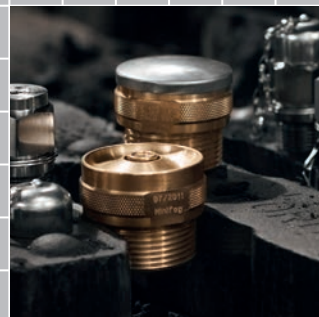
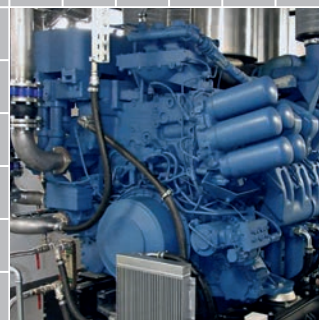


Experts in fire protection

Minifog ProCon XP High-Pressure Water Mist System



TECHNOLOGIES

MINIFOG WATER MIST SYSTEMS

Fire protection for enclosed equipment

Minifog ProCon XP high-pressure water mist systems by Minimax offer excellent fire protection with minimal water consumption and are ideal for turbines, machines and equipment with combustible liquids that are operated in confined spaces. Typical applications are gas turbine enclosures and motor test benches. People, assets and the environment will be reliably protected around the clock, substantial investments will be secured and long, costly downtimes will be avoided.

The use of water means that no specific health and safety measures are required to protect people against the extinguishing agent. Normally, the protected space can be entered immediately after successful extinction of the fire, whereas with CO₂ gas extinguishing systems, traditionally installed with gas turbines and motor test benches, the extinguishing gas must be extracted from the protected room first. Furthermore, using Minifog ProCon XP means that pressure relief devices may be designed considerably smaller than for gas extinguishing systems – even discharging the pressure into adjacent rooms is possible.

Compared to classic water spray systems, Minifog ProCon XP reduces water consumption by up to 95%. This extremely low level of water consumption reduces the risk of water damage and thermal distortion of hot machine parts to a minimum. At the same time, the water supply unit becomes considerably smaller, thus saving space and money.

The Minifog ProCon XP system uses pipes with much smaller diameters. This, in turn, facilitates system retrofitting.

Unlike conventional high-pressure water mist systems, the approvals by the independent German testing institution for fire protection and security, VdS Schadenverhütung, and by FM Global for the Minifog ProCon XP system also cover the use of the system in particularly large spaces. Space volumes of up to 2,430m³ and heights of up to 13.5m are permitted.

Ideally the activation of the Minifog ProCon XP is done by means of the well-proven fire detection and extinguishing control systems by Minimax. This ensures full compatibility of electrical and mechanical system components and prevents the wasteful coordination of components of different manufacturers.



Classic spray nozzle

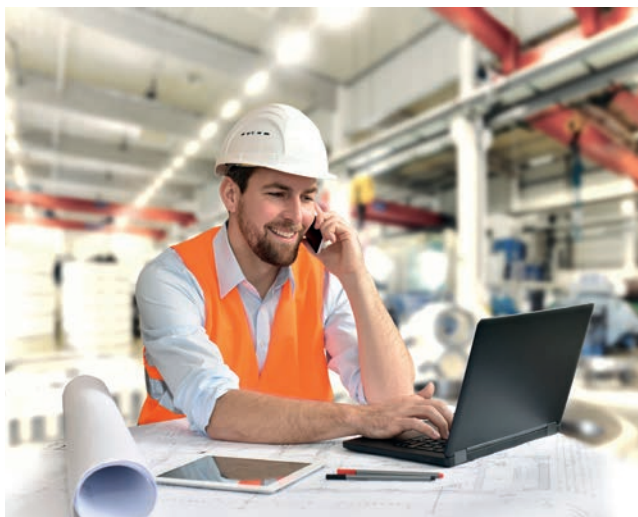


ProCon XP nozzle

Water mist systems

Minimax has constructed and installed high- and low-pressure water mist systems for numerous applications since 1993 and as such is one of the pioneers in the field of water mist technology.

Compared to traditional water systems, the fine spray technology - also known as water mist extinguishing system - exploits the physical properties of the water more efficiently. The water is distributed finely through special nozzles and sprinklers and/or with increased operating pressure. This increases the overall surface of the water, enabling it to absorb heat and evaporate faster. The related cooling and smothering effect makes it possible, in certain applications, to fight the fire very effectively with minimal water consumption.



