



**Minifog ProCon**  
Low-pressure water mist system

*Cool down.  
Fire Protection by*

**MINIMAX**

# FIRE PROTECTION

## Efficient – even for non-enclosed equipment

*Minifog ProCon systems by Minimax use innovative low-pressure water mist technology and offer particularly efficient fire fighting for enclosed and non-enclosed equipment in industrial environments, such as cable ducts and conveyor belts as well as hydraulic units and paint shops. People, assets and the environment are reliably protected around the clock, considerable investments protected and long and expensive interruptions in operation avoided.*

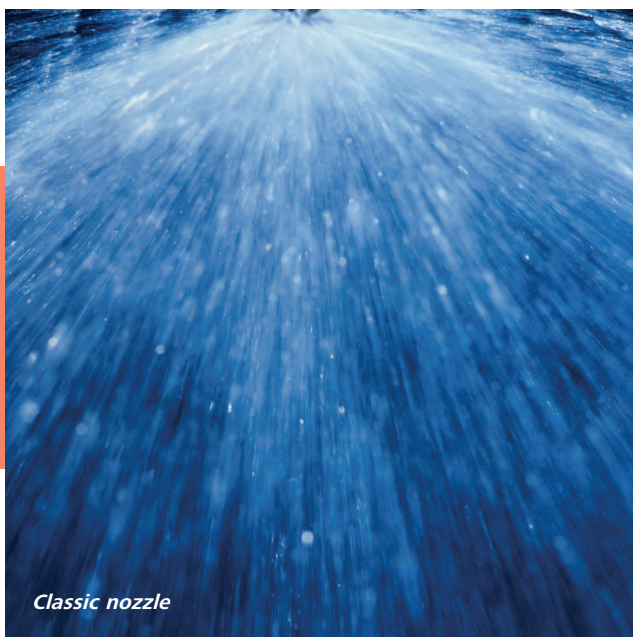
In the event of fire the water is finely distributed via ProCon extinguishing nozzles. The result is a larger total surface of the water, allowing it to absorb heat and to evaporate more quickly. Thanks to the accompanying cooling and oxygen displacing effect Minifog ProCon systems operate with up to 70 per cent less water compared with classic deluge systems. The system's water supply and pipe network can be made smaller accordingly. This saves not only cost but also space – a big advantage particularly when retrofitting in existing buildings.

Minifog ProCon systems are based on low-pressure water mist technology. This not only allows the use of cost-efficient system components but also increases the potential for other cost and space savings: Low-pressure water mist systems can be combined with classic sprinkler and

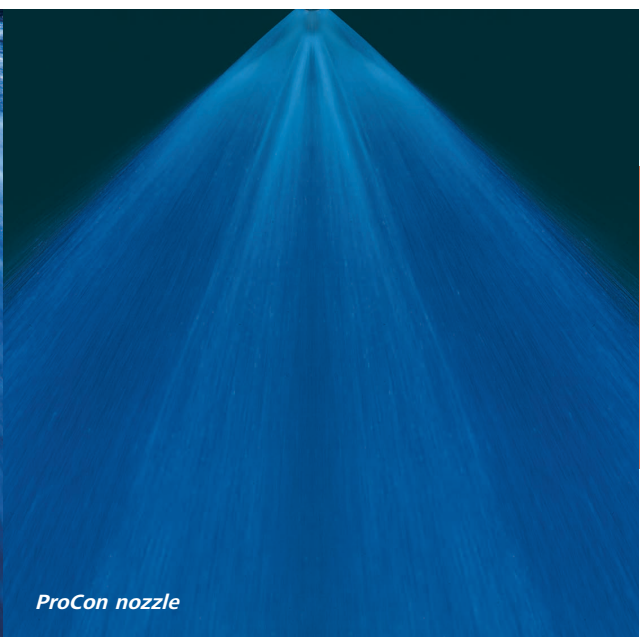
hydrant systems and share an existing water supply. Furthermore feeding-in via the fire brigade supply is possible – an additional safeguard, e.g. if the power supply for the pumps should fail.

