



FIXED EXTINGUISHING SYSTEM

with CARBON DIOXIDE  
EXTINGUISHING AGENT

HIGH  
PRESSURE

FIRE  
PROTECTION

# IMMEDEATE AND EFFECTIVE ACTION AGAINST FIRE AND ITS EFFECTS



**Fire protection** is an industry in **constant development** which must provide innovative solutions adaptable to any design factor.

Currently protected enclosures house high-value goods, both in terms of the cost of the objects themselves and, increasingly, in terms of their function and contents. As a result, **fire damage, especially damage affecting critical equipment, has dire consequences** and may lead to service interruptions, delays, loss of data, legal problems and, in short, difficulties or obstacles that lead to a cessation of activity, not to mention material losses.

The **SIEX-CO<sub>2</sub><sup>TM</sup>** fixed extinguishing system plays a dual role **as a means of permanent fire safety**: it deals quickly and effectively with fire while not jeopardizing equipment and installations.



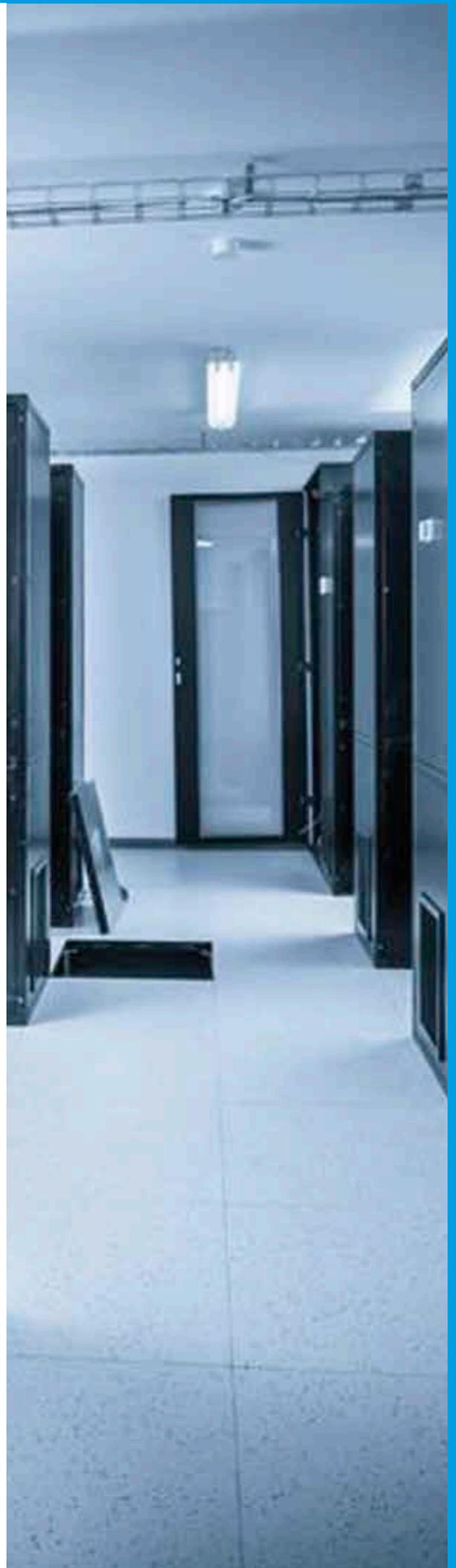
# CO<sub>2</sub>, ACCUMULATED EXPERIENCE

Carbon dioxide is probably the most used gaseous extinguishing agent in the world, thanks to its versatility, performance and extensive track record, with outstanding results and proven properties. It is a clean gas that leaves no residue, is non-conductive, non-corrosive, chemically unreactive, does not affect the ozone layer (zero ODP), and is colourless, odourless and tasteless.

