

Automatic fire extinguishing systems
for paint spraying plants

Safe for certain.

MINIMAX

RISK

IDENTIFYING

With the extreme high degree of automation in painting technology, the risk of fire has also increased. If sources of ignition are not already detected in the origination phase and nipped in the bud, the result can be a devastating fire. The protection of human life and of facilities therefore necessitates the use of special fire protection systems, which are specially adapted to the respective process technology.

Fire risks in painting technology:

- ▶ Use of flammable paints or coating materials.
- ▶ Formation of explosive concentrations of paint or coating materials.
- ▶ Combustion of the spray mist at the powder gun or atomizer, especially with electrostatic painting processes.
- ▶ Coated parts which are poorly grounded or not grounded.
- ▶ Deposits of coating materials or paints in booths, filters or air scrubbers.



Reliable all-round fire protection

The fire protection concept for paint spraying plants focuses on the extremely fast responding fire extinguishing system. It automatically detects acute fire hazards and fights fires at its incipient phase in several stages, depending on the res-

pective combustion speed, with gaseous extinguishants or water spray.

Parallel to the extinguishing process, it initiates important control actions, e.g. to interrupt the supply of power, paint, air or solvents, to switch off high voltage, machines, robots,

conveyors and ventilation systems, to close fire doors and ventilation flaps and to activate the alarm organization. In order to develop a customized and effective fire protection concept, all conditions in the environment must be taken into account.

SOLUTION

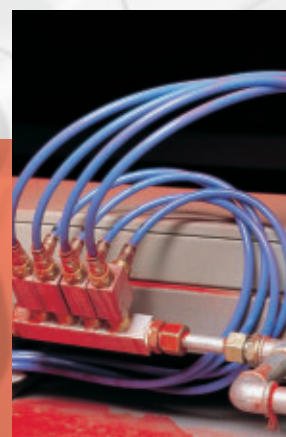
MINIMAX PROVIDES RELIABLE FIRE PROTECTION

The protection is suitable for:

- ▶ electrostatic powder-coating and wet painting systems
- ▶ systems with paint robots
- ▶ manual and automatic paint spraying plants
- ▶ paint ovens and exhaust zones
- ▶ ventilation ducts and paint recovery systems



Inlet for workpieces of a powder coating booth



Shuttle non-return valve block for extinguishant release into spraying equipment

THE COMPO

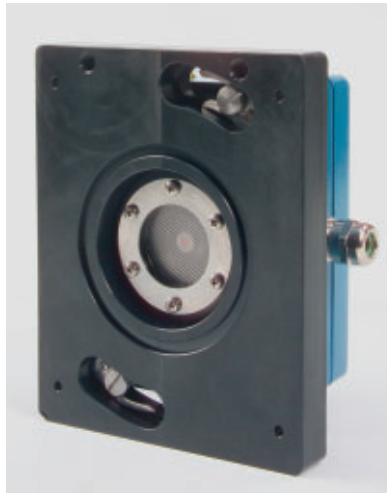
FOR RELIABLE FIRE PROTECTION

Painting processes in particular are subject to the formation of open flames and the rapid spread of fire. Therefore, optical radiation detectors are recommended for first line fire detection, since they can already detect sources of ignition. These fire detectors can be positioned to monitor especially hazardous zones or the painting plant in its entirety. In order to provide optimum protection for all applications, fire detectors of various types and sensitivities are used; these can also be adapted for specific types of applications.

2-channel flame detector

Both channels of this detector operate in different spectral ranges of infrared radiation. Possible signals are compared with the stored typical patterns of a hostile fire, e.g. radiation intensity or flicker

frequency. If the signals received by both channels correspond to the saved values, an alarm signal is sent to the fire detection control panel.



Flame detector FMX35xx with air flushing device

This detector is available in two variants, either as a non-delayed version for local protection or with a time delay for room protection. Each of them can also be obtained as an explosion-proof model.