ProCon extinguishing nozzles create a spectrum of different drop sizes. This ensures efficient fire fighting even if there are inhibiting factors such as thermal currents or air movement. Minifog ProCon systems are therefore also suitable for the protection of non-enclosed equipment and the local application of water mist for particular hazard spots.

The cooling effect, which reflects heat radiation and the ability to bind smoke gases of a Minifog ProCon low-pressure water mist system, also provide excellent personal protection in the event of fire.



Classic nozzle



ProCon nozzle



# HIGH PERFORMANCE

with minimum use of water

The appropriate ProCon water mist nozzle is ready for every application: Impulse nozzles, swirl nozzles and twin cone nozzles have spray pattern optimally adjusted for their respective area of use. Thanks to their special nozzle design they dissipate the water even at the lowest operating pressure of 4 bar so finely that the particular extinguishing effects of water mist technology can be completely deployed.

All ProCon extinguishing nozzles are characterised by relatively large outlet cross sections. This, in connection with the large-area strainers built into the nozzles, reduces its vulnerability to impurities in the water supply.

Due to their robust construction and special protective caps which are ejected when water is emitted, ProCon nozzles are also suited for the use even under tough environmental conditions and in areas with more dirt or other contaminants.

The appropriate extinguishing nozzle for every use



► **Impulse nozzles**

Impulse nozzles of the MXID type are the most frequently installed extinguishing nozzles in Minifog ProCon systems. Via an external spiral-shaped deflector they create a full cone spray pattern and in doing so throw the fine drops forward with a powerful momentum. Versions with a spray cone of 90° or 120° are available.

► **Swirl nozzles**

Swirl nozzles of the MXDD type are particularly suited for use in paint shops. The internal swirl body creates a particularly homogeneous full cone spray pattern at a spraying cone of 90°.

► **Twin cone nozzle**

Twin cone nozzles of the MXZD type are primarily used for the protection of cable ducts and cable distribution rooms. Two internal swirl bodies create two hollow cone shaped spray patterns with spraying cones of 90° and 120°.

# STRUCTURE A

As regards structure and function, the Minifog ProCon system resembles a classical deluge system. The system is subdivided into one or more extinguishing zones with corresponding zone partitioning, a water supply unit and fire detection and extinguishing control technology.

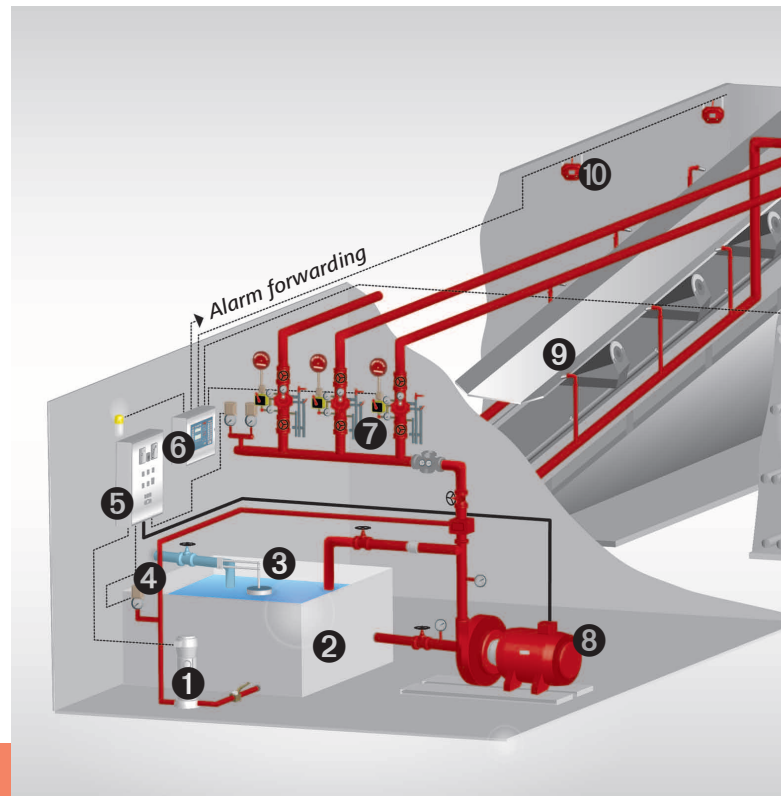
## Extinguishing zones and zone partitioning