It combines **low cost and high availability** anywhere in the world, making it a leading product. It is recommended for protecting virtually any risk: Unlike others, it may be used when the design includes openings on the enclosure walls, either by **total flooding** or by **local application** to ensure highly effective and versatile extinguishing.

CO<sub>2</sub> systems may be completely safe for people if the safety devices developed by SIEX are properly used: lock-out valves, pneumatic retarder, sirens, etc.

**SIEX offers a range of safety devices to facilitate safe evacuation** prior to discharge. These devices are adaptable to each project and each client. The system as a whole (components and calculation software) has all national and international guarantees and certifications.

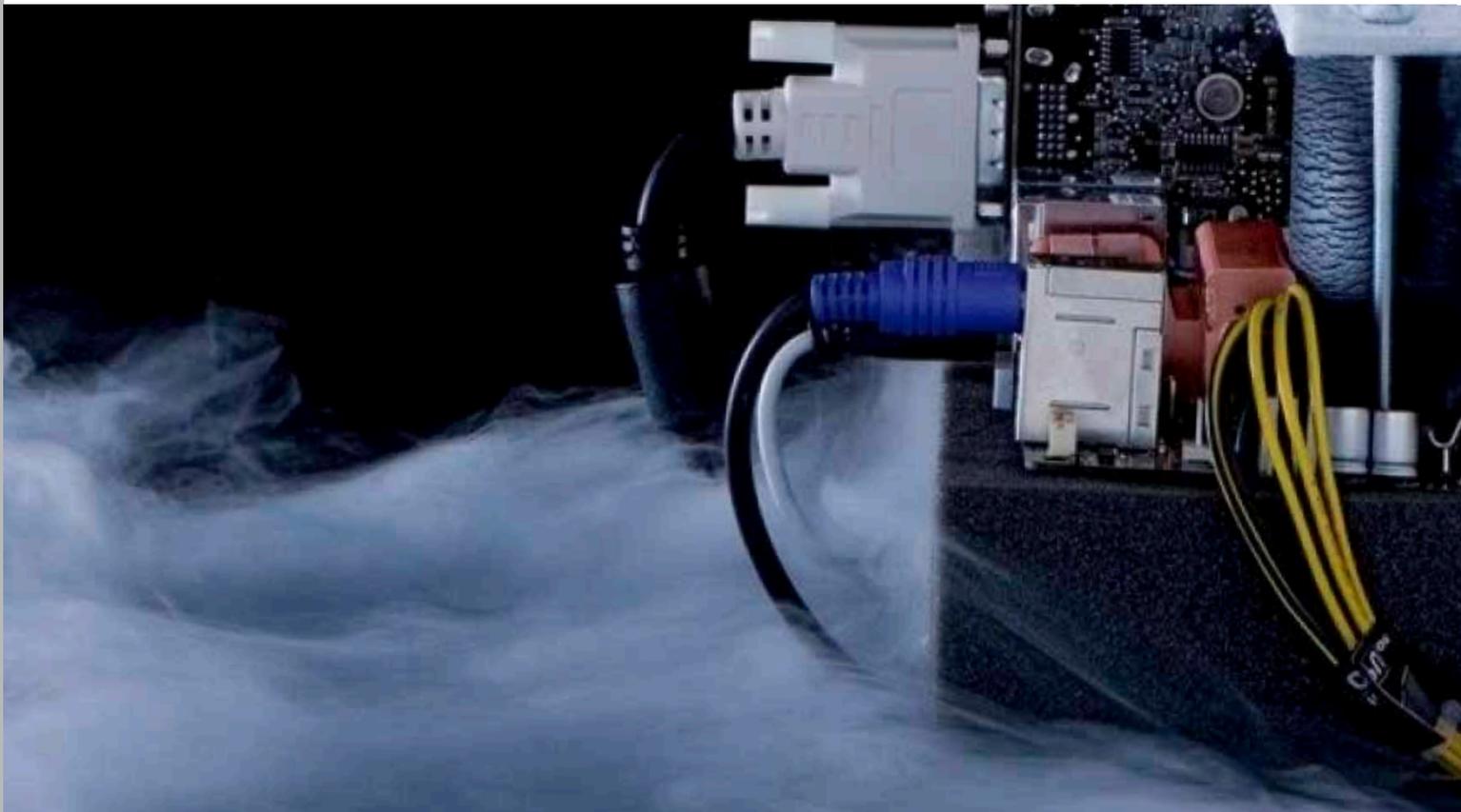
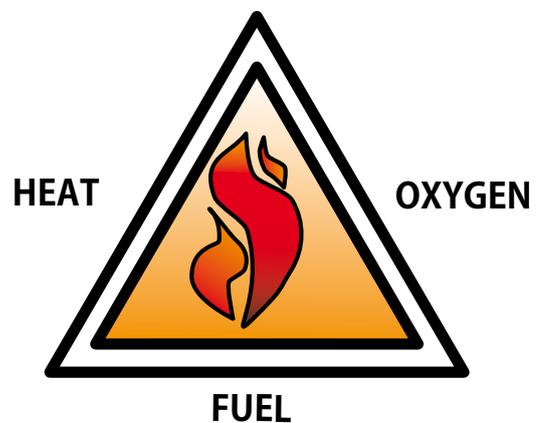


