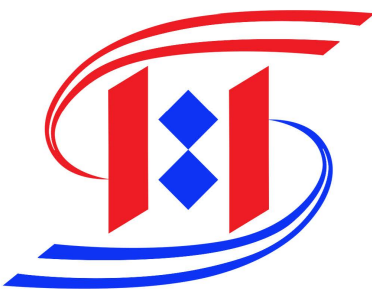


مشاوره، نظارت و اجرای سیستم‌های آتش نشانی



آبادگستر تاسیسات ایرانیان (آتا)
Abad Gostar Tasisat Iranian Co., LTD



فروش و تجهیز سیستم‌های اعلام و اطفاء حریق

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MX 200 Fire Extinguishing Systems
Fighting Fire using HFC-227ea

*Cool down.
Fire Protection by*

MINIMAX

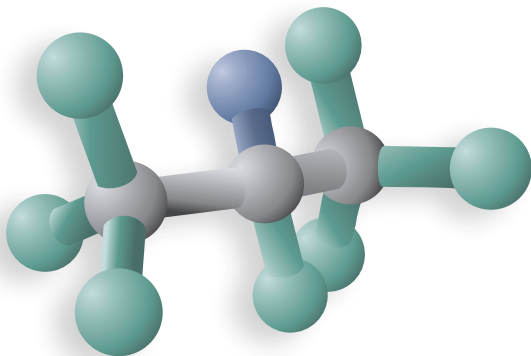
FIRE PROTECTION

Efficient and compact

MX 200 fire extinguishing systems fight fires using HFC-227ea. This extinguishing agent is particularly suitable for the protection of spaces with electronic and electrical equipment and offers an economical fire protection solution especially for small and medium-sized rooms. The 50-bar technology of the MX 200 system makes optimal use of the characteristics of this extinguishing agent.

The HFC-227ea extinguishing agent reduces the heat of the fire and thus stops the combustion reaction. It is very efficient yet unaggressive at the same time. The extinguishing agent is stored as a liquid, it transforms into a gas only when it exits from the extinguishing nozzles. It therefore extinguishes, as a rule, even concealed fire sources instantaneously.

The rapid extinguishing of a fire already in the nascent phase minimizes the fire damage and prevents long downtimes or business interruptions.



Furthermore, - unlike the case of water, foam or powder - secondary damage caused by the extinguishing agent itself is practically impossible.

Therefore, HFC-227ea is neither corrosive nor electrically conductive, leaves no residue and can easily be removed from the space concerned through ventilation. HFC-227ea is, besides inert gases, the preferred extinguishing agent for electronic and electrical risks.

HFC-227ea fire extinguishing systems already achieve their extinguishing effect at a substantially lower design concentration than that of inert gas extinguishing systems. This means that in the event of fire, less extinguishing agent must be introduced, which in turn makes it possible to implement shorter flooding periods. In addition, the pressure relief valve can be made significantly smaller, in most cases.

Furthermore, the comparatively small quantity required for use is stored in liquid form. This allows for extremely compact storage of the extinguishing agent. In addition, in the design concentration of HFC-227ea does not present any health hazard, which is why MX 200 installations are also suitable for areas with high human activity.

In 1992 HFC-227ea replaced halon, which had been banned in the meantime, and since then has been used in hundreds of thousands of fire extinguishing systems. It is better known under its trade names, for example FM-200® from DuPont™.



50 BAR

...for more options

MX 200 systems are also available – in addition to the operating pressures of conventional HFC-227ea fire extinguishing systems of 25 bar and 42 bar – in a 50 bar configuration, which offers some significant advantages. For example, it can be adapted individually and tailored specifically to the requirements of the protected area.

Longer pipelines

The regulations for fire extinguishing systems using HFC-227ea require that the protected area be flooded within a maximum of 10 seconds. The 50-bar technology makes it possible to use longer and more complex piping than systems using lower operating pressures. This means that the extinguishing agent can also be stored outside the protected area.

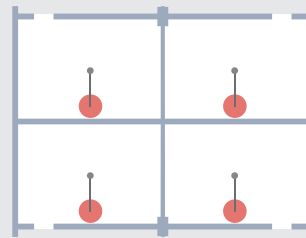
This option has the following advantages:

- ▶ In the event of fire, the extinguishing system itself is not exposed to fire.
- ▶ The space in the protected area can be used for its actual purpose, e.g. for additional server cabinets in the server room.
- ▶ The stock of extinguishing agent can be serviced quickly and easily without having to enter sensitive areas.

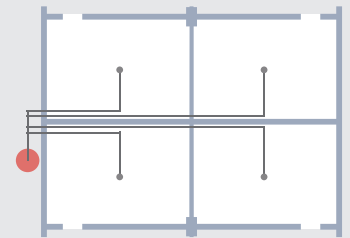
Multi-zone systems

With 50-bar technology, it is possible to set up one multi-zone system instead of several single-zone systems. Multi-zone systems jointly use a single stock of extinguishing agent for all rooms, while in the case of single-zone systems, a separate storage facility must be provided for each room. This reduces costs and saves space, especially if several rooms of a similar dimension have to be protected in a building.

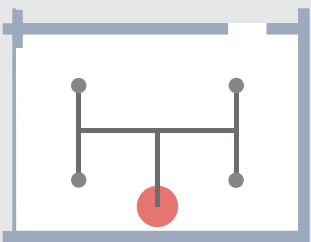
Conventional single-zone systems



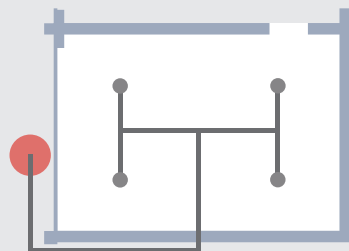
MX 200 multi-zone technology



Conventional extinguishing system with 25 bar



MX 200 fire extinguishing system with 50 bar



STRUCTURE A

Single-zone system

MX 200 fire extinguishing systems can be designed for use as a single-zone system to protect a single protected area or in the form of a multi-zone system to protect two or more areas.