In the extinguishing zones, ProCon fine spray nozzles are aimed at the facilities to be protected. On taller equipment they are also installed at several levels. In the event of fire the water is delivered as a mist into the source of the fire via all the ProCon nozzles installed in an extinguishing zone. This way even quickly spreading fires can be suppressed.

Minifog ProCon systems can be designed both as a single-zone system for the protection of one extinguishing zone and as a multi-zone system for the protection of two or more extinguishing zones with just one water supply. Each extinguishing zone is assigned a deluge valve set which in the event of fire is triggered by the fire detection and extinguishing control technology and releases the flow of water only in the affected extinguishing zone. The more extinguishing zones are formed, the more targeted the fire fighting at the source of the fire and the less water needs to be used. Larger equipments are often subdivided into several extinguishing zones.

## Water supply

The Minifog ProCon system water supply is generally via a storage tank with automatic refilling and a pump. Alternatively in many cases the system can be combined with a classic sprinkler or hydrant system to share the existing water supply. Minifog ProCon systems can however also be connected to a suitable service water network or – using appropriate safety equipment – to the public drinking water supply. Additional safety is achieved through feeding-in via a fire brigade supply which then also allows supply if for example the power supply to the pumps fails.



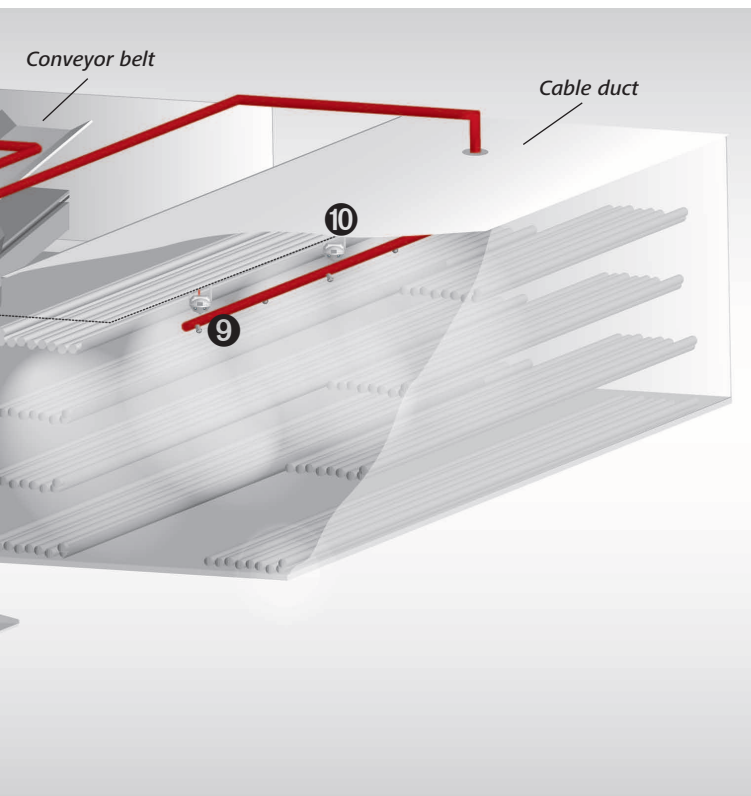
- 1 Jockey pump
- 2 Storage tank
- 3 Automatic feed mechanism
- 4 Town mains connection

- 5 Pump control cabinet
- 6 Fire detection and extinguishing control panel

# ND FUNCTION

## Simply safe

In the operational readiness condition the pipe network is filled with water as far as the deluge valve sets. In this case, a jockey pump - controlled via a pressure transmitter - maintains a constant system pressure of approx. 9 bar, which drops briefly in the event of a fire due to the opening of one of the deluge valves. Another pressure switch detects this and the main pump is activated via the pump control cabinet.