# EXTINGUISHING

The primary extinguishing mechanism involves smothering the fire by displacing the oxidizer. To avoid re-ignition, the concentration is maintained for a given period. It is at this stage that the agent's cooling capacity is critical, absorbing heat energy from the fire and preventing its reignition.

It is supplied as a pressurized liquefied gas to reduce the number of cylinders and storage space (space that can be used for other uses). This high storage pressure means that the storage area can be located away from the protected hazard, if necessary, and pipe runs can be quite complicated to avoid architectural obstacles.

Allows quick action and responds to the threat very effectively, quickly suppressing any outbreak without damaging existing assets.

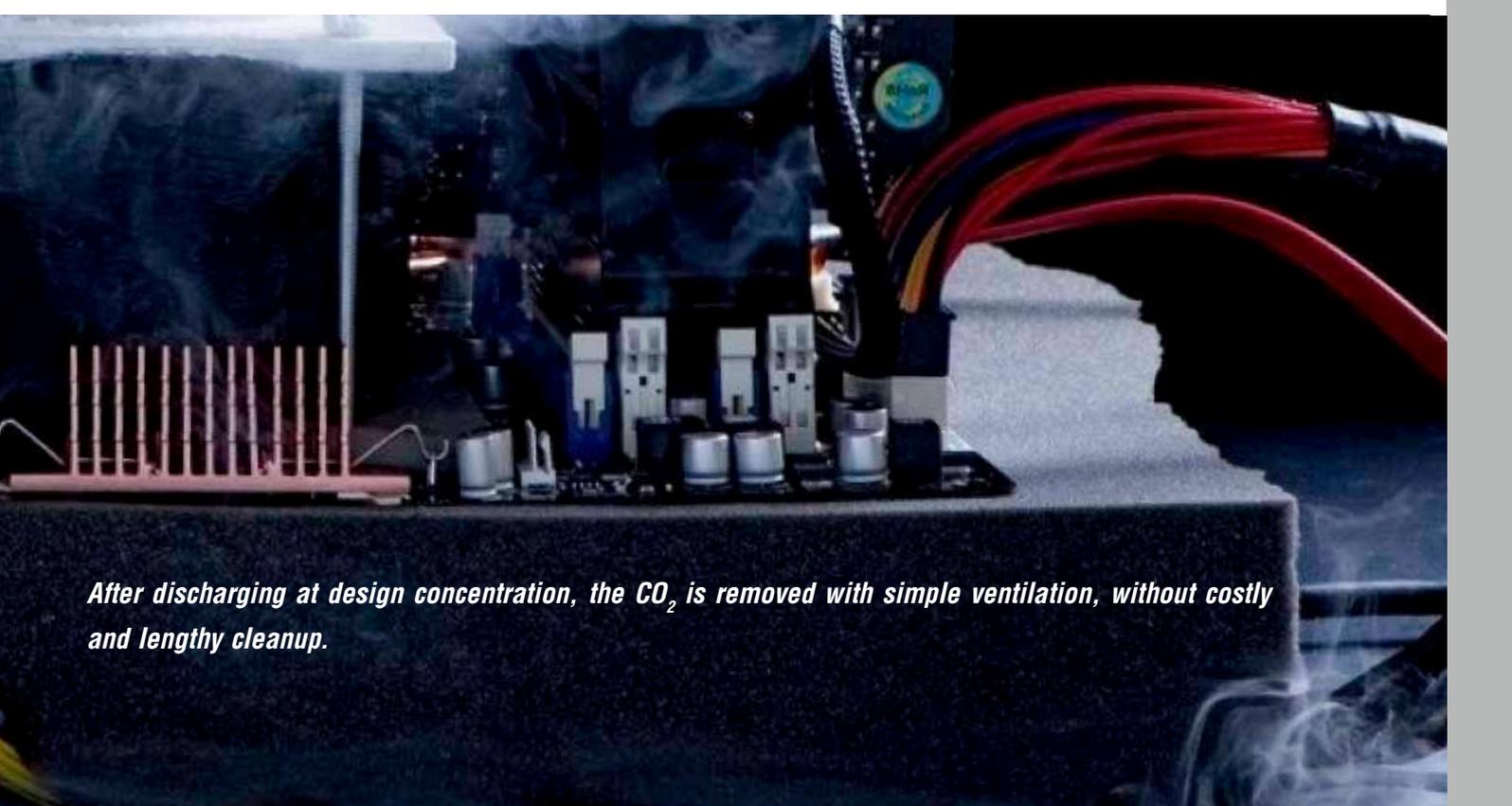


