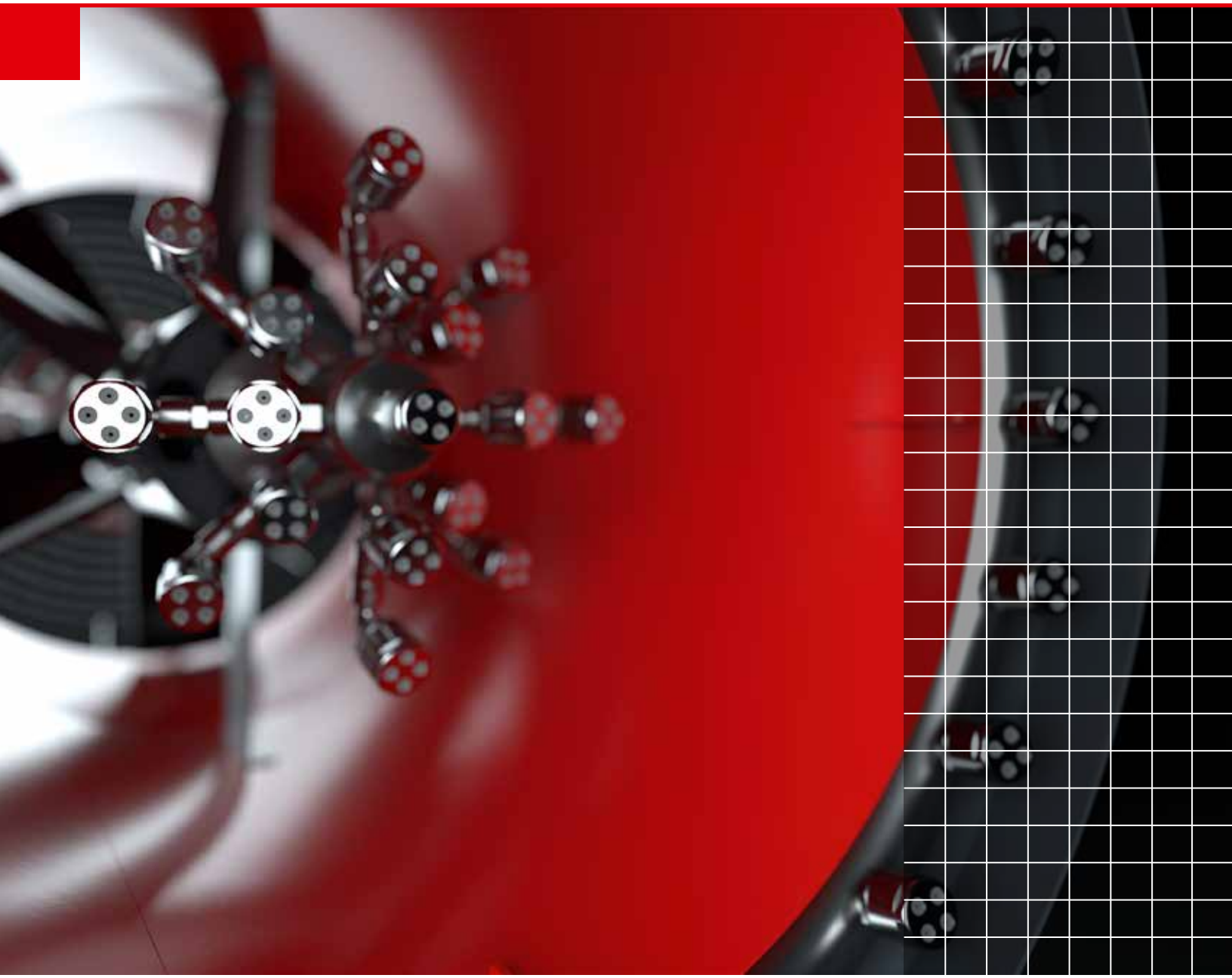
Experts in fire protection

MXOne High-Performance Firefighting Turbine – Innovative Fire Protection Using Water Mist From A Safe Distance



FLAMEX® INC.
Fire Protection Solutions for Industrial Processes

Next-Generation Fire Protection

Optimal fire protection requires the best possible solution for every area of use. As a provider of integrated fire protection solutions, Minimax can draw on a unique range of proven, groundbreaking fire protection systems and components developed in its in-house development and manufacturing facilities. Minimax has been protecting people, property and the environment for more than 110 years.