Single-zone systems

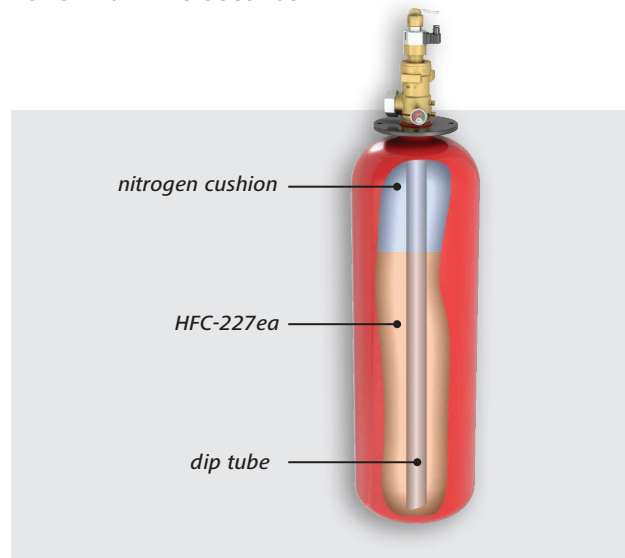
A pipework system installed with MX 200 extinguishing nozzles is installed in the protected space, while the dimension of the pipework, as along with the number and layout of the extinguishing nozzles, is determined by the risk concerned and the specific local conditions. The extinguishing agent is stored in liquid form in special cylinders, where a nitrogen cushion is superimposed over the extinguishing agent and thus generates the operating pressure of 42 or 50 bar.

To protect smaller rooms, a single cylinder is often sufficient. Multi-cylinder systems are used to protect larger rooms.

Smoke detectors continuously monitor the extinguishing zone and send a signal to the fire detection and extinguishing control panel in the event of a fire. In the case of single-cylinder systems, the control panel then opens the electrical valve of the extinguishing agent cylinder to release the agent into the pipework. In the case of multi-cylinder systems, the first cylinder is electrically activated and through the nitrogen cushion in this first cylinder, the other cylinders are triggered

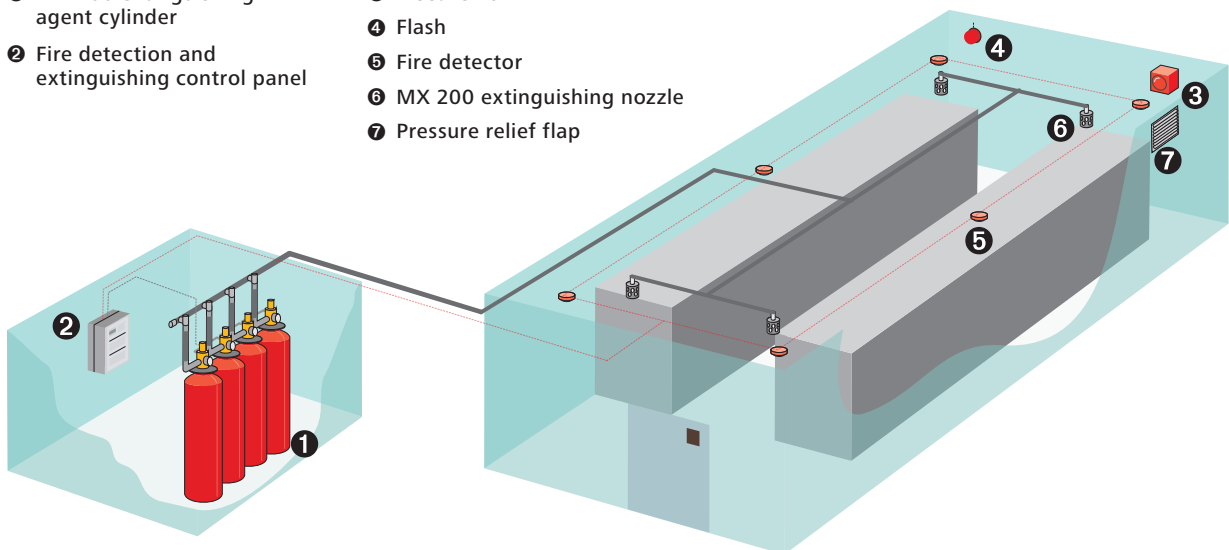
pneumatically. At the same time the fire detection and extinguishing control panel triggers an audible and visual alarm, whereby persons present will be asked to leave the room.

At the same time, it transmits a signal to a permanently manned station. After expiry of a predetermined warning time, the extinguishing process starts: The extinguishing agent is carried through the pipework into the extinguishing zone within 10 seconds.



- ❶ MX 200 extinguishing agent cylinder
- ❷ Fire detection and extinguishing control panel

- ❸ Electric horn
- ❹ Flash
- ❺ Fire detector
- ❻ MX 200 extinguishing nozzle
- ❼ Pressure relief flap



