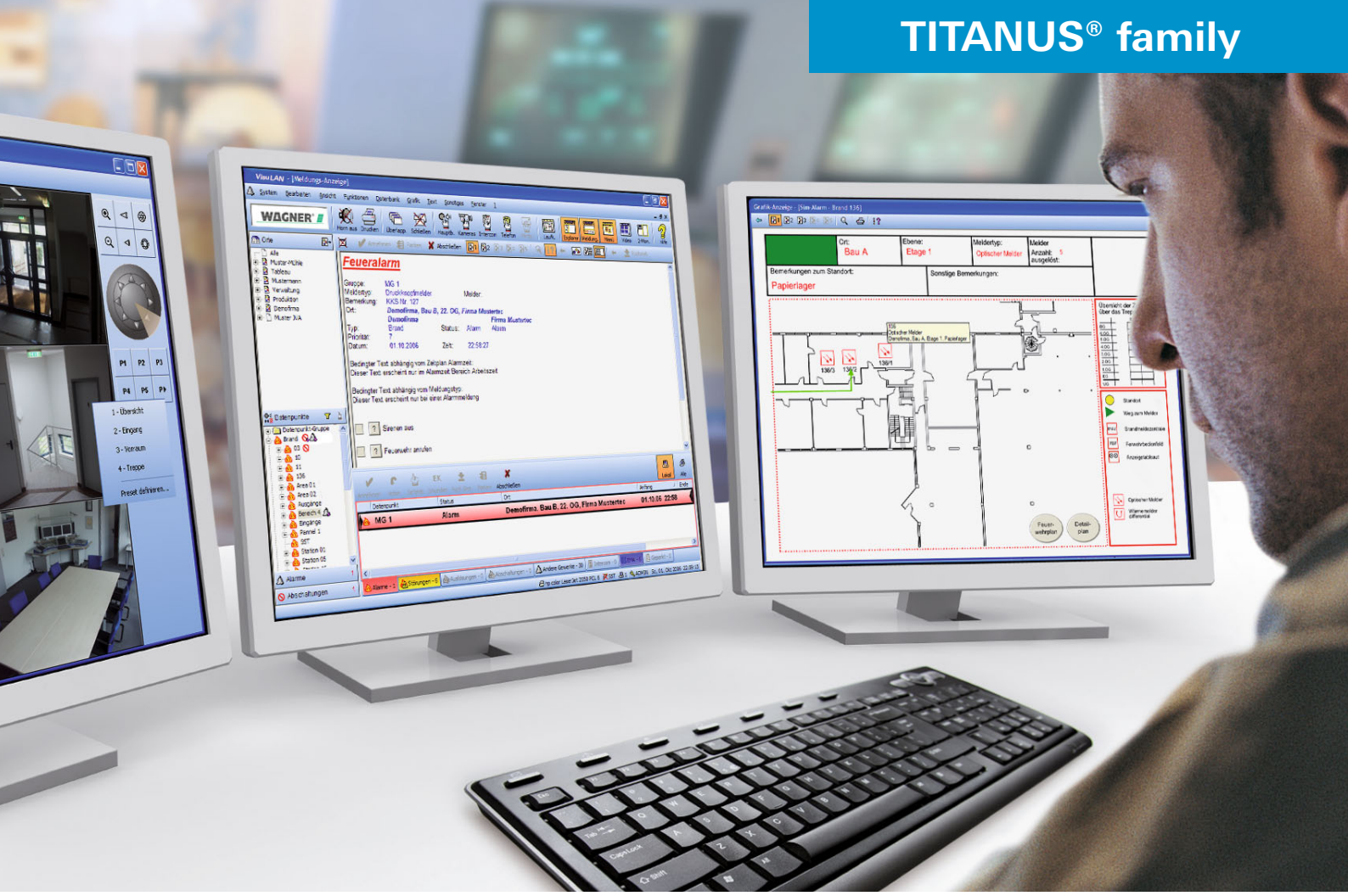
Cost benefits through optimised process chains and a modular solution portfolio

TITANUS® air sampling smoke detection systems are noted for their modular and optimised construction, which offers clear advantages. The equipment is designed and built in such a way as to save time when it comes to design, installation, commissioning and inspection. Furthermore, they are suitable for use in a wide variety of different requirements and applications. These properties offer a clear cost benefit compared to other technologies.