MXOne, the high-performance firefighting turbine represents a new generation of stationary fire protection systems. This unique system has a 360 ° operating range and enables the highly precise application of water mist from a safe and great distance. In the event of a fire, the water mist absorbs a huge amount of energy, cools particularly effectively, and reaches hidden fire sources better than classic monitors. It binds smoke gases, pollutants and odors and can spread rapidly and effectively across large areas without flushing away burning goods, as is the case with traditional fire monitors using bundled jets. Consequently, MXOne is ideally suited for protecting numerous industries and risk areas from specific fire risks inside or outside of buildings like never before.

MXOne enables a wide range of fire scenarios to be safely managed using flexible different extinguishing media. MXOne can be operated with drinking water, seawater and with/without foaming agents. Spray patterns can range from a fine water mist to a full fire monitor jet. The high-performance firefighting system reaches a flow rate of up to 4,000 liters per minute.

Depending on the configuration, MXOne can be aimed at a hot spot either fully automatically or manually via remote control. Thanks to a smart operating system, a single turbine can supply water alternately to two or more neighboring areas, even in automatic mode. Consequently, several fires can be fought in parallel, or nearby facilities threatened by fire can be specifically cooled in a targeted manner.

Due to its advantageous operating parameters, the turbine can be easily integrated into existing plants and is suitable for use in areas with temperatures ranging from -15 °C to +55 °C.

Advantages

- Rapid firefighting and ambient cooling using sophisticated water mist technology
- Automatic or manual precision alignment
- Adjustable spray patterns – water mist to full jet
- Flexible use of drinking water/seawater and foam
- Targeted adjustment of spray pattern and extinguishing medium to the burning material that needs protection
- Large operating area: 360 ° swivel and throw distance of up to 80 m
- Infinitely variable navigation by means of a quickly adjustable tilting angle (-19 ° to +43 °)
- Simple and safe operation by remote control
- Low operating pressures make it easier to use an existing water supply
- Can be easily integrated into operating infrastructure and existing fire suppression systems
- Immediate smoke suppression by powerfull air blower (31,000 m^3/h)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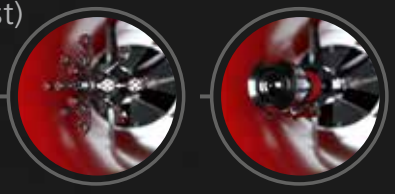
Operating pressure 4 to 16 bar (58 to 232 psi)

Configurations:
nozzle head (water mist)
or jet pipe (spray jet)