ND FUNCTION

Multi-zone system

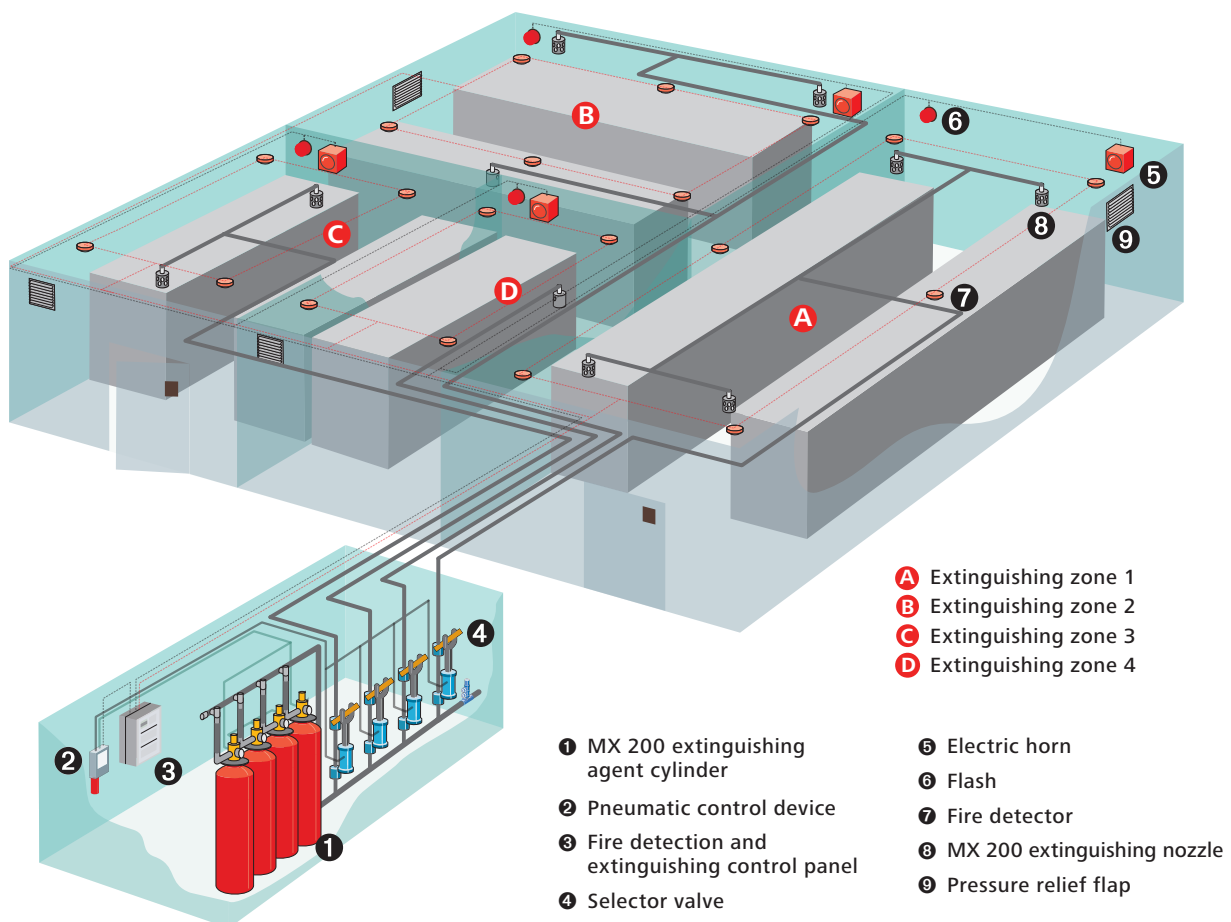
Multi-zone systems

Multi-zone systems are very similar to single-zone systems, except that they use a common stock of extinguishing agent to protect all rooms. In the event of a fire, the fire detection and extinguishing control panel controls specific selector valves. These valves release the extinguishing agent only into the extinguishing zones affected by the fire.

The required quantity of extinguishing agent is always calculated in relation to the largest protected space. If a smaller space is affected by the fire, only as much extinguishing agent as is required is released to extinguish the fire in this space. Due to the reserve of extinguishing agent, the fire extinguishing capacity of the system is guaranteed even after the extinguishing system has been triggered – providing continuous, uninterrupted operation.

Fire detection and extinguishing control panel:

The control and function monitoring capacity of MX 200 fire extinguishing systems should be provided ideally by the tried and tested Minimax FMZ 5000 fire alarm and extinguishing control technology. This ensures optimal compatibility - supported by relevant certifications - of electrical and mechanical system components and avoids unnecessary coordination expense and interface problems between different system parts.



OPTIMAL

Design – with the Minimax DesignManager

In the pipework, a two-phase flow - composed of liquid HFC-227ea and gaseous nitrogen - is generated after activation of the extinguishing system; this presents a particular challenge for the hydraulic calculation when planning the system.

MX 200 fire extinguishing systems are designed for specific projects with the Minimax Design Manager. This design program is based on a specially developed simulation model for the two-phase flow, which has been verified in numerous flow tests on extinguishing system models.

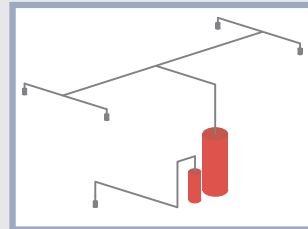
Thanks to the calculation accuracy of the Minimax DesignManager, extinguishing systems can be optimally designed - both as regards safety systems and from an economic perspective: The designed extinguishing systems have been proven to be dependable and effective. Unlike conventional design programs, the Minimax DesignManager is also able to calculate complex and asymmetric pipework, thus offering more flexibility in the system design.

Whether a 50- or 25-bar system, with either symmetric or asymmetric pipework – Minimax DesignManager will always find the ideal system version and solution for each project. To further ensure safety in the design of the system, the guided menu of the Minimax DesignManager is designed so as to perform an error and plausibility check even while the basic data are entered into the system.

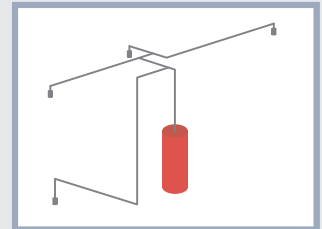
Another highlight:

An interface to the AutoCAD software integrated into the Minimax DesignManager offers a convenient design of the installation and makes it possible to import the result into the project documents and system records afterwards.

Conventional extinguishing system with symmetric pipework



MX 200 fire extinguishing system with asymmetric pipework



APPLICATIONS

A class on its own

MX 200 fire extinguishing systems are particularly suitable for the protection of spaces with electrical and electronic facilities, even if people are present in the premises.

All system variants and options of MX 200 fire extinguishing systems are tested and certified by the VdS Schadenverhütung (independent German testing institution for fire protection and security). Beyond this there are listings from UL and there are approvals from FM Global as well as from other international certification bodies.



Examples of use

- ▶ Server rooms and other IT facilities
- ▶ Data archives
- ▶ Telecommunications equipment
- ▶ Control rooms and control stations
- ▶ Instrumentation and control rooms
- ▶ Electrical switch rooms
- ▶ Switchgear and distribution cabinets



In Europe the use of the extinguishing agent HFC-227ea (GWP 3220) used in the MX 200 fire extinguishing systems is regulated by the Regulation (EU) No. 517/2014 on fluorinated greenhouse gases.



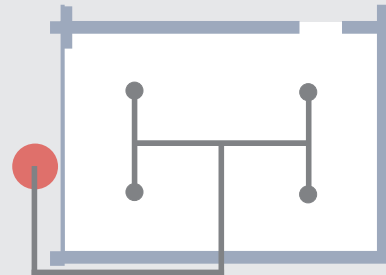
BENEFITS

at a glance

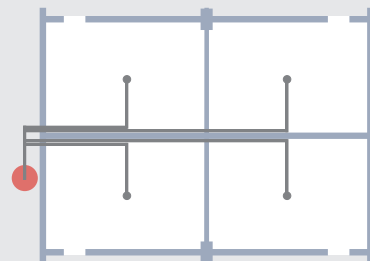
There are many reasons for choosing a MX 200 fire extinguishing system by Minimax:

- ▶ The systems provide an excellent extinguishing effect in rooms with electronic and electrical equipment.
- ▶ The HFC-227ea extinguishing agent is neither corrosive nor electrically conductive, leaves no residue and can easily be removed from the space in question through ventilation.
- ▶ The HFC-227ea extinguishing agent is also very suitable for zones that are frequented by people and has no ozone depletion potential.
- ▶ Operating pressures up to 50 bar allow for more extensive pipework and storage of the extinguishing agent outside the protected area.
- ▶ Through cost-effective multi-zone systems, a single stock of extinguishing agent is sufficient to cover several zones.
- ▶ The Minimax DesignManager calculates complex, asymmetrical pipework automatically and delivers optimal solutions - both from a safety-related and an economic perspective.