Design and installation

As one of the world's leading full-service providers in the field of fire protection, Minimax not only develops, produces and supplies the full range of technology components - from detectors to nozzles - for the Minifog ProCon XP high-pressure water mist system, but also handles the entire project management, including planning, installation and commissioning as well as postsales service, to ensure optimal and consistent fire protection from a single source.

Structure and function - simply safe

In regards to structure and function, the Minifog ProCon XP system resembles a classic water spray extinguishing system. The system is made up of one or more zones with corresponding zone subdivisions, a water supply unit and a fire detection and control system.

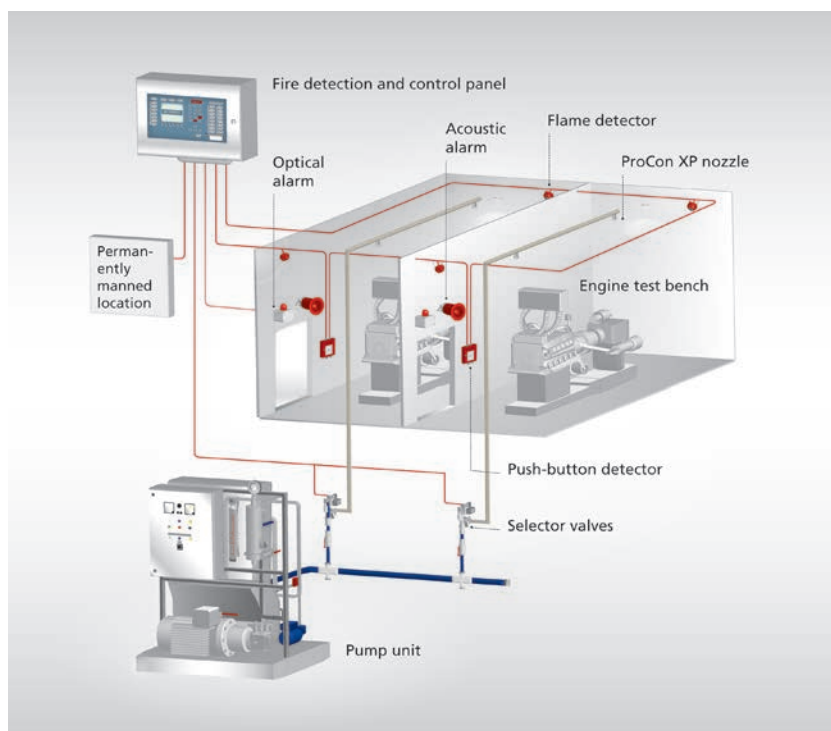
Extinguishing zones and zone partitioning

A piping network with ProCon XP nozzles covers the protected rooms. Since a single nozzle can protect an area of up to 21m², and very small diameters are being used, the piping network is much less complex than that of a classic water spray systems. In the event of fire, water is sprayed through all ProCon XP nozzles installed in the extinguishing zone. At a pressure from 40 to 90bar, they spray and distribute the water evenly in very fine droplets.

To ensure the desired spray characteristics, the Minifog ProCon XP system uses corrosion-resistant materials such as stainless steel; furthermore all

nozzles are equipped with filters, and the system uses filtered water. Minifog ProCon XP systems can be designed as a single-zone system to protect only one room or as a multi-zone system for the protection of two or more zones.

Multi-zone systems are equipped with selector valves, which, in the event of a fire, will be controlled by the fire detection and control panel in such a way that water is only sprayed into the room affected by the fire.



Minifog ProCon XP nozzles type MXD



Water supply unit

Water supply

Usually, water is supplied via a pump unit. The pump unit consists primarily of a break pump, the high-pressure pump and the pump control cabinet. The automatic refilling of water into the break tank ensures practically unlimited operability.

With regards to single-zone systems, the high-pressure pump is activated by a signal from the fire detection and control panel. In multi-zone systems the pipe network is filled with water up to the selector valves in stand-by mode. An additional jockey pump – controlled via a pressure transmitter – maintains a constant pressure of approx. 14 bar, which drops briefly when a selector valve is opened in the event of fire. This is detected by a pressure transmitter, and the high-pressure pump is then activated via the pump control cabinet.

