Technical Datasheet

Active Chemical Suppression and Isolation System

The **ExSuppression chemical explosion suppression system** is an active protection solution designed to detect and neutralize an explosion in its initial phase within industrial equipment. The system acts in **milliseconds**, extinguishing the incipient flame and limiting the pressure rise before the explosion fully develops, thus preventing structural damage to the protected equipment.

The system is activated by signals from **explosion detectors**, such as dynamic pressure sensors or infrared optical detectors. These signals are processed by a **control unit**, which instantly activates rapid-discharge suppressors when an incipient deflagration is detected. The suppressors release an extinguishing **agent within** the protected volume. This agent disperses rapidly, inhibiting combustion, extinguishing the flame, and reducing the explosion pressure to safe levels.

The system can be integrated with **chemical explosion isolation**, preventing the deflagration from propagating through ducts or connections to other process equipment.

Key Advantages

- Ultra-fast response: Acts in milliseconds from the moment an explosion is detected, limiting pressure and preventing equipment damage.
- Active process protection: The explosion is extinguished within the equipment without the need to release pressure or flames to the outside.
- Protection of interconnected processes: Integration with chemical isolation systems prevents the explosion from spreading to other equipment.
- High operational reliability: Continuous system monitoring via detectors and a control unit with monitoring and self-diagnostic functions.
- Flexible configuration: A single controller can manage multiple suppressors, adapting to different process configurations.
- Food industry compatible: Available with suppressants suitable for food processing.

Standards & Certification

- ATEX Certification: LOM 13ATEX7045X compliant with EN 14373 - Explosion suppression systems
- ATEX Marking: Ex D

Applications

Chemical suppression is particularly suitable for enclosed equipment with the potential presence of combustible dust, where explosion venting is not feasible, or when a fully contained protective solution is required within the process.

Typical applications:

- Bucket elevators.
- Filters, dust collectors, and cyclones.
- Pneumatic conveying systems.
- Storage silos and process vessels.
- Mills, dryers, and other equipment connected in series.
- Process lines with multiple interconnected pieces of equipment.
- Installations in the food, chemical, wood, paper, biomass, and metallurgical industries.

Main Characteristics

Dust type	Organic and inorganic dusts, up to Kst = 250 bar·m/s
Extinguishing Agent	Sodium bicarbonate (food-grade option available)
Main Supply	230 V AC -10% to +15%
Output Voltage	24 V DC
Battery Supply	24 V DC max. 2 A
Current operating	200 mA
Pred max.	1 bar
Discharge Section	3" (75 mm)
Working temperature	-20 ºC to + 70ºC

Components

> **Control Unit – SUCDL.**

This unit processes detector signals and activates the suppression system. It manages multiple protection zones, with continuous system monitoring, alarm management, and event logging. Its modular design allows it to adapt to different risk levels and process configurations.

- Configurable operating logic per line
- Zonal alarm relays
- Fault and event memory

Main Supply	230 V AC ± 5%
Secondary Supply	24 V DC ± 5%
Actuation Output	24 V DC max. 2A
Battery Backup Time	4 hours
Protection Rating	IP66
Storage and Operating Temperature	- 20ºC to 60ºC

> Detection System – SUDetP Explosion Detector.

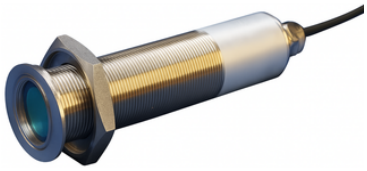
A highly sensitive pressure sensor designed to detect, in milliseconds, the overpressure characteristic of an incipient explosion. It continuously monitors the process and sends an activation signal to the control system when a sudden pressure change is detected. Certified for use in explosive gas and dust atmospheres.

Detection Principle	Ceramic capacitive
Pressure Measurement	Dual channel
Pressure Range	-200 to +800 mbar
Response Time	< 1 ms
Permissible Overpressure	2 bar
Vacuum Resistance	500 mbar
Output Signal	4–20 mA
Power Supply	7,5–30 VDC
Working temperature	-20 °C to +80 °C
Maximum Humidity	80%
Protection Rating	IP65
Certifications	ATEX, IECEx
ATEX Marking	Ex ia IIC T4 Ga | Ex ia IIIC T135 °C Da
Requires intrinsic safety barrier	

> FST Spark Explosion Detector.

The FST-4 optical detector instantly detects the infrared radiation emitted by an incipient combustion, allowing for the immediate activation of the extinguishing system before dangerous overpressures are generated or the explosion propagates.

- Ultra-fast response
- Suitable for environments with ambient light (without direct sunlight)
- Detector with quick-release mounting. With pre-assembled cable (2 m) and plug for connection to the circuit board in the KK3 ATEX
- Maximum operating temperature: 60°C
- For Zone 20 (dust)



> Suppression bottle - SUP0311.

The suppression cylinder is the component responsible for storing and releasing the extinguishing agent during an explosion. Upon detection of an incipient deflagration, the system activates the suppressor, which discharges the chemical agent at high speed into the protected equipment. The rapid dispersion of the agent inhibits combustion, extinguishes the flame, and limits the pressure increase of the explosion, preventing damage to the equipment and reducing the risk of the explosion spreading to other elements of the process.

- Extremely fast response
- Dual activation for greater reliability
- Pressure gauge
- Low pressure switch option

Triggering Element	Gas generator
Extinguishing Agent	Sodium bicarbonate (food-grade option available)
Volume	10L
Extinguishing Agent Charge	6 kg
Working Pressure	60 - 90 bar (+5% / 20ºC)
Discharge Section	3” (75mm)
Working temperature	-20 °C a +70 °C
Protection Type	II 3D T85ºC IP65
Application	Zone 22