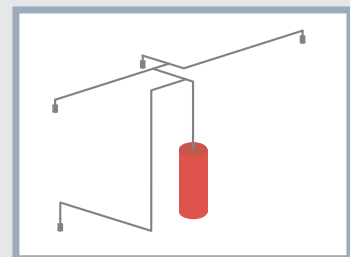
MX 200 50-bar technology – makes it possible to use long pipework



MX 200 multi-zone technology – saves space and extinguishing agent



Minimax DesignManager – calculates the optimal solution



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Photos

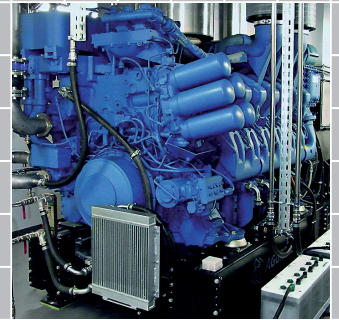
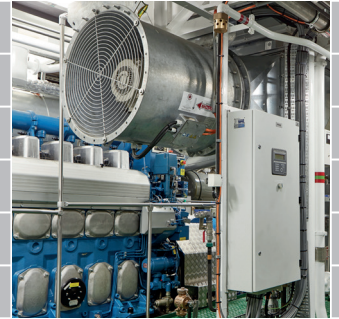
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For further information, please refer to the technical documentation.
Subject to technical modifications without notice.

Experts in fire protection

MINIMAX

MX 1230 Marine & MX 200 Marine clean agent fire suppression systems



GAS EXTINGUISHING SYSTEMS

CHEMICAL EXTINGUISHING SYSTEMS

Effective – speedy and careful

At sea, safety requirements for ships are of the utmost importance. This also applies to fire protection measures. After all, in the event of fire, rapid escape is usually impossible and the prompt arrival of help from outside cannot be expected.

In light of the various types of fire risks which exist on board ships, specific solutions are necessary for the space or object to be protected in order to ensure optimal fire protection on board.

Areas that deserve special attention include machine rooms and rooms with electrical and electronic devices, such as control rooms and switch cabinets. In the event of a fire, the failure of machines or devices on board a ship at sea can have fatal consequences. In such risk areas, fire suppression systems must put out fires quickly and residue-free, in order to ensure that sensitive equipment is not damaged.

A perfect solution are the MX 1230 Marine and MX 200 Marine clean agent fire suppression systems, which meet the demanding requirements on board a ship and are fully certified with many major marine sector approvals (e.g. DNVGL, ABS, LR, MED).

The systems utilise the approved fire suppression agents Novec™ 1230 or HFC-227ea: neither fire suppression agent is corrosive or electrically conductive, or causes any damage to sensitive parts through short circuits or residues.

Fire suppression agents

Novec™ 1230 is used in the MX 1230 suppression system. Novec™ 1230 is the latest clean agent and is environmentally friendly and safe to persons. Of both fire suppression agents, Novec™ 1230 possesses a larger safety margin between the design and a hazardous concentration.

HFC-227ea is used in the MX 200 Marine clean agent fire suppression system. It is the most common clean agent and world wide available.



Unique

The 50-bar system pressure is a new standard for clean agent fire suppression on ships:

- at most 30% smaller nominal pipe width and consequently less weight and space required
- cylinder displacement from machinery space – consequently no redundancy required
- more fire suppression agent per cylinder but we have also the standard pressure system with 25 bar and 42 bar system pressure. The pressure system will be chosen acc. to the requirements on board.

Effectiveness

The fire suppression systems are characterised by their rapid fire suppression. The common flooding time is maximum 10 seconds. This minimises the possible damage and prevents the spreading of flames to other nearby areas.

Space & weight

Both clean agents are extremely effective: the fire suppression is effective at a design concentration of 5.5 resp. 8.7 % per vol. – consequently less space for storage is required.

Personal safety

Releasing the fire suppression systems does not present any danger to people. Both fire suppression agents are completely safe for use in occupied spaces due to their large safety margin between the design and a hazardous concentration.

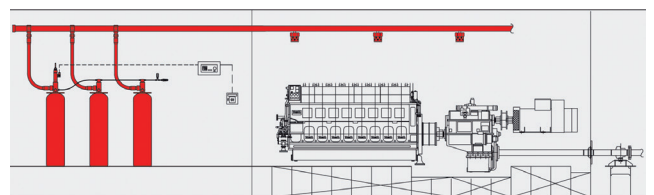


Respect for the environment

Neither fire suppression agent possesses ozone depletion potential. However, the Novec™ 1230 fire suppression agent is categorized as more environmentally friendly based on its extremely low greenhouse potential (GWP = 1).

Flexibility

Flexibility in pipe routing and the wide range of fire suppression agent cylinder sizes ensure that the system can be individually adapted to the room to be protected and the space available for installation.



System lay-out

The main components of MX 1230 Marine and MX 200 Marine clean agent fire suppression systems are the fire suppression agent supply with a pipe network and discharge nozzle.

Advantages of the MX 1230 Marine & MX 200 Marine clean agent fire suppression systems

The fire suppression systems have been developed especially for machine rooms and areas with electronic and electrical risks on ships.

- Unique: 50-bar system pressure
- Rapid flooding and suppression (<10 seconds)
- No consequential damage caused thanks to residue-free and clean fire suppression
- Weight and space saving installation
- Easy to refill, worldwide available agents
- Environmentally friendly and safe for use in occupied areas
- Approved for many major marine applications (e.g. DNVGL, ABS, LR, MED)



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MX 1230 compact extinguishing systems with
the extinguishing agent Novec™ 1230 from 3M™

*Cool down.
Fire Protection by*

MINIMAX

COMPACT

Compact fire protection

8

Fire: an everyday risk with consequences

Nearly no company nowadays can compete without its data processing and communication technology. The prerequisite for an effective company workflow are operational EDP and IT systems that need special protective technology for reliable operation.

Fire protection is a very important part!

Fire can break out at any time. This only requires a certain ratio of combustibles, heat and oxygen:

- ▶ Combustible exists in electronic systems in the form of circuit boards, cables, plugs and the like.
- ▶ Hazardous heat is generated at overloaded components, in short circuits and due to insufficient cooling.
- ▶ The oxygen a fire needs is always contained in the air.

Once the fire reaction has started and produces heat itself, it must be immediately extinguished to avoid a catastrophe. Even a small fire can cause the irretrievable loss of data and valuable materials or the breakdown of important systems. The result is a longer interruption of business, which in the worst-case scenario can be life threatening for a company.