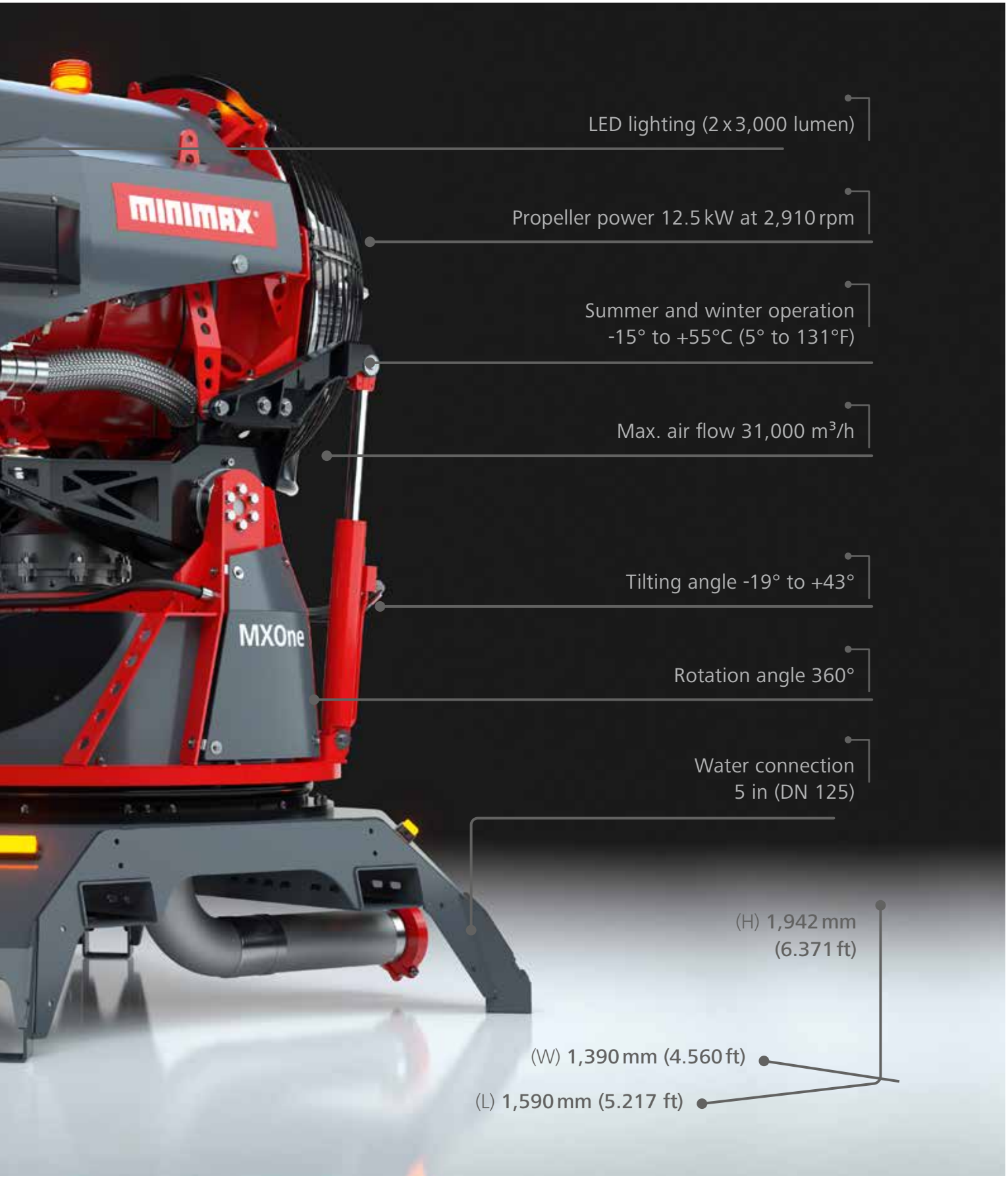
Nozzle ring

Max. flow rate 4,000 l/min (1,057 US gpm)

Power connection 400 V/50 Hz (480 V/60 Hz)
Nominal max. current 34 A

Controlling: fully automatic or
manually via remote control

Weight 945 kg (2,083 lbs)


MINIMAX
MXOne
LED lighting (2 x 3,000 lumen)
Propeller power 12.5 kW at 2,910 rpm
Summer and winter operation
-15° to +55°C (5° to 131°F)
Max. air flow 31,000 m³/h
Tilting angle -19° to +43°
Rotation angle 360°
Water connection
5 in (DN 125)
(H) 1,942 mm
(6.371 ft)
(W) 1,390 mm (4.560 ft)
(L) 1,590 mm (5.217 ft)

Spray patterns and fire extinguishing media

MXOne has the unique ability to fight a fire with water mist from a great distance. The turbine is able to offset the susceptibility of small droplets to external factors such as crosswinds or headwinds using a smart control system and switching on the propeller. Furthermore, the system can be flexibly adapted to almost any challenge posed by different fire scenarios. Due to the fact that either drinking water, seawater or foaming agents are used and the extinguishing agent in question can be applied using different spray patterns – from fine water mist to full jet – MXOne is extremely versatile like nothing ever seen before.