After detectors are activated as a step prior to agent discharge, the control instruments start the security mechanisms (alarms, sirens, retarders, etc.) for evacuation. The area is prepared for discharge by stopping fans, compartmentalizing areas and sealing the enclosure. If the room is unoccupied, the discharge would begin immediately upon detection.

Alternatively, the discharge can be manually triggered by staff. The manual system also includes a non-electric lockout for aborting the process.

## **CLEAN and VERSATILE, it is the universal, quick and effective solution**

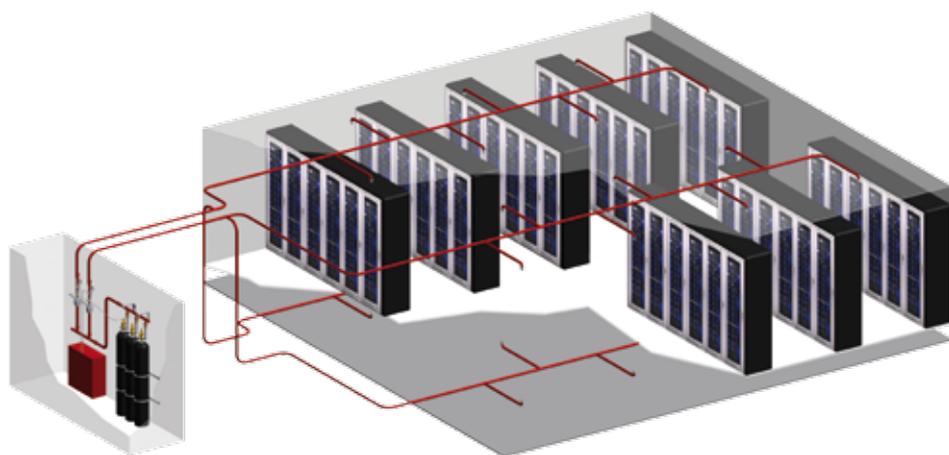
**The pressure at which the agent is released ensures that it is distributed homogeneously in all directions and in any gap** (wiring harnesses, slots or obstacles) ensuring effective extinguishing without depositing particles that could damage the equipment or affect their performance.