24 hours, 365 days automatic fire protection

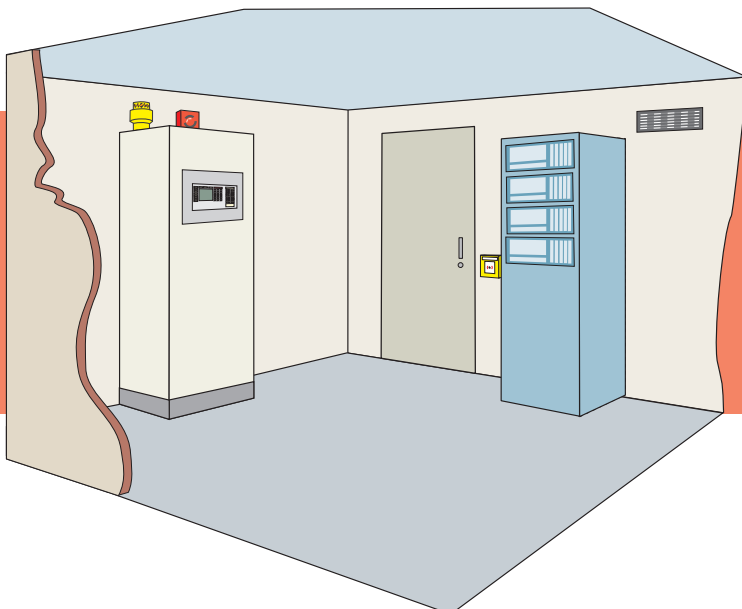
Reliable, automatic and round the clock, the Minimax MX 1230 compact extinguishing system with the extinguishing agent Novec™ 1230 from 3M™ protects data processing and electronic control systems. The compact extinguishing system is space-saving, detects the fire hazard automatically in an early state, automatically separates the supply of current, extinguishes independently, quickly and residue free. The extinguishing agent is environmentally friendly and guarantees safety for people.

Novec™ 1230 is the perfect extinguishing agent for the protection of sensitive EDP and IT systems. It binds the heat energy directly in the flame and thus interrupts the combustion process. The extinguishing agent is colourless and nearly odourless and liquid at room temperature. It is neither corrosive nor electroconductive, causes no damage and leaves no residues on sensitive electronic components.

Novec™ 1230 is the newest generation of clean agents with excellent properties for protecting the atmosphere.

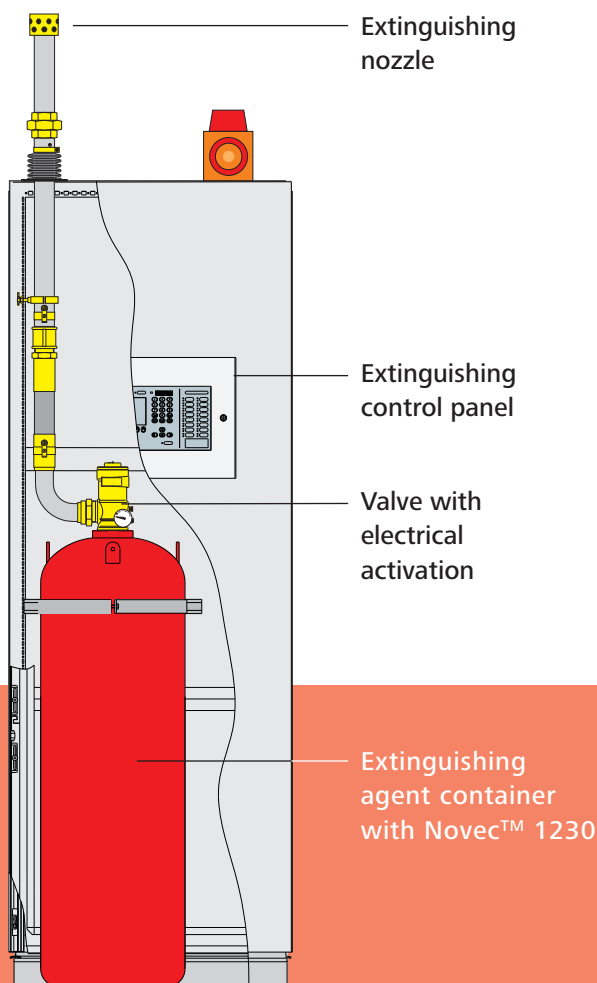
Typical operational areas of the MX 1230 compact extinguishing system are rooms with electrical and electronic systems, such as:

- ▶ Computer and server rooms
- ▶ EDP and communication equipment
- ▶ Control centres
- ▶ Laboratory and medical equipment, as well as mainframe archives and the like



Set-up, connect, ready to extinguish

The special advantage of the MX 1230 compact extinguishing system: control panel, extinguishing agent supply and on request also extinguishing nozzles, buzzers and flashing lights are housed together in a cabinet. The system can hence be installed in the area it is designed to protect, which saves space and requires minimal assembly and installation.



This is how secure fire protection with the MX 1230 compact extinguishing system works

Sensitive fire detectors on the ceilings and in double floors, as needed, monitor the protected area continuously and without interruption. At even the slightest deviation from normal conditions the detectors detect a fire and send a signal to the fire detection and extinguishing control panel. This separates the circuit of the endangered devices, switches off the climate control and triggers an audible and visual alarm. After a programmable delay time, the extinguishing agent container is opened automatically, the extinguishing agent flows to the nozzles, where it is vaporised as exits. Within 10 seconds the gas is evenly distributed in the area and extinguishes the fire.

Intelligent supplement

An effective system supplement is the highly sensitive Helios early fire detection system. The earliest detection provides personnel on the scene with a valuable head start. In this early phase a simple measure, such as switching off the equipment, can prevent a smouldering fire from developing into an open fire.