Spark detectors

Spark detectors are used for special applications, e.g. for monitoring of ducts. They are installed only in dark, closed systems.

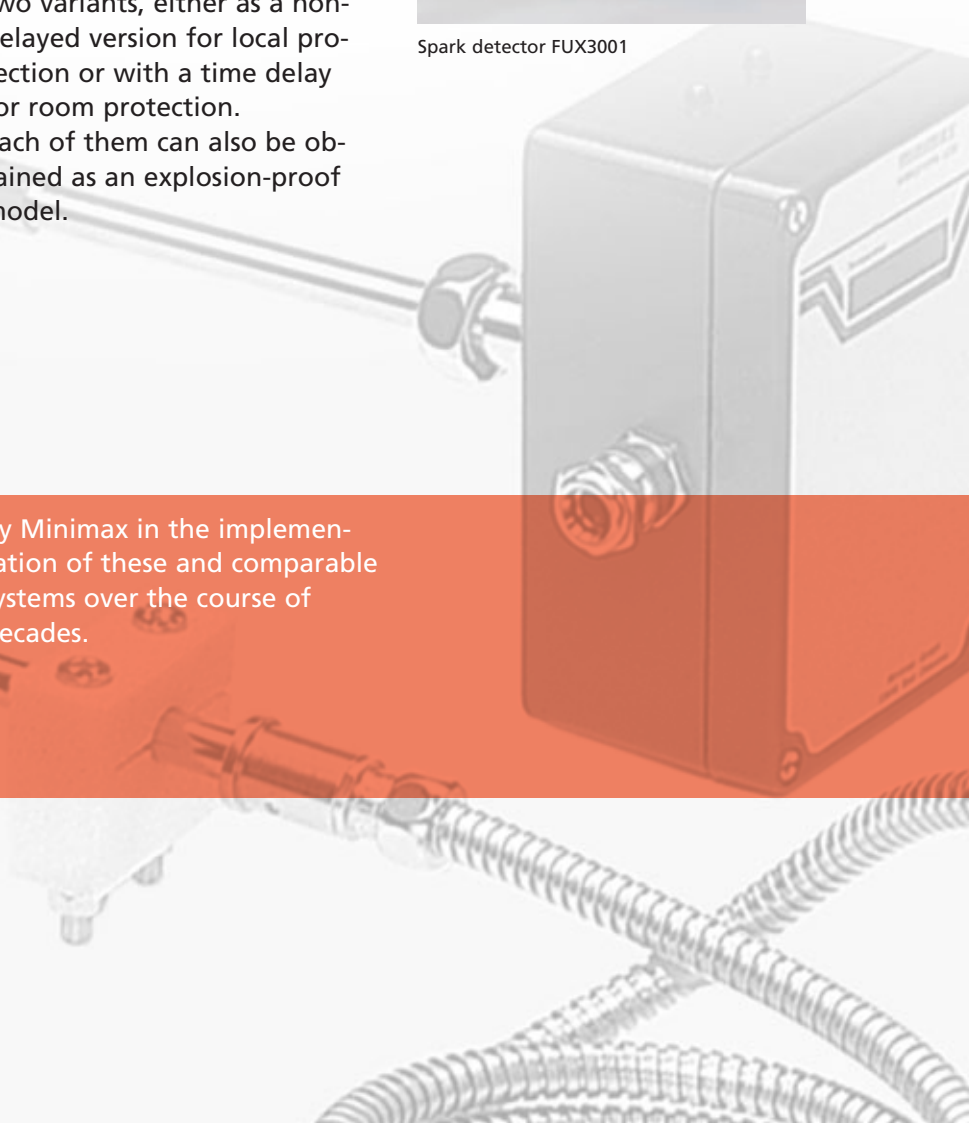
Their signal receiving circuitry is similar to that of the flame detector; however, they already respond to the slightest infrared radiation and send the converted signal without delay to the fire detection and control panel.