Water mist

Open spray jet

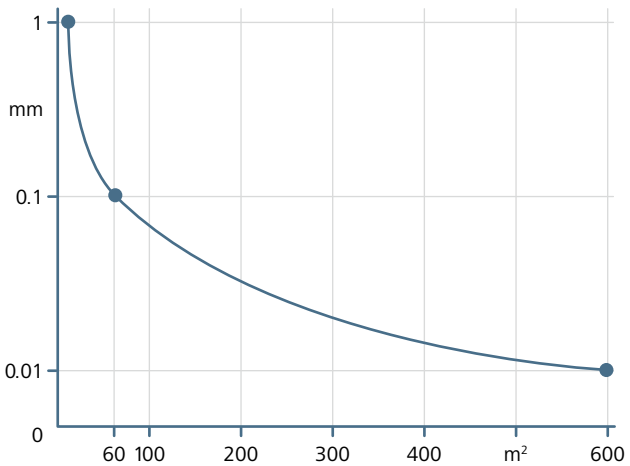
Closed spray jet

Full jet

Firefighting with water mist

Minimal amount of water used. Maximal effectiveness.
When extinguishing a fire with water mist, the water is atomized under high pressure, meaning that the smallest of water droplets and thus a larger reaction surface is formed that absorbs heat. When water evaporates, its volume is increased many times over, thus displacing the oxygen at the source of the fire and the resulting smothering effect fights the fire directly. The cooling effect of the water mist also protects people and property from the effects of heat. The volume of water consumed during the firefighting effort as well as the consequential damage caused by the water is extremely low.

- Water has a very high specific heat capacity (~ 4.2 kJ/(kg-K)). Consequently, it is able to absorb a large amount of energy compared to other liquids and solids.
- The smaller the water droplets during distribution, the larger their surface area and the quicker they heat up and evaporate (energy withdrawal from the fire). The evaporation also results in inertization by means of displacing the oxygen.
- The entire surface area of a water droplet is inversely proportional to its diameter.
- Example: 1 l water sprayed as a drop size of
  - 1 mm diameter = 6 m²
  - 0.1 mm diameter = 60 m²
  - 0.01 mm diameter = 600 m²
- Due to the properties of water mist, firefighting can be done effectively using a minimal amount of water.



Ratio of drop diameter to surface area

Operating concept – stationary or mobile control

The turbine can be controlled and aligned fully automatically. Information from at least two fire detectors (e.g. UniVario industrial fire detectors or infrared cameras) is assessed in the fire detection control panel and the location of the source of the fire is accurately determined before MXOne is activated. Alternatively, manual control of the turbine is always feasible. Both stationary and mobile control variants can be implemented according to the operator's requirements.

Fully automatic firefighting mode, manual control and simplified commissioning

Fire detection and extinguishing control panel
- Control of single-zone and complex multi-zone suppression systems
- Touch display

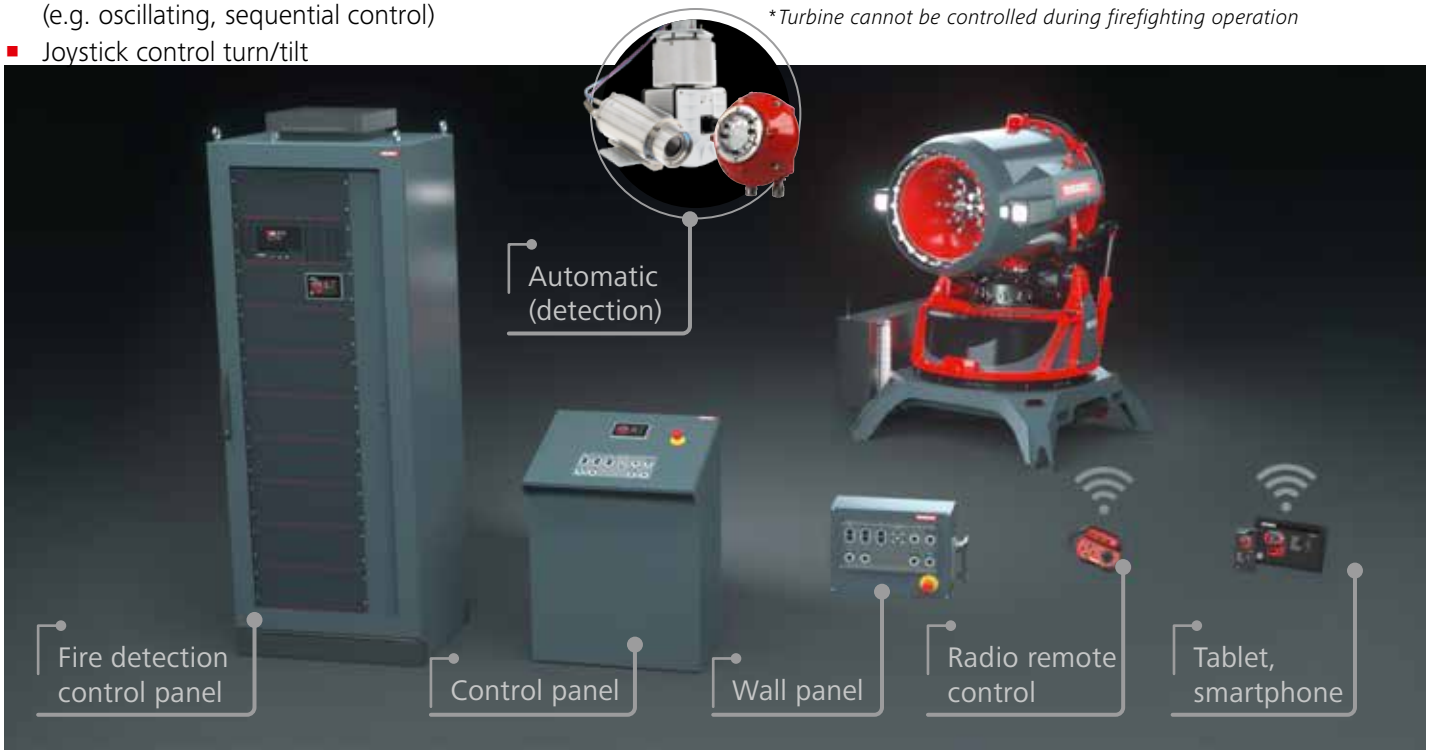
Control panel
- MXOne control incl. soft start device (reduced starting current)
- Touch display
- On/off switch (emergency stop): turbine, monitor, nozzle ring, foam, LED spotlight
- Monitor: full/spray jet (open to closed)
- Optional switch scenarios (e.g. oscillating, sequential control)
- Joystick control turn/tilt