*After discharging at design concentration, the CO<sub>2</sub> is removed with simple ventilation, without costly and lengthy cleanup.*

# TOTAL FLOODING

SIEX fixed carbon dioxide firefighting equipment can be applied generally and extensively in rooms which are water-tight or with openings below a certain proportion of their surface (walls, floor and ceiling). It simply replaces the atmospheric air with CO<sub>2</sub> until the concentration required for fire suppression is reached depending on the content or characteristics of the room to be protected. It also cools the focus of the fire with maximum efficiency without damaging the protected property.

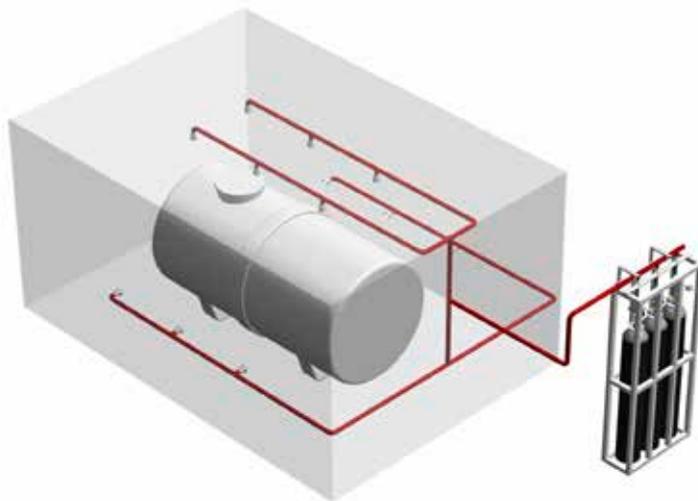


Protects the entire contents of an enclosure. If the number of openings is above a certain limit, adapting the system for local application is very easy.

For evaluating the leak tightness of an enclosure, SIEX (as accredited agent) offers a premise leak tightness test service, also known as a Door Fan Test. It consists of an in situ check of actual leaks to determine the losses and determine if the sealing of cracks and openings needs to be re-addressed.

# LOCAL APPLICATION

SIEX supplies CO<sub>2</sub> equipment for local application that provides maximum fire-fighting efficiency, ensuring rapid and safe extinguishing.



The agent is discharged within 30 seconds, which extinguishes the fire quickly, minimizing the damage.

**It is used whenever the openings of a room exceed a certain limit** of the total surface or when the protected asset is in a large room that makes total flooding of the entire enclosure infeasible or unnecessary.



## SPECIAL APPLICATIONS

CO<sub>2</sub> stands out for its versatility, adaptability and suitability to protect a host of hazards, including working conditions where the use of other gaseous agents is infeasible.

The advice from our technical department, coupled with the extensive experience and SIEX's approved calculation software will ensure strict regulatory compliance so you can rest assured to have your critical or valuable assets protected.

### MARINE SECTOR

Governed by the sector-specific SOLAS Convention, it covers the protection of enclosures such as: machinery and pump rooms, loading areas, storerooms, kitchens, ducts, etc.

CO<sub>2</sub> is so competitive mainly due to its low replacement cost, high geographical availability and three-dimensional action for quick, complete and homogeneous flooding, that it is ideal for marine use.

SIEX equipment is approved by collaborative entities such as: Bureau Veritas, Lloyd's Register, RINA, DNV, etc.