Spark detector FUX3001

The development and planning of fire extinguishing systems for paint spraying systems takes place in close cooperation with manufacturers and operators, and makes use of the large store of knowledge acquired

by Minimax in the implementation of these and comparable systems over the course of decades.



Detectors with advanced fiber optics attachments

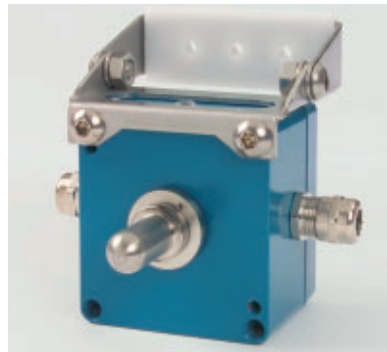
These are used for monitoring areas where flame detectors and spark detectors cannot be installed directly in the hazard zone due to limited space or in case of thermal or electro-magnetic influences.



FMX3100 (Ex) L1 or FUX3200 L1 UEWA

Heat detectors

These are recommended as an additional safety measure, since they enable more extensive monitoring in combination with flame detectors. For example, adjoining zones can also be included.



Heat detector WMX1000 F 60/90

Push-button release

These are installed for the manual activation of local protection and room protection systems along the escape routes.



Push button release DMX

Fire detectors for explosion hazard zones

The automatic detectors comply with Protection-Standard IP65 and therefore fulfill – even under extreme conditions at the installation location – the most important requirement for trouble-free operation.

If the detectors are carried out as Protection-Standard Ex-I (inherent safety) they can be used in potentially explosive areas of zones 1 and 2, 21 and 22. These approvals correspond to the latest requirements for equipment in explosion hazard zones (ATEX).



Heat detector WMX 3111 FS with rigid or flexible sensor

THE COMPO

FOR RELIABLE FIRE PROTECTION

Fire detection control panel – analysis and control

All important components of the automatic fire extinguishing systems for paint spraying plants, such as detectors, activating elements and alarm units, are connected with the fire detection and extinguishing control panel.

In the event of an alarm, the fire detection and control panel registers and verifies the signals sent by the detectors, issues an alarm and activates the extinguishing system and the pre-programmed control functions.

Therefore, the following features are extremely important for the protection of paint spraying plants from fire:

- ▶ Alarm analysis – non-delayed (local protection) or after alarm analysis (room protection).
- ▶ Programmable safety circuits, e.g. 2-detector or 2-zone dependency
- ▶ Monitoring of the extinguishing system for operational reliability and extinguishant supplies.

- ▶ Control of the extinguishing system and the alarm units



Fire detection and control panel FMZ 5000

- ▶ The extinguishant control can be programmed individually:
 - Use of extinguishant only during the detector response time – also with set over-run time (e.g. in case of danger of re-ignition)
 - Total flooding via pulse triggering of a cylinder system
 - Total flooding via electronic extinguishant control of a low pressure system

- ▶ Control functions for
 - Interruption of supply of powder, paint, air and solvents
 - Shut-down of high-voltage lines, machines, conveyors and ventilation systems
 - Closing of fire protection flaps and doors.

The extinguishing system

The Argotec® extinguishing system, which uses carbon dioxide (CO₂), argon (Ar) or nitrogen (N₂) as extinguishants, provides for the optimum protection of paint spraying plants

The gases extinguish the fire leaving no residue and therefore cause no subsequent damage. The extinguishants used reduce interruptions in operation to a minimum in the event that a room protection system is activated.

If a local protection system is activated, interruptions in operation can even be prevented completely under certain circumstances.

Minimax holds approvals for both the individual system components and the complete systems. In addition, Minimax is recognized as a manufacturer and installer

of fire extinguishing systems by the Verband der Schadenversicherer e.V.

The extinguishant is supplied to the protected area by means of a fixed pipe network with open nozzles.

If it is necessary for fire protection reasons to release the extinguishant via paint spraying system components, the extinguishant is supplied via hoses.