BENEFITS

All components in one unit

Fire protection with the MX 1230 compact extinguishing system has many benefits:

- ▶ Optimised damage limitation by sensitive detection, brief flooding time and rapid extinguishing effect
- ▶ Optimal use of valuable technology surfaces through compact and space-saving assembly
- ▶ Minimum disruption to operating sequences during assembly due to the pre-assembled Plug & Play system with minimum time and expense involved in installation
- ▶ High environmental compatibility of the extinguishing agent
- ▶ Optimal system for areas where people are present due to use of a safe extinguishing agent
- ▶ Effective and complete all-around security for all systems and installations in the protected area



The MX 1230 compact extinguishing system comes in three models

System type	Protected volume ¹⁾ in m ³	Dimensions (w x h x d) in cm	Weight ^{2) 3)} in kg
MX 1230 – 40	approx. 12 - 32	800 x 2100 x 600	approx. 230
MX 1230 – 80	approx. 32 - 70		approx. 270
MX 1230 – 140	approx. 70 - 140		approx. 300

¹⁾ larger protected volumes on request

²⁾ approx. weight plus extinguishing agent (approx. 1 kg per m³ protected volume)

³⁾ approx. weight when equipped with FMZ 5000 mod 4 (+ 11 kg with FMZ 5000 mod 12)

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Experts in fire protection

MINIMAX

MX 1230 Fire Extinguishing Systems Fire Fighting with 3M™ Novec™ 1230



TECHNOLOGIES

GAS EXTINGUISHING SYSTEMS

Fire protection – efficient and compact

MX 1230 fire extinguishing systems fight fires using 3M™ Novec™ 1230 Fire Protection Fluid. This extinguishing agent is particularly suitable for the protection of spaces with electronic and electrical equipment and offers a compact fire protection solution especially for small and medium- sized rooms. The 50-bar technology of the MX 1230 system makes optimal use of the characteristics of this extinguishing agent.



The 3M™ Novec™ 1230 Fire Protection Fluid reduces the heat of the fire and thus stops the combustion reaction. It is very efficient yet unaggressive at the same time.

The fluid is stored as a liquid, it transforms into a gas only when it exits from the extinguishing nozzles. It therefore extinguishes, as a rule, even concealed fire sources instantaneously.

The rapid extinguishing of a fire already in the nascent phase minimizes the fire damage and prevents long downtimes or business interruptions.

Furthermore, – unlike the case of water, foam or powder – secondary damage caused by the extinguishing agent itself is practically impossible. 3M™ Novec™ 1230 is neither corrosive nor electrically conductive: It leaves no residue and can easily be removed from the space concerned through ventilation. Therefore, 3M™ Novec™ 1230 is, besides inert gases, the preferred extinguishing agent for electronic and electrical risks.



3M™ Novec™ 1230 Fire Protection Fluid achieves its extinguishing effect at a substantially lower design concentration than that of inert gas extinguishing systems. Furthermore, the comparatively small quantity required for use is stored in liquid form. This allows for extremely compact storage of the extinguishing agent. In addition, in the design concentration of 3M™ Novec™ 1230 does not present any health hazard.

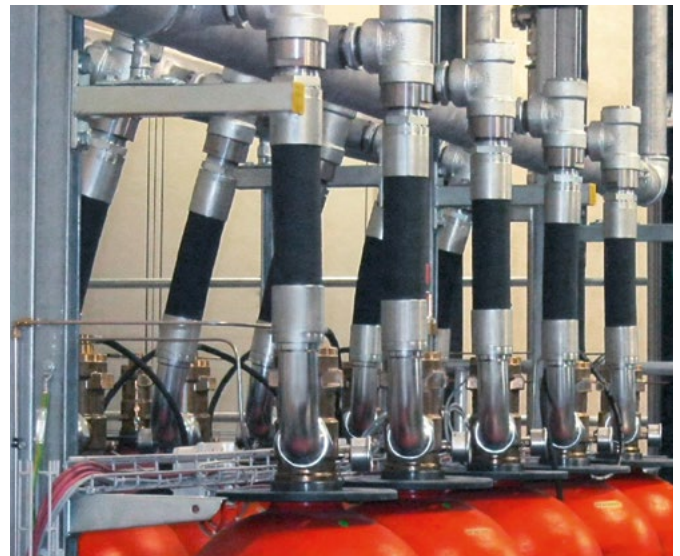
3M™ Novec™ 1230 fluid has the best environmental properties, compared to other gaseous chemical extinguishing agents. It does not produce any hazard for the ozone layer and has a very low global warming effect. It dissipates completely within a mere five days.

50 bar-technology

In addition to the operating pressures of conventional fire extinguishing systems of 25 bar and 42 bar, MX 1230 systems are also available in a 50-bar configuration, which offers some significant advantages.

Longer pipelines

The regulations for fire extinguishing systems using 3M™ Novec™ 1230 fire protection fluid require that the protected area can be flooded within a maximum of 10 seconds. The 50-bar technology makes it possible to use longer and more complex piping than systems using lower operating pressures. This means that the extinguishing agent can also be stored outside the protected area.

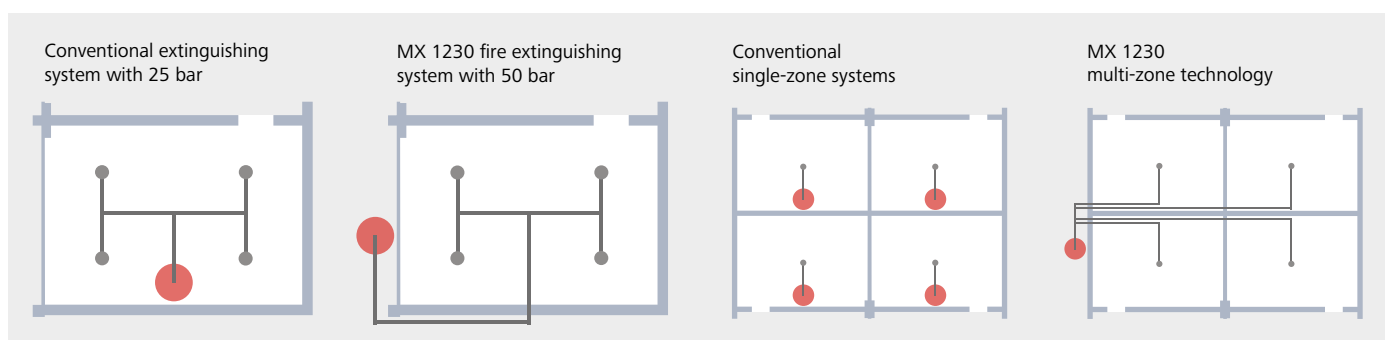


Multi-zone systems

With 50-bar technology, it is possible to set up one multi-zone system instead of several single-zone systems. Multi-zone systems jointly use a single stock of extinguishing agent for all rooms, while in the case of single-zone systems, a separate storage facility must be provided for each room. This reduces costs and saves space, especially if several rooms of a similar dimension have to be protected in a building.

This option has the following advantages:

- In the event of fire, the extinguishing system itself is not exposed to fire.
- The space in the protected area can be used for its actual purpose, e.g. for additional server cabinets in the server room.
- The stock of extinguishing agent can be serviced quickly and easily without having to enter sensitive areas.



Installation with single-zone or multi-zone technology

MX 1230 fire extinguishing systems can be designed as single-zone systems protecting single areas or in the form of a multi-zone systems to protect two or more areas each.