TITANUS® “details“ are the key to success

Risk-appropriate alarm concept

TITANUS® air sampling smoke detection systems have up to 3 alarms, depending on the configuration, creating a tiered alarm concept. According to the level of alarm, a risk-appropriate alarm response can be activated and alarm signals triggered. Here the system simply needs to be connected to the relevant risk and building management systems.



Securing the protection function

The highly precise air flow monitoring system, PIPE·GUARD developed by WAGNER, keeps a constant check on the entire pipe system for breakages and obstructions. The system reacts – depending on the setting – to changes in the air flow of as little as +/- 10 %. The patented air flow monitoring system is temperature-compensated and can be installed according to the relevant air pressure.

Suitable for particularly noise-sensitive areas

The Silent technology from WAGNER is particularly well suited for those applications where the aesthetics of the architecture or the demand for secure early fire detection is combined with the need for silence, concentration or enjoyment. The **TITANUS®** Silent systems operate at noise levels as low as 23 dB(A), which sets a whole new standard. The Silent technology makes it easy to comply with current national and international noise protection directives (e.g. WHO "healthy sleep": 30 dB(A)).

Cost savings on installation and maintenance

The Plug & Play function makes it possible to commission the **TITANUS®** air sampling smoke detection systems quickly and simply without the need for any additional equipment. Depending on the type of device used, all standard functions are either pre-configured or easy to adjust. The diagnosis tool guarantees rapid maintenance while the modular construction means that components can be changed quickly and easily.

Individual room monitoring

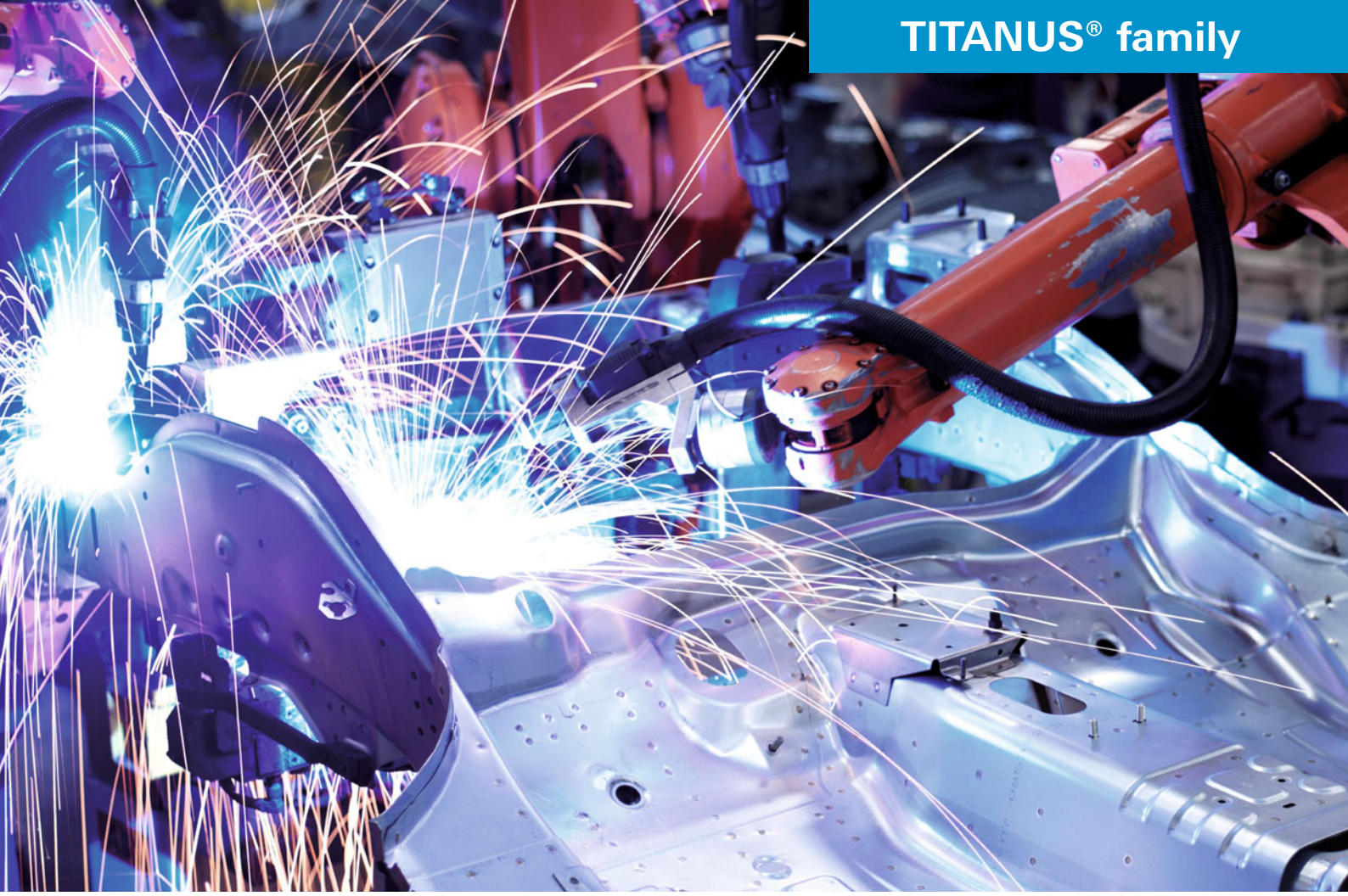
The patented ROOM·IDENT localisation process is an inexpensive way of using one detection unit to provide individual monitoring for up to five rooms. The principle of ROOM·IDENT, the first system of its kind in the world, comprises four phases:

Phase 1: Normal operation
Active air sampling to check for possible smoke particles
Phase 2: Very early fire detection
Immediate alarm following the detection of smoke particles
Phase 3: Blow cleaning
Blow cleaning the pipe system of smoke particles
Phase 4: Localisation
Measuring the time needed for the smoke to re-enter the detector module

The appropriate solution for any situation

Customised and cost effective

The modular construction of the TITANUS® product range combines uncompromising quality and functional reliability with the requirement for greater flexibility and simpler operation. The product portfolio of the TITANUS® family offers an appropriate, cost effective solution for virtually all customer specifications.



For different room sizes

The **TITANUS®** range of air sampling smoke detection systems extends from the monitoring of small rooms and facilities to the maximum approved monitored areas.

For difficult environmental conditions

The use of HPLS light source technology makes it possible for **TITANUS®** air sampling smoke detection systems to be used in a broad temperature range from -40 °C to +60 °C. This means they can also be deployed in cold storage applications. Thanks to well developed, patented algorithms for fire pattern recognition and a broad range of accessories the systems can also be used to monitor extremely dusty areas (e.g. tunnels and recycling plants) as well as areas with high levels of condensation.

As much technology as needed

TITANUS® air sampling smoke detection systems provide appropriate and cost effective solutions for individual situations. For years, WAGNER has offered the broadest and most modular range of products in the world.

Application examples

For very early fire detection

e.g. for IT and telecommunications areas, semiconductor industry

Minimising operational shutdowns through early fire detection; a thousand times more sensitive than conventional, point-type smoke detectors.

Poor accessibility

e.g. in high-bay storage areas, atriums and spaces with high-ceilings

Fast and simple inspection of the fire detection technology with the detection unit installed at an easily accessible height.

In adjacent rooms

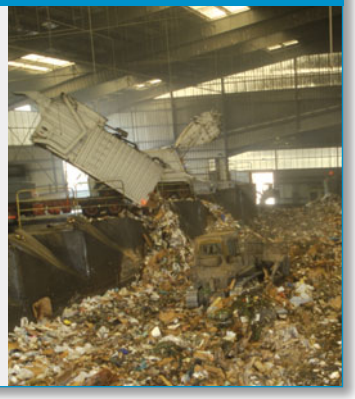
e.g. hotel rooms, hospitals, ships' cabins, railway carriages, prison cells

Inexpensive monitoring of up to five adjacent rooms with the ability to precisely identify the source of the fire.