**BUREAU VERITAS**  
Certification





MACHINERY ROOMS



TURBINE ROOMS



TRANSFORMERS



PAINT BOOTHS



FALSE CEILING  
AND RAISED FLOOR



STORAGE OF  
FLAMMABLE  
LIQUIDS



PRINTING INDUSTRY



ELECTRICAL  
PANELS



SILOS



KITCHENS

## SPECIAL PROTECTION

Includes plants which, by their nature, require a specially designed extinguishing system, for example: kitchen hoods, fryers, rotary and thermal treatment devices, etc.

## EXTENDED DISCHARGE, SECOND DISCHARGES AND DEEP-SEATED FIRES

SIEX has equipment suitable for enclosures with too many openings which cannot be closed and where therefore the design concentration cannot be maintained during the stipulated hold time. This special equipment is also advisable in enclosures with ventilation or with an abundance of oxygen (such as generator rooms). The minimum duration of the extended discharge is 10 minutes, during which time the minimum concentration required will be maintained.

Second discharges are designed for fully heated liquids (baths, buckets, etc.). Finally, for deep-seated fires, SIEX designs equipment that cools the fuel and prevents reactivation of smoldering fires.

# COMPONENTS

## CYLINDERS

They are manufactured in seamless steel for high pressure and are offered in a wide variety of storage configurations. Tested for working pressure of 140 bar at 50 °C, guaranteeing maximum safety.

The configuration of the cylinder bank includes a pilot bottle of nitrogen for the activation of banks containing more than nine units.

The valve assembly, cylinder, burst disc and protections are VdS certified and CE and π marked, vital to ensure their quality and suitability.

CYLINDER CAPACITY			
CODE	VOLUME (L)	LOAD (lbs)	LOAD MÁX.
CM2	2.7	4.4	2 kg
CM4	4.7	6.9 - 7.7	3.12-3.5 Kg
CM6	6.7	9.9 - 11	4.5-5 kg
CM13	13.4	19.8 - 22	9-10 kg
CM26	26.8	39.7 - 44	18-20 kg
CM40	40.2	59.5 - 66	27- 30 kg
CM67	67	99 - 110	45-50 kg
CM80	80	116.8 - 132	55-60 kg
CM100	100	147 - 165	66.7 - 75 kg
CM120	120	176.4 - 198.4	80 - 90 kg
CM140	140	206 - 231.5	93.4 - 105 kg
CM150	150	220.5 - 248	100 - 112.5 kg

## CYLINDER VALVES

The RGS-MAM-11-1, 12-1 and 12-1C valves are high-flow valves and quick-opening, facilitating the tasks of recharging and maintenance. They are built in brass and include burst disc. Subjected to the most stringent tests, they ensure the highest quality and most reliable operation.

## ACTUATORS

They serve the function of triggering discharge. They are arranged in the valve ports and can be activated as required:

ELECTRIC  
MANUAL  
PNEUMATIC

PYROTECHNIC FIRING PIN  
EXPLOSION-PROOF

These devices can be installed together:

PNEUMATIC-MANUAL  
PYROTECHNIC-MANUAL  
ELECTRO-MECHANICAL  
REMOTE MANUAL



## NOZZLES

Effectively release and distribute extinguishing gas in the area or equipment. The orifice plate size and calibration are determined based on specific hydraulic calculations. The model depends on the type of application:

SIZES AVAILABLE FROM 3/8" TO 2", DEPENDING ON MODEL, MADE OF STAINLESS STEEL, CHROME, BRASS OR ALUMINUM.

**ERDF nozzles:** for total flooding of the enclosure, placed either vertically covering 360° (centred) or 180° (next to wall).

**CADIC nozzles:** for high-projection local application. Cylindrical-conical shaped, placed around the hazard facing the same.

● **Jet nozzles:** used often for duct total flooding, also available with flange and protection against clogging by dirt or dust.

**CADIBV low-velocity nozzles,** used for local application on flammable liquid fires to prevent leakage. Burst disc for protection can be included, which prevents possible clogging by particles or harmful substances.