Single-zone systems

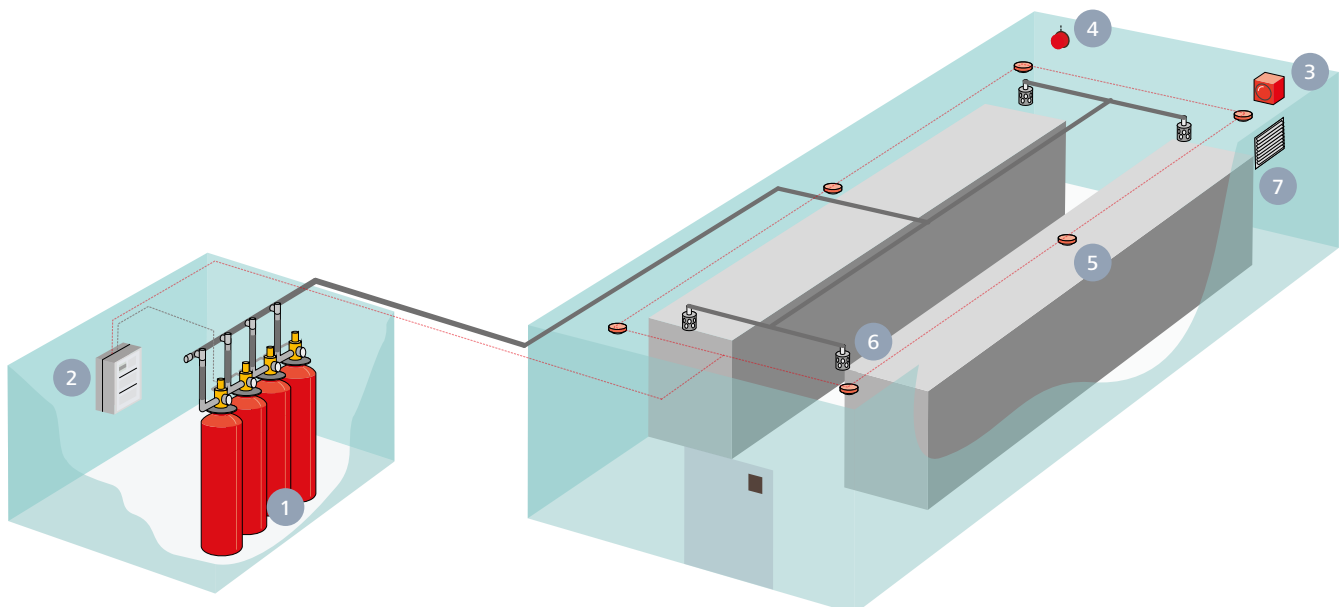
A pipework system with MX 1230 extinguishing nozzles is installed in the protected space, while the dimension of the pipework, as well as the number and layout of the extinguishing nozzles, is determined by the risk concerned and the specific local conditions. The extinguishing agent is stored in liquid form in special cylinders. A nitrogen cushion is superimposed over the extinguishing agent generating the operating pressure of 25, 42 or 50 bar.

To protect smaller rooms, a single cylinder is often sufficient. Multi-cylinder systems are used to protect larger rooms.

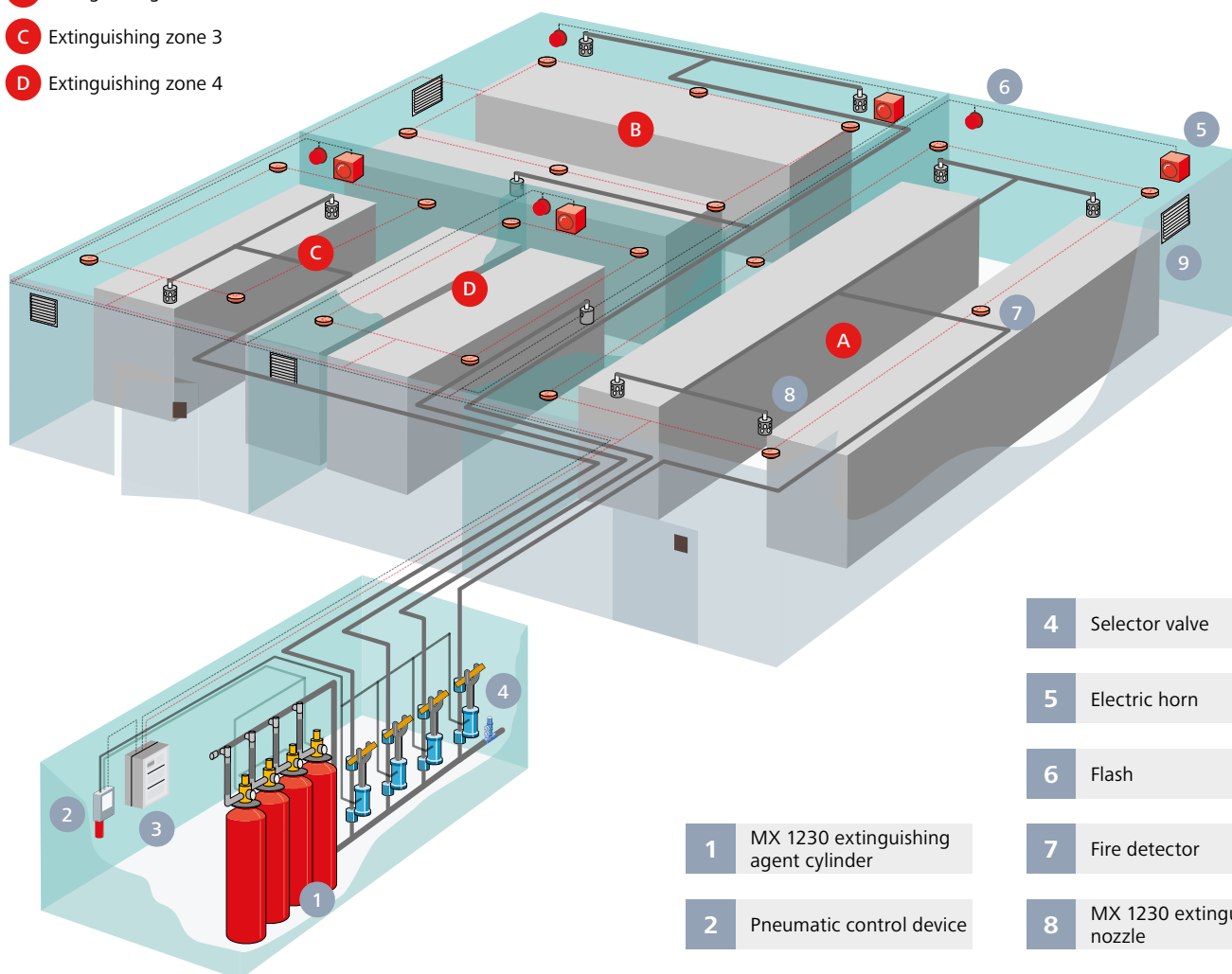
Smoke detectors continuously monitor the extinguishing zone and send a signal to the fire detection and extinguishing control panel in the event of a fire. In the case of single-cylinder systems, the control panel then opens the electrical valve of the extinguishing agent cylinder to release the agent into the pipework. In the case of multi-cylinder systems, the first cylinder is electrically activated and through the nitrogen cushion in this first cylinder, the other cylinders are triggered pneumatically.