High dust levels

e.g. in recycling plants, tunnels and in the paper industry

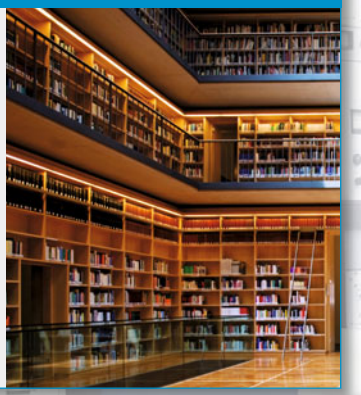
High degree of false alarm prevention through a combination of robust technology with application-specific accessories e.g. special filters, blow cleaning equipment



Where the appearance is critical

e.g. in libraries, modern and historic architecture

Virtually invisible fire detection technology thanks to the hidden installation of sampling pipes and sampling holes.



In secure areas

e.g. prison cells, strong rooms, gun rooms, clean rooms

Areas with high security concerns should not need to be accessed for inspections and service work.

Ice and frost

e.g. in cold storage units and unheated storage areas

Early fire detection even at -40 °C through innovative HPLS light source technology and special cold storage equipment and accessories.

When technical support needs to be available

e.g. in switch cabinets, production plants and server rooms

The best possible guarantee of availability of neuralgic production and communication plants through early fire detection that allows early intervention.

In confined spaces

e.g. in cable channels, cable shafts and false floors

Optimal fire protection in areas where there is not enough space to install conventional fire detection technology.

In stand-alone applications

e.g. in wind farms and accessible transformer stations

Inexpensive monitoring of smaller spaces with the option of remote diagnosis, especially for isolated, decentralised installations.

In the presence of electro-magnetic fields

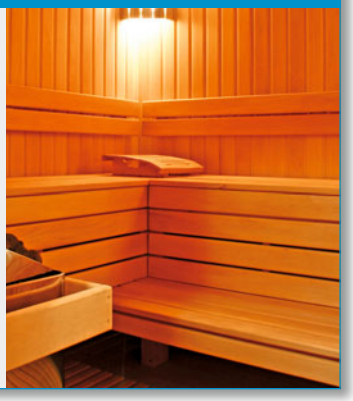
e.g. in high voltage switching stations and transformer stations

Fire detection unaffected by electro-magnetic fields or radioactive radiation by installing the detection unit outside the monitored area.

In the presence of condensation

e.g. in saunas, cool rooms, unheated storage areas

Not susceptible to condensation thanks to the installation of a condensation precipitator before the detection unit.



The appropriate solution for your company

Never far away

With over 30 years of dedicated development work and the experience gained through countless projects carried out around the world, WAGNER is a leader in the field of fire protection. An international network of branch offices, subsidiaries and coope-ration partners reflect the emphasis placed on customer service and demonstrate a highly customer-oriented approach.

Consultation

WAGNER's fire protection solutions represent extreme reliability in terms of fire protection, even in the face of difficult conditions and requirements. It is precisely in such areas that the effectiveness of a protection concept with professional advice stands or falls. For Wagner and it's partner's, customer service is an integral part of the product. Skilled sales engineers in your area are happy to advise and support you in every part of your project, from specification and design to installation.

Planning and project design

If your requirements are very complex and far exceed the scope of conventional systems, we can offer you a solution. Send us your specifications and we will develop the right solution for you. Together with a comprehensive consultation we believe that an intensive planning process forms the core of our work and your project.

Customer Service

When faults arise our technical customer support team and those of our partners are always available and will help wherever necessary. Service technicians can be with you in no time to provide you with help as promptly as possible.

WAGNER sets standards for innovative and comprehensive solutions in fire protection: with TITANUS® for earliest fire detection, FirExting® for fire-extinguishing, with OxyReduct® to actively prevent fires from breaking out and Visu*LAN*® for hazard management. For more information visit **www.wagner.eu.**

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