Fire detection and control technology

The extinguishing zones are ideally monitored by fast and reliable UniVario flame detectors, which transmit a signal to the FMZ 5000 fire detection and extinguishing control panel in the event of fire. Additionally, the extinguishing zones are equipped with electrical push-button detectors for manual activation of the Minifog ProCon XP system. In the event of fire, the fire detection and extinguishing control panel activates the water supply unit and, in multi-zone systems, the corresponding selector valve. At the same time, it triggers an acoustic and optical alarm and transmits a signal to a permanently manned post.



Selector valves



FMZ 5000 Fire detection and extinguishing control panel

Compact alternatives

Alternatively, for extinguishing zones of up to 260m³ and a height of up to 5m, water can be supplied by a space-saving pump unit or with a cylinder battery.

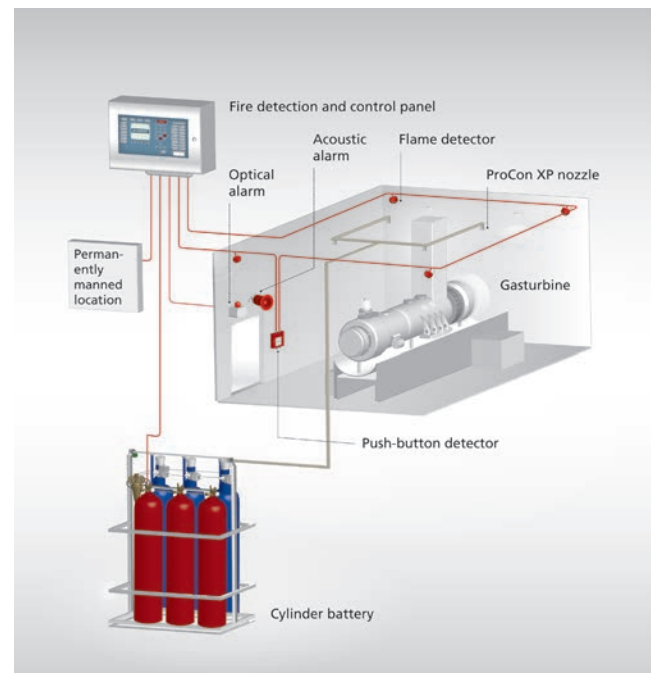
Compact pump unit

In the compact pump unit, the break tank, the high-pressure pump, the pump control cabinet and other components are grouped together in a highly concentrated space. The compact design on a common base frame enables quick installation.

Cylinder battery

The cylinder battery, which is not dependent on an external power supply, made up of nitrogen and water cylinders, contains water for at least 10 minutes of operating time.

By combining several cylinder batteries, longer operating times are possible. In the event of fire, the fire detection and control panel activates the pilot nitrogen cylinder. The other nitrogen cylinders are opened by pneumatic release mechanisms.



The compressed gas flows into the water cylinders and drives the water into the pipework and onto the nozzles.

The Minifog ProCon XP system can be designed as a multi-zone system even when the water is supplied by a cylinder battery.

For enhanced safety, the Minifog ProCon XP system uses the innovative ConstantFlow technology. It keeps the system pressure at the nozzle and in the water supply with the cylinder battery constant over the full operating time. As a result, the water mist system is as effective in the last minute as it is in the first, thus offering increased protection against reignition caused, e.g., by combustible liquids leaking onto hot machine parts.



