

Spark Extinguishing Systems
Fire protection solutions
for pneumatic conveyors

Safe for certain.

MINIMAX

SPARK

THE RISK

If your company utilizes pneumatic conveying and air filtration systems in the manufacturing process, you are at risk from dust fires and explosions.

The normal operation of many production machines can easily produce a spark. This is then picked up by the pneumatic system and transported along with highly combustible wood chips, dust or other finely divided particles. A single spark that enters filters, silos or the dust collector is sufficient to cause fires or dust explosions resulting in excessive damage and costly downtimes or even worse threatens life.

The solution

A potential disaster of this magnitude is best handled with preventative measures that are immediate, effective and reliable. With the Minimax system sparks can be detected and extinguished prior to reaching the filter or dust collector thereby protecting all company assets.

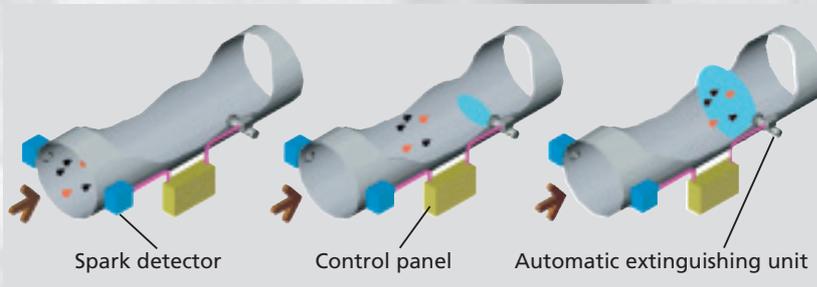
The function

A fully automatic spark extinguishing system (figure) consists of spark detectors, control panel and an automatic extinguishing unit.

Sparks travelling through the duct of the conveying system are instantly identified by the infrared spark detectors mounted flush to the wall of

the duct. The spark detector sends a signal to the control panel which then triggers the solenoid valve of the automatic extinguishing unit, while simultaneously activating an audible alarm. The extinguishing water is released and injected into the duct via the strategically placed flat spray nozzles creating a wall of water covering the entire cross section. The glowing particles are conveyed into the water spray.

The complete detection and extinguishing process normally operates during production in order to eliminate expensive downtimes, however if required it is also possible to have the conveying machine automatically shut down.



The automatic self-monitoring capabilities of both the spark detector and the automatic extinguishing unit guarantees an outstanding level of operational reliability.



The distance required between the spark detector and the automatic extinguishing unit is dependent on the response time and the system parameters such as velocity, duct diameter and water pressure. The response time is defined as the time between detection of the spark and the formation of

a full spray throughout the entire cross section of the duct.

With the Minimax flat spray nozzle and the automatic extinguishing unit the response time is significantly reduced in comparison to conventional spark extinguishing systems. By reducing the response time,

the distance required between spark detection and the automatic extinguishing unit can also be reduced therefore allowing Minimax to protect even shorter conveying systems.

Quick-assembly sets are used for both detectors and extinguishing nozzles to minimize installation times.

EXTINGUISHING

FAST AND SAFE

Spark detectors

The highly advanced Minimax infrared detectors are engineered for the immediate identification of sparks in industrial environments. The detector is flush mounted with the inside wall of the duct and responds to the infrared radiation generated by passing sources of heat i.e. sparks or glowing embers.

The detector continuously checks its own visibility and the correct function of its electronics, any faults identified are automatically relayed to the control panel notifying plant personnel.

In areas where high ambient temperatures are expected, flexible temperature resistant fiber optic cables are used to

thermally separate the electronic components of the spark detector from these hot areas.

For conveyor systems which are not completely enclosed, e.g. conveyor belts, special spark detectors insensitive to daylight can be installed.

Minimax, the pioneer in the development of spark extinguishing systems, has successfully proven the effectiveness of its protection concept in thousands of installations.



SAFETY

COMPLEX SYSTEM

Control panel

The Minimax control panels are engineered with the latest technological features including an audible and visual alarm, a 24-hour battery back-up supply, power status indicator and internal supervision for both detectors and valve circuitry. Every Minimax control panel has a modular design, supplied with auxiliary relays which can be used to enhance plant safety by allowing automatic equipment shut down, activation of remote alarms, dampers or high speed abort gates. The control panel registers a signal sent by the spark detector and initiates both the extinguishing process and the alarm.

Automatic extinguishing unit

On receipt of a signal from the spark detector, the control panel activates the quick-acting solenoid valve of the automatic extinguishing unit releasing a minimised quantity of extinguishing water. The water is injected by means of the unique flat spray nozzle

engineered especially for the conditions in conveying systems. Unlike conventional nozzles it creates a water spray which covers the entire cross section of the duct. In Minimax systems, the flow detector is not installed on the water supply, but rather at the automatic extinguishing unit. This allows plant personnel to identify problem zones easily. The stainless steel material and the flush construction of the Minimax flat spray nozzle increase its durability even in the most severe environments.

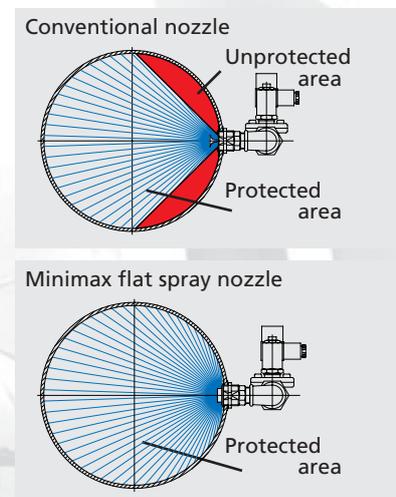
Water supply

The Minimax pressure booster system, consisting of a centrifugal pump and a diaphragm pressure vessel, is the most cost effective and efficient means of increasing the water supply pressure if the minimum pressure required cannot be provided by an existing sprinkler system or a service water supply. The diaphragm pressure vessel supplies water with sufficient

pressure immediately upon activation of the automatic extinguishing unit. The centrifugal pump automatically supplies the pressure vessel if the water pressure drops below a specified value. Even in the unlikely event of pump failure, several extinguishing impulses from the diaphragm pressure vessel are possible.

Plug-up detector

Cyclones can become blocked during the production process. In order to detect the accumulation of material in its initial phase and thereby preventing production interruptions, special infrared sensors are installed in the conical section of the cyclone.



Please see Minimax product sheets for detailed information.

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