Wall panel
- Operating elements for manual control

Radio remote control
- Control elements for manual control, including predefined scenarios
- Industrial radio link

*Mobile devices: smartphone or tablet**
- Ease of commissioning, service and maintenance
- Measurement of project-specific spatial data and direct transfer to the system

**Turbine cannot be controlled during firefighting operation*



Areas of use

Typical requirements for systems that are to be used in harsh, industrial environments: resilience, reliability and efficiency. MXOne fully meets these requirements and, despite its robust design, is easy to operate and requires little maintenance. Thanks to the turbine technology, MXOne achieves throw distances of up to 80 m, and is quickly and infinitely adjustable, both in terms of elevation and tilting angle. This means that the throw distance can be adjusted at any time.
The fire suppression system can be used in areas with an ambient temperature of -15 ° to 55 °C (5 °F to 131 °F).

Wood-processing industry
There has not, to date, been an ideal fire protection solution for outdoor storage in the wood-processing industry even though the raw materials for the entire supply chain of this industrial sector are stored there. Microbial and chemical processes, environmental influences, technical failure, human carelessness or arson can quickly cause a fire here.

In addition, there are some areas on the site that are difficult to access and control in the event of a fire, with an increased risk of fire, such as drying, mechanical conveying, storage in silos or transformers located outside (see p 10).

MXOne is used in these areas with and without foaming agents and effectively fights fires – even raging fires.

Recycling companies

It is necessary to adequately counteract any potential cause of fire right from the get-go, i.e. as soon as the recycled material comes onto the property and is stored. The quantities of organic and inorganic mixtures of substances pose a considerable risk of fire due to fermentation processes. When the recycled material contains batteries, containers with flammable liquids or spray cans that have not been emptied completely, the potential of the recycled material to ignite increases many times over.

In delivery and storage areas, whether indoors or outdoors, MXOne protects human life, reusable materials, processes and the environment.

Chemical plants & refineries

Lots of chemical plants and refineries continually invest in modernizing and expanding their production facilities. The fire protection requirements are particularly strict due to the processing and storing of highly flammable liquids.

MXOne is used here mainly with foaming agents to suppress flames as quickly as possible in the event of a fire, to cover the surface with a foam film and to prevent reignition. At the same time, adjacent areas can be cooled down as a preventive measure and protected against the spread of flames.

By using water mist, escaping gases can also be bound and smoke development can be suppressed immediately.

Airports/hangars

Airports are generally public places with high footfall and strict security standards. Moreover, large quantities of flammable liquids are stored and transported in the immediate vicinity (kerosene, petrol, oil). In addition, there are high-value goods located here – e.g. in fully occupied hangars. If an aircraft catches fire, immediate action needs to be taken and the firefighting process initiated with foam.