The extinguishants

The extinguishing effect of the gaseous extinguishants is due to the fast displacement of oxygen from the source of the fire, which smothers the fire suddenly. Since they not only extinguish the fire leaving no residue, but also do not conduct electricity, they are especially suitable for the protection of electrostatic paint spraying plants.

The gaseous extinguishants are provided in compressed gas cylinders, the number of which can be adapted to the

required quantity of extinguishant. The advantage of carbon dioxide over argon and nitrogen is that it is stored liquefied under pressure and therefore requires very little storage space.

The extinguishing process

Both in automatic detection, e.g. via flame detectors, and in manual activation, the fire detection and extinguishing control panel provides for the initiation and control of the flooding process. An acoustic alarm announces the flooding. If necessary for organizational reasons, the actual extinguishing process does not begin until after a specified pre-warning time has expired.

The extinguishing gas is fed into the flooding zone via the pipe network, after which it emerges from the nozzles to displace the oxygen from the source of the fire.

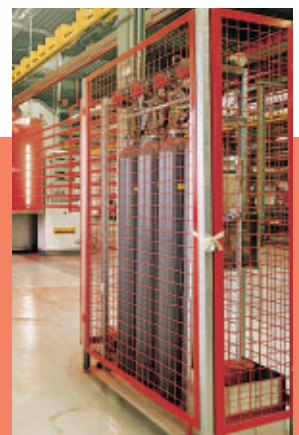
Booth extinguishing systems

In addition to the fire extinguishing installations described above for paint spraying areas, total flooding systems should be provided for the protection of painting and powder-coating booths. These systems fulfill all the requirements for protecting the entire booth including corresponding areas. For this application Minimax also offers customized and economical system solutions.

For some protection concepts, the Minifog® fine spray extinguishing system can be used for room protection as an alternative to the Argotec® extinguishing system.



Extinguishant cylinders for gun- and filter protection



Cylinder bank for cabin extinguishing system

ADVANTAGE

OUR COMPETENCE

Fire extinguishing systems for painting technology – an important factor in the overall fire protection concept

Despite the importance of a fire extinguishing system, it can of course only be part of a comprehensive fire protection concept. For optimum protection of the entire area, planning must be preceded by a risk analysis and evaluation.

In order to implement a comprehensive fire protection concept, Minimax offers a complete fire protection program: from fire extinguishers to fire and gas detection systems, sprinkler systems and stationary fire extinguishing systems with gaseous extinguishants and structural fire protection. Competent advice and special engineering allow us to find an individual solution for every problem, at a price that is affordable.

Approved, recognized and, often for good reasons, provided Minimax fire extinguishing installations for paint spraying systems consist of tried and tested VdS-approved system components that can be adapted for the individual facilities.

In Germany the design of booth protection systems (total flooding) and local protection systems is regulated by the Verband der Schadenver-

The following European standards require the use of extinguishing systems:

Wet paint spraying systems:

EN 50176

Automatic electrostatic spraying installations for flammable liquid spraying material

EN 12215

Spray booths for application of organic liquid coating materials

Powder-coating systems:

EN 50177

Automatic electrostatic spraying installations for flammable coating powder

EN 12981

Spray booths for application of organic powder coating material

sicherer e.V. in the directive VdS 2093. In addition, the BG safety regulation BGI 764 "Electrostatic Spraying" prescribes the installation of extinguishing systems in electrostatic painting facilities.

24-hour service and maintenance

The Minimax fire protection service is available 24 hours a day in case of emergency. Experienced service technicians provide fast, reliable and competent assistance.

Minimax service does not end with the final inspection of the fire extinguishing system and introduction to it. A maintenance contract with Minimax puts the burden of responsibility on us and reduces your work load. Because only regular maintenance and repairs by competent specialists can ensure the constant operational readiness of the extinguishing system.

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For detailed information, please refer to the Minimax product sheets.