- 7 Deluge valve set
- 8 Main pump
- 9 ProCon fine spray nozzle
- 10 Fire detector

### Fire detection and extinguishing control technology

The Minifog ProCon system is triggered by the proven Minimax fire detection and extinguishing control technology. This guarantees optimal compatibility of electrical and mechanical system components. Unnecessary expenditure of effort on coordination and interface issues between different contractors are thus avoided.

Fire detection is adjusted to the risk of the equipment to be protected - generally by means of electronic fire detectors which in the event of a fire send a signal to the FMZ 5000 fire detection and extinguishing control panel. This then activates the deluge valve for the affected extinguishing zone. At the same time acoustic and optical alarms are triggered and optionally forwarded to a permanently manned location, e.g. in order to alert the fire brigade.

The right Minimax fire detector is ready for any application. In connection with Minifog ProCon water mist systems UniVario flame and heat detectors and HELIOS AMX5000 smoke aspiration systems are frequently the first choice.

### Water mist systems

Since 1993, Minimax has developed and installed high-pressure and low-pressure water mist systems under the "Minifog" brand name for a wide range of applications, thus making it one of the pioneers of water mist technology. This technology utilizes the physical properties of the water more efficiently than classic water fire suppression systems. The water is emitted through special nozzles and sprinklers as a very fine spray under increased operating pressures. The result is a larger total surface of the water, allowing it to absorb heat and to evaporate more quickly. The cooling and oxygen displacing effect allows for particularly effective fire-fighting using a minimum amount of water.



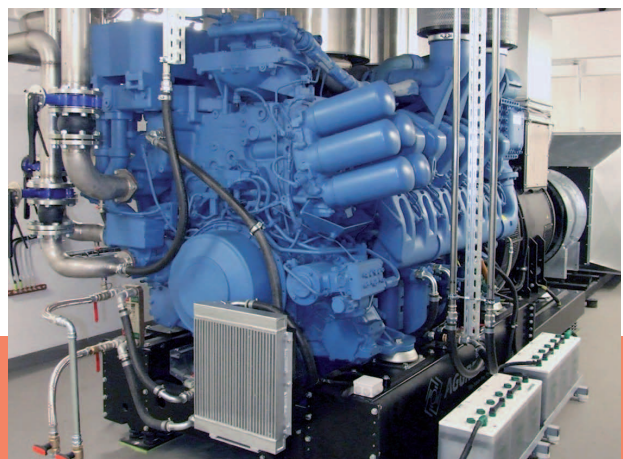
# APPLICATION

Numerous fire tests have proved that Minifog ProCon low-pressure water mist systems are eminently suitable for a multitude of applications, and this has been confirmed by a large number of real operations. The components used and the design parameters of the system have been tested and certified by VdS Schadenverhütung and other independent test centres and approval bodies.

## Application examples

- ▶ Cable ducts
- ▶ Cable distribution rooms
- ▶ Conveyor belts
- ▶ Coating systems
- ▶ Paint shops
- ▶ Motor test benches
- ▶ Machine tools
- ▶ Hydraulic units including oil sump and oil tank
- ▶ Diesel emergency power generators

Minifog ProCon can also be used for the protection of non-enclosed equipment and thus allows targeted protection of particular hazard points such as the oil-lubricated bearings of steam turbines and generators. Even tough environmental conditions such as are found in wind energy converters and steel- and car plants are basically no problem for fire protection. In addition, Minifog ProCon is eminently suitable for preventative cooling, e.g. of glass cladding or steel structures.



**Example: Protecting cable ducts**

For fire detection in cable ducts fire detection systems with optical smoke detectors are installed. In many cases smoke aspiration systems are also used here for the even earlier detection of any fires occurring. In cable ducts either twin cone nozzles or impulse nozzles are aimed at the cable trays to be protected. The applicability of Minifog ProCon for the protection of cable ducts has been proven in various fire tests on original reconstructions. This application is approved by both VdS Schadenverhütung and the DMT Fire Protection Department.