## **SAFETY FEATURES**

**SIEX has developed the widest range of security and control devices on the market to ensure the safety of occupants and eliminating any risk.**

### **PNEUMATIC RETARDERS**

They allow evacuation prior to discharge, delaying it 30 or 60 seconds. They are available for direct or indirect action, depending on how they act on the master cylinder and the pilot cylinder, respectively. They include a manual release to cancel the delay. They operate autonomously and feature automatic activation.

### **PRESSURE DAMPERS**

They prevent structural damage to the enclosure due to excess pressure during agent discharge, allowing displaced air to be released outdoors and subsequently sealing the room to ensure leak tightness.

### **ODORIZER**

Emits a strong smell together with the gas. It prevents accidents by warning people of the presence of the agent during discharge and after ventilation, but it is extremely important as a warning in the event of small CO<sub>2</sub> leaks and releases, avoiding any danger.

### **PNEUMATIC SIRENS**

They warn of impending extinguishing action. They are activated automatically and autonomously when the system is triggered.

### **REMOTE MANUAL PULL RELEASE**

Serves to safely initiate the discharge from a distance. Located next to the exit, designed to mechanically activate the system via a tensioned steel cable connected to the cylinder or pilot cylinder.

### **PNEUMATIC CLOSING OF VENTILATION FLAPS**

They seal the vents or openings of the enclosure, to minimize loss of agent. Operation is automatic and autonomous, prior to CO<sub>2</sub> discharge.

## AUXILIARY VALVES

The **ISOLATING VALVE** blocks and diverts the activation of the pilot cylinder to prevent accidental discharge of the auxiliary cylinders.

The manifold's **PIPED EXHAUST relief valves** facilitate a controlled outlet for gas should its pressure increase dangerously, safeguarding the system's safety.

The **THREE-WAY VALVE** prevents accidental discharge during handling, or directs the release between the main and backup cylinder banks in the selector valve kit. In this situation, the system blocks the accidental triggering of the pilot cylinder, diverting the pressure to a vent zone and thus prevent discharge of the cylinder bank. Optional electrical signal to the fire panel available.



## SHUT-OFF VALVE WITH ELECTRIC SIGNAL

Increases the system's security level, especially in maintenance operations, blocking the accidental discharge of agent. a supervisory switch warns about valve status.

## QUALITY AND ADVICE

SIEX-CO<sub>2</sub><sup>TM</sup> meets national, international and other specific regulations.  
Meets NFPA 12, ISO 6183, CEA 4007, CEPREVEN, SOLAS (marine).

We comply with European CE and American UL and FM.



## EQUIPMENT CONTROL AND OPTIMIZATION

### CONTINUOUS WEIGHING

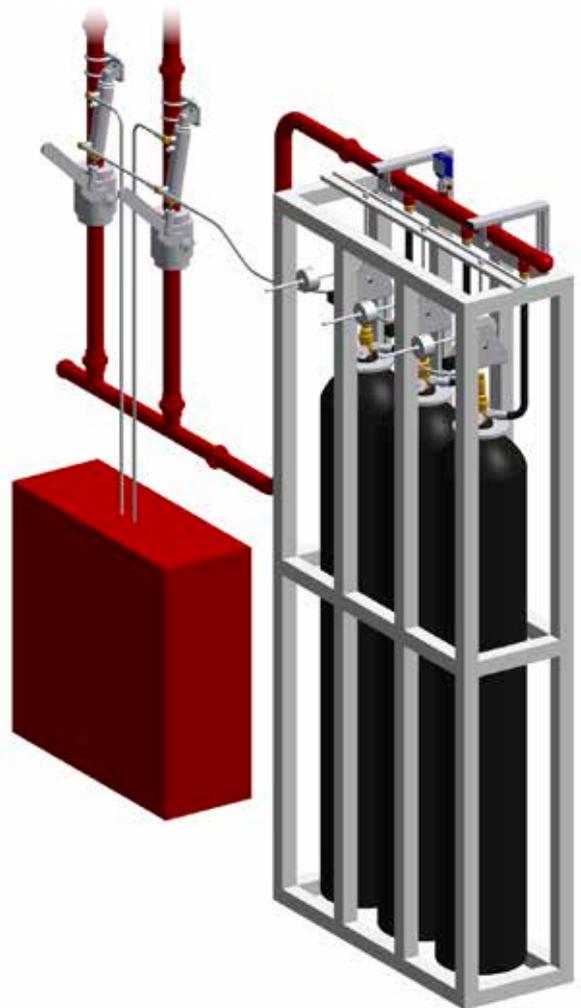
SIEX-CO<sub>2</sub>™ features continuous weighing devices to ensure accurate control of the agent fill and therefore guarantee safe and effective extinguishing. Since it is a harmful gas in normal extinguishing concentrations, the continuous weighing feature is vital for controlling leaks, which may otherwise go unnoticed and pose a serious threat.