With MXOne, in the event of a fire, the fire suppression system is fast, particularly targeted and, above all, selective. The ability of the turbine to quickly turn in all directions as well as the flexible throw distance make it an optimal fire protection system at airports and in hangars. The use of lower amounts of extinguishing agents compared with other foam suppression systems considerably reduces the environmental impact.

Substations & transformers

Transformer stations are the intersections of our power supply. There are well over 1,000 of them in Germany alone. They bring together power lines, transform electricity to different voltage levels and pass it on. Transformers are the heart of a substation. In addition, transformers are used at large industrial sites. They convert the alternating voltage into the voltage level required for industrial operations.

Large amounts of heat are generated during operation, which is why power transformers are usually designed as oil-cooled transformers. If oil leaks, it can easily ignite on hot surfaces or as the result of a spark.

In these areas, MXOne is primarily used with foaming agents. Even raging fires can be fought effectively.

A system that works – extensively tested

MXOne is not only a firefighting turbine. Rather, it is a complex high-performance suppression system that has had to prove its reliability in numerous tests. Minimax engineers have successfully optimized the system in full-scale fire tests (flammable liquids, plastic, wood piles or kerosine) for use in its application areas. Minimax know-how in engineering, installation and service ensures that MXOne provides customers with a system that sets new standards in supporting fire protection.

Tests on a 1:1 scale

Not only successful fire trials using different representative flammable materials are part of the development of a suppression system. Minimax engineers also repeatedly test MXOne under various weather conditions and continuously incorporate practical experience into the further development of the system. Throw distances have already been increased significantly, and spray patterns have been optimized for use in various fire scenarios.

Solid combustibles
Depending on the distance from the fire, weather or thermal conditions, fires caused by solid combustibles can be put out successfully with water mist or an adapted spray jet. The choice of spray pattern has a decisive effect on the throw distance and penetration of the extinguishing agent. Spray obstructions must also be taken into account when setting the spray pattern for optimal firefighting where embers form.

Fires caused by liquids
Fires involving liquids are best fought with a foaming agent. It is important that the extinguishing agent is applied gently and spread evenly to ensure that the fire is put out quickly and successfully. The foam needs to cover the entire surface without any burning liquid escaping from the test tank. The foam blanket prevents the fire from reigniting.

Detection
Detecting fires can be carried out with industrial fire detectors as well as with infrared cameras. The position of a fire can be determined precisely using information from at least two fire detectors from different perspectives.

Optional accessories and enhancements

Meeting special requirements: MXOne can be adapted to meet a wide variety of environmental requirements and customer needs. Different types of mounts – for instance with an extended reach on a tower or mobile on a trailer – underpin the versatility of MXOne. The system can also be integrated into existing suppression systems and expanded at a later date. Changing requirements can be accommodated flexibly through the use of container and module solutions.

Installing in a stationary position: on the ground or on a tower

MXOne is usually installed on an assembly frame on the ground. It is, however, also possible to install the equipment in an elevated position, e.g. on a solid tower (tall pole). The height increases the throw distance achieved by the system.

Mobile version on a trailer

Installing the turbine on a trailer connected to electricity and water supplies allows maximum mobility and flexibility. MXOne can be placed quickly in position and connected to local power and water supplies to provide reliable fire protection in almost any company. When placed where it is needed, the turbine is operated using an industrial radio remote control.

Module solutions

Any fire suppression system, no matter what size, can be retrofitted or added to quickly and easily using prefabricated containers. These fire protection modules are manufactured, delivered and put into operation on site according to standardized processes. The commissioning costs are manageable due to the high degree of prefabrication, thus saving time and money.

Tests and certifications

The effectiveness of MXOne has been extensively tested and confirmed by independent bodies, including accredited fire protection certification bodies such as DMT or MPA Dresden

Minimax is an AwSV*-approved enterprise

The Federal Water Act (WHG) regulates in the *Ordinance on Facilities Handling Substances that are Hazardous to Water (AwSV) who may handle corresponding substances (Article 62 WHG). Accordingly, plants that are run using substances that are proven to be hazardous to water may only be installed, converted and maintained by qualified specialist companies.

Operators of such plants are also subject to equivalent requirements. Minimax is an accredited company in accordance with WHG and places particularly high demands on itself when handling foam extinguishing agents, for example.

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