Compact pump unit



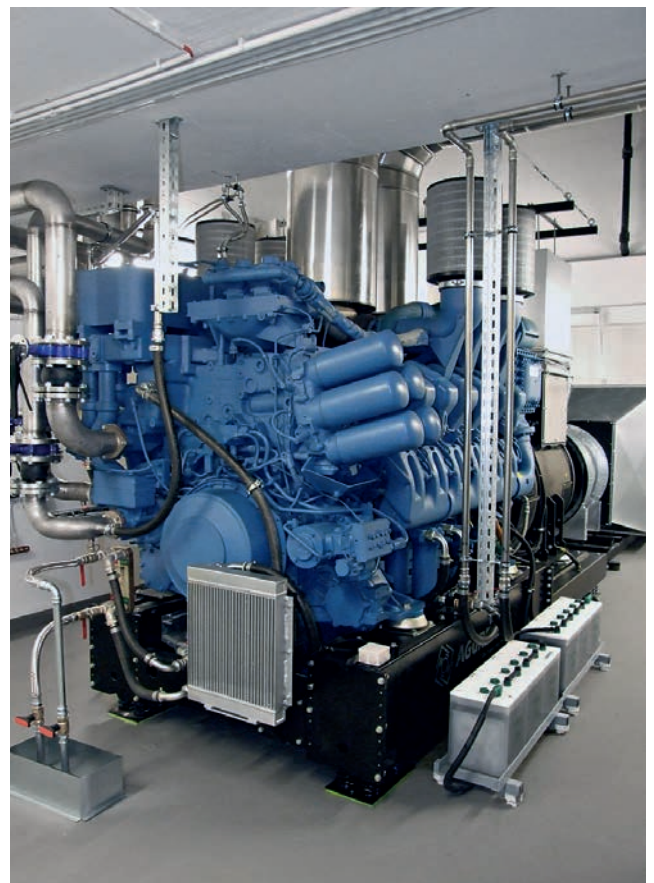
Cylinder battery

The excellent suitability of Minifog ProCon XP is proven by numerous fire and suppression tests under life-like conditions. Both VdS Schadenverhütung and FM Global have tested and certified the components, design parameters and suppression effectiveness of the system.

The system approvals of VdS Schadenverhütung and FM Global include engine rooms and turbine enclosures and their auxiliaries with a volume of up to 2,430m³ and a height of up to 13.5m.

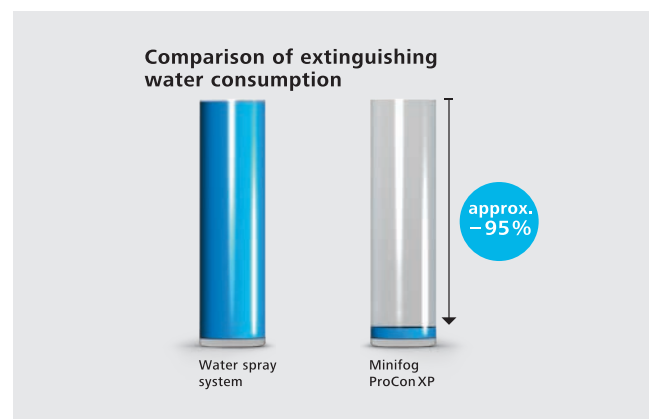
Examples of use:

- Motor test benches
- Gas turbines
- Steam turbines
- Auxiliaries of turbines
- Gears, drive shafts and bearings
- Hydraulic units including oil sump and oil tank
- Generators
- Diesel emergency power supply units
- Machine tools
- Compressors

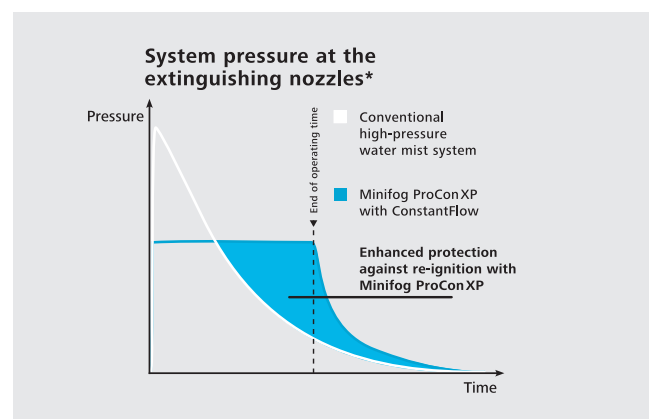


Advantages at a glance

- Minifog ProCon XP protects engines, turbines and other equipment.
- Substantial investments will be protected and long and costly downtimes can be prevented.
- The use of water means that generally no specific health and safety measures are required to protect people against the extinguishant.
- Compared to classic water spray systems, Minifog ProCon XP reduces water consumption water by up to 95%.
- Minifog ProCon XP offers protection of particularly large spaces with a volume of up to 2,430m³ and a height up to 13.5m.
- The Minifog ProCon XP system can be designed as a multi-zone system even when the water is supplied by a cylinder battery.
- Enhanced protection against re-ignition: The ConstantFlow technology keeps the system pressure constant throughout the entire operating time even if the water is supplied by a cylinder battery.
- The use of the well-proven Minimax fire detection and control technology ensures optimal compatibility of electrical and mechanical system components.



Comparison of water consumption



System pressure at the nozzles *

*In case of water supply with cylinder battery.

Photos

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