At the same time the fire detection and extinguishing control panel triggers an audible and visual alarm, whereby persons present will be asked to leave the room. At the same time, it transmits a signal to a permanently manned station. After expiry of a predetermined warning time, the extinguishing process starts: The extinguishing agent is carried through the pipework into the extinguishing zone within 10 seconds.

1	MX 1230 extinguishing agent cylinder	5	Fire detector
2	Fire detection and extinguishing control panel	6	MX 1230 extinguishing nozzle
3	Electric horn	7	Pressure relief flap
4	Flash		



- A** Extinguishing zone 1
- B** Extinguishing zone 2
- C** Extinguishing zone 3
- D** Extinguishing zone 4



- | | | | |
|----------|--|----------|------------------------------|
| 1 | MX 1230 extinguishing agent cylinder | 4 | Selector valve |
| 2 | Pneumatic control device | 5 | Electric horn |
| 3 | Fire detection and extinguishing control panel | 6 | Flash |
| 7 | Fire detector | 8 | MX 1230 extinguishing nozzle |
| 9 | Pressure relief flap | | |

Multi-zone systems

Multi-zone systems are very similar to single-zone systems, except that they use a common stock of extinguishing agent to protect all rooms. In the event of a fire, the fire detection and extinguishing control panel controls specific selector valves. These valves release the extinguishing agent only into the extinguishing zones affected by the fire. The required quantity of extinguishing agent is always calculated in relation to the largest protected space. If a smaller space is affected by the fire, only as much extinguishing agent as required is released to extinguish the fire in this space. Due to the reserve of extinguishing agent, the fire extinguishing capacity of the system is guaranteed even after the extinguishing system has been triggered – providing continuous, uninterrupted operation.

Fire detection and extinguishing control technology

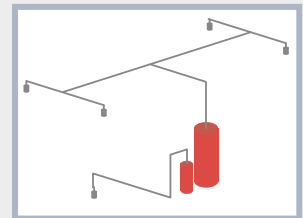
The control and function monitoring capacity of MX 1230 fire extinguishing systems should be provided ideally by the tried and tested Minimax Clunid FMZ6000 fire alarm and extinguishing control technology. This ensures optimal compatibility – supported by relevant certifications – of electrical and mechanical system components and avoids unnecessary coordination expense and interface problems between different system parts.

Optimal Design – with Minimax DesignManager

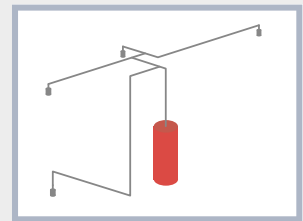
For the customer-specific design of our MX 1230 fire extinguishing systems, our planners have a calculation program with unique accuracy at their disposal: The Minimax DesignManager meets the high requirements placed on such calculation programs by the international certification authorities Vds, UL and FM Global. It is based on a specially developed simulation model for two-phase flow, which has been verified in numerous flow tests on extinguishing system models.



Conventional extinguishing system with symmetric pipework



MX 1230 fire extinguishing system with asymmetric pipework



In the pipework, a two-phase flow – composed of 3M™ Novec™ 1230 Fire Protection Fluid and gaseous nitrogen – is generated after activation of the extinguishing system; this presents a particular challenge for the hydraulic calculation when planning the system. Whether a 25-, 42- or 50-bar system, single- or multi-zone, symmetric or asymmetric pipework – the Minimax DesignManager will always find the ideal system version and solution for each project.

Thanks to the calculation accuracy of the Minimax DesignManager, extinguishing systems can be optimally designed – both as regards safety systems and from an economic perspective. Because unlike conventional design programs, the Minimax Design-Manager is also

able to include zone distributors of multi-zone systems with up to 15 outlets in the calculation. It also calculates complex and asymmetric pipework, thus offering more flexibility in the system design.

To further safety in the design of the system, the guided menu of the Minimax DesignManager is designed to perform an error and plausibility check even while the basic data are entered into the system.

Another highlight: An interface to the AutoCAD software integrated into the Minimax DesignManager offers a convenient design of the installation and makes it possible to import the result into the project documents and system records afterwards.

Wide Range of Applications

MX 1230 fire extinguishing systems are particularly suitable for the protection of spaces with electrical and electronic facilities.



Examples of use

- Server rooms and other IT facilities
- Data archives
- Telecommunications equipment
- Control rooms and control stations
- Instrumentation and control rooms
- Electrical switch rooms
- Switchgear and distribution cabinets

Compact system needs no piping

In the compact design control panel, extinguishing agent supply and on request also extinguishing nozzles, buzzers and flashing lights are housed in a cabinet. The system can hence be installed in the area it is designed to protect, which saves space and requires minimal assembly and installation.

Benefits at a glance

There are many reasons for choosing a MX 1230 fire extinguishing system by Minimax:

- The systems provide an excellent extinguishing effect in rooms with electronic and electrical equipment.
- The 3M™ Novec™ 1230 Fire Protection Fluid is neither corrosive nor electrically conductive and it has a very high environmental compatibility. It leaves no residue and can easily be removed from the space in question through ventilation.
- Operating pressures up to 50 bar allow for more extensive pipework and storage of the extinguishing agent outside the protected area.
- Through cost-effective multi-zone systems, a single stock of extinguishing agent is sufficient to cover several zones.
- The Minimax DesignManager calculates complex, asymmetrical pipework automatically and delivers optimal solutions – both from a safety-related and an economic perspective.
- Also available as compact system without piping.



Internationally approved

All system variants and options of the MX 1230 fire extinguishing systems, including the Minimax DesignManager, are tested and certified by FM Global, by UL as well as by VdS Schadenverhütung (independent German testing institution for fire protection and security). In addition, there are approvals by other international certification bodies.

Photos

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Page 7 Minimax GmbH/DLR/Fotolia

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