**APPROVED, EASY-TO-INSTALL SYSTEM.** Very effective thanks to its mechanical operation, without contacting the agent: bottles hang by a counterbalanced mechanical device that sends a signal if the balance is changed, either due to discharge or leakage of any kind.

Fire panel notified of any changes in the weight of the cylinder (between 5% and 10%). Stored, pressurized liquefied CO<sub>2</sub> cannot be controlled with gauges or pressure switches. In the event of a leak, part of the liquefied gas evaporates, whereby **the pressure in the cylinder remains constant while the fill level drops inadvertently. This has a double effect:** it is an odourless, toxic gas dangerous to personnel, and in the event of a fire, there may not be sufficient remaining agent for effective extinguishing.

### PRESSURE SWITCH

It can be attached to the valve of the inert gas pilot cylinder. This device allows controlling the internal pressure in the activation system, sending a signal to the fire panel in case of failure.



### GAUGE WITH ELECTRICAL CONTACTS

It allows knowing the pressure inside the inert gas pilot cylinder at all times, locally or remotely. It sends a signal to the control panel should there be any pressure changes (involving gas loss, either by discharge or leaks).

# BENEFITS OF USING SIEX-CO<sub>2</sub><sup>TM</sup>

## GREAT PROPERTIES

- **Multipurpose:** it is the only extinguishing gas that allows total flooding and local application.
- **Wide range of uses:** solid fires, flammable liquids, electrical equipment, etc.
- Suitable for **special extinguishing situations:** hoods, ducts, marine, extended or double discharges, deep-seated fires, etc.
- It is stored as liquefied gas, which translates into **compact, cost-efficient and manageable equipment.**

## INSTALLATION & MAINTENANCE

- **Immediate resumption** of activity, no residues, no cleaning work and no harm to documents or assets.
- Very well-known and widespread: **low cost** and extensive global availability.
- Innovative valves for **easy handling and recharging.**
- Comprehensive advice at every stage.

## SAFETY AND COMMITMENT

- **Environmentally friendly:** no impact on ozone.
- Wide experience in its use and **proven efficiency.**
- SIEX comprehensive **safety devices:** personnel can evacuate safely.
- **International certifications and approvals** from prestigious organizations, which ensures the quality and safety of the system and its components. VdS, UL and FM.

## VERSATILE AND EFFICIENT EXTINGUISHING

- **Omnidirectional:** homogeneously distributed even among obstacles or tight spaces.
- **Dual extinguishing mechanism:** smothering and cooling.
- Clean and **does not damage the equipment.**
- Provides its own pressure: allows **long and complex pipe runs.**

## **SIEX**

**C. MERINDAD DE MONTIJA Nº 6  
P.I. VILLALONQUÉJAR 09001  
BURGOS (SPAIN)**

**TLFNO: +34 947 28 11 08  
WEB: WWW.SIEX2001.COM**

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