**Example: Protecting conveyor belts**

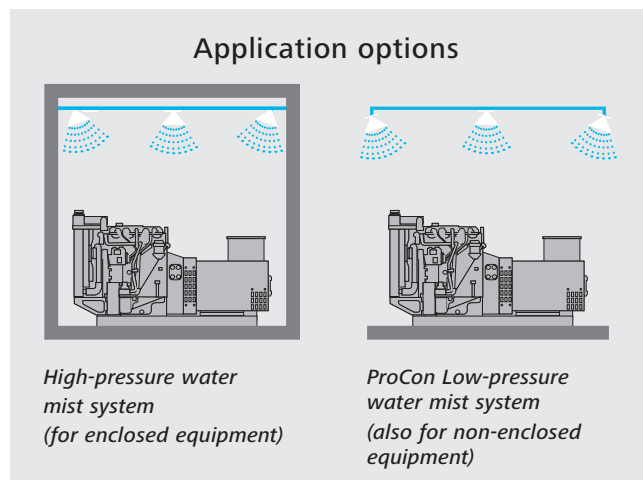
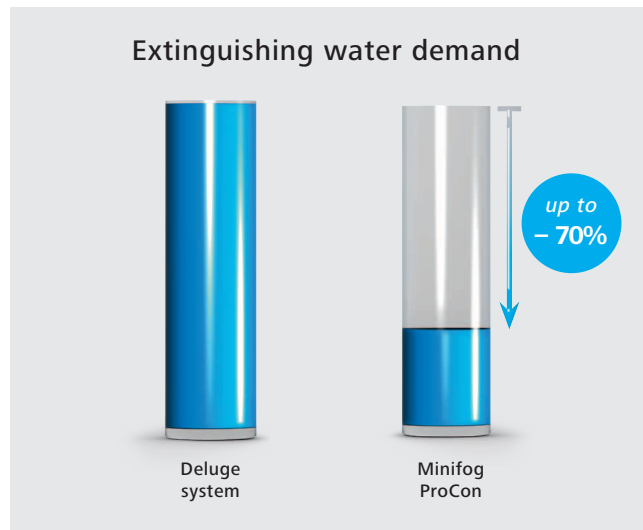
The choice of fire detector to be installed on conveyor belts depends among other things on the material being conveyed. Here linear heat detectors, gas emission detectors or multisensor detectors are used in order to detect the fire at a very early stage. Minifog ProCon water mist systems with impulse nozzles constitute an attractive solution for conveyor belts with upper and lower belts. These have been tested in numerous fire tests at the DMT Fire Protection Department and are certified by DMT.

As one of the world's leading suppliers of comprehensive fire protection systems, Minimax produces and offers not only the full range of system components – from detectors to nozzles – for the water mist system, but is also able to implement the entire project, from design, installation and commissioning to subsequent service for optimal and consistent one-stop fire protection.

# BENEFITS

at a glance

- ▶ Protection of investments and prevention of interruptions in operation
- ▶ Up to 70% less water compared to classic deluge systems
- ▶ Low expenditure on water supply and pipe network installation - ideal for retrofitting in existing buildings
- ▶ Use of cost-effective low-pressure components
- ▶ Options for combination with classic sprinkler and hydrant systems
- ▶ Additional safeguard via fire brigade supply
- ▶ Excellent solution for the protection of non-enclosed equipment and the targeted protection of particular hazard spots
- ▶ Use even under tough environmental conditions and in areas with more dirt and other contaminants



Minimax GmbH & Co. KG  
Industriestrasse 10/12  
23840 Bad Oldesloe  
Germany  
Phone: +49 45 31 8 03-0  
Fax: +49 45 31 8 03-248  
E-mail: [water@minimax.de](mailto:water@minimax.de)  
[www.minimax.de](http://www.minimax.de)



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